

GREAT INTERNATIONAL FISHERIES EXHIBITION.  
LONDON, 1883.

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UNITED STATES OF AMERICA.

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CATALOGUE

OF THE

APPARATUS FOR THE CAPTURE OF FISH

EXHIBITED BY THE

UNITED STATES NATIONAL MUSEUM.

BY

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CURATOR OF THE FISHERIES COLLECTIONS, U. S. NATIONAL MUSEUM, AND  
ASSISTANT U. S. FISH COMMISSION.

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\* The classification here adopted is, with a few unimportant exceptions, that devised by Prof. G. Brown Goode, and employed by him in his catalogue of the Government exhibit at the Centennial Exhibition at Philadelphia in 1876 of apparatus for the capture of animals; and in his catalogue of the fishery apparatus exhibited by the United States at the Berlin Fisheries Exhibition in 1880.

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## INTRODUCTORY NOTE.

The apparatus enumerated in this catalogue, including as it does many of the primitive forms employed by the North American Indians and Eskimo and the inhabitants of all portions of the country, for both fresh-water and sea-fishing, is exceedingly varied, and some of the forms are of peculiar interest. The list does not pretend, however, to include all of the American forms, or, indeed, all of those in the collections of the National Museum, but simply those that were sent to the London Fisheries Exhibition.

It frequently happens that the fishermen are obliged to partially cure their fish before landing them, in which case the apparatus employed in this work, as it is used by the fishermen themselves, is included with the apparatus of capture. The other implements used in preparation are excluded, and may be found in the catalogue of fishery products, prepared by Mr. A. Howard Clark, of the U. S. National Museum.

The apparatus employed in whaling being fully treated in the catalogue on "The Whale Fishery and its Appliances," prepared by Mr. James Temple Brown, who had charge of the collection and installation of the whaling exhibit, is also omitted.

In order to make the collection more intelligible to the English public, a large series of fishery photographs, representing all of the more important commercial fisheries in actual operation, were secured in uniform 8 by 10 inch negatives, by Mr. T. W. Smillie, the museum photographer, who visited the fishing districts for this purpose. The more important views were enlarged by means of the electric light to 30 by 40 inch photographs, many of them being retouched with crayon and India ink to render them more perfect in detail. This valuable collection was sent to London, and used both for purposes of decoration and illustration. These photographs, which number several hundred, are included with the apparatus which they are intended to illustrate.

An elaborate report on the history and development of American fishery apparatus is being prepared by Mr. G. Brown Goode and others, for publication in the reports of the United States Fish Commission; any detailed description of apparatus or history of the development of any particular form is, therefore, unnecessary in this place.



## A.—APPARATUS OF DIRECT APPLICATION.

### I.—HAND IMPLEMENTS.

#### 1. UNARMED CLUBS.

##### CLUBS USED FOR KILLING SEALS AND SEA-ELEPHANTS.

###### SEALER'S CLUB.

A rough hickory stave, with knobbed handle and rope wrist-becket. Used by antarctic sealers and sea-elephant hunters. Length, 3 feet 3 inches. New Bedford, Mass., 1882. 54,533. Gift of Loum Snow & Son. Upon this club may be seen traces of blood from seals which its blows have killed.

###### SEALER'S CLUB.

A rough hickory stave. Used by the seal and sea-elephant hunters of Connecticut in the antarctic seal-grounds. Length, 4 feet. New London, Conn., 1880. 54,534. Gift of Lawrence & Co.

##### CLUBS USED FOR KILLING SALMON.

###### SALMON CLUB.

Made of cedar; end rudely carved in form of head of some animal. Length, 15 inches. Indians of Columbia River, 1860. 651. Collected by George Gibbs.

##### CLUBS USED FOR KILLING HALIBUT AND OTHER LARGE FISH BEFORE TAKING THEM INTO THE BOAT.

###### FISH CLUB.

Used for killing fish. Indian name "Tinethl." Length, 14½ inches. Makah Indians, Neah Bay. 72,660. James G. Swan. Every fisherman carries a club, and on hauling a fish to the surface invariably knocks it on the head to prevent it from jumping about in the canoe.

###### FISH CLUB.

Large end, natural formation of the root. Ornamentation on the end of handle was made by entwining the small limbs of a growing fir sapling into the form of a "Turk's head." In three or four years the sapling was cut, peeled, and finished. Length, 18 inches. Makah Indians, Neah Bay, W. T., 1883. 72,681. James G. Swan. Used by native fishermen to stun the fish by striking it on the head before the hook is removed from the mouth. Such clubs are usually nothing more than a billet of wood roughly fashioned, though sometimes rudely carved.



**HALIBUT KILLER.**

Made of hard wood, rudely carved. Used by Indians and Aleuts in the halibut fishery of Southern Alaska. Length, 20 inches. Southern Alaska, 1882. 67,828. Collected by John J. McLean.

**HALIBUT-KILLER.**

Made of oak. The head carved in the form of an eagle. Used by Indians and Aleuts in the halibut fishery of Southern Alaska. Length, 20 inches. Southern Alaska, 1882. 67,827. Collected by John J. McLean.

**HALIBUT-KILLER, OR GOB-STICK.**

Made by fishermen from the butt of an ash oar. The blunt end is used as a club; in the flat end is a notch for detaching hooks which have been swallowed. Near the blunt end is driven a peg, sometimes used to hold the line while extracting a swallowed hook. Length, 2 feet. Gloucester, Mass., 1879. 32,717. Gift of Capt. Philip Merchant, schooner Marion. This halibut-killer was in use for several months, and with it at least 1,000 halibut have been killed.

**CLUB, OR GOB-STICK.**

Lothrop's improved pattern. Made of white oak with brass gulleter. Used in the cod and halibut fisheries. Length, 28 inches. Gloucester, Mass., 1882. 54,532. U. S. Fish Commission. Unlike the old-fashioned halibut-killer, this implement has the club head and gulleter at the same end.

**DRAWINGS ILLUSTRATING FISHERIES IN WHICH CLUBS ARE EMPLOYED.****SEA-ELEPHANT HUNTING.**

An India-ink sketch of a portion of the shore of Herd's Island, covered with sea-elephants and men engaged in killing them with clubs and skinning them. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott, artist.

Flensing sea-elephants. An India-ink sketch of fishermen at Herd's Island engaged in skinning sea-elephants which they have killed with clubs, and preparing their skins for shipment. Size 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott, artist.

**2. KNIVES.****ABORIGINAL KNIVES OF STONE AND METAL.****KELP KNIVES.****KELP-CUTTER.** (Indian name "Che-bai-ak.")

Used by natives in procuring kelp for fishing-lines and other purposes. The kelp is gathered, while growing, at certain points

## KELP-CUTTER—Continued.

only, and is found in its best condition for the uses of the natives during July and August. Length,  $42\frac{1}{2}$  inches. Port Townsend, W. T., 1883. 72,658. James G. Swan. Resembles in shape the capital letter **A**, the cross-piece forming the blade or knife for severing the kelp. A loop of cedar withe, for making fast a line, is fastened to each leg of the instrument. This apparatus is slipped over the bulb of the kelp and lowered to the bottom by means of a stone sinker, and a slight pull on the line severs the stem close to the ground.

## SNOW-KNIVES.

## SNOW-KNIFE.

Long blade, said to be made from a whaleman's boarding-knife, the original having been made from a navy cutlass; handle, walrus ivory. Length,  $17\frac{1}{2}$  inches. New Bedford, Mass., 1882. 68,125. U. S. Fish Commission. Obtained from one of the crew of whaling brig George and Mary. Made and used by Eskimo, Hudson Bay, for cutting out blocks of ice and snow in building igloos, as well as for cutting walrus meat, &c.

## FISH KNIVES FOR GENERAL USE.

## FISH-KNIFE.

Slate blade, with convex edge, set edgewise in wooden handle and secured by lashing of a strip of skin. Length,  $3\frac{3}{4}$  inches. Big Lake, Alaska, 1879. 36,303. E. W. Nelson.

## FISH-KNIVES (5).

Short slate blades, with convex edges, set edgewise in wooden handles. Length,  $3\frac{1}{4}$  to  $5\frac{3}{4}$  inches. Bristol Bay, Alaska, 1882. 55,916. Charles L. McKay.

## FISH-KNIVES, old (2).

Short slate blades, with convex edges, set edgewise in wooden handles. Length,  $3\frac{1}{4}$  and  $3\frac{7}{8}$  inches. Bristol Bay, Alaska, 1882. 55,917. Charles L. McKay.

## FISH-KNIFE.

Carefully finished; curved slate blade, pointed and having one edge, inserted in the end of a rudely-carved bone handle. Length,  $6\frac{1}{2}$  inches. Bristol Bay, Alaska, 1882. 56,025. Charles L. McKay.

## FISH-KNIFE.

Blade, roughly chipped jasper, set edgewise in wooden handle. Length,  $3\frac{3}{4}$  inches. Hotham Inlet, Alaska, 1880. 63,766. E. W. Nelson.

## FISH-KNIFE.

Blade, roughly chipped jasper, set edgewise in wooden handle. Length,  $3\frac{1}{2}$  inches. Hotham Inlet, Alaska, 1880. 63,765. E. W. Nelson.

## FISH-KNIVES (3).

Thin iron blades; two are set edgewise in ivory handles, the other is turned on itself in a scroll-shaped handle. Length,  $3\frac{7}{8}$  to  $6\frac{3}{4}$  inches. Bristol Bay, Alaska, 1882. 55,918. Charles L. McKay.

## FISH-KNIFE.

Thin iron blade, set edgewise in ivory handle. Length,  $3\frac{1}{4}$  inches. St. Lawrence Island, Alaska, 1880. 63,277. E. W. Nelson.

## SHEATH-KNIVES.

## DAGGERS (4) AND SHEATHS (3).

Daggers consist of metal arrow-heads riveted into slots in short bone heads, in the other ends of which are inserted short plain wooden handles from  $3\frac{1}{2}$  to 7 inches long. Sheaths consist of two pieces of cedar hollowed out and lashed together. Lengths: daggers, 10 to 12 inches. 16,106, 16,107, 16,108, 16,110. Lengths: sheaths,  $4\frac{1}{2}$  to 5 inches; breadths,  $1\frac{1}{4}$  to 2 inches. 16,104, 16,106, 16,110. Magemut Eskimos, Cape Etolin, Nunivak Island, Alaska, 1874. Collected by William H. Dall.

## DAGGER.

Metal arrow-head riveted into a slot in a short bone head, in the other end of which is inserted a short, plain, wooden handle three-fourths of an inch in diameter. Nunivak Indians. Length, 11 inches; handle, 7 inches. Collected by William H. Dall.

## SABER.

A common cavalry saber, obtained from a whaling-vessel. Length, 37 inches. New London, Conn., 1882. Gift of Lawrence & Co. 56,886. Used on board ship in the manufacture of boarding-knives, &c.

## SAILORS' SHEATH-KNIVES.

Steel blades, thick and dull, with round point. Wooden handles. First and third qualities. Leather sheaths and belts. Centennial collection, 1876. 29,427-8. Gift of Wilcox, Crittenden & Co., Middletown, Conn. This style of blade is called "law abiding," and is the only style of sheath-knife allowed by law to sailors or fishermen.



## HUNTERS' KNIVES.

Steel blades. Ivory, ebony, and hard-wood handles. Metal or solid guards. Blades, 5 to 7 inches long. Centennial collection, 1876. 26,143-163-225-6-8. Made by John Russell Cutlery Company, Turner's Falls, Mass. Carried by anglers and sportsmen.

## MODERN FISH KNIVES.

## BAIT KNIVES.

## COD BAIT KNIFE.

Steel blade; single edge. Hard-wood handle. Length: blade, 8 inches; handle,  $4\frac{1}{2}$  inches. Gloucester, Mass., 1878. 32,665. U. S. Fish Commission. For cutting bait; carried in dories to remove refuse fish from trawls.

## MACKEREL BAIT KNIFE.

Small size; steel blade, single edge. Pine handle. Length: blade,  $3\frac{1}{2}$  inches; handle,  $3\frac{1}{2}$  inches. Gloucester, Mass., 1878. 32,672. U. S. Fish Commission. Used in mackerel hook-fishery to cut bait in small pieces.

## MACKEREL BAIT KNIFE.

Large size; steel blade, single edge. Pine handle. Length: blade,  $4\frac{1}{4}$  inches; handle,  $3\frac{3}{4}$  inches. Gloucester, Mass., 1878. 32,671. Gift of Alex. McCurdy, maker. Used in mackerel hook-fishery to cut bait in small pieces.

## HALIBUT BAIT KNIFE OR CHOPPER.

Steel blade, single edge. Pine handle, bell-shaped. Length: blade,  $13\frac{1}{2}$  inches; handle,  $5\frac{1}{2}$  inches. Gloucester, Mass., 1880. 39,180. Gift of Alex. McCurdy, maker. Latest pattern of knife used on vessels to cut up fish for halibut bait.

## HALIBUT BAIT KNIFE.

Steel blade, heavy and wide, razor-shaped, single edge. Hard-wood handle, riveted with metal pins, clinched and counter-sunk. Length: blade,  $11\frac{1}{2}$  inches; handle, 5 inches. Gloucester, Mass., 1878. 32,664. U. S. Fish Commission. Used on vessels to cut up fish for halibut bait.

## HALIBUT BAIT KNIFE.

Steel blade, single edge. Pine handle. Length: blade,  $11\frac{1}{2}$  inches; handle, 6 inches. Gloucester, Mass., 1877. 29,406. Gift of Alex. McCurdy, maker. Used on vessels to cut up fish for halibut bait.

## HALIBUT BAIT KNIFE.

Steel blade, heavy, curved, single edge. Hard-wood handle, hook-shaped. Length: blade, 14 inches; handle,  $6\frac{1}{4}$  inches. New

**HALIBUT BAIT KNIFE—Continued.**

London, Conn., 1876. 26,201. Made by John Russell Cutlery Company. Used on New London fishing vessels to cut up small cod and other fish for halibut bait.

**HALIBUT BAIT KNIFE.**

Steel blade, heavy, curved, single edge. Beech-wood handle, hook-shaped. Length: blade, 12 inches; handle,  $5\frac{3}{4}$  inches. New London, Conn., 1876. 26,196. Centennial collection. Used on New London fishing vessels to cut up small cod and other fish for halibut bait.

**HALIBUT BAIT KNIFE.**

Steel blade, wide and heavy, single edge. Hard-wood handle, straight. Length: blade, 12 inches; handle, 6 inches. New London, Conn., 1876. 26,159. Made by John Russell Cutlery Company. Used on New London fishing vessels to cut up small cod or other fish for halibut bait.

**MINCING-KNIFE.**

An old mincing-knife which has seen many years of service, showing the manner in which the width of blade has been reduced by frequent applications to the grindstone. Length, 36 inches. New Bedford, Mass., 1882. 56,849. Gift of Thomas Knowles & Co.

**SPLITTING AND RIPPING KNIVES.****COD SPLITTING KNIFE.**

Steel blade, with curved edge. Pine handle. Length: blade,  $5\frac{3}{4}$  inches; handle,  $4\frac{1}{2}$  inches. Gloucester, Mass., 1878. 32,687. U. S. Fish Commission. For splitting fish and removing back bone.

**COD SPLITTING KNIFE.**

Steel blade, with straight edge. Pine handle. Length: blade,  $6\frac{1}{2}$  inches; handle,  $4\frac{3}{4}$  inches. Gloucester, Mass., 1878. 32,668. U. S. Fish Commission. For splitting fish and removing back-bone.

**MACKEREL SPLITTING KNIFE.**

Steel blade, single edge, round end. Factory made handle. Length: blade,  $3\frac{5}{8}$  inches; handle,  $3\frac{1}{2}$  inches. Gloucester, Mass., 1878. 32,673. U. S. Fish Commission. Used to split mackerel for salting.

**MACKEREL SPLITTING KNIFE.**

Steel blade, single edge. Pine handle, stained, pewter mounted. Length: blade,  $3\frac{1}{2}$  inches; handle,  $4\frac{1}{4}$  inches. Gloucester, Mass.,

**MACKEREL SPLITTING KNIFE—Continued.**

1877. 29,408. Gift of Samuel Elwell, jr. Used to split mackerel for salting.

**MACKEREL SPLITTING KNIFE.**

Steel blade, single edge, round end. Home-made handle, pewter mounted. Length: blade,  $3\frac{1}{8}$  inches; handle,  $3\frac{5}{8}$  inches. Gloucester, Mass., 1877. 29,402. Gift of Alex. McCurdy, maker. Used to split mackerel for salting.

**FISH SPLITTING KNIFE. (Indian name "Ko-che-tin.")**

Used for splitting various kinds of fish, and for cutting halibut into thin flakes to facilitate drying. Length, 6 inches. Makah Indians, Neah Bay, W. T., 1883. 72,661. James G. Swan. The Makahs prefer this form of knife to any other for flaking halibut, as it is well adapted to the work. The women use it with great dexterity.

**HADDOCK RIPPING KNIFE.**

Steel blade, single edge. Whitewood handle. Length: blade,  $4\frac{1}{2}$  inches; handle, 5 inches. Gloucester, Mass., 1877. 29,415. Gift of Alex. McCurdy, maker. For ripping the fish from throat to vent in dressing cod-fish.

**FLITCHING KNIVES.****HALIBUT FLITCHING KNIFE.**

Steel blade, straight back, single edge. Pine handle. Length: blade,  $9\frac{3}{4}$  inches; handle,  $5\frac{1}{2}$  inches. Gloucester, Mass., 1877. 32,690. Gift of Adolph Voss, maker. Used on fishing vessels to cut off flitches or strips of halibut for salting and smoking.

**HALIBUT FLITCHING KNIFE.**

Steel blade, straight back, single edge. Pine handle, pewter mounted. Length: blade,  $8\frac{1}{2}$  inches; handle,  $5\frac{3}{4}$  inches. Gloucester, Mass., 1877. 29,412. Alex. McCurdy, maker. Used on fishing vessels to cut off flitches or strips of halibut for smoking.

**HALIBUT FLITCHING KNIFE.**

Steel blade, long and slender, single edge. Pine handle, pewter mounted. Length: blade, 13 inches; handle 6 inches. Gloucester, Mass., 1877. 29,400. Alex. McCurdy, maker. Used by shores-men to cut off flitches or strips of halibut for smoking and fins for pickling.

## SLIVERING KNIVES.

## MENHADEN SLIVERING KNIFE.

Steel blade, long and slender, single edge. Rough pine handle. Length: blade,  $10\frac{1}{2}$  inches; handle,  $4\frac{1}{2}$  inches. Gloucester, Mass., 1878. 32,666. U. S. Fish Commission. Used to cut off the fleshy parts or slivers of menhaden to be salted for cod, haddock, or mackerel bait.

## MENHADEN SLIVERING KNIFE.

Steel blade, long and slender, straight back, single edge with one side beveled. Pine handle. Length: blade,  $8\frac{1}{2}$  inches; handle, 6 inches. Beverly Mass., 1877. 29,407. Gift of G. P. Foster. This was the earliest style of knife used by Cape Ann fishermen to prepare slivers of menhaden for cod, haddock, or mackerel bait.

## MENHADEN SLIVERING KNIFE.

Steel blade, same width from hilt to point, straight back, single edge. Pine handle, short and thick. Length: blade,  $9\frac{1}{4}$  inches; handle,  $4\frac{3}{4}$  inches. Nantucket, Mass., 1877. 29,405. Gift of Samuel Elwell, jr. This is the pattern of knife used at Nantucket to prepare slivers of menhaden for cod, haddock, or mackerel bait.

## MENHADEN SLIVERING KNIFE.

Steel blade, long and slender, single edge. Pine handle. Length: blade,  $8\frac{1}{2}$  inches; handle,  $5\frac{3}{4}$  inches. Gloucester, Mass., 1877. 29,399. Alex. McCurdy, maker. Used to cut off the fleshy parts or slivers of menhaden to be salted for cod, haddock, or mackerel bait.

## MENHADEN SLIVERING KNIFE.

Steel blade, long and narrow, single edge. Pine handle. Length: blade,  $8\frac{1}{2}$  inches; handle,  $5\frac{1}{4}$  inches. Gloucester, Mass., 1876. 25,764. Gift of Samuel Elwell, jr. Used to cut off the fleshy parts or slivers of menhaden to be salted for cod, haddock, or mackerel bait.

## HALIBUT-BAIT SLIVERING KNIFE.

Steel blade, single edge. Hard-wood handle. Length: blade, 12 inches; handle, 5 inches. Centennial collection, 1876. 26,144. Made by John Russell Cutlery Company, Turner's Falls, Mass. Used in Gloucester fisheries to slice off or "sliver" the fleshy parts of haddock and other fish for halibut bait. Sometimes used to fitch halibut.



## HEADING KNIVES.

## HALIBUT HEADING KNIFE.

Steel blade, single edge. Pine handle. Length: blade,  $17\frac{1}{2}$  inches; handle, 6 inches. Gloucester, Mass., 1878. 57,590. Gift of Adolph Voss, maker. Used for cutting off halibut heads.

## THROATING KNIVES.

## COD THROATING KNIFE.

Steel blade, single edge. Pine handle. Length: blade,  $5\frac{3}{4}$  inches; handle, 6 inches. Beverly, Mass., 1877. 29,413. Gift of G. P. Foster. Knife used in early part of this century by Grand Bankers for cutting off heads and ripping bellies in dressing codfish.

## COD THROATING KNIFE.

Steel blade, double edge. Pine handle, lead mounted. Length: blade,  $6\frac{3}{4}$  inches; handle,  $3\frac{3}{4}$  inches. Alaska pattern, 1880. 57,560. Gift of Alex. McCurdy, maker. Made at Gloucester, Mass., for use in Alaska in cutting off heads and ripping bellies in dressing codfish.

## COD THROATING KNIFE.

Steel blade, double edge. Pine handle. Length: blade, 6 inches; handle,  $4\frac{1}{4}$  inches. Gloucester, Mass., 1878. 32,670. U. S. Fish Commission. For cutting off heads and ripping bellies in dressing codfish.

## COD THROATING KNIFE.

Steel blade, single edge. White-pine handle. Length: blade, 6 inches; handle,  $4\frac{1}{4}$  inches. Gloucester, Mass., 1878. 32,669. U. S. Fish Commission. For cutting off heads and ripping bellies in dressing codfish.

## COD THROATING KNIFE.

Steel blade, single edge. Pine handle, stained. Length: blade, 7 inches; handle, 5 inches. Gloucester, Mass., 1877. 29,411. Gift of Capt. E. L. Rowe. For cutting off heads and ripping bellies in dressing codfish.

## COD THROATING KNIFE.

Steel blade, double edge. Pine handle. Length: blade,  $5\frac{1}{4}$  inches; handle,  $5\frac{1}{2}$  inches. Beverly, Mass., 1877. 29,403. Gift of G. P. Foster. Used for cutting off heads and ripping bellies in dressing cod fish.

## CHEEKING KNIVES.

## COD CHEEKING KNIFE.

Steel blade, single edge, curved. Pine handle. Length: blade,  $4\frac{1}{2}$  inches; handle,  $4\frac{1}{2}$  inches. Gloucester, Mass., 1877. 29,438. Gift of Alex. McCurdy, maker. For cutting cheeks from cod heads. Cheeks are salted and dried for food.

## WHALEMEN'S KNIVES.

(See list of apparatus employed in the whale fishery.)

## SKINNING KNIVES.

## SEAL LEANING KNIFE.

Steel blade, long, curved. Hard-wood handle. Length: blade, 12 inches; handle,  $5\frac{1}{2}$  inches. New London, Conn., 1882. 57,691. Gift of Lawrence & Co. Used by the Antarctic sea-elephant hunters to "lean" or remove flesh from the blubber.

## SEAL FLAYING KNIFE.

Steel blade, curved, single edge. Hard-wood handle. Length: blade, 6 inches; handle,  $4\frac{1}{2}$  inches. New London, Conn., 1880. 57,690. Gift of Lawrence & Co. Used by Antarctic fur-seal hunters.

## SEAL FLAYING KNIVES.

Steel blades, curved, single edge, 5 to 7 inches long. Hard-wood handles. Centennial collection, 1876. 26,211-26,213, 26,169-26,171, 26,179-26,181, 26,185-26,190. Made by John Russell Cutlery Company, Turner's Falls, Mass. Used by the seal and sea-elephant hunters of Connecticut in the Antarctic seal fisheries.

## SKINNING KNIFE.

Slate blade, bowie-knife pattern, in end of wooden handle, served with strip of bark of cedar root. Length, 11 inches. Cape Vancouver, Alaska, 1880. 43,482. E. W. Nelson.

## SKINNING KNIFE.

Arrow-shaped, slate-blade, sharp on both edges, set in the end of a wooden handle. Dug up on the site of an old village. Length, 7 inches. Saint Michael's, Norton Sound, Alaska. 43,431. E. W. Nelson.

## KNIFE, STEEL, AND SHEATH.

Case containing knife and steel. Sheath made at sea; wood, two pieces bound with brass hoops; leathern guard or strap for attaching case to waist-belt; stamped with ornamental design

## KNIFE, STEEL, AND SHEATH—Continued.

and initials (E. T.) of owner. Ordinary steel, handle "run in" with lead. Knife, bone handle, checkered; blade worn by sharpening. Length of case 10 inches, of knife 12 inches, of steel 14 inches. New Bedford, Mass., 1882. Gift of L. & W. R. Wing. 56,881. Used by the "skimmers" (men whose duty it is to skin or flay seals) in the seal and sea-elephant fishery, at Herd's Island, Patagonia, South Georges, South Shetland, Desolation Island, &c.

## PLOWS FOR CUTTING THE FLESH ALONG THE BACKBONE OF MACKEREL TO GIVE THEM A THICKER, FATTER APPEARANCE.

## MACKEREL PLOW.

Steel blade; hickory handle. Length, 8 inches. Gloucester, Mass., 1882. 54,686. Gift of Capt. George Merchant. This plow was used for many years by Captain Merchant.

## MACKEREL PLOW.

Ivory blade; hickory handle. Length, 7 inches. Gloucester, Mass., 1882. 54,684. Gift of Capt. Charles Parsons. This plow was used for many years by Captain Parsons.

## MACKEREL PLOW.

Pewter blade; ash handle, carved and profusely ornamented; marked J. Blatchford. Length,  $8\frac{3}{4}$  inches. Centennial collection, 1876. 25,775. Gift of Mrs. Hannah M. Burt.

## MACKEREL PLOW.

Steel blade; ash handle, pewter mounted. Length,  $7\frac{1}{2}$  inches. Centennial collection, 1876. 25,774. Gift of Edward Davis.

## MACKEREL PLOW.

Copper blade; hickory handle, pewter mounted. Length,  $6\frac{1}{2}$  inches. Centennial collection, 1876. 25,773. Gift of Edward Davis.

## MACKEREL PLOW.

Silver blade, made of three-cent coin; walnut handle, cut in imitation of a human leg. Length,  $7\frac{1}{2}$  inches. Centennial collection, 1876. 25,772. Gift of Sanford Freeman.

## MACKEREL PLOW.

Steel blade, semicircular edge; cedar handle, pewter mounted. Length,  $6\frac{3}{4}$  inches. Gloucester, Mass., 1876. 25,771. Gift of Samuel Elwell, jr.

## MACKEREL PLOW.

Steel blade; plain ash handle. Length, 7 inches. Gloucester, Mass., 1876. 25,770. Gift of Samuel Elwell, jr.

## MACKEREL PLOW.

Steel blade, semicircular edge; plain cedar handle. Length,  $7\frac{1}{2}$  inches. Gloucester, Mass., 1876. 25,769. Gift of Samuel Elwell, jr.

## MACKEREL PLOW.

Steel blade; oak handle, profusely ornamented with pewter; marked "E. B." Length,  $7\frac{3}{4}$  inches. Centennial collection, 1876. 25,768. Gift of Edwin Blatchford.

## MACKEREL PLOW.

Factory made. Steel blade; walnut handle, with brass shaft. Length,  $7\frac{1}{2}$  inches. Provincetown, Mass., 1876. 25,720. Gift of Central Wharf Company.

## MACKEREL PLOW.

Steel blade, three-cornered; ash handle. Length,  $7\frac{7}{8}$  inches. Harwichport, Mass., 1875. 25,674. Gift of Sanford Freeman.

## SCRAPERS AND INSHAVES.

## SCRAPER.

Roughly made handle, wood; half-ovate blade, with spur for insertion in handle; metal ferrule. Length,  $8\frac{1}{4}$  inches. New Bedford, Mass., 1882. 57,074. Gift of Jonathan Bourne. May be used as a bone-scraper or inshave.

## BONE-SCRAPER.

Handle of wood; blade of common hoop-iron, riveted to handle; roughly made. Length,  $8\frac{1}{2}$  inches. New London, Conn., 1882. 57,072. Gift of Lawrence & Co.

## BONE-SCRAPER.

Handle of rough wood; shank and iron ovate frame forming the blade, common hoop-iron, slotted in handle; blade riveted to shank. A very old specimen. Length,  $11\frac{1}{2}$  inches. New Bedford, Mass., 1882. 57,076. Gift of Thomas Knowles & Co.

## COOPER'S INSHAVE.

Handle, wood; frame, acute-ovate, with forward cutting-edge, riveted to handle. Length, 7 inches. New Bedford, Mass., 1882. 57,075. Gift of Thomas Knowles & Co. An old inshave, used for many years on a whaling vessel.



## COOPER'S INSHAVE.

Wooden handle; blade of steel, with spur for fastening to handle; no ferrule; old. Length,  $6\frac{1}{4}$  inches. New London, Conn., 1882. 57,073. Gift of C. A. Williams & Co.

## COOPER'S LARGE INSHAVE.

Socket and shank of iron; ovate frame, with sharp cutting edge forward. Length,  $19\frac{1}{4}$  inches. New London, Conn., 1882. 57,071. Gift of C. A. Williams & Co.

## COOPER'S LARGE INSHAVE.

Handle, turned wood; iron frame, with cutting edge, and rear extension for attaching to handle. Length,  $12\frac{1}{4}$  inches. New London, Conn., 1882. 57,070. Gift of C. A. Williams & Co. Used by the cooper of a whale vessel for smoothing the interior surfaces of wooden utensils.

## COOPER'S SMALL INSHAVE.

Handle, wood; frame of iron, oblong-ovate; cutting edge on forward part; spur in rear for attaching to handle; metal ferrule. Length, 10 inches. New Bedford, Mass., 1882. 57,069. Gift of John McCullough.

## COOPER'S INSHAVE.

Handle, turned wood; frame, iron; a true oblong-ovate, with blade on forward edge and spur for insertion in handle; metal ferrule. Length,  $11\frac{1}{2}$  inches. New Bedford, Mass., 1882. 57,067. Gift of Jonathan Bourne. An implement used by the cooper of a whale-ship for smoothing the interior of small utensils, such as boat-kegs, lantern-kegs, &c.

## NET-MENDER'S KNIVES.

## NET-MENDING KNIVES.

No handle; steel blade, round point, heel curled to fit middle finger like a ring. One for right and one for left hand. Gloucester, Mass., 1877. 29,439 and 29,440. Gift of Alex. McCurdy, maker.

## 3. AXES AND CUTTING SPADES.

## AXES PROPER.

(See list of apparatus employed in the whale fishery.)

## SPADES.

## CUTTING SPADES AND WHALEMEN'S SPADES.

(See list of apparatus employed in the whale fishery.)

## SPADES USED FOR DIGGING CLAMS AND OTHER INVERTEBRATES.

## ROOT AND CLAM DIGGER.

Used by women. Indian name, "Kla-pai-uk." Length,  $39\frac{1}{2}$  inches. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,677. James G. Swan.

## PHOTOGRAPHIC ILLUSTRATIONS OF FISHERIES IN WHICH SPADES ARE EMPLOYED.

## CLAM-DIGGING.

Photographs of clam-boats stranded upon the beach, with clam-diggers engaged in unloading cargoes and carrying them to the clam-shanties, where they are shucked and sold for bait or sold fresh to peddlers, who carry them through the country. Size, 8 by 10 inches. Essex, Mass., 1882. (309) 1,961. U. S. Fish Commission.

## CLAM-DIGGING.

A nearer photographic view of 1,961 (309), showing the men unloading clam-boats, and boys engaged in shelling, and peddlers' carts waiting to be loaded. Size, 8 by 10 inches. Essex, Mass., 1882. (310) 1,962. U. S. Fish Commission.

## CLAM-DIGGING.

Photograph of clam-boats stranded upon the beach, with clam-diggers engaged in unloading cargoes and carrying them to the clam-shanties, where they are shucked and sold for bait, or sold fresh to peddlers, who carry them through the country. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Essex, Mass., 1882. (309) 1,961. U. S. Fish Commission.

## CLAM-DIGGING.

A nearer photographic view of 1,961 (309), showing the men unloading clam-boats, and boys engaged in shelling, and peddlers' carts waiting to be loaded. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Essex, Mass., 1882. (310) 1,962. U. S. Fish Commission.

## CLAM AND BAIT CHOPPERS.

## CLAM-CHOPPER (old style).

Two iron blades, parallel to each other and joined at the top to a shank which is driven into a wooden handle. Length of blades, 8 inches; width,  $1\frac{1}{2}$  inches; length of handle,  $2\frac{1}{3}$  feet; diameter,  $1\frac{1}{2}$  inches. Rockport, Mass., 1840. 54,418. Gift of W. B. Parsons. Used for chopping up clams for mackerel bait

## CLAM-CHOPPER.

Iron; a circular steel-edged blade with straight blade crossing at right angles, these being joined to iron handle, which has an eye or loop at top. Diameter of circular blade, 5 inches; length of chopper (including blades),  $2\frac{3}{4}$  feet. Provincetown, Mass., 1877. 29,489. Gift of William H. Hesbolt. Used to chop clams for mackerel bait.

## CLAM-CHOPPER.

Iron; three parallel steel-edged blades joined to iron handle, which has knob at top. Length of blades,  $5\frac{1}{2}$  inches; width,  $2\frac{1}{4}$  inches; length of handle,  $3\frac{1}{3}$  feet. Gloucester, Mass., 1878. 32,676. Gift of Adolph Voss. Used to chop clam-bait for mackerel.

## BAIT-CHOPPER.

Specimen of an old-style bait-chopper used by New England fishermen. Exhibited by William B. Parsons, Rockport, Mass.

## BAIT-MILL.

Used in cutting bait in menhaden fishery. Little used at present, owing to the introduction of the purse-seine. Manufactured and exhibited by Adolph Voss, Gloucester, Mass.

## 4. THRUSTING SPEARS AND PRODS.

## LANCES.

## WHALING LANCES.

(See list of apparatus used in the whale fishery.)

## LANCES USED IN KILLING SEALS.

## SEAL-LANCE.

Pole, wood; lance-head, flint, lashed to pole and served with seal sinew; grip, ivory. Length, 10 feet 2 inches. Norton Sound, Alaska. Collected by E. W. Nelson.

## SEAL-LANCE.

Long, heavy, semi-cylindrical blade of walrus ivory, secured in heavy cedar handle by a serving of stout sinew; butt of heavy ivory, secured in similar manner. Length, 49 inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,833. Lieut. P. H. Ray, U. S. A.

## SEAL-LANCE.

A stout wooden handle with walrus-ivory lance, hollowed on one side, and an ivory butt-piece; the lance is lashed to the handle with a seizing of gut, and further secured by a string from the inner side of tip; an ivory peg is fastened to the butt of

## SEAL-LANCE—Continued.

the point or blade, by means of which the operator is assisted in steadying the lance when manipulating it. Length, 5 feet. Bristol Bay, Alaska, 1882. 72,401. Collected by Charles L. McKay.

## SEAL-LANCE.

A kind of lance which may be used for killing seal, sea-elephant, or walrus. Socket with extended sleeve. Section of pole attached. Length, 24 inches. New London, Conn., 1882. 56,369. Gift of Lawrence & Co. Old; has been used. Obtained from a New London sealer.

## SEAL-LANCE.

A kind of lance which may be used for killing seal, sea-elephant, or walrus. Spoon-shaped head and extended sleeve or socket. Used by New Bedford sealers. Length, 24 inches. New Bedford, Mass., 1883. 56,368. Gift of Luom Snow & Son. Old. Obtained from a New Bedford sealing vessel.

## SEAL-LANCE.

A kind of lance with a short shank, which may be used in killing seal, sea-elephant, or walrus. Socket with an extended sleeve. Length, 28½ inches. New Bedford, Mass., 1883. 56,367. Gift of Luom Snow & Son. Old; has been used.

## SEAL-LANCE.

Long head; diamond point; common shank and socket. Manufactured by James Barton for the New London sealers. New. Length, 32½ inches. New Bedford, Mass., 1882. 56,366. U. S. Fish Commission.

## SEAL-LANCE.

Pole, wood; lance-head, flint, lashed to pole and seized with seal sinew. Length, 9 feet. Cape Nome, Alaska. 45,419. Collected by E. W. Nelson.

## SEAL-LANCE.

Pole, wood, served at tip with strips of baleen; shank, ivory, seized with thong of seal-skin; lance-head, iron, riveted to shank. Length, 12 feet 2 inches. Poonook, Alaska. 15,954. Collected by H. W. Elliott. Used by natives for the capture of seal or walrus.

## SEAL LANCE AND HARPOON.

Handle, wood; lance, walrus ivory, lashed to butt with seal-skin; butt and tip of pole served with strips of wood; head-piece, walrus ivory, recessed for harpoon shank and lashed to pole



## SEAL-LANCE AND HARPOON—Continued.

with a thong of seal-skin; grip, ivory. Harpoon wanting. Length, 12 feet. Cape Lisburne, Arctic Ocean. 46,176. W. H. Dall. Lance and harpoon combined; used by Eskimo.

## ESKIMO SEAL-LANCE.

Pole, wood; butt, ivory, with wedge-shaped scarf for lance or spear; lance lashed to butt with seal-skin thong; finger-grip, ivory; tip of pole served with black and horn-colored baleen strips; head-piece and shank, walrus ivory; harpoon wanting. Length, 9 feet. Sledge Island. 45,416. Collected by E. W. Nelson. Harpoon and lance or spear combined.

## ESKIMO LANCE.

Handle, wood,  $\frac{1}{2}$  inches in diameter; butt-piece, ivory, wedge-shaped, inserted in scarf in the butt of pole and lashed and served with the sinew of the seal; ivory peg near tip of handle used as a finger-grip when manipulating the instrument; lance-blade, longitudinal section of walrus-tusk lashed to pole with seal thong. Total length, 8 feet. Alaska. 36,063. Collected by E. W. Nelson. Used by natives in the capture of seal and walrus.

## ESKIMO LANCE.

Pole, wood; butt-piece seized to pole with seal sinew; grip, ivory; lance-blade, section of walrus tusk, 20 inches long, seized to pole and served with seal sinew. Length, 8 feet 3 inches. Alaska. 36,062. Collected by E. W. Nelson. Made and used by natives to kill both seal and walrus.

## ESKIMO LANCE.

Pole, wood; butt-piece, ivory, wedge-shaped, inserted in scarf at butt of pole and served with seal sinew; grip, ivory; lance, walrus ivory,  $18\frac{3}{4}$  inches long, lashed to pole and served with seal sinew. Length, 7 feet 6 inches. Nunivak Island, Alaska. 43,379. Collected by E. W. Nelson. Used by natives to kill seal and walrus.

## ESKIMO LANCE.

Pole, wood; butt-piece seized to pole with seal sinew; grip, ivory; lance-blade, section of walrus tusk, 19 inches long, seized to pole and served with seal sinew. Length, 8 feet 3 inches. Nunivak Island, Alaska. 48,380. Collected by E. W. Nelson. Made and used by natives to kill both seal and walrus.

## ESKIMO LANCE.

Pole, wood; butt-piece, ivory, served with seal sinew; rigid ivory grip; lance piece of walrus tusk, seized to pole with seal sinew.

## ESKIMO LANCE—Continued.

Length, 7 feet 8 inches. Nunivak Island, Alaska. 48,378. Collected by E. W. Nelson. Manufactured and used by natives to kill both seal and walrus.

## ESKIMO LANCE.

Pole, wood; butt-piece, ivory, wedge-shaped, seized and served with seal sinew; grip, ivory, lashed to pole with seal sinew; tip of pole served with seal sinew, recessed for lance; lance, bone, 22 inches long, lashed to pole with thongs of seal-skin. Length, 8 feet. Nunivak Island, Alaska. 48,377. Collected by E. W. Nelson. Used by natives to kill both seal and walrus.

## WALRUS AND SEA-ELEPHANT LANCES.

## WALRUS-LANCE.

Pole, wood; lance-head, flint,  $4\frac{1}{8}$  by 5 inches, inserted in recessed tip, lashed and served with seal-sinew; pole in two sections, to fit case. Total length, 20 feet 4 inches. Ooglaamie, Point Barrow, Alaska, 1882. 56,765. Collected by Lieut. P. H. Ray, U. S. A.

## SEA-ELEPHANT LANCE.

Iron lance, 35 inches long, fitted to pole 6 feet long. New London, Conn., 1882. 57,077. Captain H. C. Chester. Used by Antarctic sea-elephant hunters.

## PRODDING INSTRUMENTS.

## SNOW-PROBES.

## SNOW-PROBE.

A slender rod of bone, with a large knob and a small ferrule, apparently made of moose-horn; ferrule fastened with a small ivory peg. Length, 33 inches. Northeast coast of America. 10,274. Collected by Capt. C. F. Hall. Used by Eskimo in probing the air-holes in ice and under the snow to detect the presence of seals.

## FISH-PRICKERS.

(Used for releasing the air from the bladders of fish before putting them in the vessel's well.)

## FISH-PRICKERS.

Brass tubes set in wooden handles. Pensacola, Fla., 1881. 54,549 and 54,550. Collected by Silas Stearns. Used by fishermen of Gulf of Mexico to release wind from "poke-blown" red-snappers.

## FISH-PRICKER.

A common awl, used by New York market-men to release the wind from the bladders of fish bloated after being caught at considerable depths. U. S. Fish Commission. 57,050.

## II.—IMPLEMENTS FOR SEIZURE OF OBJECTS.

## 5. SCOOPS.

## SHOVELS.

## OYSTER-SHOVELS.

Model of shovel used in handling oysters on board vessels and boats in the Chesapeake oyster fishery. Baltimore, Md., 1880. 26,717. T. B. Ferguson.

## DIP-NETS.

## DIP-NETS USED FOR CATCHING FISH.

## HAND-NET.

A dip-net made of woven sinews, with wooden frame; oval shape. Cape Navarin, Alaska. 38,728. Collected by E. W. Nelson. Used by natives of Alaska for taking sticklebacks.

## FISHING BASKET.

Made in oval shape, of willow strips, by the Mohave Indians of Colorado River. Handle, 4 feet long, fastened across the center of the basket, which is 6 feet long, 25 inches wide, and 13 inches deep. Colorado River, Arizona. 24,148. Collected by Dr. E. Palmer. These baskets are pushed up-stream in front of the fishermen, who either wade or are paddled along in canoes.

## DIP-NET.

Made by the McCloud River Indians, and used for fishing in small streams. Shasta County, California. 21,725. Collected by Livingstone Stone.

## DIP-NET.

Made by the Indians and used in the capture of the oulachon or candle-fish (*Thaleichthys pacificus*) on the northwest coast of America. 658. Collected by G. Gibbs.

## FISH-DIPPER.

Made of spruce roots, and fitted to short handle. Diameter of bowl, 8 inches; depth, 7 inches. Bristol Bay, Alaska. 55,936. Collected by C. L. McKay. Used by natives of Alaska in dipping up blackfish.

## SMELT-NET.

Made of whalebone, with stone sinker. Diameter of hoop, 44 inches; depth of net, 24 inches. Plover Bay, Alaska. 49,178. Collected by E. W. Nelson.

## SMELT-NET.

Made of the fiber of the common stinging nettle (*Urtica dioica*, L.). Stretched between two parallel sticks at the end of a curved handle; the inner stick plays on the handle to close net. Made by the Quilleute Indians, about thirty miles south of Cape Flattery. Handle, 53 inches long; sticks, 58½ inches; net, 53 by 15 inches at mouth, 30 inches deep; mesh, from ½ inch at point to 1½ at mouth. Washington Territory, 1883. 72,837. James G. Swan, Port Townsend, Wash. Used in taking a very choice species of smelt, *Hypomesus pretiosus*, called the surf-smelt, from its peculiar habit of depositing its spawn among the shingle of the beach, coming in with the surf in incredible numbers, and in this respect somewhat resembling the capelin, *Malotus villosus*, of New Brunswick. On the first appearance of the fish the Indians rush into the surf and press the outer edge of the net down firmly on the sand or shingle, the swash of the breaker forcing the smelts into the net. Then, as the water recedes, they turn round quickly and hold the net so that the undertow will force more smelts into it. In this way, at times, at least a bushel are taken at a single scoop.

## SMELT-NET.

Made of the fiber of the common stinging nettle (*Urtica dioica*, L.). Stretched between two parallel sticks at the end of a curved handle; the inner stick plays on the handle to close net. Made by the Quilleute Indians, about thirty miles south of Cape Flattery. Handle, 67 inches long; sticks, 64 inches; net, 58 by 15 inches at mouth, 30 inches deep; mesh, from ½ inch at point to 1½ at mouth. Washington Territory, 1883. 72,836. James G. Swan, Port Townsend, Wash. Used for the same purpose and in the same way as 72,837.

## DRAWINGS ILLUSTRATIVE OF THE USE OF DIP-NETS.

## SURF-FISHING WITH DIP-NETS.

In India-ink drawings, showing west coast Indians wading in the surf, and securing large quantities of small fish by means of dip-nets. Others are on the beach, employed in dressing the fish and stringing them upon lines to dry. Size, 30 by 40 inches. Coast of British Columbia, 1882. Henry W. Elliott.

DIP-NETS USED TO LIFT FISH FROM THE WATER AFTER THEY HAVE BEEN BROUGHT TO THE SURFACE BY MEANS OF THE HOOK AND LINE.

## LANDING NET.

Rigged with short handle and used in trout-fishing. U. S. Fish Commission (C. B. & M.). 39,199.



## LANDING NET.

Made with folding ring and bamboo-tip case handle. U. S. Fish Commission (C. B. & M.). 39,201.

## LANDING NET.

Used in a boat for landing trout and other fish. U. S. Fish Commission (C. B. & M.). 39,200.

## LANDING NET.

Made of blue silk, braided. U. S. Fish Commission (B. & A.). 25,639.

## SALMON LANDING-NET FRAME.

Folding ring, nickel plated; handle in two parts. U. S. Fish Commission (C. B. & M.).

## LANDING-NET STAFF.

Nason's patent net-staff, with flexible ring carried inside the staff. U. S. Fish Commission (B. & A.). 25,492.

## LANDING-NET STAFF.

Nason's patent solid net-staff, with flexible ring. U. S. Fish Commission (B. & A.). 25,493.

## DIP-NETS USED FOR CONVENIENCE IN HANDLING FISH.

## MACKEREL DIP-NET.

An iron bow fitted with white cotton netting, and set in wooden handle 3 feet long. Gloucester, Mass., 1880. 39,483. Made by Alexander McCurdy. Used for scooping mackerel out of the seine and off the deck.

## BOW OF SCOOP-NET.

Made of galvanized iron. A net is rigged to this bow and used in dipping fish from the well of a smack. Newport, R. I., 1875. 25,608. Gift of J. M. K. Southwick.

## MENHADEN SHOVEL-NET FRAME.

Made of galvanized iron and set in shovel handle. Gloucester, Mass., 1878. 32,682. Made by Adolph Voss.

## SCOOP-NET HOOP.

Series of different-sized hoops, made of galvanized iron, and used for crab-nets. Wilcox, Crittenden & Co. 25,165.

## MACKEREL BOW-NET FRAME.

Made of galvanized iron and set in wooden handle about 3 feet long. Gloucester, Mass., 1878. 32,681. Made by Adolph Voss.

**MACKEREL DIP-NET** (exhibited with lay figure).

Consists of galvanized-iron hoop fastened to a long, stout, spruce-wood handle. A deep bag-net of tarred cotton is secured to the hoop, to which is also fastened a rope bridle with a thimble seized in the bight; into this thimble is bent a hoisting rope when the net is used. Diameter of hoop, 27 inches; length of handle, 10 feet; diameter of handle, 3 inches. Gloucester, Mass., 1883. 57,830. U. S. Fish Commission. Used for bailing mackerel from purse-seines or pockets to the deck of a schooner.

**FISH-SCOOP.**

Oval-shaped scoop made of wire, 20 inches long and 17 inches wide, fitted to wooden handle 46 inches long. U. S. Fish Commission. Used in Western States for handling whitefish.

**DIP-NETS USED FOR REMOVING ICE FROM FISHING HOLES.****SMALL ICE-DIPPER.**

Handle, wood, half-inch in diameter; dipper, bone, steamed and bent; circular bottom and flaring tip; bottom reticulate. Length,  $21\frac{1}{2}$  inches. Diomed Island, Alaska. 63,605. Collected by E. W. Nelson. Old. Used by natives for removing loose ice from seal-holes.

**LARGE ICE-DIPPER.**

Handle, wood, partially painted brick-dust red; dipper made of whalebone, steamed and bent into an almost circular shape ( $3\frac{3}{8}$  inches by  $3\frac{7}{8}$  inches at bottom, 1 inch deep), with a lip; the bottom is interlaced with seal-skin thongs, forming a strainer; the dipper is lashed to the pole with seal sinew. New. Length, 38 inches. Alaska. 36,024. Collected by E. W. Nelson. Used by natives, when seal-hunting, for removing loose ice from seal-holes.

**DREDGES.****SMOOTH DREDGES.****OYSTER-SCRAPE.**

Galvanized-iron frame and net; no teeth. U. S. Fish Commission. 57,090. Used along Atlantic coast of the United States on oyster-beds in shoal water and soft bottom.

**OYSTER-DREDGE.**

Iron frame, 7 feet wide across mouth; lower side of net of iron mesh; upper side of white line; large wooden roller at bottom of net; no teeth. U. S. Fish Commission. 57,571. This style of dredge is used by the steam oyster-dredgers in Long Island Sound; usually two are carried, one being worked on each side of the vessel.

## OYSTER-DREDGE AND HOISTING APPARATUS.

Model. Illustrating the method of hauling oyster-dredges in the Delaware and Chesapeake Bays. Received from C. S. Belbin, Baltimore, Md. 31,792.

## SCALLOP-DREDGE.

Frame of iron; net, iron-mesh. Value, \$4. 57,088. J. T. Brown. Style used at New Bedford, Mass., at present time.

## SCALLOP-DREDGE.

Frame of iron; net, twine-mesh. Value, \$3. 57,087. J. T. Brown. Style formerly used at New Bedford, Mass.; now obsolete.

## SCALLOP DREDGE OR SCRAPE (usual style).

Triangular-shaped frame, consisting of two iron bails forming sides, their junction the apex, and an iron rim forming the base of the triangle; bails, 3 feet long, bent at 4 inches from ends at right angles to plane of frame and riveted to ends of rim; rim, 30 inches long, 1 inch wide; plane of rim at right angles to that of frame; bag, 2 feet deep; upper side of twine (2-inch mesh) attached to a small iron cross-bar across bails, 8 inches from ends; lower side of iron rings, 2 inches in diameter, six tiers, joined to edge of rim; across bottom of bag is lashed a small stick, 27 inches long,  $\frac{3}{4}$  inch in diameter, for convenience in handling bag and shaking out contents. Value, \$5. 56,935. U. S. Fish Commission. Used in Narragansett Bay, Rhode Island, on hard bottoms.

## SCALLOP-DREDGE (kettle-bail variety).

Frame triangular in shape, consisting of two iron bails joined at apex of triangle and forming an eye for attaching dredging rope. The base of triangle is formed by the "rim," a flat, slightly curved piece of iron, 1 inch wide and 30 inches long. The rim and ends of bails are joined by means of eyes welded in each, so as to permit the rim to work loosely and assume any inclination to the plane of the bails which may be rendered necessary by the character of the bottom. Three inches from the ends, and before joining the rim, the bails are bent in a direction at right angles to the plane of the frame. A small iron cross-bar extends across the bails 8 inches from ends, to which is attached the upper part of the "bag," which is of twine-netting, 3-inch mesh. The bag is 2 feet deep; under side composed of six tiers of iron rings, 2 inches in diameter. At bottom of bag is lashed a small stick,  $\frac{3}{4}$  inch in diameter and 27 inches long, for convenience in handling and shaking out contents. Value, \$5. 56,934. U. S. Fish Commission. Used in Narragansett Bay, Rhode Island, on muddy bottoms.

## SCALLOP-DREDGE (sliding variety).

Triangular-shaped frame, consisting of two iron "bails" forming sides, their junction the apex, and an iron "rim" forming the base of the triangle; bails, 3 feet long, bent at 3 inches from end at right angles to the plane of the frame and riveted to rim; rim, 30 inches long, 1 inch wide, set at an angle of about 30° with plane of frame; bag, 2 feet deep; upper side of twine (2-inch mesh) attached to a small iron cross-bar across bails, 8 inches from ends; lower side of iron rings, 2 inches in diameter, six tiers, joined to edge of rim; across bottom of bag is lashed a small stick, 27 inches long and  $\frac{3}{4}$  inch in diameter, for convenience in handling bag and shaking out contents. Value, \$5. 56,933. U. S. Fish Commission. Used in Narragansett Bay, Rhode Island, on grassy bottoms.

## SCALLOP-DREDGE.

Old-style dredge, formerly used in the scallop-fisheries along the southern coast of New England. Exhibited by John A. Sawyer, New Bedford, Mass.

## PHOTOGRAPHS ILLUSTRATING THE USE OF DREDGES.

## OYSTER-DREDGING.

Photograph of a small steamer at work on the oyster banks off the coast of Southern New England. The steamer is towing two dredges, having a line fastened amidships on either side. A portion of the crew are just hauling a third dredge, loaded with oysters, over the gunwale. Size, 30 by 40 inches. New Haven, Conn., 1882. U. S. Fish Commission.

## TOOTHED DREDGES AND RAKES.

## OYSTER-RAKE OR TOOTHED DREDGE.

Galvanized-iron frame; 12 teeth; net of iron-mesh; lower braces fitted with iron sliders to protect side of vessel from teeth. U. S. Fish Commission. 57,089. Used along Atlantic coast of the United States in natural oyster-beds.

## CLAM-RAKE.

Iron frame, consisting of head 28 inches wide, and four iron bows connecting teeth, head, and frame; teeth, 23 in number,  $4\frac{1}{2}$  inches long; frame covered with twine-net; pole, 13 feet long, fits in socket at top of frame. U. S. Fish Commission. 57,695. Used at Nantucket, Mass., in taking "sea-clams" (*Mactra solidissima*).

## CLAM-RAKE.

Four-foot handle, fitting in socket in head of rake. Rake of iron. J. T. Brown. 57,091. Style used at Provincetown, Mass.



## CLAM-RAKE.

The rake is an iron frame, with 12 teeth, each 6 inches long; head, 17 inches wide; handle, 5 feet long, fits in iron socket. U. S. Fish Commission. 36,047. Used at Wellfleet, Mass.

## CLAM-RAKE.

The rake consists of an iron head 15 inches long, with 13 teeth set at right angles to the plane of the head; the back of the rake is formed by three iron bars of the same length and parallel to the head, and extending at the extremities 2 inches to the front and joining an upright iron piece welded to the exterior. A pole or handle 5 feet long fits in a socket on the upper bar. U. S. Fish Commission. 36,046. Used at Wellfleet, Mass.

## CLAM-RAKE. •

Iron frame, 28 inches wide. Head furnished with 16 teeth, each 6 inches long. Pole or handle, 23 feet long, fits in socket at top of frame. U. S. Fish Commission. 36,043. Used on the coast of New England in taking the "hard" or "round" clam (*Venus mercenaria*) and the "sea" clam (*Mactra solidissima*).

## CLAM-RAKE.

Iron frame, 2 feet wide; head furnished with 16 teeth, each 6 inches long; pole or handle, 18 feet long, fits in socket on top of frame. U. S. Fish Commission. 36,040. Used on coast of New England in taking "hard" or "round" clams (*Venus mercenaria*) and "sea" clams (*Mactra solidissima*).

## CLAM-RAKE.

Triangular shaped frame, consisting of two iron bails and iron rim; the bails forming the sides, their junction the apex, and the rim the base of the triangle. Rim flat, slightly curved to rear, 2 inches wide, and 33 inches long; bails riveted to ends; teeth, 17 in number, 10 inches long, riveted to upper side of rim and bent downward at right angles to plane of frame. Apex of triangle, 40 inches from rim, and formed in an eye for attaching rope. Bag of twine, 40 inches deep, 1-inch mesh; attached to the rim and to a light iron frame, bolted to rim and perpendicular to plane of frame. U. S. Fish Commission. 36,043 (a). Used at Nantucket and vicinity in taking the "sea" or "hen" clams (*Mactra solidissima*).

## 6. GRASPING IMPLEMENTS.

## TONGS.

## OYSTER-TONGS.

Wooden heads, 17 inches wide, fitted with eight small, iron teeth in each; frame consists of eight brass rods or bows joining

**OYSTER-TONGS—Continued.**

heads and shafts, and forming the receptacle for the oysters; head and frame in same plane with shaft; shafts of wood, 8 feet long, joined 27 inches from heads by a brass pin. Providence, R. I. 26,109. S. Salisbury. Used in Narragansett Bay and Long Island Sound.

**OYSTER-TONGS.**

Wooden heads, 2 feet wide, fitted with 12 small iron teeth in each; 11 brass rods extend from heads to shafts, forming the receptacle for the oysters; head and frame in same plane as shaft; each shaft is made of wood, and is 8 feet long; shafts joined 31 inches from heads by a brass pin. Providence, R. I. 26,110. S. Salisbury. Used in Narragansett Bay and Long Island Sound.

**OYSTER-TONGS.**

Iron head and frame, 20 inches wide; frame consists of 3 iron rods on each side, curved outward to increase capacity; 10 teeth in each head; shafts, 10 feet long, joined at 33 inches from head. U. S. Fish Commission. 57,693. Used along the whole coast.

**OYSTER-TONGS.**

Galvanized-iron head and frame, 20 inches wide. Frame consists of 5 iron bars on each side, curved outward to increase capacity; 10 teeth in each head; shafts of wood, joined at 30 inches from head. U. S. Fish Commission. 57,694. Used from Narragansett Bay to the Capes of Virginia.

**OYSTER-TONGS.**

Galvanized-iron frame and head, 20 inches wide; frame consists of two bars, slightly curved outward to increase capacity; 10 teeth in each head; shafts of wood, joined at 29 inches from head. Middletown, Conn. 25,205. Wilcox, Crittenden & Co. Used in Long Island Sound.

**OYSTER-TONGS.**

Small model of oyster-tongs used on the New Jersey coast. Exhibited by William P. Haywood, West Creek, N. J.

**NIPPERS.****CATFISH-NIPPERS.**

Philadelphia, Pa. Exhibit of A. B. Shipley & Sons.

## 7. HOOKED IMPLEMENTS.

(Those used with a single motion, that of hooking.)

## SINGLE-POINTED HOOKS.

## GAFF-HOOKS.

## SALMON-HOOK.

Iron, single barb, lashed to wooden sockets by seizing of bark of cedar roots (?); rawhide ganging; socket fits on end of staff. Quilleute Indians, about 30 miles south of Cape Flattery. Length,  $7\frac{1}{2}$  inches; spread, 3 inches. Washington Territory, 1883. 72,838. James G. Swan, Port Townsend, Wash. Used in deep water. It is placed on the end of a long pole, which is held down to the bottom until a salmon is felt against it, when, with a quick pull, the fish is hooked and hauled on board.

## GAFF-HOOK.

Round bend Kirby hook, the same kind as is used by our eastern coast halibut fishermen. Wooden socket for pole served with common white wrapping twine. Length,  $7\frac{1}{2}$  inches. Makah Indians, Cape Flattery, 1883. 72,653. James G. Swan. Used for the capture of salmon in streams. Common to the Indians of the Northwest coast.

## GAFF-HOOK.

Round bend, barbless hook, with wooden socket for pole served with twine. The pole when inserted in the socket is held by a lanyard. Length, 12 inches. Makah Indians, Cape Flattery, 1883. 72,652. James G. Swan. Used for the capture of salmon in streams. The salmon are gaffed, knocked on the head with a club and secured. Common to the Indians of the Northwest coast.

## GAFF-HOOK.

Round bend Kirby hook, the same kind as is used by our eastern coast halibut fishermen. Wooden socket for pole served with common white wrapping twine. Length,  $5\frac{1}{2}$  inches. Makah Indians, Cape Flattery, 1883. 72,654. James G. Swan. Used for the capture of salmon in streams. Common to the Indians of the Northwest coast.

## SALMON-GAFF.

Nickel-plated hook, 8 inches long, with  $2\frac{1}{2}$  inches spread, fitted to oak handle 4 feet long. U. S. Fish Commission.

## SALMON-GAFF.

Hook 7 inches long, with  $2\frac{1}{2}$  inches spread, fitted to wooden handle. Length, 46 inches. U. S. Fish Commission. 25,225.

## SALMON-GAFF.

Hook 7 inches long, with  $2\frac{1}{2}$  inches spread, fitted to bamboo handle. Gaff detachable from handle. U. S. Fish Commission (C., B. & M.). 39,202.

## TERRAPIN HUNTERS' GIG.

Iron hook driven into hard-wood handle; iron ferrule at lower end of handle. Length of handle,  $3\frac{1}{2}$  feet; hook, 4 inches; width of hook,  $2\frac{1}{4}$  inches. Centennial collection, 1876. 25,930. U. S. Fish Commission. Used for hooking terrapins out of marshes.

## MACKEREL-GAFF.

Long galvanized steel-wire shank with two recurved points, attached to hard-wood handle by seizing of tarred line. Length of steel shank, 3 feet 5 inches; handle, 6 feet; diameter of handle, 1 inch. Gloucester, Mass., 1877. 29,436a. U. S. Fish Commission. Formerly used to gaff mackerel as they swam alongside of the vessel.

## MACKEREL-GAFF.

Double hook, with  $2\frac{1}{2}$ -inch prongs, on shank of iron wire 2 feet 6 inches long. Wellfleet, Mass., 1877. 29,436. Gift of M. W. Grant. This gaff, attached to a six-foot pole, is used in catching mackerel when swimming in large schools.

## DECK HALIBUT-GAFF.

Iron hook fastened to hard-wood shovel-handle. Length of hook, 7 inches; spread of point, 3 inches; length of handle,  $19\frac{1}{2}$  inches. Gloucester, Mass., 1878. 32,683. Collected by G. Brown Goode. Used for handling halibut on vessel's deck during process of cleaning, &c.

## DECK HALIBUT-GAFF.

Galvanized-iron hook seized with tarred line to hard-wood handle. Length of handle, 6 feet; hook, 8 inches; breadth of hook,  $2\frac{1}{2}$  inches. Gloucester, Mass., 1878. 32,678. U. S. Fish Commission. Used by hand-line fishermen for gaffing halibut.

## DECK COD-GAFF.

Galvanized-iron hook seized with tarred-cotton line to oak handle. Length of handle, 4 feet; hook,  $4\frac{1}{2}$  inches; breadth of hook,  $2\frac{1}{2}$  inches. Gloucester, Mass., 1876. 25,938. Gift of Alex. McCurdy. Used for gaffing fish from the deck of a schooner.

## DECK HALIBUT-GAFF.

Iron hook with looped handle at top. Total length, 12 inches; spread of hook, 4 inches. Gloucester, Mass., 1876. 25,934.



## DECK HALIBUT-GAFF—Continued.

Gift of Alexander McCurdy. Used for handling halibut on vessel's deck, in ice-houses, &c.

## HALIBUT-GAFF.

Iron hook with looped handle at top of shank. Length, 14 inches; spread of hook,  $3\frac{1}{2}$  inches. Gloucester, Mass., 1877. 29,388. U. S. Fish Commission. Used for gaffing halibut in dories and for handling these fish generally.

## DORY COD-GAFF.

Iron hook seized with tarred line to hard-wood handle. Length of handle, 3 feet; hook, 4 inches; spread of hook, 2 inches. Gloucester, Mass., 1876. 25,939. Gift of Alexander McCurdy. Used for gaffing fish which have broken loose from the hooks, or which are too heavy to be lifted into a dory by the gangings.

## DORY HADDOCK-GAFF.

Steel hook seized to hard-wood handle, with tarred line. Length of hook,  $6\frac{1}{2}$  inches; width, 2 inches; handle, 3 feet long. Gloucester, Mass., 1876. 25,935. U. S. Fish Commission. Used by haddock fishermen to gaff fish which drop off the hook of the trawl or set line.

## DORY HADDOCK GAFF. (Small size.)

Iron hook seized with tarred line to hard-wood handle. Length of handle, 3 feet; hook,  $7\frac{1}{2}$  inches; breadth of hook,  $1\frac{1}{2}$  inches. Gloucester, Mass., 1876. 25,225. U. S. Fish Commission. Used for gaffing haddock which fall off the hooks.

## SEALER'S GAFF.

A small steel hook 4 inches long, 1 inch wide; seized with twine to flat oak handle 4 feet long. New London, Conn., 1883. 56,889. Collected by James Temple Brown. Used by Antarctic fur-seal hunters.

## HALIBUT-HAWKER'S LONG-HANDLED GAFF.

Iron hook seized with tarred line to hard-wood handle. Length of handle, 4 feet; hook, 7 inches; width,  $2\frac{1}{2}$  inches. Gloucester, Mass., 1883. 57,832. U. S. Fish Commission. Used by halibut packers to haul fish about the floor of packing-houses.

## HALIBUT-HAWKER'S HAND-GAFF.

Iron; looped handle, closed at right angle to shank. Length of gaff, 22 inches; spread of hook,  $2\frac{1}{2}$  inches; handle,  $4\frac{1}{2}$  inches long. Gloucester, Mass., 1883. 57,833. U. S. Fish Commission. Used by halibut buyers and packers in handling and boxing fish.

## GAFFS USED IN DRESSING FISH.

## HALIBUT HEADER'S HOOK.

Galvanized-iron S-shaped hook, fastened into wooden handle. This implement is similar to the common cotton-hook. Length of hook,  $7\frac{1}{2}$  inches; spread of point, 3 inches; length of handle, 4 inches. Gloucester, Mass., 1878. 32,691. U. S. Fish Commission. Used in fresh-fish establishments for holding up the heads of halibut while they are being cut off.

## HALIBUT FLITCHER'S HOOK.

Made of iron, with eye and rope strap. Gloucester, Mass., 1882. 54,476. Gift of Captain Joseph Ryan. Used on halibut vessels at Greenland in preparing flitches for salting. The rope-strap loops on a peg in the table-edge when the hook holds the fish in place.

## HALIBUT FLITCHER'S HOOK.

A double hook of iron, connected with a swivel. Gloucester, Mass., 1882. 54,412. Gift of A. M. Burnham. Used on halibut vessels in preparing flitches for salting. The smaller hook fits on the edge of the cutting-table, while the larger one hooks into the fish, holding it in place while being flitched.

## FISH-SOUNDERS.

## SOUNDER.

A small-pronged hook, with shank 13 inches long; piece of wood 8 inches long on the shank. Moorehead City, N. C. 54,505. Collected by R. E. Earll. Used to remove the bladders or sounds from fresh squeteague or spotted trout.

## MANY-POINTED HOOKS.

## FISH FORKS OR PEWS.

## FISH-PEW.

A curved and pointed steel prong driven into an oak handle and secured by an iron ferrule. Length of prong,  $6\frac{1}{2}$  inches (outside); handle, 4 feet; ferrule, 4 inches. Gloucester, Mass., 1878. 32,716. Gift of Capt. S. J. Martin. Used for handling fish more especially cod, &c.

## TWO-PRONGED PEW-GAFF.

This is a combination of the pew and the gaff, the ordinary fish-pew being supplemented by a short curved spur which is welded upon it close to its junction with the handle. Steel pew and hook fastened to hard-wood handle, which has iron ferrule on lower end. Length of handle, 4 feet; pew-tine, 5 inches;

## TWO-PRONGED PEW-GAFF—Continued.

gaff-tine, 4 inches. Gloucester, Mass., 1880. 32,685. U. S. Fish Commission. Used for pitching or gaffing fish and for rolling barrels.

## FISH-FORK.

A common two-tined pitchfork, steel tines, hard-wood handle. Length of tines,  $8\frac{1}{2}$  inches; handle, 4 feet; iron ferrule on handle, 4 inches long. Gloucester, Mass., 1878. 32,684. Gift of Adolph Voss. Used for handling fish.

## FISH-FORK.

Three tines, steel, hard-wood handle, iron ferrule on lower end of handle. Length of tines, 7 inches; handle,  $28\frac{1}{2}$  inches; ferrule,  $3\frac{1}{2}$  inches. Gloucester, Mass., 1878. 32,730. U. S. Fish Commission. Used for handling fish, more especially the smaller species.

## SQUID FORKS USED IN BAITING HOOKS WITH SQUID.

## SQUID-FORK.

A two-pronged fork, set in a wooden handle. Gloucester, Mass., 1878. 32,727. U. S. Fish Commission. Used in handling squid for cod-bait.

## MANY-POINTED FISH-JIGS.

## MACKEREL-BOB.

Made of galvanized wire. Shank,  $6\frac{1}{2}$  inches long; two pieces crossing at right angles formed to foot of shank with four prongs  $1\frac{1}{2}$  inches long. Provincetown, Mass., 1877. 29,441. Gift of William H. Hesbolt. Used when mackerel, in large numbers, are baited up close to the vessel. Four fish are sometimes taken at a time with this bob.

## OULACHON RAKES OR SPEARS.

## OULACHON RAKE OR COMB.

A long wooden pole with series of teeth at one end. Made by Flat-head Indians of Northwest coast. Port Townsend, Washington Territory. Collected by J. G. Swan. Used in the capture of the oulachon or candle-fish (*Thaleichthys pacificus*).

## SQUID-JIGS.

## SQUID-JIG.

Pattern of 1830. Made of 8 iron wire pins molded to lead sinker 5 inches long. Provincetown, Mass., 1877. 29,443. Gift of Lemuel Cook, 2d. Used to catch squid for cod bait.

## SQUID-JIG.

Pattern of 1846. Made of brass pins seized with cotton twine; lead sinker  $3\frac{1}{2}$  inches long. Gloucester, Mass. 54,480. Gift of David W. Low. Used to catch squid for cod-bait.

## SQUID-JIG.

Style of 1850. Made of 8 brass pins molded in lead sinker  $3\frac{1}{2}$  inches long. Gloucester, Mass. 39,177. Gift of Daniel McAskell. Used in catching squid for bait.

## SQUID-JIG.

Made by fishermen on shipboard. Brass pins molded to lead sinker 2 inches long. Gloucester, Mass. 57,947. Gift of Captain George Merchant, jr. Used to catch squid for cod-bait.

## SQUID LINE AND JIG.

White cotton line on wooden reel; blue cotton ganging; jig made of brass pins molded to lead sinker  $3\frac{1}{2}$  inches long. Gloucester, Mass. 54,414. U. S. Fish Commission. Used in hand-line dory cod-fishing on Grand Bank to catch squid for bait.

## SQUID-JIG.

Made by fishermen on ship-board. Brass pins seized with tarred cotton twine to lead sinker  $3\frac{1}{2}$  inches long. Gloucester, Mass., 1880. 39,176. U. S. Fish Commission. Used to catch squid for cod-bait.

## SQUID-JIG.

Made of brass pins molded to lead sinker  $3\frac{1}{4}$  inches long, painted red. Gloucester, Mass., 1878. 32,722. Gift of Robert H. Hurlburt. Used to catch squid for cod-bait.

## SQUID-JIG.

Made of brass pins molded to lead sinker 3 inches long. Gloucester, Mass., 1878. 32,721. Gift of Robert H. Hurlburt. Used in catching squid for cod-bait.

## SQUID-JIG.

Made of brass pins molded to lead sinker 3 inches long, painted red. Gloucester, Mass., 1876. 25,776. Collected by A. R. Crittenden. Used to catch squid for cod-bait.

## SQUID-JIG FORMER.

Made of soapstone in truncated form, with longitudinal grooves for shaping pins for squid-jigs. Rockport, Mass., 1877. 29,447. Gift of John B. Parsons.

## 8. BARBED IMPLEMENTS.

(Those used with two motions, the first that of thrusting.)

## SPEARS WITH FIXED HEADS.

## SINGLE-POINTED SPEARS.

## CONCH-HARPOON.

Made of iron, with single flue; socket for pole; rope-strap. Key West, Fla. 39,426. Gift of Dr. J. W. Velie. Used by Bahamians and fishermen of Key West in the capture of large fish.

## CRAB AND FLOUNDER SPEARS.

Made of iron; used with pole. Newport, R. I., 1876. 25,594-5. Gift of J. M. K. Southwick.

## PORPOISE-SPEAR.

Iron spear head and shank, 13 inches long; handle, 12 feet long. Eastport, Me., 1882. 54,337. U. S. Fish Commission. Used by Passamaquoddy Indians, near Eastport, Me., in porpoise hunting, for striking and holding the porpoise after it has been shot.

## MANY-POINTED SPEARS.

*Stationary prongs.*

## FISH-GRAINS.

Two prongs with barbed ends. Socket for handle. U. S. Fish Commission. 57,095.

## NEPTUNE EEL-SPEAR.

Galvanized iron, three flat prongs, serrated edges; socket for handle. U. S. Fish Commission. 29,491.

## DOLPHIN-GRAINS.

Three prongs, barbed; socket for handle. Length, with pole, 6 feet. U. S. Fish Commission. 25,931.

## FISH-SPEARS.

Three and five prongs, barbed; spike-head for handles. U. S. Fish Commission (B. & A.). 25,556.

## FISH-SPEARS.

Four prongs, barbed; socket for handle. U. S. Fish Commission. 25,556(a).

## EEL-SPEAR.

Five prongs, two pointed, one flange end; socket for handle. U. S. Fish Commission (B. & A.). 25,557. Used for spearing eels in summer season.



## FISH-SPEAR.

Five prongs, barbed; screw-head for handle. U. S. Fish Commission (C., B. & M.). 39,203.

## FISH-SPEARS.

Five prongs, barbed. Sockets for handles. U. S. Fish Commission (C., B. & M.). 39,204-5.

## EEL-SPEAR.

Six flat prongs, unbarbed; spike-head for handle. U. S. Fish Commission, 1876. 25,225. Used in southern New England.

## EEL-SPEAR.

Seven prongs, three pointed, and four flange ends; screw-head for handle. U. S. Fish Commission (B. & A.). 25,557 (*a*). Used for spearing eels in summer season.

## EEL-SPEAR.

Seven prongs; six with hook ends and one spear end. U. S. Fish Commission (C., B. & M.). 39,206.

## EEL-SPEAR.

New Bedford pattern. Seven prongs: six with hook ends and one spear end. New Bedford, Mass., 1876. 25,647. Gift of H. S. Kirby.

## EEL-SPEAR.

Seven prongs: six with hooked ends and one spear-shape; socket for handle. U. S. Fish Commission (B & A.). 25,559. Used for spearing eels in the winter season.

## EEL-SPEAR.

Seven prongs: six hook ends and one spear end; socket for handle. U. S. Fish Commission (B. & A.). 25,557 (*b*). Used for summer fishing.

## EEL-SPEAR.

Seven prongs; three hooked and one spear-shape; socket for handle. U. S. Fish Commission (B. & A.). 25,558. For winter fishing.

## FROSTFISH SPEAR.

Eight prongs of bronzed wire; pine handle; full length of handle, 5 feet. New Bedford, Mass., 1882. 57,084. Gift of S. Eggers, jr. Used by fishermen of Southern New England in the capture of frostfish.

## EEL-SPEAR.

Made of galvanized iron; eight hook-prongs and one spear-shape; socket for handle. Belfast, Me., 1877. 29,495. Gift of John Thombs. Pattern of eel-spear peculiar to Belfast and vicinity.

## EEL-SPEAR.

Nine prongs, eight with hook ends and one speared; socket for handle. U. S. Fish Commission (B. & A.). 25,558 (a). For winter fishing.

## EEL-SPEAR.

Eleven prongs, ten with hooked ends and one spear-shape; socket for handle. U. S. Fish Commission. 25,224. Southern New England pattern.

## FROSTFISH SPEAR.

A row of twelve sail-needles set in flat piece of wood; pine handle, spliced in wedge-shaped form in head of ash. Full length of handle, 5 feet. New Bedford, Mass., 1882. 57,083. Gift of James Beetle. Used on Southern New England coast for the capture of frostfish.

*Adjustable prongs.*

## FIVE-PRONGED GRAINS.

Adjustable; prongs of steel; socket for handle. Wilcox, Crittenden & Co. 54,324. Used same as spear in the capture of fish.

## EEL-SPEARS.

Adjustable prongs, patent; seven prongs; six with hook ends, one spear-shape. U. S. Fish Commission. 57,096.

## EEL-SPEARS.

Adjustable prongs; Hedges's patent; socket for handle; five and nine prongs. Made by S. P. Hedges. 26,072 to 26,074.

## EEL-SPEAR.

Nine prongs, adjustable, patent; six prongs, with hook ends, one spear-shape. U. S. Fish Commission. 57,097.

## ADJUSTABLE PRONGS.

Hook ends; for patent eel-spear. U. S. Fish Commission. 57,098.

## ABORIGINAL FISH-SPEARS.

## SALMON-SPEAR.

Pole, white pine; two bone prongs, with triangular barbs, fastened with wooden pegs and lashed with strips of baleen; central spear, bone, barbless. Length, 52 inches. Norton Sound, Alaska, 1876. 29,864. Collected by L. M. Turner. Used to capture salmon when ascending small rivers and creeks.

## FISH-SPEAR.

Sharp-pointed, conical, horn tip, secured by a pin to the end of a rough wooden staff. Made by Clallam Indians. Length, 57 inches. Washington Territory, 1876. 23,519. James G. Swan.

## FISH-SPEAR.

Pole, wood; two projecting prongs, with bone barbs seized with twine; central spear tipped with bone and lashed to pole with twine. Length, 62 inches. Northwest coast of United States. 23,518. Collected by James G. Swan.

## POINTS FOR SALMON-SPEARS (2).

Made of split deer-bones, with wooden sockets to receive shaft; covered with pitch. Line of modern manufacture. Made by McCloud River Indians. Length,  $3\frac{1}{2}$  and  $4\frac{1}{4}$  inches. Shasta County, California, 1873. 13,743. Livingston Stone.

## SALMON-SPEAR.

Pole, spruce; two wooden prongs, each with a triangular barb, and a central barbless iron spear lashed to the tip of handle. Length, 100 inches. Eastport, Me. 11,429. Passamaquoddy Indians. Dr. E. Palmer.

## FISH-SPEARS (4).

With one, two, and three points, of ivory, bone, or iron. Length,  $12\frac{3}{4}$  to  $29\frac{1}{4}$  inches; spread, 2 to 5 inches. Northern and north-western coasts of America. 10,283, 10,380, 18,933.

## FISH-SPEAR.

Shaft of cedar,  $\frac{1}{2}$  inch in diameter, painted red, and end enlarged into a head, in which is inserted and lashed a flat carved and barbed bone 1 foot 2 inches in length. In a slot in outer end of latter is lashed a metal spear-head. Used in fishing by Alaskan Indians, Sitka. Length, 4 feet 9 inches; bone head, 1 foot 2 inches. Alaska, 1867. 5,776. Collected by Captain Howard, U. S. Revenue-Marine Service.

## SPEAR-HEADS.

Consist of two parts: A carved, barbed bone, which is pointed and fits into head of wooden shaft, and a metal head, barbed, which is lashed in a slot in outer end of the bone head. From Anderson River. Lengths,  $6\frac{1}{2}$  inches to 1 foot 2 inches. British America, 1867. Collected by Robert Macfarlane. Nos. 7,420, 2,431, and four specimens, No. 2,675.

## FISH-SPEAR.

Shaft of cedar,  $\frac{1}{2}$  inch in diameter, painted red, and end enlarged into a head, in outer end of which is inserted and lashed a flat

## FISH-SPEAR—Continued.

barbed piece of bone 1 foot in length. In a slot in outer end of latter is lashed a metal spear-head. Used in fishing by Alaskan Indians, Sitka. Length, 4 feet 9 inches; point, 3 inches. Alaska, 1867. 5,775. Collected by Captain Howard, U. S. Revenue-Marine Service.

## SPEAR-HEAD.

Carved from elk-horn, barbed and pointed. Used in fishing. Length,  $7\frac{1}{2}$  inches. Northwest coast, 1868. 5,714. Collected by George Gibbs.

## FISH-SPEAR HEADS (2).

Thin iron heads, with one deep barb; two bone barbs on shank form socket for staff; secured by serving of bark and pitch. Short lanyard of sennit. Made by Indians. Length,  $4\frac{1}{2}$  inches. Columbia River, 1841. 2,628. United States Exploring Expedition, Capt. Charles Wilkes, U. S. N., commanding.

## FISH-SPEAR.

Handle, red wood; two prongs, whalebone, with ivory barbs lashed at tips with reindeer sinew; central spear ivory, with one small barb. Length, 90 inches. Tschutschis Indians. 2,543. Capt. John Rodgers, North Pacific Exploring Expedition.

## FISH-SPEAR.

Pole, spruce; two prongs and barbs, bone; barbs fastened to wooden pegs with seal sinew. Central piece ivory, barbless, lashed with seal sinew. Length, 64 inches. Norton Sound, Alaska. 33,861. Collected by E. W. Nelson.

## FISH-SPEARS.

Light shafts of cedar, fitted with adjustable heads of ivory, mortised into and lashed to ends of shafts. In ends of heads are wooden plugs, in which fit barbed ivory points secured to heads with lanyards. The butt ends are fitted with feathers, and to the shafts are attached lanyards for the harpoon lines. Used in fishing by Alaskan Indians of Norton Sound and elsewhere. Length, 4 to  $4\frac{1}{2}$  feet; heads, 3 to 7 inches in length; points,  $1\frac{1}{2}$  to 3 inches. Alaska. 36,099, 34,035, 33,989, 33,906, 29,808, 11,852, 36,191, 33,921, 33,927, 29,806, 48,364, 48,153, 15,681, 15,677, 8,006, 8,005, 11,348, 72,414. Collected by E. W. Nelson, L. M. Turner, W. H. Dall, and others.

## SPEAR.

Staff of cedar, 1 inch in diameter, pointed at one end and beveled at the other, the latter being shod with a flat, pointed, and



**SPEAR—Continued.**

barbed piece of bone 1 foot and 1 inch in length and  $1\frac{1}{4}$  inches in width. Used in fishing by Indians of Lower Yukon River. Length, 4 feet. Alaska, 1879. 36,070. Collected by E. W. Nelson.

**FISH SPEAR OR GIG.**

Rough tip, made of two pieces of bone, fastened together by sinew and pitch, fitted over the ends of rough wooden slanks of unequal length, which are secured to a stout staff by a serving made of cedar roots. The line, fastened to the tips, is of twisted rawhide or sinew. Made by Clallam Indians. Length, 53 inches. Washington Territory, 1876. 23,522. James G. Swan.

**FISH-SPEAR.**

Model of the kind of salmon-spear used by the Eskimo of Hudson Bay. Wooden handle, with central barbless spear, brass, and two projecting prongs, wood, armed each with a bent tack. Length,  $13\frac{3}{4}$  inches. New Bedford, Mass., 1882. U. S. Fish Commission. This model was made by a native at the request of a whaleman. It is said to be a correct representation of the large size employed by the Eskimo, with the exception of the tacks, intended as barbs, as well as the spear, which are made of bone. Obtained from the crew of the whaling brig George and Mary.

**FISH-SPEAR.**

Pole, wood; prongs, walrus ivory, with triangular barbs fastened with pegs and lashed with sealskin; central spear, barbless. Length,  $70\frac{1}{2}$  inches. Norton Sound, Alaska. Collected by E. W. Nelson.

**SPEAR FOR WHITEFISH.**

Three short, slightly converging ivory barbs, serrated on inner edges, surrounding a shorter, straight point, secured to end of long, light cedar staff by an ivory collar and serving of twisted sinew. Length, 49 inches. Nunivak Island, Alaska, 1880. 48,343. Collected by E. W. Nelson.

**FISH-SPEAR.**

Pole, wood; two bone spears, with two notches each, lashed to pole with seal-thong. Length,  $58\frac{1}{2}$  inches. Rasboinsky, Alaska. 49,049. Collected by E. W. Nelson.

**FISH-SPEAR.**

Pole, spruce; two bone prongs recurved, with bone barbs lashed with seal-skin; central spear, bone, with two notches; pole partly painted brick-dust red. Length, 71 inches. Rasboinsky, Alaska. 49,051. Collected by E. W. Nelson.



## FISH-SPEAR.

Pine pole; two projecting prongs, with single rigid barbs and one central barbless spear lashed to the tip of pole with seal sinew. Length, 34 inches. Bristol Bay, Alaska. 55,922. Collected by C. L. McKay. Used for the capture of salmon and whitefish.

## FISH AND BIRD SPEAR.

Slender pole with finger-rest, with five spear-heads with two barbs each on one side, for killing fish and ducks, principally the latter. Length, 10 feet 6 inches. Makah Indians, Neah Bay, Washington Territory. 72,672. "At certain times, during stormy weather, the wild fowl congregate in vast numbers in Neah Bay. The Indians go out in their canoes with a bright light from torches of pitchwood placed in the stern. The canoe is paddled stern first among the flocks of wild fowl. The birds, bewildered by the light, are killed in great numbers. The prongs of the spear get entangled among the feathers and hold fast. A bird is hauled in the canoe, its neck wrung, and others in succession quickly speared. Sometimes as many as one hundred canoes will be out at the same time, and the light from their torches moving about on the water on a dark night is a very interesting sight."—(*J. G. Swan.*)

## BIRD AND FISH SPEAR.

Three long diverging barbs, serrated on inner edges, lashed to the end of a cedar shaft. Length, 54 inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,794. Lieut. P. H. Ray, U. S. A.

## SPEARS WITH DETACHABLE HEADS.

## LILY-IRONS.

## SWORD-FISH DART-HEADS.

Four varieties of Cape Cod patterns, made of galvanized iron and composition. Wilcox, Crittenden & Co. 29,458.

## SWORD-FISH DARTS.

Four varieties, made of composition; used by fishermen of Maine. Wilcox, Crittenden & Co. 29,422.

## SWORD-FISH DARTS.

Gloucester patterns; series of four sizes and styles, made of galvanized iron and composition. Wilcox, Crittenden & Co. 29,421.

## SWORD-FISH DARTS.

Provincetown patterns. Wilcox, Crittenden & Co. 29,386.

## SWORD-FISH LILY-IRONS.

Two samples of Gloucester patterns. Adolph Voss. 32,714, 32,715.

## SWORD-FISH LILY-IRON.

The double lance-head or lily-iron, 3 inches long, fits on an iron shank 4 feet long, and this shank to a wooden pole 8 feet long; grommet-strap, 23 inches long, fastened to lily-iron; short strap attached to head of shank for long warp. Gloucester, Mass., 1878. 32,703. Made by Vinal McCaleb. Used by Gloucester fishermen in the capture of codfish.

## SWORD-FISH LILY-IRON. (Allen's patent.)

Rigged for use. Movable catch to hold toggle. Length of iron, 5 inches; iron shank,  $22\frac{1}{2}$  inches long, attached to a pole 10 feet long; grommet-strap, 18 inches long, fastened to lily-iron and attached to a line. Second line, to haul back the pole, fastened to cleat to keep it taut from the iron. Cuttyhunk, Mass., 1883. 57,078. U. S. Fish Commission.

## SWORD-FISH LILY-IRON. (Allen's patent.)

Rigged for use. Movable catch to hold the toggle in place. Lines attached to pole and iron. Cuttyhunk, Mass., 1883. 57,079. Frederick S. Allen. "This iron can be used for sword-fish or other soft-meated fish. When the movable catch that holds the toggle strikes the skin of the fish it unlocks the iron, but nevertheless will remain in position as long as it continues going. When the action is reversed, or the iron drawn out, it immediately toggles or comes crossways. Then the long shank can be easily pulled out of the short or lower shank by means of the small line attached to the end of the pole. The fish then remains fastened by the iron and held by the long line."—(*F. S. Allen.*)

## PORPOISE-IRON.

Very old style, used by Provincetown fishermen. 29,504. Isaiah A. Small.

## TOGGLE-IRON.

Toggle made of hoop-iron held by a rope grommet; roughly made pole; socket served and iron-strap attached. Length, 9 feet. New Bedford, Mass., 1882. 57,698. Gift of Jonathan Bourne. A peculiar harpoon, made on board ship, probably by the blacksmith. Evidently intended for striking blackfish or porpoise.

## TOGGLE-IRON.

Head and portion of shank of toggle-iron. Joggle wrought-iron, elongated point, fluked at rear end, slotted and pivoted to end

## TOGGLE-IRON—Continued.

of shank. Intended to be used in striking sword-fish or porpoises. Length,  $10\frac{3}{4}$  inches. 56,409. Gift of A. R. Crittenden.

## TOGGLE-IRON.

Head and portion of shank of toggle-iron. Evidently intended for striking sword-fish, porpoises, and blackfish. Head, steel, mortised; shank, wrought-iron. Length, 10 inches. 56,407. Gift of A. R. Crittenden.

## TOGGLE-IRON.

Head and portion of shank of toggle-iron. Evidently a kind of lily-iron intended to be used for striking the sword-fish or porpoise. Toggle with double diamond point; slotted and hinged at center to end of shank; shank wrought-iron. Length,  $10\frac{1}{2}$  inches. 56,406. Gift of A. R. Crittenden.

## TURTLE-PEG HARPOON.

A dart or harpoon about two inches long, with lines attached; head to set in pole. Key West, Fla., 1880. 39,427. Gift of Dr. J. W. Velie. Used on the southern coast for the capture of turtles.

## LILY-IRON.

Sample of an improved form of lily-iron used in the capture of swordfish off the New England coast. Exhibited by William Taylor, Portland, Me.

## MODERN HARPOONS.

(See catalogue of "The Whale Fishery and its Appliances.")

## ABORIGINAL HARPOONS.

*Fish harpoons.*

## FISH-SPEAR. (Model.)

Long, light, bone head, driven into slender cedar staff and secured by seizing of fine sinew; wooden socket in end receives detachable barbed ivory tip, through which is rove the line made of sinew sennit. Length: staff, 23 inches; head,  $7\frac{3}{4}$  inches; tip,  $1\frac{1}{8}$  inches. Alaska, 1857. 2,530. U. S. Pacific Exploring Expedition, Commodore John Rodgers, U. S. N., commanding.

## FISH-SPEAR.

Long, round, bone head, bifurcated to receive light wooden shaft and secured by serving of fine sinew. Wooden socket in end receives small detachable ivory tip, through which is rove the line made of sinew sennit. Length: staff,  $43\frac{1}{4}$  inches; head, 8 inches; tip,  $2\frac{1}{2}$  inches. Alaska, 1857. 2,530-2. U. S. Pacific Exploring Expedition, Commodore John Rodgers, U. S. N. commanding.

## FISH-SPEAR.

Heavy, bone head, driven into light cedar staff and secured by seizing of fine sinew. Wooden socket in end receives small detachable ivory tip, through which is rove the line made of sinew sennit. Length: shaft, 42 inches; head, 6 inches; tip, 2 inches. Alaska, 1857. 2,530-2. U. S. Pacific Exploring Expedition, Commodore John Rodgers, U. S. N., commanding.

## FISH-SPEAR.

Heavy, bone head, driven into light cedar staff and secured by seizing of fine sinew. Wooden socket in end receives detachable barbed ivory tip, through which is rove the line, made of twisted hemp cord. Length: staff, 43 inches; head, 9 inches; tip, 2 inches. Alaska, 1857. 2,530-4. U. S. Pacific Exploring Expedition, Commodore John Rodgers, U. S. N., commanding.

## FISH-SPEAR.

Heavy, bone head, driven into light cedar staff and secured by seizing of fine sinew. Wooden socket in end receives detachable barbed ivory tip, through which is rove the line, made of twisted vegetable fiber. Length: shaft, 42 inches; head  $9\frac{1}{2}$  inches; tip,  $2\frac{1}{2}$  inches. Alaska, 1857. 2,530-5. U. S. Pacific Exploring Expedition, Commodore John Rodgers, U. S. N., commanding.

## FISH-SPEAR.

Long, round head of bone, driven into light cedar staff and secured by seizing of fine sinew. Wooden socket in end receives detachable tip, through which is rove line made of fine cotton-twine sennit. Length: staff,  $41\frac{1}{2}$  inches; head and tip,  $10\frac{3}{4}$  inches. Sitka, Alaska, 1868. 5,779. Capt. W. A. Howard, U. S. R. M.

## FISH-SPEAR.

Heavy bone head, driven into light cedar staff and secured by seizing of fine sinew. Wooden socket in end receives detachable barbed ivory tip, through which is rove the line, made of walrus or sealskin. Length: staff, 19 inches; head, 5 inches; tip,  $2\frac{1}{2}$  inches. Kotzebue Sound, Alaska, 1875. 16,675. W. H. Dall.

## FISH SPEAR OR GIG (Quating).

Double, detachable points, ingeniously made by passing a small piece of deer-horn, sharpened at each end, through a socket, and securing it with seizing and pitch. The socket is large enough to receive end of shank. Line of twisted vegetable fiber fastened to middle of points to insure toggling when fish



## FISH SPEAR OR GIG—Continued.

is struck. Made by Pai Ute Indians. Length: staff, 24 inches; points,  $2\frac{1}{2}$  inches. Pyramid Lake, Nevada, 1875. 19,046. Stephen Powers.

## SALMON-SPEAR.

Two prongs,  $\frac{1}{2}$  inch in diameter, seized to slender pole 1 inch in diameter. Used with detachable heads, made from the splint bones of deer (heads wanting), in the capture of salmon. Length,  $23\frac{1}{2}$  feet. McCloud River Indians, Shasta County, California. 21,413. Livingston Stone.

## FISH SPEAR OR GIG (Korontoomul).

Detachable tips, made of short iron points and wooden barbs lashed by a seizing of twine and pitch, fit over the end of rough wooden staff—staff has been broken. The line attached to these tips is of modern manufacture. Made by Hoochnowe Indians. Length: staff,  $34\frac{1}{4}$  inches; tips, 3 inches. South Eel River, California, 1876. 21,413 (a). Stephen Powers.

## FISH-SPEAR HEADS (2), (Milkayt).

Large, flat, elk-horn points and double barbs, fastened together with serving of vegetable fiber and pitch, form a socket for the insertion of the shaft of the spear, to which the detachable points are fastened by a leather lanyard. Made by Hoopa Indians. Length,  $4\frac{3}{4}$  and 6 inches. Hoopa Valley, California, 1876. 21,308. Stephen Powers.

## HEAD OF FISH-DART.

Made of native copper; five barbs on each side; through the shank is rove a strap made of braided sinew. Length, 7 inches. Fort Simpson, British Columbia, 1876. 20,653. Collected by James G. Swan.

## HEAD OF FISH-DART.

Made of native copper; five long barbs on one side. Length, 8 inches. Alaska, 1869. 9,083. Lieut. F. W. Ring, U. S. Army.

## HEAD OF FISH-DART.

Made of native copper, by Eskimo; six barbs on one side. Length, 6 inches. Sitka, Alaska, 1868. 6,564 (a). Dr. T. T. Minor.

## HEAD OF FISH-DART.

Made of native copper, by Eskimo; five barbs on one side. Length,  $5\frac{1}{2}$  inches. Sitka, Alaska, 1868. 6,564. Dr. T. T. Minor.



*Seal, walrus, and sea-otter harpoons.*

## SEAL SPEAR AND BUOY.

A short, heavy head of bone or horn, into which is driven a stout staff of cedar, secured by a becket; wooden socket in the end receives adjustable tip of bone, barbed on each side, to which is fastened the line made of stout walrus or seal hide. On one side of the staff, about its middle, is fastened a curved bone pin, against which the forefinger presses to strengthen the grip when hurling. A buoy, made of seal bladder, is attached to staff near its butt. Length: staff, 39 inches; head, 6 inches; tip,  $2\frac{3}{4}$  inches. St. Michael's, Norton Sound, Alaska, 1876. 29,841. Collected by L. M. Turner.

## SEAL HARPOON AND BUOY.

A short, heavy head of bone or horn, into which is driven a stout staff of cedar secured by a becket; a wooden socket in the end receives adjustable tip of bone, barbed on each side, to which is fastened the line, made of stout walrus or seal hide; on one side of the staff, about its middle, is fastened a curved bone pin, against which the forefinger presses to strengthen the grip when hurling. A buoy made of seal bladder is attached to staff near its butt. Length: staff,  $49\frac{1}{4}$  inches; head 5 inches; tip,  $2\frac{1}{2}$  inches. St. Michael's, Norton Sound, Alaska, 1878. 33,863. Collected by E. W. Nelson.

## SEAL AND BELUGA HARPOON AND BUOY.

A long, heavy head of bone or horn, into which is driven a stout staff of cedar, secured by a becket; wooden socket in the end receives adjustable tip of bone, barbed on each side, to which is fastened the line, made of stout walrus or seal hide; a buoy made of seal-bladder is attached to staff near its butt. Length: staff,  $52\frac{1}{2}$  inches; head,  $6\frac{1}{2}$  inches; tip,  $4\frac{1}{2}$  inches. St. Michael's, Norton Sound, Alaska, 1878. 33,939. Collected by E. W. Nelson. Used after the seal or beluga has been struck with another spear in order to prevent it from sinking. The float is inflated when in use; at other times it is folded around the staff.

## SEAL AND BELUGA HARPOON AND BUOY.

A short, heavy head of bone or horn, into which is driven a stout staff of cedar, secured by a pin; a wooden socket in the end receives adjustable tip of bone, barbed on each side, to which is fastened the line, made of stout walrus or seal hide; a buoy, made of seal-bladder, is attached to a staff near its butt. Length: staff,  $47\frac{1}{4}$  inches; head,  $3\frac{1}{2}$  inches; tip, 4 inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,940. Collected by E. W. Nelson.

## SEAL SPEAR AND BUOY.

A short, round, ivory head, driven into a long, light cedar staff, and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed ivory tip, to which is fastened the line, made of sinew sennit. Small buoy, made of seal intestine, is attached to staff near butt. Length: staff, 45 inches; head,  $2\frac{1}{2}$  inches; tip,  $4\frac{1}{2}$  inches. Bristol Bay, Alaska, 1882. 72,415. Collected by Charles L. McKay.

## SEAL SPEAR AND BUOY.

A short, round, ivory head, driven into long, light cedar staff, and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed ivory tip, to which is fastened the line, made of sinew sennit. Small buoy made of seal intestine is attached to staff near butt. Made by Eskimo. Length: staff,  $46\frac{3}{4}$  inches; head,  $3\frac{1}{8}$  inches. Bristol Bay, Alaska, 1872. 11,356. Vincent Colyer.

## SEAL SPEAR AND BUOY.

A short, round, ivory head, driven into long, light cedar staff, and secured by serving of fine sinew; wooden socket in end receives adjustable barbed ivory tip, to which is fastened the line, made of sinew sennit. Small buoy, made of seal intestine, is attached to staff near butt. Length: staff,  $44\frac{1}{2}$  inches; head, 3 inches; tip,  $3\frac{1}{2}$  inches. Nushegag Indians, Alaska, 1869 7,998. Dr. T. T. Minor.

## HARPOONS, LINES, AND FLOATS. (3 models.)

Harpoon-heads have copper blades, with ivory wings or barbs; lines made of twisted fiber, served with twine; floats, wood carved in imitation of seal-skin buoys. Made by Makah Indians. Neah Bay, Washington Territory. 4,131. Collected by James G. Swan.

## HARPOON WITH BLADDER-FLOAT.

Pole, wood, painted black, striped with dull red; tip served with seal sinew and recessed for harpoon-head; harpoon, bone, two barbed notches, attached to line with seal thong; line, probably seal sinew, fastened to pole; float-bladder of seal, old, lashed to pole with seal sinew; ivory plug, ornamented, inserted in neck of bladder to be used when the bladder is inflated; finger-rest, horn. Length, 14 feet. Kodiak, Alaska. 11,362. Vincent Colyer.

## SEAL-HARPOON.

Eskimo, Igloodik. 10,400. Collected by Capt. C. F. Hall.

**SEAL-SPEAR (model.)**

Arrow-shaped, adjustable ivory head, with iron blade; long, ivory shank in cedar staff. Line, fine sinew sennit. Length, 18 inches. Anderson River District, 1866. 1,678. R. Macfarlane.

**SEAL-HARPOON.**

Heavy, ivory head, driven into light cedar staff, and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff,  $47\frac{1}{2}$  inches; head,  $3\frac{1}{2}$  inches; tip,  $2\frac{1}{2}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,871. Collected by E. W. Nelson.

**ESKIMO SEAL-HARPOON.**

Pole, wood, 1 inch in diameter; butt recessed to receive a recurved bone spear, which is lashed with seal-skin; ivory peg for grip, lashed to pole with seal-skin; tip mounted with a bulb-like ivory head recessed for shank; shank, ivory, fastened to line with a seal-skin lanyard or becket; lily-iron, ivory, tipped with iron; rigid eye for line; seal-skin line attached to head. Total length, 9 feet 2 inches. Norton Sound, Alaska, 1874. 33,888. Collected by E. W. Nelson. Combined harpoon and lance, manufactured and used by natives in the capture of seal.

**SEAL-HARPOON.**

Heavy, ivory head, driven into light cedar staff, and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff, 44 inches; head,  $4\frac{5}{8}$  inches; tip,  $3\frac{1}{2}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,909. Collected by E. W. Nelson.

**SEAL-HARPOON.**

Heavy, ivory head, driven into light cedar staff, and secured by seizing of fine sinew; wooden socket in end receives adjustable tip, to which is fastened the line. Length: staff,  $51\frac{3}{4}$  inches; head, 4 inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,925. Collected by E. W. Nelson.

**HARPOONS.**

Shafts of cedar, oval in cross-section, fitted into bone heads, in outer end of which are wooden plugs in which are inserted barbed-bone points secured to heads by lanyards. On middle of shafts are fastened bone finger-cleats, and near ends are lashed seal-bladder buoys, with bone mouth-pieces; harpoon line is attached to lanyard of shaft. Length, 4 to 5 feet; bone heads, 7 inches; points, 3 to 5 inches. Alaska. Collected by

## HARPOONS—Continued.

E. W. Nelson and L. M. Turner. 33,936, 29,040, 33,911, 33,912, 33,930, 33,938, 33,864, 33,975, 33,933. Used by Alaskan Indians of Norton Sound and elsewhere in seal and beluga hunting, and thrown after the game has been previously speared to prevent them from sinking or escaping.

## SEAL-HARPOON.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff, 44 inches; head, 4 inches; tip, 3 inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,961. Collected by E. W. Nelson.

## HARPOON OR SEAL-SPEAR.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff,  $49\frac{1}{4}$  inches; head, 4 inches; tip,  $2\frac{3}{4}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,977. Collected by E. W. Nelson.

## HARPOON OR SEAL-SPEAR.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff,  $46\frac{1}{2}$  inches; head,  $3\frac{3}{4}$  inches; tip,  $2\frac{1}{2}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,979. Collected by E. W. Nelson.

## HARPOON OR SEAL-SPEAR.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line; made of seal or walrus hide. Length: staff,  $46\frac{1}{2}$  inches; head,  $3\frac{5}{8}$  inches; tip,  $2\frac{1}{2}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,983. Collected by E. W. Nelson.

## HARPOON OR SEAL-SPEAR.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff, 45 inches; head, 4 inches; tip, 3 inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,984. Collected by E. W. Nelson.



**HARPOON OR SEAL-SPEAR.**

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff,  $44\frac{3}{4}$  inches; head,  $3\frac{3}{4}$  inches; tip, 2 inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,986. Collected by E. W. Nelson.

**HARPOON OR SEAL-SPEAR.**

Heavy, ivory head, driven into light cedar staff, and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff,  $45\frac{1}{2}$  inches; head, 4 inches; tip,  $2\frac{1}{2}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,987. Collected by E. W. Nelson.

**HARPOON OR SEAL-SPEAR.**

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line, made of seal or walrus hide. Length: staff, 45 inches; head,  $4\frac{1}{2}$  inches; tip,  $3\frac{1}{2}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 34,007. Collected by E. W. Nelson.

**SEAL-SPEAR.**

Heavy, bone head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives detachable barbed ivory tip, through which the line is rove. Length: staff,  $48\frac{1}{2}$  inches; head, 5 inches; tip,  $2\frac{1}{2}$  inches. Lower Yukon River, Alaska, 1879. 36,088. Collected by E. W. Nelson.

**SEAL-HARPOON.**

Pole, wood; lance, walrus ivory, seized to butt with seal thongs; grip, ivory, carved in imitation of head of seal; tip of pole served with alternate layers of black and transparent strips of baleen; head-piece, ivory, recessed for ivory shank, lashed to pole with a seal thong. Harpoon wanting. Length, 11 feet. Golofnin. Bay, Alaska. 43,346. Collected by E. W. Nelson. Harpoon and lance combined.

**SEAL-SPEAR (toy model).**

Arrow-shaped iron blade in adjustable ivory head, with ivory shank. Cedar staff. Length,  $13\frac{1}{2}$  inches. Cape Nome, Alaska, 1880. 44,666. Collected by E. W. Nelson.

**SEAL-SPEAR.**

Pole, wood; spear or lance, bone, lashed to butt with a seal thong; grip, ivory, carved in imitation of head of seal, lashed to cen-



## SEAL-SPEAR—Continued.

tral part of pole; tip of pole served with strips of baleen; head-piece, ivory, recessed for ivory shank, lashed to pole with a seal thong. Harpoon wanting. Length, 9 feet 5 inches. Sledge Island, Alaska. 45,418. Collected by E. W. Nelson. Harpoon and lance or spear combined.

## SEAL-SPEAR.

Heavy, bone head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives detachable barbed ivory tip, through which the line is rove. Length: staff, 46½ inches; head and tip, 5½ inches. Cape Darby, Alaska, 1880. 45,428. Collected by E. W. Nelson.

## SEAL-SPEAR.

Heavy, bone head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives detachable barbed ivory tip, through which the line is rove. Length: staff, 45 inches; head and tip, 7 inches. Cape Nome, Alaska, 1880. 45,429. Collected by E. W. Nelson.

## SEAL-SPEAR.

Heavy, bone head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives detachable ivory tip, through which the line is rove. Length: staff, 45½ inches; head, 4 inches; tip, 2½ inches. Cape Nome, Alaska, 1880. 45,430. Collected by E. W. Nelson.

## SEAL-SPEAR.

Heavy, bone head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives detachable barbed ivory tip, through which the line is rove. Length: staff 46½ inches; head and tip, 7 inches. Sledge Island, Alaska, 1880. 48,156. Collected by E. W. Nelson.

## SEAL-HARPOON.

Pole, wood; spear or lance, ivory, seized to butt with seal-skin; grip, ivory; head-piece and shank, walrus ivory; tip of pole served with seal sinews. Harpoon wanting. Length, 9 feet 6 inches. Port Clarence, Alaska. 48,429. Collected by E. W. Nelson. Harpoon and lance or spear combined.

## SEAL-SPEAR HEADS AND LANYARDS.

A slender staff or pole, with two prongs of unequal lengths, upon which are placed respectively two metal heads with one barb each. The spear-heads are held in place by lanyards, which are hauled taut and firmly grasped with the pole in the left

## SEAL-SPEAR HEADS AND LANYARDS—Continued.

hand. When used, the ends of the lanyards are attached to a long line, one end of which remains in the boat. The butt of the pole is provided with a flaring piece of wood, which is used as a finger-rest when the Indian thrusts the instrument into the seal. Length, 15 feet 10 inches. Makah Indians, Neah Bay, Washington Territory. 72,671. James G. Swan.

“Used by the natives in killing fur-seals. The canoe is paddled silently to a short distance from the sleeping seal and the spear thrust forcibly into the animal. The canoe is hauled by means of the rope closer to the seal, which is dispatched by a blow on the head with a club. The Indians invariably smash in the skull of a seal even when the animal is killed by the thrust of the spear, which is frequently the case. So universal is this practice that I was unable, during a residence of three years at Neah Bay, to obtain a perfect specimen of a skull, although hundreds of skulls may be seen on the beach any day during the sealing season, but every one was fractured.”—(*J. G. Swan.*)

## SEAL-SPEAR.

Head made of a slightly curved piece of walrus ivory, driven into a light cedar staff, and secured by seizing of fine sinew; wooden socket in end receives adjustable double-barbed tip, to which is fastened the line, made of sinew sennit. Length: staff, 50 $\frac{3}{4}$  inches; head, 7 $\frac{1}{4}$  inches; tip, 1 $\frac{1}{2}$  inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,789. Lieut. P. H. Ray, U. S. A.

## SEAL-SPEAR.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives detachable barbed tip, to which is fastened the line made of twisted sinew. Length: staff, 52 $\frac{3}{4}$  inches; head, 5 inches; tip, 2 inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,790. Collected by Lieut. P. H. Ray, U. S. A.

## SEAL-SPEAR.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line made of sinew sennit. Length: staff, 44 inches; head, 5 $\frac{1}{2}$  inches; tip, 1 $\frac{3}{4}$  inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,791. Collected by Lieut. P. H. Ray, U. S. A.

## SEAL-SPEAR.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line made of sinew sennit.

## SEAL-SPEAR—Continued.

Length: staff, 52 inches; head,  $6\frac{1}{4}$  inches; tip,  $1\frac{3}{4}$  inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,792. Collected by Lieut. P. H. Ray, U. S. A.

## SEAL-SPEAR.

Heavy, ivory head, driven into light cedar staff and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed tip, to which is fastened the line made of sinew sennit. Length: staff,  $49\frac{3}{4}$  inches; head, 6 inches; tip,  $1\frac{1}{2}$  inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,793. Collected by Lieut. P. H. Ray, U. S. A.

## SEAL-SPEAR. (Model.)

Ivory, arrow-shaped, adjustable head, with long shank in cedar staff. Length,  $20\frac{1}{2}$  inches. Saint Lawrence Island, Alaska, 1874. 15,631. Collected by H. W. Elliott.

## SEAL-SPEAR.

Frobisher Bay, 1864-'69. 10,264. Collected by Capt. C. F. Hall.

## SEAL SPEAR OR LANCE.

Long, round, ivory blade, in larger ivory shank; secured in heavy cedar staff by serving of sinew sennit. Length, 58 inches. King William's Land, 1864. 10,271. Collected by Capt. C. F. Hall.

## SEAL-SPEAR.

Four conjoined pieces; lance-point, bone, rigidly fastened into the recessed bulb-shaped end of shank; shank, walrus bone, chamfered at rear extremity and lashed to the handle with seal-sinew; handle, wood; butt, recessed; small bone butt-piece inserted in recess and lashed with seal-skin; lance-strap seal-skin. Length, 65 inches. King William's Land, 1864-'69. 10,272. Collected by Capt. C. F. Hall.

## SEAL AND WALRUS SPEAR.

A short, round, ivory head, rudely ornamented with incised lines, driven into heavy cedar handle and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed ivory tip, to which is fastened the line, made of sinew sennit; small ivory pin in butt. Length: Staff,  $51\frac{1}{2}$  inches; head,  $4\frac{1}{4}$  inches; tip,  $3\frac{1}{2}$  inches. Nunivak Island, Alaska, 1880. 48,372. Collected by E. W. Nelson.

## MINIATURE HARPOON (Oon-a-gag-u-uk).

Blade, head, and shank, ivory; cedar staff; line, thin strip of seal-skin. Length,  $16\frac{1}{2}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,840. Collected by E. W. Nelson.

## ESKIMO HARPOON.

Handle, wood, tipped with head of an animal carved in bone; bone shank inserted in recess of tip and lashed with rawhide to handle; end of handle near tip served with strips of baleen and rawhide; small seal head carved in bone and seized to central part of handle, used as a finger rest and as a stop for the line. Wanting, harpoon butt and head. Total length, 54 inches. Sledge Island, Alaska. 45,415. Collected by E. W. Nelson.

## WALRUS HARPOONS.

Common toggle-irons; shanks, wrought iron; toggles, malleable cast iron, mortised; stamped "L. Cole" (manufacturer). Total length (56,415), 22 inches; total length (56,413), 22½ inches; length of toggles, 6 inches. Fairhaven, Mass., 1883. U. S. Fish Commission. Used by whalers in the Arctic Regions in the capture of walrus.

## WALRUS-SPEAR.

Detachable head, bone, tipped with slate; lashed with raw hide to a light wooden handle. Total length, 24½ inches. Bristol Bay, Alaska, 1882. 72,418. Collected by Chas. L. McKay.

## WALRUS-HARPOON.

End recessed for pole; rigid eye for lanyard. Length, 5 inches. Eskimo, Igloodik. 10,136. Collected by Capt. C. F. Hall.

## SEA-OTTER SPEAR AND BUOY.

A short, round, ivory head, driven into long, light cedar staff, and secured by seizing of fine sinew; wooden socket in end receives adjustable barbed ivory tip, to which is fastened the line, made of sinew sennit. Small buoy, made of seal intestine, is attached to staff near butt. Length: staff, 45¾ inches; head, 3 inches; tip, 5 inches. Tshernoburo Island, Cook's Inlet, Alaska, 1882. 72,518. Collected by William J. Fisher. Native names: The whole spear, Pi-shu-dak; socket or bone head, Kag-li-shwik; bladder, Ak-tshuk; line, Puhn-ak; staff, Tu-puh-gat; tip, Tshi-guik.

## HARPOON-HEAD AND FLOAT-LINE.

Head, walrus ivory, with iron tip riveted with native copper; line, walrus hide; bight caught in rigid eye of harpoon and seized with strips of baleen. Length of head, 4¾ inches; of line, 107 feet. Point Tchaptin, Siberia. 49,151. Collected by E. W. Nelson.



## HARPOON LINE AND HEAD.

Line, walrus-hide; head, bone, tipped with brass, fastened to line by means of a small lanyard and an ivory toggle. Used by natives in capturing the beluga. Length of line, 68 feet. Bristol Bay, Alaska, 1882. 72,397. Collected by C. L. McKay.

## THREE HARPOON-HEADS.

Bone and iron; recessed in rear end for poles; rigid eyes for lanyards. Length,  $4\frac{7}{8}$ ,  $5\frac{3}{8}$ , and  $5\frac{5}{8}$  inches. Eskimo, Northeast coast. 9,838. Presented by Prof. Spencer F. Baird.

## HARPOON-HEAD.

Bone, tipped with iron. Used in beluga-fishing, with the accompanying harpoon-shafts (72,392-3). Length,  $9\frac{1}{4}$  inches. Bristol Bay, Alaska, 1882. 72,394. Collected by C. L. McKay.

## HARPOON-HEAD.

Cut from bone; fitted in one end with a wooden plug for inserting barbed point, and mortised in other end for attachment to shaft. Used by Tschutschi Indians, Northwest coast. Length, 10 inches; diameter,  $1\frac{1}{2}$  inches; mortise, 2 inches long. Northwest coast, 1857. 2,538. Collected by Commodore John Rodgers, U. S. N.

## HARPOON-HEAD.

Part of ancient Inuit harpoon-head; bone. Length,  $3\frac{3}{4}$  inches. Repulse Bay. 10,404. Collected by Capt. C. F. Hall.

## IRON HARPOON-HEAD.

Line of walrus hide. Smith Sound. 14,255. Collected by Capt. C. F. Hall. Used by Eskimo.

## THREE HARPOON-HEADS.

Ivory, tipped with iron; recessed for poles, and eyes for lanyards. Tip of one broken. Length,  $4\frac{1}{8}$ ,  $4\frac{3}{4}$ , and  $5\frac{1}{8}$  inches. Eskimos, Cumberland Gulf. 29,974. Collected by W. A. Mintzer, U. S. N.

## HARPOON-HEAD.

Bone and iron; recessed for pole; rigid eye for lanyard. Length,  $5\frac{1}{2}$  inches. Cumberland Gulf. 29,975. W. A. Mintzer, U. S. N. Used by Eskimo.

## HARPOON-HEAD.

Bone, with walrus-hide line. Port Foulke. 565. Collected by Dr. I. I. Hayes. Used by Eskimo.



## HARPOON-HEADS (40).

Ivory or bone "lily-irons" and shanks, with blades of bone, ivory-flint, slate, iron, and copper; inserted into ends of harpoon, staves. The line is fastened to these heads, which become detached when the animal is struck; some are provided with wooden caps. Length, 3 to 13 inches. Alaska.

## HARPOON-HEAD.

Detachable head tipped with iron; rear end bifurcate; raw-hide strap. Length of head,  $5\frac{1}{2}$  inches. Nunivak Island, Alaska. 48,241. Collected by E. W. Nelson.

## HARPOON-HEAD.

Detachable head of bone, with iron tip; rear part of head bifurcated; strap, raw hide. Wooden neck or shank inserted in recess of head, and fastened to strap with a small raw-hide becket. Length,  $5\frac{1}{2}$  inches. Nunivak Island, Alaska. 48,240. Collected by E. W. Nelson.

## HARPOON-HEAD.

Detachable harpoon-head, made of bone and iron. Length,  $5\frac{7}{8}$  inches. Big Diomedé Island, Alaska. 46,373. Collected by Dr. T. H. Bean. Used by Eskimo.

## HARPOON-HEAD.

Detachable harpoon-head; bone, with iron tip. Length, 6 inches. Eskimo, Cape Estenberg, Kotzebue Sound. Collected by Dr. T. H. Bean.

## SPEAR-HEAD.

Detachable; made of bone; two deep barbs on blade and two on shank, forming socket for staff; secured by serving of sinew and pitch. Made by Indians. Length,  $7\frac{1}{2}$  inches. New Mexico, 1866. 1,439. Lieutenant Whipple, U. S. A.

## HARPOON-HEAD.

Detachable bone harpoon-head, tipped with brass; recessed for end of pole; eye for strap; strap, raw hide. Length of head,  $4\frac{3}{4}$  inches; length of strap, 12 inches. Ooglaamie, Point Barrow, Alaska, 1882. 56,623. Collected by Lieut. P. H. Ray, U. S. A.

## HARPOON-HEAD.

Detachable harpoon-head, bone, tipped with slate; line for bending on buoy, rawhide. Length of head,  $4\frac{3}{4}$  inches. Ooglaamie, Point Barrow, Alaska, 1882. 56,612. Lieut. P. H. Ray, U. S. A.

## HARPOON-HEAD.

A detachable harpoon-head, bone, tipped with brass. Length, 9 inches. Ooglaamic, Point Barrow, Alaska, 1882. 56,601. Lieut. P. H. Ray, U. S. A.

## BONE HARPOON-HEAD.

Length,  $7\frac{1}{2}$  inches. Bristol Bay, Alaska, 1882. 72,395. Collected by C. L. McKay.

## SALMON SPEAR-HEADS (2.)

Straight-iron points, with bone barbs forming socket; wrapped with bark of spruce root (?) and thickly pitched; joined by rawhide ganging. Quilleute Indians, about thirty miles south of Cape Flattery. Length, 4 inches. Washington Territory, 1883. 72,839. James G. Swan, Port Townsend, Wash. Used on a pole with two prongs like seal spears.

## SEAL HARPOON-HEAD.

Walrus ivory, tipped with brass; lanyard, seal-hide. Length of head, 3 inches; of lanyard, 8 feet 8 inches. Cape Lisburne, Alaska. 49,034. Collected by W. H. Dall. Made and used by Eskimo.

## SEAL HARPOON-HEAD.

Walrus ivory, with brass tip; lanyard, rawhide, seized with sinew of seal. Length of head,  $3\frac{1}{4}$  inches; of lanyard,  $16\frac{3}{4}$  inches. Eskimo, Cape Lisburne. 46,038. Collected by W. H. Dall.

## SEAL HARPOON-HEAD.

Walrus ivory, tipped with iron; lanyard of rawhide; bights seized with seal sinew. Length of head, 3 inches; of lanyard, 51 inches. Cape Lisburne, Alaska. 46,035. Collected by Wm. H. Dall. Made and used by Eskimo.

## SEAL HARPOON-HEAD.

Ivory, tipped with brass; lanyard, rawhide, seized with seal sinews. Length of head,  $3\frac{1}{4}$  inches; of lanyard, 13 inches. Eskimo, Cape Lisburne. 46,033. Collected by Wm. H. Dall.

## SEAL HARPOON-HEAD.

Walrus ivory, tipped with brass; new; lanyard, rawhide; bight seized with seal sinew. Length of head, 3 inches; of lanyard, 59 inches. Eskimo, Cape Lisburne, Arctic Ocean. 46,032. Collected by Wm. H. Dall.

## SEAL HARPOON-HEAD.

Walrus ivory, with brass tip riveted with native copper; lanyard, rawhide; bights in the ends of lanyard seized with seal sinew.

## SEAL HARPOON-HEAD—Continued.

Length of head, 3 inches; of lanyard, 40 inches. Cape Lisburne, Arctic Ocean. 3,627. Collected by W. H. Dall. Old; has been used.

## SPEAR-HEADS (3).

Bone, ivory, and wooden shafts, 6 to 13 inches long and  $\frac{1}{4}$  inch in diameter, pointed at one end for inserting in shaft of spear, and having lashed in slot in other end metal-barbed arrow-heads. N. W. Coast of America, 1841. 2,627, 2,693. U. S. Exploring Expedition, Capt. Charles Wilkes, U. S. N., commanding.

## SPEAR-HEAD.

Bone head, in one end of which is riveted a barbed metal head 3 inches long, and in the other a slot  $2\frac{1}{4}$  inches long is cut for securing head to wooden staff. From Fort Anderson. Length, 7 inches; bone head, 4 inches. British America, 1867. 5,818. Collected by Robert Macfarlane.

## HARPOON-SHAFT.

Head made of walrus ivory, carved to represent an animal's head, and ornamented with incised circles and lines; wooden socket in animal's mouth to receive shank; head driven into white cedar shaft and secured by serving of stout twisted sinew. Length: staff, 48 inches; head, 9 inches. Nunivak Island, Alaska, 1880. 43,750. Collected by E. W. Nelson. Used in beluga, walrus, and seal hunting.

## ESKIMO HARPOON-HANDLE.

Handle, wood, tipped with bone; shank, bone, inserted in recessed head of tip and lashed to handle with hide; pole in two sections to fit case. Total length, 76 inches. Cape Lisburne, Alaska. 46,177. Collected by Wm. H. Dall.

## HARPOON-SHAFT, WITH THROWING-STICK ATTACHED.

Head made of ivory or bone, rudely carved; wooden socket in the end receives shank; head is driven into white cedar staff and secured by a serving of fine twisted sinew. Used in beluga, walrus, and seal hunting. Length of staff,  $48\frac{1}{2}$  inches; head,  $5\frac{1}{2}$  inches. Norton Sound, Alaska, 1874. 33,898. Collected by E. W. Nelson.

## HARPOON-SHAFT.

Head made of walrus ivory, carved to represent an animal's head; wooden socket in its mouth to receive shank; head is bifurcated to receive white cedar shaft and secured by a serving of

## HARPOON-SHAFT—Continued.

stout twisted sinew. Used in beluga, walrus, and seal hunting. Length of staff, 46 inches; head,  $8\frac{1}{2}$  inches. Magemut Eskimo, Nunivak Island, Alaska, 1874. 15,658. W. H. Dall.

## HARPOON-SHAFT.

Head made of walrus ivory, carved to represent an animal, black beads for eyes, red and white beads for nostrils; wooden socket in animal's open mouth to receive shank; head is bifurcated to receive white cedar staff, which is secured by a serving of stout twisted sinew. Used in beluga, walrus, and seal hunting. Length: staff,  $46\frac{1}{4}$  inches; head,  $9\frac{3}{4}$  inches. Chulitmut, Alaska, 1879. 36,080. Collected by E. W. Nelson.

## HARPOON-SHAFT.

Head made of walrus ivory, carved to represent an animal; wooden socket in its mouth to receive shank; head is bifurcated to receive white cedar shaft, and secured by a serving of stout twisted sinew. Used in beluga, walrus, and seal hunting. Length of staff, 46 inches; head, 7 inches. Lower Kuskoquim, Alaska, 1879. 36,081. Collected by E. W. Nelson.

## HARPOON-SHAFT.

Head made of a curved piece of walrus ivory, ornamented with incised lines and circles; wooden socket in the end receives shank; head is bifurcated to receive white cedar staff, which is secured by a serving of stout twisted sinew. Length: staff,  $46\frac{1}{2}$  inches; head, 9 inches. Kushunuk, Alaska, 1879. 36,082. Collected by E. W. Nelson. Used in beluga, walrus, and seal hunting.

## HARPOON-SHAFT.

Head made of walrus ivory, rudely carved; wooden socket in the end receives shank; head is driven into white cedar staff and secured by serving of fine twisted sinew. Length: staff,  $45\frac{3}{4}$  inches; head, 7 inches. Cape Vancouver, Alaska, 1879. 36,083. Collected by E. W. Nelson. Used in beluga, walrus, and seal hunting.

## HARPOON-SHAFT.

Head made of walrus ivory, carved to represent an animal, blue beads for eyes; wooden socket in the end receives shank; head is driven into white cedar staff, and secured by a serving of fine twisted sinew. Length: staff,  $43\frac{1}{4}$  inches; head,  $10\frac{3}{4}$  inches. Nunivak Island, Alaska, 1879. 43,748. Collected by E. W. Nelson. Used in beluga, walrus, and seal hunting.



## HARPOON-SHAFT.

Head made of walrus ivory, carved to represent an animal; wooden socket in its mouth to receive shank; head is bifurcated to receive white cedar shaft, and secured by a seizing of stout twisted sinew. Length: staff,  $43\frac{3}{4}$  inches; head, 8 inches. Nuniwak Island, Alaska, 1880. 43,751. Collected by E. W. Nelson. Used in beluga, walrus, and seal hunting.

## HARPOON-SHAFT.

Head made of walrus ivory, ornamented with incised lines; wooden socket in the end receives shank; head is bifurcated to receive white cedar staff, and secured by a serving of sinew and caribou hair. Length: staff,  $44\frac{1}{2}$  inches; head,  $10\frac{1}{2}$  inches. Nuniwak Island, Alaska, 1880. 48,367. Collected by E. W. Nelson. Used in beluga, walrus, and seal hunting.

## STAFF FOR SEAL SPEAR.

Slender pole, with two prongs on the forward end and a finger-rest at the butt; spears wanting. Used to kill seal. Length, 15 feet. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,670. James G. Swan.

## PHOTOGRAPHS AND DRAWINGS ILLUSTRATIVE OF THE USE OF SPEARS AND HARPOONS.

## PORPOISE FISHING.

Photographs of Passamaquoddy Indians in birch-bark canoe in the act of spearing a porpoise after it has been shot with buck-shot fired from a common muzzle-loading shot-gun. Porpoises sink very soon after being shot, and the Indians must be quick in their movements to secure them with the spear. Size, 8 by 10 inches. Pleasant Point, near Eastport, Me., 1882. (206) 1,904. U. S. Fish Commission.

## PORPOISE FISHING.

An enlarged photograph of Passamaquoddy Indians in birch-bark canoe in the act of spearing a porpoise after it has been shot with buck-shot fired from a common muzzle loading shot-gun. Porpoises sink very soon after being shot, and the Indians must be very quick in their movements to secure them with the spear. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. (206) 1,904. Pleasant Point, near Eastport, Me., 1882. U. S. Fish Commission.

## TERRAPIN SPEARING.

An India-ink drawing, showing North Carolina negroes wading about in shoal water in search of terrapin, which they secure by

## TERRAPIN SPEARING—Continued.

means of a crude one-pointed spear armed with a metal tip. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

## INDIANS SPEARING FISH.

A crayon sketch showing a birch-bark canoe with two Indians engaged in catching fish. One Indian sits in the stern paddling the boat, while the other stands in the bow ready to spear the fish. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

## ESKIMO SEAL HUNTING.

An India-ink sketch showing an Alaskan Eskimo dressed in his fur suit and provided with a harpoon creeping up to a seal on the ice. The costume of the Eskimo as he lies stretched out upon the ice causes him to somewhat resemble a seal in appearance, and by the use of a scratcher made out of seal's claws he makes a noise which frequently draws the seal near enough to him to enable him to strike it with a harpoon. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott, artist.

## 9. TANGLES.

## TANGLES.

The tangles are employed by naturalists for the purpose of gathering small spiny animals, such as sea-urchins and star-fishes, from the bottom at considerable depths. They adhere to the fibers of the spun-yarn in great numbers. It has been thought that this instrument might advantageously be employed in freeing oyster-beds from their worst enemies, the star-fish. (See apparatus for deep-sea research.)

## B.—APPARATUS OF INDIRECT APPLICATION.

### III.—MISSILES.

*\* Simple missiles (those propelled by the unaided arm).*

#### 10. HURLED SPEARS.

##### DARTS AND LANCES.

(See under spears, above enumerated, many of which may be used as missiles.)

*\*\* Centrifugal missiles.—(Propelling power augmented by an artificial crease of the length of the arm.)*

#### 11. MISSILES PROPELLED BY THROWING-STICKS.

##### SPEARS AND THROWING-STICKS.

###### THROWING-STICK.

Wood, elaborately carved. A groove in the upper surface, ending against a small bone or ivory near smaller end, receives butt of spear. A small hole near the larger end receives the tip of the forefinger; the second finger rests against a pin on one side and the thumb in a slot on the other side. Used to increase leverage of arm when throwing harpoons, spears, &c. Length,  $18\frac{3}{4}$  inches; width,  $2\frac{1}{2}$  inches. Alaska, 1857. 2,523. U. S. Pacific Exploring Expedition, Commodore John Rodgers, U. S. N., commanding.

###### THROWING-STICK.

Wood, rudely carved. A groove in the upper surface, ending against a small shoulder of bone or ivory near small end, receives butt of spear. A small hole near the large end receives tip of forefinger; the second finger rests against a pin on one side and the thumb in a slot on the other side. Used to increase leverage of arm when hurling harpoons, spears, &c. Length,  $19\frac{1}{2}$  inches; breadth,  $3\frac{1}{4}$  inches. Nunivak Island, Alaska, 1873. 16,242. W. H. Dall.

###### THROWING-STICK.

A stick of wood, with a groove in upper surface, ending against a small strip of ivory nailed across the groove; on the side are two ivory pegs. Used to give leverage to arm in throwing harpoons, &c. The stick is grasped by the larger end, the

## THROWING-STICK—Continued.

forefinger placed against it, the thumb around it, and two fingers over the pegs. The butt of the spear rests in the groove. Length, 1 foot 6 inches; width, 2 inches. Alaska, 1878. 33,914. Collected by E. W. Nelson.

## THROWING-STICK.

Wood, rudely carved; a groove in the upper surface, ending against a small shoulder of bone or ivory at smaller end, receives butt of shaft. A small hole near the larger end receives the tip of the forefinger; the second finger rests against a pin on one side, and the thumb in a slot on the other side. Length, 21 inches; breadth,  $2\frac{3}{4}$  inches. Norton Bay, Alaska, 1881. 48,142. Collected by E. W. Nelson. Used to add force to the blow of the harpoon by increasing leverage of arm.

## THROWING-STICK.

Wood, grooved on one side; shoulder of ivory, against which the butt of the harpoon-shaft rests, rigidly fastened at the rear end of the groove; two ivory pegs are permanently fastened on one side at the rear end to strengthen the grip. Used by natives for hurling the harpoon in the capture of the beluga. Length, 18 inches. Bristol Bay, Alaska, 1882. 72,398. Collected by Charles L. McKay.

## THROWING-STICK.

Wood, rudely carved; a groove in the upper surface, ending against a small shoulder of bone or ivory at smaller end, receives butt of spear. A small hole near the larger end receives the tip of the fore-finger; the second finger rests against a pin on one side, and the thumb in a slot on the other side. Length,  $18\frac{1}{2}$  inches; breadth, 3 inches. Tshernoburo Island, Cook's Inlet, Alaska, 1882. 72,519. Collected by Wm. J. Fisher. Used to increase leverage of arm when hurling harpoons, spears, &c.

## BELUGA HARPOON OR WHALING-STICK.

A light stick,  $\frac{1}{2}$  inch in diameter, with walrus-ivory tip carved in the shape of the head of an animal; a wooden plug is inserted in the mouth, and recessed for the insertion of the neck or shank; head, bone, tipped with slate. When the beluga is struck the head becomes detached from the shaft. Used in connection with the throwing-stick. Length, 5 feet. Bristol Bay, Alaska, 1882. 72,391. Collected by C. L. McKay.

## BELUGA LANCE-BUTTS.

Two butts made of walrus ivory; wedge-shaped, so as to be conveniently driven into the end of the lance, and provided with



**BELUGA LANCE-BUTTS—Continued.**

shoulders, by means of which they are seized and lashed. Length,  $3\frac{3}{4}$  inches. 72,403. Length, 4 inches. 72,402. Bristol Bay, Alaska, 1882. C. L. McKay.

**BELUGA HARPOON-SHAFT.**

Light, wooden stick,  $\frac{1}{2}$  inch in diameter, tipped with walrus ivory, carved in shape of a head of an animal. Harpoon wanting. Length, 4 feet  $5\frac{1}{2}$  inches. Bristol Bay, Alaska, 1882. 72,392. Collected by Charles L. McKay. Used by natives, in connection with the accompanying throwing-stick (72,398), for the capture of the beluga.

**BELUGA HARPOON-SHAFT.**

Wood,  $\frac{1}{2}$  inch in diameter, with ornamental head carved in walrus ivory. Harpoon wanting. Length, 4 feet 4 inches. Alaska. 72,393. Collected by C. L. McKay. Used by natives, in connection with the accompanying throwing-stick (72,398), in the capture of the beluga.

**BIRD-SPEAR AND THROWING-STICK.**

Pole, wood; iron spear barbed, inserted in tip; brass ferrule; three diverging bone barbs with one "beard" each, lashed to central part of handle. Throwing-stick, an instrument held in the right hand and used to hurl the spear; wood, slotted on one side for the reception of the handle of spear; one hole for index finger, and notches for thumb and fingers. Length of spear, 55 inches; of stick, 21 inches. Arctic America. 10,267. Smithsonian Institution.

**BIRD-SPEAR.**

Pole, wood; butt tipped with ivory; three branching barbs with two notches each, ivory, lashed to handle in center; two iron spears with one barb each inserted in tip of pole; tip of pole served with strips of baleen. Old; has been used. Length, 66 inches. Eskimo, Greenland. 19,516. Collected by George Y. Nickerson.

**BIRD-SPEAR.**

Long, smooth, ivory tip, slightly curved; cedar shaft; three converging ivory barbs, serrated on inner edges, are lashed to shaft 17 inches from butt. Length, 59 inches. Saint Michael's, Norton Sound, Alaska, 1876. 29,853. Collected by Lucien M. Turner.

**BIRD-SPEAR (Nu-i-n'et).**

Tip made of a heavy curved piece of walrus ivory, sharp-pointed and deeply serrated on one edge; long, cedar shaft; three di-

## BIRD-SPEAR—Continued.

verging ivory barbs, serrated on outer edge, are lashed to shaft 7 inches from butt. Length,  $55\frac{1}{2}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,851. Collected by E. W. Nelson.

## BIRD-SPEAR.

Three long, converging, ivory barbs, serrated on inner edges, lashed to end of cedar shaft by serving of twisted sinew. Length, 55 inches. Collected by E. W. Nelson. Nunivak Island, Alaska, 1880. 43,745.

## BIRD-SPEAR.

Four long, diverging, ivory barbs, serrated on inner edges, lashed to the end of long cedar shaft by serving of twisted sinew. Length,  $57\frac{1}{4}$  inches. Nunivak Island, Alaska, 1880. 48,356. Collected by E. W. Nelson.

## BIRD-SPEAR.

Pole, wood, two pieces, scarfed and served with seal sinew; single spear at tip, serrated in three places on each side, seized in wedge-shaped scarf at tip with seal sinew; three bone barbs.  $8\frac{3}{4}$  inches long, each with four notches, seized to pole 45 inches from the tip with seal sinew. Length, 69 inches. Ooglaamie, Alaska, 1882. 72,830. Collected by Lieut. P. H. Ray, U. S. A.

## BIRD-SPEAR.

Shaft, wood, in two sections, scarfed near tip, and served with seal sinew; butt of pole served with baleen; two bone barbs, with four notches, each on the inside, lashed to pole, about 42 inches from tip, with seal sinew. Length,  $69\frac{1}{4}$  inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,832. Collected by Lieut. P. H. Ray, U. S. A.

## GOOSE-SPEAR.

Long, round, iron tip in long cedar shaft; three diverging ivory barbs, serrated on inner edge, lashed to shaft  $16\frac{1}{2}$  inches from butt. Length,  $57\frac{1}{4}$  inches. Saint Michael's, Norton Sound, Alaska, 1878. 33,878. Collected by E. W. Nelson.

\*\*\**Missiles propelled by a spring.*—(*Spring consisting of bent rod.*)

## 12. BOWS AND ARROWS.

## BOWS AND HARPOON-ARROWS USED IN FISHING.

## Bow.

Spruce(?); semi-oval; string, a strip of deer-skin. Length, 51 inches; width,  $1\frac{3}{4}$  inches. Bella Bella, British Columbia, 1876. 20,912. Collected by James G. Swan. Accompanied by three

## Bow—Continued.

arrows; light cedar shafts with round bone heads; small, detachable, barbed tips—one of copper, two of bone—through which are rove the lines made of fine sennit, braided of sinew.

## FISHING-BOWS.

Whalebone spreaders, 19 inches long, in shape of triangle; two snelled hooks; cone-shape lead sinker. Philadelphia, Pa., 1876. 25,667. Gift of Wm. M. Young. Used in the capture of catfish and other river species.

## Bow.

Spruce; the ends are broad and thin, tapering to a point at their outer extremities, and to a nearly square shoulder at the middle of the bow; wrapped with strong twisted sinew. Length, 56½ inches. Bristol Bay, Alaska, 1882. 72,411. Collected by Charles L. McKay.

## Bow.

Made of an elliptical piece of spruce, wrapped and strengthened with strong sinew. Length, 43 inches; width, 1½ inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,771. Lieut. P. H. Ray, U. S. A.

## QUIVER.

Made of sealskin. Length, 28¾ inches; width, 6 inches. Ooglaamie, Point Barrow, Alaska, 1882. 72,788. Collected by Lieut. P. H. Ray, U. S. A.

## DEER ARROW.

Long, pointed, ivory tip, serrated on one edge; cedar staff; head and feathers secured by seizing of sinew. Length, 32 inches. Big Lake, Alaska, 1879. 36,176. Collected by E. W. Nelson.

## DEER AND BEAR ARROW.

Long, stout, sharp-pointed, ivory tip, serrated on one edge, driven into cedar shaft; tip and feathers secured by serving of twine. Length, 36 inches. Rasboinsky, Lower Yukon River, Alaska, 1880. 49,043. Collected by E. W. Nelson.

## BOW AND SIX ARROWS.

Bow made of a broad thin piece of spruce wood, with bark on inner side, served in two places with thin strips of fiber. Arrows have tips of iron and ivory, variously shaped, driven into light cedar shafts, tips and feathers being secured by a seizing of fiber paid with gum. Made by Indians. Bow: length, 35 inches; width, 1⅜ inches; arrows, 25¾ to 32½ inches. Northwest coast of America, 1841. 2,751. U. S. Exploring Expedition, Capt. Charles Wilkes, U. S. N., commanding.

## BOW AND FIVE ARROWS.

Bow made of a broad, thin piece of spruce, with bark on inner side, served for a short distance with thin strips of fiber. Made by Indians. The arrows have variously-shaped tips, some with double points, some barbed; all the heads are driven into light cedar shafts, the heads and feathers being secured with a seizing of fiber secured by gum. Length of bow, 35 inches; width,  $1\frac{1}{2}$  inches; arrows, 26 to 32 inches. N. W. coast of America, 1841. 2,754. U. S. Exploring Expedition, Capt. Charles Wilkes, U. S. N., commanding.

## ESKIMO HUNTING-CASE, BOWS, AND ARROWS.

Case, deer-skin; one bow has end pieces made of the ribs of the deer and center-piece made of walrus tusk; the other bow made of ribs of deer and wood; thongs, sinews of the deer. Bows and case have been used; arrows new. Length of case,  $34\frac{1}{4}$  inches. New Bedford, Mass., 1882. 68,127. U. S. Fish Commission. Eskimo, Hudson Bay. Used by some of the tribes in hunting deer, walrus, musk-oxen, seals, bears, partridges, &c. Obtained from crew of whaling-brig George and Mary.

## BOW AND ARROWS.

Bow made of yew (*Taxus brevifolia*). Arrows brass-tipped and feathered. Center of bow served with common white wrapping twine. Length of bow, 43 inches. Makah Indians, Cape Flattery, 1883. 72,655. James G. Swan. Used by natives for killing both fish and birds.

## BOW AND ARROWS.

Bow made of yew (*Taxus brevifolia*). Arrows tipped with steel; one with two points. Center of bow has hair from head of a young squaw—a superstition that the bow will be lucky—wrapped with slips of bark. Length of bow, 40 inches. Makah Indians, Cape Flattery, Washington Territory, 1882. 72,656. James G. Swan. Used by natives to kill both fish and birds.

## QUIVER AND ARROWS.

From St. Lawrence Island, Bering Strait. Made by Eskimo. St. Lawrence Island, 1880. Collected by E. W. Nelson.

## FISH-ARROWS (2).

Detachable tips, made of short iron points, with wooden barbs lashed together with seizing made of cedar roots, fit over the ends of light wooden staves. The line, made of twisted sinew or gut, is fastened to tips. Made by Makah Indians. Length,  $39\frac{1}{2}$  inches. Cape Flattery, Washington Territory, 1862. 650. George Gibbs.



## FISH-ARROWS (6).

Heads of barbed ivory or iron, driven into light cedar shafts. Heads and feathers secured by seizing of fine sinew. Used by Eskimo of Arctic coast of North America. Length: shafts,  $21\frac{3}{4}$  to  $24\frac{1}{2}$  inches; heads,  $3\frac{1}{2}$  to 7 inches. Anderson River district, 1863. 1,106. Robert Macfarlane.

## ARROWS FOR HUNTING AND FISHING (9).

Bone or ivory heads—two blunt, quadrilobate, having barbed ivory or iron tips. The heads are driven into light cedar shafts; heads and feathers secured by seizing of fine sinew. Used by Eskimo of Arctic coast of North America. Length of shaft,  $21\frac{1}{2}$  to 26 inches; heads,  $2\frac{1}{2}$  to  $6\frac{1}{2}$  inches. Mackenzie River district, 1863. 1,965. B. R. Ross.

## FISH-ARROWS (10).

Barbed ivory heads; one blunt, quadrilobate, driven into light cedar shafts; heads and feathers secured by seizings of fine sinew. Used by Eskimo of Arctic coast of North America. Length: shafts,  $20\frac{3}{4}$  to  $25\frac{3}{4}$  inches; heads, 2 to 7 inches. Mackenzie River district, 1863. 1,966. B. R. Ross.

## FISH-ARROWS (10).

Thin, lozenge-shaped iron heads, beveled edges, serrated on inner edges, driven into light cedar shafts. Heads and feathers secured by seizing of fine sinew. Used by Eskimo of Arctic coast of North America. Length: shafts, 25 inches; heads, 4 to 5 inches. Mackenzie River district, 1873. 1,967. B. R. Ross.

## ARROW.

Shaft of cedar,  $\frac{3}{8}$  inch in diameter, with butt feathered, and with carved barbed bone head attached to outer end in a slot, in the end of which is lashed a clipped flint arrow-head 2 inches long. Length, 2 feet 5 inches; bone head, 6 inches. Alaska, 1867. 6,609. Collected by Hon. George McKeim.

## FISH-ARROWS (4).

Long, round, ivory or bone heads, with detachable barbed copper tips through which the line is rove. Staves of white cedar; feathers secured by serving of fine sinew. Made by Yakutst Indians. Length, including head, 33 to 35 inches. Port Mulgrave, Alaska, 1874. 16,406. William H. Dall.

## ARROWS (3).

Shafts of cedar,  $\frac{1}{2}$  inch in diameter, with butts feathered, and with carved, barbed bone heads in slots, in outer end of which are

## ARROWS (3)—Continued.

lashed barbed metal arrow-heads  $1\frac{1}{2}$  inches long. Magemut Indians, Nunivak Island. Length, 2 feet 7 inches; bone heads,  $6\frac{1}{2}$  inches. Alaska, 1874. 16,413. Collected by William H. Dall.

## ARROWS (2).

Shafts of cedar,  $\frac{1}{2}$  inch in diameter, with butts feathered, and with carved, barbed bone heads in slots, in outer ends of which are lashed barbed metal arrow-heads  $1\frac{1}{2}$  inches long. Magemut Indians, Nunivak Island. Length, 2 feet 8 inches; bone heads,  $6\frac{1}{2}$  inches. Alaska, 1874. 16,414. Collected by William H. Dall.

## ARROW.

Shaft of cedar,  $\frac{1}{2}$  inch in diameter, with butt feathered, and with carved, barbed bone head in slot, in outer end of which is lashed a barbed metal arrow-head. Magemut Indians, Nunivak Island. Length, 2 feet 6 inches; bone head, 7 inches. Alaska, 1874. 16,415. Collected by William H. Dall.

## FISH ARROW OR DART.

Head made of a curved piece of walrus ivory, with double barbs; staff, white cedar, unfeathered. Length: staff, 34 inches; head, 5 inches. Bella Bella, British Columbia, 1876. 20,690. James G. Swan.

## FISH ARROWS (7).

Six specimens with long, bone or ivory tips, sharp-pointed, notched on one edge; one specimen with long, double-edged, rounding, flint head; cedar shafts; heads and feathers secured by seizing of fine sinew. Length, 29 to 31 inches. Kavianagmut, St. Michael's, Norton Sound, Alaska, 1877. 33,822. Collected by E. W. Nelson.

## ARROWS (5).

Long, narrow, sharp-pointed, ivory heads, barbed on one edge, driven into light cedar shafts. Heads and feathers secured by serving of fine sinew. Length,  $20\frac{5}{8}$  to  $22\frac{1}{2}$  inches. Kavianagmut, Norton Sound, Alaska, 1878. 33,825. Collected by E. W. Nelson.

## ARROWS (7).

Long, triangular, ivory points, irregularly serrated; cedar shafts; feathers secured by seizing of fine sinew. Used for killing ducks, muskrats, &c. Length, 28 to 36 inches. St. Michael's, Norton Sound, 1878. 33,829. Collected by E. W. Nelson.

## ARROWS (7).

Small, sharp-pointed, ivory heads, with from one to three barbs on one edge, driven into cedar shafts. Heads and feathers secured by seizing of sinew. Length,  $23\frac{3}{4}$  to  $28\frac{3}{4}$  inches. St. Michael's, Norton Sound, Alaska, 1878. 33,845. Collected by E. W. Nelson.

## FISH-ARROWS (9).

Heavy, bone or ivory heads with detachable, small barbed bone tips, secured by becket of fine twisted sinew; staves of white cedar; feathers secured by serving of fine sinew. Length, from 29 to 35 inches. Alaska, 1879. 36,142, 36,145, 36,167, 36,168, 36,169, 36,150, 36,151, 36,152, 36,153. Collected by E. W. Nelson.

## FISH-ARROW.

Three diverging ivory barbs, lashed to end of cedar shaft; feathers secured by seizing of fine sinew. Length,  $35\frac{1}{2}$  inches. Kushunuk, Alaska, 1879. 36,162. Collected by E. W. Nelson.

## FISH-ARROWS.

Three diverging, ivory barbs, serrated on inner edges, lashed to end of cedar shaft; feathers secured by seizing of fine sinew. Length,  $37\frac{1}{2}$  inches. Chatetmut, Alaska, 1879. 36,170. Collected by E. W. Nelson.

## ARROWS (10).

Long, ivory heads, sharp-pointed, three-sided, with from one to three notches on one edge; cedar shafts; feathers are caught in deep incision at forward end and secured by seizing of fine sinew at butt. Made by Mahlemuts, of Nunivak Island, formerly of Norton Sound. Length,  $27\frac{3}{4}$  to  $28\frac{3}{4}$  inches. Nunivak Island, Alaska, 1880. 43,682 to 43,692. Collected by E. W. Nelson.

## FISH AND BIRD ARROW.

Two converging, ivory barbs, serrated on outer edges, lashed to end of cedar shaft; feathers secured by seizing of fine sinew. Length, 33 inches. Rasboinsky, Lower Yukon River, Alaska, 1880. 49,039. Collected by E. W. Nelson.

## ARROW.

Small, thin iron tip, with single barb, in long, ivory shank; cedar shaft. Length,  $29\frac{1}{2}$  inches. Saint Lawrence Island, Alaska. 1880. 63,580. Collected by E. W. Nelson.

## ARROW.

Flat, narrow, sharp-edged, ivory head, cedar shaft. Head and feathers secured by serving of fine sinew. Length,  $29\frac{1}{2}$  inches.

## ARROW—Continued.

Saint Lawrence Island, Alaska, 1880. 63,581. Collected by E. W. Nelson.

## ARROW.

Small, thin iron tip in long, ivory shank; cedar shaft; shank and feathers secured by seizing of fine sinew. Length,  $29\frac{3}{4}$  inches. Saint Lawrence Island, Alaska, 1880. 63,583. Collected by E. W. Nelson.

## ARROW.

Three-edged, sharp-pointed, ivory head in cedar shaft, secured by seizing of fine sinew. Length,  $35\frac{1}{2}$  inches. Saint Lawrence Island, Alaska, 1880. 63,584. Collected by E. W. Nelson.

## ARROW.

Lanceolate, iron tip, barbed at base, with long shank that is driven into cedar shaft; tip and feathers secured by seizing of fine sinew. Length,  $27\frac{1}{2}$  inches. Saint Lawrence Island, Alaska, 1880. 63,585. Collected by E. W. Nelson.

## ARROWS (2).

Long, round, ivory heads, with sockets to receive adjustable barbed ivory tip, to which is fastened the line made of twisted sinew; cedar shaft; head and feathers secured by seizing of fine sinew. Length, 31 inches. Bristol Bay, Alaska, 1882. 72,412. Collected by Charles L. McKay.

## ARROW.

Three converging, ivory barbs, serrated on inner edges, lashed to end of cedar shaft. Feathers secured by seizing of fine sinew. Length, 35 inches. Bristol Bay, Alaska, 1882. 72,413. Collected by Charles L. McKay.

## ARROWS (17).

Iron and ivory or bone heads, in a variety of shapes, driven into light cedar shafts; heads and feathers secured by seizing of fine sinew. Length, 23 to 31 inches. Ooglaamie, Point Barrow, Alaska, 1881-'82. 72,754 to 72,770. Lieut. P. H. Ray, U. S. A.

## ARROWS (16).

Ivory, bone, flint, and copper heads in a variety of shapes, driven into light cedar shafts; heads and feathers secured by seizing of fine sinew. Length, 27 to 30 inches. Ooglaamie, Point Barrow, Alaska, 1881-'82. 72,772 to 72,787. Lieut. P. H. Ray, U. S. A.



\*\*\*\* *Missiles propelled by explosives.*

### 13. GUNS.

WHALING GUNS, SHOULDER GUNS, SWIVEL GUNS.

(See section E, "The Whale Fishery and its Appliances.")

### IV.—BAITED HOOKS, ANGLING TACKLE, &c.

#### 14. HOOKS WITH MOVABLE LINES. HAND TACKLE.

TACKLE FOR SURFACE FISHING.

ANGLER'S TACKLE FOR FLY-FISHING.

(Salmon tackle, trout tackle, black-bass tackle, shad tackle.)

TROLLING TACKLE.

(Trolling tackle, whiffing-tackle, drailing-tackle. The parts of these gears may be seen in their proper places, with hooks, lines, &c.)

PAINTINGS AND PHOTOGRAPHS ILLUSTRATIVE OF ANGLING.

*Paintings of game fishes.*

#### GAME FISHES OF THE UNITED STATES :

A series of 20 magnificent paintings of fishes and scenery, by S. A. Kilbourne, with text by G. Brown Goode, assistant director United States National Museum and assistant in the United States Fish Commission; ten parts in wrappers, not stitched, large folio, 1879-1881.

The plates are the exact reproductions of the water-color paintings of S. A. Kilbourne, the studies for which were made from life, by the brook and on the shore. The details of form and structure are preserved with scientific accuracy, while color and life-action are shown with excellent effect. The work has been completed in ten parts, each part containing two plates, size 20½ by 14 inches, mounted on heavy board, 28 by 22 inches: and the letter-press printed on rich-toned calendered paper. Wood-engravings are added.

"Mr. Kilbourne's paintings will open up a new world of delight to many who have never dreamed of the loveliness of the denizens of our own streams and bays. \* \* \* Game fishes are those which, by reason of their cunning, courage, strength, beauty, and the sapidity of their flesh, are sought for by those who angle for sport with delicate fishing tackle. \* \* \* In preparing the following essays my endeavor has been to give a concise account of habits and geographical distribution. Descriptions would be superfluous, for Mr. Kilbourne has combined in his paintings artistic truth of coloring and scientific accuracy in the delineation of form. Fish-culture is frequently

## GAME FISHES OF THE UNITED STATES—Continued.

referred to, since its results are of great interest to the zoologist, the angler, and the public at large." (From the preface of Mr. Goode.)

Contents: Part I, the Atlantic Salmon; the Eastern Red-speckled Trout. Part II, the Spanish Mackerel; the Black Basses. Part III, the Striped Bass; the Red Snapper. Part IV, the Bluefish; the Yellow Perch. Part V, the Mackerel; the Weakfish or Southern Sea Trout. Part VI, the Pompano and its allies; the Sea Bass or Southern Black-fish. Part VII, the King-fish and the Whiting; the Sheepshead and the Scuppaug. Part VIII, the Namaycush or Lake Trout; the Bonito and the Tunnies. Part IX, the Red-fish; the Grayling. Part X, the California Salmon; the Muskellunge, Pike, and Pickerel.

Exhibited by Charles Scribner's Sons, New York City.

Charles Scribner's Sons also exhibited a map showing by means of colored lines the geographical distribution of the game fishes of eastern North America extensively sought by anglers, compiled from sketches by G. Brown Goode; and 18 plates of the "Game Fishes" in 24 by 30 frames as follows:

1. A sea-bass or Southern blackfish (*Serranus atrarius*) lying upon the grass, with the ocean shore in the background, and fishermen on the beach overhauling their nets and putting them on reels to dry.
2. A striped bass (*Roccus saxatilis*), fresh from the water, with a portion of the shore and sea in the background, showing the breakers and the hull of an old vessel stranded upon the beach.
3. A bluefish (*Pomatomus saltatrix*) lying upon the bank, with the ocean in the background and vessels engaged in trolling.
4. A yellow perch (*Perca americana*) being drawn from the river by means of an angler's fly which it has just taken.
5. Brook trout (*Salvelinus fontinalis*) hooked by an angler's fly in the lower jaw and jumping from the water in frantic efforts to free itself. A portion of a wild river-bank, with rapids in the distance.
6. A grayling (*Thymallus tricolor*) lying on the moss-covered roots of an old pine tree, with a long strip of a Michigan grayling stream, lined with pine forests, in the background.
7. A namaycush or lake trout (*Salvelinus namaycush*) fresh from the water, lying on a moss-covered rock.
8. A California salmon (*Oncorhynchus chouicha*) with the rod, reel, and fly on which it was taken lying by its side, and the stream, with rapids, in the background.
9. An Atlantic salmon (*Salmo salar*) struggling at the surface of the water with an angler's hook in its upper jaw; a portion of a river-bank in the background.

## GAME FISHES OF THE UNITED STATES—Continued.

10. A mackerel (*Scomber scombrus*) lying on a rock, with a long strip of beach showing breakers, and the ocean in the background. In the distance are a few sail of vessels engaged in mackerel fishing.
11. A squeteague or weakfish (*Cynoscion regalis*) on a moss-covered ledge, with a distant view of the water from which it was taken.
12. A Spanish mackerel (*Scomberomorus maculatus*) sporting at the surface of the sea, with a school of others a little less distinct near by. The picture is supposed to show the habit of the fish in schooling at the surface and jumping from the water in long graceful leaps.
13. A Southern pompano (*Trachynotus carolinus*) in its native element, just about to take a hook that has been baited with a live shrimp. Another fish of the same species swimming about at a little distance from the first.
14. A red snapper (*Lutjanus blackfordii*) among the branching corals in the bottom of the sea, in the act of taking a baited hook, which hangs suspended in the water.
15. A red drum red-fish (*Sciaenops ocellatus*) fresh from the surf, which is represented in the background.
16. A striped bonito (*Sarda pelamys*) lying near an old boat, from which it has been taken.
17. A sheepshead (*Diplodus probatocephalus*) feeding upon scallops, which have fastened themselves to the vegetation at the bottom of the sea. The view shows fragments of scallop shells which have been broken and dropped to the bottom by the sheepshead.
18. Two king-fish (*Menticirrus nebulosus*) lying upon a log on the beach, with a strip of ocean and a vessel in the background.

*Photographs of angling scenes.*

## STRIPED BASS ANGLING.

Photograph showing Newport anglers with their rods, reels, and gaffs, together with ten enormous bass, ranging from 36 to 58 pounds, which they have just taken. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 inch negative. Newport, R. I., 1880. U. S. Fish Commission.

## SURF-TACKLE FOR THROWING AND HAULING.

DRAWINGS ILLUSTRATING THE METHOD OF USING SURF-TACKLE.

## COD-LINE FISHING FROM REACH.

An india-ink sketch of Aleuts standing on the beach in front of their settlement and throwing baited hooks into the water, which the fish quickly swallow, and are drawn out and killed

## COD-LINE FISHING FROM BEACH—Continued.

with clubs. This is a common mode of fishing among the Eskimo and Indians. Size, 30 by 40 inches. Alaska, 1882. Henry W. Elliott.

## BLUEFISH TACKLE.

## BLUEFISH TROLLING-LINE.

White linen line; eel-skin squid. Newport, R. I. 24,808. Gift of J. M. K. Southwick. Used by Block Island fishermen in trolling for bluefish.

## SKANEATELES TROLLING-LINE.

Tarred cotton line, hard-laid, 650 feet long. The baited hook represents a piece of pork cut round; to the end of this is attached a small strip from a sucker, which they call a flipper. A piece of lead pipe is used to extricate the hook when caught in a log or other obstruction when in motion. A short leader with sinker attached is used on this line for still fishing; the line is then kept bobbing, in from 40 to 70 feet of water, the boat being at anchor. Skaneateles, N. Y., 1883. 57,040-1. Collected by Reuben Wood. This gear is coiled in a cheese-box, and is rigged for use.

## BLUEFISH TROLLING-LINES.

Blue cotton lines; cone-shaped lead sinkers; long, straight-shank ringed hooks, covered with colored cotton cloth. Block Island, R. I., 1875. 24,802-5. Gift of J. M. K. Southwick. Used by Block Island fishermen in trolling for bluefish.

## BLUEFISH TROLLING-LINE.

Full rigged; 5-pound tarred cotton line wound on wooden stick; piano-wire ganging 9 inches long; one straight-shanked hook. Staten Island, N. Y., 1883. 57,576. Gift of Capt. F. M. Redman. Used by New York, New Jersey, and Southern New England fishermen, but especially by the New York market fishermen.

## BLUEFISH TROLLING-LINE.

Blue cotton line, leather strap, red cotton squid, central-draught hook. Provincetown, Mass., 1875. 25,711. Gift of Coleman Cook. This style of line and squid is peculiar to Provincetown.

## TACKLE FOR FISHING BELOW THE SURFACE.

## SHORT HAND-GEAR.

## THROW-LINE WITH MINNOW HOOKS.

Long line, probably of *Asclepias* fiber, with gangings 3 to 4 inches long, 7 to 9 inches apart. Throw-stick 2 feet long. Hooks of



## THROW-LINE WITH MINNOW HOOKS—Continued.

wood and bone. Used by Pai-Ute (Nyuma) Indians. Pyramid Lake, Nevada, 1876. 19,047. Collected by Stephen Powers.

## FISHING TACKLE.

“Otter” with line and flies attached. The tackle consists of a flat board, 1 inch thick, cut in boat shape, 2 feet long and 1 foot wide; main line of linen wound on a thin board; gangings of braided silk; gut snells; trout hooks trimmed with feathers. Lake City, Minn., 1877. Gift of William Morris. 29,293. Used in lake and river fishing in Western States.

## DEEP-SEA HAND-GEAR.

(*Hand-lines used by Eskimo and Indians.*)

## HALIBUT FISHING TACKLE (3).

Lines made of the stem of the giant kelp (*Nereocystis lutkeana*), the lower portion of which is solid and cylindrical, and about a fourth of an inch in diameter. Hooks made of splints from hemlock knots bent in form somewhat resembling an ox-bow. Barbs made of bone are lashed to lower side with slips of spruce or strips of bark of white cherry. Made by Clioquet and Makah Indians. Puget Sound, 1863–1876. 1,140; 26,819; 26,822. Collected by James G. Swan.

## HALIBUT LINE AND HOOK.

Kelp (*Nereocystis*) made in lengths of about 30 feet and knotted together as required. Hook made of splints from hemlock knot; bone barb. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,642. James G. Swan. The kelp is obtained during summer in 15 or 20 fathoms of water on the halibut banks off Cape Flattery, soaked in running fresh water, stretched on the beach till partly dry, and finally smoked and “cured.” When dry the lines are brittle; when wet, exceedingly tough and durable, and make excellent fishing-lines.

## FISH-LINE AND HALIBUT HOOKS (2).

Line made of kelp (*Nereocystis lutkeana*). Hooks made of wood, in two pieces, lashed together in a point at lower end, with iron barbs. One shank is carved to represent a fish, the other a man’s arm and hand. Made by Scowallis tribe of Haidah Indians. Prince of Wales Archipelago, Alaska, 1868. 6,561. Collected by Dr. T. T. Minor.

## FISH-HOOKS AND LINE-SPREADER.

Hooks made of bone, with curved stock and straight shank; no barb; spreaders a small round piece of wood; lines and gangings made of seal-skin. Made by Thlinket Indians. Length: Hooks,  $7\frac{1}{4}$  to 9 inches; spreader, 11 to 17 inches. Sitka, Alaska, 1874. 16,311; 16,312. Collected by William H. Dall.

## FISHING TACKLE (6).

Short wooden sticks, notched at the ends for reeling line; lines of sinew, seal-skin, whalebone, or vegetable fiber; hooks iron or copper barbs passed through bone or ivory shanks, some with gangings and sinkers, some without. Alaska, 1878 to 1881. 33,725, 33,815, 33,852, 33,899, 33,900, 56,544. Used in catching small fish, such as tomcod, whitefish, pickerel, wolf-fish, &c.

## FISHING TACKLE (8).

Short wooden sticks, notched at the ends for reeling line; line made of split quills, twisted sinew, whalebone, or seal-skin; hooks, curved brass or iron, barbless points passed through bone or ivory shanks; some have stone or ivory sinkers and gangings of same material as line. Used in catching smaller fish, such as tomcod, whitefish, blackfish, &c. Alaska, 1878 to 1881. 33,811; 33,812; 33,814; 33,816; 33,817; 33,853; 33,915; 53,543.

## FISHING LINES.

Two fishing-lines, kelp; floats, sea-lion gut; gorge-hooks, bone. Brittle when dry, tough and pliable when wet. Used in the capture of small fish. Makah Indians, Cape Flattery, Washington Territory, 1882. 72,643-4. James G. Swan. Indian names: Lines, "Sar-dat-tlh"; float, "koo-yu"; hook, "kodo-datie." The entire apparatus, "Ho-kwaksh-to-kuptl," or small fish line.

## FISHING-LINES (2).

Made of kelp, to which are fastened small gorge-hooks by twisted cord ganging. The hooks are made of a piece of bone, sharp as a needle at both ends and tied in the middle. Small bladder buoys are attached to upper portions of line, several of which are set at one time, and when the fish is hooked it pulls the bladder but cannot draw it under water. Used for small fish like perch or rockfish. Made by Makah Indians. Neah Bay, Washington Territory, 1883. 72,643-4 (a). James G. Swan.

## FISHING-LINE.

Kelp line, with sharp-pointed straight wire toggles, or gorge-hooks. These hooks are very effective in securing the fish, and are preferred to the common form when fishing on "catchy" bot-

## FISHING-LINE—Continued.

toms, as they do not foul with the rocks. Makah Indians, Cape Flattery, Washington Territory. 72,645. James G. Swan.

## FISHING-LINE.

Made of kelp, to which are fastened seven small gorge-hooks made of pieces of iron sharp at both ends, by a ganging of twisted sinew tied to middle. Neah Bay, Wash., 1883. 72,645 (*a*). Collected by James G. Swan. Made by Makah Indians, and preferred for fishing on a rocky bottom, as they will not foul like bent hooks.

*(Modern hand-line gear.)*

## SHORE COD HAND-LINE.

Full rigged, ready for use. Wooden reel, with handle; 6-pound tarred cotton line, 25 fathoms long; Lothrop's improved 2-pound lead sinker, with brass tail-stock and bumper, and brass horse with swivel, and leather strap; tarred cotton snood, hemp ganging; one central-draught hook, No. 12, flatted. Gloucester, Mass., 1882. U. S. Fish Commission. 54,501. Used in the shore cod boat-fisheries in the vicinity of Cape Ann, Mass.

## SHORE COD HAND-LINE.

Full-rigged, 8-pound tarred cotton line, 25 fathoms long, on wooden reel; 2-pound lead sinker, with brass ring, swivels and horse, and leather straps; blue cotton snoods; hemp ganging; one Kirby hook, No. 2, flatted. Rockport, Mass., 1882. U. S. Fish Commission. 57,583. Used by the shore boat fishermen of Cape Ann, Mass.

## SHORE COD HAND-LINE GEAR.

Lothrop's 1-pound lead sinker, with leather strap, brass bumper, and horse with swivel; snood of 6-pound tarred cotton line partly served with twine; slot swivel at end, hemp gangings; two central-draught hooks, No. 13, flatted. Gloucester, Mass., 1880. U. S. Fish Commission. 39,187. Attached to from 25 to 75 fathoms of tarred cotton line, this gear is used in the shore cod boat fishery in the vicinity of Cape Ann, Mass.

## SHORE COD HAND-LINE GEAR.

Lothrop's 1½-pound lead sinker, with leather strap, brass bumper, horse and swivel; snoods of 6-pound tarred cotton line partly served with twine; slot swivels at ends; hemp gangings; two central-draught hooks, No. 13, flatted. Gloucester, Mass., 1880. U. S. Fish Commission. 39,186. Attached to from 25 to 75 fathoms of tarred cotton line, this gear is used in the shore cod boat fishery in the vicinity of Cape Ann, Mass.

**GEORGE'S COD HAND-LINE.**

Full rigged, ready for use; 16-pound tarred cotton line, 75 fathoms long; 9-pound lead sinker with galvanized iron tail-stock; wooden horse, with brass swivel; sling-ding gear of tarred cotton line served with twine; brass spreader; snoods 5 feet long, of 12-pound tarred cotton line; slot swivels of brass; hemp gangings; two central-draught hooks, No. 10, flattened. Boston, Mass., 1876. 25,687.

**GEORGE'S COD HAND-LINE.**

Rigged for use; 16-pound tarred cotton line, on wooden reel; 9-pound lead sinker, with galvanized iron tail-stock; iron horse, with brass swivel at end; sling-ding gear, with iron spreader; snoods each 5 feet long, of 8-pound tarred cotton line, with slot swivels; tarred cotton gangings; two central draught hooks, No. 10, flattened. Gloucester, Mass., 1877. Made by Alexander McCurdy. 29,471. Used by Gloucester vessels in cod and halibut fishery on George's Bank.

**GEORGE'S HAND-LINE GEAR.**

Lothrop's 9-pound lead sinker, with galvanized iron tail-stock and brass bumper; wooden horse, with brass swivel; sling-ding gear of tarred cotton line, and galvanized iron spreader; tarred cotton snoods, with slot swivels; hemp gangings; two central-draught hooks, No. 10, flattened. Gloucester, Mass., 1880. U.S. Fish Commission. 39,182. Attached to 125 fathoms of line, this gear is used in the fishery for cod and halibut on George's Bank.

**GEORGE'S COD HAND-LINE.**

Full-rigged, ready for use, coiled in wooden tub made from a flour barrel; 16 pounds tarred cotton line, 125 fathoms long; Lothrop's improved 9-pound lead sinker with galvanized iron tail-stock, leather strap, brass bumper, and wooden horse, with brass swivel; sling-ding gear of tarred cotton line, and galvanized iron spreader; snoods of tarred cotton, with slot-swivels at ends; hemp gangings; two central-draught hooks, No. 10, flattened. Gloucester, Mass. 1882. U. S. Fish Commission. 54,499. Used by Gloucester vessels in fishing for cod and halibut on George's Bank.

**COD HAND-LINE.**

Style of 1812 to 1830. Cotton line; 5-pound lead sinker with leather straps; horse made of heavy line, horn swivel, short snoods, two straight-shank cod hooks seized to gangings 12 inches long. Provincetown, Mass. 1877. Gift of Capt. Lemuel Cook, 2d. 29,483. This hand-line was used by Captain Cook from 1812 to 1830 in the Bank and shore cod fisheries.



**BANK AND SHORE COD HAND-LINE.**

Full rigged, ready for use. Wooden reel with becket and swivel; 8-pound tarred cotton line, 50 fathoms long; Lothrop's improved 3-pound lead sinker with brass tail-stock, bumper, and horse with swivel; tarred cotton snoods, partly served with twine; slot swivels at ends, hemp gangings, two hooks, central-draught, No. 12, flatted. Gloucester, Mass., 1882. U. S. Fish Commission. 54,502. Used in the Western, Grand Bank, and shore cod hand-line fisheries.

**BANK COD HAND-LINE.**

Full rigged, ready for use. Wooden reel with becket and swivel; 12-pound tarred cotton line, 50 fathoms long; Lothrop's improved 4-pound lead sinker with brass tail-stock, bumper, and horse with swivel; snoods of tarred cotton partly served with twine, slot swivels at ends; hemp gangings; two central-draught hooks, No. 12, flatted. Gloucester, Mass., 1882. U. S. Fish Commission. 54,503. Used in the hand-line cod fisheries on Banquereau and Grand and Western Banks.

**BANK COD HAND-LINE.**

Full rigged, ready for use. Wooden reel with handle; 10-pound tarred cotton line, 25 fathoms long; 5-pound lead sinker; rope horse served with twine, brass swivel at end; snoods of 8-pound tarred cotton line partly served with twine; gangings of hemp; two central-draught hooks, No. 12, flatted. Centennial collection, 1876. Bradford & Anthony, Boston, Mass. 25,686. Used in varied lengths by many New England vessels in the Western and Grand Bank cod fishery.

**BANK COD HAND-LINE.**

About 15 fathoms of 10-pound tarred cotton line, on wooden reel, with handle; 3½-pound lead sinker with strap and horse made of tarred cotton line served with twine; blue cotton snoods; hemp gangings; two Kirby hooks, Nos. 2 and 4, flatted. Gloucester, Mass., 1882. U. S. Fish Commission. 57,584. Used in cod fishery from dories on Banquereau, Grand, and Western Banks.

**SHORE COD AND POLLOCK HAND-LINE.**

Full rigged, ready for use. Blue cotton line 50 fathoms long, on wooden reel; 1 pound lead sinker with brass ring and swivel; leather strap; and brass horse with leather straps; blue cotton snood; hemp gangings; one central-draught hook, No. 14, flatted. Rockport, Mass., 1882. U. S. Fish Commission. 57,582. Used by the shore boat fishermen of Cape Ann in the capture of cod and pollock.

## POLLOCK HAND-LINE.

Full rigged, ready for use. Wooden reel with handle; 6-pound tarred cotton line, 25 fathoms long; Lothrop's improved 1-pound lead sinker with brass tail-stock and bumper, and brass horse with swivel; tarred cotton snood; hemp ganging; one central-draught hook, No. 13, flatted. Gloucester, Mass., 1882. U. S. Fish Commission. 54,500. Used in shore fishery for pollock.

## POLLOCK HAND-LINE.

Full rigged, ready for use. Blue cotton line No. 4, 25 fathoms long, on wooden reel;  $\frac{1}{2}$ -pound lead sinker with leather straps; tarred cotton snoods, white cotton gangings; one hook, central-draught, No. 14, flatted. Rockport, Mass., 1882. 57,581. Used by the boat fishermen of Cape Ann in the capture of pollock.

## POLLOCK HAND-LINE.

Rigged on wooden reel with handle; 6-pound tarred cotton line; 1-pound lead sinker with horse 12 inches long, of heavy tarred line served with twine and swivel at end; snood of blue cotton line; hemp ganging; one central-draught hook, No. 13, flatted. Centennial collection, 1876. Bradford & Anthony, Boston, Mass. 25,685. Used to some extent in off-shore fishery for pollock.

## BIRD HAND-LINE.

Full-rigged; white cotton mackerel line on wooden reel; blue cotton ganging; one mackerel-hook. Gloucester, Mass., 1880. 55,415. U. S. Fish Commission. Used in Grand Bank cod-fishery in catching birds for bait.

## SHEEPSHEAD GEAR.

White cotton ganging, double, served with thread; two straight-shank (I. P. large quarter) hooks, flatted. Saint Augustine, Fla., 1880. 54,701. Collected by R. E. Earll. Used by fishermen of Saint Augustine in the capture of sheepshead.

## SEA-BASS GEAR.

White cotton ganging, double, served with thread; two Virginia hooks ( $\frac{3}{8}$ ), flatted. Saint Augustine, Fla., 1880. 54,507. Collected by R. E. Earll.

## SEA-BASS HAND-LINE.

Full rigged; 5-pound tarred cotton line on wooden reel; small lead sinker  $2\frac{3}{4}$  inches long; snood 8 inches long, of double and twisted line; gangings 6 and 12 inches long; two central-draught hooks, No. 15, eyed. Staten Island, N. Y., 1883. 57,577. Gift

**SEA-BASS HAND-LINE—Continued.**

of Capt. F. M. Redmond. Used by the market fishermen of New York and Southern New England in the capture of sea-bass.

**SEA-TROUT LINE.**

Full rigged; white cotton line on wooden reel; two straight-shanked hooks on cotton gangings 9 inches long; lead sinker. Magnolia, Del., 1883. 57,563. Gift of M. S. Van Burkalow. Sea-trout are caught in large quantities along the shore with the common surf or haul seine during May and June, which is the spawning season. During July, August, and September these fish move off shore and are then taken with the hand-line.

**SPOTTED-TROUT HAND-LINE GEAR.**

Two spreaders made of small forked branches of tree; short gangings; three hooks, straight shanks, flatted; lead sinker attached by line 13 inches long to crotch of lower spreader. Wilmington, N. C., 1880. 57,579. Collected by R. E. Earll. Used in the capture of spotted trout, pig-fish, and other species.

**BLACKFISH AND WHITING GEAR.**

White cotton gangings (double) served with thread; two Kirby hooks, No. 8, flatted. Saint Augustine, Fla., 1880. 54,506. Collected by R. E. Earll. Used along the Florida coast for the capture of blackfish and whiting.

**WHITING HAND LINE.**

Full rigged, white cotton line; lead sinker in three pieces, acting as spreader; gangings  $5\frac{1}{2}$  inches long; three small-size Kirby hooks; one extra hook above the sinker. Charleston, S. C., 1880. 57,580. Collected by R. E. Earll. Used by the negroes of Charleston and vicinity in the capture of various marine species of fish.

**FISHING-TACKLE.**

Wooden rest; leaders, sinkers, and brass spreaders. U. S. Fish Commission. 25,563. Used for smelt fishing through the ice.

**HAND-LINES.**

Full rigged for pond fishing. Silk and cotton lines, wood and quill floats, small sinkers and hooks. Centennial collection, 1876. 25,665. Gift of William M. Young.

## DRUM-FISH HAND-LINE.

White cotton line wound on circular block; two round, sliding sinkers; ganging served with thread; large, curved hook. Saint Augustine, Fla., 1880. 54,504. Collected by R. E. Earll. Used in the capture of drum-fish off the Florida coast.

## PHOTOGRAPHS, DRAWINGS, AND PAINTINGS ILLUSTRATIVE OF THE HAND-LINE FISHERIES.

## POLLOCK HAND-LINING.

Photograph showing a fleet of vessels and boats engaged in pollock fishing off Cape Ann. A pinkey in the foreground has fishermen in the act of hauling fish on deck. Size, 8 by 10 inches. Massachusetts Bay, 1882. (277) 1,940. U. S. Fish Commission.

## HAND-LINING ON GEORGE'S BANKS.

An India-ink sketch showing a portion of the deck of a Gloucester vessel with three of the crew engaged in catching cod with hand-lines. One man is unhooking a fish which he has just caught, a second is just hauling a large cod over the rail with a gaff, while the third is holding his line out for a bite. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

## ESKIMO FISHING FOR HALIBUT.

An India-ink sketch showing a number of Eskimo in single bidarkas, engaged in fishing for halibut with hand-lines on the Alaskan coast. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

## ESKIMO FISHING FOR HALIBUT.

An India-ink sketch of Eskimo in single and double kyaks engaged in catching halibut with hand-lines on the coast of Alaska. To prevent the kyaks from upsetting, two boats come together and steady themselves by means of the paddles which are stretched from one to the other and held firmly. A man in one boat holds the hand-line, and the one in the other holds a club ready to kill the halibut as soon as it is brought to the surface. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

## BLUEFISH HAND-LINING.

An enlarged photograph showing group of bluefish fishermen on board their vessel, with apparatus and outfit ready for engaging in the fishery. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. New York Harbor, 1882. U. S. Fish Commission.



**POLLOCK HAND-LINING.**

An enlarged photograph. A fleet of vessels and boats engaged in pollock fishing off Cape Ann. A pinkey in the foreground has fishermen in the act of hauling fish on deck. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Massachusetts Bay, 1882. (277) 1,940. U. S. Fish Commission.

**DORY HAND-LINING.**

A crayon sketch showing the crew of a Gloucester fishing schooner distributed over the fishing-grounds on the Western Banks and actively engaged in catching codfish with hand-lines. The view shows eight dories, with one man in each, and the vessel at anchor in the distance. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

**ICE-FISHING.**

An India-ink drawing of fishermen engaged in fishing through the ice on Lake Michigan with lines. The lines are rigged with a pole and flag, the poles being set in such a way that when a fish pulls the line the flag comes up, signaling to the fisherman, who is standing behind the temporary shelter to screen him from the wind. Size, 30 by 40 inches. Lake Michigan, 1882. Henry W. Elliott.

**SHORE HAND-LINE FISHING.**

A crayon sketch showing two New England fishermen engaged in hand-lining for cod from a common fishing boat on the shore grounds off Gloucester, Mass. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

**CATCHING BIRDS FOR BAIT.**

A crayon picture showing fishermen in a dory on western banks catching hagdons, to be used as bait on their hand-lines in fishing for cod. The boat is surrounded by birds which have been "tolled up" by fish-lines, which the men have thrown overboard to attract them. Formerly great quantities of birds were taken by the Cape Cod fishermen, but of late they are seldom caught, as fishermen find it more economical to take bait from home or to run in to Newfoundland or Nova Scotia and buy fresh herring, capelin, and squid. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

**HAND-LINING ON GEORGE'S.**

An oil painting representing a Cape Ann fishing schooner anchored on George's Bank, the crew engaged in catching cod with hand-lines from the vessel's deck. The view shows the vessel at anchor and the spray dashing over the bow. Size, 30 by 40 inches.

## DRESSING MACKEREL ON SHIPBOARD.

A crayon sketch showing a portion of the crew of a mackerel hand-liner dressing their catch to be salted and packed before stowing in the vessel's hold. Size, 30 by 40 inches. Massachusetts Bay, 1882. H. W. Elliott and J. W. Collins.

## 15. HOOKS WITH STATIONARY LINES.—SET TACKLE.

## BOTTOM SET LINES.

## TRAWL OR LONG LINES.

## INDIAN TRAWL-LINE.

Ground-line made of cedar roots (*Thuja excelsa*); gangings of whale-bone and cedar; hooks of cedar and iron. Indians of Vancouver Island. Collected by Dr. T. T. Minor. 6,560. Used by the Indians of the Northwest coast in the ocean fisheries.

## HALIBUT TRAWL-LINE (section).

Ground-line 52 feet long, of 28-pound steam-tarred cotton. Gangings 5 feet long of 16-pound steam-tarred cotton, fastened with lobster-twine beackets, 10 feet 6 inches apart on ground-line. Cast-steel hooks, No. 2, Kirby, flattened. Gloucester, Mass., 1882. 54,701. U. S. Fish Commission. A full set of trawls for a halibut vessel is about 54,000 feet long, with from 3,600 to 5,000 hooks. It is made up into twenty-four "skates," or parts, each 375 fathoms long, and each dory usually sets four "skates." (See full-rigged halibut trawl.)

## COD TRAWL-LINE (section).

Ground-line 35 feet long, of 18-pound steam-tarred cotton. Gangings 3 feet long, of 30-thread tanned cotton, 5 feet apart on ground-line. Central-draught eyed hooks, No. 4. Gloucester, Mass., 1882. 54,703. U. S. Fish Commission. A full set of trawls for a vessel in the cod fishery is 72,000 feet long, with from 14,400 to 15,000 hooks. It is made up in "tubs" or parts, each 1,500 to 3,000 feet long, and each dory sets from two to four tubs. (See full-rigged cod-trawl.)

## COD-TRAWL.

Full rigged for use. Ground-line of 18-pound tarred cotton; gangings of 30-thread cotton; 500 hooks. The line is coiled in a tub and is fitted with buoys, anchors, buoy-lines, staves and black balls properly numbered. Gloucester, Mass., 1882. 54,513 to 54,520. U. S. Fish Commission. Used in the cod fisheries of New England.

**HADDOCK TRAWL-LINE (section).**

Ground-line 24 feet long, of 12-pound steam-tarred cotton. Gangings 27 inches long, of 24-thread tanned cotton, 40 inches apart on ground-line. Central-draught, eyed hooks, No. 15. Gloucester, Mass., 1882. 54,702. U. S. Fish Commission. A full set of trawls for a haddock vessel is 60,000 feet long with 18,000 hooks. It is made up in "tubs" or parts, each 1,750 feet long, and each dory sets from 6 to 8 "tubs." (See full rigged haddock trawl.)

**HADDOCK TRAWL-LINE (section).**

Ground-line 24 feet long, of 12-pound steam-tarred cotton. Gangings 27 inches long, of 30-thread cotton, 40 inches apart on ground-line. Center-draught, eyed hooks, No. 15. Gloucester, Mass., 1882. 54,702 (a). U. S. Fish Commission.

**HADDOCK TRAWL.**

Full rigged for use. Ground-line of 14-pound tarred cotton; gangings of 30-thread cotton; 500 No. 16 hooks. The line is coiled in a tub and fitted with buoys, anchors, buoy-lines, staves, and black balls properly numbered. Gloucester, Mass., 1882. 54,528 to 54,531. U. S. Fish Commission. The common style of trawl used in the fresh-haddock fishery.

**SHORE TRAWL.**

Two sections in baskets, rigged for use. Length of ground-line in each 350 fathoms, with 415 hooks; underrunning-line and rock; iron killicks and warps; inner, outer, and end buoys with flags. Rockport, Mass., 1882. 54,535 to 54,541. U. S. Fish Commission. Used in near-shore fishing for cod, hake, and haddock.

**LAY-OUT LINE.**

Section; white cotton ground-line, with gangings  $5\frac{1}{2}$  inches long and 12 inches apart; small central-draught eyed hooks. Magnolia, Del., 1883. 57,562. Gift of M. S. Van Burkalow. Used in rivers and bays for catching cat fish. A full size lay-out line is from 50 to 200 feet long, and is held in position by stakes at either end or by weights with buoys attached.

**UNDER-RUNNING STICK.**

Hard wood, notched  $2\frac{1}{2}$  inches from upper end, slightly tapering at lower end. Length 25 inches, diameter 1 inch. Gloucester, Mass., 1883. 54,823. J. W. Collins. Used when under-running trawls.

## PHOTOGRAPHS AND SKETCHES ILLUSTRATIVE OF THE TRAWL FISHERIES.

## CLEARING TRAWLS.

Photograph showing schooner Ontario engaged in the haddock trawl fishery, with crew at work untangling and baiting trawls on deck. Size, 8 by 10 inches. Gloucester, Mass., 1882. (555) 2,093. U. S. Fish Commission.

## BAITING TRAWLS.

Photographs of schooner Lydia A. Harvey, Capt. John Clancey, engaged in haddock trawling from Boston. Showing the men at work on deck baiting up their trawls. Taken while lying at Commercial wharf. Size 8 by 10 inches. Boston, Mass., 1882. (16) 1,810. U. S. Fish Commission.

## BAITING UP.

Photograph of a Gloucester schooner, engaged in the Grand Bank cod-fisheries, under sail, with a small herring-weir boat alongside, from which herring are being bailed on deck and packed in ice below to serve as bait in the trawl fishery. Size, 8 by 10 inches. Taken at Eastport, Me., 1882. (234) 1,918. U. S. Fish Commission.

## BAITING TRAWLS.

Photograph of schooner Mystic, of Gloucester, engaged in the haddock trawl fishery, showing crew of Nova Scotia fishermen at work baiting trawls on deck, preparatory to setting them. Size, 8 by 10 inches. Massachusetts Bay, 1882. (524) 2,066. U. S. Fish Commission.

## TRAWL FISHING.

Photograph showing Albert Norwood and Frederick Giles hauling a dog-fish trawl into a dory. The picture shows a fish just coming over the gunwale of the boat, and a fisherman in the act of killing it with a club. Size, 8 by 10 inches. Taken at Rockport, Mass., 1882. (64) 1,832. U. S. Fish Commission.

## DRESSING HALIBUT.

Photograph of schooner Willie M. Stevens, of Gloucester, engaged in halibut trawl fishing, showing the method of dressing fish on deck before icing them in the vessel's hold. Size, 8 by 10 inches. Gloucester, Mass., 1882. (330) 1,974. U. S. Fish Commission.

## HADDOCK.

Photograph of deck of schooner Belle A. Keyes, of Boston, engaged in haddock trawling. Showing trawls upon the deck, and



**HADDOCK—Continued.**

the crew in the act of "hoisting out" the cargo. Size, 8 by 10 inches. Taken while lying at Commercial Dock, Boston, Mass., 1882. (6) 1,804. U. S. Fish Commission.

**UNLOADING CODFISH.**

Photograph of view showing the unloading, culling, weighing, and wheeling of Grand Bank codfish at the wharf of Parmenter, Rice & Co., Gloucester, Mass., 1882. Size, 8 by 10 inches. (293) 1,952. U. S. Fish Commission.

**BANK FISHERMEN BAITING TRAWLS.**

Crayon drawing of crew of schooner Marion, of Gloucester, engaged in the halibut fishery, baiting trawls on deck preparatory to setting them. Size 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

**SETTING COD TRAWLS.**

India-ink drawing showing two Gloucester fishermen engaged in setting their trawls for codfish on the Western Banks from a fishing dory. The picture shows the fishing vessel at anchor in the distance, and three other dories getting ready to set their trawls. Size 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

**SETTING TRAWLS UNDER SAIL.**

A crayon sketch of a Gloucester schooner on the fishing grounds, with the crew engaged in setting their trawls while the vessel is under way. The drawing shows one dory setting the trawl, another about to begin, and the other still in tow of the vessel. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

**CRABBING.**

An India-ink drawing showing two Chesapeake negroes in an old-fashioned boat engaged in fishing a trot-line which has been set for crabs. One is hauling the line while the other uses the dip-net to secure the crab before it has let go of the bait. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

**BAITING TRAWLS.**

A crayon sketch showing a crew of Gloucester fishermen at work in the hold of the vessel baiting their trawls. The trawls are usually baited after the work of the day, by lamplight, in order that they may be ready to set by daybreak on the following morning. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

## UNLOADING HALIBUT.

Photograph of the crew of a vessel engaged in the halibut trawl fishery unloading their cargo. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Gloucester, Mass., 1882. U. S. Fish Commission.

## HALIBUT TRAWLING.

India-ink sketch showing a crew of Gloucester fishermen that have left the vessel in dories on the fishing banks to haul their trawls. The picture shows the men overtaken by a storm, with the spray and water dashing wildly over them. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

## TRAWL-FISHING.

Photograph showing Albert Norwood and Frederick Giles hauling a dog-fish trawl into a dory. The picture shows a fish just coming over the gunwale of the boat, and a fisherman in the act of killing it with a club. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Taken at Rock port, Mass., 1882. (64) 1,832. U. S. Fish Commission.

## BAITING TRAWLS.

Photograph of schooner Mystic, of Gloucester, engaged in the haddock trawl fishery, showing crew of Nova Scotia fishermen at work baiting trawls on deck, preparatory to setting them. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Massachusetts Bay, 1882. (524) 2,066. U. S. Fish Commission.

## 16. PARTS AND ACCESSORIES OF ANGLING AND DEEP-SEA FISHING-TACKLE, AND OF HARPOONING IMPLEMENTS.

## HOOKS.

## ABORIGINAL HOOKS.

## SHELL HOOK.

Shank made from the hinge of a pearl-bearing shell (*Avicula margaritifera*); hook portion of border from probably the same species, made fast to shank with a seizing of some vegetable fiber. Length, 5 inches. New Bedford, Mass., 1882. 68,139. U. S. Fish Commission. Called "Kanaka hook" by whalers.

## FISH-HOOK.

A barbless piece of curved copper in the end of short, flat, wooden shank. Length,  $3\frac{3}{4}$  inches; spread, 1 inch. Etotowig, near Victoria Harbor, Victoria Land. 10,142. Capt. C. F. Hall.

## FISH-HOOK.

Made of a piece of curved iron, barbless; long ganging of cord. Length,  $2\frac{1}{2}$  inches; spread, 1 inch. Pyramid Lake, Nevada. 1876. 19,064. Stephen Powers.

## FISH-HOOK.

An iron nail driven through the end of a knotty piece of wood and secured with pitch. Length,  $4\frac{1}{2}$  inches. Wallapai Indians. 1870. 9,765. Dr. Edward Palmer.

## FISH-HOOKS (3).

Straight, iron points, lashed to short, wooden stocks by serving of bark or fiber. Line, braided fiber. Length, 3 to  $3\frac{1}{2}$  inches; spread,  $\frac{3}{4}$  to 1 inch. Chilkah, Alaska, 1870. 9,807. Lieutenant F. W. Ring, U. S. A.

## FISH-HOOK.

Made of bird's claw. Cooyuwei Pai Ute Indians. Length,  $1\frac{1}{2}$  inches; spread,  $\frac{3}{4}$  inch. Pyramid Lake, Nevada, 1876. 19,064 (b). Stephen Powers.

## FISH-HOOK.

Reindeer horn. Square shoulders instead of curves; sharp point, barbed; barb on bottom of shoulder. Hole in shank for attachment of line. Length,  $2\frac{1}{4}$  inches; breadth,  $1\frac{3}{8}$  inches. Chesterfield Inlet, north of Hudson Bay, 1861. 72,609. Collected by Capt. H. C. Chester. Gift of Dr. Emil Bessels.

## FISH-HOOKS (4).

Unbarbed, brass hooks at the ends of split quills which pass through a bone sinker at right angles; the sinker is fastened to the end of a short snood which depends from the end of a small pole. Length of stick, 12 inches. Spread of hooks,  $7\frac{1}{2}$  inches. Used as a grab-hook in catching small fish. Bristol Bay, Alaska, 1882. 55,926. Collected by Chas. L. McKay.

## FISH-HOOKS (6).

Ivory shanks with rude iron points, unbarbed. Length,  $1\frac{1}{2}$  to  $5\frac{3}{8}$  inches. Bristol Bay, Alaska, 1882. 55,925. Collected by Charles L. McKay.

## FISH-HOOK.

Hook of carved bone; back, carved from shell; bound together with sinew and cord of twisted vegetable fiber. Length,  $4\frac{1}{2}$  inches. Fiji Islands, 1840. 2,844. U. S. Exploring Expedition, Capt. Charles Wilkes, U. S. N.

## FISH-HOOKS (4).

Shank made of a hemlock splint, the ends brought nearly together and held by a light lashing; short, wooden barb; line, twisted bark. Indians of Northwest coast. Length, 4 to  $5\frac{1}{2}$  inches. Bella Bella, British Columbia, 1876. 20,654. James G. Swan.

## FISH-HOOKS (31).

Wood, stone, bone, or ivory shanks, with short, curved iron barbs. Many rudely carved and ornamented with inlaid beads, &c. Eskimo. Length, from 1 to 6 inches. Northwest coast of America. 1,441; 1,622; 2,093; 2,191; 2,192; 2,248; 5,117; 5,118. R. Kennicott and R. MacFarlane.

## FISH-HOOK.

Wooden stock, slightly curved; straight, bone shank; no barb. Stock, 6 inches. Shank  $4\frac{1}{4}$  inches. Yukon River, Alaska. 1,123. W. H. Dall.

## FISH-HOOKS (14).

Bone or wooden shanks, through the lower end of which are passed barbless ivory, iron, or copper points. Gangings made of split quills, walrus whisker, or whalebone; some have stone or ivory sinkers with snoods; lines made of walrus hide, whalebone, &c. Used by Eskimo. Northwest coast of America, 1866. 2,197; 2,239; 4,324; 5,116; 5,590; 16,311. Robert Macfarlane and William H. Dall.

## FISH-HOOKS (2).

Iron, joined by whalebone ganging. Russian manufacture. Length, 4 and  $4\frac{1}{2}$  inches; spread, 1 and  $1\frac{1}{4}$  inches. Saint Lawrence Island, Alaska, 1873. 15,635. Henry W. Elliott.

## FISH-HOOKS (4).

Straight, wooden stock, split at lower end to receive straight, bone shank; no barb; line made of twisted and braided sinew. Made by Thlinket Indians. Length of stocks,  $3\frac{1}{2}$  inches; shanks,  $2\frac{1}{2}$  to 3 inches. Sitka, Alaska. 16,311. William H. Dall.

## FISH-HOOKS (2).

Titama; line and hooks for large fish; made of bits of greasewood about an inch long, each with a bit of bone firmly lashed to it at nearly a right angle, so arranged that, when taken in the mouth of the fish, it turns crosswise. Cooyuwee Pai Ute Indians. Length,  $2\frac{1}{2}$  inches; spread,  $\frac{3}{4}$  inch. Pyramid Lake, Nev., 1876. 19,064 (a). Stephen Powers.



## HALIBUT-HOOK.

Two pieces of wood seized with a cedar withe. Barbless spear, common nail, sharpened, lashed to upper end of arm with withes of cedar rootlets. Cedar withes knotted to shank for tying hook to line. Upper end of shank ornamented with head of a water-fowl. Length,  $10\frac{3}{4}$  inches. Sitka, Alaska. 42,976. Gift of Commander L. A. Beardslee, United States Navy.

## HALIBUT-HOOK.

Shank and arm, wood; barb, metal; lanyards for tying to line, rootlets of cedar. Shank ornamented with head of a bird. Barb lashed to upper end of arm with cedar rootlets. Old. Length,  $11\frac{2}{3}$  inches; spread,  $3\frac{3}{4}$  inches. Alaska. 56,449 (b). James G. Swan.

## HALIBUT-HOOK.

Wood, two pieces; shank and arm lashed with cedar rootlets. Shank ornamented at upper end with the head of an animal—apparently some design of fancy—and a rigid cleat. Metal barbs lashed to upper end of arm with rootlets of cedar. Small lanyard for attaching the hook to line, rootlets of cedar. Has been used. Length,  $9\frac{1}{2}$  inches; spread,  $3\frac{5}{8}$  inches. Alaska. 56,449 (c). James G. Swan.

## HALIBUT-HOOK.

New. Shank and arm, wood, lashed in two places with rootlets of cedar. Shanks carved with the totem of some animal. Withes made of cedar rootlets for "bending on to line." Metal barb seized to upper end of arm. Length, 10 inches; spread,  $4\frac{7}{8}$  inches. Alaska. 60,177. J. J. McLean.

## HALIBUT-HOOK.

Apparently new. Shank and arm, wood, lashed with cedar rootlets. Shank carved—figure of man holding two fishes. Barb wanting. Lanyard for attaching hook to line; cedar rootlets knotted in shank. Length,  $10\frac{1}{2}$  inches; spread,  $3\frac{7}{8}$  inches. Alaska. 60,178. J. J. McLean.

## HALIBUT-HOOK.

Wood; shank and arm lashed together. Shank carved with grotesque figure of a man. Metal barb seized to end of arm with rootlets of cedar. Has been used. Length,  $11\frac{1}{2}$  inches; spread, 4 inches. Alaska. 60,179. J. J. McLean.

## HALIBUT-HOOKS.

Made of splints from hemlock knots usually taken from decayed logs. Length, 6 inches. Makah Indians, Cape Flattery, Washington

## HALIBUT-HOOKS—Continued.

Territory, 1883. 72,648 to 72,650. James G. Swan. The knots are split into small pieces, and after being shaped with a knife they are inserted in a hollow piece of kelp-stem and steamed in hot ashes until pliable. They are then bent into the required shape and tied. A barbless bone spur is firmly lashed to the lower side of the hook with slips or thin ribbons of spruce, or with strips of the bark of wild cherry. The upper end of the hook is recurved and served with bark to prevent splitting. A thread, made of whale sinew, is usually fastened to the hook for the purpose of tying on the bait, which is commonly a piece of an arm of the cuttle-fish or squid (*Octopus tuberculatus*). Another piece of loosely-twisted cord of sinew is used to fasten the hook to the line. As the mouth of the halibut is vertical, instead of horizontal, like that of most other kinds of fish, it readily takes the hook, the upper portion of which passes outside and over the corner of the mouth and acts as a spring to fasten the barb into the fish's jaw.

## HALIBUT-HOOKS (13).

Curved wooden stock, with straight bone shanks; no barbs. Used by Indians. Length,  $4\frac{1}{2}$  to 10 inches. Northwest coast of America.

## HALIBUT-HOOKS (3).

Wooden stock and shank lashed together at a point; bone barbs. Made by Indians. Length,  $6\frac{1}{2}$  inches; barbs,  $1\frac{1}{2}$  to 2 inches. Northwest coast of America. 653. Collected by George Gibbs.

## HALIBUT-HOOKS (6).

Wooden stocks and shanks, lashed together in a point at lower ends; iron barbs; stocks grotesquely carved; gangings, made from the long fibrous roots of the spruce, are rove through middle of stocks. Length, from 10 to  $12\frac{1}{2}$  inches; spread, from 4 to 6 inches. Alaska. 1,153; 9,103; 9,104; 9,271; 20,889.

## HALIBUT-HOOKS (6).

Wooden stocks and shanks, lashed together in a point at lower end; iron barbs; stocks rudely carved to represent human figures, fish, birds' heads, &c.; gangings, made from the long fibrous roots of the spruce, rove through middle of stocks. Length, 9 to 12 inches; spread, 5 to  $5\frac{1}{2}$  inches. Northwest coast of America. 1873-75. 16,315; 18,909; 20,750. Collected by William H. Dall and James G. Swan.

## HALIBUT-HOOKS (5).

Wooden stocks and shanks, lashed together in a point at lower ends, or cut from a single curved knot; iron barbs; some stocks

## HALIBUT-HOOKS (5)—Continued.

curved, others plain; gangings, made from the long fibrous roots of the spruce or of twisted grass (?), are rove through or bent on to the middle of stocks. Length, from  $9\frac{1}{2}$  to 12 inches; spread, from  $4\frac{1}{2}$  to 6 inches. Northwest coast of America, 1875. 20,649; 20,650; 20,652; 20,656; 20,657. Collected by James G. Swan.

## HALIBUT-HOOK.

Straight, wooden stock; straight, bone shank, lashed to lower end at an angle of about 45 degrees; no barb; line of twisted bark. Length: Stock,  $6\frac{1}{2}$  inches; shank, 4 inches. Bella Bella, British Columbia, 1876. 20,651. Collected by James G. Swan.

## BUTT-END OF HEMLOCK LIMB.

Prepared for steaming and making a halibut-hook. Makah Indians. Length,  $12\frac{1}{2}$  inches. Puget Sound, Washington Territory, 1873. 1,141. Collected by James G. Swan.

## COD-HOOK.

Leaders and snells, whalebone (baleen); hooks, ivory, straight and barbless, seized with bark strips. Length, 23 inches. Makah Indians, Neah Bay, Washington Territory, 1883. 72,651. James G. Swan. Used for catching the green rock cod, or cultus cod (*Ophiodon elongatus*), the "Toosh kow" of the Makah Indians.

## CODFISH HOOKS (4).

Long whalebone stock, to the lower end of which is fastened a bone shank by serving of bark; no barb; the upper end is bent into an eye, through which the line is fastened. Used by Eskimo. Length,  $12\frac{1}{2}$  to  $13\frac{1}{2}$  inches. Northwest Coast of America. 243.

## CODFISH HOOK.

Wood; straight stock and shank, lashed together with thin strips of rattan; no barb; to the upper end of stock is lashed a small stone sinker. Made by Makah Indians. Length of stock, 11 inches; shank, 5 inches. Neah Bay, Washington Ter., 1874. 14,280. James G. Swan.

## MODERN HOOKS, PLAIN.

*Single hooks.*

## HOOK MANUFACTURE.

The ten processes through which American hand-made fish-hooks pass from the wire to the finished hook. Made entirely by hand-labor in the factory of J. W. Court, Brooklyn, N. Y. 25,682. Bradford & Anthony, Boston, Mass.

CARLISLE HOOKS.—Tied to gimp. 25,546.

CARLISLE TROUT HOOKS.

Ringed. 25,521. Flatted. 25,520.

CARLISLE KIRBY HOOKS FOR BASS.—Tied to double gut. 42,873 (b.)

CARLISLE KIRBY HOOKS FOR BLUEFISH AND PICKEREL.

Tied to gimp. 42,873 (a.)

KIRBY RIVER AND TROUT HOOKS.

Ringed. 25,522. Flatted. 25,523. Spear points, ringed. 25,522  
(a.)

KIRBY SALMON HOOKS.—Flatted. 25,519.

KIRBY SEA-FISH HOOKS.

Flatted. 25,528. Flatted and galvanized. 25,529. Ringed. The  
two largest sizes for halibut trawls. 25,530.

KINSEY TROUT HOOKS.

Ringed. 25,591. Tied to gut. 25,540. Flatted. 25,525.

KINSEY HOOKS FOR BASS.—Tied to double gut. 42,873 (d).

HOLLOW-POINT LIMERICK HOOKS.

Tied to double gut. 25,543. Tied to twisted gut. 25,544. Tied  
to gimp. 25,545. Ringed. 57,025.

HOLLOW-POINT LIMERICK TROUT HOOKS.—Tied to gut. 25,939.

LIMERICK RIVER AND TROUT HOOKS.

Spear points, flatted. 25,515. Spear points, ringed. 25,514; 57,026.

LIMERICK SALMON HOOKS.

Hollow point, flatted. 25,516. Hollow point, ringed. 25,517.

LIMERICK HOOKS FOR BASS.—Tied to double gut. 42,873 (f).

LIMERICK HOOKS FOR PERCH.—Tied to double gut. 42,873 (g).

LIMERICK HOOKS FOR PICKEREL.—Tied to gimp. 42,873 (c).

VIRGINIA HOOKS.

Flatted, tapered points. 25,524. English make. A. B. Shipley &  
Son. 57,054. Wm. Mills & Son. 56,988.

ABERDEEN HOOKS.

Tied to gut. 25,542. English make. Wm. Mills & Son. 56,984.



ABERDEEN TROUT HOOKS.—Flatted. Graded sizes. 25,518.

FISH HOOKS.—Rhode Island patterns. 57,057-8.

NEW YORK TROUT HOOKS.—English make. Wm. Mills & Son. 56,982.

NEW YORK BASS HOOKS.

Tied to gut. 25,541. English make. Wm. Mills & Son. 56,983.

SNECK HOOKS.—English make. Wm. Mills & Son. 56,985.

SPROAT HOOKS.

Tapered ends. English make. William Mills & Son. 56,986.

CHESTERTOWN HOOKS.

English make. William Mills & Son. 56,987.

SHEEPSHEAD HOOKS.—English make. A. B. Shipley & Son. 57,055.

CENTRAL-DRAUGHT HOOKS.—Flatted. For cod hand-lines. 25,531.

Eyed. Large size for cod and haddock trawls. 25,532. Ringed.

For cod and haddock trawls. 25,533. Flatted. English make.

William Mills & Son. 56,989.

HALIBUT HOOKS.

Straight shanks, ringed. 25,640.

COD HOOKS.

42,898. Flatted. 57,027; 25,526. Ringed. 25,527.

MACKEREL AND EEL HOOKS.

Drop point, flatted and ringed. 25,536 and 25,534.

BLACKFISH HOOKS.

English make. William Mills & Son. 56,980. Taperpoints. Eng-

lish make. William Mills & Son. 56,981. Japanned and

flatted. 25,535.

BLUEFISH HOOKS.

42,897. Mounted on piano wire. 42,881. Mounted on brass snells.

42,896.

HORSE-MACKEREL HOOK.

Made of galvanized iron, ringed, curved shank. Length,  $9\frac{1}{2}$  inches;

spread,  $3\frac{1}{2}$  inches. Belfast, Me., 1877. 29,467. Gift of John

Thomas.

DOGFISH HOOKS.

Straight shanks, ringed. 25,641.

## GROUND-SHARK HOOK.

Pattern of 1840. Made of galvanized iron, rigged with chain ganging; length of hook,  $10\frac{1}{2}$  inches; spread, 3 inches. Provincetown, Mass., 1877. 29,464. Gift of Elisha Cook.

## SHARK HOOK.

Made of galvanized iron, ringed. Length, 10 inches; spread, 3 inches. Wellfleet, Mass., 1877. 29,465. Gift of M. W. Grant.

## SHARK HOOKS.

Made of iron, painted black; chain gangings; straight and curved shank hooks. Series of eight sizes, for small and large sharks. U. S. Fish Commission. 25,538.

## SHARK HOOKS.

Made of iron, painted black; very large and heavy; chain gangings, with swivels; two sizes. Length of hooks, 18 inches. U. S. Fish Commission. 25,538 *a*.

## "FORGED" O'SHAUGHNESSY HOOKS.

Tied to double gut. 42,873 *e*.

## SAMPLES OF FISH-HOOKS USED IN SEA FISHERIES.

Manufactured by J. W. Court & Co., Brooklyn, N. Y. These hooks are mostly used in the cod, haddock, hake, halibut, and mackerel fisheries, though the latter fishery is now conducted almost entirely with the purse-seine. The central-draught hooks are the latest pattern, and are usually given the preference over the straight-shank hook. No. 10, central-draught, and No. 6,281 straight-shank are used for large codfish in hand-line fishing, and Nos. 11, 12, and 13, and 6,282 to 6,284 for smaller fish. No. 14 is a Grand Bank trawl hook, and 15, 16, and 17 are for haddock trawls. Exhibited by Nickerson & Baxter, Boston, Mass.

## BARBLESS HOOKS.

Samples of home-made barbless hooks used in trout and bass fishing. Exhibited by Monroe A. Green, Mumford, N. Y.

*Treble hooks.*

## BRIGHT TREBLE HOOKS.

Eyed. English make. William Mills & Son. 56,991.

## TREBLE HOOKS.

Bright. English make. A. B. Shipley & Son. 57,056.

## TREBLE HOOKS.

Spring shank. English make. William Mills & Son. 56,990.

## MODERN HOOKS, DECORATED.

(Those partially covered with artificial animals, feathers, bright-colored cloth, or metal spoons and spinners, or other devices for alluring the fish and causing them to take the hook.)

*Jigs and drails.*

## MACKEREL JIGS.

Old style. 39,175. Pattern of 1840. 25,941. Gloucester pattern.  
Style of 1850. 32,734. Cape Ann patterns. 29,479; 39,171.  
Rhode Island pattern. 25,599.

WEAKFISH JIG.—Rhode Island pattern. 25,600.

CODFISH JIGS.—Cape Cod patterns of 1850. 25,601; 29,461.

## BLUEFISH DRAILS.

Hook-shanks covered with eelskin and cotton cloth. Cape Cod and Rhode Island varieties. 24,807; 24,809; 29,425.

## BLUEFISH DRAIL.

Hook with shank-mold in lead, shape of fish; leather strap. Wellfleet, Mass., 1830. 29,485. Gift of Newell B. Rich.

## BLUEFISH DRAILS.

Plain and galvanized hooks, variously mounted in lead, ivory, and pearl. Used along the coasts of Southern New England and New Jersey in trolling for bluefish.

## BLUEFISH DRAILS.

Varieties of pearl and metal mounted hooks; double hook gear. U. S. Fish Commission. 57,677.

## BASS AND BLUEFISH DRAILS.

Various designs; hook-shanks mounted with cedar, bone, or cloth. U. S. Fish Commission. 29,448; 57,677; 57,678.

## BLUEFISH SQUIDS.

Revolving metals, double hooks. U. S. Fish Commission (C., B. & M.), 1880. 42,895.

## DOLPHIN DRAIL.

Long hook, shank covered with blue cotton, baited with white cotton cloth. Gloucester, Mass., 1883. 57,044. Capt. J. W. Collins. Carried on merchant vessels; used in tropical waters for the capture of dolphins.

## MACKEREL-JIG MOLDS.

Style of 1840. 39,174. Patent, 1870. 23,780. Style of 1880. 39,173.  
Lead-lined. 25,781. Jig partly formed. 25,782; 39,171*a*.

SKIN OF DOGFISH.—For smoothing jigs. 56,954.

STEEL FILE.—For smoothing jigs and hooks. 54,398.

JIG-RASP.—For shaping jigs. 54,397.

JIG-LADLE.—For pouring lead into molds. 54,383.

LEAD FOR MAKING JIGS.—32,663.

*Artificial minnows, etc. (made to represent the minnows, etc., on which the fish feeds).*

#### ARTIFICIAL BAIT.

Soft-rubber crawfish, helgamites, frogs, grasshopper, May fly, and cricket. William Mills & Son. 57,003; 57,004; 57,012.

#### PHANTOM MINNOWS.

Made of silk coated with rubber, very light. Mounted with three-treble hooks. William Mills & Son. 57,008.

#### PROTEAN MINNOWS.

Made of soft rubber, with snells and treble hooks. William Mills & Son. 57,010.

#### CALEDONIAN MINNOWS.

Made of hard rubber, with snells and treble hooks. William Mills & Son. 57,009.

#### ARTIFICIAL BAIT.

Minnows made of pearl, for single or double hooks. Centennial collection, 1876. 25,666. Gift of William M. Young.

#### ARTIFICIAL BAIT.

Metal minnow, treble hook, wire snell, with swivel. U. S. Fish Commission, 1876. 25,550 c.

#### MINNOW GANGS.

Single and treble hooks, mounted on gut and gimp snells and rigged with swivels. William Mills & Son, New York. 56,992.

*Spoon baits.*

#### SPOON BAITS.

Nickel-plated spoons, double hooks, trimmed with feathers. Syracuse, N. Y., 1876. 25,549 a. Made by John H. Mann.

#### MACHARG'S PEARL SPOONS.

Made of pearl, with treble hooks trimmed with feathers; fitted with swivels and snells. U. S. Fish Commission (B. & A.), 1876. 25,550 a.



## SPOON BAITs.

Plated spoons, treble hooks, feather-trimmed, swivels and snells. Brooklyn, N. Y., 1876. 25,552. Made by W. H. James.

## THE NEW ECLIPSE SPOON.

Nickel-plated and brass, feathered hooks; spring link from spoon to shaft. Value, 1883, \$6.30 to \$10 per dozen. William Mills & Son, New York. 57,006. One of the most successful spoons for taking black bass, pike, pickerel, and lake trout.

## SPOON BAITs.

Silver-plated spoons, treble hooks, trimmed with feathers, rigged with swivels and gimp-snells. U. S. Fish Commission (C., B. & M.), 1880. 42,885; 42,886.

## LONE STAR FLY-SPOON.

Face of spoon half gold and half nickel plated; four sizes. Value, 1883, \$4.75 to \$6.50 per dozen. William Mills & Son, New York. 57,005. This is a very light spoon, and desirable for black-bass fishing.

## SPOON BAITs.

Metal spoons, plated; single and treble hooks, trimmed with feathers or tape. U. S. Fish Commission (C., B. & M.), 1880. 42,882.

## SPOON BAITs.

Metal spoons; single and treble hooks; swivels and snells. U. S. Fish Commission (C., B. & M.), 1880. 42,882a.

## SPOON BAITs.

Metal spoon; double and treble hooks, feathered and plain; brass and wire snells. U. S. Fish Commission. 42,882c.

## SPOON BAITs.

Metal spoons, treble hooks, trimmed with feathers; wire spreaders. Whitehall, New York, 1876. 25,551a. Made by J. T. Buel.

## BUEL'S BAITs.

Metal spinners, plain treble hooks, swivels, and snells. U. S. Fish Commission (B. & A.), 1876. 25,550b.

## ARTIFICIAL BAITs.

Series of metal spoon-baits, nickel-plated; swivels; single and treble hooks. Centennial collection, 1876. 25,549. Made by John H. Mann, Syracuse, N. Y.

## ARTIFICIAL BAITES.

Series of metal spoon baits; swivels and snells; single hooks. Centennial collection, 1876. 25,555. U. S. Fish Commission. Used in the capture of bass and bluefish.

## BATES'S PATENT SPINNER.

English manufacture; two sizes. Value, 1883, \$5 per dozen. 57,007. William Mills & Son, New York.

## PEARL BAITES.

Spoons made of mottled pearl; double and treble hooks trimmed with white-ibis feathers. U. S. Fish Commission (C., B. & M.), 1880. 42,875.

## SKINNER'S FLUTED BAIT.

Metal spoons, plated, fluted, treble hooks trimmed with feathers. Gananoque, Canada, 1876. 26,793. Made by G. M. Skinner.

## CHAPMAN'S BAITES.

Minnow propellers made of metal; treble hooks, feathered. Value, 1882, \$6 to \$10 per dozen. U. S. Fish Commission (C., B. & M.). 42,883.

## SPOON BAITES.

A large case containing samples of all the more important styles of spoon baits manufactured by L. S. Hill & Co.; also a framed card of illustrations of same. Exhibited by L. S. Hill & Co., Grand Rapids, Mich.

## TROLLING-SPOONS.

A large case containing numerous varieties of trolling-spoons. Manufactured and exhibited by John Mann & Co., Syracuse, N. Y.

*Artificial flies.*

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS. 32,737.

Bradford & Anthony, Boston, Mass. [NOTE.—For convenience, this entire collection is provisionally entered under a single catalogue number.]

- a. Peacock, with water-color sketch of original.
- b. March brown, with water-color sketch of original. Body: Fur of the fox-squirrel's face ribbed over with olive silk. Tail: Two strands of brown feather of the wild mallard. Wings: From the side feathers of the shoveler duck approaching the tail; the light yeast-colored feather is the best, and, if nicely tied, must be an excellent fly. Legs: A grizzled cock's hackle, wound twice or thrice

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

- at the shoulder. For Pennsylvania, hooks Nos. 6 to 8; for New York, hooks Nos. 5 and 6; New England, hooks Nos. 4 and 5.
- c.* Great red spinner, with water-color sketch of original.
- d.* Water-cricket, with water color sketch of original.
- e.* Great dark drone, with water-color sketch of original.
- f.* Cow-dun. Body: Yellow mohair mixed with a little dingy brown fur from the bear. Wings: From the quill-feather of the curlew or whimbrel. Legs: Of a ginger-colored cock's hackle. For Pennsylvania, hooks Nos. 8 to 10; for New York, hook No. 8; for New England, hook No. 6.
- g.* Red fly, with water-color sketch of original. Body: The red part of squirrel's fur mixed with an equal quantity of claret mohair. Wings: The softest quill-feather of the pea-hen's wings. Legs: Claret-colored hackle; clip some of the upper fibers off that the wings may lie flat. For Pennsylvania, hook No. 6; for New York, hook No. 4; for New England, hook No. 3.
- h.* Blue dun, with water-color sketch of original. Body: Fur of a gray squirrel spun very thinly on fine yellow silk. Tail: Two fibers of a dun hackle. Wings: From a quill-feather of the blue-jay. Legs: Two or three turns of a ginger-dun hackle at the shoulder helps to keep the wings upright. For Pennsylvania, hook No. 6; for New York, hook No. 5; for New England, hook No. 4.
- i.* Red spinner, with water-color sketch of original. Body: Bright brown silk ribbed, with fine gold twist. Tail: two fibers of red cock's hackle. Wings: Upright from a mottled gray feather of the mallard stained a pale blue, the brighter in color the better. Legs: Plain red cock's hackle. For Pennsylvania, hook No. 6; for New York, hook No. 5; for New England, hook No. 4.
- j.* Nicholson.
- k.* Black dog.
- l.* Atkinson.
- m.* Policeman.
- n.* Claret wasp.
- o.* Blue wasp.
- p.* Wren-tail, with water-color sketch of original. Body: Ginger-colored fur ribbed with gold twist. Wings: Feathers from a wren's tail; if these cannot be procured a small scapular feather of the woodcock makes a good imitation, and may be hackled with the same kind of feather. For Pennsylvania, hook No. 10; for New York, hook No. 8; for New England, hook No. 6.

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

- q.* Red ant, with water-color sketch of original. Body: Peacock's herl tied with red-brown silk. Wings: From the quill-feather of the blue-jay. Legs: A small red cock's hackle.
- r.* Silver horns, with water-color sketch of original.
- s.* Golden-dun midge, with water-color sketch of original.
- t.* Sand-fly, with water-color sketch of original. Body: Of the sandy-colored fur from the rabbit's neck or from the fox-squirrel spun on silk of the same color. Wings: From the whimbrel wing made full. Legs: From a light ginger feather from the neck of a hen. For Pennsylvania, hooks Nos. 6 to 8; for New York, hooks Nos. 5 and 6; for New England, hooks Nos. 4 and 5.
- u.* Stone-fly, with water-color sketch of original. Body: Fur of the gray squirrel, when it is shortest is best, mixed with a little yellow mohair, leaving yellow about the tail. Tail: A strand or two of brown mottled feathers, say of mallard. Wings: From the soft inside feather of the peahen's wing. Legs: Blue-dun cock's hackle. For Pennsylvania, hooks Nos. 6 to 8; for New York, hooks Nos. 5 and 6; for New England, hooks Nos. 4 and 5.
- v.* Gravel bed, with water-color sketch of original. Body: Dark dun or lead-colored silk floss dressed very fine. Wings: From a covert feather of the woodcock's wing. Legs: A black cock's hackle, rather long, wound twice only round the body. For Pennsylvania, hooks Nos. 8 to 10; for New York, hooks Nos. 6 to 8; for New England, hooks Nos. 5 and 6.
- w.* Grannum, with water-color sketch of original. Body: Fur of a rabbit's face with a little fine green mohair worked in at the tail. Wings: From the inside wing-feather of a grouse. Legs: A pale ginger hen's hackle. For Pennsylvania, hooks Nos. 8 to 10; for New York, hooks Nos. 6 to 8; for New England, hooks Nos. 5 and 6.
- x.* Yellow dun, with water-color sketch of original. Body: Yellow mohair mixed with a little pale blue from a mouse or yellow floss silk with the least blue rabbit fur spun upon it. Wings: Upright, from the inside wing-feather of a mallard or summer duck. For Pennsylvania, hook No. 10; for New York, hook No. 8; for New England, hooks Nos. 5 and 6.
- y.* Iron-blue dun, with water-color sketch of original.
- z.* Hawthorn, with water-color sketch of original. Body: Black ostrich's herl. Wings: From the quill-feather of the English snipe. Legs: A black cock's hackle. For Penn-



## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

- sylvania, hooks Nos. 8 to 10; for New York, hooks Nos. 6 to 8; for New England, hooks Nos. 5 and 6.
- aa.* Jenny spinner, with water-color sketch of original.
- ab.* Dennison. Body: Green floss silk ribbed with silver twist. Tail: Orange-tipped fibers of tippet, wood-duck, ibis, and green parrot. Legs: A golden yellow hackle. Wings: Of the following kinds—wood-duck, tippet, brown mallard, bustard, green parrot, blue and yellow macaw, with a few strands of red macaw; black ostrich head. Hooks, Nos. 1, 2, and 3.
- ac.* Deacon. Body: Bright yellow seal's fur ribbed with silver tinsel backed with gold twist. Tail: Sprigs of gray mallard and ibis. Legs: Bright yellow hackle. Wings: Strips of gray mallard dressed full; black ostrich head. Hooks, Nos. 2 and 3.
- ad.* Montreal. Body: Claret mohair ribbed with gold tinsel. Tail: Three or four fibers of scarlet ibis. Legs: Claret hackle. Wings: Brown turkey. Hooks, Nos. 1, 2, and 3.
- ae.* Rangely. Body: Dark claret mohair ribbed with gold tinsel. Tail: Fibers of wood-duck and ibis. Legs: Dark claret hackle. Wings: Strips of wood-duck mixed with sprigs of scarlet ibis. Hooks, Nos. 1, 2, and 3.
- af.* Tinsel ibis. Body: Silver tinsel ribbed with gold twist. Tail: A slip of wood-duck mixed with ibis. Legs: A covert wing-feather of the ibis. Wings: Strips from the large covert-feather of the ibis (the wing may be varied, adding a slip of wood-duck on each side); black ostrich head. Hooks, Nos. 1, 2, and 3.
- ag.* Lake George. Body: Gold twist ribbed with silver twist. Tail: A small China topping. Legs: A bright orange hackle with a shoulder of bright claret. Wings: Two tipped feathers mixed with argus pheasant, brown mallard; black ostrich head. Hooks, Nos. 1, 2, and 3.
- ah.* Chateaugay. Body: Lemon-yellow floss ribbed with gold twist. Tail: A few fibers of brown mallard. Legs: A ginger-colored cock's hackle. Wings: Strips of shoveler duck mixed with fibers of argus pheasant.
- ai.* Yellow drake. Body: yellow mohair ribbed with silver twist. Tail: Three fibers of yellow macaw. Legs: Yellow hackle with two turns of ibis on shoulder. Wings: Strips of gray mallard; black ostrich head. Hook, No. 3.
- aj.* Richardson. Body: A light-blue floss silk ribbed with silver twist. Tail: Three strands of brown mallard. Legs:

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

Black cock's hackle. Wings: Strips of English blue-jay mixed with brown mallard. Hooks, Nos. 3 and 4.

*ak.* Anthony.

*al.* Snow-fly.

*am.* Captain.

*an.* Combination. Body: First half, yellow seal's fur; second half, red claret seal ribbed with silver tinsel (the fur to be picked out). Tail: A few fibers of gray mallard mixed with ibis. Legs: A natural red hackle dipped in yellow dye. Wings: A piece of the same kind of hackle with pale ibis strips. On each side a piece of gray mallard sufficiently large to make the wing full; black ostrich head. Hooks, Nos. 1, 2, and 3.

*ao.* Silver Doctor. Body: Silver tinsel ribbed with gold twist—Tail: China pheasant topping. Legs: A pale-blue hackle with a small teal or guinea-hen at the shoulder. Wings: Mixed fibers of wood-duck, brown mallard, guinea-hen, green parrot, blue macaw, teal, and bustard; black ostrich head. Hooks, Nos. 2 and 3.

*ap.* Prouty. Body: First joint, silver twist; second, black ostrich with three turns of the twist over it. Tail: Orange floss with a turn or two of twist, a topping mixed with fibers of English blue-jay. Legs: A yellow dyed list hackle wound over the ostrich. Wings: Strips of white swan, dyed yellow. One each side a rib of teal-feather, red macaw feelers; black ostrich head. Hooks, Nos. 2 and 3.

*aq.* Black Cricket.

*ar.* Grasshopper.

*as.* Great Blow.

*at.* Cadiz.

*au.* Murray. Black silk floss ribbed with silver twist. Tail: A small feather from the neck of the scarlet ibis. Legs: A golden yellow hackle. Wings: Dark mottled turkey; black ostrich head. Hooks, Nos. 1 and 2.

*av.* Round Lake.

*aw.* Nameless. Body: Brown ostrich herl, ribbed with gold twist, tag orange floss. Tail: Two or three short sprigs of yellow macaw. Legs: A small sooty orange hackle, wound from tag to shoulder. Wings: Alternate strips of brown peacock-wing feather and shoveler duck, with a sprig or two of wood-duck; peacock herl head. Hooks, Nos. 1, 2, and 3.

*ax.* Rackette. Is made in two joints of black orange mohair, with gold tinsel. Legs: A dyed black hackle wound from tail to head. Tail: Bright yellow toucan. Wings:

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

A mixture of gold pheasant tail, argus, and teal. Hooks Nos. 1, 2, and 3.

- ay.* Priest.
- az.* Francis Sykes.
- ba.* Duke.
- bb.* Dhoon.
- bc.* Dustin.
- bd.* Lascelles.
- be.* Snitching Sandy.
- bf.* Prouty.
- bg.* Grace.
- bh.* Powells.
- bi.* Hawthorne.
- bj.* Edmonson.
- bk.* Witcher.
- bl.* Carshalton.
- bm.* Professor. Body: Yellow mohair or silk floss, ribbed with silver twist or tinsel. Tail: Two or three strands of scarlet ibis wing-feathers. Wings: From the gray ibis.
- bn.* Coughton.
- bo.* Alder.
- bp.* Chantry.
- bq.* Kingdom.
- br.* Hoflan Fancy.
- bs.* Coachman. Body: Peacock's herl. Wings: From a white hen's wing-feather, or a pigeon wing-feather will answer the purpose. Legs: A red cock's hackle wound twice or thrice at the shoulder. For Pennsylvania, hooks Nos. 8 to 10; for New York, hooks Nos. 5 and 6; for New England, hooks Nos. 4 and 5.
- bt.* Willow.
- bu.* Prouty.
- bv.* Notion. Body: First half gold twist, remainder brown mohair, with three turns of the twist over it. Tail: A topping mixed with blue kingfisher. Legs: Brown hackle. Wings: Two tipped feathers mixed with argus pheasant, brown mallard, teal, China pheasant tail-feathers, blue and yellow macaw, with a blue kingfisher on each side of the wing; black ostrich head. Hooks, Nos. 2 and 3.
- bw.* Louise. Body: Brown mohair ribbed with gold twist. Tail: China feather topping. Legs: Reddish-brown hackle, blue-jay on shoulder. Wings: Pheasant tippet feather and tail mixed with sprigs of green parrot, blue macaw, and kingfisher. Head: Orange mohair. Hooks, Nos. 1 and 2.

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

*bx.* Round Lake. Body: Orange and red claret merging into each other, silver tinselled. Tail: Sprigs of gold pheasant tippet, blue macaw, and green parrakeet. Legs: A claret hackle with a turn or two of orange on the shoulder. Wings: Two strips of brown turkey, with a small jungle-cock's feather on each side. Hooks, Nos. 1, 2, and 3.

*by.* Nicholson.

*bz.* Our pattern.

*ca.* Saranac. Body: Claret floss silk ribbed with gold tinsel, backed with silver twist. Tail: China pheasant crest-feather. Legs: A claret hackle. Wings: Two China pheasant tippet feathers on each side, a strip or two of brown mallard and argus pheasant; black ostrich head. Hooks, Nos. 1-0, 2, and 3.

*cb.* Long Tom of Long Lake. Body: Gray squirrel mixed with a little green mohair ribbed with silver tinsel. Tail: China pheasant crest-feather. Legs: A blue dun cock's hackle; at shoulder two or three turns of bright claret hackle. Wings: Strips of brown mallard mixed with strands of summer duck, peacock-wing, and upper covers of the wild turkey, red macaw feelers; black plush head. Hooks, Nos. 1, 2, and 3.

*cc.* St. Regis. Body: Cinnamon mohair ribbed with double gold twist. Tail: A strip of China pheasant tippet mixed with a few strands of bustard. Legs: A chestnut hackle with three turns or so of orange-dyed guinea-hen, small and short in the fibers. Wings: Strips of brown mallard, brown turkey, English pheasant tail, and China tippet; black ostrich head. Hooks, Nos. 1 and 2.

*cd.* No. 8. Body: Three or four turns of mohair, rest of black mohair ribbed with silver tinsel and backed with gold twist. Tail: A small topping. Legs: A dyed black hackle and a shoulder of red claret. Wings: Mixed fibers of mallard, guinea-hen tail-feather over wing, two strips of dark turkey tipped with white. Hooks, Nos. 2 and 3.

*ce.* Highlander.

*cf.* Lady of Mertoun. Body: Water-rat's fur ribbed with silver twist. Tail: A tip of common ostrich or mohair and a gold pheasant topping. Legs: Two or three turns of a small red hackle finished off with a black hackle. Wings: Strips of dark-gray mallard. Head: Crimson ostrich or mohair. Hooks, Nos. 1-0, 1, and 2.

*cg.* Topy. Body: Black mohair ribbed with silver tinsel. Tail: A topping tip crimson. Legs: A turn or two of red



## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

- hackle, the rest black hackle. Wings: Black or brown turkey tipped with white. Head: Crimson. Hooks, Nos. 1-0, 1, and 2.
- ch.* Sapper. Body: Orange mohair ribbed with gold tinsel. Tail: Fibers of green parrot, guinea-hen, tippet feather, and ibis. Legs: Orange hackle, shoulder a dyed black hackle. Wings: Strips of peacock-wing feather, brown mallard, green parrot, guinea-hen, gold pheasant tail, blue macaw feelers; black ostrich head. Hooks, Nos. 1-0 and 1.
- ci.* Stephens. Body: Brick-colored silk, ribbed with gold twist and blue tip. Tail: Gold pheasant topping. Legs: Hackle, same color as body. Wings: Gold pheasant tippet and slight mixture of mallard; black ostrich head. Hooks, No. 1.
- cj.* Jock Scott. Body: In two joints, gold-colored floss the lowest and black floss the upper; from the joint are tied two short toucan points, and over the butts of them at the joints two turns of black ostrich. Tail: One gold pheasant topping and one Indian crow feather. Legs: Black hackle over the black joint and speckled guinea-hen at the shoulder. Wings: A white tip turkey slip, in the middle fibers of bustard, teal, brown mallard, yellow, red, and green parrot, one topping over all; blue macaw feelers. A kingfisher on either cheek; black ostrich head. Hooks, Nos. 1-0, 1, and 2.
- ck.* Whitcher. Body: Black mohair ribbed with silver, tip yellow silk. Tail: Gold pheasant topping. Legs: Black hackle. Wings: A mixture of mallard and hooded merganser; black ostrich head. Hooks, Nos. 1 and 2.
- cl.* Nicholson. Body: Blood-red mohair ribbed with gold tinsel. Tail: Sprigs of mallard and pheasant tippet feather. Legs: A blood-red and dark-blue hackle wound on together. Wings: Brown mallard and blue macaw feelers; black ostrich head. Hooks, Nos. 1 and 2.
- cm.* Caribou. Body: Tip gold tinsel, tag golden-yellow silk, next a black silk joint, the rest of gray caribou. Legs: Gray hackle with a claret on the shoulder. Tail: Gold pheasant topping. Wings: Turkey and mallard with sprigs of macaw and pheasant tippet feather; black ostrich head. Hooks, Nos. 1-0 and 1.
- cn.* Moose. Body: Yellow floss ribbed with silver tinsel. Tail: A China pheasant topping. Legs: A yellow hackle; shoulder hackle a guinea-hen. Wings: Two tippet feathers of the China pheasant with fibers of mallard

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

- wood duck on each side; black ostrich head. Hooks, Nos. 1, 2, and 3.
- co.* Moosehead. Body: Deep claret mohair ribbed with gold twist. Tail: A topping. Legs: A claret hackle, with three turns of orange hackle at the shoulder. Wings: Strips of brown mallard and tippet feather, with red macaw feelers; black ostrich head. Hooks, Nos. 1, 2, and 3.
- cp.* Fiery-brown. Body: Fiery brown mohair ribbed with gold tinsel. Tail: A small topping mixed with wood-duck. Legs: A brown-red hackle. Wings: Brown mallard, with a little wood-duck and golden pheasant neck-feather mixed; black head. Hooks, Nos. 1, 2, and 3.
- cq.* Parson. *cr.* Gold wing. *cs.* Gold Mallard. *ct.* Kireud-brightshire. *cu.* Eagle. *cv.* Tartan. *cw.* Last Fly. *cx.* Atkinson. *cy.* Strachan.
- cz.* Parson. Body: Black mohair tipped with orange and ribbed with silver twist. Tail: A small topping. Legs: A black hackle. Wings: Brown turkey-tail; black head. Hooks, Nos. 2 and 3.
- da.* Ross. Body: Cinnamon-colored floss ribbed with gold twist. Tail: Springs of green parrot. Legs: A furnace hackle. Wings: Brown mallard mixed with peacock herl; black ostrich head. Hooks, Nos. 1-0 and 1.
- db.* Forsyth. *dc.* Chamberlain. *dd.* Green. *de.* Whitcher. *df.* Langrin. *dg.* Emmet. *dh.* Captain. *di.* Major. *dj.* Darling. *dk.* Durham Ranger. *dl.* Goldfinch. *dm.* Britannia. *dn.* Popham. *do.* White Tip. *dp.* White Wing. *dq.* Drake Wing. *dr.* Dun Wing. *ds.* Black and Yellow. *dt.* Blue Doctor. *du.* Kate. *dv.* Ruggles.
- dw.* Little Yellow May Dun, with water-color sketch of original.
- dx.* Oak Fly, with water-color sketch of original. Body: Orange floss silk, ribbed with ash-colored silk thread or a little floss, the ash-color to be shown well at the tail and shoulders. Wings: From a scapular feather of the woodcock. Legs: A furnace hackle or cock's hackle, with a black list up the middle. For Pennsylvania, hooks Nos. 8 to 10; For New York, hooks Nos. 6 to 8; for New England, hooks Nos. 5 and 6.
- dy.* Black Gnat, with water-color sketch of original. Body: Black ostrich herl. Wings: From the quill-feather of the rice-bird or grackle. Legs: Black hackle. For Pennsylvania, hooks Nos. 10 to 12; for New York, hooks Nos. 8 to 10; for New England, hook No. 8.

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

- dz.* Fern Fly, with water-color sketch of original. Body: Orange floss silk. Wings: From the quill-feather of the summer-duck wing; the smaller-sized hooks can be dressed from the wing-feather of the blue-jay. Legs: a red cock's hackle. For Pennsylvania, hooks Nos. 8 to 10; for New York, hooks Nos. 6 to 8; For New England, hooks Nos. 5 and 6.
- ea.* Yellow Sally, with water-color sketch of original. Body: Any yellowish fur ribbed, with yellow or apple green-silk. Wings: From a wing-feather of a white hen or white pigeon stained pale yellow. Legs: A white cock's hackle, stained in the same dye. For Pennsylvania, hooks Nos. 6 to 8; for New York, hooks Nos. 5 and 6; for New England, hooks Nos. 4 and 5.
- eb.* Alder Fly, with water-color sketch of original. Body: Peacock's herl. Wings: From a feather of a brown hen's wing. Legs: A red cock's hackle or a black cock's hackle will answer tolerably well. For Pennsylvania, hooks Nos. 8 to 10; for New York, hooks Nos. 5 and 6; for New England, hooks Nos. 4 and 5.
- ec.* Sky Blue, with water-color sketch of original.
- ed.* Little dark Spinner, with water color sketch of original.
- ee.* Turkey Brown, with water-color sketch of original.
- ef.* Magalloway. Body: Half black ostrich and half brown mohair, ribbed with gold twist. Tail: Short fibers of yellow macaw. Legs: A furnace hackle of the shoulder. Wings: Strips of brown quill feathers of the peacock; black ostrich head. Hook, No. 3.
- eg.* Bemis stream. Body: Chestnut mohair ribbed with gold tinsel. Tail: China pheasant topping. Legs: A chestnut hackle. Wings: Strips of brown peacock mixed with bustard. Hooks, Nos. 1 and 2.
- eh.* Mooselocmaguntick. Body: About equal parts mixed of gray squirrel's fur and pea-green mohair ribbed with gold twist. Tail: Four strands of argus feathers. Legs: A brown bittern hackle. Wings: Gray speckled turkey, white tipped (dye yellow), with a strip of argus feather on each side; green ostrich head. Hook, No. 1.
- ei.* Molechunkemunk. Body: Orange floss silk ribbed with gold tinsel, backed with silver twist. Tail: China pheasant topping. Legs: A furnace hackle. Wings: Brown mallard; black ostrich head.
- ej.* Willow Finch. Body: Yellow seal's fur ribbed with silver twist. Tail: Sprigs of tippet feathers mixed with yellow macaw. Legs: A yellow hackle, at the shoulder a small



## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

- guinea-hen stained yellow. Wings: Strips of swan feather dyed yellow with a spray of guinea-hen (tail-feather) dyed yellow; black ostrich head. Hooks, Nos. 1, 2, and 3.
- ek.* Oquassac. Body: Red claret mohair ribbed with pink floss. Tail: Yellow tag with pieces of argus and tippet feathers. Legs: A claret hackle. Wings: Strips from the quill-feather of the argus pheasant; black ostrich head. Hooks, Nos. 1-0 and 1.
- el.* Welokennebago. Body: Red pig's hair ribbed with broad gold tinsel, backed with silver twist. Tail: A mixture of black turkey tipped with white and scarlet ibis. Legs: Scarlet hackle. Wings: Fibers of red macaw mixed with strips of black and brown turkey, tipped with white; black ostrich head.
- em.* Capsuptuc. Body: Silver tinsel ribbed with gold twist. Tail: Fibers of China pheasant tail mixed with guinea-hen and red macaw. Legs: A brilliant scarlet hackle. Wings: Mixed and to be made full. Two strips of brown turkey tipped with white-brown mallard; China pheasant tail and guinea-hen; black ostrich head. Hooks, Nos. 1-0, 1, and 2.
- en.* Orange Grouse. *eo.* Thunder and Lightning. *ep.* Lough Gill. *eq.* Lillie. *er.* Black Ant. *es.* Blue Blow. *et.* Mare. *eu.* Hare's Ear. *ev.* Ibis. *ew.* Seth Green. *ex.* Red Creeper. *ey.* Turkey Brown. *ez.* Queen of the Waters. *fa.* Governor. *fb.* White Miller. *fc.* Lion. *fd.* Waterwitch. *fe.* Atkinson. *ff.* Our Own Pattern.
- fg.* Green Drake, with water-color sketch of original. Body: Pale straw-colored floss silk ribbed with brown silk thread or floss; the extremities are of brown peacock's herl. Tail: Three rabbit's whiskers. Wings: Made from a mottled feather of mallard, stained a pale yellowish-green. Legs: A grizzled cock's hackle stained a yellowish-green in the same dye. For Pennsylvania, hooks Nos. 6 to 8; for New York, hooks Nos. 4 to 6; for New England, hooks Nos. 3 and 4.
- fh.* Gray Drake, with water-color sketch of original. Body: The middle part of white floss silk ribbed with silver twist; the extremities of brown peacock's herl. Tail: Three rabbit's whiskers. Wings: Made from a gray mottled feather of the mallard. Size of hooks same as green drake
- fi.* Orange Dun, with water-color sketch of original. This fly is equally attractive to trout, and is a prime favorite in



## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

its day—the end of June, July, and August. Body: Dark orange silk. Tail: Two fibers of brown mallard feather. Wings: From the quill-feather of the large red-crowned woodpecker. For Pennsylvania, hooks Nos. 6 to 8; for New York, hook No. 6; for New England, hooks Nos. 5 and 6.

- fj.* Green mackerel, with water-color sketch of original.
- fk.* Brown mackerel, with water-color sketch of original.
- fl.* Marlow Buzz, with water-color sketch of original.
- fm.* Pale evening Dun, with water-color sketch of original.
- fn.* July Dun, with water-color sketch of original. Body: Mole's fur and pale-yellow mohair mixed and spun on yellow silk. Tail: Two or three whiskers of a dark dun hackle. Wings: From the quill-feather of a bluejay. Legs: Dark dun hackle. For Pennsylvania, hooks Nos. 8 to 10; for New York, hooks Nos. 6 to 8; for New England, hooks Nos. 5 and 6.
- fo.* Gold-eyed gauge-wing, with water-color sketch of original.
- fp.* Butcher, No. 1. *fq.* Blue Ranger. *fr.* Black Ranger. *fs.* Colonel. *ft.* Children's Farlow. *fu.* Candlestick Maker. *fv.* Baker. *fw.* Butcher. *fx.* Namsen. *fy.* Black and Teal. *fz.* Guinea Hen. *ga.* Claret. *gb.* Inquichin. *gc.* Maxwell Ranger.
- gd.* August Dun, with water-color sketch of original. Body: Brown floss silk ribbed with yellow silk thread. Tail: Two rabbit's whiskers. Wings: Feather of a brown hen's wing. Legs: A dark red hackle. For Pennsylvania, hook No. 8; for New York, hook No. 6; for New England, hook No. 5.
- ge.* Orange, with water-color sketch of original. Body: Orange floss silk, ribbed with black silk. Wings: Dark part of the blue-jay's wing. Legs: A very dark furnace hackle. For Pennsylvania, hooks Nos. 8 to 10; for New York, hooks Nos. 6 to 8; for New England, hook No. 6.
- gf.* Cinnamon, with water-color sketch of original. Body: Fawn-colored floss silk, ribbed with red silk thread. Wings: Feather of a yellow-brown hen's wing. Legs: A ginger hackle. For Pennsylvania, hook No. 8; for New York, hook No. 6; for New England, hook No. 6.
- gg.* Blue-Bottle, with water-color sketch of original. Body: Bright blue floss silk, with a few turns of brown floss at the shoulder. Wings: From the quill-feather of a water-hen. Legs: Black hackle from a cock, wrapped down the principal part of the body. For Pennsylvania, hook No. 8; for New York, hook No. 6; for New England, hook No. 5.

## ARTIFICIAL FLIES FOR SALMON, TROUT, AND BASS—Continued.

- gh.* Whirling Blue Dun, with water-color sketch of original. Body: Squirrel's red-brown fur, mixed with yellow mohair. Tail: One or two whisks of a pale ginger hackle. Wings: From the quill-feather of a mallard. For Pennsylvania, hook No. 8; for New York, hook No. 8; for New England, hook No. 6.

## SALMON FLIES.

42867. Manufactured by Conroy, Bissett & Malleson, New York.  
U. S. Fish Commission.

- a.* Halifax. *b.* Curtis. *c.* Blue Sandy. *d.* Fairy. *e.* Unknown. *f.* Sapper. *g.* Silver Gray. *h.* Jock Scott. *i.* Claret Body. *j.* Fancy Yellow. *k.* Butcher. *l.* Popham. *m.* Silver Doctor. *n.* Red Blue. *o.* Fiery Brown. *p.* Claret Fairy. *q.* Unknown. *r.* Silver Doctor. *s.* Prouty. *t.* Jock Scott. *u.* Red Robin. *v.* Black Robin. *w.* Donkey. *x.* Dark Claret.

## LAKE FLIES.

42868. Manufactured by Conroy, Bissett & Malleson, New York.  
U. S. Fish Commission.

- a.* Blue Dun. *b.* Professor. *c.* Grizzly King. *d.* Scarlet Ibis. *e.* Golden Pheasant. *f.* Grizzly Hackle. *g.* Coachman. *h.* Black Moose. *i.* Jungle Cock. *j.* Brown Hackle. *k.* Cow Dun. *l.* Yellow Sally. *m.* Yellow Moose. *n.* Turkey. *o.* Saranac. *p.* Black Fly. *q.* White Miller. *r.* White Miller (fall wings). *s.* Cow Dun. *t.* Black Hackle. *u.* Silver Doctor. *v.* Fiery Yellow. *w.* March Brown. *x.* Abbey. *y.* Yellow Body Moth.

BASS FLIES, USED FOR THE BLACK BASS (*Micropterus pallidus*).

42869. Manufactured by Conroy, Bissett & Malleson. U. S. Fish Commission.

- a.* Scarlet Ibis. *b.* Black Fly. *c.* Mealy Mouth. *d.* Turkey Brown. *e.* Yellow Ferguson. *f.* Page. *g.* Holberton's Humble Bee. *h.* Cape Vincent. *i.* Holberton. *j.* Ferguson. *k.* White Miller. *l.* Yellow Bee. *m.* St. Lawrence. *n.* Grizzly King. *o.* Mallard. *p.* Scarlet Moth. *q.* Scarlet Moth, No. 2. *r.* Mallard.

## TROUT AND GRAYLING FLIES.

42871. Manufactured by Conroy, Bissett & Malleson, New York.  
U. S. Fish Commission.

- a.* Professor. *b.* Grizzly Hackle, or Palmer. *c.* Grey Drake. *d.* Yellow Sally. *e.* Black Gnat. *f.* Red Hackle, or

**TROUT AND GRAYLING FLIES—Continued.**

- Palmer. *g.* Scarlet Ibis. *h.* Brown Hackle, or Palmer.  
*i.* Grizzly King. *j.* Black Fly. *k.* Blue Blow. *l.* White  
 Miller. *m.* Olive Gnat. *n.* Green Body Black Fly.  
*o.* March Brown. *p.* Scarlet Body Black Fly. *q.* Great  
 Dun. *r.* Claret Gnat. *s.* Jungle Cock. *t.* Golden Spin-  
 ner. *u.* Cock-Y. *v.* Beaverkill. *w.* Grouse Hackle. *x.*  
 Abbey or Jew Fly. *y.* Yellow Jungle Cock. *z.* Ginger  
 Hackle. *aa.* Cow Dun. *ab.* Yellow May Fly or Green  
 Drake. *ac.* Coachman. *ad.* Canada. *ae.* Shoemaker.  
*af.* Red Spinner. *ag.* Blue Dun. *ah.* Queen of the  
 Water. *ai.* Black Hackles, or Palmer.
- ai.* Willow, with water-color sketch of original. Body: Mole's  
 fur mixed with a little fine yellow mohair. Wings:  
 From the quill-feather of a water-hen or coot. Legs:  
 A dark dun hen's hackle. For Pennsylvania, hooks Nos.  
 8 to 10; for New York, hook No. 8; for New England,  
 hooks Nos. 5 and 6.
- aj.* Snowy. *ak.* Beauty Snow.
- al.* Red Palmer, with water-color sketch of original. Body:  
 Red mohair ribbed, with gold twist or tinsel. Legs: A  
 blood-red cock's (saddle) hackle wrapped nicely over it,  
 working the hackle closely together at the shoulder.  
 For Pennsylvania, hooks Nos. 6, 8, and 10; for New  
 York, hooks Nos. 4, 5, and 6; for New England, hooks  
 Nos. 3, 4, and 5.
- am.* Black and Red Palmer, with water-color sketch of original.
- an.* Brown Palmer, with water-color sketch of original.
- ao.* Furnace. *ap.* Grizzle. *aq.* Ginger. *ar.* List. *as.* Soldier.  
*at.* White. *au.* Grizzle Peacock. *av.* Red. *aw.* Black  
 Peacock. *ax.* Black. *ay.* Brown Peacock. *az.* Scarlet.

*Fly-books.*

**HOLT PATENT FLY-BOOKS (two).**

One with cover, one without. Manufactured by Abbey & Imbrie.  
 39,248. U. S. Fish Commission.

**PERFECTION EXPANDING POCKET TACKLE-BOOK.**

39,249. U. S. Fish Commission.

**FLY-BOOKS.**

Containing salmon, black bass, shad, grayling, and trout flies.  
 Manufactured by Abbey & Imbrie, New York. 39,254. U. S.  
 Fish Commission.

**SALMON FLY-BOOK.**

For carrying artificial flies. 25,548.

**TROUT FLY-BOOK.**

For carrying artificial flies. 25,547. Lent by Bradford & Anthony, Boston, Mass.

**HOLBERTON FLY-BOOK.**

For salmon flies. 39,208. U. S. Fish Commission. (C., B. & M.)

**HOLBERTON FULL-LENGTH FLY-BOOK.**

Capacity, 8 dozen flies. 39,209. U. S. Fish Commission. (C., B. & M.)

**HOLBERTON FULL-LENGTH FLY-BOOK.**

Capacity, 6 dozen flies. 39,210. U. S. Fish Commission. (C., B. & M.)

**HOLBERTON FULL-LENGTH FLY-BOOK.**

Capacity, 3 dozen flies. 39,211. U. S. Fish Commission. (C., B. & M.) All the Holberton fly-books mentioned above are intended to hold gut at full length, and are furnished with the improved "Hyde clips" for keeping the flies in place.

**SNELL BOOK.**

With changeable pockets. 39,212. U. S. Fish Commission. (C., B. & M.) This snell-book is of new style, and is very convenient for carrying a variety of flies.

**SOUTHSIDE FLY-BOOK.**

With Abbey & Imbrie's patent clip for holding flies at full length.  $7\frac{3}{4}$  inches long. 39,247. U. S. Fish Commission. (A. & I.)

**IMITATION SOUTHSIDE FLY-BOOK.**

Eight inches long. 39,316. U. S. Fish Commission. (A. & I.)

**IMITATION SOUTHSIDE FLY-BOOK.**

Six inches long. 39,317. U. S. Fish Commission. (A. & I.)

The following fly-books were exhibited by Wakeman Holberton, of New York City, and entered for competition :

**FULL-LENGTH HOLBERTON FLY-BOOKS.**

- No.  $\frac{2}{6}$ . Finest alligator-skin cover; capacity, 6 dozen trout flies.
- No.  $\frac{0}{1}$ . Russia cover; capacity, 3 dozen salmon or bass flies.
- No. 1. Russia cover; capacity, 1 gross trout flies. No. 2. Russia cover; capacity, 8 dozen trout flies. No. 3. Leather cover; capacity, 6 dozen trout flies. No. 4. Leather cover; capacity, 3 dozen trout flies. No. 5. Muslin cover; capacity, 3 dozen trout flies.



## FULL-LENGTH HOLBERTON FLY-BOOKS—Continued.

*Advantages claimed for these books.*—"Flies are kept separate, straight, and at full length, so that the angler, when fishing, can attach them at once to the leader. No woolen leaves to attract moths. The finer qualities have a heavy blotting-paper leaf for drying the flies, and all have pockets between each leaf. These books have a greater capacity and are much less bulky than the old ones. The clips are of spring brass and silver plated, and will not tear out or come loose with ordinary use. These books were invented by W. Holberton, and are now universally used, and have been copied by all dealers."—(*Holberton.*)

## HOLT PATENT FLY-BOOKS.

Leaves of morocco, with hooks and elastics to hold flies at full length. One with cover and one without. U. S. Fish Commission. (A. & I.) 39,215; 39,248.

## SOUTHSIDE FLY-BOOK.

Leaves of American artificial parchment, with patent clips for holding flies at full length. Woolen pads for drying. U. S. Fish Commission. (A. & I.) 39,247.

## IMITATION SOUTHSIDE FLY-BOOK.

Leaves of artificial parchment, with clip for holding flies at full length. Woolen drying pads. Length, 6 inches. U. S. Fish Commission. (A. & I.) 39,317.

## IMITATION SOUTHSIDE FLY-BOOK.

Leaves of artificial parchment, with clips for holding flies at full length. Woolen drying pads. Length, 8 inches. U. S. Fish Commission. (A. & I.) 39,316.

## FLY-BOOKS WITH FLIES.

These books contain an assortment of salmon, black-bass, shad, grayling, and trout flies. U. S. Fish Commission. (A. & I.) 39,254.

## TACKLE-BOOK.

"Perfection expanding" pockets, with imitation alligator-leather covers. U. S. Fish Commission. (A. & I.) 39,249.

## FISHING LINES AND SNOODS.

## SILK LINES.

## FISHING LINES.

Raw silk, braided, oiled. Assorted sizes, C to G. Length, 50 yards each. Centennial collection, 1876. 25,632. Made by G. H. Mansfield & Co., Canton, Mass. For anglers' use.

## FISHING LINES.

Raw silk, braided. Assorted sizes, C to G. Length, 50 yards each. Centennial collection, 1876. 25,633. Made by G. H. Mansfield & Co., Canton, Mass. For anglers' use.

## FISHING LINE.

Silk, oiled. Length, 100 yards. Value, 1880, \$2. 42,777. U. S. Fish Commission. (C., B. & M.) Used by anglers in fishing for trout.

## FISHING LINE.

Silk, oiled. Length, 100 yards. Value, 1880, \$4. 42,767. U. S. Fish Commission. (C., B. & M.) Used by anglers in fishing for black bass.

## FISHING LINE.

Silk, tapered, water-proof. (C.) Length, 50 yards. Value, 1883, \$5. 57,589. U. S. Fish Commission. (C. & B.) Used by anglers for trout-fishing.

## FISHING LINES.

Silk, waterproofed. Two sizes. Length, 30 and 50 yards each. Value, 1880, \$2.40 and \$4. 42,775 and 42,776. U. S. Fish Commission. The long line is for black bass, the short one for trout-fishing.

## FISHING LINE.

Silk, braided, tapered. (B.) Length, 50 yards. Value, 1883, \$5. 57,588. U. S. Fish Commission. (C. & B.) Used by anglers in fishing for grilse.

## FISHING LINE.

Silk, braided, water-proof. (E.) Length, 100 yards. Value, 1880, \$10. 42,774. U. S. Fish Commission. (C., B. & M.) Used by anglers in fishing for grilse.

## FISHING LINES.

Silk, water-proof, braided and tapered. Assorted sizes and lengths. Value, 1880, \$2 to \$4 each. 39,250 to 39,253. U. S. Fish Commission. Used by anglers in fresh-water fishing.

## FISHING LINE.

Silk, braided, tapered, water-proof. (No. 10.) Length, 120 yards. Value, 1880, \$12. 42,766. U. S. Fish Commission. (C. B. & M.) Used by anglers in fishing for salmon with light rods.

## FISHING LINES.

Silk, braided. Assorted grades and sizes for anglers' use. Length, 50 yards each. 25,628; 25,629; 42,765; 42,769; 42,778; 42,779.

## FISHING LINES—Continued.

Value, 1880, \$1.25 to \$2 each. G. H. Mansfield & Co. and U. S. Fish Commission.

## FISHING LINES.

Silk, braided. Assorted sizes, C and G. Length, 50 yards each. Centennial collection, 1876. 25,630. Made by G. H. Mansfield & Co., Canton, Mass. For anglers' use.

## FISHING LINES.

Silk, braided, water-proof. Assorted sizes and lengths. Centennial collection, 1876. 25,627. Made by G. H. Mansfield & Co., Canton, Mass. For anglers' use.

The following silk lines were exhibited by William Mills & Son, of New York City, and entered for competition :

Salmon lines : Standard tapered silk (B and C), 120 yards each.

Fly lines : Standard level silk (E, F, and G), 100 yards each.

Braid-silk lines : Standard (C, D, E, F, G, and H), 50 yards each.

Fly lines : Standard tapered silk (F), each 30 and 50 yards.

Fly lines : Standard tapered (E), each 25 and 40 yards.

Silk leaders : Single, double, and twisted, Nos. 1 to 8 ; 3 feet, 6 feet, and 9 feet.

## WATER-PROOF FLY-LINE.

Exhibited by A. B. Shipley & Sons, of Philadelphia, Pa.

## LINEN LINES.

## FISHING LINE.

Linen, shroud-laid, blue and red. (No. 0.) One dozen lines, 18 feet each. Value, 1882, \$0.40 per dozen. 54,386. U. S. Fish Commission. Used for snoods or snapper lines on mackerel hand-lines.

## FISHING LINE.

Linen, shroud-laid, blue and yellow. (No. 1.) One dozen lines, 18 feet each. Value, 1882, \$0.40 per dozen. 54,387. U. S. Fish Commission. Used for snoods or snapper-lines on mackerel hand-lines.

## FISHING LINE.

Linen, shroud-laid, blue and red. (No. 2.) One dozen lines, 18 feet each. Value, 1882, \$0.60 per dozen. 54,388. U. S. Fish Commission. Used for snoods or snapper-lines on mackerel hand-lines.

## FISHING LINE.

Linen, white, shroud-laid. (Small.) Length, 25 fathoms. Value, 1882, \$2.40 per 300 fathoms. 54,355. Made by M. B. Jackman & Co., Newburyport, Mass. Used for snoods, 3 feet long, on pollock hand-lines.

## FISHING LINE.

Linen, white, shroud-laid. (Large.) Length, 25 fathoms. Value, 1882, \$3.60 per 300 fathoms. 54,357. Made by M. B. Jackman & Co., Newburyport, Mass. Used for snoods, 6 feet long, on George's cod hand-lines.

## FISHING LINE.

Linen, shroud-laid. Length, 600 feet. Centennial collection, 1876. 25,637. Bradford & Anthony, Boston, Mass. Used by anglers in fishing for bass.

## FISHING LINES.

Linen, braided. (Letters B, C, and D.) Length, 50 yards each. Centennial collection, 1876. 25,631. Made by G. H. Mansfield & Co., Canton, Mass. Used by anglers in fresh-water fishing.

## FISHING LINES.

Linen, braided. (Letters E, F, and G.) Length, 50 yards each. Centennial collection, 1876. 25,631 (*a*). Made by G. H. Mansfield & Co., Canton, Mass. Used by anglers in fresh-water fishing.

## FISHING LINES.

Linen, hard braid. (Nos. 1 to 5.) Length, 50 yards each. Centennial collection, 1876. 25,626. Made by G. H. Mansfield & Co., Canton, Mass. Used by anglers in fishing for trout.

## FISHING LINES.

Linen. Assorted colors, grades, and lengths. Centennial collection, 1876. 25,613. Made by J. & S. Allen, Walpole, Mass. Used in pond and brook fishing.

## FISHING LINES.

Linen. Assorted colors, grades, and lengths. Centennial collection, 1876. 25,612. Made by J. & S. Allen, Walpole, Mass. Used in blackfish and pond fisheries.

## CUTTYHUNK BASS LINE.

Hand-made, of the best Irish flax. Length, 200 yards. Value, 1882, \$1.25. 57,676. U. S. Fish Commission. (C., B. & M.)



## FISHING LINES.

Irish flax, special extra quality (9-thread and 12-thread). Length, 200 yards each. Value, 1880, \$2.50 and \$3. 42,768 and 42,764. U. S. Fish Commission. This is a favorite line for striped-bass fishing.

## FISHING LINES.

Braided linen lines. (B, C, D, E, F, G.) Exhibited by William Mills and Son, of New York City

## FISHING LINES.

Linen, braided. B. Length, 50 yards. Value, 1880, \$0.75 42,781. U. S. Fish Commission. (C. B. & M.)

## COTTON LINES.

## FISHING LINES.

Cotton, shroud-laid. Series of sizes from 00 to 12, in 20-foot hanks. Centennial collection, 1876. 25,619. Made by L. Crandall & Co., Ashaway, R. I. Used in sea-fisheries of Southern New England, New York, and Southern States.

## FISHING LINES.

Cotton, white, hawser-laid. Seven lines. (Nos. 1 to 7.) Length, 28 fathoms each. Centennial collection, 1876. 25,621. Made by L. Crandall & Co., Ashaway, R. I. Used in sea-fisheries of New York and New Jersey; No. 1 for mackerel hand-lines, other numbers for sea-bass, bluefish, and blackfish hand-lines.

## FISHING LINES.

Cotton, white, shroud-laid. Six lines. (Nos. 2 to 7.) Length, 50 feet each. Centennial collection, 1876. 25,620. Made by L. Crandall & Co., Ashaway, R. I. Used for hand-lines and trawl-lines in sea-fisheries of New York and New Jersey.

## FISHING LINE.

White cotton, shroud-laid; one ball, No. 1. Value, 1882, \$0.30 per pound. 57,675. U. S. Fish Commission. (C., B. & M.) Used by fishermen of New Jersey and Southern States for lay-out or trotlines.

## FISHING LINE.

White cotton, shroud-laid; one ball, No. 2. Value, 1882, \$0.30 per pound. U. S. Fish Commission. (C. B. & M.) 57,675 (a). Used by fishermen of New Jersey and Southern States for lay-out or trot lines.

## FISHING LINE.

White cotton, shroud-laid; one ball, No. 3. Value, 1882, \$0.30 per pound. U. S. Fish Commission. (C. B. & M.) 57,675 (b).

## FISHING LINE—Continued.

Used by fishermen of New Jersey and Southern States for layout or trot lines.

## FISHING LINE.

Cotton, blue, shroud-laid. (No. 4.) One line, 25 fathoms. Value, 1882, \$3 per dozen. 54,351. Made by M. B. Jackman & Co., Newburyport, Mass. Used for snoods, 3 feet long, on pollock hand-lines.

## FISHING LINE.

Cotton, blue, shroud-laid. (No. 5.) Length, 25 fathoms. Value, 1882, \$3.60 per dozen. 54,352. Made by M. B. Jackman & Co., Newburyport, Mass. Used for snoods, 3 feet long, on pollock hand-lines.

## FISHING LINES.

Cotton, white and oiled, cable-laid and shroud-laid. Assorted sizes. (Nos. 5 to 9.) Centennial collection, 1876. 26,733 to 26,735; 26,739 to 26,744. Made by J. W. Dresser, Castine, Me. Used for mackerel hand-lines. One of the lines is rigged on a cleat and ready for use.

## FISHING LINE.

Cotton, blue, shroud-laid. (No. 6.) Length, 25 fathoms. Value, 1882, \$4 per dozen. 54,353. Made by M. B. Jackman & Co., Newburyport, Mass. Used for pollock hand-lines, 25 to 75 fathoms long.

## FISHING LINES.

Cotton, white. (Superior, No. 6.) One dozen lines, 14 fathoms each. Value, 1882, \$1.10 per dozen. 54,395. Made by M. B. Jackman & Co., Newburyport, Mass. Used for mackerel hand-lines, 7 fathoms long.

## FISHING LINES.

Cotton, shroud-laid, steam-tarred. (No. 6.) One dozen lines, 14 fathoms each. Value, 1882, \$1.25 per dozen. 54,389. Made by M. B. Jackman & Co., Newburyport, Mass. Used for mackerel hand-lines, 7 fathoms long.

## FISHING LINES.

Sea Island cotton, white. (No. 6.) One dozen lines, 14 fathoms each. Value, 1882, \$1.25 per dozen. 54,392. U. S. Fish Commission. (M. B. J. & Co.) Used in 7-fathom lengths for mackerel hand-lines.

## FISHING LINES.

Sea Island cotton, white. (No. 7.) One dozen lines, 14 fathoms each. Value, 1882, \$1.35 per dozen. 54,393. U. S. Fish Commission. (M. B. J. & Co.) Used in 7-fathom lengths for mackerel hand-lines.

## FISHING LINES.

Cotton, shroud-laid, steam-tarred. (No. 7.) One dozen lines, 14 fathoms each. Value, 1882, \$1.35 per dozen. 54,390. Made by M. B. Jackman & Co., Newburyport, Mass. Used for mackerel hand-lines, 7 fathoms long.

## FISHING LINES.

Sea Island cotton, white. (No. 8.) One dozen lines, 14 fathoms each. Value, 1882, \$1.50 per dozen. 54,394. U. S. Fish Commission. (M. B. J. & Co.) Used in 7-fathom lengths for mackerel hand-lines.

## FISHING LINES.

Cotton, shroud-laid, steam-tarred. (No. 8.) One dozen lines, 14 fathoms each. Value, 1882, \$1.50 per dozen. 54,391. Made by M. B. Jackman & Co., Newburyport, Mass. Used for mackerel hand-lines, 7 fathoms long.

## FISHING LINES.

Cotton, white, hawser-laid. Five lines. (Nos. 8 to 12.) Length, 14 fathoms each. Centennial collection, 1876. 25,622. Made by L. Crandall & Co., Ashaway, R. I. Used on the coasts of New York and New Jersey for hand-lines, in sea fisheries.

## FISHING LINES.

Cotton, shroud-laid, tarred. Two lines. (Nos. 10 and 12.) Length, 25 fathoms each. Centennial collection, 1876. 25,624. Made by L. Crandall & Co., Ashaway, R. I. Used on southern coast of New England for hand-lines in general fisheries for cod, &c.

## FISHING LINES.

Cotton, white, shroud-laid. Four lines. (Nos. 10 to 13.) Length, 50 feet each. Centennial collection, 1876. 25,623. Made by L. Crandall & Co., Ashaway, R. I. Used for hand-lines in sea-fisheries on southern coast of New England.

## FISHING LINE.

Cotton, white, shroud-laid. (24-thread.) Length, 50 fathoms. Weight, 24 ounces. Value, 1882, \$0.35 per pound. 54,372. Made by H. & G. W. Lord, Boston, Mass. Generally tarred by the fishermen for haddock trawl-gangings.

## FISHING LINE.

Cotton, white, shroud-laid. (27-thread.) Length, 50 fathoms. Weight, 30 ounces. Value, 1882, \$0.35 per pound. 54,350. Made by H. & G. W. Lord, Boston, Mass. Used for haddock trawl-gangings, 27 inches long, and for knitting mackerel dip-nets.

## FISHING LINE.

Cotton, shroud-laid, tanned. (30-thread). Length, 25 fathoms. Weight, 9 ounces. Value, 1882, \$0.38 per pound. 54,349. Made by M. B. Jackman & Co., Newburyport, Mass. Used for cod trawl-gangings 3 feet long, and haddock trawl-gangings 27 inches long.

## FISHING LINES.

Cotton, white, shroud-laid. Centennial collection, 1876. 25,636. Bradford & Anthony, Boston, Mass.

## FISHING-LINES.

Cotton, braided; assorted sizes. Centennial collection, 1876. 25,625. Made by G. H. Mansfield & Co., Canton, Mass. For anglers' use in sea-fisheries.

## FISHING-LINE.

Cotton, shroud-laid, steam-tarred. (4-pound.) Length, 25 fathoms. Weight, 4 pounds to dozen lines. Value, 1882, \$1.25 per dozen. 54,358. Made by M. B. Jackman & Co., Newburyport, Mass. Used for haddock trawl-gangings, 27 inches long.

## FISHING-LINE.

Cotton, white, shroud-laid. (4-pound.) Length, 25 fathoms. Weight, 4 pounds to dozen lines. Value, 1882, \$1.30 per dozen. 54,373. Made by M. B. Jackman & Co., Newburyport, Mass. Generally tarred by the fishermen for haddock trawl-gangings, 27 inches long.

## FISHING-LINE.

Cotton, white, shroud-laid. (5-pound.) Length, 50 fathoms. Weight, 5 pounds to 300 fathoms. Value, 1882, \$3.20 per 300 fathoms. 54,374. Made by M. B. Jackman & Co., Newburyport, Mass. Used for cod trawl-gangings, 3 feet long.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (5-pound.) Length, 25 fathoms. Weight, 5 pounds to dozen lines. Value, 1882, \$1.40 per dozen. 54,359. Made by M. B. Jackman & Co., Newburyport, Mass. Used for cod trawl-gangings, 3 feet long; and haddock trawl-gangings, 27 inches long.



## FISHING LINE.

Cotton, white, shroud-laid. (6-pound.) Length, 25 fathoms. Weight, 6 pounds to 300 fathoms. Value, 1882, \$1.80 per 300 fathoms. 54,375. Made by M. B. Jackman & Co., Newburyport, Mass. Used for cod trawl-gangings, 3 feet long; and shore cod hand-lines, 25 to 50 fathoms long.

## FISHING LINE.

Cotton, shroud-laid, hard, steam-tarred. (6-pound.) Length, 25 fathoms. Weight, 6 pounds to dozen lines. Value, 1882, \$1.60 per dozen. 54,407. Made by M. B. Jackman & Co., Newburyport, Mass. Used for shore cod or pollock hand-lines.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (6-pound.) Length, 25 fathoms. Weight, 6 pounds to dozen lines. Value, 1882, \$1.60 per dozen. 54,360. Made by M. B. Jackman & Co., Newburyport, Mass. Used for shore cod trawl-gangings, 3 feet long.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (8-pound.) Length, 25 fathoms. Weight, 8 pounds to dozen lines. Value, 1882, \$2 per dozen. 54,361. Made by M. B. Jackman & Co., Newburyport, Mass. Used for shore cod hand-lines, 25 to 75 fathoms long.

## FISHING LINE.

Cotton, white, shroud-laid. (9-pound.) Length, 25 fathoms. Weight, 9 pounds to dozen lines. Value, 1882, \$2.20 per dozen. 54,376. Made by M. B. Jackman & Co., Newburyport, Mass. Used for shore cod or pollock hand-lines, 25 to 75 fathoms long.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (10-pound.) Length, 25 fathoms. Weight, 12 pounds to dozen lines. Value, 1882, \$2.40 per dozen. 54,362. Made by M. B. Jackman & Co., Newburyport, Mass. Little sold now, but formerly used for shore cod hand-lines, 25 to 75 fathoms long; halibut trawl-gangings, 5 feet long; and haddock trawl ground-lines, 1 to 3 miles long in sections or "tubs" of 1,750 feet.

## FISHING LINE.

Cotton, white, shroud-laid. (12-pound.) Length, 25 fathoms. Weight, 12 pounds to dozen lines. Value, 1882, \$2.50 per dozen. 54,377. Made by M. B. Jackman & Co., Newburyport, Mass. Used for shore cod hand-lines, 25 to 75 fathoms long. Tarred by fishermen for shore cod trawl ground-lines, 500 to 2,000 fathoms long, in "tubs" of 250 fathoms.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (12-pound.) Length, 25 fathoms. Weight, 12 pounds to dozen lines. Value, 1882, \$2.80 per dozen. 54,363. Made by M. B. Jackman & Co., Newburyport, Mass. Used for bank dory cod hand-lines, 25 to 75 fathoms long.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (14-pound.) Length, 25 fathoms. Weight 14 pounds to dozen lines. Value, 1882, \$3.15 per dozen. 54,364. Made by M. B. Jackman & Co., Newburyport, Mass. Used for halibut trawl-gangings, 5 feet long; and haddock trawl ground-lines, in "tubs" of 1,750 feet.

## FISHING LINE.

Cotton, white, shroud-laid. (15-pound.) Length, 25 fathoms. Weight, 15 pounds to dozen lines. Value, 1882, \$3 per dozen. 54,378. Made by M. B. Jackman, & Co., Newburyport, Mass. Used for shore cod and haddock trawl ground-lines, in "tubs" of 250 fathoms each; also for shore or bank cod hand-lines, 25 to 75 fathoms long.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (16-pound.) Hard-laid and heavily tarred. Length, 25 fathoms. Weight, 16 pounds to dozen lines. Value, 1882, \$3.50 per dozen. 54,365. Made by M. B. Jackman & Co., Newburyport, Mass. Used especially for George's cod hand-lines, 150 fathoms long.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (16-pound.) Length, 25 fathoms. Weight, 16 pounds to dozen lines. Value, 1882, \$3.50 per dozen. 54,366. Made by M. B. Jackman, & Co., Newburyport, Mass. Used for haddock trawl ground-lines, 1 to 3 miles long, in "tubs" of 1,750 feet; and halibut trawl-gangings, 5 feet long.

## FISHING LINE.

Cotton, white, shroud-laid. (18-pound.) Length, 25 fathoms. Weight, 18 pounds to dozen lines. Value, 1882, \$3.85 per dozen. 54,379. Made by M. B. Jackman & Co., Newburyport, Mass. Used for bank cod trawl ground-lines, 1,000 to 2,000 fathoms long, in "tubs" of 250 to 500 fathoms.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (18-pound.) Length, 25 fathoms. Weight, 18 pounds to dozen lines. Value, 1882, \$3.75

## FISHING LINE—Continued.

per dozen. 54,367. Made by M. B. Jackman & Co., Newburyport, Mass. Used for cod trawl ground-lines, 1,000 to 2,000 fathoms long, in "tubs" of 250 to 500 fathoms; and haddock trawl ground-lines, 1 to 3 miles long, in "tubs" of 1,750 feet.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (20-pound.) Length, 25 fathoms. Weight, 20 pounds to dozen lines. Value, 1882, \$4.20 per dozen. 54,368. Made by M. B. Jackman & Co., Newbury-Mass. Used for cod trawl ground-lines, 1,000 to 2,000 fathoms long, in "tubs" of 250 to 500 fathoms.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (24-pound.) Length, 25 fathoms. Weight, 24 pounds to dozen lines. Value, 1882, \$4.75 per dozen. 54,369. Made by M. B. Jackman & Co., Newburyport, Mass. Used in shoal water, less than 100 fathoms, for halibut trawl ground-lines, 1,500 fathoms long, in "skates" of 375 fathoms.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (28-pound.) Length, 25 fathoms. Weight, 28 pounds to dozen lines. Value, 1882, \$5.25 per dozen. 54,370. Made by M. B. Jackman & Co., Newburyport, Mass. Used in shoal water, less than 100 fathoms, for halibut trawl ground-lines, 1,500 fathoms long, in "skates" of 375 fathoms.

## FISHING LINE.

Cotton, shroud-laid, steam-tarred. (32-pound.) Length, 50 fathoms. Weight, 32 pounds to 300 fathoms. Value, 1882, \$6.40 per 300 fathoms. 54,371. Made by M. B. Jackman & Co., Newburyport, Mass. The most common line at Gloucester for halibut trawl ground-lines, 1,500 fathoms long, in "skates" of 375 fathoms. Used in water from 100 to 300 fathoms deep.

## FISHING LINES.

Exhibit of fishing-lines manufactured by Castine Cordage Company, Castine, Me., including cotton fishing-lines used in the capture of cod and mackerel, several grades of hand-lines and trawl-lines. J. W. Dresser, Castine, Me., president.

## HEMP LINES.

## FISHING LINE.

Hemp. (6-thread.) Length, 25 fathoms. Value, 1882, \$3 per dozen. 54,404. U. S. Fish Commission. Used in 3-foot lengths for cod trawl-gangings.

## FISHING LINE.

Hemp. (9-thread.) Length 25 fathoms. Value, 1882, \$3.25 per dozen. 54,405. U. S. Fish Commission. Used in 3-foot lengths for cod trawl-gangings.

## FISHING LINE.

Hemp. (12-thread.) Length, 25 fathoms. Value, 1882, \$4 per dozen. 54,406. U. S. Fish Commission. Used for cod hand-lines and in 3-foot lengths for cod trawl-gangings.

## FISHING LINE.

Hemp. (18-thread.) Length, 25 fathoms. Value, 1882, \$6 per dozen. 54,356. U. S. Fish Commission. Used for hook-gangings, 10 inches long, on George's cod hand-lines.

## HEMP SALMON TWINE.

One ball; weight, 2 pounds. Value, 1882, \$0.55 per pound. 54,380. U. S. Fish Commission. Used for serving spreaders and horses, and seizing swivels on hand-lines; for seizings on trawl-buoys, and other uses.

## SAIL-TWINE.

Hemp, one skein. Value, 1882, \$0.15 per skein. 54,400. U. S. Fish Commission. Used for seizing halibut trawl-hooks on the gangings, for mending sails, rigging hand-line gear, and other general uses.

## FISHING-LINE.

Hemp, two-strand. One hundred lengths, 3 feet each. Value, 1882, \$0.50 per 100. 54,354. U. S. Fish Commission. Used for shore cod hand-line gangings, and for shore trawl-gangings.

## MANILA LINES.

## BUOY-LINE.

Manila, tarred, six-thread, one coil; weight, 20 pounds. Value, 1882, \$0.17½ per pound. U. S. Fish Commission (S. D. & Co.). 54,409. Used for buoy-lines on cod, haddock, and halibut trawls.

## BUOY-LINE.

Manila, six-thread, one coil; weight, 26½ pounds. Value, 1882, \$0.17½ per pound. U. S. Fish Commission (S. D. & Co.). 54,411. Commonly used for buoy-lines on cod, haddock, and halibut trawls.

## BUOY-LINE.

Manila, nine-thread, one coil; weight, 42 pounds. Value, 1882, \$0.17½ per pound. U. S. Fish Commission (S. D. & Co.).



## BUOY-LINE—Continued.

54,410. Used for buoy-lines on halibut trawls, for warps to lobster traps, and for boat-anchor warps.

## LOBSTER-TWINE.

Manila lobster-twine. One ball,  $4\frac{3}{4}$  pounds. Value, 1882, 24 cents per pound. 54,399. U. S. Fish Commission. For lobster trap-heads; for halibut trawl-beckets to fasten gangings to ground-line; for seizings, etc.

## ROOT AND BARK LINES.

## TOW-LINE.

Small tow-line. Makah name "Les-tope." Made of fibers of spruce roots; used by natives for towing the whale ashore. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,633. James G. Swan.

## TOW-LINE.

Small size; Indian name "Les-tope." Made of spruce roots (*Abies Douglasii*). The process of manufacture consists in (1) roasting the material in hot ashes; (2) splitting with knives into fine fibers, and (3) twisting the fibers into a rope. Durable and strong. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,631. James G. Swan. Used by natives in towing whales ashore.

## TOW-LINE.

New, large size. Made of fibers of spruce roots (*Abies Douglasii*). The long slender roots are first roasted in the ashes, then split into fine strands with knives, twisted, and laid up into ropes by hand. These ropes are beautifully made, exceedingly strong and buoyant. The Indians not only understand the art of rope-making by hand as well as the whites, but they can also "knot" and "graft" a rope as well as white sailors. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,632. James G. Swan. Used by natives for towing whales ashore.

## BARK.

Inner bark of white cypress (*Cupressus nuyatensis*), from which the twine used in whaling, as well as soft beds for infants, is manufactured. Small package; length, 5 inches. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,641. James G. Swan. When a harpoon with one buoy attached has been darted into a whale, another buoy is immediately attached to the lanyard of the first, the operation being repeated until a sufficient number of buoys have been *bent on*. It is often necessary to detach some of the buoys to make them fast to others. The

## BARK—Continued.

twine made from cypress bark is well adapted for this purpose, as it breaks easily when wet, and quickly releases the buoys, which would not be the case with other kinds of twine.

## GRASS LINES.

## FISHING LINES.

Grass, relaid. Assorted sizes. Centennial collection, 1876. 25,635. Bradford & Anthony, Boston, Mass. Used chiefly by anglers in Western States.

## FISHING LINES.

Grass, cable-laid and shroud-laid. (Nos. 0, 1, and 3.) Centennial collection, 1876. 25,634. Bradford & Anthony, Boston, Mass. Used chiefly by anglers in Western States.

## GUT LINES.

[See also gut leaders, snoods, and traces attached to fish-hooks.]

## SPANISH SILK-WORM GUT.

For salmon, trout, and bass leaders. 42,829 to 42,835.

## GUT LEADERS.

Single, double, and twisted leaders; 3, 6, and 9 feet long. For salmon, trout, and bass fishing. William Mills & Son. 56,995 to 57,001.

## GUT LEADERS.

Single, double, and twisted leaders; 3, 6, and 9 feet long. For salmon, trout, and bass fishing. U. S. Fish Commission. (C., B. & M.) 42,872.

## GUT LINES.

Samples of Foster's transparent gimp gut. Exhibited by C. Recht, New York City.

## HIDE LINES.

## FLOAT-LINE.

Line made of walrus-hide, used in the capture of walrus and whales, for attaching buoys. Sledge Island, Alaska, 1880. 45,403. Collected by E. W. Nelson.

## FLOAT-LINE.

A line made of seal-skin, used by natives when capturing the beluga, for bending on buoys. Cape Darby, Alaska. 48,106. Collected by E. W. Nelson.

## LINE (Puh-noch-pak).

Made of braided sinew, decorated with tufts of red and blue worsted and long seal hair. Has an eye in one end, the other end being

## LINE—Continued.

double. Is attached to seal spear. Length, 80 feet. Bristol Bay, Alaska, 1882. 72,490. Collected by William J. Fisher. Nushagmut Eskimo, Nushagak River.

## SINKERS.

## HAND-LINE SINKERS.

## LEAD SINKERS.

For hand-lines used in pond and sea fisheries; cod-line sinker, style of 1840, with soapstone mold. Patent adjustable. For pond fishing. 39,428 (a). 39,428 (b). 39,428 (c). 39,428 (d). For tautog fishing. 57,564. Southern New England pattern. 25,607. Rhode Island pattern, for cod and tautog. 25,605.

TAUTOG DOUBLE SINKERS.—Rhode Island pattern. 54,511.

LEAD SINKER, WITH SPRING STOCK.—For bluefish line. 54,336.

## MOLD AND SINKER FOR COD-LINE.

(Pattern of 1840.) Soapstone mold in two parts; globe-shape inside; sinker with iron stock. Gloucester, Mass. 54,510. U. S. Fish Commission. Style of sinker used on shore cod hand-lines at Cape Ann in 1840.

## HAND-LINE SINKER.

Lothrop's improved pattern for George's hand-lines. Made of lead, with brass bumper on the foot. Weight, 9 pounds. Gloucester, Mass., 1880. 54,489. U. S. Fish Commission.

SINKER FOR COD HAND-LINE. Cape Ann pattern. 57,556.

COD-LINE SINKERS. Cape Cod patterns. 25,716.

## SINKERS.

Samples of "The connecting sinker or fish-hook holder." A contrivance "that can be used for the double purpose of connecting or disconnecting, in a twinkling, the hook, catgut, or snell with the line, and also serving as a sinker at the same time, thereby having the great advantage of avoiding the trouble and annoyance of tying and untying the string on and off the hook, &c." Prices for 1883: No. 1 (smallest size), \$3.50 per dozen; No. 2 (middle size), \$4 per dozen; No. 3 (largest size), \$4.50 per dozen. Exhibited by Van Altena & Scheltus, Milwaukee, Wis.

## STONE SINKER FOR HALIBUT-LINE.

Used by Makah Indians. Length, 10 inches. Port Townsend, Washington Territory, 1883. 72,659. James G. Swan.

## HAND-LINE TAIL-STOCK.

Made of galvanized iron, with eye at upper end. Length, 13½ inches. Gloucester, Mass., 1880. 54,492. U. S. Fish Commission. Used in upper end of George's Bank hand-line lead sinker.

## HAND-LINE TAIL-STOCK.

Made of brass, with eye at each end. Length, 4¼ inches. Gloucester, Mass., 1882. 54,497. U. S. Fish Commission. Used in lead sinkers of shore cod hand-lines.

## HAND-LINE HORSE.

Made by a fisherman on shipboard. Piece of manila rope 15 inches long, served with twine; outer end also served with canvas and inner end with leather. Gloucester, Mass., 1882. 39,183. U. S. Fish Commission. Used in lead sinker of George's Bank cod hand-line.

## HAND-LINE HORSE.

Made of white oak with brass snood-swivel at outer end. Length, 18 inches. Gloucester, Mass., 1882. 54,491. U. S. Fish Commission. Used in lead sinker of George's Bank cod hand-lines.

## HORSE AND BUMPER.

Made of brass, with swivel at outer end. Gloucester, Mass., 1882. 54,498. U. S. Fish Commission. Used in lead sinkers of shore cod hand-lines.

## HAND-LINE BUMPER.

Made of brass, unpolished, oval shape. Gloucester, Mass., 1882. 54,496. U. S. Fish Commission. These bumpers are molded into the foot of George's Bank hand-line sinkers to protect them when banged against rocky bottom.

## SET-LINE SINKERS.

## TRAWL-KILLICK.

E. N. Twiss's patent, April, 1878. Cast-iron: two pieces of iron with chisel-shaped ends crossing each other at right angles, and attached to bottom of an iron shank. Length of flukes, 7½ inches, 1½ inches thick; shank, 10 inches long. 32,651. Used for anchoring fishing-gear.

## UNDER-RUNNING ROCK.

Rough, oblong, flat piece of granite, around which is tied a piece of fishing-line 4 feet long. Length of stone, 8½ inches; width, 6 inches. Cape Ann, Mass., 1882. 54,346. U. S. Fish Commission. Used to sink end of trawl-line when the latter is set for under-running.



## UNDER-RUNNING ROCK.

An oval-shaped beach stone (6 inches by 5 inches), having a hole in one end, into which is driven a wooden peg. A short piece of fishing-line is fastened to the stick. Cape Ann, Mass., 1883. 54,346 (a). A. Howard Clark. Used for the purpose of sinking the end of a trawl-line which is set for under-running.

TRAWL-ANCHORS. (For descriptions see Sec. I.)

IRON KILLICKS. (For descriptions see Sec. I.)

VOSS'S IMPROVED SELF-STOCKING ANCHOR. (See Sec. I, p. 111.)

## NET-SINKERS

## NET-SINKERS.

Old-style lead sinkers for nets. Wellfleet, Mass. 29,474. Gift of Newell B. Rich.

## MENHADEN-NET SINKERS.

Old-style flat rings made of lead. Beverly, Mass., 1876. 25,800. Gift of G. B. Foster. Formerly used at Beverly and vicinity on the foot of menhaden seines.

## NET-SINKERS.

Samples of large and small lead rings used as net-sinkers. Wilcox, Crittenden & Co. 29,393; 25,394.

STONE KILLICKS. (For descriptions see Sec. I.)

GRAPPLING-ANCHOR. (For description see Sec. I.)

## SWIVELS.

## LINE SWIVELS.

## SWIVELS.

Series of brass, horn, and iron swivels, used on hand-lines, nets, and trawls. Old and new patterns.

## HAND-LINE SWIVELS.

For cod and pollock lines.

## HORN COD-LINE SWIVEL.

Formerly much used by Grand and George's Banks fishermen. 25,798.

## HORSE-SWIVEL.

Used on cod-line. 29,392. Lothrop's patent. For cod hand-line. 32,659.

SHARK-HOOK SWIVEL. 29,457.

COD GANGING AND SWIVEL. Showing mode of fastening. 29,486.

HAND-LINE SWIVEL. (Old style.)

Made of horn about the year 1800. Length, 2 inches. Gloucester, Mass. 39,178. Gift of L. D. Lothrop. This style of swivel was in use for many years on cod hand-lines.

HAND-LINE SWIVELS.

For pond fishing. 39,428.

HAND-LINE SLING-DING.

Made of galvanized-iron wire, with eye at each end. Length, 21 inches. Gloucester, Mass., 1882. 54,493. U. S. Fish Commission. Used as a spreader on George's Bank cod hand-lines.

HAND-LINE SWIVELS.

Made of brass; snood swivel for end of horse, and slot swivel for lower end of snood. Gloucester, Mass., 1882. 54,494. U. S. Fish Commission. Used on George's Bank cod hand-lines. The hook-ganging fits in opening of slot-swivel.

SLOT-SWIVELS.

Used for hook-gangings on cod-lines. Latest pattern. 56,952-3.

#### TRAWL-BUOY SWIVELS.

TRAWL-BUOY SWIVELS.

Old style. 29,395. Cape Cod pattern. 25,946. Socket for staff. 25,187. Old style, Gloucester pattern. 32,694. Gloucester patterns. 29,498; 32,713; 56,951.

HALIBUT TRAWL-BUOY SWIVEL.—Cape Cod pattern. 29,476.

#### NET-SWIVELS.

TRIPPLE NET-SWIVEL.

For cod gill-nets to connect the buoy-line and under-running line. 54,495.

#### FLOATS.

##### LINE-FLOATS OF WOOD AND QUILL.

LINE-FLOATS.

Series of egg-shaped wooden floats with wood and quill tops; patent adjustable floats; for pond fishing. 25,661; 39,428; 42,874.

LINE-FLOATS.

Series of barrel-shaped wooden floats with wood and quill tops; patent adjustable floats; snake-head and quill floats; used in pond fishing. 25,662; 39,428; 42,874.

## HARPOON-FLOATS OF INFLATED SEAL-SKIN.

## SEAL-SKIN BUOY.

Skin of hair seal used by natives in the capture of the whale. Indian name "Do-ko-kuptl." Old; not inflated. Length, 34 inches. Makah Indians, Cape Flattery, Washington Territory. 72,751. James G. Swan.

## SEAL-SKIN BUOY.

Skin of hair seal. Small stationary wooden toggle at either end for holding eye-splice of harpoon-line. Small lanyards made of fibers of spruce roots for "making fast" to other buoys. Indian name "Do-ko-kuptl." Length, 38 inches. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,630. James G. Swan.

"This form of buoy is simply a seal-skin taken from the animal whole, the hair being left inwards. The apertures of the head, feet, and tail are tied up air-tight and the skin inflated like a bladder."—"Indians of Cape Flattery."

Inflated and attached to the harpoon, showing the manner in which the apparatus is used during the capture. A number of buoys being made fast to the whale prevents its progressive motions, thus affording the natives an opportunity to kill it with a lance. 72,674.

## SEAL-SKIN BUOY.

Skin of the hair seal, used by natives in the capture of the whale. Indian name "Do-ko-kuptl." New; not inflated. Length, 36 inches. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,629. James G. Swan.

## SEAL-SKIN BUOY.

Skin of a small seal turned inside out; the apertures of head and feet are tied up or hermetically fastened by means of small bone studs, with the exception of one of the forelegs, which is used for inflation, the hole being stopped by a wooden plug. A grommet, through which the buoy-line is rove, is seized to the neck. Size, 26 by 15 inches. Bristol Bay, Alaska, 1882. 72,400. Collected by Charles L. McKay.

## SEAL-SKIN BUOY.

Skin of a small seal turned inside out; the apertures of head and feet are tied up or hermetically fastened by means of small bone studs, with the exception of one of the forelegs, which is used for inflation, the hole being stopped by a wooden plug. A grommet, through which the buoy-line is rove, is seized to the neck. Size, 24 by 15 inches. Bristol Bay, Alaska, 1882. 72,399. Collected by Charles L. McKay.

## SEAL-SKIN BUOY.

Stuffed; ornamented with ivory pendants and feathers. Flippers attached. North Greenland. 19,515. G. Y. Nickerson.

## TRAWL AND NET FLOATS OF METAL, CORK, WOOD, AND GLASS.

## CAMEL'S BACK BUOY.

Made of tin, in two sections, soldered together; ring at each end. Length, 12 inches; diameter, 9 inches. Kelley's Island, Ohio. 57,030. Gift of Charles Carpenter.

## NET-BUOY.

Cork floats lashed around a staff. Swivel and rope strap at end of staff. Rockport, Mass., 1883. 57,145. U. S. Fish Commission.

## GLASS FLOAT.

Partly filled with water by being sent down in the mouth of a beam-trawl to the depth of 787 fathoms in Lat.  $39^{\circ} 59' 45''$  N., Lon.  $68^{\circ} 54'$  W., during a dredging trip of the U. S. Fish Commission steamer Fish Hawk in the summer of 1882. Washington, D. C., 1883. 57,093. Gift of James A. Smith, U. S. N.

## TRAWL-BUOY.

Five glass balls, each 18 inches in circumference, covered with netting, and lashed around a series of cork floats strung on a staff. Swivel and rope strap at end of staff. Rockport, Mass., 1883. 57,144. U. S. Fish Commission.

## REELS.

## SIMPLE REELS FOR FLY-FISHING, WITH AND WITHOUT CLICK.

## FISHING REEL.

Hard rubber. German-silver rim; plate; click. Capacity, 100 yards. Value, 1882, \$6.50. 25,569. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Hard rubber. German-silver band; plate; click. With leather case. Capacity, 60 yards. Value, 1882, \$10. 25,577. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Hard rubber. German-silver mounted; plate; balance handle; click. Capacity, 300 yards. Value, 1882, \$20. 39,245. U. S. Fish Commission. (A. & I.)

## FISHING REEL.

Hard rubber and German-silver. German-silver band; plate; balance handle; click and rubber sliding drag. Capacity, 300



## FISHING-REEL—Continued.

yards. Value, 1882, \$30. 42,813. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

Hard rubber and German-silver; plate; click. Capacity, 80 yards. Value, 1882, \$12. 42,814. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

Hard rubber and brass; plate; click. Capacity, 15 yards. Value, 1882, \$2.50. 42,825. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

(Winans & Whistler patent.) Hard rubber and brass, silver-plated. Complete with 250 yards of line. Secured by plate and rivet. Balance-handle. Value, 1882, \$40. 42,827. U. S. Fish Commission. Adjustable spring guide or line-eye checks overrunning of the line by preventing rotation of reel when casting. Slotted, hinged cover, guides and controls flow of line; and thumb brake controls rotation of reel when playing fish. (C., B. & M.)

## FISHING REEL.

Hard rubber; plate; click. Capacity, 25 yards. Value, 1882, \$5.50. 42,820. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

(Fowler's patent.) Hard rubber, perforated, with plate. Capacity, 80 yards. Value, 1882, \$2.50. 25,581. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Hard rubber, plain rim; plate; click. Capacity, 40 yards. Value, 1882, \$2.00. 25,571. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Celluloid; plate; click. Capacity, 80 yards. Value, 1882, \$3.50. 25,579. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

German silver and rubber; raised pillar; capped click. Balance-handle. Capacity, 120 yards. Value, 1882, \$35. 57,671. U. S. Fish Commission. (C. & B.)

## FISHING REEL.

(Orvis's patent.) German-silver, nickel plated; plate and click. Capacity, 50 yards. Value, 1882, \$3.50. 54,281. Gift of Bradford & Anthony, Boston, Mass.

## FISHING REEL.

German silver; plate; capped; click. Capacity, 40 yards. Value, 1882, \$5. 42,823. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

German silver; plate; secret click. Capacity, 40 yards. Value, 1882, \$5. 42,822. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

German silver, with plate; click. Capacity, 60 yards. Value, 1882, \$3.38. 25,666. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

(Orvis's patent.) German-silver, nickel plated. Perforated for lightness, and to keep it free from sand, also that line may dry without removal from reel after use. Plate. Capacity, 50 yards. Value, 1882, \$3. 25,532. Gift of Bradford & Anthony, Boston, Mass.

## FISHING REEL.

German-silver, with plate; click, with rim. Capacity, 40 yards. Value, 1882, \$3. 25,575. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

German-silver; plate; click. Capacity, 150 yards. Value, 1882, \$6.50. 25,565. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

German-silver; plate; click. Capacity, 300 yards. Value, 1882, \$18. 25,564. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Ebonite, German-silver mounted; plate; click. Capacity, 30 yards. Value, 1882, \$8. 39,432. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Ebonite, German-silver mounted; plate; click. Capacity, 40 yards. Value, 1882, \$10. 39,431. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Ebonite, German-silver mounted; plate; balance-handle; click. Capacity, 80 yards. Value, 1882, \$12. 39,430. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

(Chubb's patent.) Nickel-plated; click; riveted plates. Value, 1882, \$1.50. 57,687. U. S. Fish Commission. (A. C. S.)

## FISHING REEL.

(Billinghurst patent.) Nickel. Value, 1883, \$3. 56,993. Wm. Mills & Son, New York City.

## FISHING REEL.

Brass, unburnished, with plate. Capacity, 30 yards. Value, 1882, \$0.60. 25,589. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Brass, unburnished, with ring; single. Capacity, 15 yards. Value, 1882, \$0.60. 25,590. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Brass, unburnished, with plate; single, with stop. Capacity, 15 yards. Value, 1882, \$0.60. 25,588. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Brass, unburnished; plate; click. Capacity, 15 yards. Value, 1882, \$0.70. 25,586. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Brass, unburnished; ring; click. Capacity, 40 yards. Value, 1882, \$1. 25,585. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Brass, burnished, with ring; single. Capacity, 40 yards. Value, 1882, \$0.75. 25,587. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Smith's patent. Brass; automatic. Capacity, 30 yards. Value, 1882, \$6. 57,685. U. S. Fish Commission. (A. C. S.)

## FISHING REEL.

Brass, with raised pillars; plate; click. Capacity, 399 yards. Value, 1882, \$4. 25,888. U. S. Fish Commission. (A. & B.)

## FISHING REEL.

Leonard's patent, 1877. Polished metal; trout click; steel click wheels secured to bridge inside of plate. Diameter,  $2\frac{1}{4}$  inches; weight,  $3\frac{1}{2}$  ounces; capacity, 40 yards. Value, 1882, \$8. 57,994. Wm. Mills & Son, New York City. Special exhibit.

## FISHING REEL.

Iron with plate. Capacity, 80 yards. Value, 1882, \$0.25. 42,826. U. S. Fish Commission. (C., B. & M.)

## AUTOMATIC REELS.

Bronze-plated automatic reel No. 1, capable of holding 90 feet of line. Nickle-plated automatic reel No. 2, capable of holding 150 feet of line. Manufactured and exhibited by Loomis, Plumb & Co., Syracuse, N. Y.

## MILAM OR FRANFORT FISHING REEL.

A combined multiplying and click reel used for either bait or fly fishing, and multiplies four times. "The friction of the parts is so slight that a smart stroke of the handle causes it to make about fifty revolutions. For bait fishing the reel is used clear, with alarm and rubber both off, and, with a little practice, one can drop his bait at any desired spot within 50 or 60 yards with ease. For fly fishing the rubber or drag is put on, and if you desire a click also, the alarm or click is used. These improvements can be used separate or together as desired. We wish to call special attention to these important adjuncts, and have their use fully understood, for with their aid you can make a multiplying or click reel at pleasure, thus rendering the 'Frankfort' doubly valuable. They are operated by sliding disks on side of reel, and do not in the least complicate its working. Made in brass and German silver in six sizes, costing from \$13 to \$26 each."—(*Milam.*) Exhibited by B. C. Milam, Frankfort, Ky.

## FISHING REELS.

Salmon reels: Leonard's patent.

Trout reels: Leonard's patent.

Salmon reels. (William Mills & Son's new patent.)

Trout reels. (William Mills & Son's new patent.)

Multiplying reels: (B. H.) adjustable click, three sizes, 2, 3, and 4, in rubber and German silver.

Leonard's click reel.

Billinghurst reel. Exhibited by William Mills & Son, of New York City, and entered for competition.

## FISHING REELS.

Salmon reel; one sample.

Trout reel; one sample.

Bass reels; two samples. Exhibited by William Mitchell, of New York City, and entered for competition.

## FISHING REELS.

70-yard balance sliding click reel.

250-yard Fairmount click reel.

300-yard balance handle, steel pivots, &c. Exhibited by A. B. Shipley & Sons, of Philadelphia, Pa.



## MULTIPLYING REELS FOR FLY-FISHING WITH AND WITHOUT CLICK.

## FISHING REEL.

Hard rubber; with plate; balance handle; multiplying. Capacity, 60 yards. Value, 1882, \$8. 25,570. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Hard rubber and German-silver; balance handle, steel pivot; multiplying. Capacity, 300 yards. Value, 1882, \$35. 42,815. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

Hard rubber, German silver bands and black bars, with plate; balance handle; combined multiplying and click with rubber sliding drag-plate. Capacity, 40 yards. Value, 1882, \$11. 42,821. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

German silver and rubber; multiplying; steel pivot, balance handle. Value, 1882, \$25.50. 57,688. U. S. Fish Commission. (A. C. S.)

## FISHING REEL.

German silver, with plate; balance handle; steel pivot; multiplying. Capacity, 200 yards. Value, 1882, \$8. 42,817. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

German silver, with plate; balance handle, steel pivot; multiplying. Capacity, 200 yards. Value, 1882, \$16. 42,816. U. S. Fish Commission. (C., B. & M.)

## FRANKFORT REEL.

German silver, with plate; balance handle; multiplying. Capacity, 15 yards. Value, 1882, \$3. 39,236. Gift of B. C. Milam, Frankfort, Ky.

## FISHING REEL.

German silver, with plate; balance handle; multiplying. Capacity, 25 yards. Value, 1882, \$3.50. 25,574. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

German silver, with plate; balance handle; steel pivot; multiplying, with drag. Capacity, 300 yards. Value, 1882, \$9. 25,572. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Celluloid, with plate; balance handle; multiplying, with click. Capacity, 150 yards. Value, 1882, \$9. 25,580. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Celluloid, plate; balance handle; multiplying, with click and extra spool. Capacity, 80 yards. Value, 1882, \$15. 25,578. U. S. Fish Commission. (B. & A.)

## FISHING REEL. (Malleson's patent.)

Nickel; multiplying; central action; adjustable click; balance handle. Value, 1882, \$7. 57,689. U. S. Fish Commission. (A. C. S.) Same as No. 57,672.

## FISHING REEL.

Nickel-plated, with plate; balance handle; quadruple multiplying. Capacity, 25 yards. Value, 1882, \$5.25. 43,824. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

Brass, with plate; balance handle; multiplying. Capacity, 40 yards. Value, 1882, \$3. 42,819. U. S. Fish Commission. (C., B. & M.)

## FISHING REEL.

Brass, bushed and polished, with plate; multiplying, with stop. Capacity, 15 yards. Value, 1882, \$1.10. 25,584. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Brass, bushed and polished, with ring; multiplying, with stop. Capacity, 50 yards. Value, 1882, \$1.60. 25,583. U. S. Fish Commission. (B. & A.)

## FISHING REEL.

Brass, bushed and polished, with plate; multiplying, with drag. Capacity, 60 yards. Value, 1882, \$2.50. 25,573. U. S. Fish Commission. (B. & A.)

## FISHING REEL. (Patent perfection.)

Multiplying; central action; adjustable click; balance handle. Value, 1882, \$7. 57,672. U. S. Fish Commission. (C. & B.)

## GUNWALE AND DECK WINCHES.

## TRAWL-LINE ROLLER AND EYE-PLATE.

Roller of lignum-vitæ wood, with single groove for trawl-line. Eye-plate of galvanized iron fastens on gunwale of boat. Width

## TRAWL-LINE ROLLER AND EYE-PLATE—Continued.

of roller, 2 inches; diameter,  $3\frac{3}{4}$  inches. Shank, 8 inches long. Length of eye-plate, 5 inches. Provincetown, Mass., 1875. 24,488. Gift of Amasa Taylor. This was the first style of trawl-roller used at Provincetown.

## TRAWL-LINE ROLLER.

Roller of lignum-vitæ wood with three grooves. Iron shank. (McDonald's patent, 1875.) Gloucester, Mass., 1880. 54,552. Gift of A. R. Crittenden, Middletown, Conn. Much worn by constant use. One of the common styles for bank cod and halibut fishing.

## TRAWL-LINE ROLLER.

Roller of lignum-vitæ wood with three grooves. Iron shank. Width of roller, 6 inches; diameter, 4 inches. Gloucester, Mass., 1880. 54,551. Gift of A. R. Crittenden, Middletown, Conn. This roller was deeply worn in the center groove, which is reinforced with leather. Two side grooves were then rudely cut, and thus gave the idea for the patent three-groove roller.

## IMPROVED WINDER OR WINDLASS.

For use on oyster-dredging vessels. U. S. Fish Commission. 57,092. The apparatus is specially arranged to prevent injuries to those working it by violent movements of the handles due to sudden strains on the dredge-line.

## PATENT ROLLER-BUSHING.

Made of brass. Used in tackle-blocks and trawl-rollers. Middletown, Conn. 57,555. Wilcox, Crittenden & Co.

## DORY ROLLER FOR COD GILL-NETS.

Hard wood, round, iron bands at ends, with iron pintles to fit in dory gunwales. Length of roller  $6\frac{1}{2}$  feet, diameter of ends  $3\frac{1}{4}$  inches; length of pintles 9 inches. Gloucester, Mass., 1883. 57,826. U. S. Fish Commission. Used in cod gill-net fishery.

## IMPROVED TRAWL ROLLER.

The improvement consists in having the spindle securely fastened to the roll, and having the outer ends revolve in a box at each end of the roll. The box is made of composition, and provided with a lubricant for the spindle to run in. Exhibited by Bagnall & Loud, Boston, Mass.

## LINE-HOLDERS.

## HOOK, LINE, AND SPEAR-HEAD HOLDERS.

## ESKIMO LINE-HOLDER.

A wooden rack, painted white. Used by natives when beluga fishing, for carrying the line, buoy, &c. When in use it is placed on the deck of the kyak in front of the hunter. Size, 43 by 14½ inches. Bristol Bay, Alaska, 1882. 72,404. Collected by Charles L. McKay.

## TRAWL-LINE BASKET.

An egg-shaped basket made of split reeds; handle on each side; strips on bottom. Boston, Mass., 1883. 57,146. U. S. Fish Commission. Used by Irish haddock fishermen of Boston for holding their trawls.

## BASKET.

Used to hold spear-heads and other small articles in sealing; called by the Makahs "kla-ash." Length, 19 inches. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,663. James G. Swan. "A very fine specimen, double; made for a chief and was procured as a special favor. Such baskets are never offered for sale. After having been used they acquire additional value, and to sell one is deemed unlucky. This being new, was more easily obtained."

## SMALL BASKET, "KLA-ASH."

Used as a receptacle for spear-heads by natives when engaged in killing seal. Dimensions, 15½ inches. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,664. James G. Swan.

## LARGE BASKET, "KLA-ASH."

Used by natives for holding spear-heads, harpoons, and lines when sealing. Length, 28 inches. Makah Indians, Port Townsend, Washington Territory, 1883. 72,665. James G. Swan. "These baskets are never offered for sale. The prices asked for them, when a native is induced to sell, exceed those of the ordinary baskets."

## BASKET.

Small "kla-ash" for holding halibut-hooks. Length, 11 inches. Makah Indians, Cape Flattery, Washington Territory, 1883. 72,666. James G. Swan.



## GRAPNELS FOR RECOVERING LOST LINES.

## DEVIL'S-CLAW GRAPNEL.

Iron, black; a piece of  $\frac{3}{8}$ -inch chain, 10 or 12 feet long, with 3-prong claw-like grapnels fastened at intervals of 3 feet along its length and one at the extreme end of the chain. Length of each grapnel, 9 inches; each prong, 5 inches. Gloucester, Mass., 1883. 54,342. U.S. Fish Commission. Used for recovering lost trawl-lines, &c.

## GRAPPLING-IRON.

Iron, black; four stout recurved hooks joined together on a single shank. Ring at top of shank served with canvas. Length of shank, 7 inches; spread of prongs, 8 inches. Gloucester, Mass. 25,936. Presented by A. McCurdy. Used to recover lost fishing-lines, &c.

## FISHING RODS.

## PICKEREL ROD.

Common; four pieces. U. S. Fish Commission. (B. & A.) 25,510.

## COMMON ROD.

Three pieces; ash and hornbeam; brass mounting. U. S. Fish Commission. (B. & A.) 25,511.

## COMMON BASS ROD.

Four pieces, brass-mounted. U. S. Fish Commission. (B. & A.) 25,508.

## BAIT ROD FOR TROUT.

Four pieces; common. U. S. Fish Commission. (B. & A.) 25,509.

## GUDGEON ROD.

Three pieces; ash and hornbeam; brass mounting; common. U. S. Fish Commission. (B. & A.) 25,512.

## CHUBB'S BASS ROD.

Double guided, with reversible reel-plate. U. S. Fish Commission. (B. & A.) 39,429.

## BLACK-BASS ROD (FLY COMBINATION.)

Three-piece bait and four-piece fly combination. U. S. Fish Commission. (C., B. & M.) 42,794.

## FLY ROD.

Red cedar; duplicate joint and three tips. U. S. Fish Commission. (C., B. & M.) 42,788.

**COLD BROOK HOLLOW ROD.**

The "Cold Brook" hollow salmon, bass, and angling rod. Nickel-plated, with reel showing an attached line working. Patented June 22, 1875. J. L. Graves, Springfield, Mass.

The following are the advantages claimed by Mr. Graves for his new rods: "1. The line is concealed and cannot be caught in underbrush or branches. 2. The strain on the rod is equalized through the entire length. 3. There is no friction through rings or guides except on the tip. 4. The strength of the rod is greatly increased. 5. The weight of the rod is diminished. 6. The wet line is not reeled up to decay. 7. The rod goes under the brush where the big trout lie. 8. It adds greatly to the comfort and pleasure of the 'gentle art.'"

25,886.

**CHUM ROD.**

Two pieces; bamboo; German-silver mountings, and wound butt. U. S. Fish Commission. (C., B. & M.) 42,803.

**KELLY ISLAND BLACK-BASS ROD.**

Bamboo; wound butt; nickel-plated mountings. U. S. Fish Commission. (C., B. & M.) 42,799.

**KELLY ISLAND BLACK-BASS ROD.**

Bamboo. U. S. Fish Commission. (C., B. & M.) 42,798.

**KELLY ISLAND BLACK-BASS ROD.**

Bamboo. U. S. Fish Commission. (C., B. & M.) 42,797.

**JOINTED ROD.**

Four joints, extra tips, tie guides; made of Calcutta bamboo; full mounted in brass. U. S. Fish Commission. (B. & A.) 25,513.

**GENERAL FISHING-ROD.**

Nine pieces; German silver mounting. U. S. Fish Commission. (B. & A.) 25,501.

**TRUNK ROD.**

Eight-pieces; ash and lancewood, Germansilver capped ferrules. U. S. Fish Commission. (C., B. & M.) 42,810.

**TRUNK ROD.**

Eight pieces; ash and lancewood, with hollow butt and German silver mountings. (U. S. Fish Commission. (C., B. & M.) 42,809.

**TRUNK ROD.**

Eight pieces; ash and lancewood, with hollow butt and brass mountings. U. S. Fish Commission. (C., B. & M.) 42,808.

**MCGUINNESS MINNOW ROD.**

Three pieces; German-silver-mounted; ash and lancewood; two tips, and bamboo tip-case. U. S. Fish Commission. (C., B. & M.) 42,793.

**NEWPORT BASS ROD.**

Three pieces; ash and lancewood; German-silver mountings. U. S. Fish Commission. (C., B. & M.) 42,802.

**GENERAL FISHING-ROD.**

Six pieces; ash and lancewood; German-silver mounting. U. S. Fish Commission. (B. & A.) 25,500.

**TRUNK ROD.**

Seven pieces; ash and lancewood; 27½-inch pieces. U. S. Fish Commission. (C., B. & M.) 42,807.

**SHORT BLACK-BASS FLY ROD.**

Ash and lancewood. U. S. Fish Commission. (A. & I.) 32,244.

**TROUT ROD.**

Four pieces and extra tip; ash and lancewood; German-silver mounting; agate-lined tips. U. S. Fish Commission. (B. & A.) 25,506.

**CALIFORNIA GENERAL ROD.**

Six pieces, making three distinct styles of rods; ash and lancewood; 37½-inch joints. U. S. Fish Commission. (C., B. & M.) 42,806.

**LIGHT BASS ROD.**

Four pieces; extra tip; ash and lancewood; German silver mounting. U. S. Fish Commission. (B. & A.) 25,498.

**BASS ROD.**

Four pieces and extra tip for sea fishing; ash and lancewood; German silver mounting; jeweled tip. U. S. Fish Commission. (B. & A.) 25,497.

**MOUNTAIN-TROUT ROD.**

Three-pieces; German silver-mounted; ash and lancewood; weight, 8 ounces. U. S. Fish Commission. (C., B. & M.) 42,795.

## TROUT FLY ROD.

Brass mounted;  $6\frac{3}{4}$  ounces; extra tip and bamboo tip-case. U. S. Fish Commission. (C., B. & M.) 42,790.

## FLY ROD.

Four pieces and extra tip; ash and lancewood; German silver mounting. U. S. Fish Commission. (B. & A.) 25,505.

## FLY ROD.

Three pieces and extra tip; extra middle joint; bamboo tip-case; ash and lancewood; German silver mounting. U. S. Fish Commission. (B. & A.) 25,504.

## FLY ROD.

German silver-mounted ash and lancewood; extra bamboo tip-case. U. S. Fish Commission. (C., B. & M.) 42,789.

## TROUT FLY ROD.

Ash and lancewood. U. S. Fish Commission. (A. & I.) 39,243.

## SALMON ROD.

Four pieces; ash and lancewood, with duplicate joint and three tips; bamboo tip-case. U. S. Fish Commission. (C., B. & M.) 42,784.

## SALMON ROD.

Four pieces and extra tips; bamboo tip-case; ash and lancewood; German silver mounting. U. S. Fish Commission. (B. & A.) 25,507.

## NEWPORT BASS ROD.

Three pieces; ash and lancewood; finest German silver mountings; duplicate joint; two tips. U. S. Fish Commission. (C., B. & M.) 42,801.

## FLY ROD.

Greenheart; with split bamboo tips and bamboo tip-case. U. S. Fish Commission. (C., B. & M.) 42,787.

## PIECE OF BAMBOO.

Showing splitting process in construction of rods. H. L. Leonard, Bangor, Me. 25,884.

## TROUT FLY ROD.

Three pieces and extra tip; split bamboo; German silver mounting. U. S. Fish Commission. (B. & A.) 25,503.



**WEAKFISH ROD.**

Six-strip split bamboo; two tips. U. S. Fish Commission. (C., B. & M.) 42,804.

**FOREST AND STREAM BAIT ROD.**

Six-strip hexagonal split bamboo; extra tip; 9 feet long. U. S. Fish Commission. (C., B. & M.) 42,792.

**BLACK BASS ROD.**

Four pieces and two extra tips; split bamboo; German silver mounting. U. S. Fish Commission. (B. & A.) 25,499.

**BAIT ROD.**

McGinness's six-strip, hexagonal, split bamboo bait rod; extra tip; 11 feet long. U. S. Fish Commission. (C., B. & M.) 42,791.

**CALIFORNIA GENERAL ROD.**

Six pieces, six-strip, split bamboo, making three distinct rods. U. S. Fish Commission. (C., B. & M.) 42,805.

**FLY ROD.**

Three pieces and extra tip; cedar and split bamboo. U. S. Fish Commission. (B. & A.) 25,502.

**LIGHT TROUT FLY ROD.**

Six-strip, split bamboo. U. S. Fish Commission. (A. & I.) 39,242.

**TROUT FLY ROD.**

Three pieces, six-strip, hexagonal, split bamboo; weight 6 $\frac{3}{4}$  ounces. These two rods are protected by well seasoned pine forms, which also prevent the pieces from warping and keep them straight. U. S. Fish Commission. (C., B. & M.) 42,786.

**BLACK BASS FLY ROD.**

Three pieces, six-strip, hexagonal, split bamboo; weight, 10 ounces. U. S. Fish Commission. (C., B. & M.) 42,785.

**GRILSE FLY ROD.**

Six-strip, hexagonal, split bamboo; German silver mountings; metal reel-seat. U. S. Fish Commission (C., B. & M.). 42,783.

**SALMON FLY ROD.**

Six-strip, hexagonal, split bamboo; German silver mountings; metal reel-plate. "These rods are made by cementing together six triangular strips from the lower sections of the best bamboo cane." U. S. Fish Commission (C., B. & M.). 42,782.

## TROLLING-POLE, HARPOON-LINE HOLDER AND CANE.

Chapman's combination. W. D. Chapman, Theresa, N. Y. 25,491.

## NEWPORT STRIPED-BASS ROD.

Six-strip, hexagonal, split bamboo; ash butt; German silver mountings; agate tube top and guide; two tips. U. S. Fish Commission. (C., B. & M.) 42,800.

## FISHING RODS.

Exhibited by Conroy & Bissett, of New York City:

- 1 Hexagonal split bamboo salmon rod, German-silver mountings, 18 feet long.
- 1 Hexagonal split bamboo Grilse rod, German-silver mountings, 15 feet long.
- 1 Hexagonal split bamboo trout and black-bass fly rod, German-silver mountings, 12 feet long.
- 1 Hexagonal split bamboo trout and black-bass fly rod, German-silver mountings, 11 feet long.
- 1 Hexagonal split bamboo Saint Lawrence rod, German-silver mountings, 10 feet long.
- 1 Hexagonal split bamboo McGuinness's black-bass rod, German-silver mountings, 11½ feet long.
- 1 Hexagonal split bamboo California general rod, making three distinct rods, German-silver mountings, 8½ to 12½ feet long.
- 1 Hexagonal split bamboo "Newport," or heavy bass rod, ash butt, agate tube top.
- 1 Hexagonal split bamboo Holberton fly rod, 2 pieces, and short ash butt. The joints of this rod are contained in the landing-net handle; the butt and folding landing-net can be carried in the angler's pocket.
- 1 Hexagonal split bamboo "Henshall" black-bass minnow rod, 8½ to 9 feet long.
- 1 Hexagonal split bamboo Southern bass or weakfish rod, 9 to 9½ feet long.

## FISHING RODS.

Exhibited by William Mills & Son, of New York City, and entered for competition :

- Salmon rod : Leonard's split bamboo, 16 feet, 32 ounces.
- Salmon rod : Leonard's split bamboo, 15½ feet, 26 ounces.
- Bass bait rod : Leonard's split bamboo, 10¾ feet, 15¾ ounces.
- Bass bait rod : Leonard's split bamboo, 8¼ feet, 9¾ ounces.
- Trout fly rod : Leonard's split bamboo, 11½ feet, 8¾ ounces.
- Trout fly rod : Leonard's split bamboo, 10½ feet, 8½ ounces.
- Catskill rod : Leonard's split bamboo, 10 feet, 4¾ ounces.
- Trunk fly rod : Leonard's split bamboo, 11 feet, 10¼ ounces.
- Combination rod : Leonard's split bamboo.

## FISHING RODS.

Exhibited by William Mitchell, of New York City, and entered for competition :

Salmon rods; five varieties. Trout rods; twelve varieties. Bass rods; five varieties.

“Trout fly rods :

Grade.	Length.	Weight.	Reel and line.	Leverage.
	<i>Feet.</i>	<i>Ounces.</i>	<i>Ounces.</i>	<i>Ounces.</i>
No. 1.....	12	9½	6½	30
No. 2.....	11½	7½	5	26
No. 3.....	11	6½	4¾	22
No. 4.....	10	4¾	3¾	16
No. 5.....	9½	4	3¾	13

“Salmon rods :

Length.	Weight.	Reel and line.	Leverage.
	<i>Ounces.</i>	<i>Ounces.</i>	<i>Ounces.</i>
14 feet.....	17	19½	20
16 feet.....	26	22	47
16½ feet.....	28	22	50
17 feet.....	30	22	64
18 feet.....	35	22	74

“Split bamboo rods of the same class average from 1 to 3 ounces heavier. (See ‘Henshall’s Book of the Black Bass,’ or ‘Forest and Stream,’ January 2, 1879.)

“The average leverage, holding the rods at an angle of 30° from the horizontal, is fairly two-thirds of the foregoing. Rod No. 1 is a standard black-bass rod. Upon a No. 2 was caught and killed, without gaff or net, a salmon which weighed 33 pounds. No. 3 is the ‘standard’ trout rod at present in this part of the country. A ‘standard’ rod of 1843, made for Daniel Webster (sent in for repair), has also been tested: Length, 12 feet; weight, 17½ ounces; weight of reel and line, 7 ounces; leverage, 5 pounds. As the reel is above the hand, this rod of 1843 is not so strong, nor will it stand work, nor can it cast as far as the 11-foot standard of to-day. A 10-ounce rod is now almost as obsolete as that one of 1843.

“A fly rod of 11 feet in length, weighing 6½ ounces, having on it a No. 4 reel and line weighing 4¾ ounces (grip above reel, of course), the leverage is 22 ounces, that is, if the rod be held level; upright, of course, there is no leverage; if the rod were held most of the time at an angle of 45°, the average power exerted would be 11 ounces; but the rod is held lower, nearer 30°, and it is safe to say that, on such a light rod, a power of over more than one pound and a half is constantly straining on the muscles.”

## HEXAGONAL SPLIT-BAMBOO FISHING-RODS.

Exhibited by B. A. Nichols, of Boston, Mass.:

## Fly rods.

- No. 1. 10 feet long; three pieces; weight, 7 ounces; two tips; bamboo tip-case; sack and wood shipping case.
- No. 2. 11 feet long; three pieces; weight, 8 ounces; two tips; bamboo tip-case; sack and wood shipping case.
- No. 3. 11½ feet long; three pieces; weight, 9 ounces; two tips; bamboo tip-case; sack and wood shipping case.
- No. 4. 11½ feet long; three pieces; weight, 10 ounces; two tips; bamboo tip-case; sack and wood shipping case.
- No. 5. 12 feet long; three pieces; weight, 10½ ounces; two tips; bamboo tip-case; sack and wood shipping case.
- No. 6. 12 feet long; three pieces; weight, 12½ ounces; two tips; bamboo tip-case; sack and wood shipping case.
- No. 7. General rod: 11½ feet long, with fly tip; weight, 10½ ounces. And 9½ feet long; weight, 9½ ounces, with short tip (2 feet long), for bait fishing or trolling. This is a very handy rod, is suitable for bass or trout, with the fly tips (of which there are two), and bait fishing or trolling, with the short tip; making the rod in three pieces; bamboo tip-case; sack and wood shipping case.

## Black-bass rods.

- No. 8. 10 feet long; three pieces; weight, 9½ ounces; ring guides; reel-seat below grasp; two tips; bamboo tip-case; sack and wood shipping case.
- No. 9. 10 feet long; three pieces; weight, 10 ounces; standing guides; reel-seat above grasp; two tips; bamboo tip-case; sack and wood shipping case.
- No. 10. 8½ feet long; two pieces; weight, 9½ ounces; standing guides; reel-seat above grasp; two tips; grooved wood case; sack and wood shipping case.

## Striped-bass rods.

- One rod; 8 feet long; two pieces; weight, 19 ounces.
- One rod; 8½ feet long; two pieces; weight, 20 ounces.
- One rod; 9 feet long; two pieces; weight, 25 ounces.
- One rod; 8 feet long; three pieces; weight, 20 ounces.
- One rod; 8½ feet long; three pieces; weight, 22 ounces.
- One rod; 9 feet long; three pieces; weight, 25 ounces.

## Salmon rods.

- One rod; 16 feet long; three pieces; weight, 26 ounces.
- One rod; 16½ feet long; three pieces; weight, 27 ounces.



## Salmon rods—Continued.

- One rod; 17 feet long; three pieces; weight, 28 ounces.  
 One rod; 17½ feet long; three pieces; weight, 30 ounces.  
 One rod; 18 feet long; three pieces; weight, 32 ounces.

## Grilse rods.

- One rod; 14 feet long; weight, 22 ounces.  
 One rod; 14½ feet long; weight, 23 ounces.  
 One rod; 15 feet long; weight, 24 ounces.  
 All rods have full German-silver reel-plate and mountings, and grooved cases covered with cloth and cloth sacks. All above rods have two duplicate tips.

## Caledonia fly rods.

- No. 1. 9 feet 4 inches long; weight, 5¼ ounces; 3 pieces; 2 tips.  
 No. 2. 9 feet 8 inches long; weight, 6 ounces; 3 pieces; 2 tips.  
 Full German-silver mounting, grooved cases, &c.

## The tourist combination rod.

Twelve feet long; in 4 pieces; weight 13 ounces; with extra butt-joint, and extra reversible grasp and reel-seat (to be used with reel above or below the hand), and extra short tip for trolling or bait fishing, and extra long butt-joint to be used instead of first and second joints, making a 9-foot 7-ounce fly rod, making in all 8 pieces, and four regular and perfect rods, all in a cloth-covered grooved case 3 feet 3 inches long, all weighing about 4 pounds when packed. It has full German-silver mountings.

## FISHING RODS.

Exhibited by A. B. Shipley & Sons, of Philadelphia, Pa., and entered for competition:

- Six-strip split-bamboo rod, \$20.  
 Six-strip split-bamboo rod, \$30.  
 Split-bamboo rod and reel in case.  
 Bethabara wood, 10-foot pole, \$16.50.  
 Bethabara wood, pole 5½ ounces, \$10.50.  
 Bethabara wood, 12-foot pole, \$16.50.

## DISGORGERS AND CLEARING-RINGS.

## GULLETER.

Made of brass, for end of Lothrop's improved gob-stick. Gloucester, Mass., 1883. 57,049. U. S. Fish Commission.

## FISH-HOOK EXTRACTOR (J. W. Foard's patent).

"Using the end of the instrument corresponding to the size of your hook, run it down the line into the bend of the hook; then draw

**FISH-HOOK EXTRACTOR—Continued.**

the line moderately taut and clamp it against the side of the shaft, and push the whole down till the barb of the hook is disengaged, and the hook will come out with the instrument." U. S. Fish Commission. 57,682.

**DISGORGER.**

For taking hook from mouth or stomach of fish. Philadelphia, Pa. Exhibit of A. B. Shipley & Sons.

**HOO-CLEARER.**

Piece of lead pipe used for releasing the hook when caught in a log or other obstruction. Skaneateles, N. Y., 1883. 57,042. Collected by Reuben Wood.

**BRASS CLEARING-RING.**

For releasing the line when caught at bottom of river. Exhibit of A. B. Shipley & Sons, Philadelphia, Pa.

**FISH-BASKETS.****WILLOW CREEL.**

With leather and web strap. U. S. Fish Commission (C., B. & M.). 42,855.

**WILLOW CREEL.**

Showing new style of left shoulder-strap. U. S. Commission (C., B. & M.). 42,856.

**HOME-MADE CREEL.**

Made in the woods by Joseph Willets, esq., of strips of wood. Oval shape; 10½ inches deep; 1 foot wide. Skaneateles, N. Y. Joseph Willets. 57,670. Used for holding fish.

**FISH-BASKET.**

Large pouch-like basket, made of bark of arbor-vitæ, used as a receptacle for dried fish. Makah Indians, Neah Bay, Washington Territory. 72,682. James G. Swan.

**LIVE BOXES.****MINNOW AND FISH CRATE. (Osgood's patent.)**

Made of wood and cotton cloth, folding. Extended ready for use it measures 24 inches long, 8 inches wide, 8 inches deep. Its weight is 1½ pounds. U. S. Fish Commission (C., B. & M.). 42,828. "The crate extended ready for use measures 24 inches long, 8 inches wide, 8 inches deep. The crate when folded is 12 inches long, 8 inches wide, 2 inches deep. Its weight is 1½

**MINNOW AND FISH CRATE—Continued.**

pounds. Every angler knows the difficulty of keeping minnows alive and the frequent failure of all ordinary means for preserving them. It is claimed that the crate meets this want. Floating beside or behind a boat its drag is scarcely perceptible. It occupies so little depth that danger from fastening on logs, &c., is almost entirely obviated. When folded, it occupies so little space that one could easily carry it under his buttoned coat during a walking excursion. Another feature that highly recommends this crate is the ease with which the bait is secured when a fresh minnow is required. No lifting is necessary. By simply tipping up the bow, the lower half or stern is submerged, leaving the door clear above the water and convenient to the hand."

**MINNOW-CRATE.**

A small collapsible crate made of wood and canvas. Used by anglers to keep small fish alive which are to be used as live bait. Exhibited by N. A. Osgood, Battle Creek, Mich.

**MINNOW-PAIL.**

Tin; tubular; flat bottom and top; painted green, with lettering "The gem fish-bait pail." Air-holes in top; movable tray inside. Height, 14 inches; diameter, 1 foot; capacity, 16 quarts. U. S. Fish Commission. 57,674. Used to carry live minnows for bait.

**LIVE CARS FOR FISH AND LOBSTERS.** (For description see Sec. K.).

**MACKEREL POCKET.**

A small model of a mackerel pocket, made of cotton netting. Used by the mackerel fishermen in connection with the purse-seine fishery. When more mackerel are taken than can be dressed at once the surplus is turned into the mackerel pocket, which is suspended from out-riggers fastened to the vessel's deck, the bottom extending 6 to 10 feet below the surface of the water. The mackerel are thus kept alive until such time as they can be cared for. Exhibited by George Merchant, jr., Gloucester, Mass.

**FISH INCLOSURE (photograph).**

A large inclosure on Detroit River, made by staking off a portion of the shoal water along the bank, and used for keeping fish alive until such time as there is a demand for them in the market. The seine is frequently drawn to the mouth of the inclosure and the fish allowed to enter without being handled. Detroit, Mich., 1882. (751) 2,212. U. S. Fish Commission.

## BROOMS.

## HALIBUT SCRUB-BROOM.

A rough broom, made from the butt of a white-oak sapling, the end of which is split into fibers which are tightly tied with marline, after which the end of the broom is rounded. Gloucester, Mass., 1883. 57,812. U. S. Fish Commission. Used for cleaning halibut after they have been eviscerated and preparatory to being packed in ice.

## HALIBUT SCRUB-BROOM.

Made of oak sapling, the butt end being stripped into fibers to form the broom; these are firmly bound together and their ends trimmed off. Gloucester, Mass., 1878. 32,718. Capt. J. W. Collins. Used for cleaning blood, &c., from the backbone of halibut before they are iced.

## LAMPS AND LANTERNS.

(For descriptions see Sec. I.)

## SEALER'S ACCESSORIES.

## ESKIMO ICE-BRUSH.

Handle, wood; flaring bone butt-piece inserted in recessed handle and wrapped with strips of seal-skin. Brush consists of a narrow strip of baleen, horn-colored, with fringe attached, and seized to the handle with seal-skin thongs. Length, 30 inches. King's Island, Alaska. 63,606. Collected by E. W. Nelson. Used by natives for brushing away snow when seal-hunting, and also for brushing snow and ice from their garments.

## SEAL-HUNTER'S STOOL.

Wood, heart-shaped; triangular hole cut near the center with chamfered edge on lower sides; three small wooden pegs inserted as legs. Size,  $12\frac{3}{4}$  by 8 inches; height,  $5\frac{3}{8}$  inches. Anderson River, Arctic coast. 3,978. Collected by Robert Macfarlane. A roughly constructed but durable utensil. Used by Eskimo to stand upon while watching for seals in winter

## ANGLER'S CAMPING OUTFIT.

(For a more detailed list of angler's camping outfit see Sec. I.)

## PACK-RACK.

An old-fashioned angler's pack-rack, which can be strapped to the back and loaded with blankets and other outfit in reaching camping-grounds which are inaccessible to wagons. Exhibited by Joseph C. Willetts, Skaneateles, N. Y.



## FISHING-BAG.

Made of water-proof canvas, bound with leather; leather shoulder-strap. U. S. Fish Commission. (C., B. & M.). 42,850.

## HEAD-NET.

Folding mosquito and black fly-net. U. S. Fish Commission. 42,851.

## PARKER POCKET-SCALE.

U. S. Fish Commission. 57,680. Used for weighing fish, &c.

## ANGLER'S POCKET-SCALE. (Parker's patent.)

Folding handle. U. S. Fish Commission. 57,680 (a).

## NOVELTY-POCKET SCALE.

Patented February 26, 1878. Place the pail or basket on the hook, bring the sliding shell down to O, then weigh the matter, and you get its exact weight without subtracting the weight of the receptacle. Weighs up to 15 pounds. U. S. Fish Commission. 57,681.

## RANGELEY TROUT.

Pencil sketch on birch-bark. Trout weighed  $9\frac{1}{2}$  pounds. Caught October 10, 1877, by Henry O. Stanley. Dixfield, Me., 1877. 56,943. Gift of Henry O. Stanley.

## A CAN OF BONELESS HAM.

Seven and one-half pounds. U. S. Fish Commission. 56,848.

## A PACKAGE OF HECKER'S SELF-RAISING GRIDDLE-CAKE FLOUR.

Six pounds. U. S. Fish Commission. 57,622.

## C.—APPARATUS TO A GREATER OR LESS EXTENT AUTOMATIC.

### V.—NETS.

#### 17. ENTANGLING NETS.

##### MESHING-NETS (ENTANGLING IN MESHES).

FIXED NETS (NETS HELD IN POSITION BY MEANS OF STAKES OR ANCHORS).

##### WHITEFISH GILL-NET.

Model, scale 1 inch to foot. Strung between driven stakes and hung to wooden floats that keep the net from sagging. Waukegan, Ill., 1876. 25,751. Gift of J. W. Milner. These nets are used in Lake Michigan for the capture of whitefish.

##### SHAD GILL-NET.

Model. American Net and Twine Company, Boston and New York. 26,126. Used in rivers of the Atlantic coast.

“These nets are knit of linen thread (22–50, 3-cord, and 20–60, 2-cord). They range in length from 50 to 200 fathoms, and in depth from 25 to 90 meshes,  $4\frac{3}{4}$  to 5 inch mesh. They are used exclusively as drift-nets. On the Connecticut River about 4,000 pounds of this netting are used annually. The average weight of a net is 30 to 40 pounds, its depth 45 to 50 meshes,  $5\frac{1}{4}$  to  $5\frac{1}{2}$  inches. On the Hudson River about 7,500 pounds are annually used, fine-threads 50–75, 2-cord), 100 to 200 fathoms in length, and from 50 to 90 meshes in depth,  $4\frac{3}{4}$  to 5 inch, weight from 15 to 30 pounds to the net. In the Delaware, Potomac, and Chesapeake 20,000 pounds are used, from 30 to 60 meshes in depth, and  $5\frac{1}{8}$  (30 to 40, 2-cord) length, 75 to 100 fathoms. In the rivers of North Carolina nets are made from coarse twine (22–35, 3-cord, and 20–35, 2-cord) 25 to 40 meshes in depth,  $5-5\frac{1}{2}$  gauge; their length is about 100 yards. About 25,000 pounds are used annually. In the rivers of South Carolina the twine is slightly finer than in North Carolina (25–35, 3-cord), 25 to 60 meshes deep, the size otherwise about the same; 1,500 pounds are used annually. In Georgia and Florida about 6,000 pounds are used. This netting is knit from linen thread (30–40, 3-cord, and 25–35, 2-cord) 40 to 60 meshes in depth;  $4\frac{3}{4}$  to  $5\frac{1}{4}$  mesh. About 18 to 24 pounds are used in a net; its length, 100 yards.”—(A. A. French.)

**HERRING GILL-NET.**

Rigged for use;  $2\frac{1}{4}$ -inch mesh; inner and outer buoys; middle or watch buoy; stone killicks and warps. Length of net 20 fathoms, 150 meshes deep. Rockport, Mass., 1882. 54,542 to 54,548. U. S. Fish Commission. Common style of herring gill-net used at Cape Ann and other parts of New England.

**HERRING-NET.**

Tanned cotton,  $2\frac{1}{2}$ -inch mesh, 14-6 twine, fully mounted. Exhibited by the American Net and Twine Company, Boston, Mass.

**HERRING-NET.**

Tanned cotton,  $2\frac{1}{2}$ -inch mesh, 10-4 twine, fully mounted. Exhibited by the American Net and Twine Company, Boston, Mass.

**COD GILL-NET.**

Hung complete, with glass floats; tanned linen twine No. 40; mesh, 9 inches. Length, 150 yards straight, 113 yards hung; depth, 18 meshes. U. S. Fish Commission. Gill-nets for the capture of cod have been used in the vicinity of Cape Ann since the winter of 1878-'79. During the winter of 1882-'83 they were used to much advantage, because of a scarcity of bait.

**MINNOW-NET.**

Pyramid Lake, Nevada. S. Powers. 19,048.

**GILL-NET.**

Anderson River Eskimo. Anderson River, Hudson Bay Territory. R. Macfarlane. 1,667.

**GILL-NET MADE OF ANIMAL FIBER.**

Kawquettle Indians. Vancouver's Island, British Columbia. Dr. T. T. Minor. 7,962.

**GILL-NET.**

Cooyuwee Pai Ute Indians. Pyramid Lake, Nevada. Stephen Powers. 19,043.

**GILL-NET MADE OF "BABICHE."**

Anderson River Indians. Mackenzie's River district, Hudson Bay Territory. R. Macfarlane. 4,765.

**GILL-NET OF "BABICHE."**

Fort Anderson, Mackenzie's River. R. Macfarlane. 4,793.

## DRIFT-NETS (NETS DRIFTING ACROSS THE TIDE).

## SALMON-NET.

Made of the fiber of the common stinging nettle, (*Urtica dioica*, L.). Stretched on light square frame at the end of a long pole. To the point of the net is fastened a bunch of thin narrow strips of white wood, which apparently acts as a lure. Made by the Quilleute Indians, about 30 miles south of Cape Flattery. Pole, 13 feet long. Net, 5 feet square, 40 inches deep, mesh 5 inches. Washington Territory, 1883. 72,835. James G. Swan, Port Townsend, Wash. Used by one canoe drifting down the river at night.

## SALMON-NET FOR DRIFTING.

Made of the fiber of the common stinging nettle (*Urtica dioica*, L.). Stretched between the ends of two long poles. To the point of the net is fastened a bunch of thin narrow strips of white wood, which apparently acts as a lure. Made by the Quilleute Indians, about 30 miles south of Cape Flattery. Pole, 14½ feet long. Net, 8 feet 6 inches spread, 33 inches wide, 5 feet deep, mesh 5 inches. Washington Territory, 1883. 72,834. James G. Swan, Port Townsend, Wash. Used by two canoes drifting down the river at night.

## PHOTOGRAPHS, DRAWINGS, AND PAINTINGS, ILLUSTRATIVE OF THE GILL-NET FISHERY.

## WHITEFISH GILL-NETS.

Photographic view of dock and shore-buildings belonging to fishermen engaged in the fisheries of the Great Lakes, showing whitefish and herring gill-nets wound upon reels to dry. Size, 8 by 10 inches. Alpena, Mich., 1882. (779) 2,235. U. S. Fish Commission.

## NET-REELS.

Photograph showing reels used for holding stake gill-nets when not in use. The reels are made of open work, and the nets, as soon as they are landed, are wound upon them, where they dry very quickly. Size, 8 by 10 inches. Alpena, Mich., 1882. (782) 2,237. U. S. Fish Commission.

## WHITEFISH GILL-NETS.

Photograph showing dock and shore-buildings belonging to fishermen engaged in the fisheries of the Great Lakes, with whitefish and herring gill-nets wound upon reels to dry. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Alpena, Mich., 1882. (779) 2,235. U. S. Fish Commission.

## NET-REELS.

Photograph showing reels used for holding gill-nets when not in use. The reels are made of open work, and the nets, as soon



## NET-REELS—Continued.

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## NORTH CAROLINA STURGEON CAMP.

A crayon sketch showing a barge with small shanties at either end, and a crew of sturgeon fishermen engaged in killing sturgeon to be iced for shipment to New York. The sturgeon are usually caught in gill-nets and brought to the camp, where they are tied by the tail to stakes driven in the mud along the river bank and kept until butchering day arrives. They are then killed, the tails being first chopped off, after which the heads, viscera, and skins are removed, and the fish packed in ice to cool. The following morning they are repacked in boxes, loaded on a small vessel, and carried to the steamboat-wharf for shipment. Size 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

## GILL-NET FISHING.

Photograph of John Connelly hauling herring-nets into a dory. Size, 8 by 10 inches. Taken at Rockport, Mass., September, 1882. (57) 1,829. U. S. Fish Commission.

## OVERHAULING HERRING-NETS.

Photograph of Frank Marble and John Hodgdon, just returned from herring-fishing, overhauling their nets in the dory, which is stranded on Niles's Beach. Size, 8 by 10 inches. Gloucester, Mass., 1882. (475) 2,034. U. S. Fish Commission.

## HERRING NET-FISHING.

Photographic view of fishermen engaged in fishing with herring gill-nets from Irish boat; showing the method of hauling and picking. Size, 8 by 10 inches. Gloucester, Mass., 1882. (437) 2,006. U. S. Fish Commission.

## HERRING NET-FISHING.

Photograph of schooner Valiant, of Friendship, Me., sailing out of Portland Harbor, with all of her apparatus and outfit, for engaging in the herring fishery with gill-nets, at Wood Island, Me. Many of the small vessels along the coast of Maine go to Portland to fit out for this fishery. Size, 8 by 10 inches. Taken at the mouth of Portland Harbor, 1882. (129) 1,866. U. S. Fish Commission.

## MENDING HERRING-NETS.

Photograph showing crew of schooner Aroline, of Bremen, Me., detained in Portland Harbor by storm while on her way to the herring fishing-grounds off Wood Island, Me. The crew are employing their time in overhauling and mending their nets, which have been spread out on the ground for that purpose. It is a common practice among fishermen to mend their nets while detained in harbor by bad weather on their way to the fishing-grounds. Size, 8 by 10 inches. Taken at House Island, near Portland, Me., 1882. (115) 1,860. U. S. Fish Commission.

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## FISHING HERRING-NETS.

A crayon sketch showing two fishermen engaged in hauling their nets into a common net-boat, removing the fish as the nets are hauled in. The view shows the common method of setting and hauling nets on the coast of Maine. They are usually set at night and allowed to remain until daybreak the following morning, when they are hauled, the fish removed, and the nets mended and spread out on the shore to dry. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott and J. W. Collins.

## GILL-NET FISHING.

Photograph of men employed in setting gill-nets for night-fishing, at the mouth of the Susquehanna River; showing a portion of the net in the water and a lantern at the end, which enables the fishermen to find the net in the darkness. Size, 8 by 10 inches. Havre de Grace, Md., 1877. 2,250. U. S. Fish Commission.

## DRIFTING FOR MACKEREL.

A night scene (painted in oil) showing the crew of a Maine mackerel schooner engaged in fishing for mackerel with gill-nets. The view shows the vessel "swinging to the nets," with a light in the rigging and mainsail set, while one of the crew is out in a dory with a flash-light signaling a passing vessel away from the nets, which would be seriously injured by her running over them. Size, 30 by 40 inches.

## POCKET NETS (ENTANGLING IN POCKETS).

## TRAMMEL-NET.

Model of trammel-net, 10 feet long, 2 feet wide, 2 and 5 inch mesh. William E. Hooper & Sons, Baltimore, Md. 25,270.

## TRAMMEL-NET.

American Net and Twine Company. 26,118, 26,129. "Used for general fishing in rivers and ponds of Northern Mississippi Valley. These nets range from 20 to 75 yards in length, 4 to 6½ feet in depth; the inside netting of finer linen thread (20-25, 3-cord), mesh 2-2¼, ⅓ deeper than the outside. The outside netting-wall from cotton (15-21 thread), mesh 8 to 10 inches."—(A. A. French.)

## 18. ENCIRCLING NETS.

## HAUL-SEINES.

## HERRING-SEINES.

Models of herring-seines. Used on coasts of New England and the Provinces in capture of herring (*Clupea harengus*), and in the Hudson, Potomac, Delaware, and Chesapeake, and in North

## HERRING-SEINES—Continued.

Carolina. American Net and Twine Company, Boston, Mass. 26,119, 26,127.

## COD-SEINE.

Model of cod-seine. Used in British Provinces in capture of cod (*Gadus morrhua*). American Net and Twine Company, Boston and New York. 30 to 40 feet deep. Mesh 5 inches, 18 to 21 thread, cotton. 26,137.

## RIVER-SEINE.

One river-seine, 100 feet long, 8 to 10 feet deep, 2½-inch mesh, 12½ patent twine, tanned and fitted complete. Exhibited by the American Net and Twine Company, Boston, Mass.

## BAIRD COLLECTING-SEINE.

Baird net. Designed by Prof. S. F. Baird. Used by naturalists in collecting small fishes in brooks and ponds, and in following behind large seines to secure the small species which escape through the meshes, 6-thread coarse cotton. American Net and Twine Company, Boston, Mass. 26,136.

## BAIRD NET.

Model of Baird net. American Net and Twine Company, Boston, Mass. 26,126.

## BAIT-SEINE.

Model of minnow-seine. Used by amateurs in capture of minnow-bait; ½ to ⅝ inch mesh, 6-thread cotton twine. American Net and Twine Company, Boston, Mass. 26,123, 26,130.

## BAIT-SEINE.

Model of minnow-seine, with bag. Used by fishermen to secure-bait for eel-pots. American Net and Twine Company, Boston, Mass. 26,121.

## SEINES USED BY INDIANS AND ESKIMO.

Seine. Anderson River Eskimo. Mackenzie's River district. Robert Macfarlane. 2,232.

Seine made of "babiche." Tschuktchi tribe. Capt. John Rodgers, U. S. N., North Pacific Exploring Expedition. 2,444.

Seine made of "babiche." Tschuktchi tribe. Capt. John Rodgers, U. S. N., North Pacific Exploring Expedition. 2,445.

Hand-seine, made of grass. Tschuktchi tribe. Capt. John Rodgers, U. S. N., North Pacific Exploring Expedition. 2,446.

Hand-seine, made of grass. Tschuktchi tribe. Capt. John Rodgers, U. S. N., North Pacific Exploring Expedition. 2,447.



## SEINES USED BY INDIANS AND ESKIMO—Continued.

- Salmon-net. McCloud River Indians. Shasta County, California. Livingston Stone. 19,234.
- Salmon-net, with wooden floats and stone sinkers. Indians of Northwest coast. Fort Simpson, B. C. J. G. Swan. 20,648.
- Hand-seine. Anderson River Eskimo. Mackenzie's River district, H. B. T. R. Kennicott. 2,231.
- Fishing-net. Made from fibers of pineapple (*Tillandsia* sp.). Mirador, Mex. Dr. Sartorius. 7,929.
- Fishing-net made of willow bark. Kootchin Indians. Mackenzie's River district. R. Kennicott. 897.
- Net made of "silkweed." Fort Crook Indians. Fort Crook, Cal. Capt. J. W. T. Gardiner. 4,883.

## PHOTOGRAPHS, DRAWINGS, AND PAINTINGS ILLUSTRATIVE OF THE HAUL-SEINE FISHERY.

## HAULING SHAD-SEINE.

- Photograph similar to 2,146 (660), from a nearer point, and after the seine is nearer the beach. Size, 8 by 10 inches. Havre de Grace, Md., 1882. (663) 2,148. U. S. Fish Commission.

## WHITE-FISH SEINE AND REEL.

- Photograph of a seine used on the Great Lakes in catching lake herring and whitefish, wound on a reel to dry. This is the common method of drying seines used in the fisheries of the Great Lakes. Size, 8 by 10 inches. Detroit, Mich., 1882. (749) 2,210. U. S. Fish Commission.

## SEINING WHITEFISH.

- Photograph showing fishermen in the act of turning their catch, from the seine into the inclosure where the fish are to be kept until the price advances sufficiently to warrant their shipment to market. Size, 8 by 10 inches. Detroit, Mich., 1882. (753) 2,213. U. S. Fish Commission.

## WHITEFISH SEINING.

- Photograph of Detroit fishermen engaged in hauling seine for whitefish; showing the methods usually employed in seine-fishing on the Great Lakes. Size, 8 by 10 inches. Belle Isle, Detroit River, Mich. (732) 2,196. U. S. Fish Commission.

## SEINING SHAD AND ALEWIVES.

- Photograph showing the landing of a seine, with an enormous draught of shad and alewives, at the Sutton Beach fishery, Albemarle Sound. The catch is so large that men are obliged to wade in the water behind the seine to assist in getting it ashore without breaking it. Size, 8 by 10 inches. Avoca, N. C., 1877. 2,253. U. S. Fish Commission.

## LOADING SHAD-SEINE.

Photograph showing men engaged in loading a large shad-seine on a boat at the Capehart fishery, in Albemarle Sound, preparatory to shooting it. Size, 8 by 10 inches. Avoca, N. C., 1877. 2,251. U. S. Fish Commission.

## HAULING SHAD-SEINE.

Photograph showing fishermen in the act of landing a seine fished for shad and herring in the Susquehanna River. Size, 8 by 10 inches. Havre de Grace, Md., 1882. (662) 2,147. U. S. Fish Commission.

## DRESSING ALEWIVES.

Photograph of a gang of negroes cutting and washing alewives that have been caught in a seine at the Capehart fishery on Albemarle Sound. Size, 8 by 10 inches. Avoca, N. C., 1877. 2,252. U. S. Fish Commission.

## LOADING SHAD-SEINE.

Photograph showing men engaged in loading a large shad-seine on a boat at the Capehart fishery in Albemarle Sound, preparatory to shooting it. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Avoca, N. C., 1877. 2,251. U. S. Fish Commission.

## SEINING SHAD AND ALEWIVES.

Photograph showing a seine with an enormous catch of shad and alewives, being landed at the Sutton Beach fishery, Albemarle Sound. The catch is so large that men are obliged to wade in the water behind the seine to assist in getting it ashore without breaking it. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Avoca, N. C., 1877. 2,253. U. S. Fish Commission.

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Photograph showing fishermen in the act of landing a seine fished for shad and herring in the Susquehanna River. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Harve de Grace, Md., 1882. (662) 2,147. U. S. Fish Commission.

## LAYING OUT SHAD-SEINE.

An India-ink sketch, showing a fishing crew engaged in shooting a shad seine in North Carolina waters. The seine is upwards of a mile in length, one-half of it being loaded on a small paddle-wheeled steamer, while the other half is loaded on a twenty-four oared seine-boat. The two boats proceed to the stake which marks the center of the fishing-ground, a mile or more from the shore; when they proceed in opposite directions, paying out the seine as they go, and carrying the line to the beach, where it is attached to drums worked by steam-engines which are employed in hauling the seine. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

## TRAILING NETS.

## BEAM TRAWL.

For dragging along the bottom at a distance from the shore. 32,720. Made by J. G. Adam. U. S. Fish Commission.

## PURSING NETS.

## PURSE-SEINE.

One hundred and sixty-five fathoms long, 10 fathoms or 500 meshes deep,  $2\frac{3}{8}$ -inch mesh; made of No. 10 twine. American Net and Twine Company, Boston, Mass. These purse-seines range in length from 120 to 220 fathoms, and from 500 to 1,000 meshes in depth, reaching the depth of 20 to 30 fathoms of water. The average mesh is  $2\frac{1}{8}$  inches. They are made of fine Sea-Island cotton twine, and cost from \$750 to \$1,500 complete. About 300 are now in use on the coast of North America. The pursuing weight varies from 100 to 150 pounds.

## HERRING PURSE-SEINE.

American Net and Twine Company, Boston, Mass. 32,781.

## MACKEREL PURSE-SEINE.

Model of purse-seine. George Merchant, Gloucester, Mass.

## PHOTOGRAPHS, DRAWINGS, AND PAINTINGS, ILLUSTRATIVE OF THE PURSE-NET FISHERY.

## PURSE-SEINE ON SEINE-BOAT.

Photograph of the seine-boat belonging to schooner E. W. Merchant, of Gloucester, Mass; fully manned; showing the seine properly stowed in the boat, ready to be "shot." Size, 8 by 10 inches. Taken at Rockport, Mass., 1882. (62) 1,831. U. S. Fish Commission.

## MACKEREL CRUISING.

Photographic view of a fleet of thirty or forty schooners, engaged in the mackerel purse seine fishery, cruising about on the fish-

## MACKEREL CRUISING—Continued.

ing-grounds in search of mackerel. The picture shows the number of vessels that frequently cruise in a small area. Size, 8 by 10 inches. Massachusetts Bay, 1882. (277) 1,940. U. S. Fish Commission.

## OVERHAULING PURSE-SEINE.

Photograph of schooner James Bliss, of Gloucester, engaged in the purse-seine mackerel fishery, showing men on deck overhauling the seine preparatory to loading it on the seine-boat. Size, 8 by 10 inches. Massachusetts Bay, 1882. (288) 1,946 *a*. U. S. Fish Commission.

## LOADING PURSE-SEINE ON SEINE-BOAT.

Photograph of schooner James Bliss, engaged in the mackerel purse-seine fishery, with men transferring seine from the vessel's deck to a seine-boat, which is being towed alongside, preparatory to setting it. Size, 8 by 10 inches. Massachusetts Bay, 1882. (287) 1,947. U. S. Fish Commission.

## DRESSING MACKEREL.

Photograph of schooner Laura Nelson, Gloucester, Mass., showing the crew engaged in dressing mackerel on deck, the vessel being under sail at the time. Size, 8 by 10 inches. Massachusetts Bay, 1882. (265) 1,935. U. S. Fish Commission.

## DRESSING MACKEREL.

Photograph of schooner Frank Foster, of Gloucester, Mass., with 200 barrels of mackerel on deck, and crew actively engaged in splitting and gibbing them. Size, 8 by 10 inches. Taken at Gloucester, Mass., 1882. (321) 1,968. U. S. Fish Commission.

## DRESSING MACKEREL.

A photograph similar to (321) 1,968, showing starboard side of the same vessel, with a portion of the crew at work. Size, 8 by 10 inches. Gloucester, Mass., 1882. (316) 1,966. U. S. Fish Commission.

## DRESSING MACKEREL.

A photographic view similar to (321) 1,968, showing the port side of same vessel, with portion of the crew at work. Size, 8 by 10 inches. Gloucester, Mass., 1882. (318) 1,967. U. S. Fish Commission.

## MACKEREL LOOKOUT.

Photograph of schooner Mabel Dilloway, of Gloucester, Mass., cruising on the mackerel fishing grounds; showing man aloft looking for a school of fish. Size, 8 by 10 inches. Massachusetts Bay, 1882. (268) 1,936. U. S. Fish Commission.



## MENHADEN FISHING.

Photograph of deck of menhaden steamer, showing the method of carrying the fish in the holds. Size, 8 by 10 inches. Tiverton, R. I., 1882. (409) 1,990. U. S. Fish Commission.

## SALTING SEINE.

Photograph of menhaden steamer, showing men engaged in overhauling and salting the purse-seine to prevent it from heating and rotting when left in a pile; also, a gang of shoresmen engaged in unloading steamer. Size, 8 by 10 inches. Tiverton, R. I., 1882. (411) 1,991. U. S. Fish Commission.

## MACKEREL LOOKOUT.

Photograph of schooner Mabel Dilloway, of Gloucester, Mass., cruising on the mackerel fishing-ground; showing man aloft looking for a school of fish. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Massachusetts Bay, 1882. (268) 1,936. U. S. Fish Commission.

## DRESSING MACKEREL.

Photograph of schooner Frank Foster, of Gloucester, Mass., with 200 barrels of mackerel on deck, and crew actively engaged in splitting and gibbing them. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Taken at Gloucester, Mass., 1882. (321) 1,968. U. S. Fish Commission.

## DRESSING MACKEREL.

Photographic view similar to (321) 1,968, showing the port side of same vessel with portion of the crew at work. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Gloucester, Mass. (318) 1,967. U. S. Fish Commission.

## DRESSING MACKEREL.

Photograph of schooner Laura Nelson, of Gloucester, Mass., showing the crew engaged in dressing mackerel on deck, the vessel being under sail at the time. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Massachusetts Bay, 1882. (265) 1,935. U. S. Fish Commission.

## MACKEREL POCKET OR SPILLER.

India-ink sketch of a New England fishing vessel, provided with a mackerel pocket, which hangs suspended from the side of the vessel reaching to the depth of 7 or 8 feet below the surface, the upper part of the netting ascending 2 or 3 feet above. The pocket was introduced into the mackerel-seine fishery in 1878 for holding the surplus catch which would otherwise spoil before being cleaned and salted. Prior to the introduction of

## MACKEREL POCKET OF SPILLER—Continued.

the pocket a large part of the catch was often thrown away; but now the surplus mackerel are emptied into the pocket where they remain alive and in good condition until the fishermen can care for them. Size, 30 by 40 inches. Washington, D. C., 1882. H. W. Elliott & J. W. Collins.

## BAILING-IN MACKEREL.

An oil-painting of a Gloucester mackerel schooner, showing the crew engaged in bailing the mackerel on deck after they have been caught in a purse-seine. The cork-lines on one side of the seine are thrown over the vessel's rail, and members of the crew are engaged in hoisting in the fish by means of long-handled dip-nets which are worked by pulleys fastened in the rigging. The remainder of the crew are in the seine-boat "drying up" the net and gradually bringing the fish into a more compact mass near the vessel. Size, 26 by 40 inches.

## DRYING-UP MENHADEN-SEINE.

An oil-painting showing the crew of a menhaden steamer engaged in pursing-up their seine, containing a large school of menhaden. One man from a small boat is holding a portion of the cork-line to prevent the fish from jumping it; two others are reducing the size of the net by drawing it into the boat, while the remainder of the crew are pulling on the purse-line. Size, 30 by 54 inches.

## CAST-NETS.

Mullet cast-nets.

Bait cast-nets.

Casting-net. Diameter,  $4\frac{1}{2}$  feet. 25,046. William E. Hooper & Sons, Baltimore, Md.

Mullet cast-net. Diameter,  $5\frac{1}{2}$  feet,  $1\frac{1}{2}$ -inch mesh. 26,799.

Shrimp cast-net. Diameter,  $1\frac{1}{2}$  feet,  $\frac{3}{4}$ -inch mesh. 26,800.

## LIFTING NETS.

## LOBSTER-NET. (Model.)

A hoop-net, with cross-hoops on top; hook for bait; warp and float. Diameter,  $6\frac{1}{2}$  inches. U. S. Fish Commission. 26,592.

## LOBSTER-NET.

Home-made. A crude net, rigged with a common iron barrel-hoop; wooden bows, with bait-hook suspended. New Bedford, Mass., 1882. 56,944. Gift of Benjamin Baker, 2d. This style of net is made and used by longshoremen and boys for fishing from the wharves, &c.

**LOBSTER-NET.**

Full size; an iron hoop, 3 feet diameter; rigged with tanned netting, 2-inch mesh; wooden bow on top. Rockport, Me., 1882. 54,428. U. S. Fish Commission.

**OPEN CUNNER-NET.**

A funnel-shaped net, rigged on two iron hoops 25 and 34 inches in diameter; ring for bait in center. Gloucester, Mass., 1878. 32,710. Collected by G. Brown Goode. These nets are baited with codfish heads or other bait, and used in the capture of cunners (*Tautogolabrus adspersus*).

**FOLDING CUNNER-TRAP.**

An iron hoop, 3 feet in diameter, with second hoop hinged to it and folding in two parts over it, covered with netting. A small hoop, 15 inches in diameter, near bottom of net. Gloucester, Mass., 1878. 32,711. Collected by G. Brown Goode. This kind of trap is used chiefly by the Irish boat-fishermen of Boston in the capture of cunners (*Tautogolabrus adspersus*) for the Boston market.

**19. PARTS OF NETS, APPARATUS OF MANUFACTURE, AND NET PRESERVATIVES.****ACCESSORIES TO PURSE-SEINES.****DAVIT-IRON.**

Made of galvanized iron. Used in Cape Ann seine-boats. The purse-blocks hook into it. Middletown, Conn. 25,166. Wilcox, Crittenden & Co.

**SNATCH-BLOCK FOR PURSE-SEINES.**

Made of galvanized iron. Used on seine-boats for pursing mackerel and mehaden seines. Gift of Higgins & Gifford. 25,179.

**SEINE-BLOCK.**

Brown's patent. Made of galvanized iron. Used on seine-boats for pursing the mackerel-seine. Middletown, Conn. 29,432. Wilcox, Crittenden & Co.

**SEINE-BOAT BLOCK.**

Made of galvanized iron. The first style of metallic seine-boat block used at Gloucester, Mass. Middletown, Conn. 29,462. Wilcox, Crittenden & Co.

**PURSE-SEINE BLOCK.**

Original design of Merchant's patent, 1882. A galvanized-iron block, oval shell, single sheave. Gloucester, Mass., 1882. 54,321. Made by Wilcox, Crittenden & Co. This purse-block,

**PURSE-SEINE BLOCK—Continued.**

the improved pattern of which is shown in another place, was intended to take the place of lead rings at the foot of mackerel-seines.

**SEINE-BLOCK.**

Made of galvanized iron. In general use along the New England coast for pursing the mackerel-seine. Varies slightly from the Higgins & Gifford or Cape Ann pattern, and meets with about the same favor. Middletown, Conn. 54,711. Wilcox, Crittenden & Co.

**IMPROVED SEINE-BLOCK.**

Used in connection with purse-seines. Exhibited by Bagnall & Loud, Boston, Mass.

**SEINE-POCKET BECKETS.**

Two rings of galvanized iron joined together. Wilcox, Crittenden & Co. 54,318, 54,319. Used for coupling the seine to the pocket while the mackerel are being turned into the pocket. The original wooden pattern, designed by Capt. George Merchant, of Gloucester, Mass., is also shown.

**SEINE PURSE-RINGS.**

Series of five patterns of galvanized iron and copper rings. Gloucester, Mass., 1880-'82. 54,555. Gift of Capt. George Merchant, jr. These rings are fitted on the foot of a mackerel-seine and the pursing line passes through them. The smallest ring was the common size in 1854, the largest ones are those still in use.

**SEINE PURSE-RING.**

Series of galvanized iron and brass rings, round and oval shape, used on purse-seines in different parts of the New England coast. Wilcox, Crittenden & Co. 54,323.

**SEINE PURSE-RING.**

Beaman's patent. Made of brass, with roller, to prevent chafing of the purse-line. Wilcox, Crittenden & Co., 1882. 54,317. Salt water easily corrodes this ring, making it generally unsuitable for use on seines; it is sometimes used on Gloucester vessels for the clew-line of the gaff topsail.

**NETTING.****UNTANNED NETTING.****WHITE NETTING.**

Cotton; quality of twine,  $\frac{2}{6}$ c; size of mesh,  $\frac{1}{2}$  inch. Made by H. & G. W. Lord, Boston, Mass. 54,556. Used by amateurs in all parts of the United States for small dip-seines and dip-nets to capture shiners and minnows for pickerel bait.



## WHITE NETTING.

Cotton; quality of twine,  $\frac{2}{6}C$ ; size of mesh,  $\frac{3}{4}$  inch. Made by H. & G. W. Lord, Boston, Mass. 54,557. Used in all parts of the United States for haul-seines, 10 to 15 feet long by 3 to 5 feet deep, for catching small fish for bait, and also for dip-nets.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{2}{9}C$ ; size of mesh, 1 inch. Made by H. & G. W. Lord, Boston, Mass. 54,558. Used in Maine and the British Provinces principally for haul-seines, 15 to 25 fathoms long by 12 to 15 feet deep, for the capture of smelts and sardines.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{2}{10}C$ ; size of mesh,  $1\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,559. Used chiefly in the British Provinces for haul-seines and traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{5}C$ ; size of mesh,  $1\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,560. Used in many parts of the United States for haul-seines for capelin and traps for herring.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{2}C$ ; size of mesh,  $1\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,561. Used in New England for pounds and traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{9}C$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,562. Used in New England for bunts of mackerel purse-seines, and in the Southern States for purse-seines for small menhaden.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{8}$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,563. Used for pound-cribs, mackerel-seine pockets, mackerel-seine, scoop-nets, and dip-nets.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{6}H$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,564. Used for wings of seines and for mackerel purse-seines set in shoal water.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{2}{9}$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,565. Used in New England for middles of small purse-seines for mackerel, and in Maryland and Virginia for wings of mendaden purse-seines.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{2}{12}$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,566. Used in New England mostly for bunts of mackerel purse-seines, and in Southern States for menhaden seines.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{6}H$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,567. Used near the bunts and sometimes for the whole wings of mackerel purse-seines, and for herring gill-nets.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{2}{6}H$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,568. Extensively used for wings of mackerel purse-seines.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{2}{12}C$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,569. Used for bunts of mackerel purse-seines, and for small haul-seines for perch and other fish in rivers and ponds.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{6}S$ ; size of mesh,  $2\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,570. Used on the Western Lakes for white fish and trout pound-traps, and on the Atlantic coast for fish-traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{2}S$ ; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,572. Used for drag-seines, pounds, and traps, and bunts of menhaden purse-seines.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ ; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,573. Used for capelin-seines, wings of haul-seines, and on Long Island and New Jersey coast for middles of menhaden purse-seines.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{2}$ ; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,574. Used for pounds, traps, fyke-nets, and all kinds of drag and haul seines.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{5}$ ; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,575. Very generally used for fish pounds and traps in all parts of the United States.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{18}$ ; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,576. Used in the United States for cribs of pounds and traps, and in Nova Scotia for bunts of cod-seines.

## WHITE NETTING.

Cotton: quality of twine,  $\frac{1}{21}$ ; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,577. Not much sold now, but formerly used for pounds and traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{2}{6}H$ ; size of mesh,  $2\frac{3}{8}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,571. Used in the United States and the British Provinces for herring gill-nets.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ ; size of mesh,  $2\frac{5}{8}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,578. Used on the Long Island coast for centers of menhaden purse-seines, and on the Carolina coast for leaders to shad and other fish-traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{2}S$ ; size of mesh,  $2\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,579. Used on the Western Lakes for haul-seines, and pounds and traps for whitefish and trout.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ ; size of mesh, 3 inches. Made by H. & G. W. Lord, Boston, Mass. 54,580. Used for wings of drag and haul seines, light leaders for turning fish into traps, and for stop-nets.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{2}$ ; size of mesh, 3 inches. Made by H. & G. W. Lord, Boston, Mass. 54,581. Not much sold now, but formerly used for wings of haul-seines and other netting purposes.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{8}$ ; size of mesh, 3 inches. Made by H. & G. W. Lord, Boston, Mass. 54,582. Used in Nova Scotia for hearts and leaders of pounds and traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{5}$ ; size of mesh,  $3\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,583. Used on the Western Lakes and in the British Provinces for pounds and traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{8}$ ; size of mesh,  $3\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,584. Used on the Western Lakes and in the British Provinces for pounds and traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{6}$ ; size of mesh, 4 inches. Made by H. & G. W. Lord, Boston, Mass. 54,585. Used for cod-seines in Newfoundland, and in the United States for whitefish traps and bluefish gill-nets.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{8}$ ; size of mesh,  $4\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,586. Not much sold now, but formerly used for leaders to pounds and traps.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{2}$ ; size of mesh, 5 inches. Made by H. & G. W. Lord, Boston, Mass. 54,587. Used for drag-seines and bluefish gill-nets.

## WHITE NETTING.

Cotton; quality of twine,  $\frac{1}{2}$ ; size of mesh, 6 inches. Made by H. & G. W. Lord, Boston, Mass. 54,588. Used for leaders to many kinds of pounds and traps.

## SERIES OF SAMPLES OF GILL-NETTING.

One piece, 300 yards long,  $2\frac{1}{2}$ -inch mesh, 9-thread half patent-laid twine, colored red.

One piece, 300 yards long,  $2\frac{1}{2}$ -inch mesh, 9-thread half patent-laid twine, colored blue.

One piece, 1,000 yards long, 3-inch mesh, 12-thread half-patent twine.

One piece, 300 yards long, 3-inch mesh, 18-thread half-patent twine.

One piece, 100 yards long by 150 meshes deep,  $2\frac{1}{2}$ -inch mesh, 14-6 hawser twine.

One piece, 100 yards long by 150 meshes deep, 2-inch mesh, 9 half patent twine.

One piece, 100 yards long by 150 meshes deep, 2-inch mesh, 6 half-patent twine.

One piece, 100 yards long by 100 meshes deep, 3-inch mesh, 12 half-patent twine.

One piece, 100 yards long by 150 meshes deep,  $2\frac{1}{2}$ -inch mesh, 10-4 hawser twine.

One piece, 100 yards long by 150 meshes deep,  $2\frac{1}{4}$ -inch mesh, 20-5 hawser twine.



## SERIES OF SAMPLES OF GILL-NETTING—Continued.

- One piece, 100 yards long by 150 meshes deep,  $2\frac{5}{8}$ -inch mesh, 20-12 cable twine.
- One piece, 100 yards long by 150 meshes deep, 3-inch mesh, 20-9 cable twine.
- One piece, 100 yards long by 150 meshes deep,  $2\frac{1}{2}$ -inch mesh, 15-9 half-patent twine. Exhibited by the American Net and Twine Company, Boston, Mass.

## TANNED NETTING.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{2}{6}C$ ; size of mesh,  $\frac{3}{4}$  inch. Made by H. & G. W. Lord, Boston, Mass. 54,589. Used for small haul-seines, 10 to 15 feet long by 3 to 5 feet deep, to capture minnows for bait, and for bags and dip-nets.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{2}{9}C$ ; size of mesh, 1 inch. Made by H. & G. W. Lord, Boston, Mass. 54,590. Used in Maine and the British Provinces for haul-seines to capture smelts and sardines.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{2}{12}C$ ; size of mesh,  $1\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,591. Used in Maine and the British Provinces for haul-seines and traps for smelts.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ ; size of mesh,  $1\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,592. Used for capelin haul-seines and very generally for netting purposes.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{6}H$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,593. Used chiefly for wings of small purse-seines for mackerel.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,594. Used for haul-seines, bunts of mackerel purse-seines, and wings of menhaden purse-seines.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{18}$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,595. Used for pound-cribs, mackerel seine-pockets, and mackerel scoop and bail nets.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{2}{1\frac{1}{2}}C$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,597. Used chiefly for bunts of mackerel purse-seines, and sometimes in Virginia for menhaden purse-seines.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{1\frac{1}{2}}$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,598. Very generally used for herring and mackerel traps, bunts of seines, and for fyke-nets, &c.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{1\frac{1}{2}}$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,599. Very generally used, especially for haul-seines, fyke-nets, and cribs for herring and mackerel pounds and traps.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{1\frac{1}{2}}$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,600. Very generally used, especially for haul-seines, drag-seines, fyke-nets, and cribs for herring and mackerel pounds and traps.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{6}H$ , size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,601. Used for herring gill-nets and wings of mackerel purse-seines.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{2}{6}H$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,602. Extensively used for herring gill-nets and wings of mackerel purse-seines.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{2}{1\frac{1}{2}}H$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,603. Used for bunts of mackerel purse-seines and for the small haul-seines.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{2\frac{1}{2}}$ ; size of mesh,  $2\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,604. Used along the Atlantic coast for fish traps and pounds.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{2}{6}H$ ; size of mesh,  $2\frac{3}{8}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,605. Very generally used in the United States and the British Provinces for herring gill-nets.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{1}{12}$ S; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,606. Very common size in use along the Atlantic coast for wings of haul-seines, around the bunts of mackerel purse-seines, and for capelin-seines.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{1}{12}$ S; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,607. Used for pounds and traps, drag-seines, haul-seines, and fyke-nets.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{1}{12}$ S; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,608. Used for cribs of pounds and sometimes for bunts of Newfoundland cod-seines.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{1}{16}$ S; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,609. Very generally used for pounds, traps, and seines of all kinds.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{2}{12}$ C; size of mesh,  $2\frac{5}{8}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,610. Used on the coasts of Long Island and New Jersey for menhaden purse-seines.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{1}{12}$ S; size of mesh, 3 inches. Made by H. & G. W. Lord, Boston, Mass. 54,611. Used in all parts of the United States, especially for trap-leaders and wings of haul-seines.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{1}{16}$ S; size of mesh, 3 inches. Made by H. & G. W. Lord, Boston, Mass. 54,612. Very generally used for pounds and traps in New England and on the Great Lakes.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{1}{16}$ S; size of mesh,  $3\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,613. Very generally used for pounds and traps in New England and on the Great Lakes.

**TANNED NETTING.**

Cotton; quality of twine,  $\frac{1}{16}$ S; size of mesh,  $3\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,614. Used for pounds and traps in New England and on the Great Lakes.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{8}$ ; size of mesh, 4 inches. Made by H. & G. W. Lord, Boston, Mass. 54,615. Used for pounds and traps in New England and on the Great Lakes.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{2}$ ; size of mesh,  $4\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,616. Used in the United States and the British Provinces for trap-leaders, cod-seines, and bluefish gill-nets.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{8}$ ; size of mesh,  $4\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,617. Sometimes used for pounds and traps.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{2}$ ; size of mesh, 5 inches. Made by H. & G. W. Lord, Boston, Mass. 54,618. Used for drag-seines, trap-leaders, and bluefish gill-nets.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{2}$ ; size of mesh, 6 inches. Made by H. & G. W. Lord, Boston, Mass. 54,619. Used chiefly on the Great Lakes for trap-leaders.

## TANNED NETTING.

Cotton; quality of twine,  $\frac{1}{8}$ ; size of mesh, 6 inches. Made by H. & G. W. Lord, Boston, Mass. 54,620. Used chiefly on the Great Lakes for trap-leaders.

## SERIES OF SAMPLES OF TANNED GILL-NETTING.

One piece 2-inch mesh, 20-6 half twine.

One piece 2-inch mesh, 9-thread half patent-laid twine.

One piece 2-inch mesh, 18-thread half patent-laid twine.

Exhibited by the American Net and Twine Company, Boston, Mass.

## TARRED NETTING.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{2}{8}$ C; size of mesh, 1 inch. Made by H. & G. W. Lord, Boston, Mass. 54,621. Used in Maine and the British Provinces for haul-seines and traps for the capture of smelts, small herring, and sardines.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{2}{12}$ C; size of mesh,  $1\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,622. Used in Nova Scotia for bags and pockets of smelt-nets. The laws of that province require those nets to be not less than  $1\frac{1}{4}$ -inch mesh.



## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ ; size of mesh,  $1\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,623. Used in the United States and the British Provinces for herring traps and haul-seines for herring and capelin.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{12}$ ; size of mesh,  $1\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,624. Used for pounds and traps for herring and mackerel.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{4}$ ; size of mesh,  $1\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,625. Used chiefly for scoop-nets and bail-nets for dipping fish from seines and traps.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ ; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,626. Used for herring-seines, bunts of mackerel purse-seines, and on the Southern coast for menhaden purse-seines.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{6}$ H; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,627. Used for wings of small-size purse-seines for mackerel.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{2}{9}$ C; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,628. Used for wings of menhaden purse-seines on Maryland and Virginia coasts, and for shoal-water purse-seines for mackerel.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{2}{9}$ C; size of mesh,  $1\frac{3}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,629. Used for menhaden purse-seines and bunts of mackerel purse-seines.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{12}$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,630. Very generally used for fyke-nets, herring-traps, and bunts of mackerel purse-seines.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{12}$ ; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,631. Used chiefly for traps and pounds, haul-seines, drag-seines, and fyke-nets.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{8}$ "H; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,632. Used in the United States and Canada for traps, pounds, haul-seines, and drag-seines for the capture of all kinds of fish.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{6}$ "H; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,633. Used for wings and near the bunts of mackerel purse-seines.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{2}{6}$ "H; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,634. Used for wings of mackerel purse-seines.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{2}{12}$ "H; size of mesh, 2 inches. Made by H. & G. W. Lord, Boston, Mass. 54,635. Used for bunts of mackerel purse-seines, and small haul-seines for perch and herring in rivers and ponds.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{12}$ "S; size of mesh,  $2\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,636. Used for fish-traps on the Atlantic coast, and for cribs of pound-traps on the Great Lakes.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{16}$ "S; size of mesh,  $2\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,637. Used chiefly for haul-seines and cribs of pounds.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{2}{6}$ "H; size of mesh,  $2\frac{3}{8}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,638. In general use for herring gill-nets.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ "S; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,639. In general use for wings of haul-seines, middles of menhaden purse-seines on the New Jersey coast, and for capelin-seines.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{15}$ "S; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,640. In general use for pounds and traps, and seines of all kinds.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{16}$  S; size of mesh,  $2\frac{1}{2}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,641. Used for pounds and traps, and seines of all kinds.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{2}{12}$  C; size of mesh,  $2\frac{5}{8}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,642. Used on the New York and New Jersey coasts for menhaden purse-seines.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{18}$ ; size of mesh, 3 inches. Made by H. & G. W. Lord, Boston, Mass. 54,643. Used in the United States and the British Provinces for hearts and leaders of weirs and traps.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{9}$ ; size of mesh, 3 inches. Made by H. & G. W. Lord, Boston, Mass. 54,644. Used for stop-nets, wings of haul-seines and drag-seines, and light leaders for turning fish into pockets.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{18}$ ; size of mesh,  $3\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,645. Used on the Great Lakes and in the British Provinces for pounds and traps.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{15}$ ; size of mesh, 4 inches. Made by H. & G. W. Lord, Boston, Mass. 54,646. Used for bluefish dragnets and gill nets, pound leaders on the Great Lakes, and for cod purse-seines at Newfoundland.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{16}$ ; size of mesh, 4 inches. Made by H. & G. W. Lord, Boston, Mass. 54,647. Used for bluefish dragnets and gill-nets, pound leaders on the Great Lakes, and cod purse-seines at Newfoundland.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{18}$ ; size of mesh, 4 inches. Made by H. & G. W. Lord, Boston, Mass. 54,648. Sometimes used for fish weirs.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{12}$ ; size of mesh,  $4\frac{1}{4}$  inches. Made by H. & G. W. Lord, Boston, Mass. 54,649. Used in the United States and the British Provinces for bluefish gill-nets, cod-seines, and trap leaders.

## TARRED NETTING.

Cotton; quality of twine,  $\frac{1}{2}$ ; size of mesh, 5 inches. Made by H. & G. W. Lord, Boston, Mass. 54,650. Used in the United States and the British Provinces for blue-fish gill-nets, drag-seines, and trap leaders.

## NETTING.

Samples of various kinds of seine and gill-net webbing manufactured by the Baltimore Net and Twine Company. Exhibited by William J. Hooper's Sons, Baltimore, Md.

## TWINE USED IN THE MANUFACTURE OF NETTING.

Samples of twine exhibited by American Net and Twine Company, Boston, Mass. One bundle each of 6, 9, 12, 15, 18, 21, 24, 27, 30, and 36 threads, half patent (bundles not papered). One bundle, half patent (papered). Two bundles each of 20-6 and 20-12 hall twine, and 20-6 and 20-9 cable-laid twine. (One bundle of each kind papered and one unpapered.) Two sample boards of patent-laid, soft-laid, and net twines.

## NET-MAKER'S TOOLS.—NET-NEEDLES, MESH-BOARDS, ETC.

USED IN MAKING AND REPAIRING NETS AND SEINES. PATTERNS USED ON THE COAST OF NEW ENGLAND.

## TWINE-MESHING NEEDLE.

Used for doubling the twine on the border of a seine-web that comes next to the rope on all sides.

## SEINE-HANGING NEEDLE.

For mackerel purse-seines, filled with 32-thread twine.

## NET-MENDING NEEDLE.

For cod gill-nets.

## NET-MENDING NEEDLE.

Made of brass.

## NET-MENDING NEEDLE.

Made of sperm whale's jaw.

## MESH-BOARD FOR MENHADEN GILL-NETS

Three and one-half inch mesh.

## MESH-BOARD FOR MENHADEN GILL-NETS

Three and three-fourths inch mesh.



## MESH-BOARD FOR HERRING GILL-NETS.

Two and one-half inch mesh.

## MESH-BOARD FOR COD GILL-NETS.

Seven and three-fourths inch mesh.

## MESH-BOARD FOR COD GILL-NETS.

Eight and one-half inch mesh.

## MESH-BOARD FOR COD GILL-NETS.

Eight and three-fourths inch mesh.

## MESH FORMER FOR COD GILL-NETS.

Nine and one-half-inch mesh.

## MESH-BOARD FOR MACKEREL GILL-NETS.

Three-inch mesh.

## ABORIGINAL NET-MAKING IMPLEMENTS.

## MESH MEASURES. (7.)

Wood or bone. A short blade of the size of the desired mesh, and handle of convenient length for grasping. Length, 5 to 10 inches. Bristol Bay, Alaska, 1882. 55,915. Collected by Chas. L. McKay.

## NET-TWINE REELS. (7.)

Wood or bone, shaped much like modern seine or netting-needles. Length,  $6\frac{3}{8}$  to 13 inches; width,  $\frac{1}{2}$  to  $1\frac{3}{8}$  inches. Bristol Bay, Alaska, 1882. 55,913. Collected by Chas. L. McKay. The net stitch or knot for making the mesh was known to the aborigines of the northwest coast of America before the advent of white men.

## ESKIMO NETTING-NEEDLES.

Seine-needle. Eskimo. Northeastern America. S. F. Baird. 9,839.

Seine-needle. Magemut Eskimo, Nunivak Island, Alaska. W. H. Dall. 16,202.

Seine-needle of wood. Yukon River. W. H. Dall. 5,613.

Needle of bone. Norton Sound Eskimo. W. H. Dall. 5,614.

Seine-needles of bone. Magemut Eskimo. Nunivak Island. W. H. Dall. 16,166 to 16,171, 16,196.

Seine-needles of wood. Chirikoff. W. H. Dall. 1,180.

Netting-needle. Eskimo. Smithsonian Institution. 1,315.

Seine-needles of bone. Eskimo of northeastern America. S. F. Baird. 9,839.

## PHOTOGRAPHS ILLUSTRATIVE OF THE MANUFACTURE OF NETS.

## NET FACTORY.

Photographic view of room containing knitting-machine and bobbin-fillers at the factory of H. & G. W. Lord. Size, 8 by 10 inches. Boston, Mass., 1882. (435) 2,005. U. S. Fish Commission.

## NET FACTORY.

Photographic view of loom-room in the net factory belonging to H. & G. W. Lord. Size, 8 by 10 inches. Boston, Mass., 1882. (423) 1,999. U. S. Fish Commission.

## NET FACTORY.

Photographic view of knitting-machine room in the net factory belonging to H. & G. W. Lord. Size, 8 by 10 inches. Boston, Mass., 1882. (421) 1,998. U. S. Fish Commission.

## NET FACTORY.

Photographic view of hanging-room in the net factory belonging to H. & G. W. Lord. Size, 8 by 10 inches. Boston, Mass., 1882. (420) 1,997. U. S. Fish Commission.

## NET FACTORY.

Photographic view of the finishing-room in the net factory belonging to H. & G. W. Lord. Size, 8 by 10 inches. Boston, Mass., 1882. (418) 1,996. U. S. Fish Commission.

## NET FACTORY.

Photographic view of room containing knitting-machine and bobbin-fillers at the factory of H. & G. W. Lord. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Boston, Mass., 1882. (435) 2,005. U. S. Fish Commission.

## NET PRESERVATIVES.

## LIQUID PRESERVATIVES.

Nelson's liquid-compound, used for preserving canvas, manila rope, and netting. Also samples of canvas, rope, and netting which have been treated with the fluid. Patented and exhibited by Chresten Nelson, Gloucester, Mass.

## PHOTOGRAPHS ILLUSTRATIVE OF THE PRESERVATION OF NETS.

## NET-TARRING MACHINE.

Photograph showing apparatus used at Church Brothers' menhaden oil and guano factory for tarring purse-seines to be used in the menhaden fishery. Acid wharf in background. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Tiverton, R. I., 1882. (400) 1,983. U. S. Fish Commission.

## NET TANNING AND TARRING MACHINE.

Photographic view of machine used by H. & G. W. Lord in tanning and tarring nets made at their factory. Size, 8 by 10 inches. Boston, Mass, 1882. (425) 2,001. U. S. Fish Commission.

## NET-TARRING MACHINE.

Photograph of apparatus used at Church Brothers' menhaden oil and guano factory for tarring purse-seines to be used in the menhaden fishery. Acid wharf in background. Size, 8 by 10 inches. Tiverton, R. I., 1882. (400) 1,983. U. S. Fish Commission.

## TANNING NETS.

Photographic view of tanning room in the net factory belonging to H. & G. W. Lord. Size, 8 by 10 inches. Boston, Mass., 1882. (424) 2,000. U. S. Fish Commission.

## D.—APPARATUS ENTIRELY AUTOMATIC.

### VI.—TRAPS.

#### 20. PEN TRAPS.

##### POCKET TRAPS.

##### FISH-SLIDE OR TRAP.

Model, scale 1 inch to the foot. Made of wooden slats set in a sloping frame, with box at upper end. Length, 10 inches; width,  $4\frac{1}{4}$  inches. James River, Virginia, 1876. 25,831. Gift of J. G. Adam. "The fish slides in the Roanoke River, North Carolina, are solid and substantial structures built of timber, and are placed in the strongest currents just below the falls. The shad, seeking the headwaters of the stream in endeavoring to find their way above the falls, get into the currents and are at once washed upon the screen of the slide, which slants upward from the bottom of the river. The power of the current effectually prevents their return, and they are easily secured, either in the box or on the screen of the slide."

##### FISH-SLIDE OR TRAP.

Model, scale 1 inch to the foot. A series of wooden slats set in a sloping frame. Length, 10 inches; width,  $4\frac{1}{2}$  inches. James River, Virginia 1876. 25,830. Gift of J. G. Adam. "A slide of this kind is set in the current of a shallow stream, its upper surface raised from the bottom at an angle of 25 to 30 degrees, the lower edge, which comes in contact with the water, facing up stream, and the top edge reaching above the water."

##### FISH-TRAP OR SLIDE.

Model. Made of wooden slats in three series, each 8 inches long, set in frame. Charlottetown, Md., 1877. 57,045. Gift of J. B. Graham.

##### LABYRINTH TRAPS.

##### FUNNEL TRAPS WITHOUT WINGS OR LEADERS.

##### *Fish-traps.*

##### FISH-TRAP.

Made of fine splints; cone-shape; two funnels. Length, 5 feet; diameter at large end,  $14\frac{1}{2}$  inches. Baltimore, Md., 1880. 56,946. U. S. Fish Commission. Used in Chesapeake Bay and adjacent waters.



## FISH-TRAP.

Model. Made of spruce-root splints; cone-shape; one funnel. Length,  $25\frac{1}{2}$  inches; diameter at large end,  $7\frac{1}{2}$  inches. Bristol Bay, Alaska. 55,899. Collected by C. L. McKay.

## FISH-TRAP.

Model. Made of spruce-root splints; cone-shape; one funnel. Length, 20 inches. Yukon Island, Alaska. 49,062. Collected by E. W. Nelson.

## FISH-TRAP.

Full size; made of small branches of willow tied together with Manila yarn; half-round shape; funnel at large end. Length, 44 inches; width at large end, 19 inches. Indians of California, 1880. 39,496. Collected by Prof. D. S. Jordan.

## WICKER FISH-POT.

Used by the Indians of California. Vicinity of San Francisco. Prof. D. S. Jordan. 39,474.

## FISH-TRAP.

Model. Made of spruce-root splints; cone-shape; one funnel. Length, 18 inches; diameter at large end, 6 inches. Norton Sound, Alaska. 32,987. Collected by E. W. Nelson.

## WICKER FISH-POT.

Model, scale 1 inch to foot. Made of soft-wood splints; heart-shape. St. Martin's, West Indies. 1,754. Collected by H. O. Claughton, U. S. A. Used at Southern Florida and the West Indies for fishing in from five to fifteen fathoms of water.

## SPRUCE-ROOT SPLINTS.

Used by natives of Alaska in making fish-traps. Lower Yukon River, Alaska. 49,095. Collected by E. W. Nelson.

## WHITE-OAK SPLINTS.

Cut in thick and thin strips about four feet long; used for making eel-pots. Vineyard Haven, Mass., 1876. 25,017. Gift of Capt. Josiah Cleveland.

## WICKER EEL-POT.

Three funnels. Used about Martha's Vineyard. Vineyard Haven, Mass. 25,014 (a). Capt. Josiah Cleveland, maker.

## EEL-TRAP.

Full size; made of wooden slats; three compartments; entrance at either end, made of cotton socks. Length, 43 inches; width,

**EEL-TRAP—Continued.**

12 inches; depth, 12 inches. Essex, Mass., 1882. 56,948. U. S. Fish Commission. This style of trap is set in Essex River in the spring of the year. It is baited with broken clams and sunk by bricks; from forty to fifty pounds of eels are frequently taken in a single trap on one tide.

**EEL-TRAP.**

Full size; made of white-oak splints; bottle shape; two funnels. Length, 6 feet; diameter at large end, 17 inches. Vineyard Haven, Mass., 1876. 25,014. Made by Capt. Josiah Cleveland. Used about Martha's Vineyard in from three to ten fathoms of water.

**EEL-POT.**

Full size; made of white-oak splints; bottle shape; has two funnels. Length, 6 feet; diameter at large end, 17 inches. Vineyard Haven, Mass., 1876. 25,015. Made by Capt. Josiah Cleveland. Used about Martha's Vineyard in from three to ten fathoms of water.

**EEL-POT.**

Model, half size. Made of white-oak splints; bottle shape; one funnel. Length, 20 inches; diameter at wide end, 9 inches. Noank, Conn., 1876. 25,019. Gift of James H. Latham. Used in Fisher's Island Sound and vicinity.

**EEL POT.**

Model, half-size. Made of white-oak splints; bottle shape; one funnel; warp and float attached. Length, 20 inches; width at large end, 9 inches. Noank, Conn., 1876. 56,947. Gift of James H. Latham. Used in Fisher's Island Sound and vicinity.

**EEL-TRAP.**

Model. Shape of barrel; holes in staves; entrance at one end; opening on side; slung with lines. Height, 9 inches. Washington, D. C., 1883. 56,949. Gift of George Woltz. Used in the Potomac River at Washington and vicinity.

**EEL-POT NET.**

Model. Series of iron hoops, 9½ inches in diameter, connected by netting; two funnels. Length, 23 inches. New York, 1877. 29,530. Gift of American Net and Twine Co. Used on coasts of Long Island and New Jersey.

*Lobster pots.*

## LOBSTER POT.

Full size; made of laths, in shape of half cylinder; netting at ends; granite sinkers; warp and buoy. Length, 4 feet; width, 27 inches; depth, 17 inches. Rockport, Mass., 1882. 54,482. U. S. Fish Commission. The most common style of lobster trap used in Massachusetts Bay.

## DOUBLE-ENDER LOBSTER POT.

Full size; made of laths, in shape of half-cylinder; netting at ends; three compartments; brick sinkers; warp and float. Length, 7 feet 3 inches; width, 26 inches; depth, 19 inches. Rockport, Me., 1882. 54,430. U. S. Fish Commission.

## LOBSTER POT.

Full size; made of laths, in shape of half cylinder; netting at ends; brick sinkers; warp and buoy. Length, 4 feet; width, 2 feet; depth, 18 inches. Rockport, Me., 1882. 54,429. U. S. Fish Commission. The most common style of trap used on the Maine coast.

## LOBSTER POT.

Model. Made of wooden slats, in shape of half-cylinder; stone sinkers; warp and float. Length, 16 inches; width,  $7\frac{1}{2}$  inches; depth,  $6\frac{1}{2}$  inches. Stonington, Conn., 1878. 29,363. Gift of N. G. Smith.

## LOBSTER POT.

Model. Made of wooden slats, in half-cylinder shape, with netting at ends; stone sinkers; warp and float. Length, 12 inches; width, 6 inches; depth, 5 inches. Noank, Conn., 1878. 29,296. Gift of G. L. Green.

## LOBSTER POT.

Model. Made of wooden slats, in shape of half-cylinder, with netting at ends; stone sinkers; warp and float attached. Length, 9 inches; width, 5 inches; depth,  $3\frac{1}{2}$  inches. Boston, Mass., 1877. 26,586. Gift of Johnson & Young.

## LOBSTER POT.

Model, scale, 3 inches to foot. Made of wooden slats, square shape; stone sinkers; warp and float. The full-size pot of this style is 26 inches square by 13 inches deep. Newport, R. I., 1875. 24,801. Gift of J. M. K. Southwick. Used in Narragansett Bay for fishing in water from 10 to 15 fathoms deep.

## LOBSTER-POT BAIT-HOOKS OR BOBS.

Two hooks of galvanized iron; one curved and the other straight shank. Length, 5 and 13½ inches. Provincetown, Mass., 1878. 29,473. Gift of Isaiah A. Small. These styles of hooks are used in the ordinary half-cylinder lobster-pots, baited with fish-heads or refuse fish.

## LOBSTER-POT.

Small wooden model of a lobster-pot used on the south coast of Massachusetts. Exhibited by Benjamin Baker 2d. New Bedford, Mass.

## FUNNEL-TRAPS WITH WINGS OR LEADERS.

## EEL WEIR AND POT.

Two funnels 22 inches long, with wings and leaders. Vineyard Haven, Mass., 1875. 24,885. Made by Captain Josiah Cleveland.

## WICKER EEL-POT.

Two funnels with leaders. Used about Martha's Vineyard, in 3 to 10 fathoms. Vineyard Haven, Mass. 25,015, 25,016. Captain Josiah Cleveland, maker.

## FISH-TRAP.

Model. Made of spruce-root splints; cone-shape; one funnel and leaders. Length, 16 inches. Norton Sound, Alaska. 32,988. Collected by E. W. Nelson.

*Fyke-nets.*

## FYKE-NET.

Full size. Made with five cedar hoops from 30 to 40 inches in diameter; white cotton netting, 2½ and 3 inch mesh; leaders, 80 feet long and 4 feet deep; wings, 16 feet long. Noank, Conn., 1883. 57,066. U. S. Fish Commission. Style of net used along the New England coast for the capture of flounders, blackfish, shad, and other species.

## MINNOW-FYKE.

Model. Made of tanned cotton netting on three hoops with right and left wings. American Net and Twine Company. 26,113.

## FYKE OR SET NET.

Made of netting, with six hoops from 10 to 17 inches in diameter. U. S. Fish Commission. 32,733.



*Pounds and weirs.*

## ABORIGINAL FISH-WEIR.

Model of weir used by the aborigines of Virginia in the fifteenth century. Consists of four oblong bowls diminishing in size toward the outer end. Made of stakes and splints or brush, with right and left wings. Models of dugout-canoe, paddles, and dip-net. Length of bowls, 9,  $7\frac{1}{2}$ , and 6 inches; wings, 11 inches long; canoe, 11 inches long. From figures in De Bry. 25,829. Gift of J. G. Adam.

## FISH-TRAP.

Model: Wood, in three sections; the first, shaped like an elongated basket, with one open side; the second, something like a turtle's back; the third, a small box, with sides made of slats. Haidah Indians. Queen Charlotte Islands, British Columbia, 1883. 72,840. James G. Swan.

Section 1 is placed with the curved end up-stream, firmly secured to a stake. Section 2 is inserted and firmly tied to section 1, and forms the entrance to the trap. Section 3 is inserted in section 2 and secured; the fish, after swimming about in sections 1 and 2, are carried with the force of the current and their own momentum into this section, which floats on the water, from which the fish are easily taken.

## HERRING-WEIR.

Model. Made with stakes driven into the bottom and wattle brush. Bunt of full-size weir 75 to 100 feet diameter, with right and left wings and leaders. Grand Manan. 26,746. Gift of W. B. McLaughlan. Used in the Bay of Fundy for the capture of herring (*Clupea harengus*).

## BRUSH-WEIR.

Model; heart-shape, with leaders or wings. Made of brush held in position by upright stakes, fastened in bed-sills and ballasted. Diameter of bunt or bowl, 8 inches; wings, 10 inches long. Grand Manan, 1872. 26,731. Gift of W. B. McLaughlan. Used in the Bay of Fundy in the capture of herring (*Clupea harengus*).

## BAR-WEIR.

Model, scale 1 inch to the foot. Made in lyre-shape, of upright stakes with splints between. Model of wharf at one end; gate or entrance of netting. Length, 30 inches; width at outer end, 12 inches. Eastport, Me., 1872. 12,102. Gift of Capt. U. S. Treat. Used in the Bay of Fundy herring fisheries.

## SALMON-WEIR.

Model, scale 1 inch to  $8\frac{1}{2}$  feet. Heart-shape bowl and pocket; leader extending from mouth of weir; made of netting held in position by anchored stakes. Length of bowl or bunt, 2 feet; width, 6 inches; leaders, 15 inches long. Dennis River, Maine. 12,106. Collected by Prof. S. F. Baird.

## POUND-NET OF LAKE MICHIGAN.

Model, scale 1 inch to  $3\frac{1}{2}$  feet. Made of netting and held in position by stakes driven into the bottom. The outer bowl, which is square, has netting on the bottom, and is hung to the stakes by rings so that it can be easily handled; inner bowl heart-shape, with no bottom, hung with rings to stakes. Outer bowl, 11 inches square; leaders, 13 inches long. Models of stake-driver, boat, dip-net, fish-house, with cleaning troughs, &c., also shown. Waukegan, Ill., 1876. 25,750. Gift of D. D. Parmelee.

## BASS-TRAP.

Model, scale half-inch to foot. Made of netting held in position by driven stakes. Consists of two bowls, one rectangular and one heart-shape, with shore leader. Length without leader, 40 inches; leader, 24 inches long. Noank, Conn., 1876. 25,704. Gift of Charles T. Potter. Used in Peconic Bay and Fisher's Island Sound.

## PHOTOGRAPHS AND DRAWINGS ILLUSTRATIVE OF THE TRAP-FISHERY.

## HERRING-WEIR.

Photographic view of a brush-weir, locally known as "whirlpool weir," built for catching small herring to be sold as sardines in Eastport. The picture is taken at half-ebb tide, and shows a sandy beach, toward which the fish are drawn in a seine when the weir is being fished. Size, 8 by 10 inches. Deer Island, N. B., 1882. (199 $\frac{3}{4}$ ) 1,900. U. S. Fish Commission.

## HERRING-WEIR.

Photographic view of a brush-weir, locally known as "Tinker's Island weir," built for catching small herring to be sold to the sardine canneries. The weir is shown at low water, with a sardine steamer, which is employed in carrying the fish to the factories, in the background. Size, 8 by 10 inches. Tinker's Island, near Eastport, Me., 1882. (150) 1876. U. S. Fish Commission.

**HERRING-WEIRS.**

Photographic view of a group of several herring-weirs built to supply the sardine canneries at Eastport with small herring and to catch large ones for smoking. Size, 8 by 10 inches. Sandy Island, near Eastport, Me., 1882. (228) 1,915. U. S. Fish Commission.

**HERRING BRUSH-WEIR.**

Photographic view of a brush-weir used in the capture of herring to be sold for bait to fishing vessels engaged in the off-shore New England cod fisheries. In the background is a Gloucester banker lying at anchor waiting till the weir has been fished to secure bait before starting for the off-shore fishing-grounds. Size, 8 by 10 inches. Sandy Island, near Eastport, Me., 1882. (224) 1,913. U. S. Fish Commission.

**CHANNEL HERRING-WEIR.**

Photographic view of a brush-weir built in a channel between two islands, which serve to direct the herring to the entrance of the weir. Size, 8 by 10 inches. Taken near Eastport, Me., 1882. (227) 1,914. U. S. Fish Commission.

**HERRING BAR-WEIR.**

Photographic view of a brush-weir, the mouth of which is closed by a bar, which is exposed at low tide, but covered to a depth of 12 to 15 feet at high water. The fish pass over the bar into the weir at high tide, where they remain until the tide ebbs, when they are prevented from escaping by the bar, which serves as a natural barrier. Size, 8 by 10 inches. Sandy Island, near Eastport, Me., 1882. (229) 1,916. U. S. Fish Commission.

**BALLASTING A HERRING-WEIR.**

Photograph of a portion of a ballasted herring-weir, taken at low tide, to show the method adopted for holding a weir in position when placed upon rocky ground where poles cannot be embedded. Size, 8 by 10 inches. Sandy Island Ledges, near Eastport, Me., 1882. (223) 1,912. U. S. Fish Commission.

**FISHING A HERRING-WEIR.**

Photographic view of a brush-weir, locally known as the "gap weir," showing men engaged in "rolling in" herring into their boats by means of dip-nets. Sandy Island Ledges, near Eastport, Me., 1882. (221) 1,911. Size, 8 by 10 inches. U. S. Fish Commission.

**SEINING HERRING-WEIR.**

Photographic view of the interior of a herring-weir, showing the common method of fishing the weir by means of seines and

## SEINING HERRING-WEIR—Continued.

dip-nets. Size, 8 by 10 inches. Sandy Island, near Eastport, Me. (147) 1,875. U. S. Fish Commission.

## LOBSTER FISHING.

Photographic view of a row of buildings used by men engaged in trapping lobsters at Cape Ann, with boats, pots, and other fishing gear scattered along the beach, Size, 8 by 10 inches. Lane's Cove, Gloucester, Mass., 1882. (74) 1,837. U. S. Fish Commission.

## LOBSTER FISHING.

Photograph of William Winn and Zebulon Parsons hauling lobster-pot from a dory; one holding the boat in position by means of the oars, while the other hauls the pot. This is the common method of hauling pots along the New England coast. Size, 8 by 10 inches. Taken at Rockport, Mass., 1882. (58), 1,830. U. S. Fish Commission.

## FYKE-FISHING FOR FLOUNDERS.

Photograph of sloop Target, of Portland, lying at wharf, with boats alongside; showing men repairing fykes for engaging in the winter fishery for flounders in the shoal waters of the numerous islands of Casco Bay. The vessel serves as a home, workshop, and packing-house. Size, 8 by 10 inches. Taken at Portland, Me., 1882. (134) 1,869. U. S. Fish Commission.

## MENDING FYKE-NETS.

Photograph showing crew of sloop Leader, of Portland, mending their fyke-nets, for the purpose of engaging in the winter flounder fisheries of that locality. The fykes have been spread out on the wharf for convenience in mending. The vessel is in the background, with other fykes hung in the rigging to dry. Size, 8 by 10 inches. Taken at Portland, Me., in 1882. (139) 1,873. U. S. Fish Commission.

## HERRING-WEIR.

Photographic view of a brush-weir, locally known as "whirlpool weir," built for catching small herring to be sold as sardines in Eastport. The picture is taken at half-ebb tide, and shows a sandy beach, toward which the fish are drawn in a seine when the weir is being fished. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Deer Island, New Brunswick, 1882. (199 $\frac{3}{4}$ ) 1,900. U. S. Fish Commission.

## HERRING-WEIRS.

Photograph showing a group of several herring-weirs built to supply the sardine canneries at Eastport with small herring, and  
2444—Bull. 27—65



**HERRING-WEIRS—Continued.**

to catch large ones for smoking. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Sandy Island, near Eastport, Me., 1882. (228) 1,915. U. S. Fish Commission.

**SEINING HERRING-WEIR.**

Photographic view of the interior of a herring-weir, showing the common method of fishing the weir by means of seines and dip-nets. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Sandy Island, near Eastport, Me. (147) 1,875. U. S. Fish Commission.

**LOBSTER FISHING.**

Photograph showing a row of buildings used by men engaged in trapping lobsters at Cape Ann, with boats, pots, and other fishing gear scattered along the beach. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Lane's Cove, Gloucester, Mass., 1882. (74) 1,837. U. S. Fish Commission.

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Photograph of William Winn and Zebulon Parsons hauling a lobster-pot from a dory; one holding the boat in position by means of the oars, while the other hauls the pot. This is the common method of hauling pots along the New England coast. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Taken at Rockport, Mass., 1,882. (58) 1,830. U. S. Fish Commission.

**TRAP-FISHING FOR LOBSTERS.**

Photograph of fishermen engaged in trapping lobsters about Nantucket Shoals, showing the shanty in which they make and repair their traps, with several traps and other apparatus in the foreground. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Edgartown, Mass., 1882. U. S. Fish Commission.

**SALMON FYKE-FISHING.**

An India-ink sketch of fyke-nets set in the shoal waters on the coast of Alaska, with leaders extending to the shore. Large quantities of salmon are taken in fykes in this way during the migratory season. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

**MENDING FYKE-NETS.**

Photograph showing crew of sloop Leader, of Portland, mending their fyke-nets for the purpose of engaging in the winter

## MENDING FYKE-NETS—Continued.

flounder fisheries of that locality. The fykes have been spread out on the wharf for convenience in mending. The vessel is in the background with other fykes hung in the rigging to dry. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Taken at Portland in 1882. (139) 1,873. U. S. Fish Commission.

## NORTH CAROLINA FISH-SLIDE.

An India-ink sketch of a fish-slide or sluice placed in the rapids of a river for catching fish. The bottom of the slide is made of open work to allow the water to pass through, the fish being caught by the current and carried into it, where they are secured by men who stand ready to catch them with dip-nets or spears. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

## NORTH CAROLINA FISHING-WHEEL.

An India-ink sketch of a dam with a sluiceway in the center in which a fishing-wheel is set. The dam is so arranged as to throw all of the water through the sluiceway, and all fish descending the stream must naturally pass through it. The wheel is made of netting and has curved arms which answer as scoops. It is revolved by the force of the water which strikes against the arms, the fish being thrown into a box placed near to receive them. Size, 30 by 40 inches. Washington, D. C., 1882. Henry W. Elliott.

## 21. SPRING TRAPS.

## ANIMAL TRAPS.

## BEAR-TRAPS.

Made of whalebone strips bent and tied. Prepared by the Anderson River Eskimo. Mackenzie River district. 7,442. Collected by Robert MacFarlane. A bent piece of whalebone is placed in a piece of frozen fat, which when swallowed melts, allowing the bone to spring.

## ANIMAL-TRAP.

Common steel trap, Hawley & Norton, No. 1 (New York). Used by whalers in the Arctic regions for the capture (for their fur) of foxes and other small animals; length 31 inches, including chain. New London, Connecticut, 1882. Gift of C. A. Williams & Co. 57,799.

## SPRING HOOKS.

## SPRING HOOKS.

For pickerel fishing. 25,561.

## SPRING HOOK, OR TRAP.

42,879.

## SNAP AND CATCH'EM HOOKS.

For pickerel fishing. 42,879.

## EAGLE-CLAW TRAP.

57,654.

## PICKEREL-TRAPS.

Spring-trap, with lines, hooks, and flags, rigged for fishing through the ice. U. S. Fish Commission. (B. & A.) 25,562.

## E.—ACCESSORIES TO FISHING.

### VII.—DECOYS AND DISGUISES.

#### 22. NATURAL AND ARTIFICIAL BAITS.

(See above under modern hooks, decorated.)

#### 23. DECOYS.

##### SIGHT DECOYS.

##### FISH-LURES.

#### LURE-FISHES.

Used in fishing through the ice for pickerel. These lure-fishes are used to decoy large fish under holes in the ice so that they may be within reach of the spear. William Morris, Lake City, Mich. 29,294.

#### LURE-FISH.

Used in fishing through the ice for salmon-trout. D. H. Fitzhugh, Bay City, Mich. 29,366.

#### FISH-LURES.

Attractive artificial baits; wood, with small stone sinkers; used for the capture of various kinds of fish. Indian name, "Mark-te-waddi." Made by a Makah Indian at Neah Bay. (Large), length, 13½ inches, 72,646. (Small), length, 8 inches, 72,647. Makah Indians, Cape Flattery, 1883. James G. Swan. Are thrust into the water by means of a fish-spear, and rise to the surface with gyratory motions, attracting the fish from all directions, at which time the Indian either spears the fish or takes them with baited hooks. Common to the Indians of the Northwest coast.

##### TORCHES.

#### BIRCH-BARK.

Used for torchlight fishing. Passamaquoddy Indians. Eastport, Me. 12,107. Gift of Dr. E. Palmer.

#### TORCH-DRAGON.

An open-work basket of hoop-iron, having an iron handle 2 feet 10 inches long, which is attached to a wooden handle 3½ feet in length. Basket 18 inches long, 22 inches wide. Gloucester, Mass., 1883. 57,879. U. S. Fish Commission. In this a fire or blaze is built when torching sperling (small herring). The dragon is fastened to the bow of a boat—the basket with the blaze projecting—which is rowed swiftly to attract the fish that gather in the light end and are scooped in.



## BOAT-LANTERNS.

Copper and glass; triangular, flat bottom, convex top, with ventilator at apex; lamp inside with two burners; width of lantern at back, 21 inches; each of the two sides 18 inches wide. Southern New England. 29,365. James H. Latham, Noank, Conn. Used in bow of boat in weequashing or spearing eels by night.

PHOTOGRAPHS ILLUSTRATIVE OF THE USE OF TORCHES IN THE CAPTURE OF FISH.

## HERRING-TORCHING.

Photograph of a fishing crew engaged in "driving" herring. A fire of birch bark is blazing in the iron dragon at the bow, and a man stands ready with a dip-net for securing the herring which approach the light as the boat is rapidly rowed through the water by the other members of the crew. Size, 8 by 10 inches. Taken at Eastport, Me., 1882. (189) 1,894. U. S. Fish Commission.

## HERRING-TORCHING.

Photograph of a fishing crew engaged in "driving" herring. A fire of birch bark is blazing in the iron dragon at the bow, and a man stands ready with a dip-net for securing the herring which approach the light as the boat is rapidly rowed through the water by the other members of the crew. Size, 30 by 40 inches. Enlarged by electric light from an 8 by 10 negative. Taken at Eastport, Me., 1882. (189) 1,894. U. S. Fish Commission.

## SOUND DECOYS.

## THREE-CLAWED SEAL-DECOY.

Handle and prongs wood, tipped with the claws of the seal; claws seized tightly with seal sinew and lashed to an ivory peg rigidly fastened in the palm. Length,  $10\frac{3}{4}$  inches. Ooglaamie, Alaska, 1882. 56,555. Collected by Lieut. P. H. Ray, U. S. A. Used by natives for scratching upon the ice or snow to attract the attention of seals.

## FOUR-CLAWED SEAL-DECOY.

Handle and prongs of wood, tipped with seal claws; claws served with seal sinew and lashed to a rigid ivory peg in palm; becket of sealskin rove through a hole in the handle and knotted. Length,  $8\frac{7}{8}$  inches. Ooglaamie, Point Barrow, Alaska, 1882. 56,557. Collected by Lieut. P. H. Ray, U. S. A. Used by natives for scratching upon the ice or snow to attract seals.