

CONTRIBUTIONS FROM
THE MUSEUM OF HISTORY AND TECHNOLOGY:

Paper 48

UNITED STATES PATENTS, 1790 TO 1870:
NEW USES FOR OLD IDEAS

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UNITED STATES PATENTS 1790 TO 1870 NEW USES FOR OLD IDEAS

Patent documents from our Nation's early years provide a rich field of exploration for the cultural historian.

United States patents of the period 1790-1870 provide a remarkable cross section of American ingenuity. The drawings—many of the early ones are in color—illustrate the changing contemporary interests.

Now in the National Archives, these patents are a unique source of information standing somewhere between objects and manuscripts. As research materials, they provide a rich field of exploration for the cultural historian.

Here, the scope of this largely untapped source of social history is suggested, and a sampling of it is given.

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THE EXTENSIVE FILES of the U.S. Patent Office confirm the fact that Americans early in the 19th century made rapid strides toward mechanization and technical proficiency. In 1794 astute critics such as Thomas Cooper found us “ingenious in the invention, and prompt and accurate in the execution of mechanism and workmanship.”¹ Others wrote, often at length, about our locomotives and steamboats and of an exuberant democratic society preoccupied with

speed and comfort. Inventors, themselves caught up in the general fervor of democratic faith, viewed their work as “essentially beneficial to mankind.”²

Everywhere Americans displayed a predilection for tinkering, a trait that manifested itself as clearly in bizarre contrivances for the home as in labor-saving devices for the farm and factory. From the cotton gin to the machine tool, from the railroad to the automatic mill, the Nation's urge to improve is dramatically

¹ THOMAS COOPER, *Some Information Respecting America* (London, 1794), p. 65.

² Benjamin Dearborn announced this worthy sentiment in his patent specification of April 30, 1799.



Figure 1.—EAGLE AND MASONIC EYE used to decorate Emanuel W. Carpenter's patent application. [All illustrations in this paper are from either original or restored patent drawings.]

documented. Progress and perfection became a national attitude propounded, disseminated, and enshrined by statesmen, politicians, writers, and architects of the day.

The files of the U.S. Patent Office, in addition to confirming these facts, suggest considerably more.³ Here lies an explanation, little cited, for American accomplishment in the years between Washington's inauguration and our successes at London's Crystal Palace in 1851 and, later, at the Centennial Exposition in Philadelphia in 1876.

Strangely, despite the currency of scientific and technical history, patent documents remain virtually unexplored. This is not to say that historians have completely ignored the patent records—quite to the contrary. Siegfried Giedion⁴ has made exciting and

³ Between 1790 and 1836 the United States granted 9,802 patents, and by 1848 the number had increased to 16,000; by 1871, patents granted numbered 131,000 (Report of the Investigation of the United States Patent Office . . . December 1912, House Doc. 1110, 62d Congr., 3d Sess., pp. 22, 58-60). For the most succinct statement to date concerning these records, see NATHAN REINGOLD, "U.S. Patent Office Records as Sources for the History of Invention and Technological Property," *Technology and Culture* (spring 1960), vol. 1, pp. 156-157. Reingold's footnotes serve as a preliminary guide to Patent Office materials. Since Reingold's article appeared, the National Archives has received from the U.S. Patent Office 30 volumes of restored patent specifications, 1790-1836; 14 volumes of restored reissued patent specifications, 1836-1840; and 10 volumes of assignments of restored patents.

⁴ SIEGFRIED GIEDION, *Mechanization Takes Command* (Cambridge, Mass., 1948).

provocative use of the patent files, which have long been a natural starting place for those tracing the primacy of invention. So, too, have the economic historians explored the theory of patent law as a keystone of the capitalistic system. Recently, historians of American technology have showed new interest, and some museums have occasionally recognized the historic importance of patent models and drawings. Nevertheless, to date, few scholars brave the intricacies of these records, even in the areas mentioned. Fewer still ever stop to consider patents as primary evidence documenting our everyday past.⁵

Could not the real treasure of the patent records, particularly the patent drawings, lie in their value as cultural documents? They are not really documents in the archival sense, but rather a unique combination standing somewhere between objects and manuscripts. Here, it would seem, is a challenge to the investigator seeking new material and fresh interpretations. What follows will suggest not only the extent to which they can be used by the social historian, but, indirectly, the degree to which they have been ignored. Considering just the period from 1790 to 1870—when the drawings show their greatest vitality—it is surprising to find the quantity of rich ore waiting to be properly assayed. For here, if one examines only the applications, drawings, and schedules, is a cross section of American ingenuity, one that yields an amazing variety of information.

From this material, a society can be analyzed—popular attitudes can be judged, living standards assessed, and the level of technology evaluated; mun-

⁵ PHILIP W. BISHOP, "The Beginnings of Cheap Steel" (paper 3 in *Contributions from the Museum of History and Technology: Papers 1-11*, U.S. National Museum Bulletin 218, by various authors; Washington: Smithsonian Institution, 1959), pp. 27-47. Bishop makes excellent and traditional use of patents, both American and British. VICTOR S. CLARK, *History of Manufacturers in the United States, 1607-1928* (New York: McGraw-Hill, Inc., 1929, 3 vols.), discusses the patents important to the growth of individual industries. The general economics of the patent system can be found in FLOYD L. VAUGHAN, *Economics of Our Patent System* (New York: MacMillan, 1925). The first two issues of *Technology and Culture* devote considerable space to notes and articles on patents; see, in particular, papers by Nathan Reingold and P. J. Federico (vol. 1, spring 1960) and by S. C. Gilfillan, Jacob Schmoekler, and I. Jordan Kunik (vol. 1, summer 1960). The United States National Museum has on occasion made splendid use of its patent model collection, although little or no use has been made of original drawings. (Patentees were required to support their written specifications with models and drawings.)

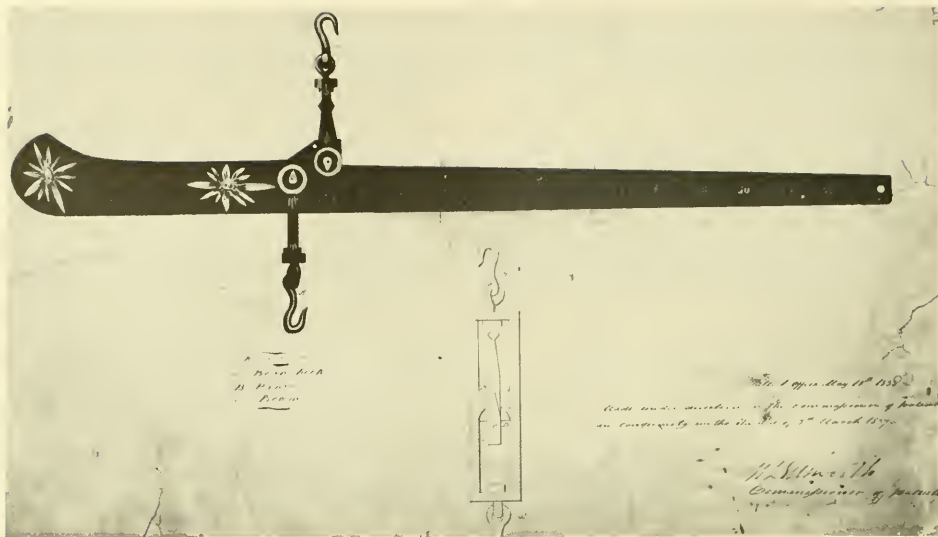


Figure 2.—VIBRATING STEELYARD patented by Benjamin Dearborn, February 14, 1799 (restored patent 234X).

dane things of the period can be identified, such as dress, household furnishings, and a variety of tools and appliances; and prevailing tastes and styles, along with the constituent or lasting contributions of the period, are revealed. If, as Frances Trollope disdainfully noted, the Patent Office indeed contains the brain children of the Nation's "mechanics and agriculturalists,"⁶ it should be valuable to illustrate the usefulness of patents with specific examples that will serve as a guide to the wealth of material deposited in the National Archives.

Patents and Popular Sentiments

What can be learned from the patent records before 1870 concerning popular sentiments? Immediately apparent is a zest for mechanical improvement. The drawings, particularly in the early part of the century, suggest this, but one should read the applications and patent schedules, because the most cursory selection of terms will document the orientation of the country and indicate a state of mind that makes innovation seem a natural consequence.

⁶ FRANCES TROLLOPE, *Domestic Manners of the Americans*, edit. Donald Smalley (New York: Knopf, 1949), p. 219.

Phrases like "great ease and convenience" predominate, but "perfectly true and uniform," "facility," "strength," "much quicker," "durability," "preservation of lives . . . and property," "simplicity," "security," "expeditious manner," "precisely," and "accuracy" almost form a litany for invention, a reason why men invented things, a foundation for rapid national progress in the mechanical arts.⁷

Alexis de Tocqueville cited the "passion for physical well being"⁸ explicit in American life, and the ter-

⁷ Quotations are from the following U.S. patents: David Wilkinson, December 14, 1798; William Hopkins, May 13, 1803; Alexander Black, October 3, 1817; Obadiah Stith, March 16, 1819; John Moore and Samuel P. Bower, March 3, 1837, No. 136; Moses Baldwin, April 29, 1837, No. 186; Emanuel Carpenter, February 6, 1838, No. 594, and Robert C. Mauck, December 26, 1845, No. 4329. "Name and Date" patents may be found in the manuscript volumes of restored patents, Record Group 241, National Archives. Numbered patents may be found in the published schedules of U.S. patents, 1856-, in Record Room, U.S. Patent Office. All illustrations in the present paper are reproduced from original or restored patent drawings, most of which are watercolors or wash drawings.

⁸ ALEXIS DE TOCQUEVILLE, *Democracy in America*, 2 vols., transl. Francis Bowen (Cambridge, Mass.: Sever and Francis, 1862), vol. 2, p. 155.

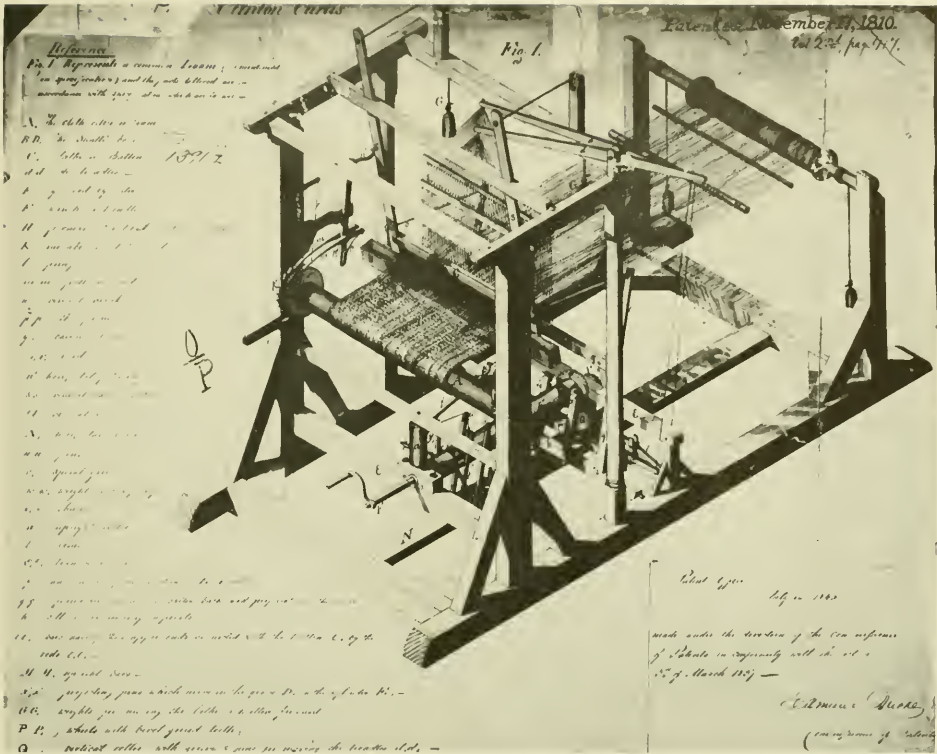


Figure 3.—IMPROVED WATER LOOM patented by Philo Clinton Curtis, November 17, 1810 (restored patent 1391X).

minology of the patent schedules confirms the quest for “domestic comfort”⁹ as a popular reason for invention. The urge existed to produce something “beautiful” as well as the less idealistic motives that simply sought a new way of doing things that would be “better, quicker, and cheaper than by hard labor.”¹⁰ Also, the goal of “excellent quality and large quantity” stimulated the American inventor.¹¹ Finally, the

records reveal that patriotism and Christian duty, whether sincere or calculated, induced innovation, a fact characterized by the calligraphic eagle and Masonic eye that adorned the patent application (fig. 1) of Emanuel Carpenter of Lancaster, Pennsylvania.

No one can explore the patent schedules and applications and remain insensitive to the fact that persons at all levels accepted the machine as a basic part of American life; and, of the facts revealed, this would seem to be the most constituent and lasting. It makes little difference whether a patent was for a decorative steelyard (fig. 2) that weighed anything from “gold coins to hogs heads of sugar,” for a loom (fig. 3) powered either manually or by “Horses, Water, Wind or Steam,” for a new method of ad-

⁹ Frederick A. Fickardt, Easton, Pennsylvania, in patent 23 (furnace for warming buildings), September 8, 1836.

¹⁰ Thomas Bedwell, in patent for a method of obtaining a new yellow color, April 20, 1796 (restored patent); and Thomas Blanchard, New York, in patent 4 (a stock-shaving or rounding machine), August 10, 1836.

¹¹ Nathan Jacobs, Newark, Ohio, in patent 145 (improvement in dressing millstones), March 11, 1837.

PLATE.

E. W. Carpenter *Regulating the mouth of Planes*
Patent Mar 27th 1849.

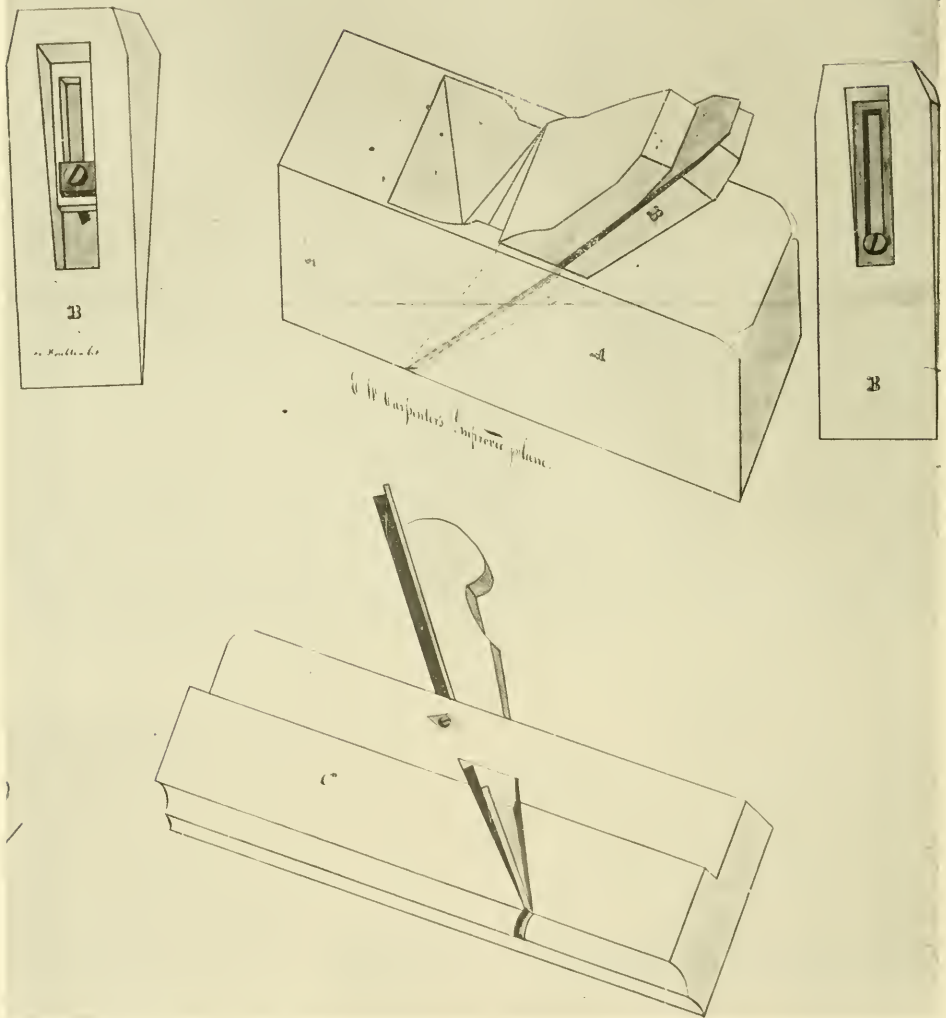


Figure 4.—METHOD FOR REGULATING THE THROATS OF PLANES invented by Emanuel W. Carpenter. Patent 6226, March 27, 1849.

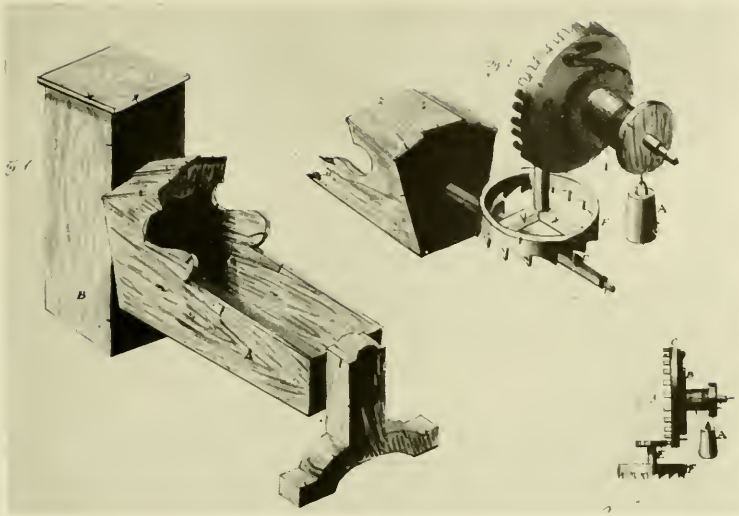


Figure 5.—CRADLE AND CHURN PROPELLER patented by Ezra Whitman, March 27, 1835 (restored patent 8726X).

justing and regulating the “throats of planes” (fig. 4), or for a self-propelled cradle and churn (fig. 5) driven by a “clock work” escapement. Individually and collectively, all machine patents suggest a public attitude that welcomed technical improvement. Surely the penchant for invention strongly reinforces the contention that well before the 1830’s there had already developed, in the United States, a vocal and well-defined “industrial consciousness.”¹²

Patents and Standard of Living

But what of more tangible things? How, for example, may living standards be assessed from the patent records? A count of the number of patents granted for improved household furnishings listed by Edmund Burke, *Patents for Inventions and Designs, Issued by the United States from 1790 to 1847*, reveals that there were nearly 600 “machines and implements for domestic purposes,” including such items as bedbug

repellents and writing desks, and that no less than 228 washing machines were awarded letters.¹³ This large number of patents for household appliances reflects an increased standard of living in a new nation where comfort and convenience gradually emerged as middle-class prerequisites newly compatible with the older gospel of “Poor Richard.”

The researcher will certainly be struck by the great increase in pianoforte patents between 1830 and 1847.¹⁴ Why is it that no less than 49 out of the 60 were granted in this 17-year period? Is this merely the old story of one invention triggering a host of variations or is it a positive reaction by inventors to something new in the society? Had Jackson’s victory at the polls put a piano in every parlor? Had scores of music-loving German immigrants aroused a new interest in music? Is this but another sign of increased leisure in a society where young women now found time to supplement artistic dabbling with recitals at the piano instead of an extra hour at the loom or wheel? Or is it purely a response to a technical

¹² SAMUEL RESNECK, “The Rise and Early Development of Industrial Consciousness in the United States, 1760–1830,” *The Journal of Economic and Business History* (August 1932), vol. 4, pp. 784–811.

¹³ EDMUND BURKE, *Patents for Inventions and Designs, Issued by the United States from 1790 to 1847*, pp. 307–318.

¹⁴ *Ibid.*, pp. 325–326.

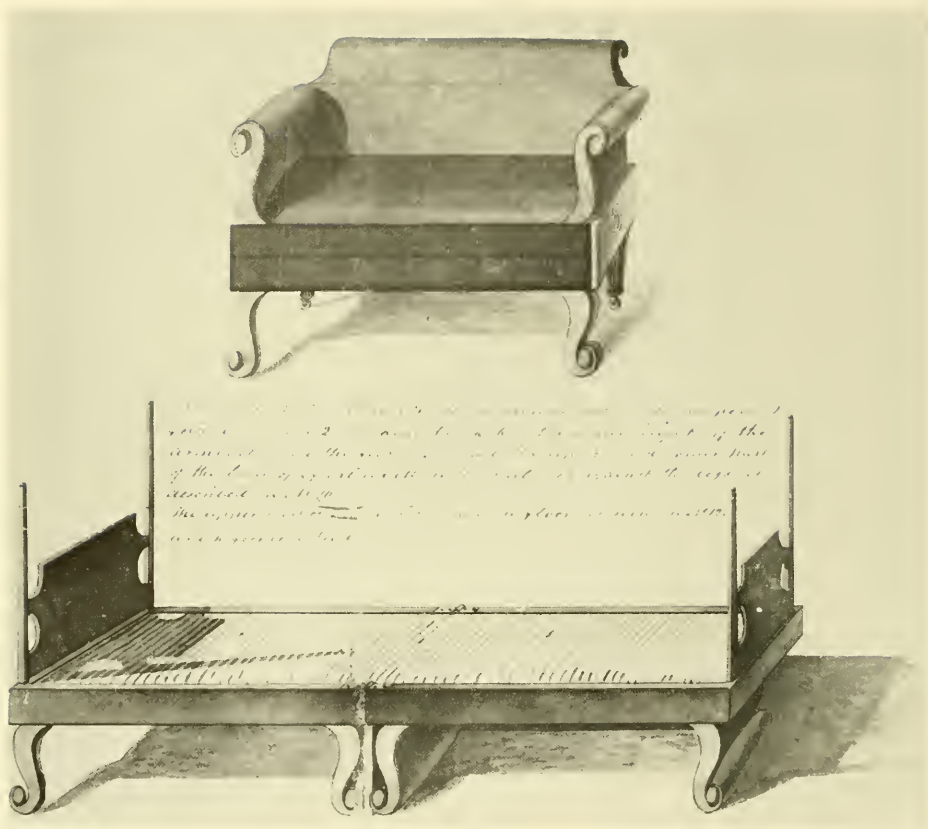


Figure 6.—SOFA-BEDSTEAD designed by Benjamin Morris, January 17, 1835 (restored patent 8668½X).

advance, the application of the metal frame to piano construction, that caused the rash of invention? The answers may lie in the patent records.

The patent drawings are no less provocative than the applications in reflecting how people lived. One is immediately curious about the popularity of combination or convertible furniture, first appearing in quantity in the 1830's.¹⁵ The drawings submitted by Benjamin Morris of Richmond, Ohio, in 1835 for a combination trunk, sofa, and bedstead provide an

¹⁵ Ibid., pp. 307-318.

intriguing example (fig. 6). What stimulated the building of this type of furniture? A host of inferences spring to life. Had increased urbanization brought crowded living quarters, thus making the combination piece more suitable for persons of moderate income and modest surroundings? Was it a reflection of a people in motion, a solution in furniture design to suit a society in flux?

When Morris' drawings are related to their accompanying description, some of the questions are answered. In addition, the value of both to the social historian becomes clearer. In his patent specification

CALCULATOR
6783 X
DIVISION

Williams Woolley
Pat. & Jobber

Oct 3rd 1831

Pat. No.

Suppose
1st. A person travels from New York
to New Orleans by sea, in a vessel, without
any other means of conveyance.
2nd. A person travels from New York
to New Orleans by land, in a stage, without
any other means of conveyance.
3rd. A person travels from New York
to New Orleans by sea, in a vessel, and
by land, in a stage, without any other
means of conveyance.

add. under the direction of the Commissioner of Patents
in conformity with act of Congress 3 March 1831

Commissioner of Patents

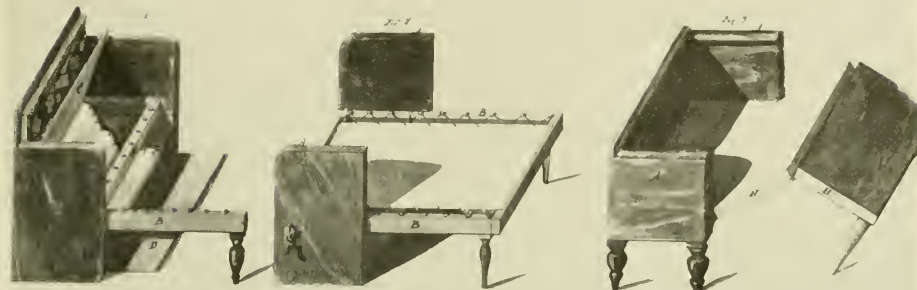


Figure 7.—BEDS WERE DISGUISED as bureaus, sofas, settees, and presses by William Woolley of New York, and patented on October 3, 1831 (restored patent 6783X).

of January 17, 1835, Morris wrote:

The ostensible design . . . is to accommodate travellers by land and water, but more especially on Steam and Canal Boats; being calculated for a safe conveyance of all such articles as are commonly conveyed in Trunks, either by land or sea, affording the proprietor at the same time, not only a comfortable bed on which he may repose at night . . . but the means of saving himself and property in case of accidents, such as the sinking or burning of the Boate, in which he is travelling, by floating, himself and Trunk, to shore, by means of cork provided for that purpose.

But Morris does not stop here. The merits of his creation as a bed and a settee were still to be considered:

Likewise the Berth . . . when unfolded is the length of a common bed, and designed to be used in Offices, Colleges, and shops, being a neat and convenient piece of furniture. The settee is also a neat and convenient piece . . . and when used as a seat, it occupies but half the space of a common settee . . . and is designed for the use of private families, or in Cabins of Steamboats and other crafts, affording a seat by day and a bed at night.

Sickness and indisposition continued prevalent in American society and this, too, is reflected in the applications for patents. No doubt the constant presence of ill health and prolonged periods of recovery stimulated the designer of sickroom accouterments; if not, then the humanitarian spirit of the day surely did. Regardless of motive, the patentees claimed the saving of "much expense as well as room" to be the greatest advantage of their furniture. Ideas to improve the lot of the invalid abounded and innovators usually camouflaged the true identity of their masterpieces by mechanically converting them to more or less conventional types when not in use. William Woolley of New York City constructed the most appealing sickroom furniture and was in addition, a prolific designer of secret beds and convertible sofas for ordinary purposes. One of the earliest of Woolley's patents, a design for a "Secret Bedstead," detailed methods of hiding beds in "Presses, Bureaus, Sofas, etc." or in fact, in any object of sufficient size (fig. 7). Between 1830 and 1838 Woolley obtained

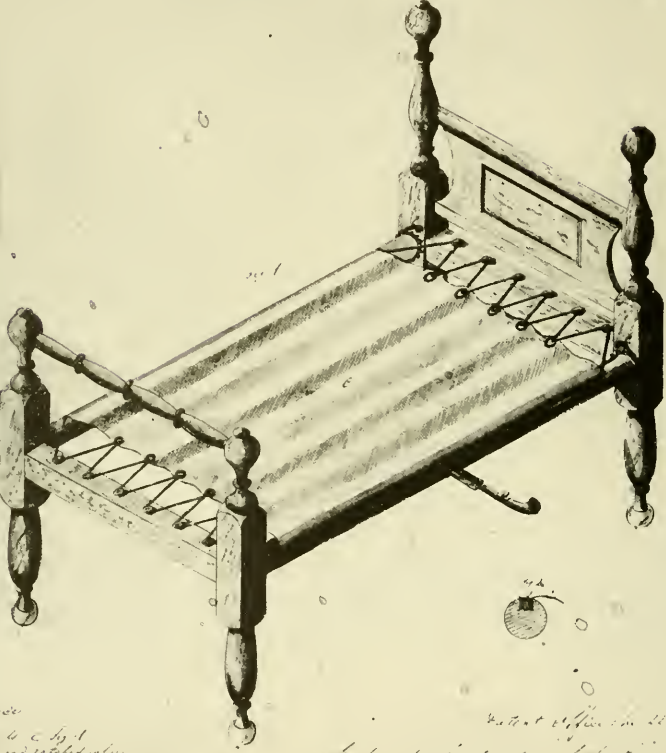
6 BEDS.
List Bottoms.
Fabr.

1821
4157
VISION.

Perigrine Williamson
Bedstead.

Col. 4. 17. 49. 50

Patent of Perigrine Williamson



*Reference
to the same is to be found
in the case, and related volume
of the records in which is what shows the nature
of the invention of the bedstead, and as
of the same
of the same*

*Patent of Perigrine Williamson
made under the direction of the Commissioners of Patents
in conformity with act of 27 March 1824*

*J. A. Smith
Commissioner of Patents*

Figure 8.—BEDSTEAD invented by Perigrine Williamson, for which a patent was issued on December 6, 1821 (restored patent 3415X).

JOHN WADE'S

Apparatus for making, and taking in sail

Patented 6th Decem^r 1836



Figure 9.—APPARATUS FOR MAKING AND TAKING IN SAIL invented by John Wade.
Patent 101, December 6, 1836.

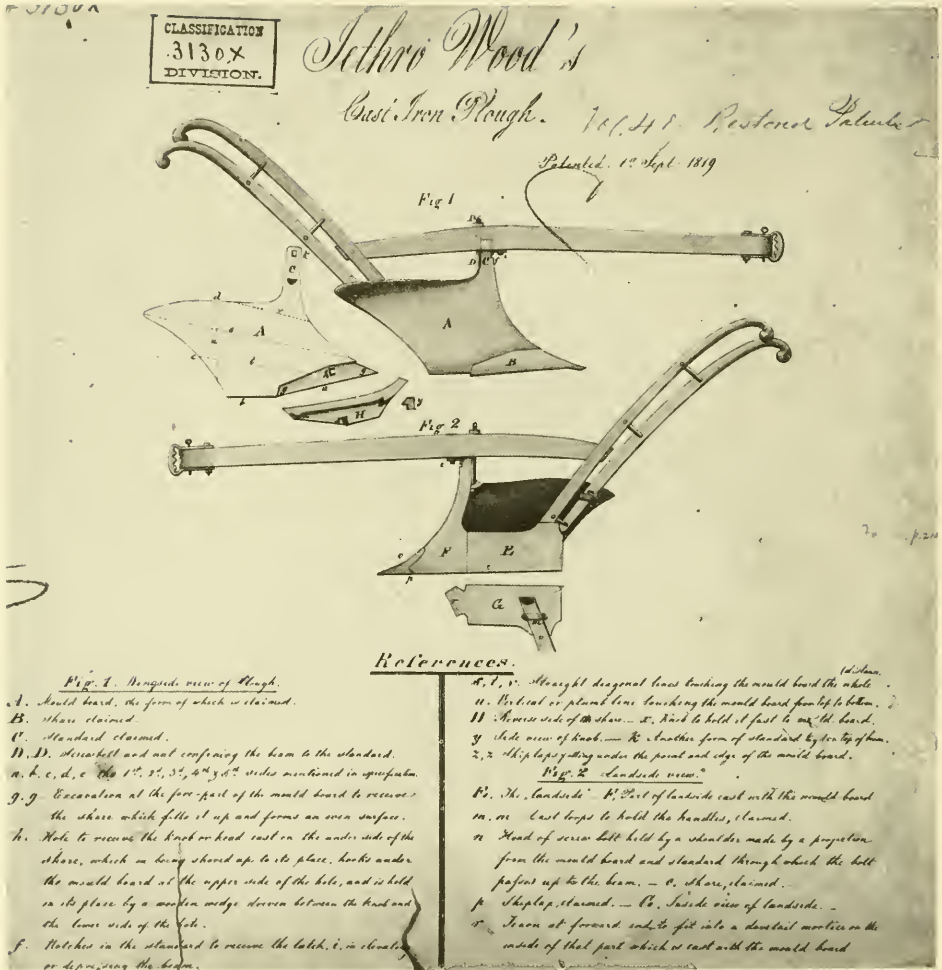


Figure 10.—CAST-IRON PLOW patented by Jethro Wood on September 1, 1819 (restored patent 3130X).

patents for a variety of improvements on his original hideaway bed and seems to be the innovator of the style, at least as revealed in the patent records. "Moveable at pleasure," the "Sofa Bedstead" had one advantage that apparently has diminished in importance over the years; namely, that the bed and bedding were "inclosed in a tight box which effectually ex-

cludes all dust and air necessary to the existence of insects" (restored patents, Oct. 3, 1831).

This type of innovation was a direct response to steamboats, canals, reduced living space, long periods of convalescence, and a transient, hurrying society all represented visually in a patent drawing and confirmed in its specification. But there is more

1827
2-7
ION.

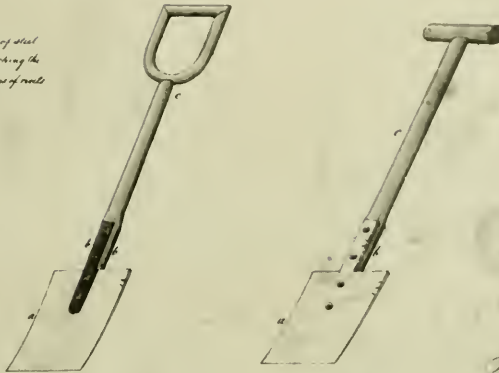
JAMES WOOD'S

Improved Spades.

Patented 10 Feb'y 1825.

References.

The blades, made entirely of steel
Iron, or steel drops, attaching the
blades to the handle by means of rods
The handle



J. H. Stone del.

Patent Office 23. April 1841
Made under the direction of the Commissioner
of Patents, in conformity with Act 3^d. March 1837
H. L. Bell
Commissioner of Patents.

Figure 11.—IMPROVED SPADES patented by James Wood, February 10, 1825 (restored patent 4022X).

to be gained than this from the patent records. The original manuscript petitions of patentees suggest the educational and social status of the inventors of the period. Carried a step further, the authors of our "anonymous history" might be properly identified and appraised in biographical sketches. Regional statistics, if assembled, might indicate that environment conditioned inventiveness, or that one section dominated all others in the number of its innovators. Drawing skills, draftsmanship, and artistic ability, in the society as a whole, can be estimated. It is even possible to study the conduct and machinery of a vast 19th-century editorial and publishing operation

carried out by the Commissioner of Patents with knowledge of its routines. administrators, editors, and artists easily obtainable.

Patents and a Changing Technology

If it is debatable that the patent records do or do not suggest a favorable public attitude toward industrialization and improvement, it is surely unquestionable that they can indicate to the historian the Nation's technical level, capabilities, and accomplishments, both statistically and pictorially. Also,

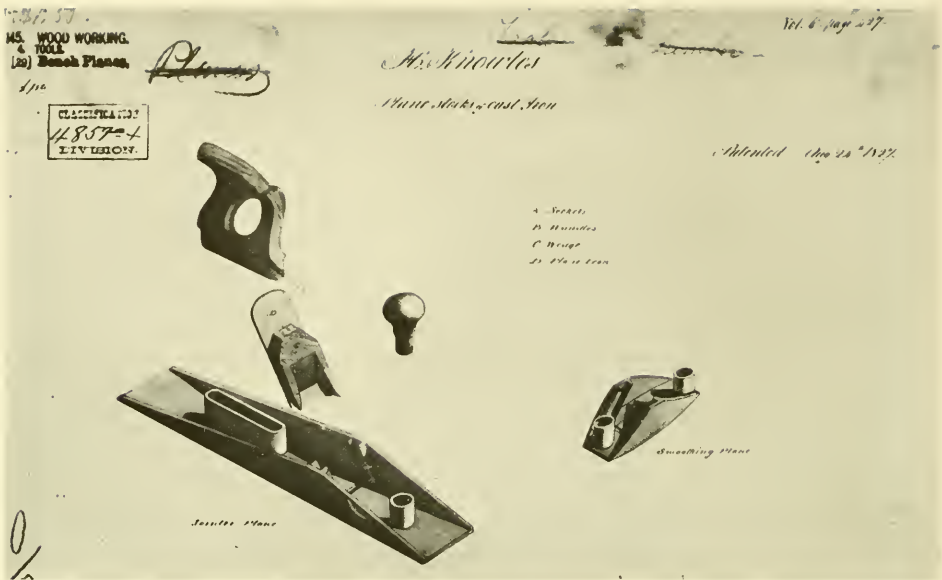


Figure 12.—PLANE STOCKS OF CAST IRON patented by Hazard Knowles on August 24, 1827 (restored patent 4859X).



Figure 13.—CAST-IRON BENCH PLANE patented by William Foster. Patent 3355, November 24, 1843.

they strongly imply that the accepted view of a persisting and predominantly agrarian society might be revised in favor of an interpretation that finds mechanization well entrenched much earlier in the 19th century than generally credited. Again, to determine the validity of this, a close counting and analysis of the patents issued would be revealing and helpful to the cultural historian. Granted that the full impact of iron and steam is realized later, it remains a challenging fact that patentees, before 1850, seemed consumed with the application of both in proposing new ways of doing things. With the patent records as a historical guide, the manufacturing debut of the United States at the Great Exhibition at London's Crystal Palace in 1851 no longer seems an unexpected display of inventiveness, but an achievement for which the country had long prepared.

Examine closely the period 1790 to 1870 in terms of the Patent Office record and what is suggested. First, a society seeking, often naively, a mechanical solution to almost every problem of the day, one that devised agricultural machines, woodworking machines, machines to spin thread, remove smut, or pare apples. Inventors found themselves seduced by the mechanical, and many of them either designed beds "precisely upon the principle of a windless" (fig. 8) or, like John Wade, applied the same ideas to "making and taking in sail by means of a revolving yard on which the sail is wound" instead of reefed (fig. 9).

Secondly, a society takes shape that is already well advanced in finding new uses for iron and steel and how to mold them. The cast-iron plow (fig. 10), the steel-bladed spade (fig. 11), iron-bodied carpenter's tools (figs. 12-20), and the sheet-metal lifeboat (fig. 38) are primary examples. It seems quite natural to find that Jethro Wood of Poplar Ridge, New York, should state in the specification for his patent that he had "very little use for wrought iron" and wanted it clearly understood that the "principle metallic material" of his plow was "cast iron"—a material which he felt made it "stronger and better, as well as more lasting and cheap." It is interesting to note that Wood was completely wrong concerning the relative strength of wrought and cast iron, although correct about their longevity and price. No less surprising is the improvement in making shovels and spades—patented by James Wood of Philadelphia on February 10, 1825—that called for blades made "from a single piece of steel rolled to the proper dimensions and not hammered." Similarly, Hazard Knowles of

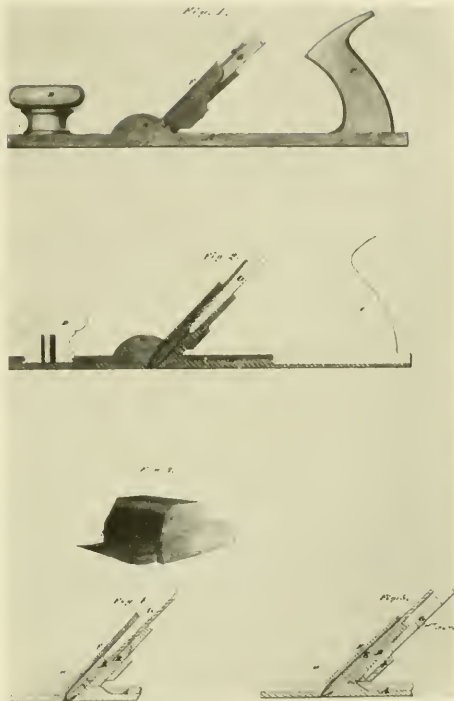


Figure 14.—IMPROVEMENT IN METAL BENCH PLANES patented by Birdsill Holly. Patent 9094, July 6, 1852.

Colchester, Connecticut, inventor of the bench plane with a cast-iron stock, informed the Commissioner of Patents on August 24, 1827, that wood no longer seemed the best structural material even for the most traditional implements:

The peculiar excellency of this kind of stock consists in this. That it is more durable than the common Stock of wood, that the face of it unlike that of the wooden will always keep in the same condition and not be like that constantly subject to wear and hollowness in the centre, and that the opening thro which the shaving passes will always retain the same width and that it can be afforded at a much cheaper price.

William Foster, a resident of the District of Columbia, patented a cast-iron bench plane in 1843 (fig. 13) and as had Knowles, he claimed that it would "run light and easy," being far superior to other planes in

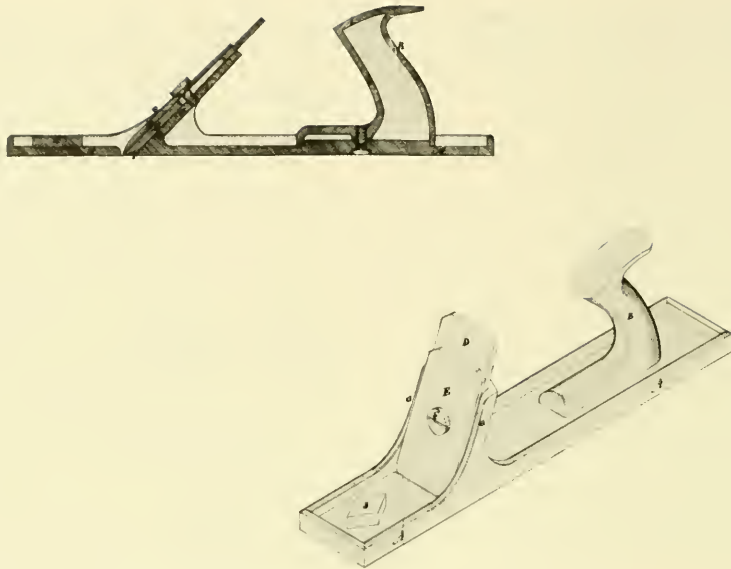


Figure 15.—IMPROVED BENCH PLANE patented by George E. Davis.
Patent 12787, May 1, 1855.

“durability, economy and convenience.” Lightness and durability motivated both Birdsill Holly of Seneca Falls, New York, and George Davis of Lowell, Massachusetts. Holly, in 1852, suggested a means by which the width of the throat of the plane could be adjusted for various types of work—flexibility achieved in a metal medium that would have been most difficult in wood (fig. 14). In 1855, Davis described an “iron plane-stock and a new method of attaching the cutting irons to the stocks to be used by carpenters and woodworkmen” (fig. 15). Davis’ patent specification stated:

The nature of my invention consists in constructing the main body of planes, molding tools, &c., of metal, which being very thin, presents little or no impediment to the shavings passing out as they are cut from the wood, using an iron or wood handle attached to these planes. By means of the lower portion of the plane stock thus made, the hand of the operator is very near the face of the plane when it is used and consequently equally near the face of the stock which is being dressed. And my invention farther consists in securing the cutting irons to the iron or other plane or tool stock, by means of a single screw (instead of the old chip) which screw secures both the cap and the cutting

iron together, and both of them to the iron tool or plane stock, and by forming a lip in the back part of the throat so as to fill it and thus give a smooth even surface to the face of the plane

Two patentees—E. G. Storke, in 1869, most likely an inmate of Auburn prison at Auburn, New York, and Ellis H. Morris, in 1870, of Salem, Ohio—specified innovations designed to make metallic planes move more easily over wood surfaces (figs. 16 and 17). To this end, Storke wrote in his specification that “it has long been known to mechanics that metallic planes have adhered to the wood much closer than wooden planes,” and to correct this, he recommended grooving, fluting, or channeling the face of the plane. Morris confirmed the friction-reducing value of the longitudinal grooves in his specification and added that “casting the body of the plane with a series of intersecting ribs, covering the entire face,” resulted in a tool of greater lightness and strength.

Fascinating among these patent drawings of metallic planes are those that depart from traditional shapes; and, interestingly, although the several patentees succeeded in introducing new forms, they were all

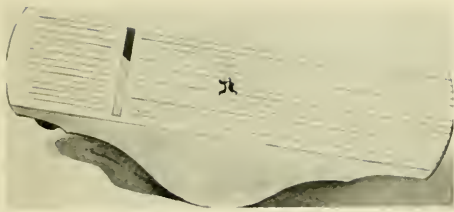


Figure 16.—GROOVED FACE FOR METALLIC PLANES patented by E. G. Storke. Patent 96052, October 19, 1869.

consistent in one respect—their quest for multipurpose solutions through the perfection of the combination tool. William Loughborough, of Rochester, New York, in 1859, invented an “Iron Fillister-Plane, the principles of which are applicable . . . to panel-plows, match-planes, dados, rabbets, and to bench-planes.” How did Loughborough propose to accomplish this? First, referring to his drawing (fig. 18), by the construction of an iron stock for fillisters, dados, rabbets, match-planes, and panel-plows; second, in the construction of a parallel fence, F, for fillisters and match-planes; third, in the construction and arrangement of a stop, P, moving diagonally to the line of pressure upon it, the same being applicable to the dado and panel-plow; fourth, in the application and arrangement of the spring cap, C, in combination with the screw 2 or any other adjustable or fixed fulcrum; fifth, the combination of the adjusting screw 1 with the bit, B, and spring cap, C; sixth, the application and arrangement of the spur, M.

Charles Miller, of Brattleborough, in 1870, detailed a plane readily “convertible into a grooving, rabbeting or smoothing-plane,” one later manufactured by the Stanley Plane and Level Company (fig. 19). The same year an even more amazing piece of Yankee ingenuity, as well as a departure from the traditional, was a plane patented by Russell Phillips (fig. 20). The multipurpose urge that prompted so many American innovations is nowhere better described than in Phillips’ specification:

This invention combines in one implement elementary features now only found in several independent tools, the result being a great saving in space in transportation, as well as in stores and carpenters’ shops, and enabling a mechanic to obtain, at small comparative cost and in a compact and efficient form, the substitutes for several classes of planes.

I have combined in this instrument a rabbeting-plane and an expansible matching-plane, to operate on and prepare

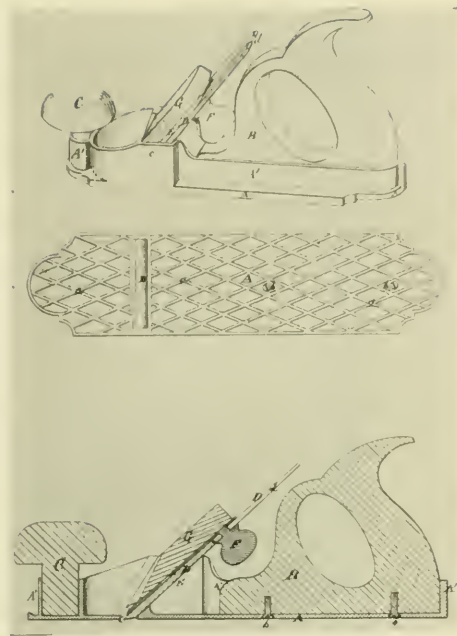


Figure 17.—METALLIC PLANE patented by E. H. Morris. Patent 109037, November 8, 1870.

boards of various thicknesses, one side of said rabbeting-plane serving as a fence or guide to the latter, as hereinafter explained.

While this invention consists, primarily, of the combination of a rabbeting-plane and an expansible matching-plane, the latter, in turn, will be found to consist of several members, or organized as to enable one to produce a “tongued groove-connection,” called “matching stuff,” a “cross-channel,” or a “plowed groove of any desired dimensions.”

Were these innovations suggested by patentees practical? Indeed, David McHardy thought they were since with such tools “the work is not only better done but in less time than formerly.” By the year of McHardy’s comments (1876), there were iron-bodied planes for every purpose, and their finish varied “according to requirement; some were ground and japanned, others polished, and some nickel-plated, the higher finish being on the smaller sizes.” By 1876, one American manufacturer alone

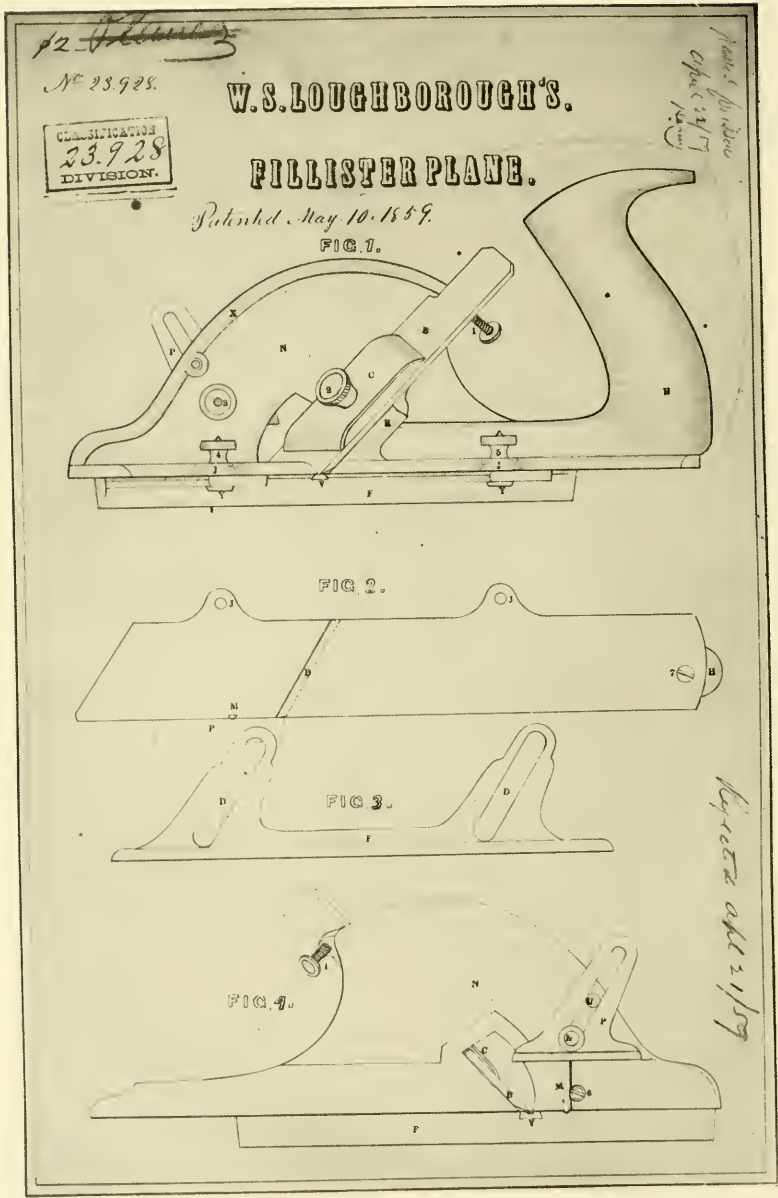


Figure 18.—FILLISTER PLANE invented by W. S. Loughborough. Patent 23928, May 10, 1859.



C. G. Miller. Carpenter's Plane.

104753

PAT. JUN 28 1870

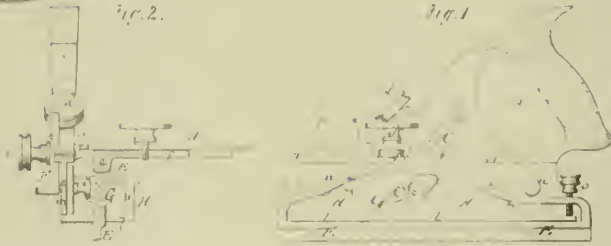


Fig. 2.

Fig. 1.

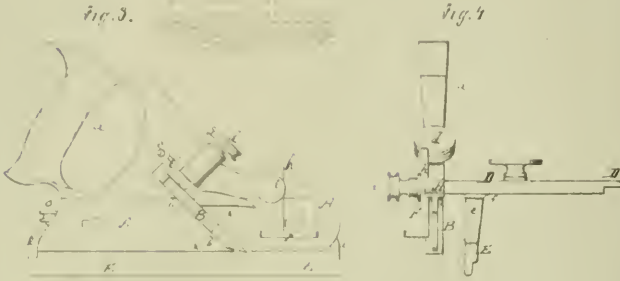


Fig. 3.

Fig. 4.

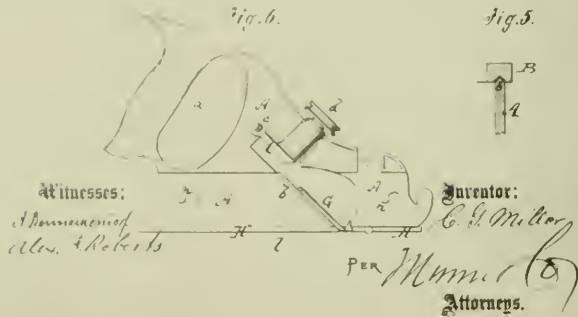


Fig. 6.

Fig. 5.

Witnesses: *J. H. Roberts*
Inventor: *C. G. Miller*
Per *Mumford*
Attorneys.

June 28 1870

Figure 19.—CARPENTER'S PLANE patented by C. G. Miller. Patent 104753, June 28, 1870.

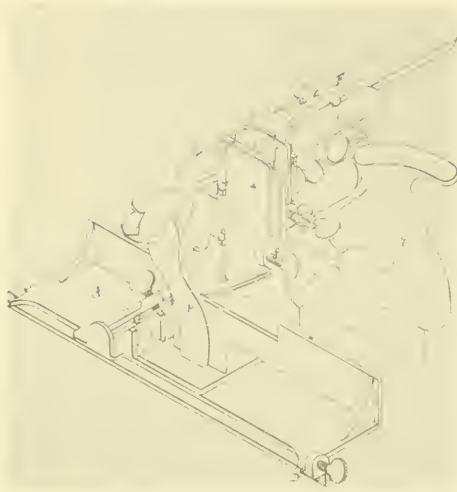


Figure 20.—CARPENTER'S COMBINATION PLANE patented by Russell Phillips. Patent 106868, August 30, 1870.

had already produced 80,000 iron bench planes.¹⁶

The patent drawings of tools, particularly the planes from 1820 forward, confirm McHardy's statements, and in addition, they document original appearance and, on occasion, even reflect attitudes that prompted innovation. The original appearance of a plane, for example, is often impossible to determine after years of disuse, particularly after gathering dirt and dust beneath an old carpenter's bench which had been long before relegated to the barn as a handy roost for chickens. The character of a tool's finish is frequently severely altered, but the watercolor drawings submitted by many a patentee will provide the restorer with an excellent guide to original color and desired finish.

The patent drawings richly document the fact that, in wood at least, the basic design of the hand plane had reached perfection and that innovators when not seeking to break entirely with traditional forms were most often concerned with minuscule improvements or, as already seen, with combining

¹⁶ *United States Centennial Commission. International exhibition, 1876. Reports and Awards, Group 1-36*, edit. Frances A. Walker; Philadelphia, J. B. Lippincott and Co., 1877-1878. See Group 15 (builders' hardware, edge tools, cutlery, etc.), p. 13. McHardy was the English judge appraising the quality of edge tools at the Centennial Exposition at Philadelphia in 1876.

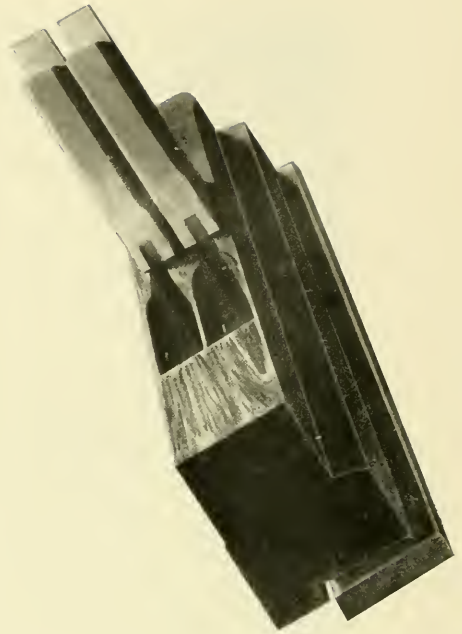


Figure 21.—IMPROVEMENT IN TONGUE AND GROOVE PLANES patented by Emanuel W. Carpenter on January 30, 1830 (restored patent 5807X).

several functions within one tool. Emanuel Carpenter's patent of 1830 for the improvement of tongue and groove planes, and that of 1838 for a method of making and applying the screw arms on all types of planes are splendid examples: in each, the basic shape of the plow, the molding plane, and the smoothing plane remain unchanged (figs. 21 and 22). Similar is William Reynolds' delineation of the trying plane to support his patent application of 1832 for the control and adjustment of the double iron (blade). No alteration appears in the body of the plane itself, and the drawing stands as a first-rate, contemporary illustration of one of the most familiar of woodworking tools (fig. 23). Few contemporary illustrations excel the watercolor representation of James Herman's tongue and groove planes submitted to the Commissioner of Patents in 1835 (fig. 24). Again, nothing new, not even a screw arm, disturbs the familiar configuration of these planes, and only

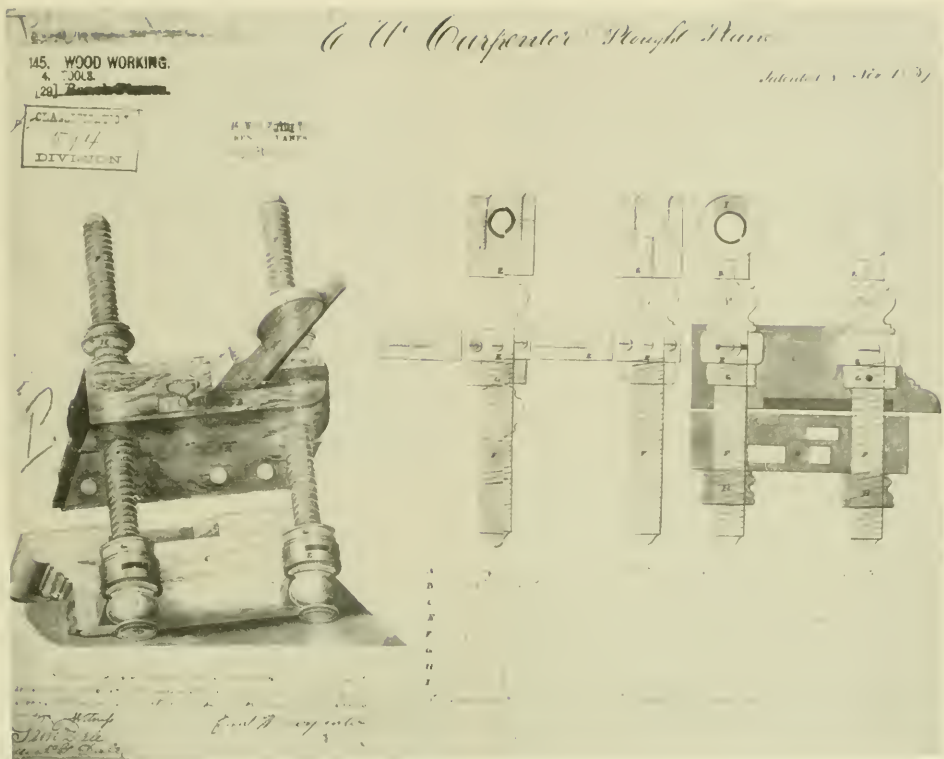


Figure 22.—PLOW PLANE patented by Emanuel W. Carpenter. Patent 594, February 6, 1838.

the insertion of rollers to help move the fence (the purpose of the patent) mars their traditional shape. Read the detailed specification submitted in 1860 by Charles Fleming, and examine his patent drawing (fig. 25) for a molding plane, the most prosaic of woodworking tools. The patentee wrote:

I, Charles Fleming, of the city of Ypsilanti, in Washtenaw county and State of Michigan, have invented a new and useful Improvement on Tools for Making Quarter-Round and Ogee Moldings, the board to be worked standing on edge, which I call "Fleming's self-regulating quarter-round and ogee molding tool;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which the figure represents a perspective of the quarter-round tool as arranged and prepared for use.

A represents the body of the quarter-round tool as commonly made.

B, B represents the key holding the iron in place.

C, C represents the iron and E, the face gage.

Parts so far described represent the common form of this tool.

D, represents a wood or metal gage placed upon the side of the tool as seen in the figure, where it is attached and kept in place by the screws S, S, S.

In the ogee tool the same gage is applied in the same manner and with like effect. This gage can be applied with perfect success to any ordinary $\frac{1}{4}$ round or ogee tool.

To use the tools, either $\frac{1}{4}$ round or ogee, attach the gage D, as seen in the drawings. Let the iron C, C, be so ground and set in the tool that it shall cut a fair shaving at the face gage E, and scarcely cut at all at the side F. Set the board on edge in the vise of the workman, and apply the tool in the ordinary way, and when the work is complete, the gage D,

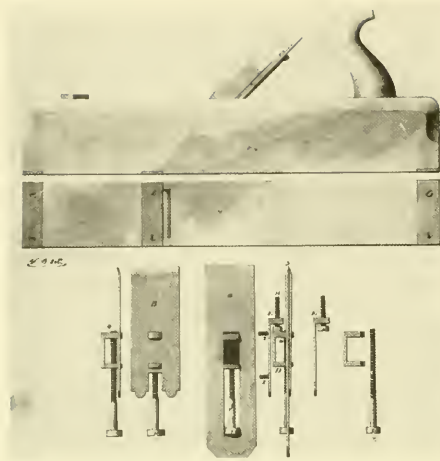


Figure 23.—DOUBLE-IRON TRYING PLANE patented by William B. Reynolds on July 7, 1832 (restored patent 7158X).

will arrest the further working of the tool without thought or care on the part of the workman. While with the ordinary tool, without this self-regulating gage, the tool will continue to cut until the whole board is wasted, and its operation must be carefully watched by the workman, to arrest it at the proper time, and then the work will not be as perfect and uniform as with the gage D, added.

Fleming's patent only slightly modified the usual shape of the plane, and sought either to ease, to make more accurate, or to strengthen it. Metal additions did not always alter the configuration of the plane, and the old wood shapes persisted, only to be changed when, as seen above, metal entirely replaced wood in the body of the tool.

Patent drawings of tools other than planes give positive evidence of tool shapes at a given date. Observe the ferruled handles on the drawing knife patented by Edmund Richards in 1836 (fig. 26), or the scored handle and exaggerated claw on the "hammer-hatchet" patented by Joel Howe in 1834 (fig. 27). These details are particularly helpful guides to the more precise dating of tools in general. The ubiquitous spokeshave, always an enigma to those asked to date it, should be considerably less so with Ira L. Beckwith's patent drawing of 1837 (fig. 28) as a reference point. Although Beckwith's innovation—the insertion of a steel roller to facilitate drawing the shave—is relatively unimportant, his specification

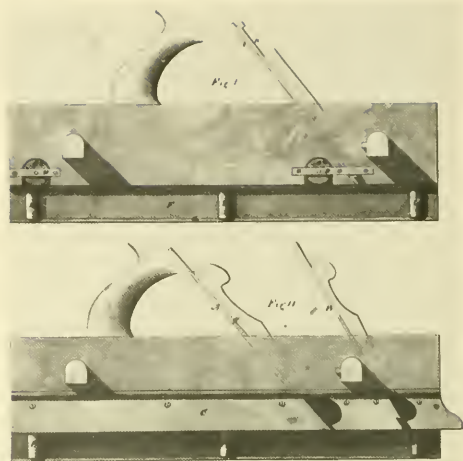


Figure 24.—ROLLER-GROOVING PLANES patented by James Herman on August 27, 1835 (restored patent 9055X).

for a boxwood body and the configuration of the shave itself represent the standard form of this tool in the 19th century. No less significant is the drawing (fig. 29) of James Hayne's frame for a wood saw, first patented in 1859 and reissued in 1863—a prototype of all subsequent bucksaws.

The carpenter's chest is rounded out by Joel Bryant's mortising gauge (fig. 30) and Peter Bradley's adze (fig. 31); both represent the perfected form of each of these implements—shapes that were mass-manufactured and thus survive today in great quantity, frequently passing as ancient woodworking tools.

But it is not just in the tracing of the evolution of design that these visual materials are helpful; they also help to document the first extended use of new tools. The screwdriver, for example, is not a common tool prior to the 1840's. It was not until the appearance of the mass-manufactured, gunlet-pointed, wood screw that American inventors begin to patent screwdrivers in any great number. Before this date, reliable drawings of this tool are few in number. In 1865, George Parr of Buffalo, New York, specified an invention that gives not only an accurate picture of the screwdriver (fig. 32) of the period, but suggests as well the general advance in toolmaking. In the standard form required by the Patent Office, Parr communicated:

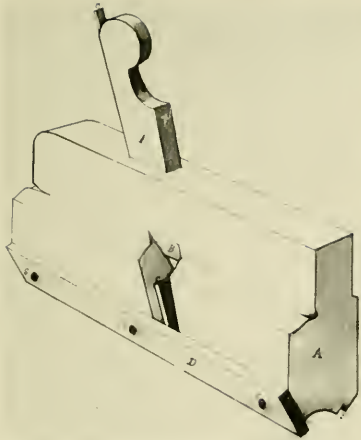


Figure 25.—MOULDING PLANE invented by Charles Fleming. Patent 29962, September 11, 1860.

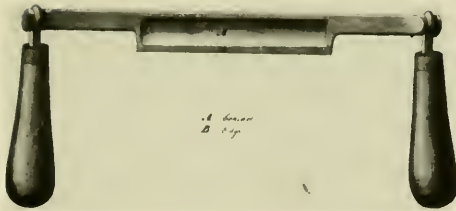


Figure 26.—CONCAVE DRAWING KNIFE patented by Edmund Richards on June 28, 1836 (restored patent 9796X).

The nature of this invention consists in the manufacture of screw-driver blanks (or blades) and other like tools by a new mode or process which greatly reduces the cost of manufacture, and at the same time secures greater strength, symmetry, and perfection of the article when made.

To enable others skilled in the art to manufacture the said articles according to my improvement, I will describe my mode or process of manufacture.

In the first place I roll the metal from which the tool is to be made into plates or sheets by the application and use of mechanical devices common in rolling-mills. These plates are rolled three feet (more or less) in length, and of a width which just equals the length of the blank tool to be punched or cut therefrom, and a transverse section of which shall be the exact thickness and taper of the blank. These



Figure 27.—HAMMER HATCHET patented by Joel Howe on July 8, 1834 (restored patent 8291X).

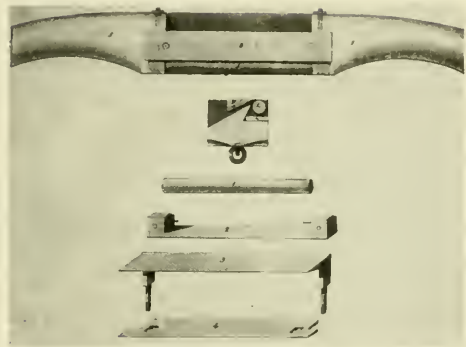


Figure 28.—SPOKESHAVE patented by Ira L. Beckwith. Patent 184, April 29, 1837.

prepared metal sheets or plates are then taken to a punching-machine for punching or cutting the blank tool therefrom.

The punching-machine (which may be of common construction) is provided with suitable punches or dies for punching or cutting the blanks from the sheets or plates of metal, and are so accurately made that the blanks produced thereby, are nearly perfect in form, symmetry, strength, and finish. They are then put into the handle in a common manner.

The sheets or plates of metal are rolled thickest in the middle with a gradual taper each way from the middle to the edge. This is done in order to properly distribute the metal and proportionate it in such parts of the blade as will insure the requisite strength in all its parts without detriment to the form and symmetry of the article. Hence,

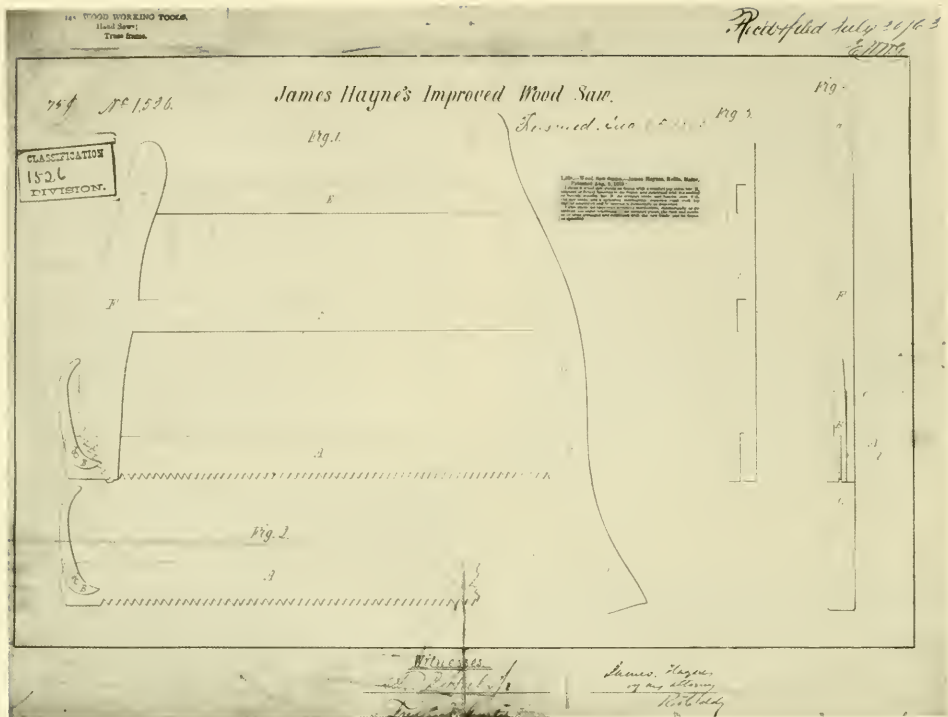


Figure 29.—IMPROVED WOOD SAW patented by James Hayne on August 9, 1859; reissue no. 1526, August 25, 1863.

although there is less width at the middle of the blade or blank, (occasioned by the scallops a a, which scallops are necessary in order to preserve the symmetry of the article,) yet there is greater thickness, and, consequently, requisite strength.

The sheets or plates are rolled of different thicknesses and widths, according to the size and quality of the tool designed to be made therefrom, and dies or punches are made of different sizes to correspond.

It is obvious that this process is a great saving in the cost of manufacture. At least one hundred per cent. is saved by this process, and a more uniform, perfect, and better article is produced, and furnished to the public at a much less expense.

It is doubly rewarding to those interested in the provenance of design characteristics to repeat Parr's statement that the scalloped blade, still retained today in screwdrivers of British manufacture, was not intended to improve the function of the tool but

rather "to preserve the symmetry of the article." [!]

In much the same fashion as the screwdriver, the common clawhammer eluded the illustrators except as a symbolic device in art. Primarily, this seems due to the persistence of mortise and tenon architecture where the treenail took the place of the nail and where the auger and wooden-headed maul were the builder's most frequent companions. But with the coming of the cheap nail and the balloon frame, the clawhammer became a more familiar object. In the patent drawings will be found the most precise renderings of the hammer, graphic evidence that fairly establishes this as the earliest appearance of the clawhammer as it is known today.

A New Hampshire man, Phineas Eastman, of Canaan, in 1838, sent to Washington his specifications for an improvement in "the Manufacture of Socket hammers & hatchets" that detailed the construction

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Fig. 1.



Fig. 2.

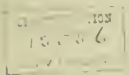


Fig. 3.

Fig. 4.



Fig. 5.



Fig. 6.

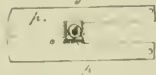


Fig. 7.

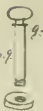


Fig. 8.



Fig. 9.

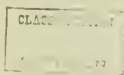


Fig. 10.

The above figures show the arrangement for the complete marking gauges, in which the markers and cutters may be changed at pleasure, the one for the other. There are other ways in which the gauges may be made so as to partially answer the purpose of the above, and be an improvement over those now in use, and that is—by omitting the arrangement for the use of the cutters, inasmuch as by that omission the holders may be made stationary with a screw thread cut within, and with a corresponding screw thread cut on the markers they may be operated raised or lowered by being turned within the said holders, which may be made like a hollow tube without the heads as shown on the figures of the holders c. and g. the heads of the said holders or their equivalent being set on the said markers; or the bars a. & b. may be made to serve as holders in my gauges as arranged with double bars, by omitting the arrangement for and the use of the cutters, by having holes cut through the said bars with a screw thread within the same and a screw thread on the markers as above stated, with heads upon the same; the first marker being set in the metal face (b.) or its equivalent, as a holder. This arrangement for holders, or the operation of markers through a metal face or its equivalent, to serve as a holder, will apply to single or common gauges also, and to every variety of gauges, by the omission above mentioned; consequently I claim this and every other similar or equivalent arrangement by which the markers may be operated, as being within the legitimate scope of my invention, and the true intent and meaning of my original specification.

Witness } *Joel Bryant*

Joel Bryant

1857

Figure 30.—CARPENTER'S GAUGE patented by Joel Bryant. Patent 15556, reissue no. 448, April 14, 1857.

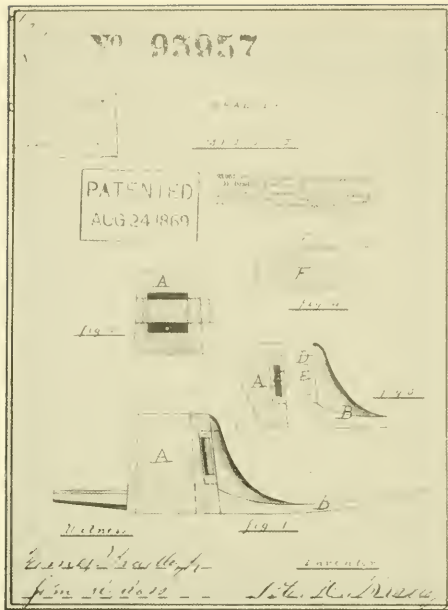


Figure 31.—IMPROVED ADZE designed by Peter H. Bradley. Patent 93957, August 24, 1869.

of a handle which could be screwed into the striking head of the tool. In July 1839, Eastman's patent was granted, and the drawing that supported it provides a classic illustration of the octagonal claw-hammer head characteristic of the early 19th century (fig. 33). The worth of Eastman's patent today lies mostly in the original watercolor drawing of his invention—a primary source for the study of the evolution of tool design. Another patentee concerned with fixing the heads of clawhammers to their handles was Charles Hammond, of Philadelphia, who, like Eastman, provided a notably clear delineation of the common hammerhead (fig. 34). Survivals of this innovation, patented in 1847, are frequently seen. Of his invention Hammond wrote:

The straps of claw hammers, and of others that are furnished therewith, have been connected with the hammer head in different ways, sometimes by welding them firmly, sometimes by allowing them to pass through the eye, and to clip over on the face of the hammer head, and sometimes they have been made to fill the whole of the eye on the face part of the hammer. I have in my improved hammer



Figure 32.—IMPROVED SCREWDRIVER designed by George Parr. Patent 45854, January 10, 1865.

adopted a method of securing the straps in place, by a device more simple, and more easily executed than any of those heretofore followed, while it is free from the objections which exist against some of them, and introduces no new one; I am consequently enabled to put a perfect article into market at less cost than usual by which I produce a public benefit.

The straps of my hammers may be placed on the sides or on the upper or lower parts of the eye, as may be preferred, both of which manners of placing them are well known. They consist of two strips of iron which are to be of equal, or nearly equal thickness, throughout their whole length, but they are widened out at that end which holds in the eye, and their edges are beveled, or made dovetailing, and fill a corresponding beveled, or dovetailed, opening made in the eye. When these straps are in place the handle is driven in between them and the whole is finished off flush with the hammer face.

The modern hammer, freed from its octagonal shape, can be seen in two patents of 1866: one submitted by W. G. Ward; the other, by Christopher Dodge. Ward's contribution, aside from its excellent documentary drawing, is a poignant reminder that whether in Savona, New York, Ward's home, or elsewhere, the prevalence of the Civil War amputee had a profound effect, serving even as a stimulus for invention (fig. 35). Dodge, from Providence, Rhode Island, reflected in his patent the predilection of

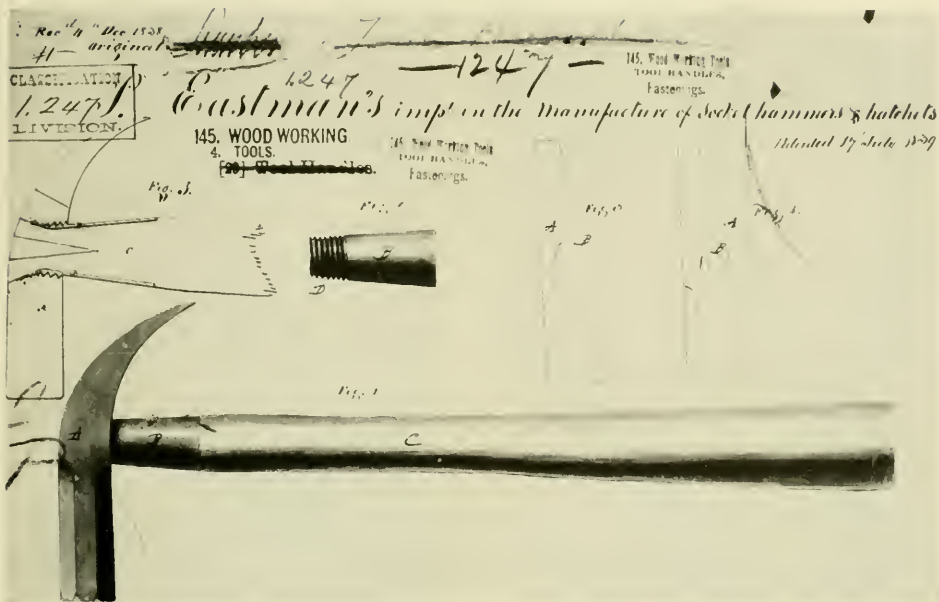


Figure 33.—IMPROVEMENT IN THE MANUFACTURE of socket hammers and hatchets patented by Phineas Eastman. Patent 1247, July 17, 1839.

inventors for the combination tool (fig. 36); but in addition to this, Dodge included in his specification a significant comment: "For household use," he wrote, "no tools are more frequently in requisition than the hammer and the screw-driver." Here, indeed, was evidence of a changed society, a new order of things marked by mass-produced hardware available within the home—fixtures applied by two basic tools, one of which had been scarcely known a hundred years before.

In 1867, Henry Cheney, of Little Falls, New York, received letters patent for an "Improvement in the construction of Hammers." Although lacking the social commentary of Ward's patent, Cheney, by illustration (fig. 37) and description, clearly terminated the evolution of the clawhammer when he wrote:

This invention relates to a new manner of forming the sockets of wrought-iron hammers, and consists in making the same of malleable iron, and brazing, soldering, or otherwise securing it to the head.

Hammers are generally made of cast iron but wrought-iron hammers are far superior, and in greater demand than any other kind. But it is not only very difficult to form the socket on a wrought-iron hammer, but also to find sound enough iron to form the socket on.

My invention is designed to overcome all these difficulties, and to provide a hammer which combines the strength and durability of a wrought-iron hammer with the facility of construction of a cast-iron hammer.

A represents the head of a hammer made of wrought-iron of the usual shape. B is the socket, cast of malleable iron, in the usual shape, and provided with tapering tips, or flanges, a a, which fit into corresponding recesses in the head A, as shown in fig. 2. The socket is brazed, soldered, riveted, or otherwise secured to the head. The face and claws of the hammer may be made of steel, and the most improved kind of hammer can thus be made at the least possible expense. The handle C of the hammer is made in the usual manner, and secured in the ordinary style.

Thus, the hammer head as once forged by the local smith had become an anachronism by contrast to the crisp, efficient lines achieved by Cheney.

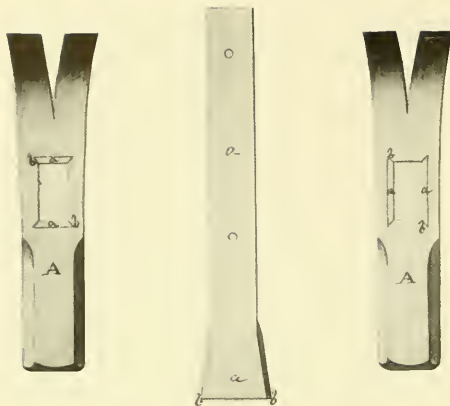


Figure 34.—HAMMERHEAD designed by Charles Hammond.
Patent 4934, January 19, 1847.

But perhaps more indicative of the increased use of iron and steel than any of the above was Joseph Francis' patent of March 26, 1845 (fig. 38), for the manufacture of sheet-iron boats "pressed into form" from a one-piece die and matrix.

Lastly, the patent records reveal a society in which, as Samuel F. B. Morse wrote Fenimore Cooper in 1833, "Improvement is all the rage."¹⁷ The era that believed passionately in the perfectability of the individual chose mechanical as well as spiritual means to achieve it. Of course, these are neither new nor original revelations. What is new and significant is to find them supported in such depth, in a place long known but little explored.

Often the historian is required to define culturally a broad span of years—to bound, so to speak, a period's limits and its accomplishments in terms of ideas and events. Contrast James Wood's improved spade of 1825 (fig. 11) with Carmichael and Osgood's excavator of 1846 (fig. 39); or Ezra L'Hommedieu's auger of 1809 (fig. 40) with Merrick's screw wrench (fig. 41) of the 1830's and 1840's? Note the manually operated shovel, albeit of steel, that together with blasting powder, the pickax, and the Irish, opened the era of canalization. Compare it to the steam-operated, iron-jawed excavator that readied the course of railroads and canals, diverted rivers,

¹⁷ SAMUEL F. B. MORSE, *His Letters and Journals*, edit. Edward Lind Morse (Boston, 1914), vol. 2, p. 22. See Samuel Morse to James Fenimore Cooper, Feb. 21, 1833.

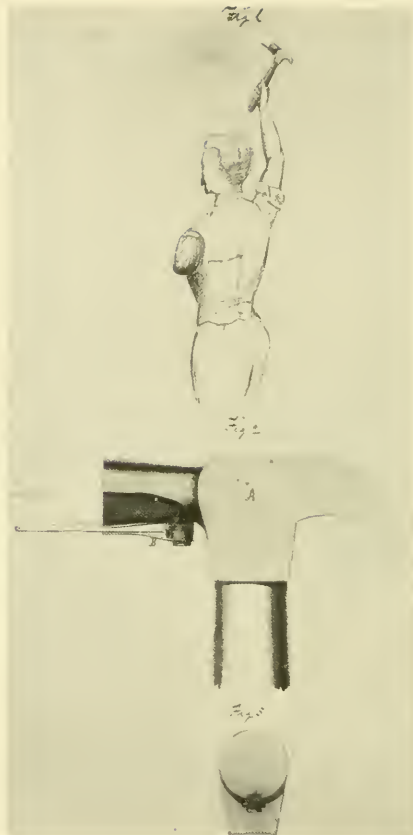


Figure 35.—IMPROVEMENT IN HAMMERS patented by W. G. Ward. Patent 56838, July 31, 1866.

dredged harbors, and vastly speeded the construction of civil works and conserved human resources. Do not these objects, in fact, meaningfully define the period by illustrating its several levels of technology? If nothing more, they are an indication of the rapid change that took place in American life in the span of 80 years.

Other patents document this in an equally significant and dramatic manner. Consider the L'Hommedieu double-podded, center-screw auger and the Merrick screw wrench. Each is of interest in itself. For instance, L'Hommedieu's patent specification of the auger is full of information.

The auger at the end of which enters the timber has a screw in the centre which supercedes the necessity of a gouge. The auger as its name implies is made with two pods directly opposite to each other and at the extremities of each pod next the screw are two sharp lips, for cutting the timber. The auger may be made of any dimension. The shaft and handles like those in common use otherwise at the pleasure of the owner. The great superiority of this auger over any other in use consists in its being more strong and durable, in turning much easier, boring faster and drawing out of the hole with more ease.

Likewise, Solyman Merrick's screw wrench would be of interest if only to know that its patent was renewed and extended through 1851.

Yet, the auger and wrench are suggestive of something more. Both tools facilitate building and construction. The former is in response to a system based on the mortise, tenon, and treenail as the standard structural fastenings, while the latter marks the beginning of modern construction practice characterized by mass-produced hardware—bolts, nuts, screws, and nails. The auger is medieval—the companion piece of the broadax, the beetle, the mortising chisel, and the adze—the wrench, on the other hand, is associated with the screwdriver, the hammer, the gimlet-pointed screw, and the factory-made nail—all, in their perfected form, symbols of the 19th century. Each expresses a level of technology. One, a composite of wood, water power, and heavy timber construction; the other, a synthesis of iron, steam, and a lighter building frame of either wood or steel. Thus, specific objects, whether a shovel or a steam dredge, an auger or a wrench, can symbolize the most significant ideas and techniques of a period. The historian will find the patent files rich indeed if he examines them in terms of the concepts and ideas that created them.

Patents and the Cultural Historian

The understanding of what objects mean in terms of the times that produced them is an important problem encountered by the cultural historian working in the museum field. But, he also faces a much lesser one, simply that of identity; and, once again, the patents are of value. The most elusive survivals to trace are invariably the commonplace, and these are often exactly what the patent records best exemplify. Usually patentees were largely unconcerned with elegant furniture, exquisite silver, and fine china. But, whether of the finer sort or not is really un-

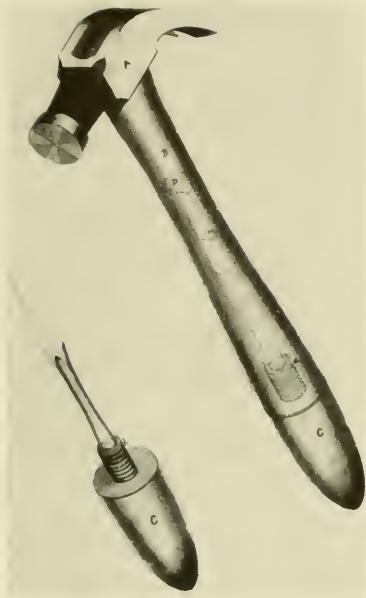


Figure 36.—NAIL HAMMER patented by Christopher G. Dodge. Patent 56191, July 10, 1866.

important because the drawings serve, regardless of an object's status, as a guide to original color and finish, to decoration and design, and to integrity of form as well as purpose.

Students of the decorative arts generally have overlooked the patent drawings—a source in which household furnishings abound. The bedstead (fig. 42) patented by Isaac Eaton of Mount Gilead, Virginia, in 1833, is typical of the 100 or more such patents applied for before 1847; and, although less numerous, patents exist for tableware and utensils that reflect the fashions of the day. Inventors also favored chairs, and considerable insight into popular tastes can be gleaned from their descriptions of them. For instance, Benjamin Hays of Pittsfield, Massachusetts, emphasized in his 1834 specification the simplicity of his easy chair (fig. 43), but quickly added that the back and sides might be “stuffed and turned into any style of plainness or elegance.” Although it is typical of patentees to attempt to cover

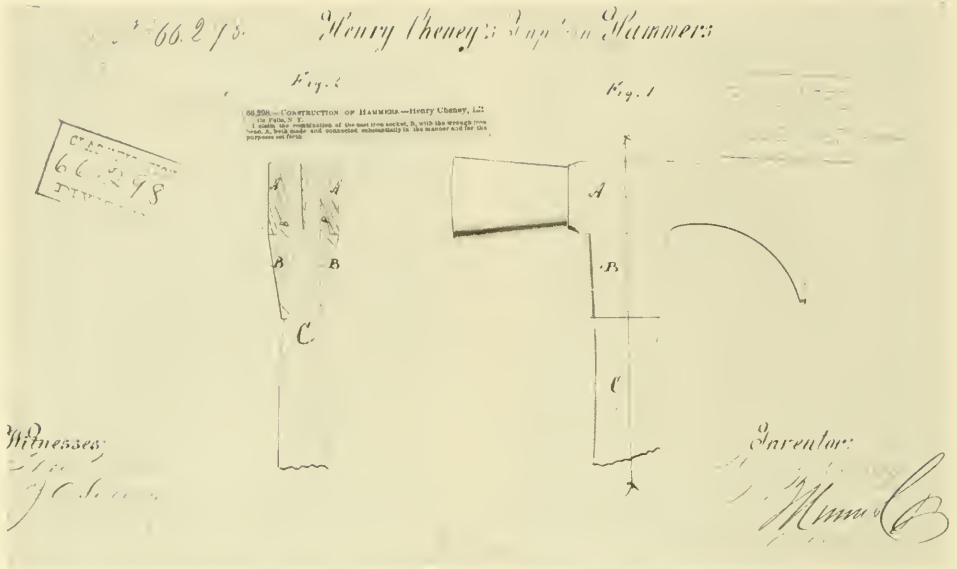


Figure 37.—HENRY CHENEY'S IMPROVEMENT IN HAMMERS. Patent 66298, July 2, 1867.

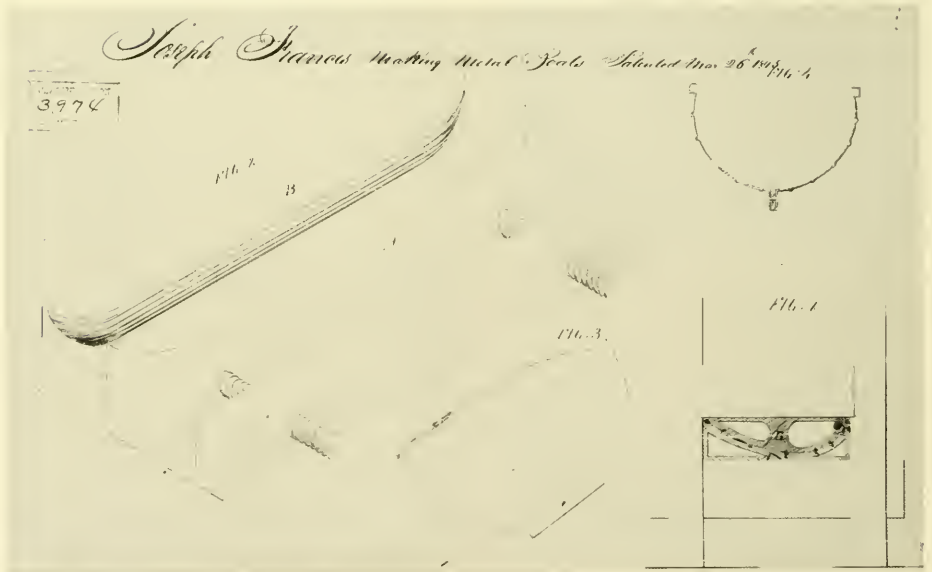


Figure 38.—MAKING METAL BOATS. Patented by Joseph Francis. Patent 3974, March 26, 1845.

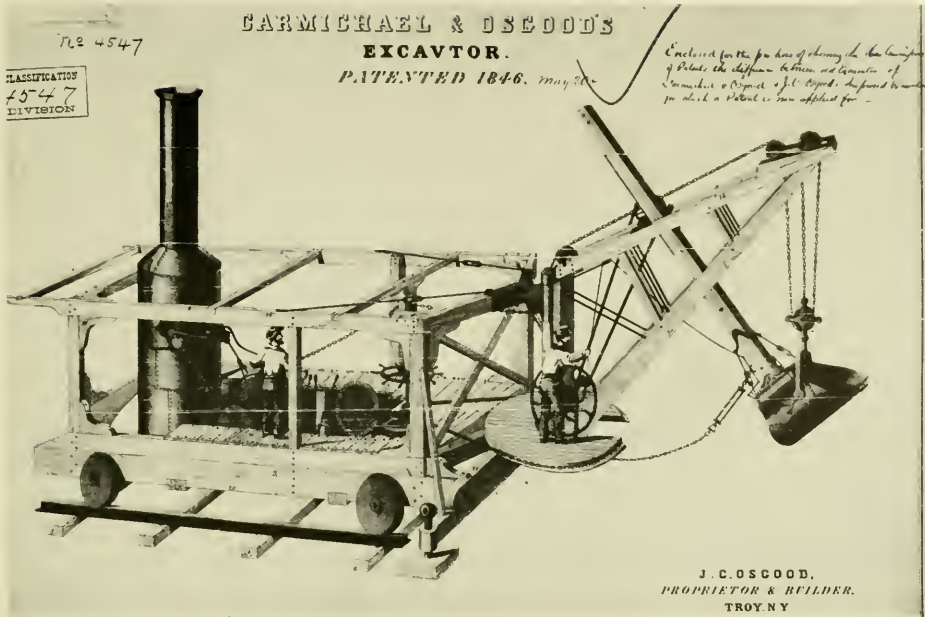


Figure 39.—EXCAVATOR INVENTED by Daniel Carmichael and Jason C. Osgood of New York. Patent 4547, May 30, 1846.

every possibility, this very willingness by Hays to achieve a flexible solution is perhaps one of the period's outstanding characteristics.

The patentees of beds and chairs seem a dull lot compared to innovators like Thomas Boynton of Windsor, Vermont, who, in 1832, requested and received a patent for "Elastic Stamp Painting" (fig. 44), an "improvement in the mode of ornamenting the walls and floors of rooms and, various other things." His patent specification provides instructions for multicolored motifs easily applied, everything from "variegated ornaments" to "stripes, flowers, etc. of various colours" to be combined "in any manner your taste may dictate."

If Boynton fails to stimulate interest, perhaps Dr. J. Wright Warren's portable bath tent (fig. 45) will. Here was a creation that combined "in one arrangement all the conveniences for taking all the several descriptions of baths, such as warm, cold, vapours, medicated vapour, and shower baths," and it was planned with all "due regard to simplicity

and portability." What could be more apt for 1840 than the good Boston doctor's reminder that the tub's exterior curtain should be crimson-colored in order "to add neatness and elegance to utility" and to make it entirely "suitable as an article of household furniture."

Costume is not neglected, nor are costume accessories such as hats, shoes, and underpinnings. In James H. Chappell's geometrical pattern book (fig. 46), "A Map of Spheres and Right Lines," appears a "Coat, Great Coat, and Vest, pantaloons, garters, Cloak, Frock, shirt collars and lappels, and a lady's habit, all of which are formed by right lines and spheres as the printed explanations fully show." Nor, as can be observed in the drawing, does Chappell neglect the militia uniform at a time when such garb was often a social requirement. Buttons, combs, hats, tailor's shears, and umbrellas as well as measuring devices were patented. Some patents, like Hiram Seger's tailor's square, included drawings of costumed figures, and thus are particularly valuable (fig. 47).

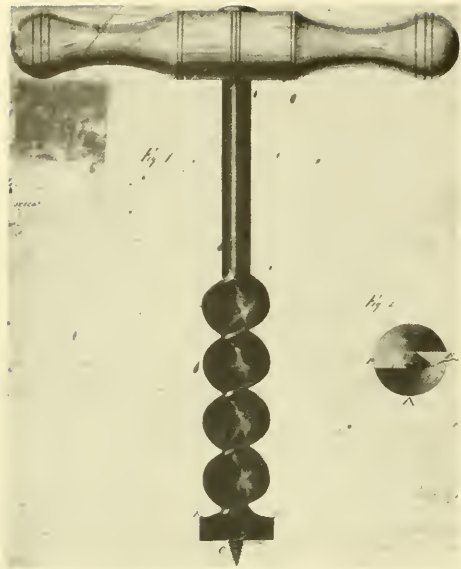


Figure 40.—DOUBLE-PODDED SCREW AUGER PATENTED BY Ezra L'Hommedieu, July 31, 1809 (restored patent 1114X).

Stoves of all sizes, shapes, and forms can be found, and all reflect the extensive use of cast iron and a flexible design aimed at achieving multipurpose results. David Little, in 1826, suggested an 11-plate range (fig. 48) "in which all kinds of boiling, broiling, roasting, baking and steaming are done," and its size was to be flexible "to suit all families or purchasers, Steam Boats and Ships." Similarly, John Harriman, in 1834, submitted a stove design (fig. 49), "both ornamental and convenient," in which, at one and the same time, food could be either boiled, roasted, baked, fried, or broiled. Thus, from beds to stoves, researchers will at least be rewarded by details of form, decoration, original appearance and use.

What, for example, do the above patents and others show of the transition of popular taste, say from the temple to the cottage, from the Greek to the Gothic? As mechanical inventions, do they reflect the romanticism of the day? Is there any indication in them of the views expounded by Downing or Greenough? Do architectural fashions manifest themselves in the architectural designs of machinery patented in the

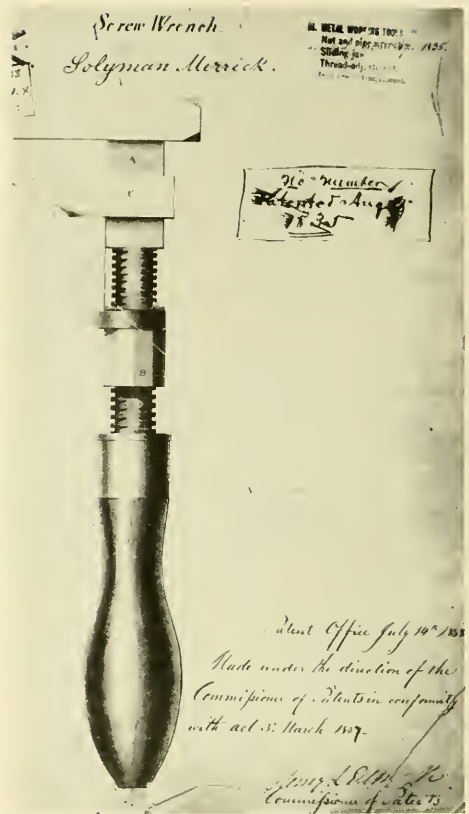
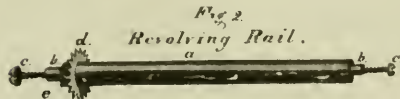
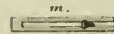


Figure 41.—SCREW WRENCH patented by Solyman Merrick, August 17, 1835 (restored patent 9090X).

period—lathe beds, steam engines, steamboats, and locomotives? How widespread is the concept of the cast-iron skeleton as articulated by James Bogardus? Is it merely coincidence that in 1849 Alexander Barclay and Charles W. Bontgen of Newark, New Jersey, patented ice skates (fig. 50) made, according to their patent specification, "of one or more pieces of iron (instead of wood as heretofore) of a skeleton form"? These questions are most frequently answered by citing physical survivals that show the given characteristics. The breadth and depth of the patent files ought to add a new dimension to such research.

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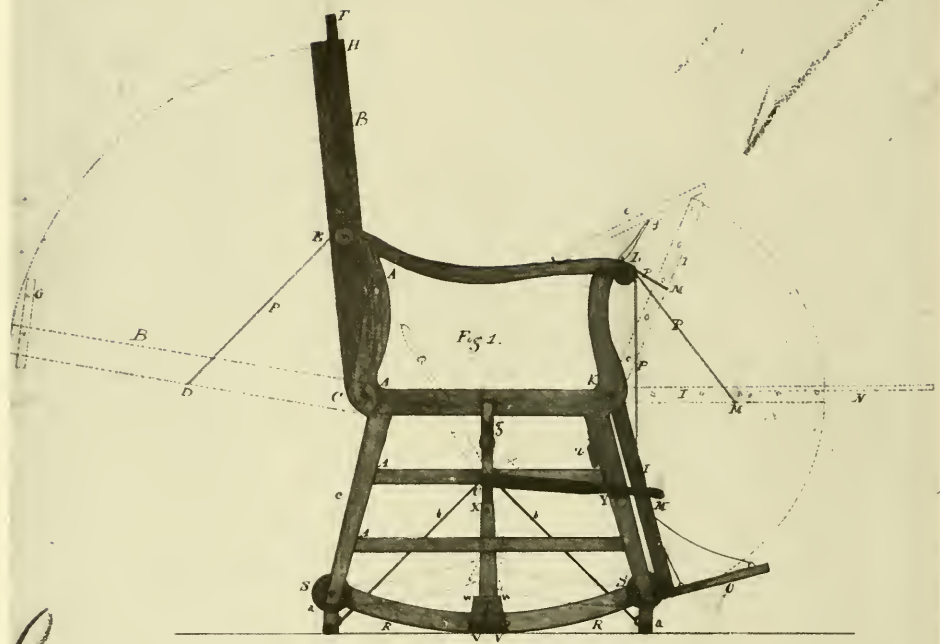


a, The rail. *bb*, the wooden gudgeons, turned on the rail. *c, c*, common bedstead screws, in the gudgeons. *d*, rag wheel. *e*, a square part, embraced by rag wheel.

Figure 42.—BEDSTEAD patented by Isaac Eaton, December 31, 1833 (restored patent 7924X).

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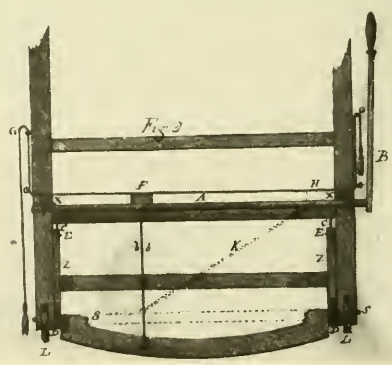


Figure 43.—EASY CHAIR PATENTED by Benjamin F. Hays, December 17, 1834 (restored patent 8537X).

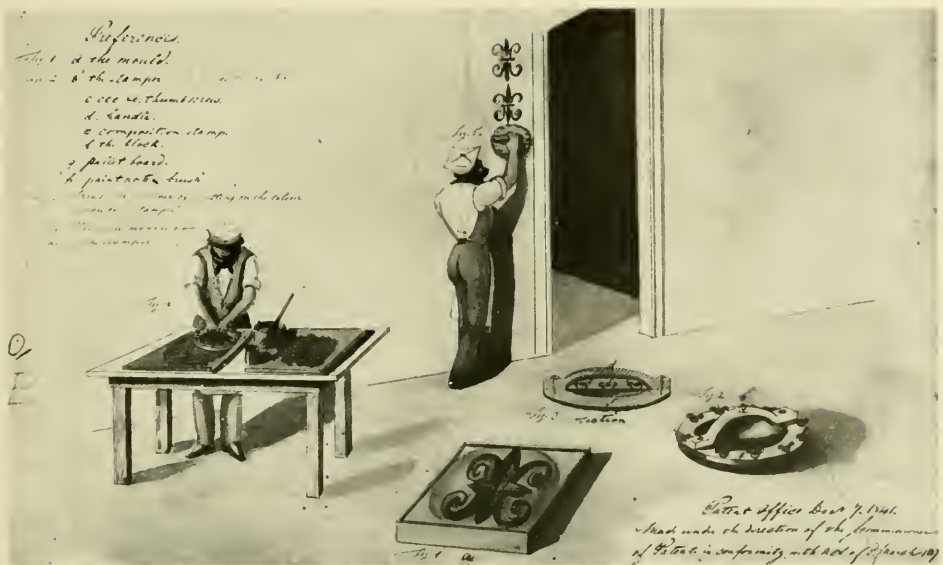


Figure 44.—ELASTIC STAMP PAINTING. Patent granted to Thomas Boynton on July 12, 1832 (restored patent 7164X).

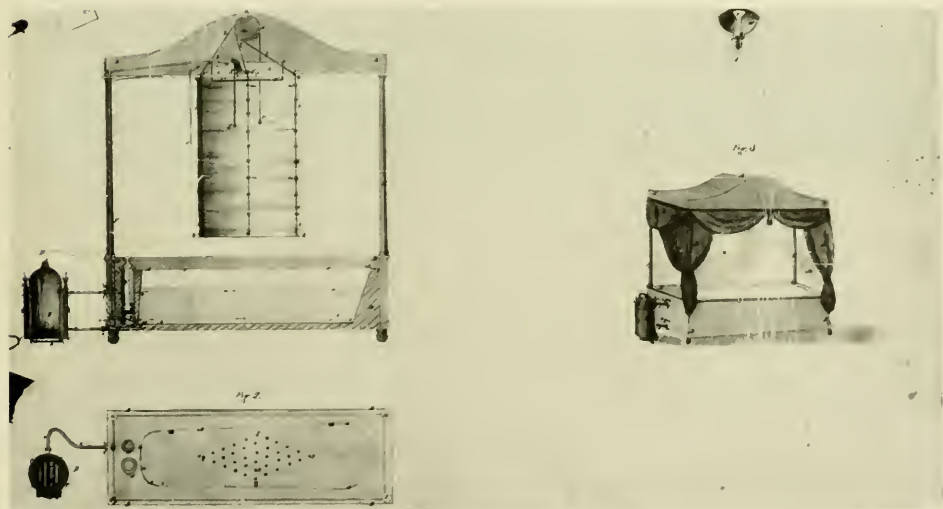


Figure 45.—PORTABLE BATH TENT patented by Dr. J. Wright Warren. Original patent 1710, July 31, 1840. Reissue no. 103, October 16, 1847.



Figure 46.—PAGE FROM PATTERN BOOK by James H. Chappell dealing with his spherical system of tailoring. Patent issued January 18, 1834 (restored patent 7962X).

The historian engaged in restoration and preservation is ill advised to bypass the Patent Office. Early industrial techniques such as charcoal burning (fig. 51) and bark grinding (fig. 52), vehicles of all types from fire engines (fig. 53) to gigs (fig. 54), agricultural implements by the score (fig. 55), and a variety of other tools are represented by watercolor drawings or specifications or both. Thomas W. Pryor's improved bark mill of 1805 is an excellent example of the patent record as an illustrative and descriptive document. The drawing (fig. 52) shows a typical, horse-powered, bark mill complete with the miller

and his horse, while the specification outlines the process.

Bark, after being prepared in the usual manner is thrown into a *Horizontal Separating Machine*, which is a cylindrical Revolutionary Wire finer or coarser as may be found most advantageous with Interstices to produce long or short filaments of Bark . . . ; the separated Bark falls into a Chest below the Separating machine, throwing out at the end. The unsmashed lumps or pieces of Bark which may not be sufficiently ground . . . are placed in a Common Bark mill and after being reground is thrown into the Separating machine and goes through the foregoing process.



Figure 47.—TAILOR'S SQUARE invented by Hiram Seger. Patent 2590, April 29, 1842.

The patent specification provides a firsthand account that can often stand alone as a description of an important routine activity such as farming or fishing. With the drawing for David Smith's improved hay rake (fig. 56) is his description of how to use it.

Cut the grain level with a cradle, or with a naked scythe (if the grain is lodged) or otherwise; hitch a horse to the ends of the ropes of the revolving rake Z. Z. Take hold of the handle R and put it on the piece B; drive in between two swaths. When the rake is full, a slight lift with the hand will turn it over, and the back teeth now become the

front. Put the handle R on the piece B. as before, fill again as before, and so on through the field. On your return stop opposite your first bunches on account of loading; move the second or third row of bunches to make room for a wagon or slide; take three or four pronged forks, either of wood or iron, or steel, hold the prongs one above the other, and stick the fork into the sides of these bunches. Two hands to pitch together and one to load, can thus put the grain on a wagon in less time than it would take them to bind it.

If the grain is to be stacked, the butts should be kept the same way on both sides of the wagon. In stacking, keep the middle full, and lay the butts nicely round the outside.

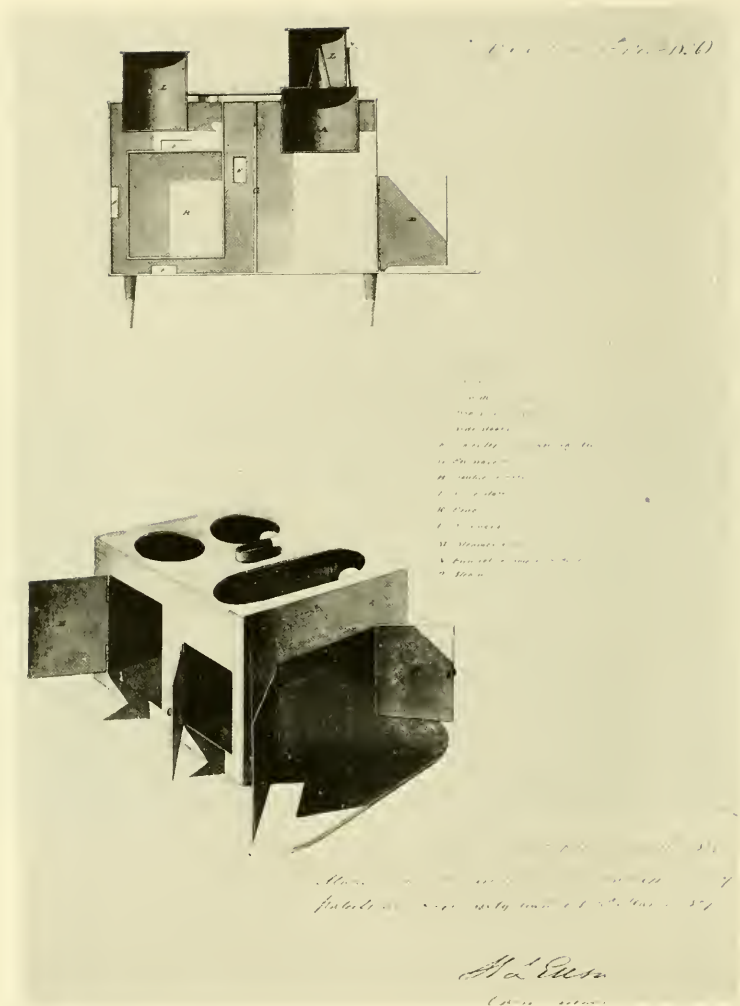


Figure 48.—COOKING STOVE invented by David Little. Patented February 1, 1826 (restored patent 4327X).



Figure 49.—COOKING STOVE invented by John Harriman and patented March 31, 1834 (restored patent 8127X).

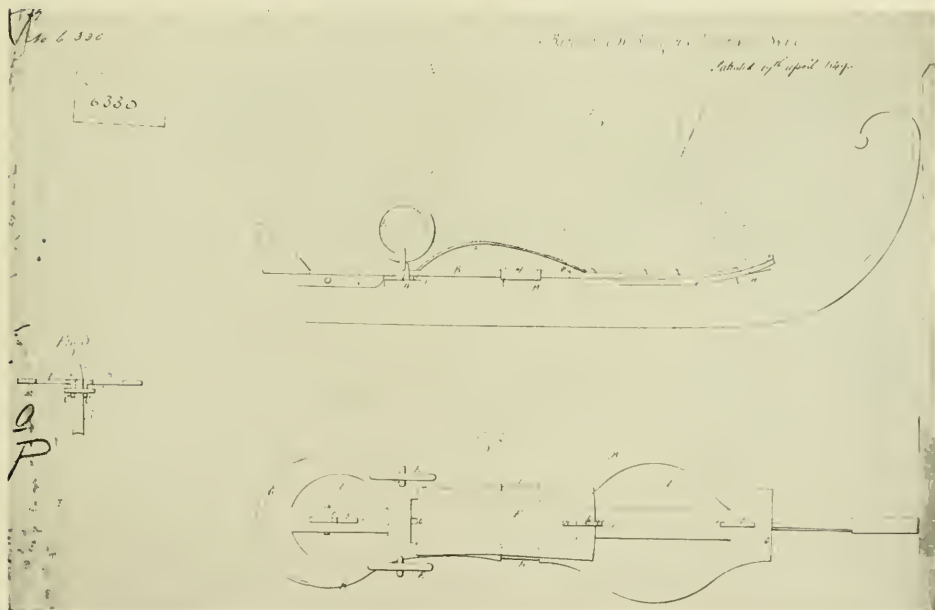


Figure 50.—IMPROVED ICE SKATE invented by A. Barclay and C. W. Bontgen. Patent 6330, April 17, 1849.



Figure 51.—MODE OF MAKING CHARCOAL invented by Michael Carroll. Patent 720, April 28, 1838.

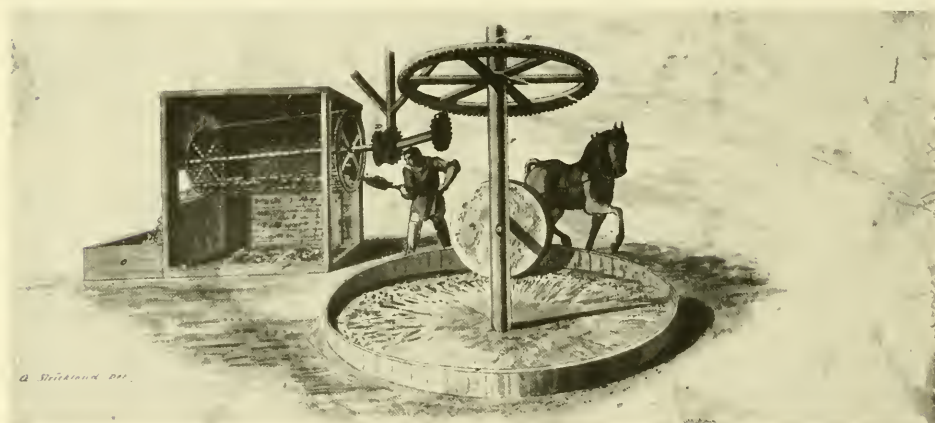


Figure 52.—AN IMPROVED BARK MILL patented by Thomas W. Pryor on May 21, 1805 (restored patent 621X).

Three or four days after the stack is settled, one hand on the top of the stack, and one below with a cloth to save the grain should beat off the loose heads with a hoop pole which they can do in a very little time. The stack will save as well as if the grain were bound into sheaves. After the wheat is taken out of the field the rake is run over where the bunches lay.

The grain when cut is left to dry in the swathes one day in fair weather. If too ripe, rake in the mornings and evenings. The grain is handled altogether with forks and not with hands, after it is raked. One acre can be raked in this way in less than 15 minutes (if the swathes are 40 rods or longer) clean and nice.

As to the other rake, fig. 1. Take hold of the handle D and after the horse is hitched to the ropes ZZ, drive

between two swathes. When the rake is full, a slight lift of the hand will turn it over on the bow D, and it will slide over the grain.

When the points are past the bunches, the rake is drawn back with the hand, filled again and so on.

By following the above plan, one half of the expense of harvesting is saved, and if the grain is thrashed with horses, one hand can lay it on the floor as fast as three could, if it were bound in sheaves. It is also easier turned with forks, and is thrashed full as fast.

Here, the character of early 19th-century farming becomes exceedingly clear with little explanation needed. Equally clear and suggestive is Benjamin Hale's illustration (fig. 57) of "taking Mackerel and

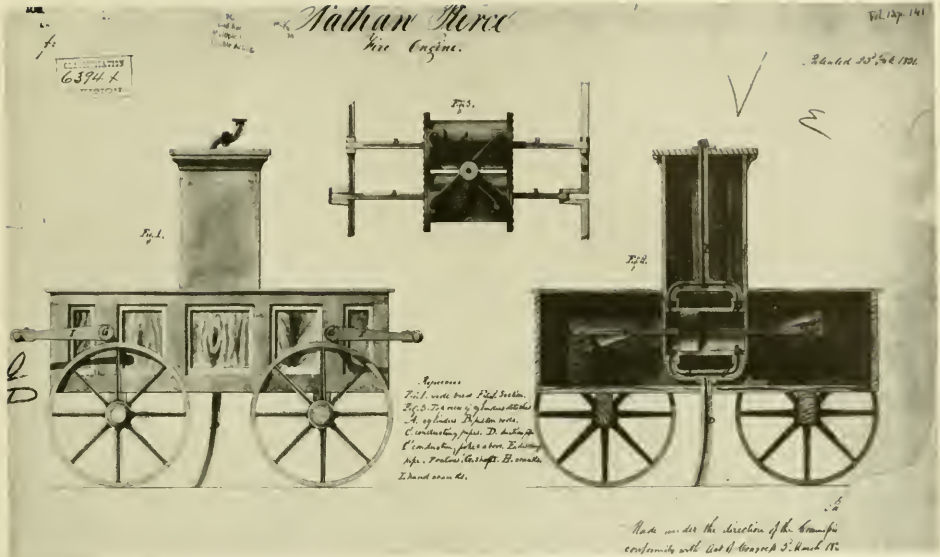


Figure 53.—FIRE ENGINE patented by Nathan Pierce, February 23, 1831 (restored patent 6394X).



Figure 54.—GIG designed by Isaac Woodcock. Patent 5514. April 18, 1848.

CLASSIFICATION
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THOMAS BORDEN'S PLOUGH.

Patented 13th Jan^y 1830



REFERENCES.

- A. *The frame of the Plough.*
- B. *The Beam.*
- C. *The Shears.*
- D. *The Handles.*

Figure 55.—Plow invented by Thomas Borden and patented January 13, 1830 (restored patent 5774X).

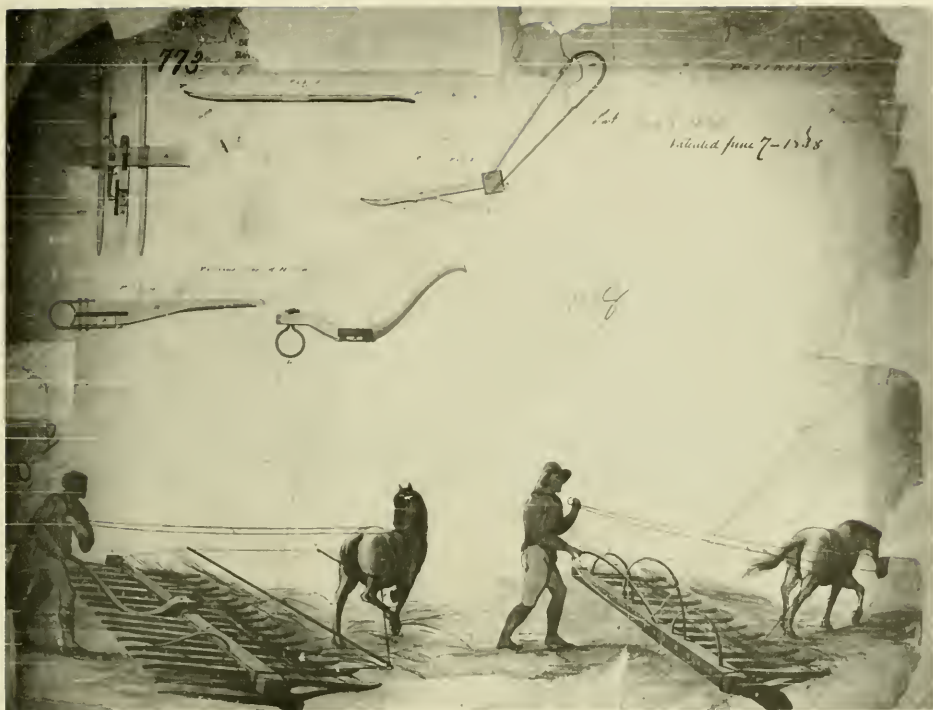


Figure 56.—HAY RAKE invented by David Smith. Patent 773, June 7, 1838.

other fish at sea, or in deep water” submitted in 1838. But these drawings and literally thousands more like them are virtually unknown. Contemporary illustrations of a society at a given period are, of course, not rare; however, neither folk art nor lithography collections provide as wide a year-by-year, graphic coverage of American activity as the profusion of watercolor drawings rendered by patentees or official delineators in support of patents prior to 1870.

Frequently, it is argued that for the period before 1836 the drawings are reconstructions of those destroyed in the Patent Office fire and, therefore, not valid as source material. This is only partially true, since some drawings are duplicates of the prefire originals; and further, many of those restored are near-contemporary reconstructions, often well re-

searched, accurate, and explicitly visual representations of ideas and attitudes current at the time of application.¹⁸ Still, even if one chooses to disregard the so-called “Name and Date,” or “Restored” patents, there are the exceedingly rich files, overflowing with drawings, that date from 1836 to 1870. They are, in reality, American renditions of persons, animals, and things, often done by individuals actively engaged in the operations they depict. They are, at times, superior

¹⁸ For example, James H. Chappell’s map of spheres and right lines (fig. 20) is apparently a duplicate of an original drawing; so is Solyman Merrick’s wrench (fig. 15). Many drawings, such as James Herman’s grooving plane of 1835 (see fig. 24) were redrawn soon after the Act of 1837 that authorized restoration. All historical evidence must be critically examined; the patent drawing is no exception, but to date the social historian has put little of it to the test.



Figure 57.—FISHING NET FOR DEEP WATER designed by B. W. Hale. Patent 763, June 4, 1838.

to the overworked reproduction of cuts from Diderot, the *Book of Trades*, the *Journal of the Franklin Institute*, or the *Scientific American* that fill our literature and anchor many a museum exhibit.

Perhaps in the future, the drawings and related files will be more widely used to describe forgotten techniques and implements, to suggest attitudes of taste and fashion, to define technical accomplishment, or to document survivals of the past; in other words, they will be used as cultural documents reflective of a very wide range of activity within a given period. To date, they remain largely unused for this purpose. Their accessibility is physically difficult; their content is little appreciated; and their bulk is tremendous with

guides few and far between. It is hoped that this paper will call attention to this situation, and further, that, if these voluminous files now preserved in the National Archives are eventually reevaluated, some consideration will be given to indexing them on a cultural basis.¹⁹ But, regardless of what form long-term revision of these records may take, they remain a lively source of social history, one needing to be fully explored.

¹⁹ For example, these records might be indexed according to GEORGE P. MURDOCK and others, *Outline of Cultural Materials* (New Haven, Conn.: Human Relations Area Files, Inc., 1950).