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with clearly hammer-marked heads, were from time immemorial, universally used in house building, until about 1800 (in Philadelphia, 1797) when cut nails (Fig. 2), because of their much greater cheapness, everywhere immediately superseded them. Therefore, where the original nails of a house are wrought (see Fig. 1), the house dates before about 1800; or, where cut, vice versa, after that date.[1]

All the evidence examined establishes this fact, with the following exceptions; namely, that long after 1800, wrought nails, to stand the jar, and because they would clench, continued to be used in the facings of window shutters; in the battens of doors; in the overlap of boards (old style) in lathed room partitions; or on door latches, etc., until about 1850. But these exceptions are not typical of the nails used to build houses after 1800. Nails used at the time a house was built are nearly always to be found in the garret floors.

The wrought nail (Fig. 1), no matter what its size, as generally used in house construction, is easily distinguished from the machine-made nails, called cut nails (Figs. 2 and 3), above referred to, and described later. It was made from rectangular strips of malleable iron, several feet long, and about a quarter of an inch thick, called nail rods, which were furnished to the blacksmith or nailer, who, holding one of them in one hand, heated its end in his forge, and then, on the anvil, pointed it with the hammer on

1 Later evidence may show that cut nails came into general use in New England two or three years earlier than in Pennsylvania. Knight's *American Mechanical Dictionary* (*cf.* "Nail Making Machine") says that Jeremiah Wilkinson of Cumberland, Rhode Island, about 1775, cut tacks from plates of sheet metal and afterwards (date not given) made nails also; and that Ezekiel Reed of Burlington, Mass., invented a machine for cutting nails from the plate in 1786. J. L. Bishop's *History of American Manuffactures* says that Jacob Perkins of Newburyport, Mass., invented in 1790, a machine for making cut nails and patented "a machine to cut and head nails at a single operation" in 1795. Bishop also speaks, without definite dates, of Thomas Odiorne and Jesse Reed as early cut-nail inventors. The Essex Institute, at Salem, Mass., exhibits a model of Nathan Read's machine for cutting and heading nails at a single operation patented by him on January 8, 1798.

Unfortunately, the very important records of the United States Patent Office, between 1791 and 1836, including the patents and drawings, have been destroyed by fire, leaving only a bare dated list of the issues, often lacking the locality of the patentee. They show cut-nail patents issued as follows:

For a Nail-Cutting Machine. Omitting localities of patentees:—J. Peerson, March 23, 1794; J. Perkins, January 16, 1795; A. Whittemore, November 19, 1796.

Nail-Heading Machine. J. Byington, December 23, 1796; J. Frost, December 23, 1796.

Nail-Heading and Cutting Machine. L. Garritson, November 16, 1796; G. Chandlee, December 12, 1796; J. Kersey, February 24, 1797; J. Nevill, August 12, 1797; J. Spence, February 16, 1797; N. Read, January 8, 1798.

Notwithstanding the fact that these patents were granted, the evidence of the nails themselves, and the notes quoted later, on N. Read's (1798) machine from Bentley's *Diary*, and from Whitaker's *Narrative*, show that the last two kinds of machines were not efficient until about 1817 to 1820.

all four sides. Next, he partly cut it, above the point, on the "hardy," with a hammer blow, and then, inserting the hot point into the swage hole, he broke off the rod and hammered the projecting end so as to spread it around the top of the hole; after which, the cooling, shrunken nail was easily knocked out of the orifice.

Wrought nails, as free-hand forged products (Fig. 1), vary greatly in style and shape, but the evidence examined has not as yet furnished any definite date for any of their variations.

CUT NAILS AFTER 1800.

The far more easily made cut nail (Figs. 2 & 3), as the evidence clearly shows, consists of a rectangular, tapering shank of iron, not hammered into a point by hand, but tapered, by a single cut, across a plate of iron. The smith was here furnished, not with a nail rod, but with a strip of plate iron, several feet long, about two and a quarter inches wide, and often about one-eighth of an inch thick. This strip he slid into a cutter, worked at first by hand-power, resembling those used by bookbinders to trim books, and not here shown. This cutter, rising and falling rapidly, clipped off the end of the iron plate crosswise into narrow, tapering, rectangular slices or nails, whose length was established by the width, and thickness, by the depth of the nail plate. The taper of the cut alone, produced the point, but not the head. This was made at first by dropping the freshly cut piece, point downward, into a slotted clamp or vise, and then spreading the larger projecting end with a hammer, as in the case of the wrought nail.

Cut nails are easily distinguishable from wrought nails by the following very apparent differences. Both have rectangular shanks, but the wrought nail (Fig. 1) tapers on all four sides; the cut nail (Figs. 2 and 3), on only two opposing sides; the latter nail being as thick (namely the thickness of the nail plate from which it was cut) at the point as at the head. Moreover, the two cut sides of the cut nail show very plainly, minute parallel striations, always absent on the wrought nail, marking the down smear of the cutter.

The evidence conclusively shows that these cut nails everywhere superseded the ancient wrought nail at the end of the eighteenth century, namely, not long after 1797, when two cut-

nail factories had been established in Philadelphia, and, therefore, if used by the builder, they will date a house as having been built after that year.

HAMMER HEADED CUT NAILS *c.* 1800 to *c.* 1825.

A still further examination of cut nails, from dated houses, shows that they may be distinguished into two classes; namely (*a*) those appearing between *c.* 1800 and *c.* 1825, with imperfect

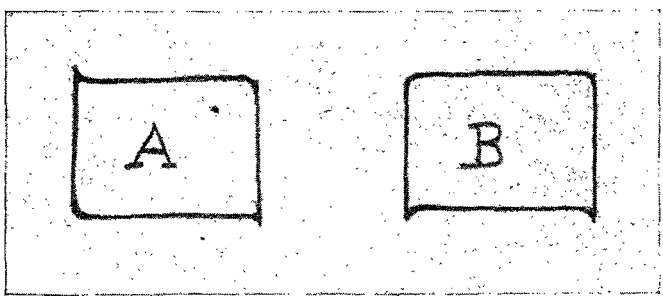

FIG. 4.—CUT NAILS AFTER 1796.

(A) Rough sketch of cross-section of a cut nail, enlarged and exaggerated, showing down-smears of the cutter on opposite sides of the shank, proving that the nail-plate has been turned.
(B) Cross-section of a cut nail, enlarged, showing both down-smears of the cutter on the same side of the shank, proving that the nail-plate has not been turned.

or irregular heads, or, more particularly, hammered heads; that is, heads showing the facets of more than one hammer blow (Fig. 2), and (*b*) those appearing after *c.* 1825, and throughout the following century, with stamped heads, showing level tops impressed by a single blow or stamp (Fig. 3).

Information gathered with difficulty from the Patent Office records and books, makes it probable (subject to correction by dated nails) that in general, up to 1825, the nail-cutting machines had not been perfected; in other words, that while after 1825, nail machinery produced cut nails at a single operation, before that time, two machines, run by handpower, but not yet by steam, nor even by water, one to cut, as described above, and another, probably nothing more than a special vise to hold the shank while hand-hammering the head, were used in the manufacture of cut nails.

The hand-cranked machine, for cutting and heading nails at

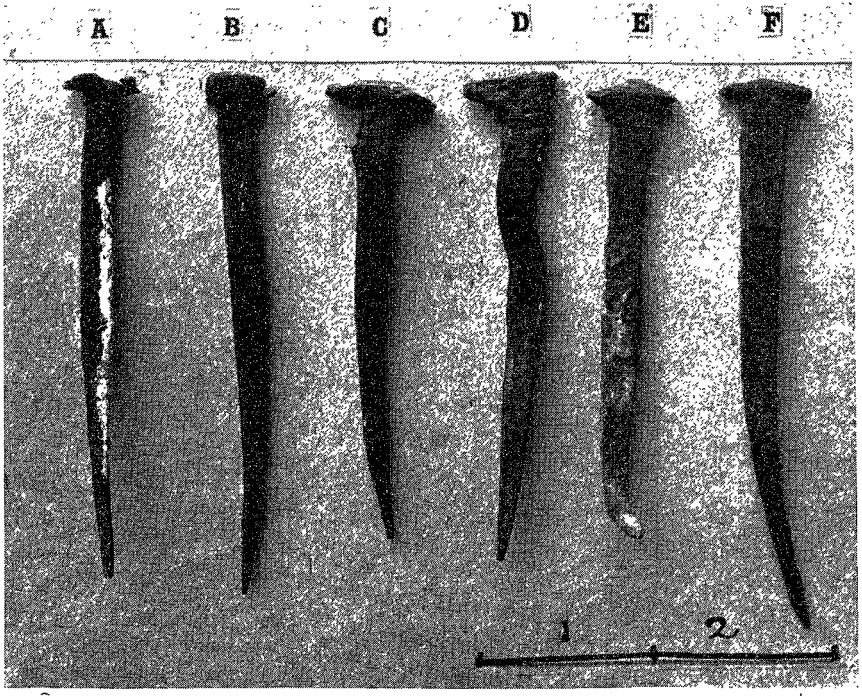

FIG. 1.—WROUGHT-IRON NAILS.

In general use until 1796-1798. From garret floors of old houses near Philadelphia. (A) Warner House, near Pineville, Pa., dated 1769. (B) "J. C." House, near Wormansville, Pa., dated 1784. (C) Brucker House, near Keelersville, Pa., before 1776. (D) Paxson-Hall House, near Doylestown, Pa., before 1776. (E) Graeme Park, near Horsham, Pa., dated 1721. (F) Brown ("I. B.") House, near Gardenville, Pa., dated 1765.

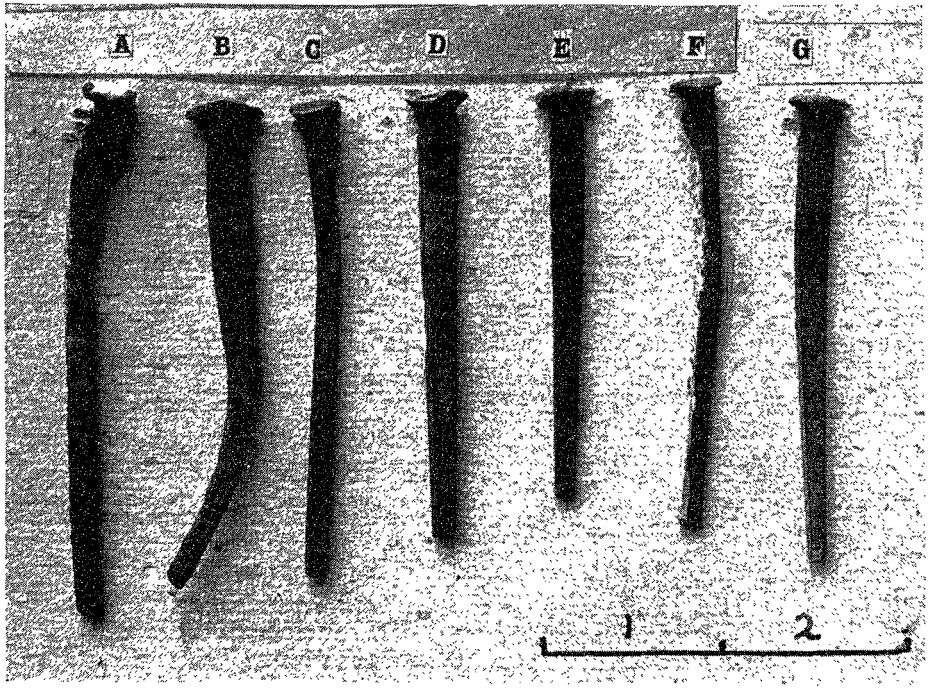

FIG. 2.—CUT NAILS—HAMMER-HEADED.

In general use from 1796-8 to *c.* 1827. Speciments removed from original garret floors of old houses in Bucks County, Pa. (A) Wenderbelt House, near Wormansville, *c.* 1800. (B) Ott Log House, Doylestown, *c.* 1806. (C) Bean's House, near Mechanicsville, dated 1804. (D) Reed's Mill, Castle Valley, dated 1815. (E) S. S. Myer's House, Pinersville, dated 1816. (F) S. Fluck House, near Deep Run, dated 1820. (G) Yoder House, near Silverdale, dated 1820.

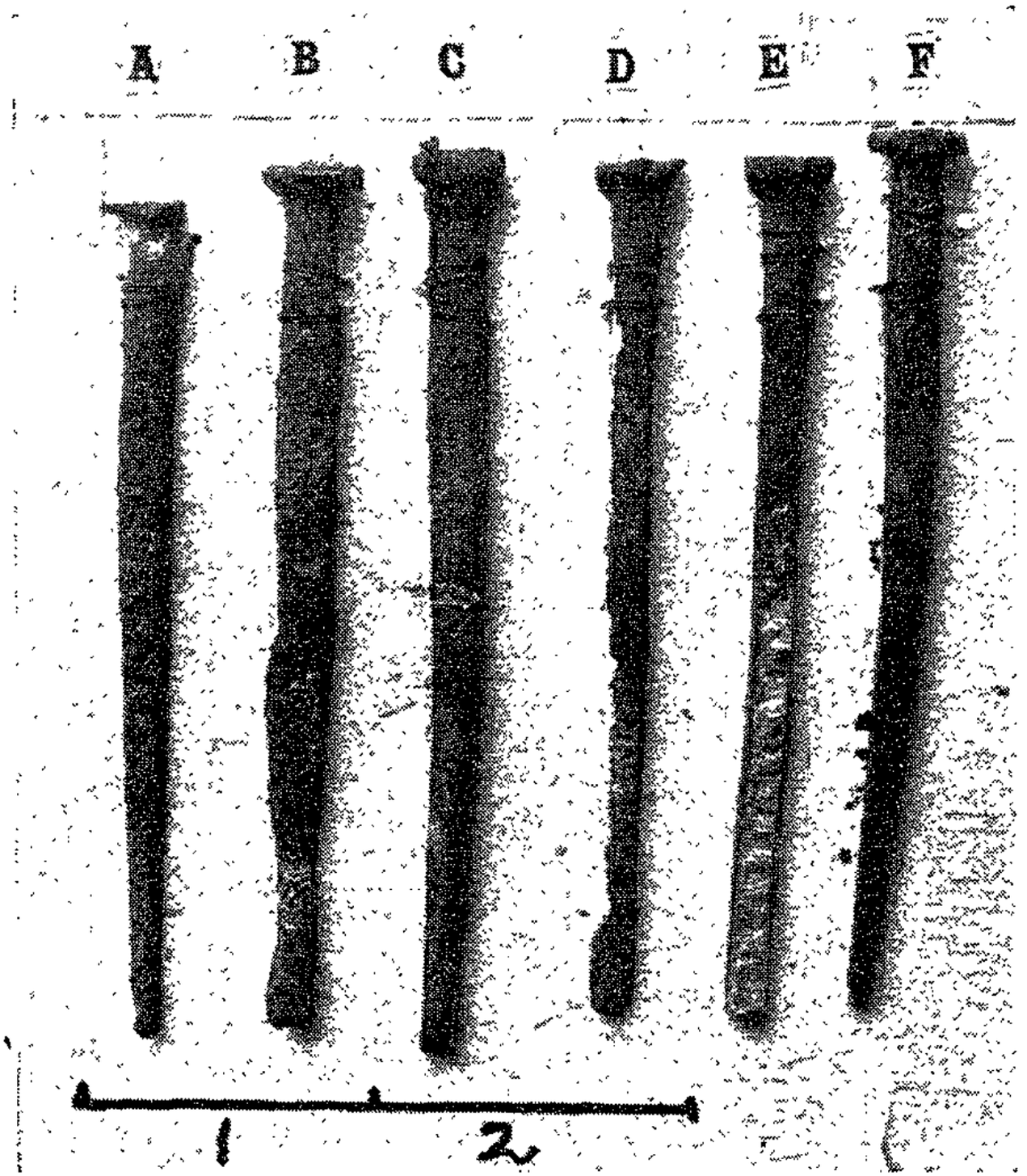

FIG. 3.—CUT-NAILS—STAMP HEADED.

In general use after *c.* 1825. Speciments removed from garret floors of old houses in Bucks County, Pa. (A) Grier House, near Dublin, dated 1827. (B) Sullivan Tenant House, near Keelersville, *c.* 1833. (C) Swartzlander-Gayman House, near Doylestown, dated 1838. (D) Bryan House (Stanley Rapp), near Fountainville, 1840. (E) Stear House, near Dublin, dated 1834. (F) L. Yoder's Desk, dated by pointed wood screews, after 1846.

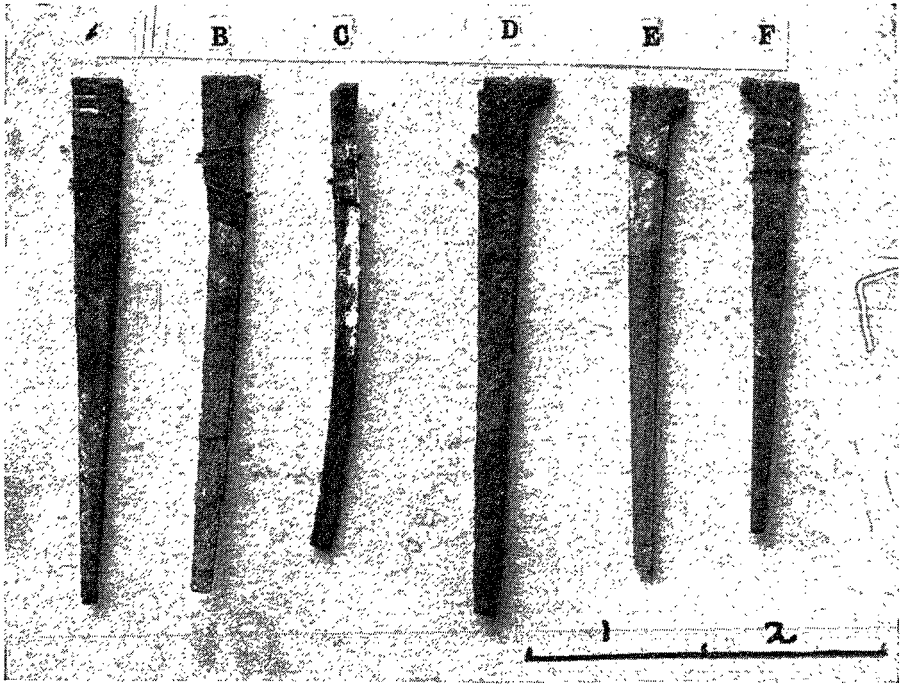

FIG. 5.—CUT-NAILS, L HEADED AND HEADLESS.

Made at a single cut from the nail-plate. They appear in Pennsylvania immediately after 1796, and continue in use along with the more common early Hammer-Headed and later Stamp-Headed Cut-Nails. Sometimes found in floors, clapboards, etc. (A) Woodman House, near Wycombe, dated 1798. (B) Wenderbelt House, near Wormansville, *c.* 1820. (C) Werner House, near Gardenville, dated 1808. (D) Giants Grave House, *c.* 1820. (E) Grier House, near Dublin, dated 1827. (F) Sullivan Tenant House, near Keelersville, *c.* 1833.

one operation, patented by Nathan Read of Salem, Mass., in 1798 (See model at Essex Institute, Salem, Mass.), was not a success. Neither were any of the other "cutting and heading" machines, or simple "heading" machines, in existence or patented at that time, as is shown by the evidence of the nails themselves, and further in the Diary of Rev. William Bentley, who visited Read's nail works in 1810 (See *Essex Institute Historical Collections,* April, 1918, page 113), and found that the workmen were then heading nails in the only way thus far successful, namely, by hand, "as it is found heading is done better by hand than by any machine as yet invented both as to time and goodness of execution."

Joseph Whitaker (See his manuscript diary in the library of the Bucks County Historical Society) was also thus making cut nails in Philadelphia, from 1809 to 1816-20, by a double operation; namely, cutting the plates with a hand-cranked machine and afterwards hammer-heading the shanks held in a clamp worked by a foot lever.

It further appears, that, at first, since the knife of the cutting machine was set diagonally so as to cross-cut the nail-plate into a tapered slice, the workmen had to turn the plate upside down at each stroke, so as to continue the taper by reversing the cut; and the very earliest cut nails (1800 to *c.* 1810) prove this fact by the down smear of the knife, round-edged above and sharp below, being reversed on the two opposing cut sides of the nail shank (See Fig. 4 A). They also show, that very early in the nineteenth century, this troublesome turning of the nail-plate was superseded by wriggling or staggering the blade of the cutter during the operation, so as to reverse the taper at each stroke without turning the nail-plate, as shown in the cross section of Fig. 4B.

At first, also, in order to dispense with the difficulty of the usual heading, angle-headed (L headed) and headless nails called "brads" (See Fig. 5), were made. But as these latter continued in use for certain purposes (often for floors) until long after the middle of the nineteenth century, their confused evidence should here be thrown out of consideration.

STAMP-HEADED NAILS AFTER *c.* 1825.

An examination, not only of the records above mentioned but also of dated nails, shows that about the year 1825, the cut-nail

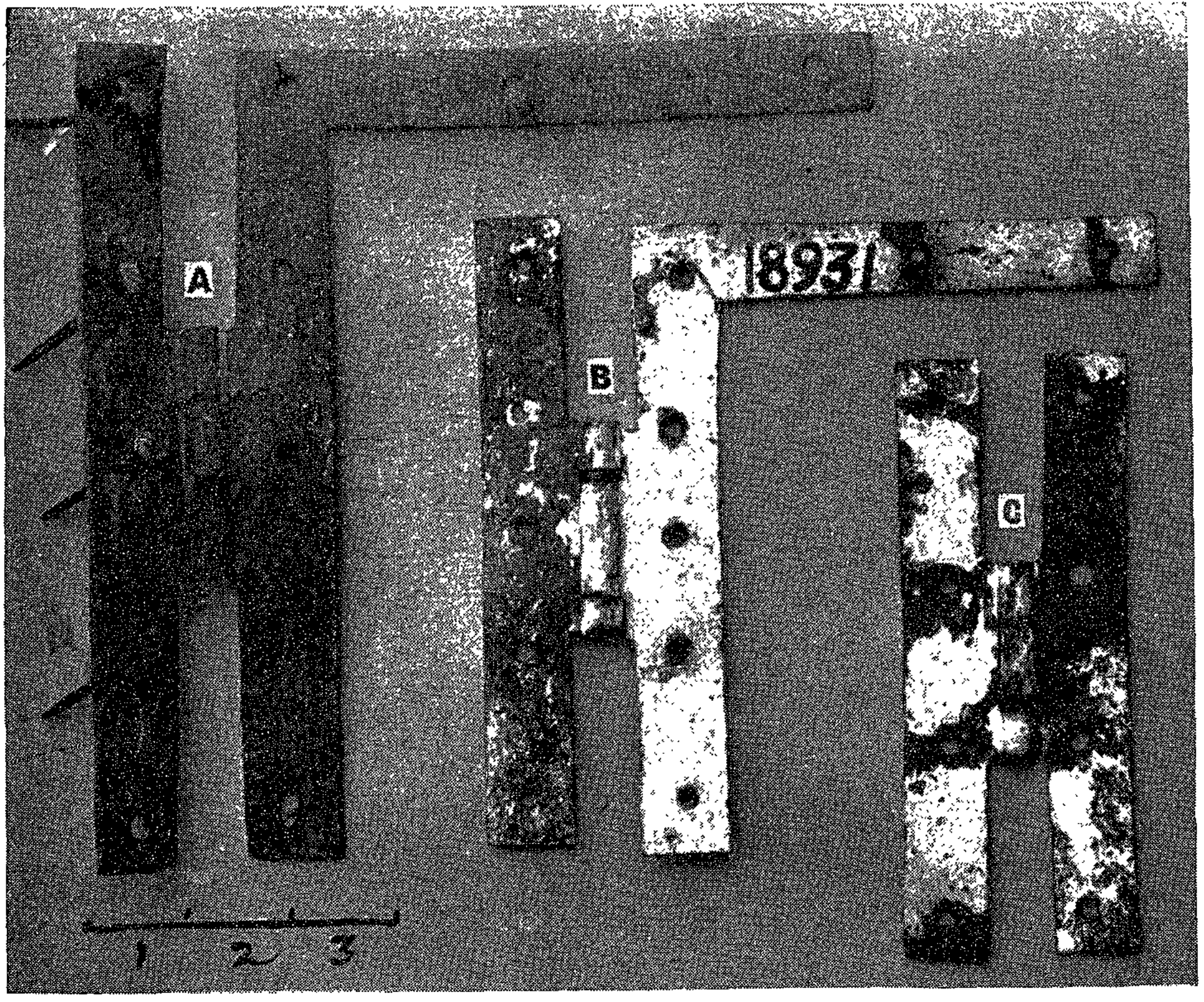

FIG. 6.—WROUGHT-IRON DOOR HINGES, H AND HL TYPE, UNTIL 1776.

Speciments in Museum of the Bucks County Historical Society, Doylestown, Pa. (A) Wenderbelt House, near Wormansville. Inner door, old wing, *c.* 1770. (B-C) David Rittenhouse House, near Germantown, Pa.

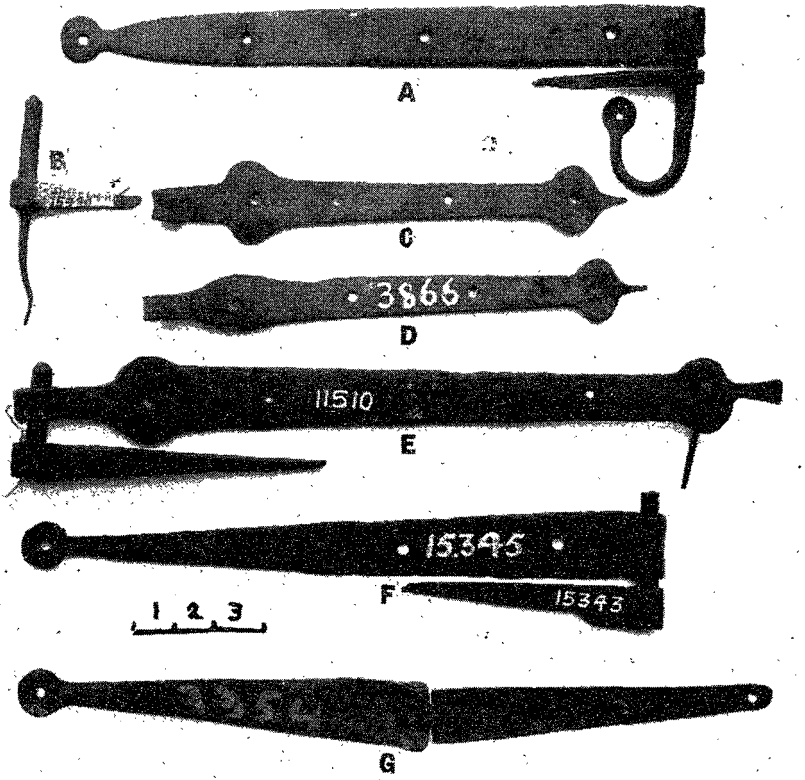

FIG. 7.—WROUGHT-IRON DOOR HINGES. "HOOK AND EYE' ALIAS "STRAP" TYPE.

Used contemporaneously with H and HL wrought hinges on interior house doors, until 1776, after which they continue in use on outer doors and shutters until *c.* 1850-60, and on barn doors until *c.* 1900. Specimens in Museum of Bucks County Historical Society. (A) Brucker House near Kellersville, showing spike hook with "rat-tail' before 1776. (B) Slifer Log House near Keller's Church, spike hinge hook with untwisted "rat-tail," *c.* 1750. (E) Yost House west of Ottsville, showing plain spike hinge hook. (C. D. F. G.) From the scrap-iron heaps of Bucks County junk dealers. (G) Wicket Hinge, used on wickets opening in large barn doors.

machine, still working by water-power rather than by hand and not yet by steam, had been so perfected as to make cut nails no longer by two operations but by a single operation in one machine, in which the apparatus cut the nail, instantly clamped it and, at a single blow, stamped the head (See Fig. 3).

These stamped heads, at first (*c.* 1825 to 1830) comparatively thin, lopsided and imperfect, became more thick, square and typically regular after 1830 and are always easily recognizable after about 1840. But regardless of their variations, in any case, stamp-headed cut nails, if used in constructing a house, reasonably date it as after about 1825.

WROUGHT-IRON DOOR HINGES.

The evidence clearly shows that in the Colonial period in America, the common iron, house-door hinges were made always of wrought-iron until 1776 to 1783, when cast-iron hinges suddenly and universally took their place.

The old wrought hinges appear in two common varieties in the houses examined; namely, the so-called H or HL hinge, cut out of heavy sheet iron and fastened against the face of the door with screws or clenched wrought nails (See Fig. 6), or the "strap" or "hook and eye" hinge (See Fig. 7); namely, a long strap, bolted or nailed with clenched nails against the door and turning on a hook or gudgeon which latter was either spiked into the lintel,

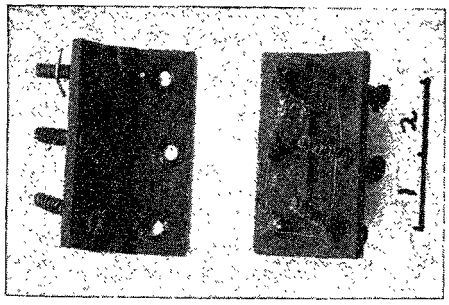

FIG. 8.—CAST-IRON DOOR HINGES, BUTT HINGES.

After 1775 and until the present time. Cast-iron hinges were invented in 1775 (Izon and Whitehurst, British Patent, October 3, 1775). At end of American Revolution (1783) they immediately superseded the previously universal door hinge of wrought-iron. The specimen here shown in face and reverse is from a door in late wing of Wenderbelt House, near Wormansville, Bucks County, Pa., *c.* 1820.

or, where the lintel was too thin for spiking, set upon a plate, variously shaped, and sometimes strengthened with a projection or prop called a "rattail."

While the H and HL hinges (many of which were probably factory-made and imported from England) and nearly all of the strap-hinges, were found plain, a few of the latter, by no means typical and generally over-exhibited in museums, show floriated decorations.

It further appears that hand-made, wrought-strap hinges (still common in 1923 on barn doors in eastern Pennsylvania and elsewhere), continued to be used on outer house doors and window shutters, long after 1783, and hence, when so found, should be disregarded as proof of dates. But with these exceptions, the evidence abundantly shows, that where wrought hinges (generally HL, more rarely strap) are found on original *inner* house doors, they date the house as Colonial, or built before the Revolution.

CAST-IRON DOOR HINGES

Cast-iron door hinges, called butt hinges, comparatively small, compact, book-shaped, mortised into the edges, not set upon the faces of the door, of the common present type (See Fig. 8), because of their superior cheapness, came into universal use, no less suddenly, though a little earlier, than cut nails. They were invented in England by Izon & Whitehurst, and patented by British patent No. 1102, October 3, 1775, and were at first imported. After the interruption of British trade and house building by the Revolutionary War, they everywhere superseded the old wrought hinges, about 1784, after which they appear without significant exception, on all the dated houses examined by the writer. Hinges of this shape and name, i.e. butt hinges, of *wrought-iron* or brass, and never of cast-iron, had been made before 1775, generally for closets, or furniture, but none were found by the writer on room doors, in the houses examined. Cast-iron butt hinges also show differences and improvements in construction (not studied closely) after about 1800. But regardless of these variations and allowing for the above noted survival of wrought strap hinges on outer doors and shutters, these cast butt hinges,

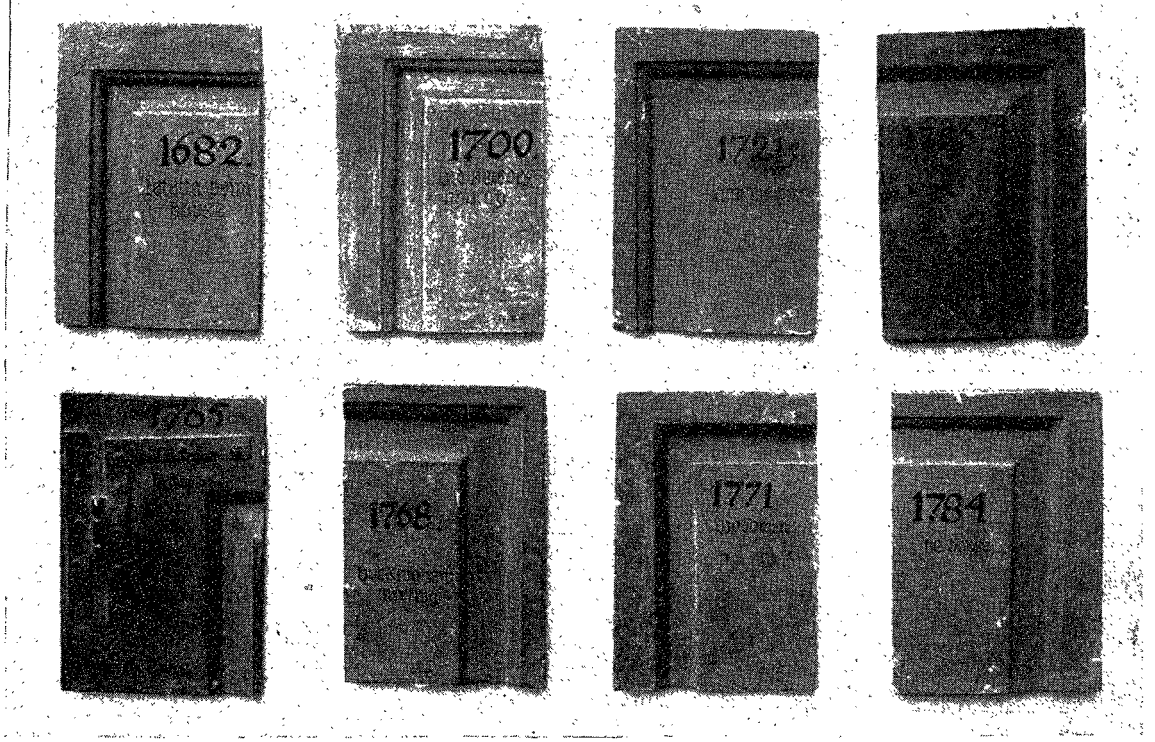

FIG. 9.—PLAIN OVOLO DOOR PANELS.

COLONIAL STYLE, MOULDING PLANED ON DOOR FRAME.

Casts from doors of old houses, dated between 1723 and *c.* 1776. Dates and names of houses of origin (in Bucks County and near Philadelphia, Pa.) marked on casts. (1682) Letitia Penn House. (1700) Old Swedes Church. (1721) Graeme Park. (1756) Neeley s Mills. (1765) Brown House. (1768) Buckingham Friends Meeting House. (1771) Woodman House. (1784) "I. C." House.

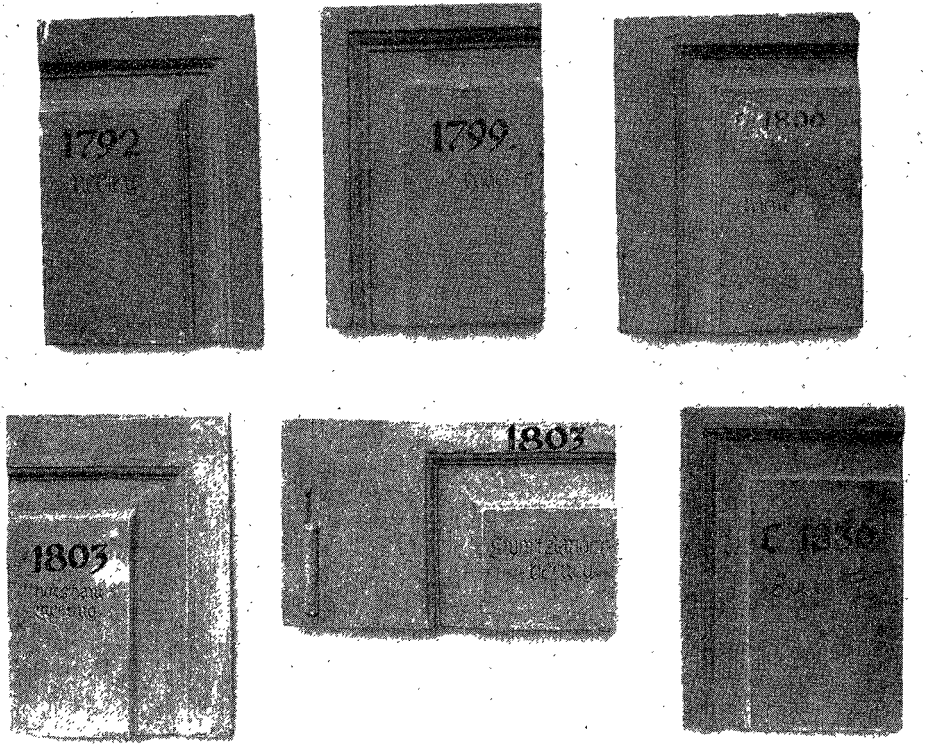

FIG. 10.—QUIRKED OVOLO AND OGEE PANELS.

on doors and shutters until machine-made mouldings take their place about 1835 (See Fig. 11).

In all the old houses examined, no significant exceptions to this rule, or survivals of old, plain ovolo panels, during the period in question, have been found, so that thus far, the evidence abundantly shows that the more ornate (i.e. beaded or quirked ovolo) door panels described, if part of the original construction of a house, will date it as built between *c.* 1776 and *c.* 1835.

MACHINE-MADE DOOR PANELS, AFTER *c.* 1835.

Besides the two significant changes in door panels, above noted, a third change, later but no less marked, took place in their construction upon the general introduction of wood-working machinery, wood-planing mills, etc., about 1835.

Revolutionary machines, of immense importance, to plane boards, make mouldings and otherwise work wood, had been invented in England by General Bentham, just before 1800 (See Knight's *American Mechanical Dictionary*) and no doubt were introduced into the United States and used about Boston, New York, Philadelphia, etc., between 1790 and 1835. Hence, very early machine-made door panels may be found later, in these and other old American cities, to prove the fact. But, in any case, these woodworking machines would have been run very restrictedly by water-power and not by steam, and the evidence shows that they were not established or their products used in the Pennsylvania country until after the general introduction of steam-power which gave birth to the modern factory about 1835.

Before that time, in the houses examined, all mouldings on door panels, whether of the plain or beaded ovolo or ogee type, above described, were hand-made and appear as solid parts of the panel, planed by hand-moulding planes upon its framework; while after that time they were machine-made and nailed on, as loose strips, around the sunken outer marginal recess of each panel (See Fig. 11).

It is not necessary for this purpose to consider the various sizes and shapes of these machine-made mouldings, nor to reason from the fact that they were introduced, not suddenly, but gradually, that the old styles of hand-made panels continued in use for a good while after their introduction. To discover that loose

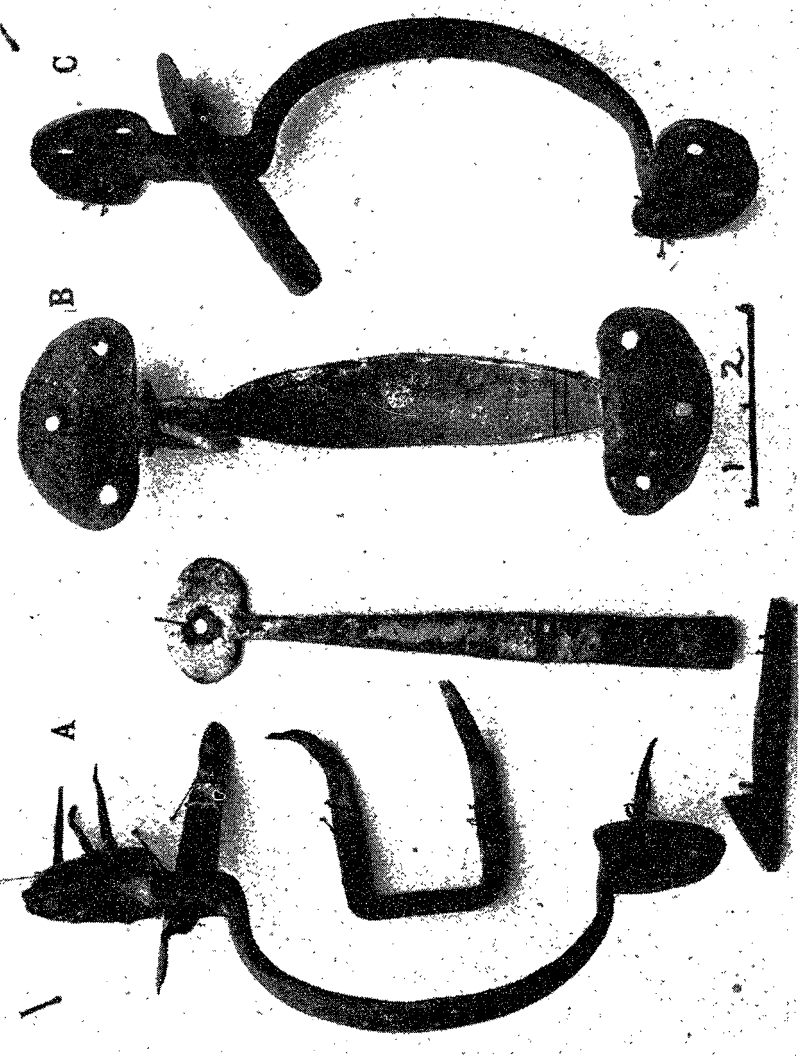

FIG. 12.—WROUGHT THUMB-LATCHES, BEAN-SHAPED AND SWIVEL-LIFT, UNTIL *C.* 1840.

Commonest type of wrought thumb-latch. More and more frequent after *c.* 1750. Probably imported from England. Superseded by cast-iron, earthen knob locks, etc., *c.* 1840. Cusp, shaped like a lima bean; Grasp flat; Lift, always straight; Works on rivet perforating slot in grasp; Catch "Figure Four" spike. (A) Showing wrought nails, bar and staple, from original door in Wenderbelt House, near Wormansville, Bucks County, Pa. (old wing), *c.* 1770. Catch, contemporary type but not original with this latch. (B) From original door in Bergey House, (old wing) near Doylestown, *c.* 1760-70. (C) Bucks County Historical Society Museum, No. 15457. Not dated.

strips of moulding have been nailed on around the sunken outer marginal recess of a panel is sufficient; that fact, where they are part of the original house construction, establishes the date of the house as not earlier than about 1835.

DOOR LATCHES WITH STRAIGHT LIFTS, BEFORE 1800.

Besides other door fastenings,—namely box knob locks, wooden latches, brass latches, German lever latches, boxed or unboxed, knob latches, etc., not here described, many original doors in old houses still standing, show their original wrought-iron thumb-latches, made of malleable iron by blacksmiths in five hammered pieces (Figs. 12 and 13), i.e. the hand grasp, an iron semi-circle; the lift, a lever with thumb press at one end penetrating the door to raise the bar; the bar thus lifted; the staple holding the bar against the door face; and the catch, a "figure 4" shaped, notched, iron piece, spiked into the lintel of the door, into which the bar falls.

These old latches are sometimes decorated (Fig. 13 B), but commonly plain (Fig. 13 A. C. D.), sometimes home-made (Fig. 13) and sometimes probably imported (Fig. 12). Sometimes they show their thumb-lifts fixed on swivels (the swivel-lift latch), (Fig. 12); sometimes they are notched into holes (the perforated cusp latch) (Fig. 13), and sometimes they appear with, but generally without, a knob or curl or pinch grasp on the bar. As yet no fixed types have been found to which dates may be ascribed beyond the following; namely, that the inner end of the lift, opposite the thumb-piece, commonly though not always appears straight before about 1800; after which it more and more often shows the familiar downcurve under the bar, characteristic of modern cast-iron latches. Doors latched with these straight-lift latches, some of which are very short, are sometimes hard to open, and sometimes, as if to remedy the difficulty, knobs or pulls appear on the bars of latches of early Colonial date. But these early knobed-bars are rare and it seems all the more remarkable that the very helpful down-curve above mentioned should not have been more generally used before 1800; nevertheless curved latch-lifts have been heard of by me, and seen by Mr. Frank K. Swain, in old houses in England, and in Pennsylvania, dating from the earlier period in question, e.g., several at the Community House,

Bethlehem, Pa., built about 1742, and several at the Letitia Penn House, Philadelphia, *c.* 1682 (doubtful).

Since the writing and first publication of this paper in *Old Time New England,* The Bulletin of the Society for the Preservation of New England Antiquities, for April, 1924, Mr. Albert H. Sonn has seen a curved lift-latch on a library door at Hadham, Conn., traced to an old mill built about 1740; one on a house at West Stockbridge, Mass., and one at Newfane, Vt., besides finding more recently a dozen or more in various parts of the eastern United States. Dr. A. Bertram Gilliland has also found several with scrolled, upturned lifts in the Stebbins House at Deerfield, Mass., built in 1772; one from the Pastor Williams House, Deerfield, built in 1770, and one at Washington's Headquarters, Newburg, N. Y., built before 1800. If more should appear later, the present evidence shows that they will continue to occur as exceptions, and that in general a curved latch-lift, if part of the original construction, will date a house after 1800.

THE NORFOLK LATCH, AFTER 1800.

The very conspicuous Norfolk latch (See Fig. 14), is easily distinguished from the wrought thumb-latches, in having its hand-grasp not enlarged at each end into plates, or cusps, but riveted upon a long, narrow, sheetiron escutcheon. Though long known in England as hand-wrought by local blacksmiths, it nevertheless appears in the American houses examined, as a *factory-made* and not smith-wrought product probably at first imported from England. Gradually taking the place about 1820 of the other forms of thumb-latch and competing with the knob-latch and the German lever latch (not shown here), it rivals, for a while, the newly invented earthen door-knob with cast-iron box, until it is generally superseded by the latter and by Blake's patent cast-iron thumb-latch of 1840 (Fig. 15).

The evidence shows that these factory Norfolk latches were made sometimes with, and sometimes without, a knob on the bar (Fig. 14); sometimes, at first, with a straight lift (A) and sometimes, later, with a curved lift (B and C), sometimes, at first, with a spiked catch (not shown here) and sometimes, later, with a catch perforating or riveted upon a plate (C). But without attempting to infer too much from these variations, we may at

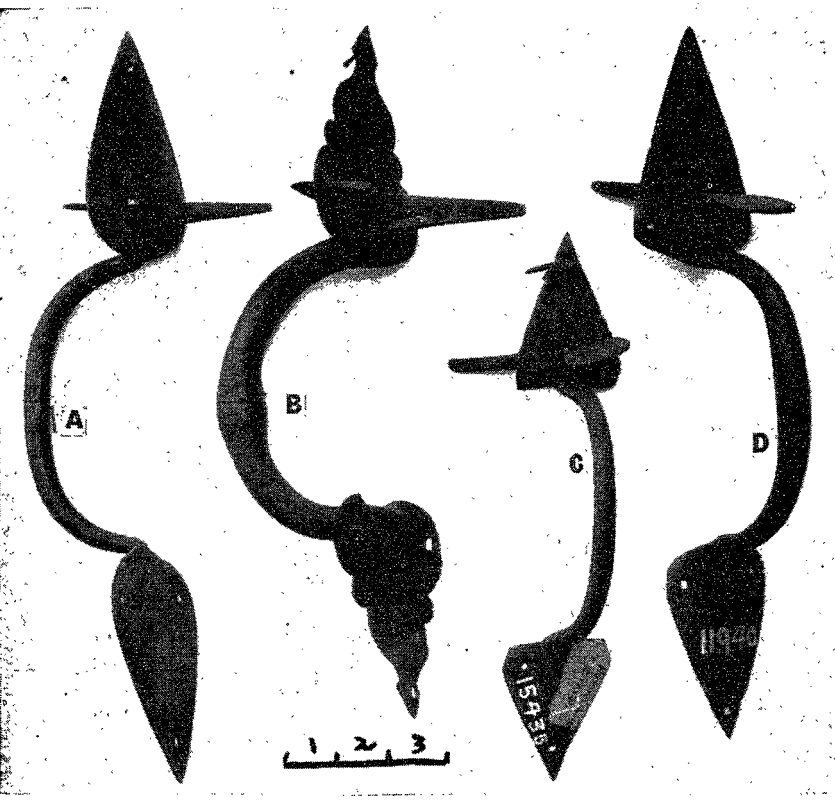

FIG. 13.—WROUGHT THUMB-LATCHES, PERFORATED CUSP TYPE, UNTIL *C.* 1840.

Lift, generally straight, until *c.* 1800, works through hole in cusp with adjustable prong (as here shown but sometimes otherwise) to prevent its falling out; Thumb press, flat; Cusps and Grasp more or less decorated. Large elaborate forms used on outer doors. Curved lifts appear on these latches after 1800-1825, and rarely before 1800. Sometimes these wrought latches show swivel lifts (See Fig. 12). Specimens, not dated, in Museum of Bucks County Historical Society, Doylestown, Pa. (A) Woodman House, near Yycombe. (B) Chittick House, near Gardenville. (C) Horne House, near Richlandtown, *c.* 1756. (D) Eastburn House, near Centre Hill.

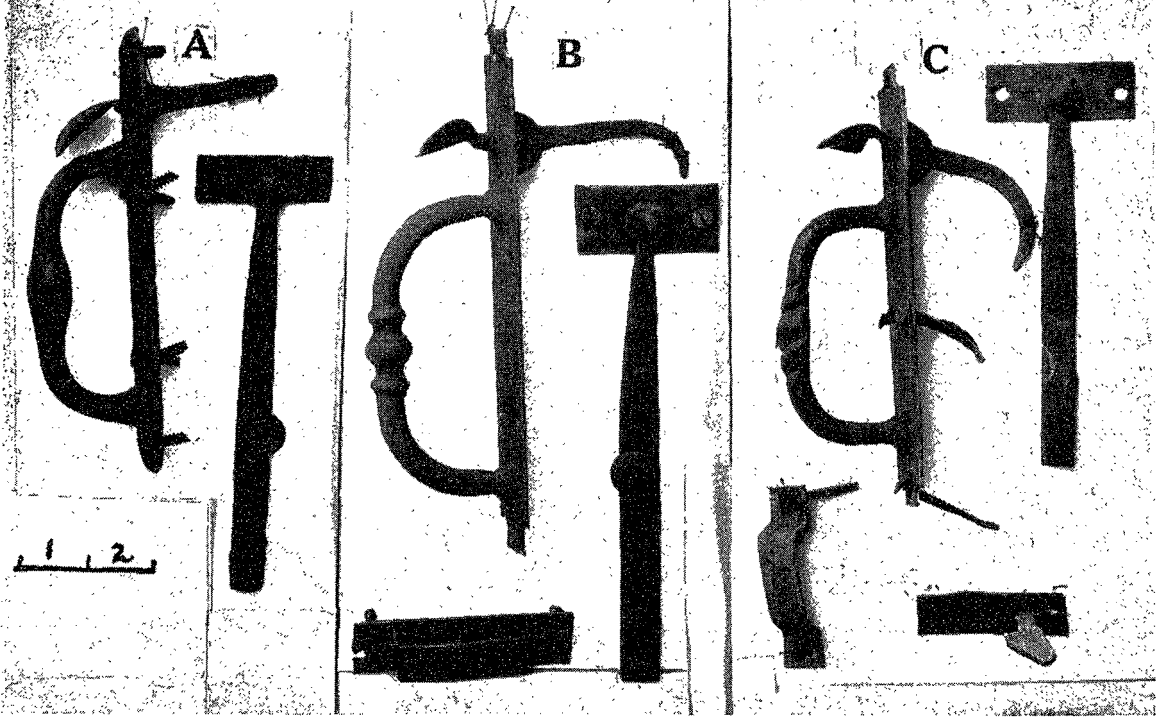

FIG. 14.—NORFOLK LATCHES, *C.* 1800 TO *C.* 1850.

Factory made, coming into general use soon after 1800. Finally superseded by cast-iron latches about 1850. Probably nearly all imported from England before *c.* 1835. Lifts, at first straight, gradually becoming curved after *c.* 1827, though straight lifts continue thereafter. (A) Ott Log House, Doylestown, *c.* 1809, spiked catch and staple missing; Saucer Press, straight lift, Knob on Bar, Pointless Screws. (B) Grier House, near Dublin, dated 1827, Saucer Press, Curved Lift, Knob on Bar, Sheet Iron Staple, Catch missing. (C) Dennett House, Kittery, Maine. First half of 19th century. Curved Lift, Saucer Press, Sheet Iron Saple, Catch on Escutcheon.

least conclude, from the evidence, that the *factory-made* Norfolk latch, if contemporaneous with the building, will date a house between 1800 and 1840, or, allowing for survivals, 1850.

BLAKE'S CAST-IRON THUMB-LATCH, AFTER 1840.

Numerous dated examples found, show that Blake's typical cast-iron thumb-latch (Fig. 15), with circular catch-plate mortised and screwed into the door lintel, hollow patent bar-pivot, hollow staple guard, and saucer lift with opposite down-curve, patented by United States patent No. 1704, July 21, 1840, first came into general use on and after that year.

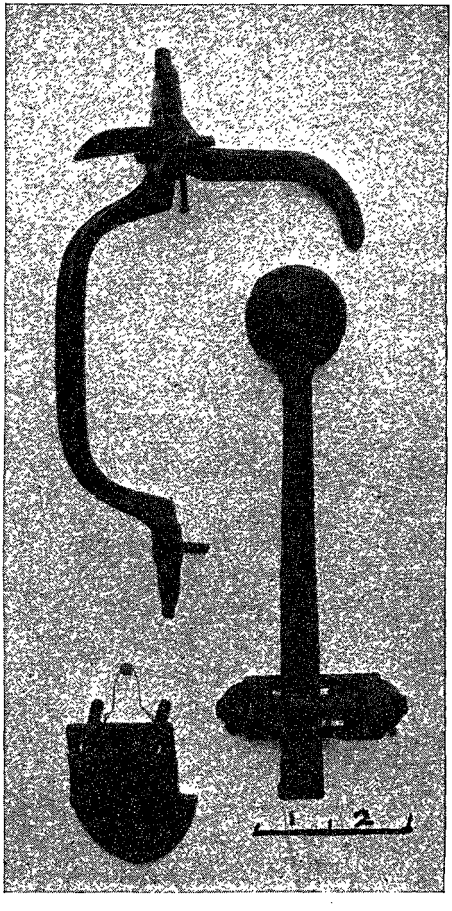

FIG. 15.—CAST-IRON THUMB-LATCH AFTER 1840
Blake's U. S. Patent, No. 1704, July 21, 1840. First patented cast-iron door latch. Specimen shown set with its original pointless wood screws. From parlour door of Frayley-Trauger House, Pipersville, Bucks Co., Pa., built 1846.

It seems probable that this latch was preceded by rare cast-iron experiments or improvements, i. e. cast-iron grasps on older wrought latches of the Fig. 12 type, etc., and was closely followed by evasive copies or patent infringements. But Blake's latch was, and still is, (1923) the cast-iron latch par excellence, and without concerning ourselves with earlier unpatented predecessors or variations of it or copies or patent infringements of its very typical catch or staple, this latch, when com-

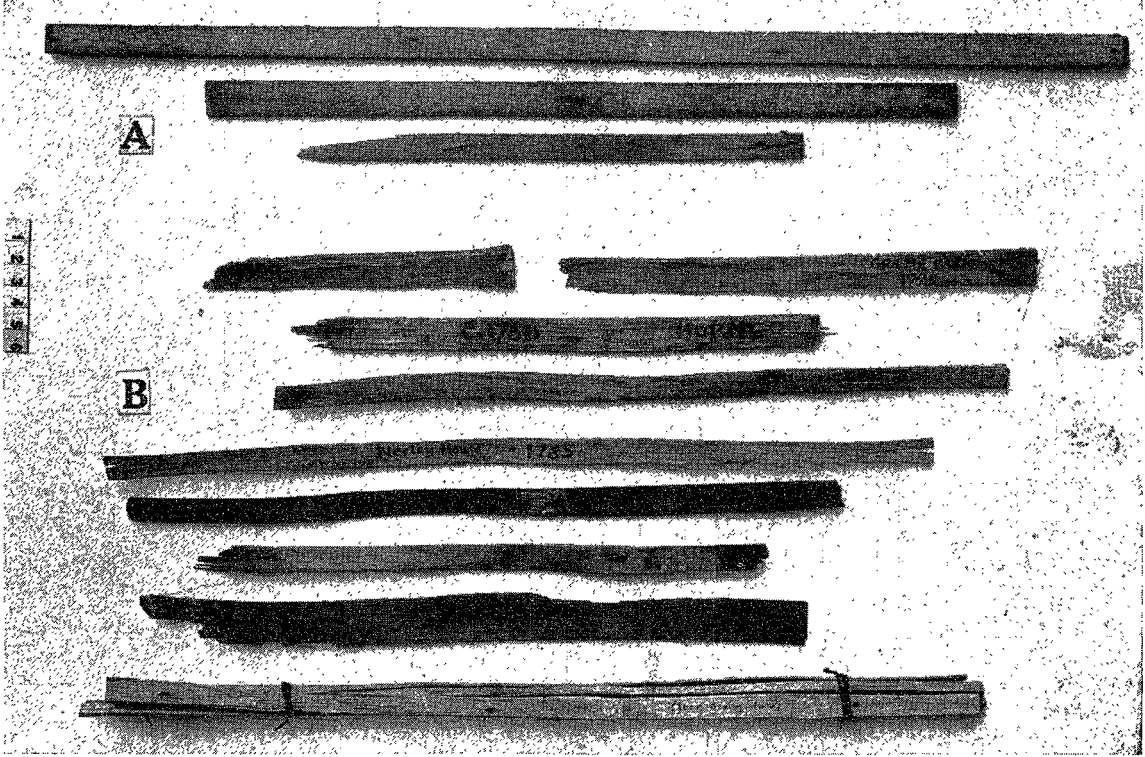

FIG. 16.—PLASTERING LATHS.

Hand split (riven) until about 1820 when the circular saw was introduced (Jackwith U. S. Patent, Mar. 16, 1820), and the mill-sawed lath (1820-1850) gradually came into use. (A) Mill-sawed lath, common type, later than 1820. (B) Riven laths from dated houses, 1722 to 1785. Those in bundle probably about 1840.

plete and original, as the evidence clearly shows, will date a house as built after 1840.

POINTLESS WOOD-SCREWS BEFORE 1846.

The unmistabable pointed wood screw, now universally used, was patented by United States patent No. 4704, August 20, 1846, before which time, all wood screws in general use, unless pointed by hand-filing, were blunt (Fig. 16).

Because these pointless screws would not start by driving into the wood, or penetrate, except by a previous gimlet hole, the pointed wood-screw suddenly and universally superseded them. Therefore, the wood-screw if pointless and original, will date a house before 1846; if pointed, after that date.

These facts, marking the end of the old house building period, though only applicable to the very latest buildings, are nevertheless important, since they may help to detect wholesale restorations or additions and show when kitchen fire-place doors stopped open-fire cooking, or where old latches, hinges, or doors have been shifted out of time or place.

SAWED LATHS, AFTER *c.* 1825 TO 1835.

Sawed laths (Fig. 17 A), i.e. thin strips of machine-sawed wood, about three feet long, by two inches wide, by a quarter of an inch thick, as keys for interior wall furring and partition plastering, first appear about 1825 to 1835. Though sawed, they were not produced by the water-run, vertical-frame saw of the old saw mills, but were first made by *circular saws,* about 1825 to 1835, on the general introduction of the circular saw, before which time, riven laths, i.e. hand-split with a frow and mallet, were invariably used (See Fig. 17 B), and no such thing as a sawed lath existed.

Riven laths were occasionally made and used for some time after the introduction of sawed laths, and therefore will not date a house as built before 1825, while sawed laths will, if original, date it as built after that time.

CONCLUSIONS.

In conclusion, it should be said in general, that in collecting and attempting to estimate the above facts, it soon became certain that very few of the old houses examined had escaped alterations

and repairs and therefore, unless the details above noted could be proved in each case to be part of the original construction, their evidence only led to error and confusion. With this reservation, reasonable certainty was always sought for and often found.

Very few houses appeared to have been raised or broadened. Therefore their original garret floors remained intact and the conclusive evidence of nails used therein, was easiest reached. When rarely, because of new floors, or L headed cut nails, this failed, we generally found it on staircases, in wash-boards or elsewhere in the house, and when, at times, this evidence seemed contradictory, some further fact, family tradition or historical record, showed that old doors or hinges, screws, or latches, had been inserted out of date into new houses, or vice versa.

Doors appeared original if set in original partitions; if frequently duplicated; if not cut down on their margins; and if with their hinges not covering old mortise nail or screw holes or outlines of removed hinges. Door panels; if on original doors; if frequently repeated or matching shutter panels. Latches; if often duplicated, and not betrayed as resettings by the marks of nail, screw or lift holes, etc., or of other door fastenings. Pointed or pointless wood screws; by their general use or appearance with otherwise original wood or iron work; and sawed laths; by their original use in partitions or in original furrings over rough unplastered walls.

Out of at least one hundred and fifty houses examined, about fifty were found dated by documentary evidence, or by date-plates or wall-stones; and the evidence of nails, woodwork and hardware, first studied in these dated buildings, always repeated and never contradicted itself in the undated houses examined later. As far as this evidence goes, it is very positive; but as yet, though quite definite after the Revolution, it fails to fix any subdivisions of time for the Colonial period (1650 to 1776).