

(No Model.)

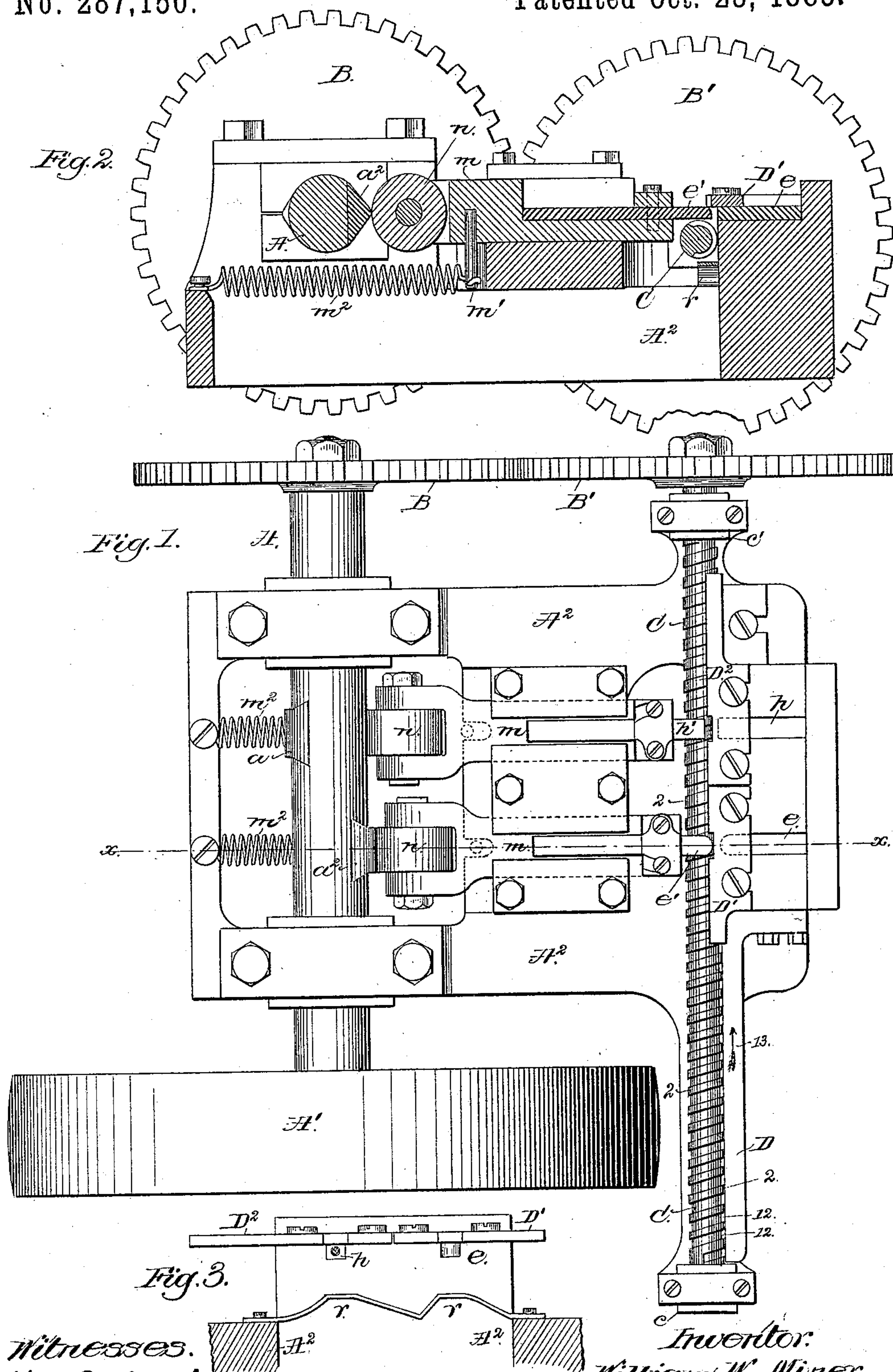
2 Sheets—Sheet 1.

W. W. MINER.

FINISHING HORSESHOE NAIL BLANKS.

No. 287,150.

Patented Oct. 23, 1883.



Witnesses.

John F. C. Finkler
Fred A. Powell

Inventor.

William W. Miner

by Crosby & Gregory
Attys.

(No Model.)

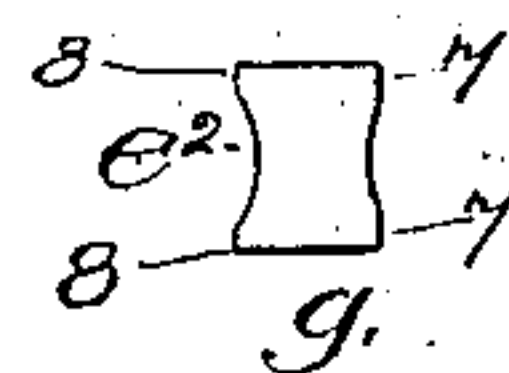
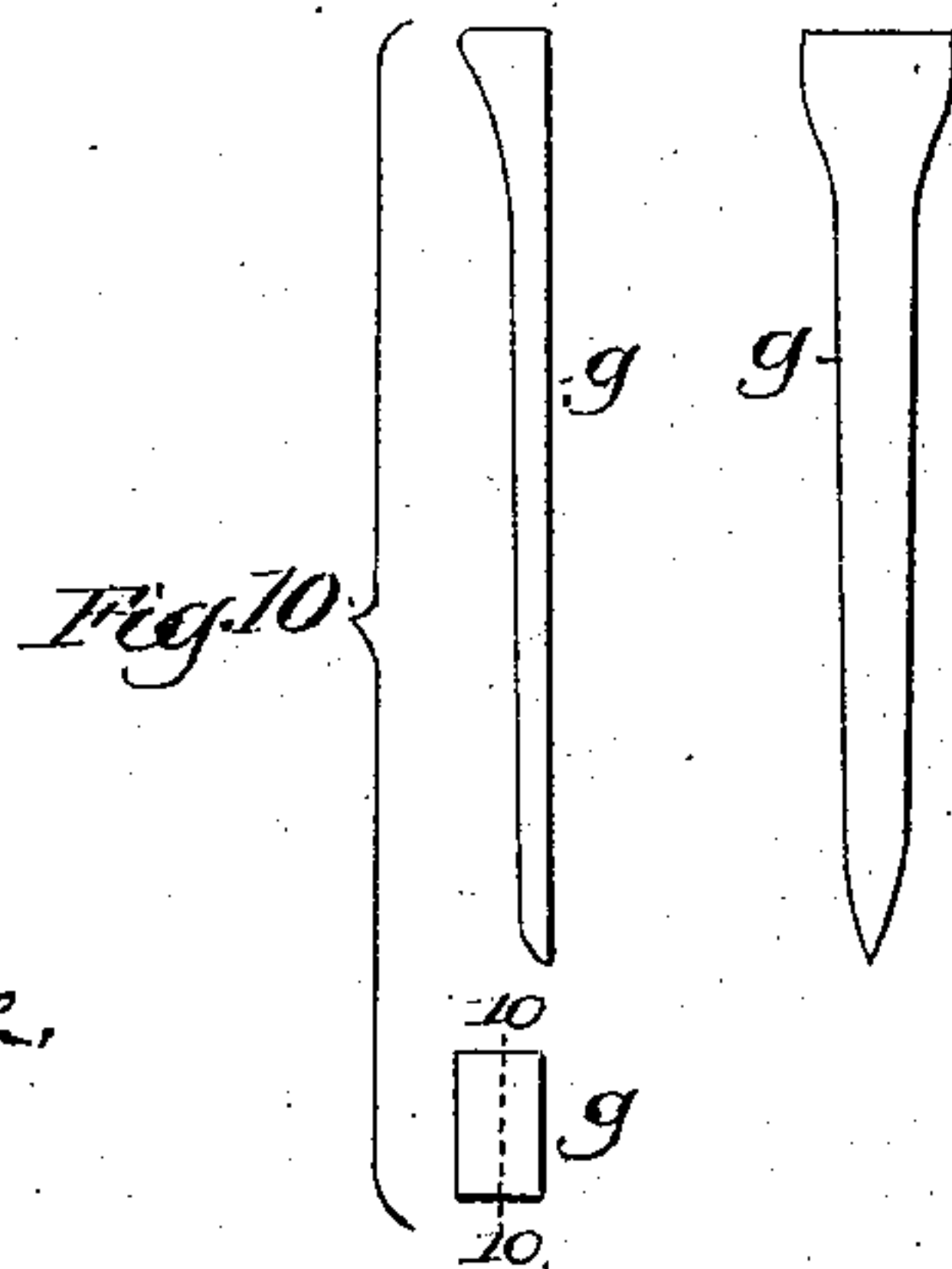
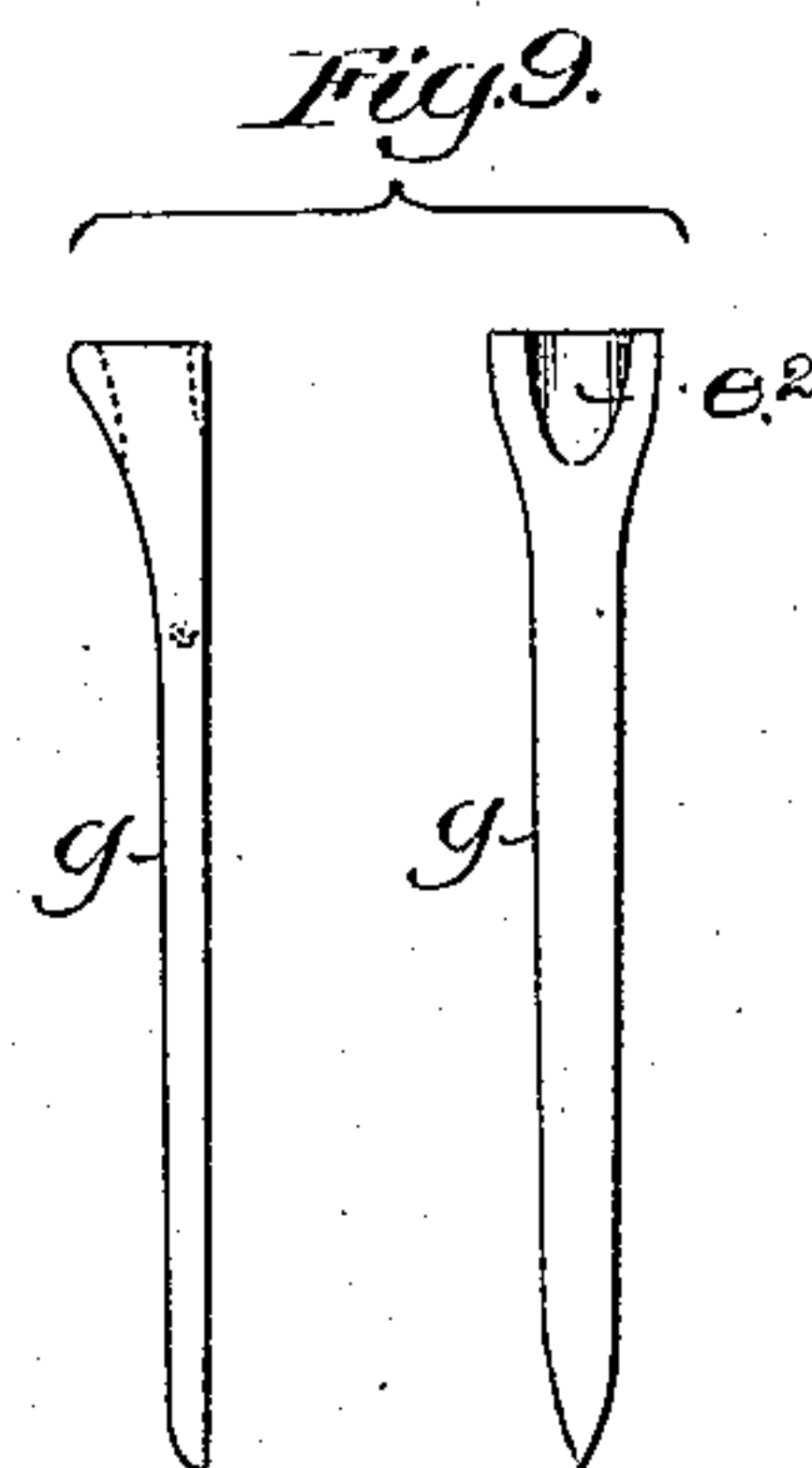
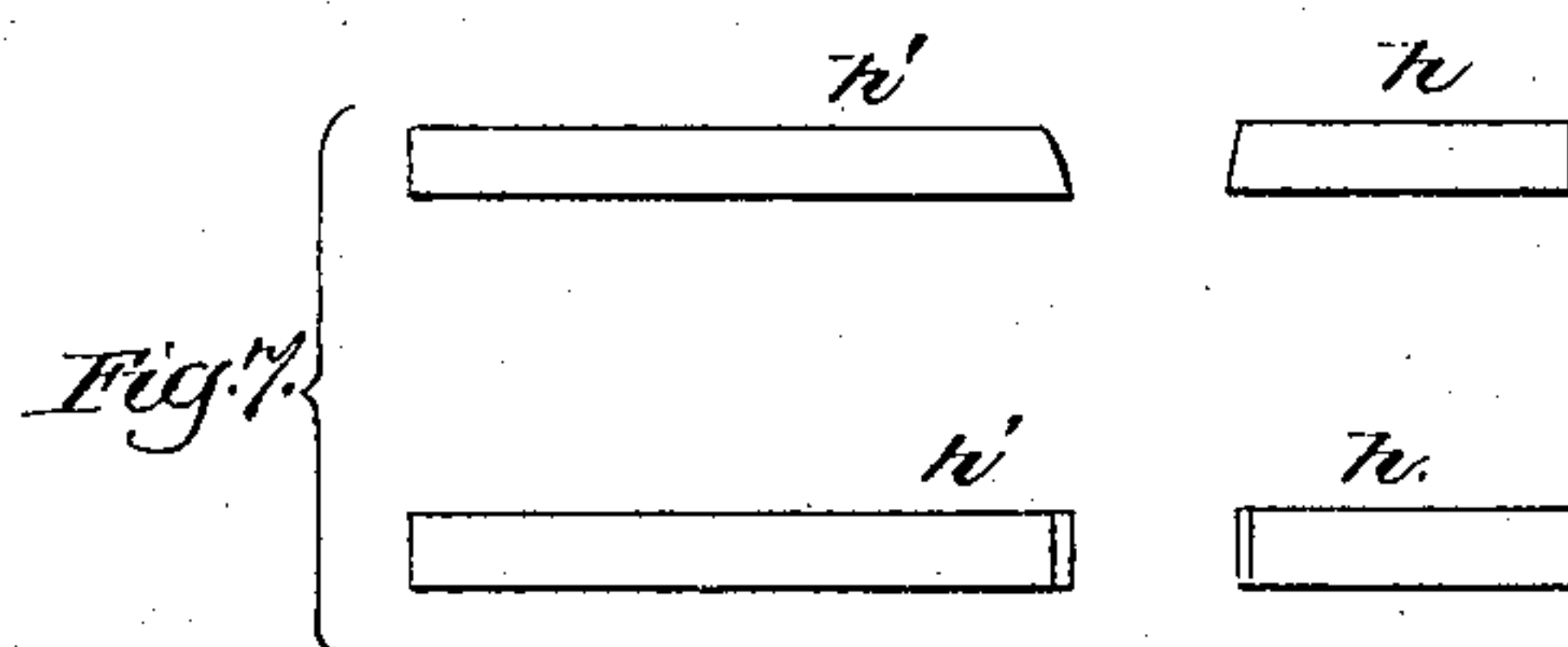
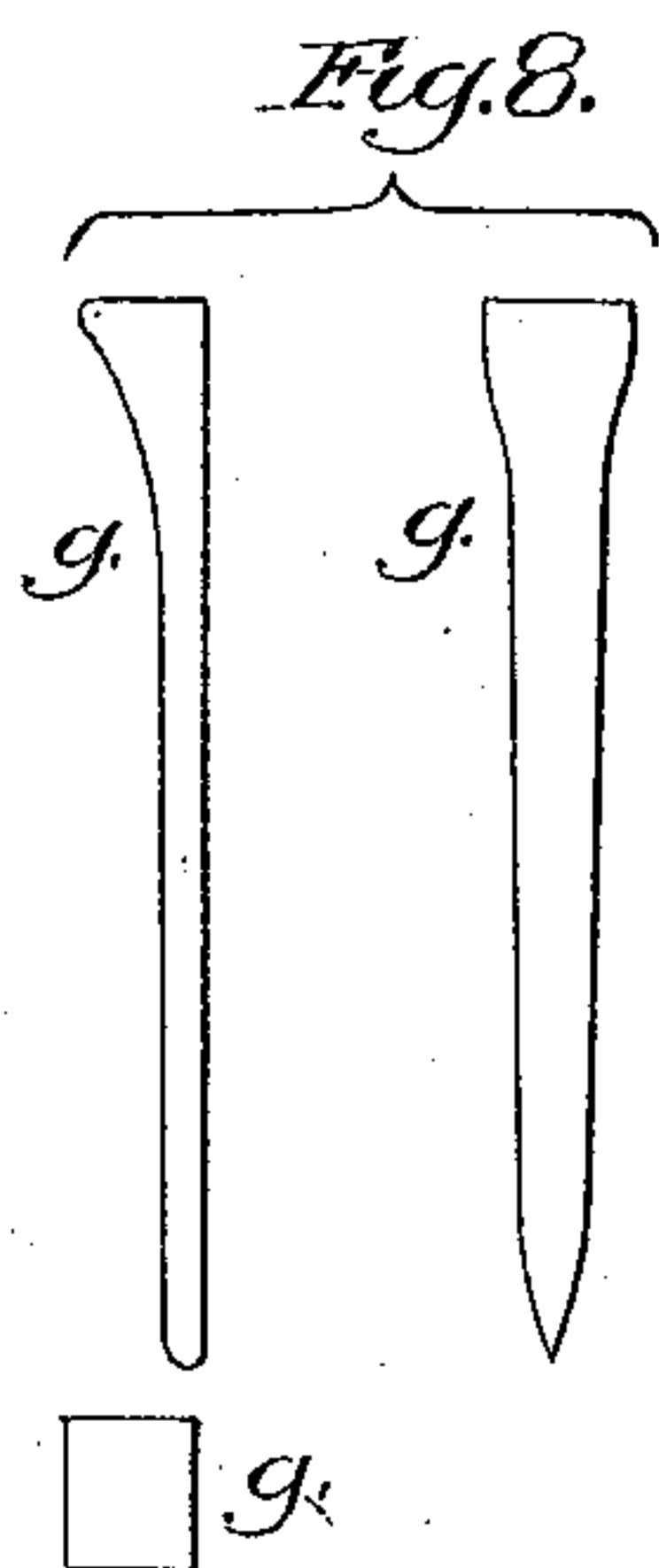
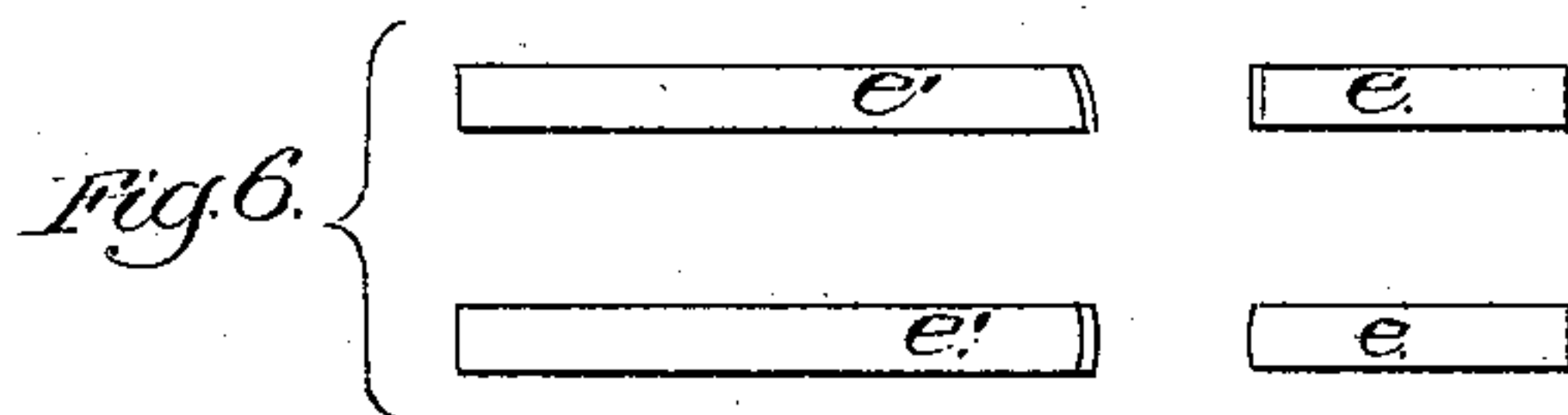
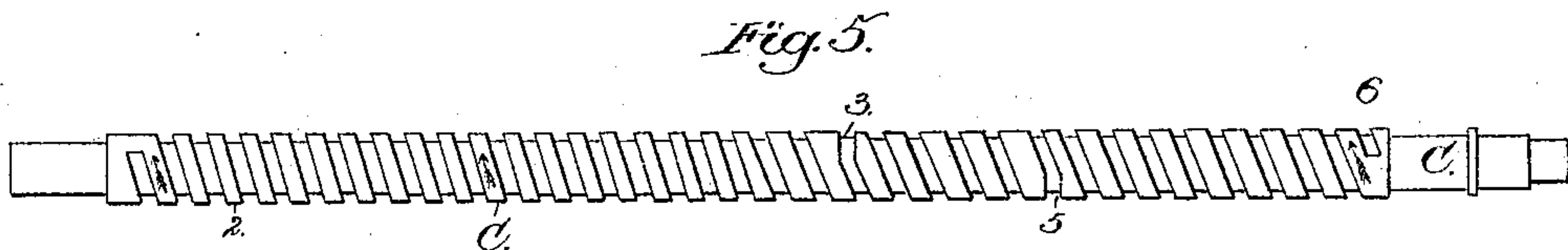
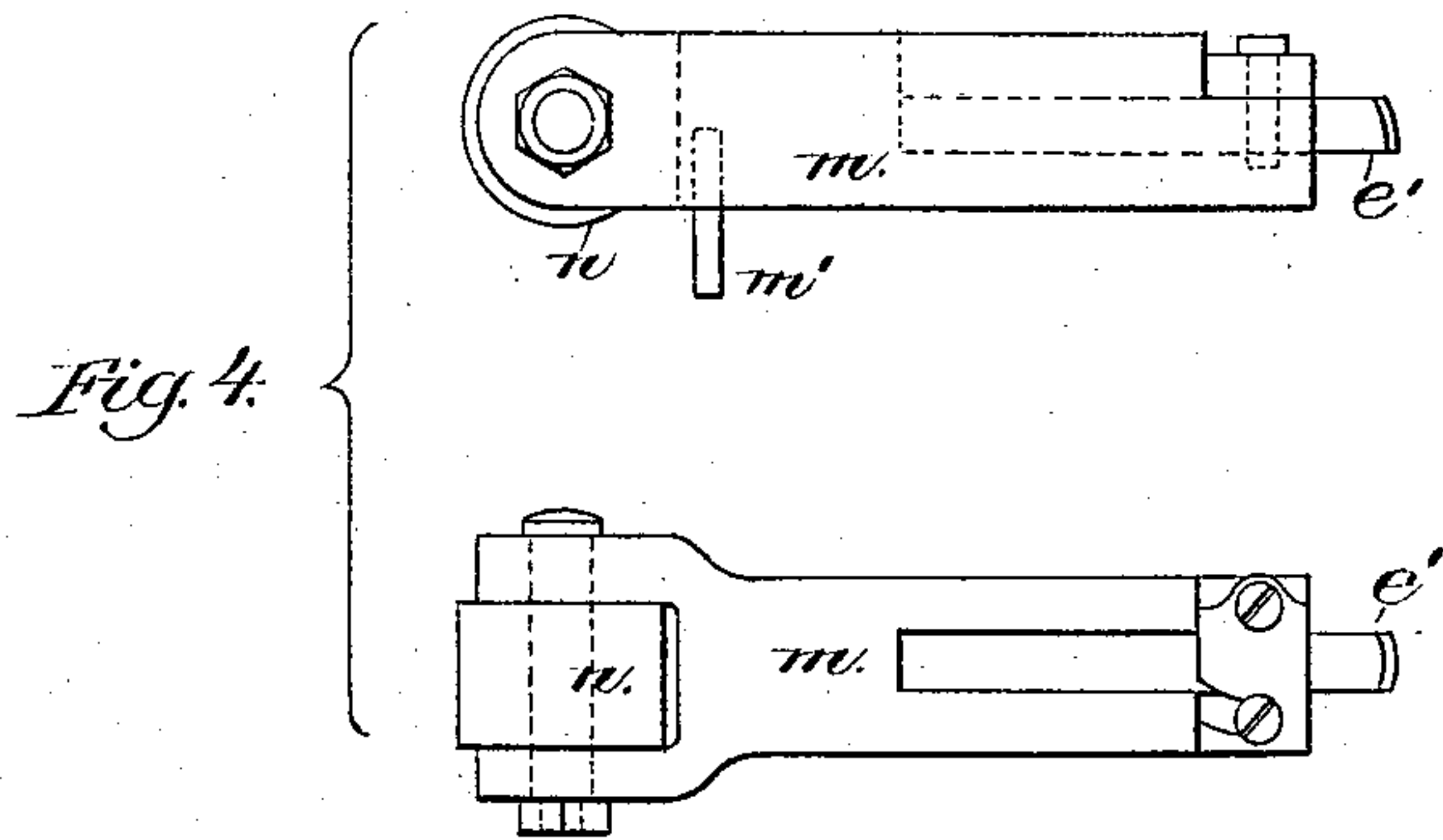
2 Sheets—Sheet 2.

W. W. MINER.

FINISHING HORSESHOE NAIL BLANKS.

No. 287,150.

Patented Oct. 23, 1883.



Witnesses.
John F. C. Prunkert,
Fred A. Powell.

Inventor:
William W. Miner.
by Crosby & Gregory
attys.

UNITED STATES PATENT OFFICE.

WILLIAM W. MINER, OF BOSTON, MASSACHUSETTS.

FINISHING HORSESHOE-NAIL BLANKS.

SPECIFICATION forming part of Letters Patent No. 287,150, dated October 23, 1883.

Application filed November 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. MINER, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Mechanism for Enlarging and Hardening the Heads of Horseshoe-Nail Blanks, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The object of my invention is the production of a mechanism to first enlarge or spread the head of a horseshoe-nail blank and then harden it, and in the machine herein shown, devised by me for such purpose, the process or method by which the head is enlarged and then hardened is a novel one. The blanks in the condition left by cutting them from a hot-rolled plate or by hot-forging are automatically fed toward and presented to the action of a "fuller-die," as it is termed, which indents the metal of the head and crowds it toward opposite side edges of the head, to be subsequently flattened by a flattening-die, which, by its action on the said head, compresses the then thickest portions each side of the "fuller-crease" to equal the thickness of the head from back to front measured in the line of the fuller-crease, the metal of the head of the blank during the flattening operation expanding laterally between the fuller-die and its anvil, and being hardened. The flattening or hardening die is also made the means of stamping a trade-mark upon the head of the nail.

Figure 1 represents in top or plan view a machine embodying my invention; Fig. 2, a section thereof on the line xx , Fig. 1; Fig. 3, a detail showing one form of lifting device to lift the suspended blanks and place their heads between the anvils and dies to enable the dies to operate upon the said heads at the proper times; Fig. 4, a plan view and side elevation of the fuller-die plunger; Fig. 5, a view of the blank-feeding device removed from the machine; Fig. 6, details in side elevation and plan view of the finishing or hardening die and its anvil; Fig. 7, like views of the fuller-die and its anvil; Fig. 8, edge, face, and head end views of the blank to be headed; Fig. 9, like views of the blank after having

been acted upon by the fuller-die, and Fig. 10 like views after having been acted upon by the finishing-die.

The main shaft A of the machine, provided with the belt-wheel A' and supported in suitable boxes on the frame A² of the machine, is provided with two cam projections, a a^2 , located at opposite sides thereof, the said cams being made as separate pieces, of dovetail shape at bottom, and inserted in correspondingly-shaped grooves at right angles to the axis of the said shaft, as in Figs. 1 and 2. The shaft A has at one end a toothed gear, B, which engages a toothed gear, B', on the blank-feeder C, shown as a screw supported in bearings c c' , rising from the frame-work, the said screw rotating, but not moving longitudinally. The screw has at its side, and parallel with it, guide-surfaces D D' D², between which and the threads 2 of the screw are placed the shanks of the blanks to be headed, the spiral channel between the threads 2 being of sufficient width to admit within it the shanks of the said blanks, which thus drop into the spaces 12 between the body of the screw C, its threads 2, and the guide D, (see Fig. 2,) the heads of the blanks then resting on the upper curved surface of the threads, which thus prevent the blanks from falling wholly through.

The blanks are supplied to the machine by an attendant inserting their points into the spaces 12 between the feed-screw and guide-surface D, and on this portion of the feed-screw the thread is of low pitch—for example, two and one-half threads to the inch—in order to give the blanks as slow a movement as consistent with the subsequent operation of the machine, thus rendering it easy for the attendant to keep the slowly-moving spaces 12 filled with blanks, the width of the thread or space between the successive turns of the spiral channel being only sufficient to receive the blanks without actual contact or interference of the head portions of adjacent blanks. The spiral channel around the portion of the feed-screw C beyond the guide-surface D, in the direction of the arrow 13, Fig. 1, or within the guide-surfaces D' D², is of steeper pitch—for example, three-fourths of a turn to the inch—so as to separate the blanks farther from one another to avoid interference between them in

the subsequent operation of the machine, they then being moved along with a greater speed, and at the point 3, opposite the "fuller-anvil," the channel is made for a short distance somewhat less than one-half a turn at right angles to the length of the screw, so that the feeding movement ceases for a moment, and the blank, raised as will be hereinafter described, remains at rest opposite the fuller-anvil *e* long enough to permit the fuller-die *e'* to be thrown forward and strike the front of the head of the blank *g* and "full" or indent it, as at *e''*, Fig. 9, leaving the head of the blank as shown in Fig. 9. The head of the blank before acted upon by the fuller-die was of the shape shown in Fig. 8. After the fuller-die has been thrown forward against the stationary nail-blank, and has retired from contact with the blank, the spiral portion of the feed-channel beyond the straight portion 3 again carries the blank along until it arrives opposite the finishing-anvil *h*, and, being raised into proper position, it will be struck by the finishing-die *h'*. It will be noticed that the feed-channel of the screw or blank feeder opposite the finishing-anvil *h* is again made to assume a direction at right angles to the axis of the screw for a sufficient distance, as at 5, to enable the blank to be held at rest long enough between the said anvil and die, while the rotation of the screw *C* is continued, for the finishing-die to be thrown forward, strike the "fulled" or indented face of the head of the blank, shaped as in Fig. 9, flatten and spread it, and bring it into the condition shown in Fig. 10, where it will be noticed that the thickness of the entire head is substantially equal to the thickness of the head of the blank, measured through its indented portion. (Shown best in Fig. 9.)

The heads of the nail-blanks in the feed-screw will normally fall below the level of the dies and anvils, and to bring such heads in line with said dies and anvils, I arrange in vertical line with the latter devices to lift or raise the nail-blanks longitudinally until their heads are successively in the paths of movement of the dies, and as the nails come opposite said dies. I have herein shown such devices as stationary inclines or cams *r*, arranged below the feed-screw in the path of travel of the nail-blanks. The finishing-die and its anvil, acting upon the high points 7 8 of the head of the blank, (points produced by the action of the fuller-die and anvil when the head of the blank was between them,) flatten the said points and cause the metal contained in them to move laterally, thus expanding or spreading the head, making it wider or broader in the line 1010. The head of the blank when acted upon by the fuller-die is in the condition of the metal left by hot-rolling or hot-forging, so the fuller-die easily indents and spreads the head. The finishing-die or anvil in thus acting on the head hardens it; but the die does not come in contact with that part of the blank which, in

the finished nail, falls at the junction of the shoe or hoof; hence that part of the blank and nail sometimes called the "neck" is not hardened, but is left in the condition resulting from cutting a blank from a hot-rolled metal plate. As soon as the finishing or hardening die has been withdrawn from contact with the face of the head of the blank, the threads of the screw or feeder again commence to carry the blank along to the delivery end 6 of the said feeder, where the guide-surface at the side of the screw—viz., the surface which keeps the shank of the blank pressed into the spaces between the projecting threads of the screw—being omitted, the blank drops out into a suitable box or receptacle. For most of its distance, especially from opposite the fuller-die, the guide-surfaces *D' D''* referred to have horizontally-projecting top flanges, which extend over the heads of the blanks being carried along by the screw. The novel feature of this feeder for the blanks consists in the change of the pitch of its screw-threads to enable the same screw in continuous rotation to feed the blank forward, and at times hold it at rest long enough to permit the dies to act upon the head of the blank.

The finishing-die may have its end cut in relief to impart any usual trade-mark upon the face or front of the head.

The dies *e'* and *h'* are carried by like plungers or slides *m*, guided in suitable guides of the frame, and having rollers *n*, which are struck by the cams *a a'* on the main shaft, the said cams throwing the said plungers and their dies forward against the heads of the blanks, as described, certain springs, *m''*, connected with the frame-work and with pins or studs *m'* of the said plungers, keeping the rollers *n* against the said cams and effecting the retraction of the plungers and dies. The dies *e' h'* will be made adjustable in the plungers. Figs. 6 and 7 show the shapes of the acting ends or faces of the two dies and their co-operating anvils. The face of the finishing-anvil and of the die is so shaped and inclined with relation to the screw which engages the shank or body of the blank that the said die will leave the face of the blank inclined outward from the neck of the blank to the top of its head, but will leave the back of the head straight, or in the same straight line with the neck and body of the blank.

I do not broadly claim a feed-screw to carry nail-blanks through a machine.

I claim—

1. The fuller-die and an opposed anvil to act upon and full or indent, as described, the head of a nail-blank, combined with a lifting device and with a blank-feeding screw having a feeding-channel adapted to carry the blank to and between the dies and anvil, hold it at rest to be struck by the die, and after the action of the die upon the head of the blank carry the blank away from between the die and anvil, and means to move the blank in the

direction of its length, all substantially as and for the purposes described.

2. The fuller-die and anvil to full or indent the head of the blank, and the finishing-die and anvil to flatten the head of the blank, combined with the feeding-screw having a feeding-channel of a variable pitch to move the blanks between the said dies and anvils and hold them at rest while being struck by the said dies and carry the blanks from between the dies and anvils, and with means for moving the blank longitudinally, all substantially as and for the purposes described.

3. The fuller-die and anvil to full or indent the head of the blank, and the finishing-die and anvil to flatten the head of the blank, combined with means to move the blank longitudinally and with the feeding-screw having a feeding-channel of a variable pitch to move the blanks between the said dies and anvils and hold them at rest while being struck by

the said dies and carry the blanks from between the dies and anvils, all substantially as and for the purposes described.

4. The fuller-die and anvil to full or indent the head of the blank vertically, and the finishing-die and anvil to flatten such "fulled" head, combined with a feeding-screw having a feeding-channel of a variable pitch, to move the blanks between the said dies and anvils and hold them at rest while being struck by the said dies and carry the blanks from between the dies and anvils, all substantially as set forth, and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM W. MINER.

Witnesses:

G. W. GREGORY,
B. J. NOYES.