(No Model.) 2 Sheets—Sheet 1.

S. E. CRAWFORD.

HAND NAILING MACHINE.

No. 447,398. Patented Mar. 3, 1891.

Fig. 1.

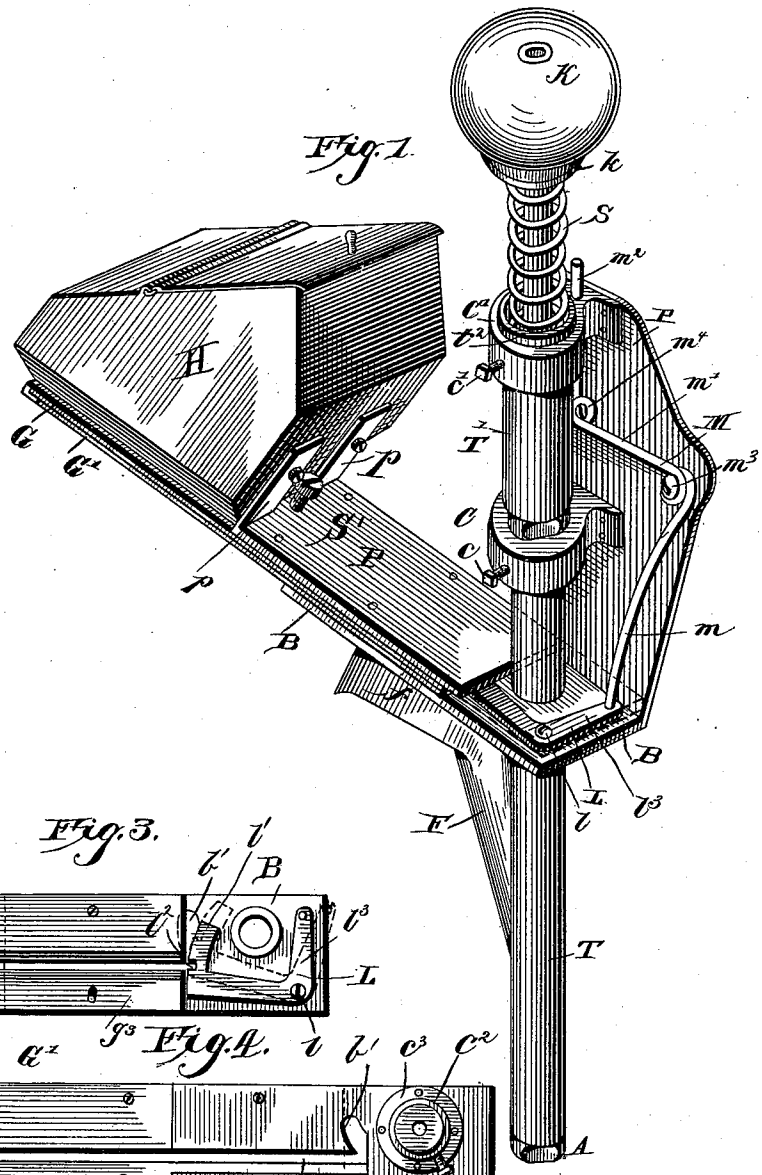
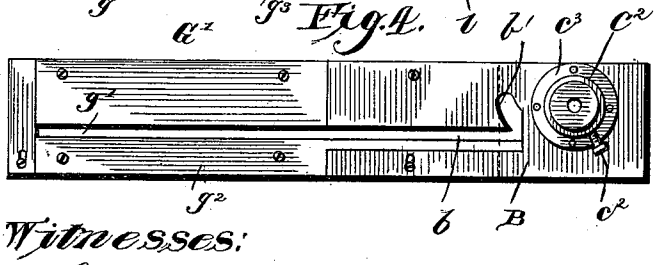


Fig. 3.

Fig. 4.



Witnesses:

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J. Thomson Cross

Inventor:

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per. Henry G. Pb

Attorney:

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

S. E. CRAWFORD.

HAND NAILING MACHINE.

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Fig. R.

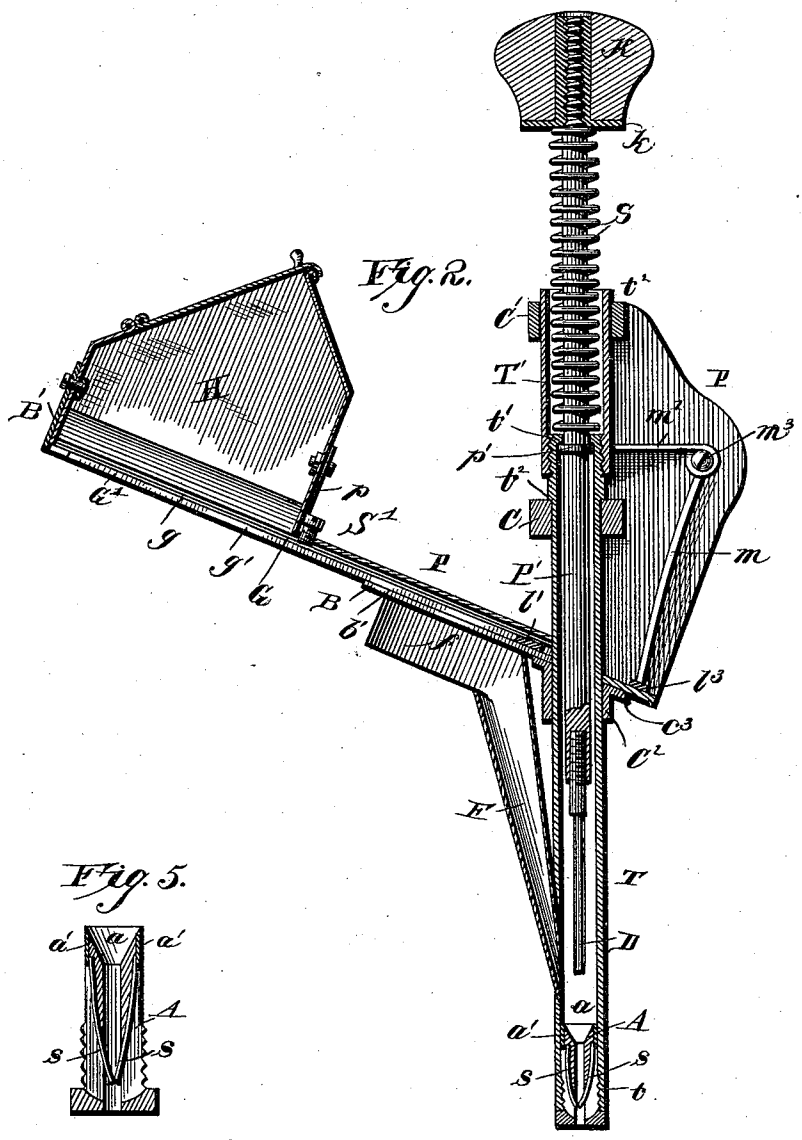


Fig. 5.

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UNITED STATES PATENT OFFICE.

SAMUEL E. CRAWFORD, OF RIPON, WISCONSIN.

HAND NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 447,398, dated March 3, 1891.

Application filed May 12, 1890. Serial No. 351,375. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. CRAWFORD, a citizen of the United States, residing at Ripon, Fond du Lac county, and State of Wisconsin, have invented certain new and useful Improvements in Hand Nailing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view of a hand nailing-machine embodying my invention. Fig. 2 is a vertical section thereof; and Figs. 3, 4, and 5 are detail views.

My invention has for its object certain improvements in the construction of hand nailing-machines, by which the efficiency thereof is enhanced, and by which a simple and durable machine convenient to handle is produced.

To these ends the invention consists in certain structural features and combinations of parts whereby the results aimed at are attained, as will now be fully described, reference being had to the drawings hereinabove referred to, in which like letters indicate like parts.

T indicates the plunger-tube, which is of equal diameter, except at its upper end, where it is enlarged to form an annular flange or shoulder t^2. The said tube is open at its lower end, and is provided at said end with an interiorly-screw-threaded portion t. At its upper enlarged end the tube has an inwardly-projecting annular flange t', is screw-threaded exteriorly, and screws into the lower end of a guide tube or sleeve T'. To the tubes T and T' is secured a bearing-plate P, by means of two collars C C', respectively. The collar C' is secured to guide-tube T' below the shoulder t^2 by means of a set or binding screw c', said collar forming a seat for the shoulder, and the collars C C^2 are secured to tube T by means of set-screws c and c^2, respectively. (See Figs. 1 and 4.) The lower collar C^2 has a bearing-flange c^3, that is formed at an angle to the axis of said collar, as shown in Fig. 2, so as to support the nail-guide at a proper inclination to guide the nails to the feed slide or lever, the bearing and supporting plate B being secured to said collar C^2.

P' is the plunger, carrying at its lower end the driver D, that drives the nails in the operation of nailing, said plunger having a collar or annular flange p', that, in conjunction with the annular flange t' at the upper end of the plunger-tube T, serves to limit the upward motion of said plunger within its tube under the stress of a coiled spring S, one end whereof abuts against the under side of a knob K, secured to the plunger, and the other against the upper end of the plunger-tube, as clearly shown in Fig. 2.

Into the lower end of the plunger-tube is screwed a thimble A, the axial passage of which is made flaring outwardly at its upper end, as shown at a in Figs. 2 and 5, and it has two vertical slots on opposite sides of said axial passage, into which project the free ends of two flat springs s s, said springs being secured to the upper end of the thimble A in any convenient manner, as by means of a collar a', for instance, as shown in said Figs. 2 and 5. These springs serve to hold the nail in proper position to be driven by the driver D, as will be readily understood.

To the supporting-plate B, secured to collar C^2, are secured the guide-plates G and G'. The upper guide-plate G has a longitudinal slot g, the sides of which are beveled or inclined outwardly to guide the nails properly. The guide-plate G is also provided with a slot g', the slots in both plates registering with a slot b in the supporting-plate B, said slot b terminating in a laterally-curved enlarged slot b'. (See Figs. 3 and 4.)

To the plate G' is secured the hopper H for the reception of the nails by means of a bracket B' and a tongue or tongues p, formed in the end of the plate P, that covers the guide-plate G, said covering-plate serving to confine the nails to the guide-slot and prevent the same from falling out should the apparatus be tilted.

The feeding of the nails one by one from the guide-slot to the feed-spout F is effected by a feed-slide in the form of a bell-crank lever L, that is pivoted at l to the bearing

plate B. The end of one of the lever-arms is constructed in the form of a segment l', in which is formed a notch l^2, which, when the lever lies in its normal position, is in register with the guideway g g', as shown in Fig. 3, thus intercepting the passage of a nail to the enlarged lateral portion b' of the guide-slot b. The arm l^3 of lever L is connected with the arm m of a spring-actuating lever M, that has substantially the form of a bell-crank lever, and is fulcrumed to plate P at m^3, the lever being formed, preferably, of a stout wire having one or more convolutions at its fulcrum, as shown in Figs. 1 and 2. The arm m' of lever M terminates also in one or more convolutions m^4, and is then bent at right angles, and the arm m^2 so formed extends above the collar C', through which it may pass, as shown in Fig. 1, so that it will be struck by the knob when depressed by a blow, thereby imparting to the feed-lever L a movement from left to right, as shown in dotted lines in Fig. 3, so that the nail in the notch l^2 of said lever will be carried into the curved enlarged portion b' of slot b in the supporting-plate B, and released by centrifugal force or by contact with the wall of slot b', the nail dropping point foremost into the feed-spout F, and thence into thimble A, where it will be held by the springs s, ready to be driven by the next downward movement of the driver D.

To avoid wear of the knob K when this is made of wood, which is preferred, when the blows thereon are given by hand, the lower face of said knob has a metallic washer k, that impacts with the arm m^2 of the spring-lever M.

The feed-spout F has wings f f extending along the guideway for the nails, to prevent injury to the hands by accidental contact with the nail-points in holding the apparatus in the operation of nailing by grasping the plunger-tube T.

The covering-plate P may, if desired, be extended over the feed-lever L, as shown in dotted lines in Fig. 1, and suitably slotted for the working of the arm m of lever M.

S' is a regulating-screw, the end of which lies above the beveled edges of the slot g in plate G to admit of the passage of but one nail-head below it, as it may happen that two nails may pass along the guide-slots with their heads overlapping and may become jammed either in said guide-slot or in the notch of the feed-lever. This is, however, avoided by adjusting the screw S' in the V-shaped slot, so that but one nail at a time can pass under it.

The machine is adapted for use of nails of different sizes within certain limits, one half g^2 of the nail-guide plate G' and one half g^3 of the nail-guide plate G being adjustable for the purpose of adjusting the width of the guide-slots g' and g, respectively, according to the size of nails used.

It has hereinbefore been stated that the slot g in the guide-plate G has its sides inclined, and this inclination may vary from about twenty degrees to forty degrees from a horizontal. The object of forming the sides of the slot inclined outwardly or beveled is to prevent a nail moving point or head on along the slot, the point or head lying under the head of a preceding nail, which would prevent the feed-lever from engaging the latter nail if the sides of the slot were vertical. By inclining the sides of said slot the nail lying point or head on on reaching the lever L will be pushed up along the inclined side of the slot from under the head of the preceding nail, thus enabling the latter to pass into the notch of said lever.

Levers having notches of a size determined by that of the nail are interchangeably used in the machine, said levers being fulcrumed on a screw, so as to be readily removed and another substituted, although this is preferred, yet a feed-lever may be provided the notch of which is of such width as to accommodate various sizes of nails.

The thimble A is, as above described, also detachably connected with the plunger-tube T, and the driver D is likewise detachably connected with the plunger P', so that a thimble having an axial passage corresponding with the size of nail used may be screwed to the plunger-tube and a driver of greater or less diameter, according to the size of nail used, to the plunger.

From what has been said above the operation of my improved hand-nailer will be readily understood, and from the description it will be seen that the apparatus is extremely simple in construction, efficient in operation, and adapted for use with different sizes of nails.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A hand nailing-machine comprising a plunger-tube, a spring-actuated plunger, and a driver connected therewith, said plunger carrying the knob K, in combination with a guide to guide the nails to the plunger-tube, a feed-lever consisting of a bell-crank lever having a notched segment the notch whereof is normally in register with the nail-guide, and means for vibrating the lever to transfer the nails from the nail-guide to the plunger-tube, consisting of the spring-lever M, provided with the vertical arm m^2, arranged in the path of the knob K on the plunger, substantially as and for the purpose specified.

2. In a hand nailing-machine, the combination, with the plunger-tube and the driver, of an adjustable nail-guide and a notched feed-lever L, adapted to vibrate across the end of the guide and carry the nails to the plunger-tube, said feed-lever being detachably connected with its support, whereby feed-levers having notches differing in size may be interchangeably used with the guide to feed nails of different thickness to the plunger-tube and driver, substantially as described.

3. In a hand nailing-machine, the combina-

tion, with the plunger-tube and the driver, of an adjustable nail-guide, a notched feed-lever L, detachably connected with its support and adapted to vibrate across the end of the nail-guide and carry the nails to the plunger-tube and driver, and a thimble A, constructed as set forth and detachably connected with the plunger-tube, whereby feed-levers having notches differing in size and thimbles having axial passages differing in diameter may be interchangeably used with the guide to feed nails of different thickness, substantially as described.

4. In a hand nailing-machine, the combination, with the nail-guide, the feed-lever L, the plunger-tube, the plunger, and the driver, arranged to operate as set forth, of the thimble A, secured to the plunger-tube, said thimble being slotted laterally and provided with springs *s*, arranged in said slots, the free end of the springs projecting into the axial passage of the thimble, substantially as and for the purposes specified.

5. The combination, with the slotted nail-guide, the slot whereof is provided with inclined sides, of the adjusting-screw S′ for regulating the depth of the slot at the point where said screw is arranged, substantially as and for the purposes specified.

6. In a hand nailing-machine, the combination, with the nail-driving mechanism, of a nail-guide provided with a longitudinal feed-slot having at one end a laterally-curved and enlarged extension, and a feed-lever having a segmental notched arm, the notch in said arm being of less diameter than the nail-head and normally in register with the feed-slot, said lever being arranged to vibrate in a direction opposite to the curvature of the lateral extension of said feed-slot and across the same, for the purposes set forth.

In witness whereof I affix my signature in presence of two witnesses.

SAMUEL E. CRAWFORD.

Witnesses:
W. V. HEDGE,
L. E. NOHL.