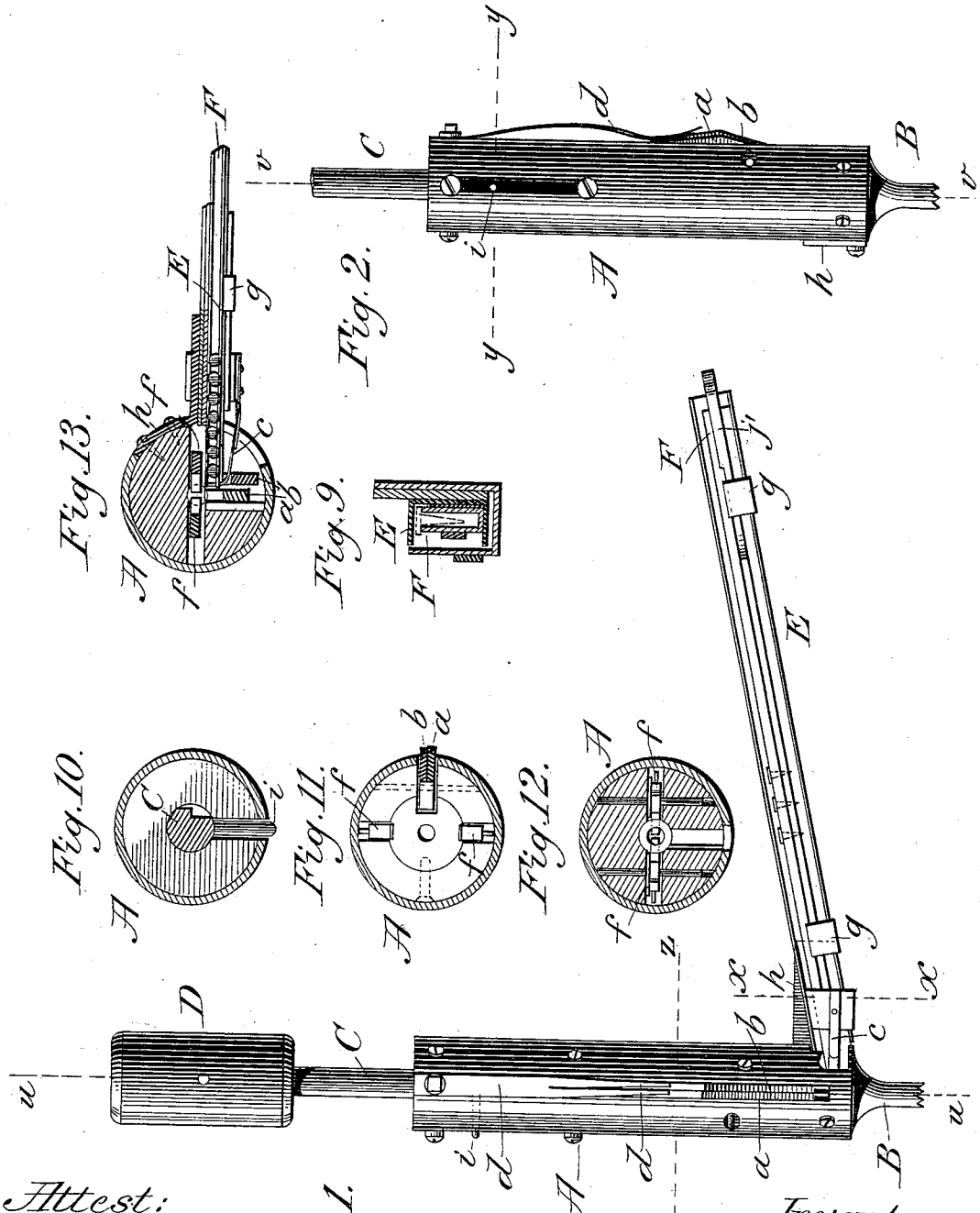
(No Model.)

2 Sheets—Sheet 1.

M. V. B. ETHRIDGE.

TACK DRIVING MACHINE.

No. 335,515. Patented Feb. 2, 1886.



Attest:
F. H. Schott
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Inventor:
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(No Model.)

2 Sheets—Sheet 2.

M. V. B. ETHRIDGE.

TACK DRIVING MACHINE.

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Fig. 8.

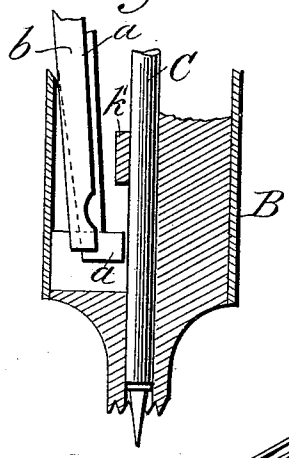
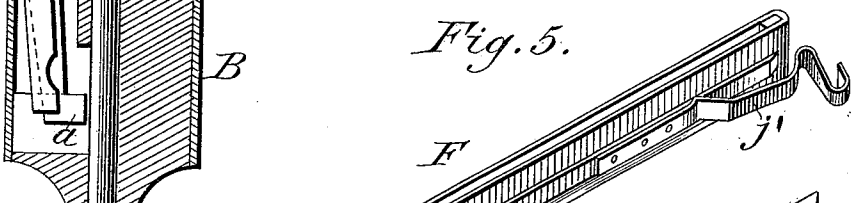


Fig. 5.



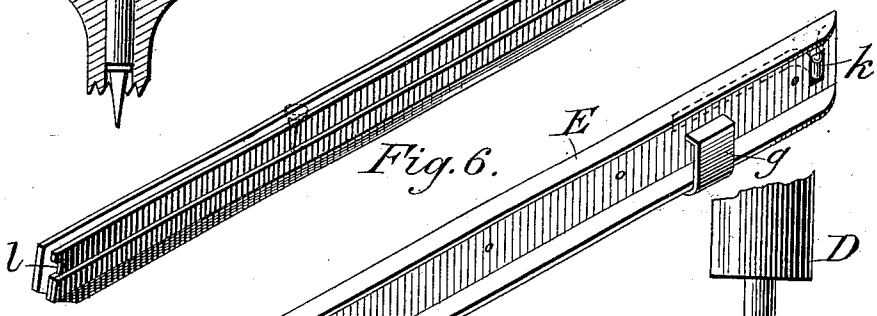


Fig. 6.



Fig. 7.

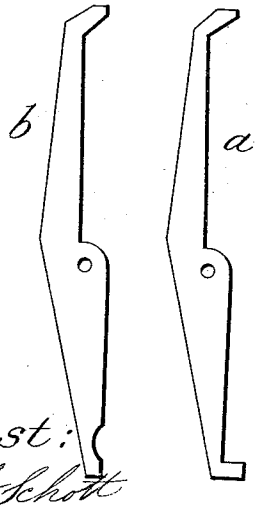


Fig. 3.

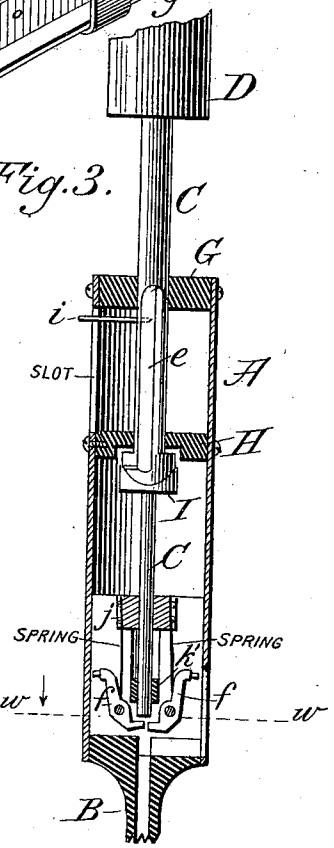
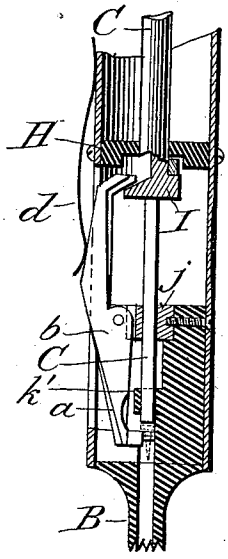


Fig. 4.



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UNITED STATES PATENT OFFICE.

MARTIN V. B. ETHRIDGE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE ETHRIDGE LASTING MACHINE COMPANY, OF KITTERY, MAINE.

TACK-DRIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 335,515, dated February 2, 1886.

Application filed November 20, 1885. Serial No. 183,448. (No model.)

To all whom it may concern:

Be it known that I, MARTIN V. B. ETHRIDGE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Tack-Driving Machines; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to an improvement in hand tack-driving machines; and it consists of a construction and arrangement of parts, which will be hereinafter specifically set forth and described.

In the annexed drawings, illustrating my invention, Figure 1 is a vertical elevation of my improved hand tack-driving machine. Fig. 2 is a vertical elevation of a portion of the same on a different angle. Fig. 3 is a vertical section on the line *v v* of Fig. 2. Fig. 4 is a section on the line *u u* of Fig. 1. Fig. 5 is a perspective of the chute-piece for the tacks. Fig. 6 is a perspective of the rack or casing which contains the chute. Fig. 7 represents the form of the two levers which work within the slot of the cylinder. Fig. 8 is a section of the lower end of the cylinder, showing the driving rod or plunger near its lowest limit. Fig. 9 is a section of the chute on the line *x x* of Fig. 1. Fig. 10 is a section on the line *y y* of Fig. 2. Fig. 11 is a section on the line *z z* of Fig. 1. Fig. 12 is also a section of the cylinder on the line *w w* of Fig. 3, and Fig. 13 is a section of the cylinder on a line parallel to *z z*.

Like letters of reference indicate like parts in the several views.

A represents a cylindrical chamber or barrel, slotted in two or more places for the more convenient and easy working of the inclosed mechanism, and provided with an upper head, G, interior head, H, and lower head, B, formed with a tubular projection, through which the tacks are driven. Both the upper head, G, and the interior head, H, are perforated with central apertures for the passage of a rod, C, which carries at its outer end a weighted handle, D. This rod differs in diameter at different portions of its length, as will best be seen by reference to Fig. 3, this change of diameter being for the purpose of adapting the rod for its different situations and different functions throughout its different portions, since the rod itself serves as a driving rod or plunger to force the tacks out through the lower head, B, and into the boot, shoe, box, or whatever other object is being operated upon. Thus the rod C is of a length equal to the length of the cylinder A, and enough in addition to allow the attachment of the handle D, and to afford ample room to manipulate the plunger with facility in driving the tacks, and the lower end of the rod is of proper size to allow it to pass easily up and down through the tubular projection on the head B, which projection is proportioned in size to that of any ordinary tack-head which is to be used with the machine. The rod C is grooved along a portion of its length at *e*, which groove terminates at a point where there is secured to the rod a circular metallic disk, I, cam-shaped upon its upper face, as represented in Fig. 3, for the purpose of actuating the levers *a b* in the peculiar manner hereinafter to be described. The rod C carries fastened into it a small horizontally-projecting pin, *i*, which works in a slot in the cylinder, as represented in Fig. 2, and limits thereby the upward and downward movement of the rod C. It also serves to keep the rod from rotating, and thus keeps the cam-shaped disk I and the groove *e* in the same position relatively to the other parts. It will be further seen, in addition to what has already been said about the interior head, H, and the cam-shaped disk I, that said head is annularly recessed on its under side, so that the said disk may enter it; but this recess is not absolutely necessary, and may be dispensed with, the purpose of providing it being to allow of greater play in the movement of the disk, and the purpose of the interior head itself is principally to limit the movement of the disk, and to prevent its cam from passing upward beyond the ends of the pivoted levers.

As represented in Fig. 1, the cylinder A is provided lengthwise with a slot, in which are pivot-

ed two parallel levers, *a b*, of a form substantially similar to those shown in Fig. 7. These levers are both nearly of the same form, but differ slightly, in order to serve for different purposes. Thus the upper end of each, as shown by their position in Fig. 7, is formed with a small beveled lug, while as regards their opposite ends one is provided with a small circular recess, while the other is provided with a lug. The lever *b* lies on the side nearest the tack-feeding chute, as shown in Fig. 1, and next to it, or on the other side, is located the other lever, *a*. The cylinder A also, at its lower end, has a portion of itself broken away, in order to allow of the attachment of the chute F and its frame E, as shown in Fig. 1. The lower head, B, is preferably formed of several parts and of a peculiar pattern, to allow of the arrangement therein of the numerous devices which combine to accomplish the driving of the tack. It is made of a diameter to fit closely within the bore of the cylinder, and of a greater or less length—say a quarter of the length of the cylinder, or from its extremity to about the line *z z* in Fig. 1. Thus this bottom head may afford two or more bearings for the rod C, as at *j* and *k'* in Figs. 4 and 3. This enables the rod C to be guided and supported with certainty during its operations. The head B is provided with a deep slot, which is coincident with the slot in the cylinder in which the levers *a* and *b* are pivoted and work; and at right angles to this slot are two other deep grooves or slots, one on each side at a distance of a quarter-circumference from it. Within each of these latter slots is journaled a lever, *f*, as shown in Fig. 3, having on its end a small lug, and held in position by means of a spring. (Represented in same figure.) These two levers will thus lie in the same plane, and their ends will almost come into contact when situated in the normal position shown in the drawings and acted on by the tension of the spring; but when the rod C descends it will strike the lugs upon the ends of these levers, and, separating the levers, pass between them onward down through the tubular projection of the head. When it again ascends beyond the levers *f f*, they will resume their normal position, under the action of the springs.

In Figs. 11 and 12 are shown in section the arrangement of slots and levers within the head B. It is evident that this head B may be made of one or of several pieces of metal, provided only the proper slots are left within which to pivot the levers *f f* and to locate the springs bearing upon them, and provided the proper bearings can be made for the rod C, so that it may be firmly supported, may strike the lugs on the ends of the levers, as above described, and separate the same, and may pass onward into the tubular projection; but, perhaps, for convenience and ease of construction, it is best to make this head of several parts and secure them together by means of screws or rivets. The tubular projection may likewise be made as a part of the head or be secured to it by suitable means, it being fashioned externally with a curved taper, in order to give it a neat appearance. The end of the tube is generally formed with a circular series of indentations, so that the device may be held in position against any object upon which it is operating.

As above stated, the lower part of the cylinder A is broken away, to admit of the attachment of an inclined chute and its frame. These are shown, respectively, in Figs. 5 and 6, and the attachment is effected by means of a metallic band, *h*, which partially encircles the cylinder and is screwed or riveted thereto. The frame of the chute is provided with guides *g g*, for holding the chute-piece in place, and it is clearly seen how this chute may be slipped into its frame until it has been pushed down far enough to allow the spring *k* to project past the end and keep it from slipping out. The other end of the frame will then be situated close to the ends of the small spring-levers *f f* within the bottom head, B, as will also the end of the chute. The chute F is shown in Fig. 5, and has a channel running its entire length, open at one end and closed at the other, which latter end is provided with a spring, *j'*. When it is desired to remove the chute from its frame, the operator may, by pressure upon the spring *j'*, bring the same into contact with the portion of the spring *k* which projects through an aperture in the frame E and retract it. Then the piece F can be easily withdrawn, using the spring *j'* as a handle. It will be noticed that the end of the chute is made with a small rectangular indentation, *l*. This is provided for the purpose of allowing a spring, *c*, fastened to the frame within which the chute is placed, to be depressed in such manner as to close tightly down over the open end of the chute. The frame also has an extending portion, *m*, which enters the head B and further assists in guiding the tacks. This inclined chute-piece is intended to be filled with tacks, arranged within the channel of the chute in the manner shown by dotted lines in Fig. 9. The heads of the tacks will be suspended by and will slide along upon the tops of the inclined side walls of the channel, and be thus fed into the machine under the action of the governing mechanism.

The operation of my machine is as follows: Suppose it first to be in a position as represented in Fig. 1, the plunger or driving rod C being depressed to its lowest limit, which evidently will be the position when its lowermost end is situated at the lower end of the tubular projection upon the head B. In this position the chute F will be open, so that a tack may drop from it into the head. Now, by catching hold of the weighted handle, raise the plunger. The two levers *a* and *b* are journaled within the slot of the cylinder, their ends nearest the top of the cylinder, and which

are provided with lugs, resting against the rod C. As the rod C is raised, the grooves and cam-shaped disk with which it is provided will impart motion to the levers *a* and *b*, for the end of the lever *b* slides upon the rod, while the end of the lever *a* slides within the groove of the rod, and the end of the lever *b* mounts the disk I, which serves as a cam, while the end of the lever *a* is carried through the portion of said disk which is hollowed out, and is only elevated when the extreme edge of the same is reached. This is seen by reference to Fig. 4. In order to keep these two levers depressed against their respective pathways upon the rod C, a bifurcated spring, *d*, is fastened to the outside of the cylinder at one end, and one bifurcation pressing upon each lever holds it firmly in place, so that the cams will operate upon it. Now, when the rod C is elevated the lever *b* will have one end elevated by the cam-shaped disk I, and the other end of the said lever, which bears upon the spring *c*, will of course depress the same and close the opening of the chute, so that no more tacks can issue therefrom until it is again opened. The other lever, *a*, whose end slides in the groove, has not yet been acted upon; but as the rod C proceeds upward the end of this lever will strike the bottom of the cam-shaped disk I, and be elevated likewise with lever *b*. The effect of elevating this end of lever *a* will be to depress the other end of the same, which is provided with a lug; but as this is depressed it will be found that a tack lies in its path, which had escaped from the chute before the same was closed by the other lever. The lug then in its movement will drive the tack before it and land it between and upon the two small spring-levers *f f*, which are slightly separated for the purpose of receiving the tack-body, and whose ends are provided with lugs for upholding the tack-head. The tack in this position is directly in the line of action of the plunger or driver C, and consequently when the operator next drives this plunger downward it will strike the tack and drive it out through the tubular projection of the head B into the object waiting to receive it. The descent of the plunger will disengage the levers *a* and *b*, and allow them to resume their former positions, while at the same time it opens the chute F and gives another tack an opportunity to emerge. Everything is now in readiness for a repetition of the series of movements just described, which may be continued indefinitely.

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

1. An automatic tack-driving machine consisting, essentially, of the slotted cylinder A, provided with upper head, G, and lower tapering head, B, the plunger C, cam-shaped disk I, levers *a b*, the chute-piece F, provided with spring *c*, and the levers *f f*, situated within the head B, all arranged and operating substantially in the manner shown and described.

2. In an automatic tack-driving machine, the lower head, B, consisting of an elongated portion containing guides *j k'* for the plunger C, and slots within which the levers *a b* operate, at right angles to which slots are other slots for the working of levers *f f* and springs bearing upon them, said head consisting also of a tapering tubular portion, substantially as shown and described.

3. In a hand tack-driving machine, the combination, with a cylinder, A, constructed substantially as described, of a frame, E, having projecting piece *m*, spring *c*, and guides *g g*, and adapted to receive a detachable sliding chute-piece, F, substantially in the manner shown and described.

4. In a tack-driving machine, the cylinder A, slotted longitudinally to receive the levers *a b* and the pin *i*, and provided with perforated upper head, G, perforated and recessed interior head, H, and the lower head, B, perforated to receive the plunger, and slotted to receive the levers *a b* and also the levers *f f*, substantially as shown and described.

5. In a tack-driving machine, the combination of the cylinder A, having heads G, H, and B, and the plunger or piston C, carrying a weight, D, grooved at *e*, and provided with a cam-shaped disk, I, substantially as and for the purpose shown and described.

6. In a hand tack-driving machine, the combination of the cylinder A, slotted longitudinally, the levers *a b*, pivoted in one of the slots, the piston C, guided by a pin, *i*, working in another slot, and provided with a cam-shaped disk, I, the bifurcated spring *d*, and the levers *f f*, substantially as and for the purposes shown and described.

7. In a tack-driving machine, the combination, with a cylinder, A, of the lever *a*, having a beveled lug at one end and a straight lug at the other, and the lever *b*, having a beveled lug at one end and a curved recess at the other, both of which levers are pivoted within a longitudinal slot of the said cylinder and adapted to be operated by means substantially as described, and in the manner shown and set forth.

8. In a tack-driving machine, the combination of the cylinder A, the frame E, attached thereto by a band, *h*, and provided with a spring-catch, *k*, and the detachable chute F, adapted to slide within the frame E and provided with a spring, *j*, substantially as shown and described.

9. In a tack-driving machine, the combination of the cylinder A, lower head, B, having levers *f f* and springs bearing upon them, the plunger C, frame E, provided with projecting arm *m* and spring *c*, and the chute F, substantially as shown and described.

10. In a tack-driving machine, the combination of the cylinder A, heads G, H, and B, levers *a b*, bifurcated spring *d*, and plunger C,

having pin *i* and cam I, substantially as shown and described.

11. In a tack-driving machine, the tack-supplying chute F, having an end slot, *l*, substantially as shown and described.

12. In a tack-driving machine, the combination, with means, substantially as described, for driving the tacks, of a chute, F, having an indentation, *l*, and a frame, E, inclosing said chute, and provided with a spring, *c*, which works within the said indentation or slot *l*, substantially as shown and described.

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

MARTIN V. B. ETHRIDGE.

Witnesses:

STEPHEN W. TROWBRIDGE,

CHAS. HALL ADAMS.