

No. 662,898.

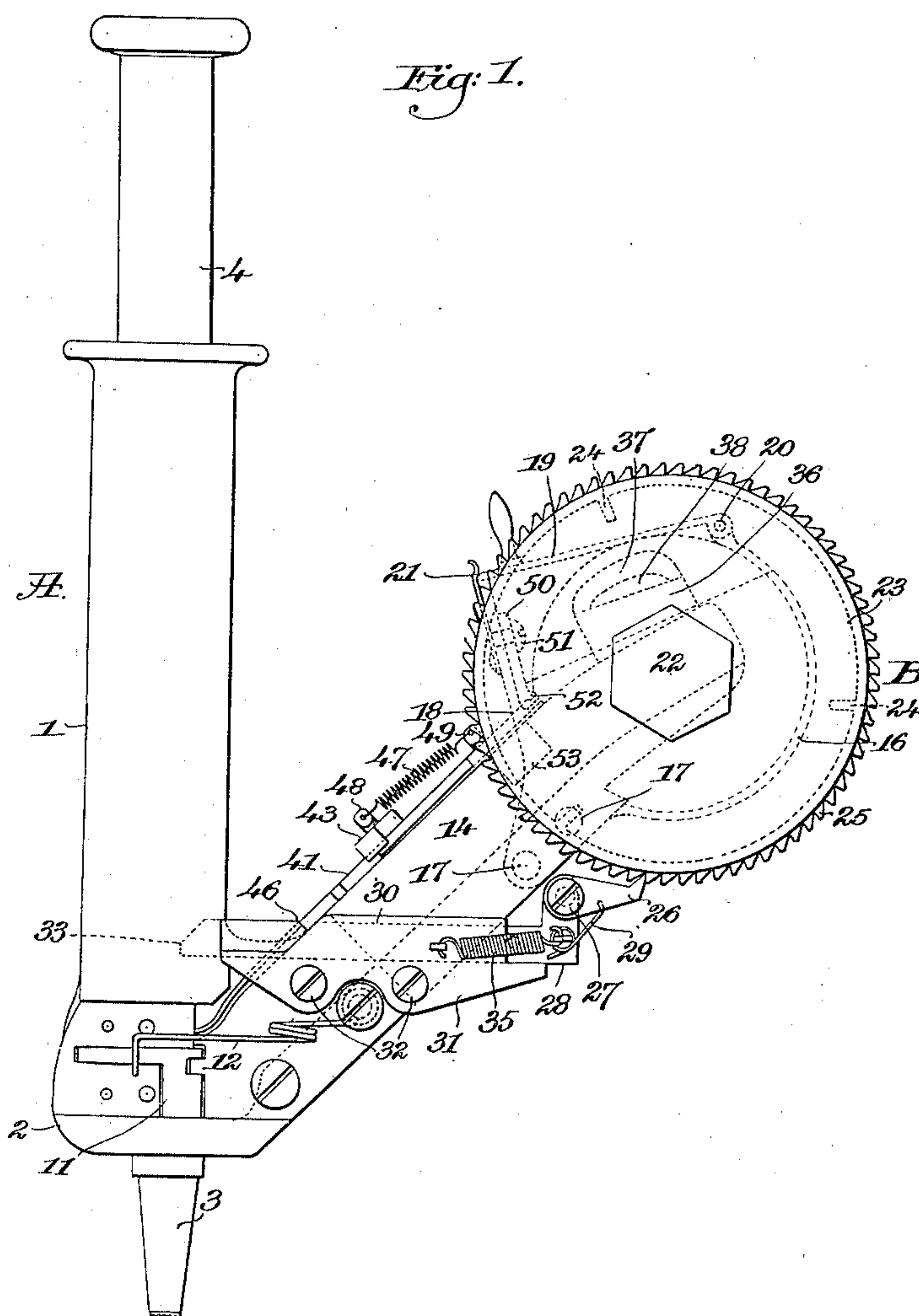
Patented Nov. 27, 1900.

E. F. GRANDY.
HAND NAILING IMPLEMENT.

(Application filed Feb. 1, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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By his attorney,
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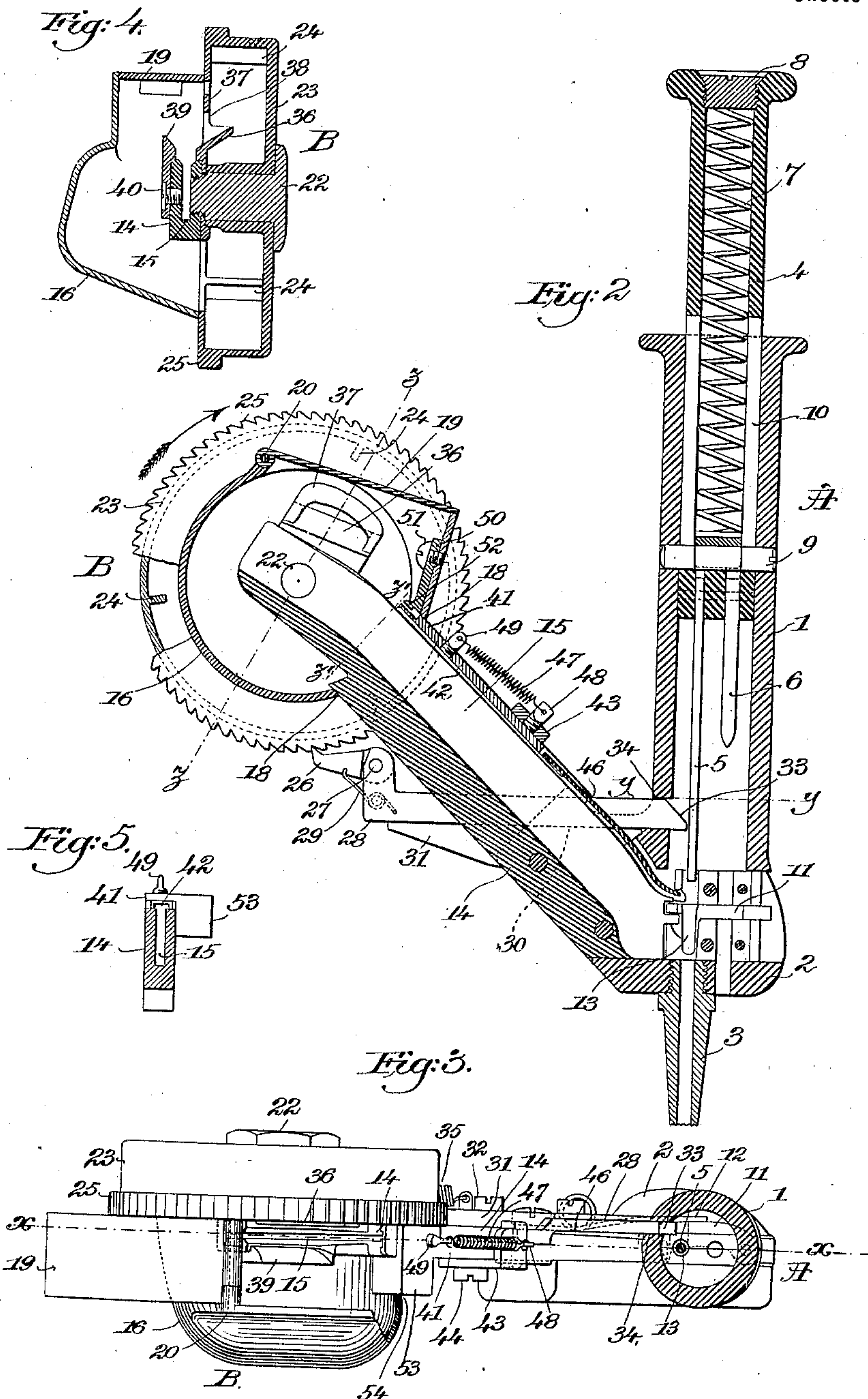
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

EDWARD F. GRANDY, OF EVERETT, MASSACHUSETTS.

HAND NAILING IMPLEMENT.

SPECIFICATION forming part of Letters Patent No. 662,898, dated November 27, 1900.

Application filed February 1, 1899. Serial No. 704,099. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. GRANDY, a citizen of the United States, residing at Everett, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Hand Nailing Implements; 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.

The present invention relates to hand nailing implements, and more particularly to that type of hand nailing implement which is provided with a reservoir or hopper adapted to receive loose tacks, from which they are fed to the driver to be driven.

The object of the present invention is to produce a hand nailing implement of the above type so constructed and arranged as to insure a better feeding of the tacks, and, further, to provide simple means whereby the tack-feeding mechanism may be actuated by the movements of the driver, and, further, to greatly simplify the construction of the several instrumentalities of the tack-feeding mechanism.

To the above end the present invention consists of the devices and combinations of devices which will be hereinafter described and claimed.

The present invention is illustrated in the accompanying drawings, wherein—

Figure 1 shows in side elevation a hand tacking implement embodying the same. Fig. 2 shows a vertical longitudinal section of the implement, taken on the line *xx*, Fig. 3. Fig. 3 shows a top view of the tacker with the cylinder in section on the dotted line *yy*, Fig. 2. Fig. 4 shows a section through the hopper and the tack-lifting wheel, taken on the line *zz*, Fig. 2; and Fig. 5 shows a section through the raceway, taken on the dotted line *z'z'* of Fig. 2.

Similar reference characters will be used throughout the specification and drawings to designate corresponding parts.

In the drawings, A represents the tacking device, and B the tack-lifting device, the tacking device and the tack-feeding device being connected together for permanent use, as will be more fully hereinafter described.

The tacking device A comprises a cylindrical metallic sleeve 1, which at its lower end is provided with a head 2, from which projects the depending nozzle 3. Arranged to reciprocate in the cylinder 1 is a plunger 4, which at its lower end carries a driver 5 and the gate-actuating device 6, and the plunger 4 is normally held in an elevated position by means of a spiral spring 7, placed therein, one end of which bears against a plug 8, screwed into the upper end of the plunger, and the other end against a pin 9, which is secured in the sleeve 1 and which passes through slots 10, formed in the plunger 4, whereby the plunger 4 may have imparted thereto longitudinal reciprocations in the sleeve 1.

In the head 2 is provided a cut-off gate 11, normally held to engage and retain the tacks in the raceway by means of a spring 12, which gate 11, as the plunger 4 is forced downward in the act of driving a tack, will be moved against the tension of the spring 12 by the gate-actuating device 6 to permit the lowermost tack in the raceway to be positioned, so that when the driver rises the gate on its return will feed it into the driving-passage 13 beneath the tack-driver 5. All the above-described parts may be of any preferred form and arrangement common to devices of this character and in and of themselves form no part of my present invention.

The tack-feeding mechanism B comprises a raceway 14, which is secured at its lower end to the head 2 of the tacking device A and which, as is common in devices of this character, is secured to the head 2 so as to be inclined upwardly relatively to the cylinder 1, and, as in all such devices, the raceway is provided with a channel 15, down which the tacks are arranged to slide with their heads resting upon the upper surface of the raceway, and the lower end of such raceway opens into the head 2, so as to discharge the tacks into the driver-passage beneath the tack-driver 5 when the cut-off gate 11 is actuated, as hereinbefore described. At the upper end of the raceway there is secured a hopper or reservoir 16, which, as shown by dotted lines in Fig. 1, is secured by means of screws to one side of the raceway and which, as clearly shown in Fig. 4 of the drawings, comprises a shell-like receptacle open at one side and ar-

ranged to cover and inclose one side of the
 upper end of the raceway, the said reservoir
 being cut out, as shown at 18, for the lead of
 the raceway therefrom. The reservoir 16 is
 5 provided with a suitable cover 19, pivotally
 secured thereto, as shown at 20, and provided
 with any suitable latch or locking device, as
 the spring-latch 21, whereby the cover 19 will
 be held closed after the reservoir has been
 10 filled with tacks. The bottom of the hopper
 16 is downwardly inclined, as shown in Fig.
 4, and is formed circularly for a purpose to
 be described. Projecting from the side of
 the raceway opposite the hopper 16 is a stud
 15 or shaft 22, upon which is mounted to freely
 turn the tack lifting and discharging wheel
 23, the said wheel, as shown in Figs. 3 and 4,
 being arranged so that its inner face is in
 close contact with the inner edge of the reser-
 20 voir 16, which opens both above and below
 the raceway, as shown in Fig. 2, directly into
 the tack-lifting wheel 23. As in devices of
 this type, the tack-lifting wheel 23 is pro-
 vided upon its interior surface with a series
 25 of blades or tack-lifting buckets 24, so ar-
 ranged that as the wheel is revolved in the
 direction of the arrow shown in Fig. 2 the
 tacks which have dropped down the inclined
 bottom of the hopper 16 will be constantly
 30 raised and dropped and by means which will
 be hereinafter described be deflected onto
 the upper end of the raceway 14.

For the purpose of imparting a rotary mo-
 tion to the tack-lifting wheel 23 to cause a
 35 constant supply of tacks to be fed to the race-
 way 14 I have so arranged the actuating mech-
 anism of the tack-lifting wheel that it will
 be actuated by each downward movement of
 the plunger 4 in the act of driving a tack,
 40 and I have so arranged the mechanism that
 as each downward movement of the plunger
 4 occurs the tack-lifting wheel 23 will have
 imparted to it a whirling movement around
 its shaft 22, which movement will be repeated
 45 during the repeated operations of the tack-
 driver.

To secure the above-suggested result, I have
 in the machine of the drawings provided upon
 the periphery of the tack-lifting wheel 23 a
 50 series of ratchet-teeth 25, which are arranged
 to be engaged by a pawl 26, pivotally secured
 at 27 to a slide-bar 28, the said pawl being
 normally maintained to engage the ratchet-
 teeth 25 by means of a spring 29, which is se-
 55 cured to the slide-bar 28 and engages at one
 end the pawl 26. The slide-bar 28 is arranged
 to have a reciprocating movement in a guide-
 way 30, (see dotted lines, Figs. 1 and 2,) formed
 in a plate 31, secured by means of screws 32
 60 to one side of the raceway 14. The forward
 end of the slide-bar 28 is beveled, as at 33,
 and projected through an aperture 34 into
 the cylinder 1 and in the path of the lower
 end of the plunger 4, the arrangement being
 65 such that as the plunger 4 is depressed its
 lower end will engage the beveled end 33 of
 the slide-bar 28 and force it backwardly in

its guideway 30, the movement being a com-
 paratively quick movement, and by means of
 the pawl 26 impart a comparatively rapid 70
 whirling movement to the tack-lifting wheel
 23, it being understood that the yielding piv-
 otal action of the pawl 26 will not to any great
 extent impede the whirling action of the tack-
 lifting wheel 23.

For the purpose of returning the slide-bar 75
 28 to its normal position, with its beveled for-
 ward end 33 projected within the sleeve 1 in
 the path of movement of the plunger 4, I have
 provided a spiral spring 35, which is secured 80
 at one end to the slide-bar 28 and at its oppo-
 site end to the plate 31. The whirling action
 of the tack-lifting wheel 23, as before ex-
 plained, will lift the tacks which have been
 caused to flow into said wheel and drop them, 85
 as before explained, and in order to deflect
 the tacks into the raceway 14 I have provided
 a deflecting-plate 36, which, as shown, is se-
 cured to the upper end of the raceway, on the
 side adjacent to the open face of the tack- 90
 lifting wheel 23, and projected upwardly from
 the raceway into said wheel, so that as the
 tacks fall from the buckets 24 they will drop
 onto the deflecting-plate 36 and be fed into
 the slot 15 in the raceway 14. In order that 95
 as the mass of tacks falls onto the deflecting-
 plate 36 they may be loosened up or separated,
 as it were, and to prevent the massing of the
 tacks on the upper end of the raceway 14, I
 have provided a guard-plate 37, which is ar- 100
 ranged, as shown in Figs. 2 and 4, to extend
 substantially in a vertical plane above the de-
 flecting-plate 36. The guard-plate 37 is sub-
 stantially yoke-shaped, as shown in Fig. 2,
 leaving a space 38 between the deflecting-plate 105
 36 and the guard-plate 37 and also a free space
 at each end of the guard and deflecting plates,
 the arrangement being such that as the mass
 of tacks falls on the deflecting-plate 36 the
 guard-plate 37 will loosen up and separate the 110
 mass of tacks, and thus cause an even flow of
 tacks into the space 15 of the raceway 14.

For the purpose of insuring that a number
 of tacks which pass from the deflecting-plate
 36 will fall properly into the raceway I have 115
 provided the upper end of the raceway on
 the side opposite to the deflecting-plate 36
 with a guard 39, secured by a screw 40 to the
 upper end of the raceway 14, and, as shown
 in Figs. 3 and 4, the upper edge of the guard 120
 39 is inclined from its outer edge downward
 toward the raceway, whereby a portion of
 the tacks which drop onto the deflecting-
 plate 36 will be caused to fall point downward
 into the space 15 of the raceway 14. It will 125
 be noted that the reservoir 16 communicates
 with the lifting-wheel 23, both above and be-
 low the raceway, and that the base of the res-
 ervoir 16, as before explained, is downwardly
 inclined toward the open side of the lifting- 130
 wheel 23, whereby a portion of the tacks con-
 tained in the reservoir 16 will fall by gravity
 into the lifting-wheel 23. It will be further
 noted that the base of the hopper 16 is circu-

lar and coincides with the circular opening formed in the tack-lifting wheel 23. (See Fig. 2 and dotted lines, Fig. 1.) The tendency of the whirling movement of the tack-lifting wheel 23 is to cause the mass of tacks in the hopper 16 to become massed in the lower forward portion of the hopper 16 above and below the raceway, and in order to prevent the massing of the tacks, as set forth, and the clogging of the raceway by the accidental wedging of a tack or the misplacing of tacks in the upper end of the raceway I have in the machine of the drawings provided a clearer and striker, combined with a guard-plate, so arranged that upon the reciprocation of the plunger 4 the clearer and striker will be actuated and the tacks which may have become wedged above the raceway and in the lower part of the hopper to one side of and below the raceway will be struck quick sharp blows and caused to fall back into the back part of the hopper in position to again flow into the tack-lifting wheel and be raised and dropped, as before described.

In the machine of the drawings the clearer is shown at 41 and consists of a plate provided upon its under surface with a longitudinal groove 42 (see Figs. 2 and 5 of the drawings) and arranged to have a sliding movement along the upper edge of the raceway 14 beneath a suitable guide-plate 43, secured by means of a screw 44 to one side of the raceway 14. The lower end of the clearer 41 is offset and brought into vertical alignment with the upper edge of the slide bar 28 and at its lower end engages a notch 46, formed in the upper edge of the slide-bar 28. The clearer 41 is held with its lower end in engagement with the notch 46 by means of a spring 47, which at one end is secured to a stud 48, projected from the guide-plate 43, and at its other end to a stud 49, secured to the clearer 41. The clearer 41 is of such a length that when the lower end thereof is in engagement with the notch 46 its upper end will project slightly within the front of the hopper 16 in the opening 18, as shown in Fig. 2 of the drawings, and upon the inside of the hopper 16 above the upper end of the clearer 41 I have provided a stripper-plate 50, which, as shown in the machine of the drawings, is secured by means of a screw 51 to the front of the hopper 16 upon its inner surface and which at its lower end is provided with a guard 52, beneath which the upper end of the clearer 41 is arranged to move. The function of this stripper-plate 50 is to prevent the tacks which may be wedged above the raceway from being drawn back with the clearer and becoming wedged between the clearer and the upper edge of the raceway, it being understood that if a tack should become wedged between the clearer 41 and the raceway that when the clearer 41 moves down, which it does very quickly under the action of the spring 47, the tack will

contact with the guard 52 and be forced out to fall back into the hopper. At one side of the clearer 41 I have provided a projection 53, which acts as a striker to strike the tacks which may have become massed upon the hopper side of the raceway in the forward part of the hopper and acts as a stirrer or clearer to drive the tacks backward into the lower part of the hopper, as hereinbefore explained, and this block 53 is arranged to reciprocate in an opening 54, cut into the front of the hopper. (See Fig. 3.)

The above arrangement is such that as the plunger 4 descends and strikes the inner beveled end of the slide-bar 28, as hereinbefore explained, the longitudinal movement imparted thereto will cause the notch 46 therein to act as a cam (see Fig. 1) and impart an upward movement to the clearer 41 along the upper edge of the raceway 14, whereby the upper end of the clearer 41 will properly clear the surplus tacks from the upper edge of the raceway and will properly position the heads of the tacks which may be in the raceway so as to slide down said raceway, while at the same time the striker 53, reciprocating through the opening 54, will act on any tacks which may have become packed on the hopper side of the raceway and force them back into the circular part of the hopper in position to be again passed into the lifting-wheel 23. After the plunger 4 rises the spring 35 will return the slide 28 to its forward position, and when the notch 45 reaches the point shown in Fig. 1 the spring 47 quickly retracts the clearer and the striker 53, carried thereby.

It is thought that the operation of my improved device has been sufficiently described in connection with the foregoing description of its form and arrangement, and a further description thereof is deemed unnecessary.

Having described the construction and operation of my machine, I claim as new and desire to secure by Letters Patent of the United States—

1. In a hand nailing implement, the combination with a tack-driver, of a tack-feeding mechanism comprising a hopper secured upon one side of the raceway, and a tack-lifting device secured to the other side of the raceway, the hopper and tack-lifting device being in open communication with each other above and below the raceway, a deflecting-plate secured to the raceway and projected into the tack-lifting device and a yoke-shaped guard-plate located substantially in the plane of the open side of the tack-lifting device and spanning the deflecting-plate and acting to regulate the flow of tacks to the raceway; substantially as described.

2. In a hand nailing implement, the combination with a tack-driver, of a tack-feeding mechanism comprising a hopper, a raceway and a tack-lifting device, a deflecting-plate secured to the raceway and projected into

the tack-lifting device, and a guard-plate located above the deflecting-plate and acting to cause an even flow of tacks to the raceway.

3. In a hand nailing implement, the combination with a hopper and raceway, of a combined clearer and striker, the clearer arranged to reciprocate along the upper surface of the raceway, and the striker arranged to reciprocate through an opening in the hopper to strike the tacks in said hopper, substantially as described.

4. In a hand nailing implement, the combination with a tacker and raceway, of a hopper secured to one side of the raceway, and a tack-lifting wheel secured to the opposite side of the raceway in open communication with each other, a slide-bar arranged to reciprocate in a guide secured to the raceway, said slide-bar having a beveled end projected into the tacker in the line of movement of the plunger, and carrying at its opposite end a spring-pawl arranged to engage ratchet-teeth on the tack-lifting wheel, a clearer reciprocating along the upper surface of the raceway, and

means whereby the reciprocations of the plunger will reciprocate the slide-bar to rotate the tack-lifting wheel and reciprocate the clearer, substantially as described.

5. In a hand nailing implement, the combination with a hopper, of a raceway leading therefrom, a striker acting to force the tacks below the raceway backward into the hopper, and means for actuating the striker, substantially as described.

6. In a hand nailing implement, the combination with a hopper, of a raceway leading therefrom, a clearer and a striker acting respectively on the tacks above and below the raceway to force the tacks backward into the hopper, and means for actuating the clearer and striker, substantially as described.

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

EDWARD F. GRANDY.

Witnesses:

T. HART ANDERSON,
A. E. WHYTE.