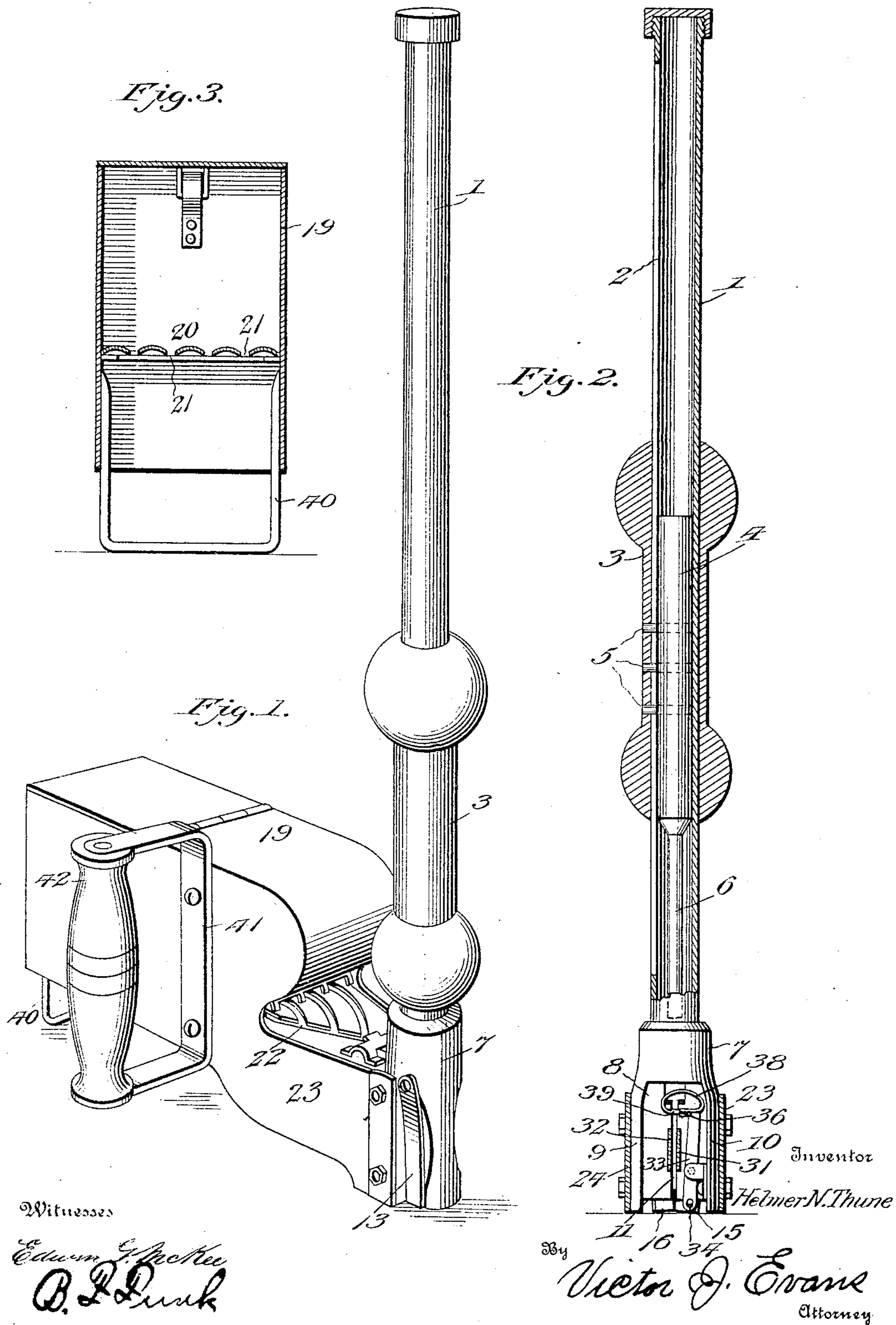


No. 803,372.

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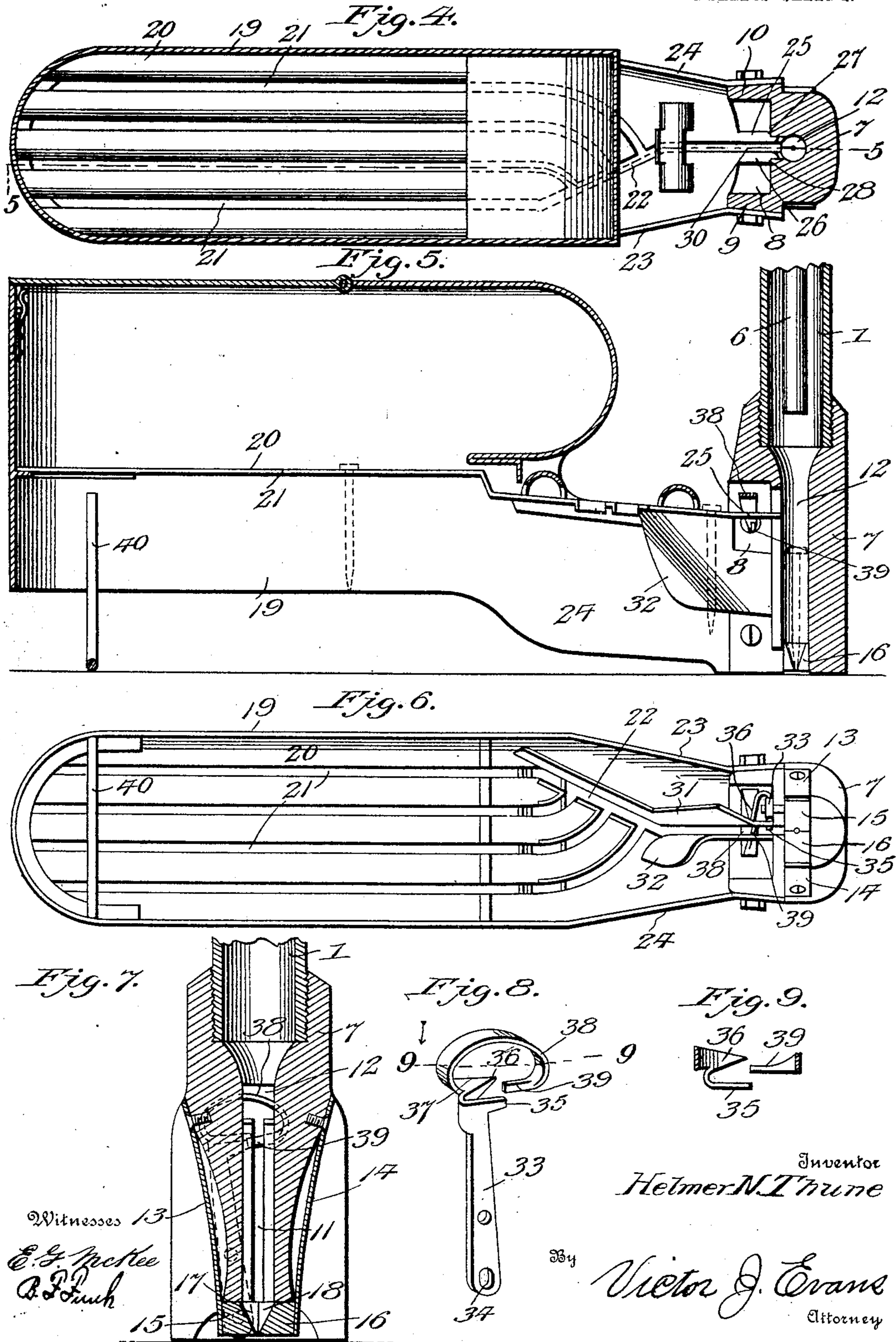
H. N. THUNE.
NAIL DRIVING MACHINE.
APPLICATION FILED OCT. 14, 1902.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.



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HELMER N. THUNE, OF NEBY, MINNESOTA.

NAIL-DRIVING MACHINE.

No. 803,372.

Specification of Letters Patent.

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Application filed October 14, 1902. Serial No. 127,280.

To all whom it may concern:

Be it known that I, HELMER N. THUNE, a citizen of the United States, residing at Neby, in the county of Polk and State of Minnesota, have invented new and useful Improvements in Nail-Driving Machines, of which the following is a specification.

This invention relates to nail-driving machines, and is particularly adapted for use in roofing to nail shingles to the roof after they have been placed in their proper relative position.

The invention consists in certain novel features of construction to be referred to hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a nailing-machine constructed in accordance with my invention. Fig. 2 is a vertical cross-sectional view through the hammer and the tube in which it slides. Fig. 3 is a transverse sectional view through the nail-reservoir. Fig. 4 is a longitudinal horizontal sectional view through the nailing-machine. Fig. 5 is a vertical longitudinal sectional view of the nailing-machine on the line 5 5 of Fig. 4, part of the hammer and its tube being broken away. Fig. 6 is a bottom plan view of the nailing-machine. Fig. 7 is an enlarged vertical cross-sectional view through the jaws of the nailing-machine. Fig. 8 is a detail perspective view of the pivoted gate, and Fig. 9 is a cross-sectional view on the line 9 9 of Fig. 8.

The reference-numeral 1 designates a vertically-arranged tube provided with a longitudinally-arranged slot 2. Sleeved on the tube 1 and slidably secured thereto is a vertically-moving weighted handle 3, connected to a concentric hammer 4 by pins or other suitable means 5, fastened to the hammer and to the handle. The hammer 4 is cylindrical in form and moves within the tube 1 simultaneously with the handle 3, to which it is connected. The hammer is provided with a restricted concentric lower projection 6, which moves with the hammer and sleeve and is arranged to strike against the head of a nail to drive it into the wood, as will be explained hereinafter.

On the lower extremity of the tube 1 is threaded or otherwise secured a head 7, having a vertically-arranged recess 8, formed by two parallel flanges 9 and 10, which are secured to the sides of the reservoir or magazine in a manner to be referred to hereinafter. A vertically-arranged slot 11 is provided be-

tween the flanges 9 and 10 in the anterior wall of the head and communicates with a vertical channel 12 in the head, which coincides with the bore in the tube 1 and is of approximately the same diameter as the restricted end 6 of the hammer 4. In rear of the channel 12 and on either side thereof are arranged flat springs 13 and 14, which carry at their lower free ends jaws 15 and 16, having upwardly-diverging grooves 17 and 18, respectively, therein. These jaws being carried on the ends of the springs overlap the outlet formed by the channel 12 and normally close the same, so as to retard the nail within the channel 12, as illustrated in Fig. 5. The magazine or reservoir, which is designated by the reference-numeral 19, comprises an approximately rectangular shell or receptacle having a horizontal and longitudinally-arranged partition or bottom 20 therein, provided with a number of longitudinally-arranged parallel slots 21, each of which empties into a common slot 22 in the forward end of the magazine, said slot 22 being arranged at an angle to the ones designated by the reference-numerals 21, the partition being formed to extend beyond the magazine and supported by two forwardly-projecting flanges 23 and 24, which are secured to the flanges 9 and 10 of the head 7.

The forwardly-extending portion of the partition or bottom is provided with parallel fingers 25 and 26, which project into the enlarged portion of the slot 11 of the head to a limited extent, however, by means of the shoulders 27 and 28, which are formed on the fingers to prevent their being inserted too far. The fingers just described are so arranged with relation to the magazine that they form a slot 30, which communicates with and forms a continuation of the slot 22, and projecting from the lower side of the partition 20 and beneath the slot 30 are two guide-shoes 31 and 32, the guide-shoe 31 extending up along the outer edge of the slot 22, so as to guide the nails into the channel 12, formed in the head 7. Whenever it is desirable to admit only one nail at a time into the channel 12, in order to retard the other nails and permit of the entrance of only one to each downward stroke of the hammer, I arrange a pivoted gate 33, which is fulcrumed intermediate its ends to the rear wall of the head 7 and is connected at its lower extremity to the jaw 15 by means of a pin or bolt which extends through a slot or perforation 34 in the arm of the gate. At the upper end of the arm of the gate is

arranged an approximately U-shaped portion the arms 35 and 36 of which diverge to form a flaring nail-receiving space between them, the arm 36 being arranged obliquely with respect to the arm 35 and providing a cam-surface to guide the nail to said space between the arms 35 and 36, as will be presently explained. The arm 36 is provided with a laterally-projecting flange 37, the rear edge of which is cut at an acute angle, so as to form a cam edge, and the rear of the flange is connected to an upwardly-curved and a downwardly-bent strip 38, which passes up over the arm 36 and terminates in a restricted finger 39, which rests between the arms 35 and 36, extending beyond the end thereof.

The arms 35, 36, and 39, together with the strip 38 and the flange 37, constitute a head, which rests at all times in front of the slot 11, and the gate is actuated by the jaw 15 as it is successively engaged by the restricted portion 6 of the hammer 4. It will be assumed that the magazine is supplied with nails, tacks, or other fastening device capable of being conveyed from the slots 21 to the slots 22 and 30. As the nails move down toward the head in the slot 30 the first nail will come in contact with the rear edge of the finger 39, which will retard the forward movement thereof.

As soon as the hammer is driven or permitted to drop downward the jaws 15 and 16 will be forced apart by the egression of the nail and by the restricted portion of the hammer as it passes between them, thus throwing the finger 39 out of alinement with the slot 11 and incidentally out of contact with the nail. Thus the nail will be projected between the arms 35 and 36 and on the forward side of the finger 39.

As soon as the handle is withdrawn or moved upward, thereby withdrawing the hammer, the jaws will spring together, thus oscillating the gate so that the arm 35 will be out of alinement with the slot 11, thus permitting the nail to drop into the channel 12 by force of gravity, where it will remain until the handle is again driven down so that the hammer will come in contact with the nail, and thus drive it into the wood. It will of course be understood that a succession of oscillatory movements of the gate will cause the nails to enter the channel only one at a time, so as to prevent the jamming of the nails in the slots or guideways which they constitute and whereby each downward movement of the hammer will be sufficient to drive the nail.

The curved strip 38 of the gate 33 is sufficiently flexible or resilient to act in the nature of a spring support or carrier for the finger 39 to adapt the latter to have movement in a direction across the throat or enlarged entrance to the flaring space between the arms 35 and 36. By this means if a large or misshapen nail should be fed through the slot 30 into the chamber 12 in the head 7 the finger

39, which forms a guard controlling the passage between the arms 35 and 36, will yield to permit the nail to pass, and by thus making the said finger 39 movable the gate is adapted to control the feed of nails varying greatly in size and nails which are imperfectly shaped without strain upon the gate and without interfering with the movement of the nail, so as to permit it to lodge in the space between the arms 35 and 36 and obstructing the continuous feed of nails to the head.

It sometimes happens that mutilated nails and nails of larger size become accidentally mixed with the nails of the size intended to be used and placed in the hopper or magazine, the mutilated and larger size nails ordinarily causing the choking of the feed-passage in nail-driving machines of ordinary construction and rendering the same temporarily inoperative. My invention overcomes this objection, as the guard-finger 39 will accommodate itself to variations in the sizes and shapes of nails, and thus permit the same to pass to the feed-passage in the head without interference.

It will of course be understood that the device is preferably held on an incline, the forward end, to which the head is secured, being the lowest. In order to insure this position of the device, I provide a rear standard 40, which is secured to the under side of the magazine below the partition or bottom 20. To one side of the magazine is secured an approximately U-shaped block or support 41, in the parallel arms of which is fastened a handle 42, so that the device may be steadied with one hand, while the weighted handle is operated with the other.

From the foregoing it will be seen that the device constructed in accordance with my invention will be cheap, durable, and efficient and may be readily operated to effect the purpose to which it is intended.

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

1. An oscillating gate for nailing-machines, comprising a lever, diverging arms at one end of the lever, a flange disposed at right angles to and projecting laterally from one of said arms, and a curved spring-strip connected to said laterally-projecting flange and carrying a finger extending oppositely to said arms and on a line between the same, said strip supporting the finger for yielding action, substantially as described.

2. In a nailing-machine, the combination of a support provided with a longitudinal passage, a head upon said support provided with a coinciding passage, said head also being provided with rearwardly-projecting flanges and a slot communicating with said passage and opening at the rear into the space between said flanges, a reciprocating hammer operating in

the passage in the support, a magazine provided with forwardly-extending flanges connected to the said flanges on the head and having a wall therein provided with guide-slots 5 having a common outlet and projecting fingers forming a slot communicating with said outlet and the slot in the head and secured to said head between the flanges, spring-jaws closing the passage in the head and adapted 10 to be opened by the hammer, and a gate pivotally connected to and operated by one of said jaws and arranged in said space between the flanges of the head in proximity to said slots in the head and between the fingers, said 15 gate being provided with means adapting it when oscillated to permit but one nail at a time to feed to the passage in the head, substantially as described.

3. In a nailing-machine, the combination 20 with a headed support having a longitudinal channel, of a hammer adapted for reciprocation within the channel, springs secured at their upper ends to the outer side of the head and provided at their lower ends with jaws 25 normally closing the outlet of the channel, a magazine connected to the head and provided with guides in communication with the channel, and an oscillating gate comprising a lever fulcrumed to the head and pivotally connected 30 to one of said jaws, said head being provided at its free end with arms divergently arranged, a flange projecting laterally from one of said

arms, a finger projecting oppositely to and disposed on a line between the divergent ends of the arms, and a curved strip connecting 35 said finger with a laterally-projecting flange, said gate being oscillated by one of said jaws upon the separation of the jaws by the hammer, whereby the divergent arms and finger of the gate will coact with said guides and 40 channel to permit but one nail at a time to feed from the guides to the channel, substantially as described.

4. In a nailing-machine, a magazine, a gravity feeder leading therefrom, a vertical head 45 having a nail-feed passage communicating with the feeder, jaws at the base of and controlling said passage, spring-strips secured at their upper ends to the heads and at their lower ends to the jaws, a hammer movable in 50 said passage, and a vertically-arranged oscillating gate controlling the feed of nails from the feeder to the passage in the head, said gate being provided with feed-governing means at 55 its upper end, pivoted intermediate its ends to the head and loosely jointed at its lower end to one of the jaws, substantially as described.

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

HELMER N. THUNE.

Witnesses:

ANTHON E. HANSON,
HELMER ESTENSON.