No. 853,931. PATENTED MAY 14, 1907.

J. A. MILLIKEN.

NAIL CHUCK.

APPLICATION FILED MAY 28, 1903. RENEWED OCT. 19, 1906.

5 SHEETS—SHEET 1.

Fig. 1.

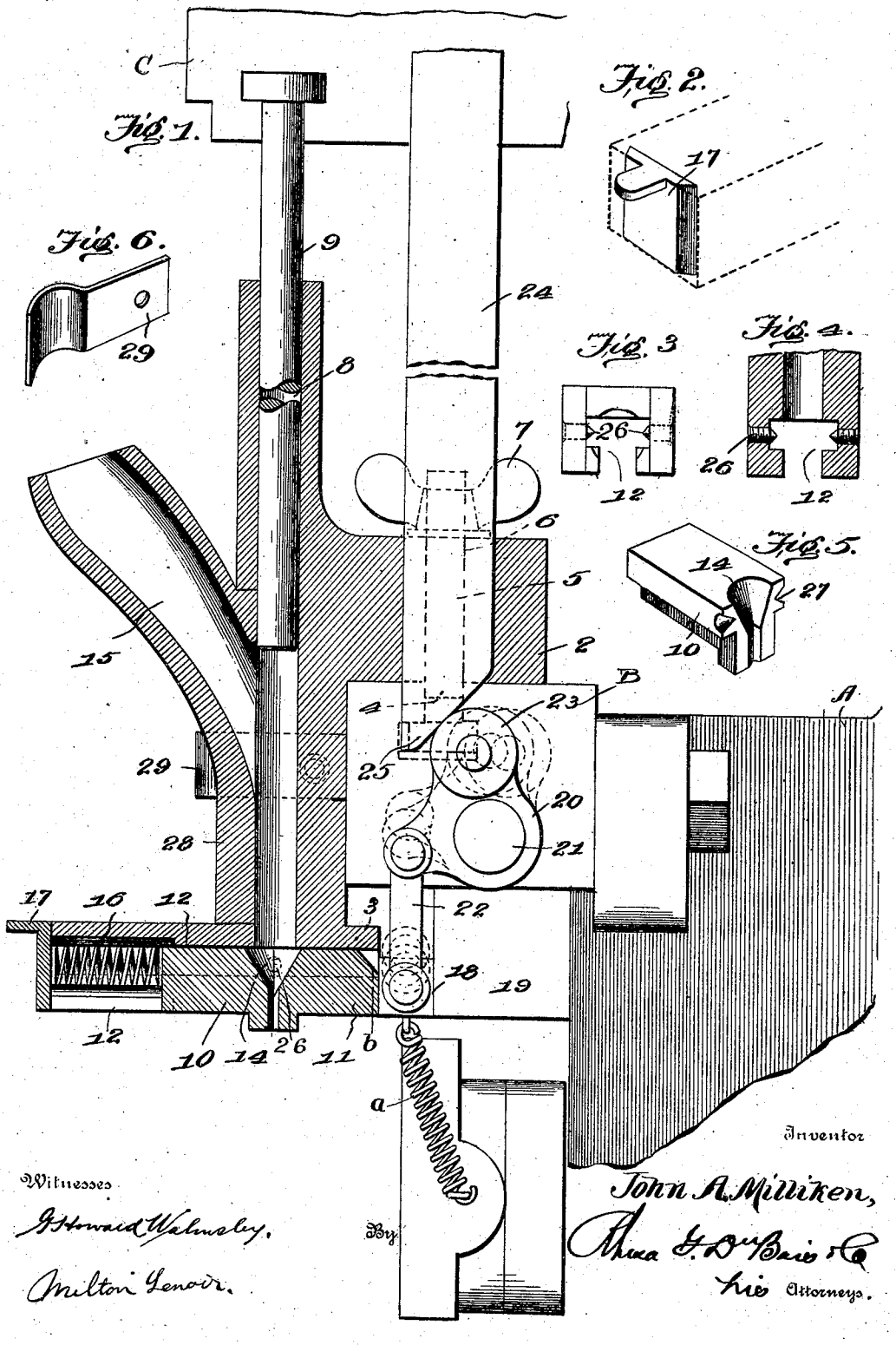


Fig. 2.

Fig. 3

Fig. 4.

Fig. 5.

Fig. 6.

Witnesses.

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Milton Lenoir.

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5 SHEETS—SHEET 2.

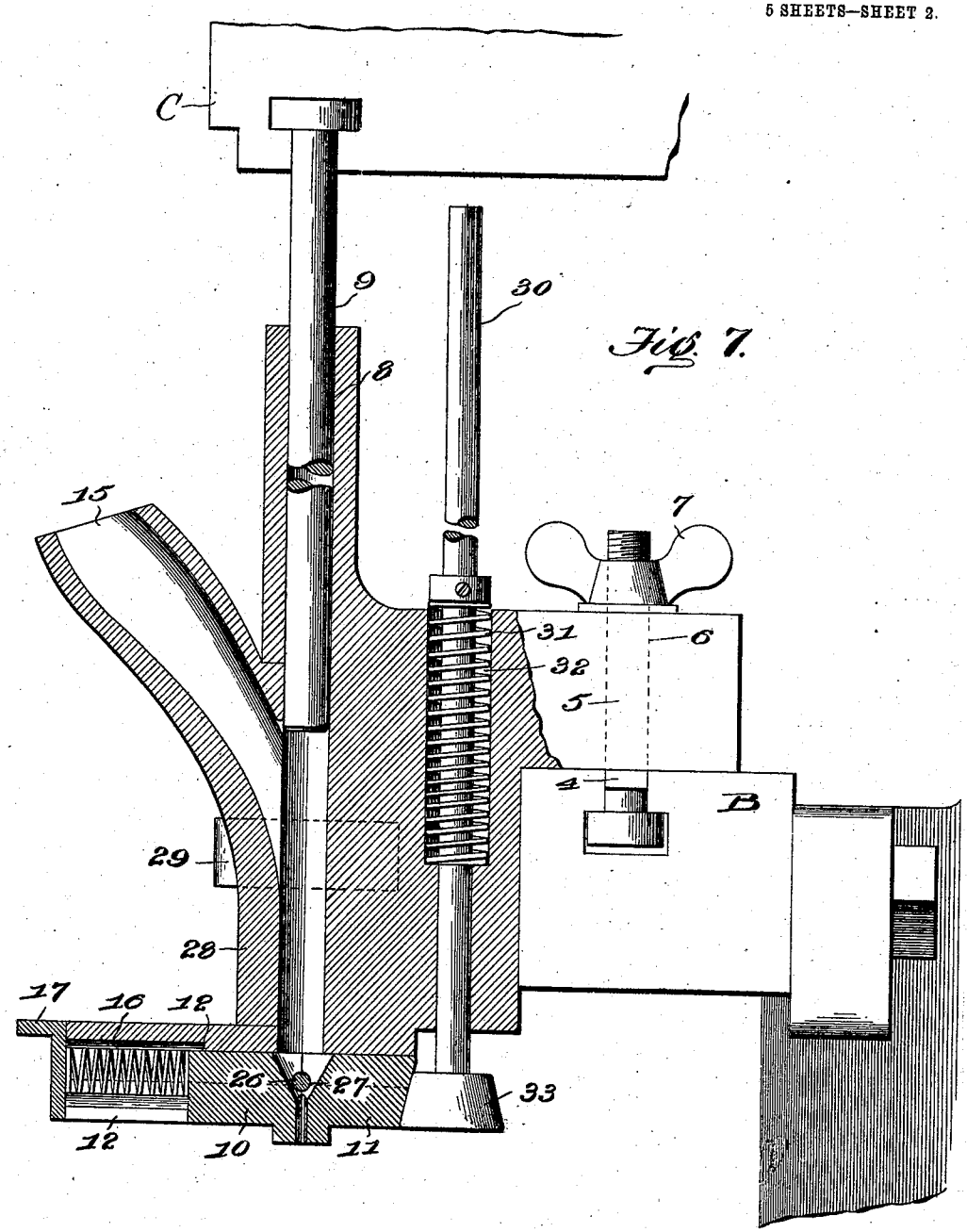


Fig. 7.

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5 SHEETS—SHEET 3.

Fig. 8.

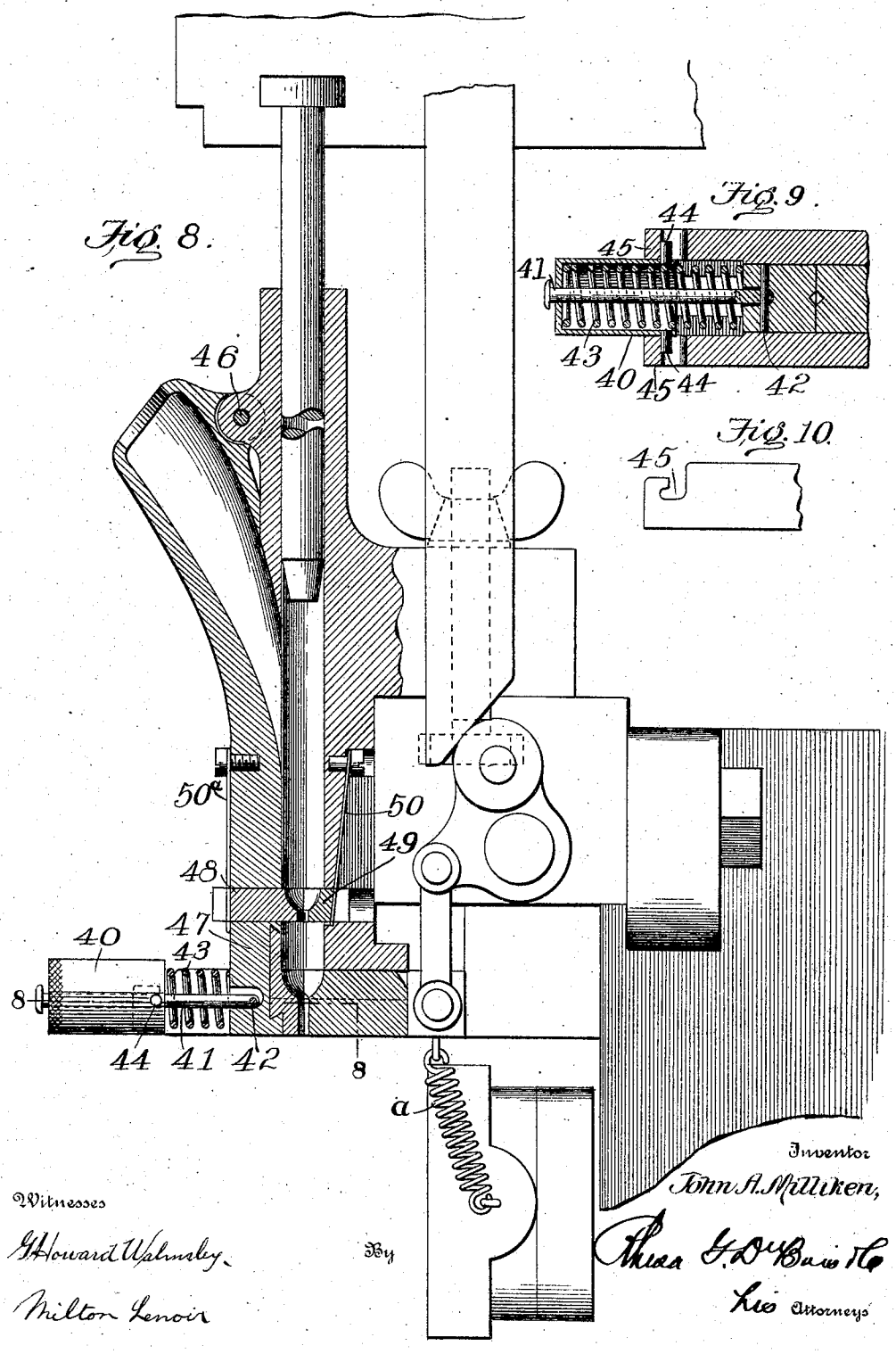


Fig. 9.

Fig. 10.

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5 SHEETS—SHEET 4.

Fig. 13.

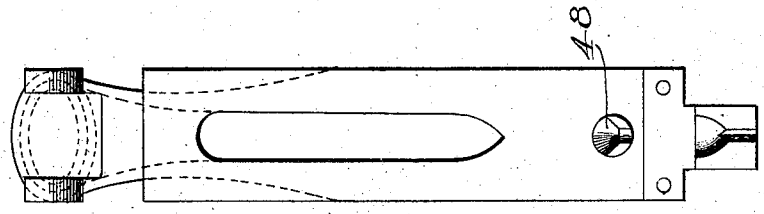


Fig. 12.

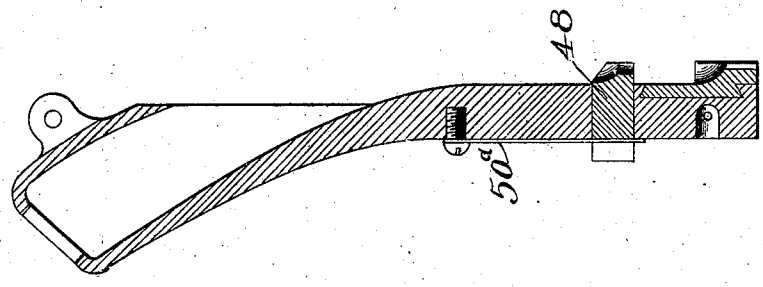
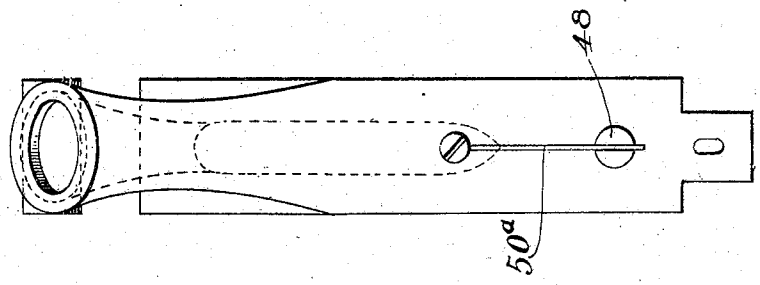


Fig. 11.



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5 SHEETS—SHEET 5.

Fig. 14.

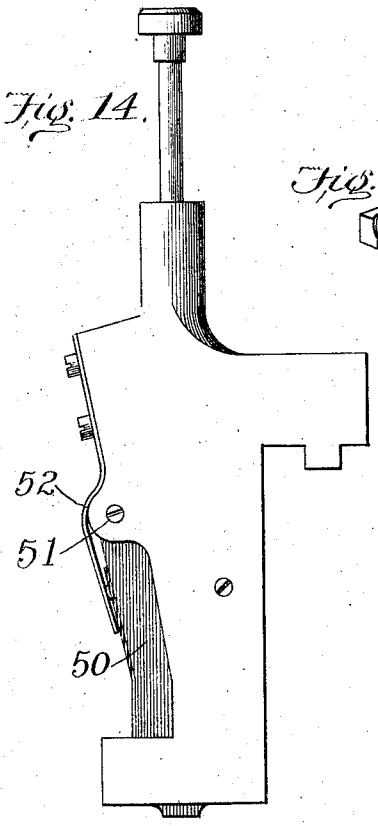


Fig. 16.

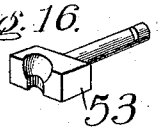


Fig. 15.

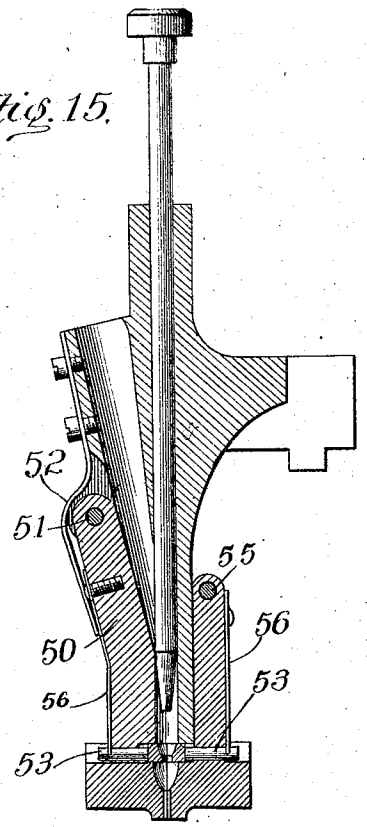


Fig. 17.

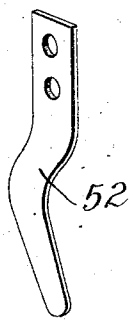


Fig. 18.



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UNITED STATES PATENT OFFICE.

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NAIL-CHUCK.

No. 853,931. Specification of Letters Patent. Patented May 14, 1907.

Application filed May 28, 1903. Renewed October 19, 1906. Serial No. 339,698.

To all whom it may concern:

Be it known that I, JOHN A. MILLIKEN, a citizen of the United States, and a resident of Flushing, in the county of Queens and State of New York, have invented a new and useful Improvement in Nail-Chucks, of which the following is a specification.

My invention relates to an improvement in nail chucks for nailing machines, the object of the invention being to provide a rigid grip upon the nail being driven whereby to insure driving it straight, and with this object in view, means is provided for holding the nail with sufficient rigidity to absolutely insure this straight course, and at the same time sufficiently yieldingly to permit it to slide between the chuck jaws. In other words, I provide means for preventing lateral play of the nail and for insuring its straight, endwise movement into the material into which it is being driven, and so holding and guiding it until the nail is driven sufficiently far to insure its continuing straight, after its release by the chuck jaws.

With these objects in view, my invention consists in certain novel features of construction and combinations of parts which will be hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional view of one form of my improved chuck, showing it in position on a nailing machine, Fig. 2 is a perspective view of the removable slide 17, dotted lines indicating the lower end of the body portion of the nail chuck, Fig. 3 is an end view of the lower end of the body portion showing the guides or tracks, Fig. 4 is a vertical section through the lower end of the body portion of the chuck, Fig. 5 is a perspective of one of the jaws, Fig. 6 is a detached view of spring jaw 29, Fig. 7 is a sectional view of one form of modification, Fig. 8 is a sectional view showing another modification, Fig. 9 is a horizontal section on line 8—8 of Fig. 8, Fig. 10 is a view taken at right angles to Fig. 9 to show hook 45, Figs. 11, 12 and 13 are views from different sides of the nail feed tube, Fig. 12 being in section, Fig. 14 shows still another modified form, Fig. 15 is a sectional view of the same, Fig. 16 is a perspective view of one of the jaws 53, and Figs. 17 and 18 are views in perspective of spring plates 52 and 56, respectively.

In the construction shown in Figs. 1 to 6, inclusive, A, represents the main frame of a nailing machine, B a rail, which occupies the position of the usual carriage, and which in the present construction is fixed to the frame, and C the movable cross-head. My improved nail chucks are connected with these parts, one of which I have shown in Fig. 1. The body portion of the nail chuck is made preferably in a single casting, and is provided with two rigid jaws 2 and 3, between which the forward edge of the rail B is embraced. The upper jaw 2 is preferably provided with a depending lug 4, adapted to fit the T-shaped groove in the top of the rail, and as a simple and convenient means for securing the chuck in place on the rail, a bolt 5 is provided, the head of which fits the T-shaped groove 6 in the upper surface of the rail, and is provided with a thumb nut 7, by which to secure it in place. The body of the nail chuck is counter-bored vertically to form a nail punch or plunger-way 8, and the punch or plunger 9 is fitted to slide vertically therein preferably throughout the entire length of the way, the upper end of the punch or plunger being fitted in the usual manner to the cross-head C, as shown in Fig. 1.

At the lower end of the body portion of the nail chuck, the chuck jaws 10 and 11 are mounted to slide endwise in guides or tracks 12, 12, constructed and adapted to confine their movement to a straight endwise or rectilinear movement. A funnel-shaped nail holder 14 is formed vertically in the inner or adjacent ends of these jaws, one half on each, so as to guide and grip the nail there between, as it is fed from the tube 15 above. One of these grip jaws 10, is spring-actuated, a moderately stiff spiral spring 16 being held between it and the removable slide 17, and means is provided for a rigid abutment for the outer end of the other chuck jaw 11, during a portion of the nailing operation, or until the nail has been driven the greater portion of the distance and its head is about to enter the tapering upper ends of the nail holder 14. In the construction shown in Fig. 1, this abutment consists of a bar 18, which is confined between a solid abutment 19, secured

to the rail B, and the end of the chuck jaw 11. This bar 18 is controlled by the bell cranks 20, supported on bearings 21, and links 22 depending loosely from the bell cranks and connected with the bar. An anti-friction roller 23 is carried by the bell crank, and a trip bar 24, depending from the cross-head C, is provided with a beveled lower end 25, adapted to engage said anti-friction roller carried by the bell crank, when it shall have descended to that point, to force the latter aside and cause the bell crank to lift the bar 18 out of the path of the chuck jaw 11. This operation is, of course, so timed as to insure the removal of the bar 18 from the jaws 11, just in time for the latter to yield or spread, to release the nail, when the head of the latter at the end of the punch reaches the tapering upper end of the holder 14, whereupon said nail head, with the end of the plunger, forces the chuck jaw apart and continues to drive the nail its full length into the material. As the punch or plunger recedes, the chuck jaws resume their normal position, as shown in Fig. 1, a spring *a* operating to force the movable abutment bar 18 downward, whereupon the latter strikes the beveled upper edge *b*, of the chuck jaw and forces it inward.

To prevent the chuck jaws from crossing the median line, stops 26, 26 in the form of set screws are provided, and the conical recesses 27, 27 are formed partly in the edge of each jaw, and fit the tapering ends of these screw-stops, when together and in their normal position.

As a simple means for gaining access to the interior of the nail chuck, in the event of a stoppage caused by more than one nail, or a defective nail, dropping into the punch or plunger-way, which occasionally happens, I provide a removable section 28, of which the tube 15 is preferably a part, which removable section may be held in place by the spring jaws 29 on either side thereof, and one of which is shown in Fig. 1, and one detached in Fig. 6.

In the modification shown in Fig. 7, in lieu of the trip bar being located inside of the body of the nail chuck, I provide for a self-contained trip bar 30, the body portion of the nail chuck being chambered out to receive, inclose and afford clearance therefor. This trip bar 30 is held normally elevated by a spiral spring 31, the bar sliding freely through guide 32, and is provided with a head 33 at its lower end, adapted to form an abutment for the chuck jaw during the nail-guiding operation. The length of the trip bar 30 is such, and its position is so arranged, that it is struck by the cross-head in descending, just in time to release the chuck jaw by removing the head 33 from its path immediately preceding the entrance of the punch and nail head into the tapering upper end of the nail holder, thereby permitting the chuck jaw to be forced aside.

From the foregoing it will be seen that a perfect parallelism is always maintained between the sides of the nail holder 14, and that the chuck jaws are maintained with sufficient rigidity to provide a firm grip upon a sufficient area of the nail's surface to absolutely preclude the possibility of a deflection in its course from a perfectly straight endwise movement into the material into which it is being driven, and this grip is maintained for a sufficient period of time to insure the nail continuing as started, after its release. Heretofore, as a general thing, these chuck jaws have been pivoted, but with heavy nails there is always a tendency toward lateral movement, which a pivoted jaw will not resist, and this tendency is fully provided for and counter-acted by my improved jaws, which slide in a straight rectilinear direction.

In the construction shown in Figs. 8, 9, 10, 11, 12, and 13 the essential features are the same as those previously described. In this construction though, a slightly different provision is made for gaining access to the feed tube, when occasion arises for opening it, and this consists in the main, in a thimble 40 which has sliding connection with a rod 41 which latter is hinged to the lower end of the nail tube by means of a pin 42. A spiral spring 43 surrounds this rod 41 and is incased in the thimble. The thimble has a pair of outwardly projecting pins 44, 44 adapted to be held in hooks 45, 45, the tension of the spring retaining the pins in the hooks, and consequently the nail tube in place. When it is desired to gain access to the interior of the tube, the thimble is grasped by the thumb and finger and forced inward against the action of the spring 43 until the pins 44, 44 are unhooked, whereupon the thimble is swung upward with the rod 41 on the pin 42 as a pivot. This unlocks the hinged section of the nail tube which may then be swung outward from the hinge 46, as a center. The spring not only locks this section but also retains the chuck jaw yieldingly in place against the nail as does the spring 16 the jaw 10, in the construction previously described. In this construction, in addition to the parts described, there are the supplemental guides 48 and 49 retained yieldingly and slidingly in place by the springs 50^a, 50^a, these supplemental guides being adapted to yieldingly grip the upper or head end of the nail, where a long nail is being driven, in order to absolutely insure a straight course or passage into the material in which the nails are to be driven.

In Figs. 14, 15, 16, 17 and 18, yet another slightly modified form is shown with its details. Here the back plate 50 of the nail tube is hinged at 51, a spring 52 is shown in

Fig. 17 retaining it in position. The other chuck jaw is also hinged at 55. The same variety of supplemental guides 53, 53 are employed in this form as in the modification just described, springs 56, 56 retaining them, yieldingly in place.

In addition to the modifications described, it is obvious that other slight changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to be restricted to the precise construction shown and described, but

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

1. The combination with a plunger-way and plunger, of a pair of movable chuck jaws constructed and adapted to guide and grip the nail to be driven, and a movable abutment adapted to cross the path of one of the jaws, and means operating in conjunction with the plunger for moving the abutment out of the path of the jaw.

2. The combination with a plunger-way and plunger, of a pair of movable chuck jaws, constructed and adapted to guide and grip the nail to be driven, and a movable abutment for one of said jaws the abutment formed independently thereof and moving relative to the jaw.

3. The combination with a plunger-way, of a pair of movable chuck jaws, constructed and adapted to guide and grip the nail to be driven, a movable abutment for one of said jaws, a plunger for forcing the nail endwise between the jaws, a cross-head carrying the plunger, and means for removing the abutment from the path of the chuck jaw, preparatory to the latter being forced aside by the plunger and nail head.

4. The combination with a nail chuck body having a plunger-way, therein, of movable chuck jaws, an abutment for one of the jaws, bell cranks connected with the abutment and a trip bar for rocking the bell cranks to move the bar out of the path of the chuck jaw.

5. The combination with a nail chuck body having a plunger-way therein, and provided with chuck jaw guides, of chuck jaws fitted to slide therein, an abutment for one of the jaws, bell-cranks connected with the abutment, and a trip bar for rocking the bell cranks to move the bar out of the path of the chuck jaw.

6. The combination with a nail chuck body having a plunger-way therein, and provided with chuck jaw guides, of chuck jaws fitted to slide therein, an abutment bar for one of the jaws, bell cranks, connected with the abutment links extending therefrom to the bar, and a trip bar for rocking the bell cranks to move the bar out of the path of the chuck jaw.

7. The combination with a body portion, of a pair of outwardly movable chuck-jaws, and stops between the jaws to prevent their crossing the median line between the jaws.

8. The combination with a body portion, of a pair of movable chuck-jaws having recesses in adjacent edges, and stops in the form, of set screws screwed into the body portion with their inner ends in position to be received in the recesses in the chuck-jaws.

9. The combination with a body portion, of a pair of movable chuck jaws having half conical recesses in adjacent edges, and stops in the form of set screws screwed into the body portion at the median line and having conical inner ends adapted to be received in the half conical recesses in the edges of the chuck jaws.

10. The combination with a plunger way, and plunger, of a pair of chuck-jaws, and a movable abutment for one jaw and means operating in conjunction with the plunger for causing the abutment to recede from the path of the jaw by the time the plunger reaches the jaw.

11. The combination with a plunger way, and plunger, of a pair of chuck-jaws, and a movable abutment for one jaw and means operating in conjunction with the plunger for causing the abutment to recede from the path of the jaw by the time the plunger reaches the jaw, said abutment acting to return the jaw to its normal position when the plunger withdraws.

12. The combination with a plunger way, plunger, and chuck jaws, of an abutment for one of the jaws, a cross-head to which the plunger is connected and means carried by the cross-head for moving the abutment into and out of the path of the chuck-jaw.

13. The combination with a plunger way and plunger, of sliding chuck jaws, one of which is spring actuated and removable, and a movable abutment for the other jaw the abutment formed independently thereof and moving relative to the jaw.

14. The combination with a plunger way and plunger, of sliding chuck jaws, one of which is spring-actuated, and removable, and a movable abutment for the other jaw, and removable means for retaining the spring actuated jaw removably in place.

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

JOHN A. MILLIKEN.

Witnesses:
HENRY RAMME,
JOHN H. BISHOP.