K. I. SIGNELL.

NAILING MACHINE.

APPLICATION FILED FEB. 6, 1918.

1,409,419.

Patented Mar. 14, 1922.

7 SHEETS—SHEET 1.

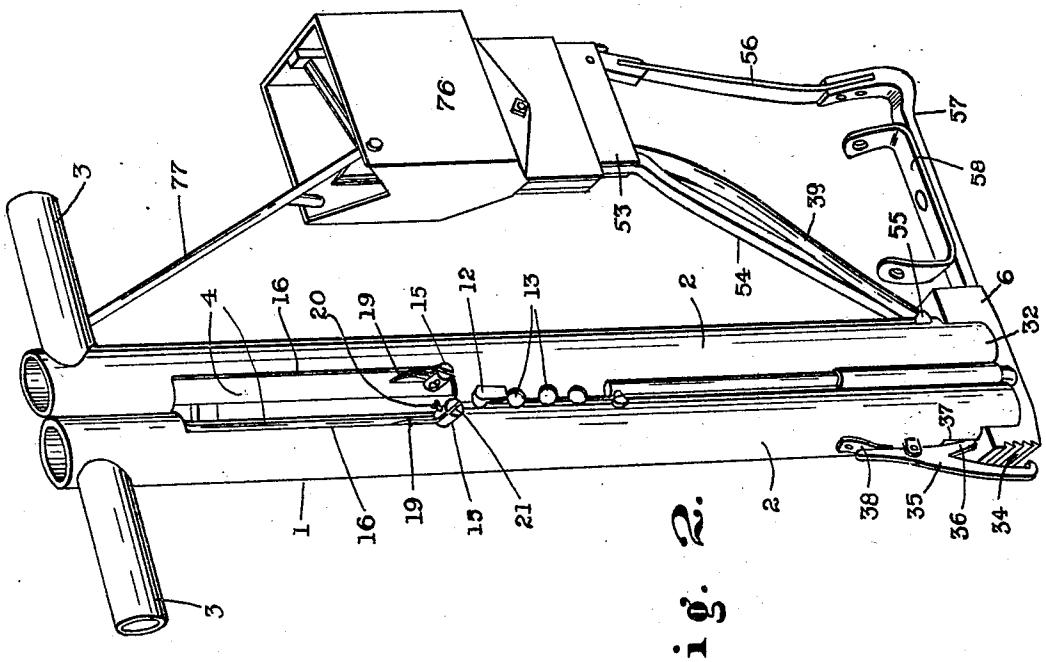
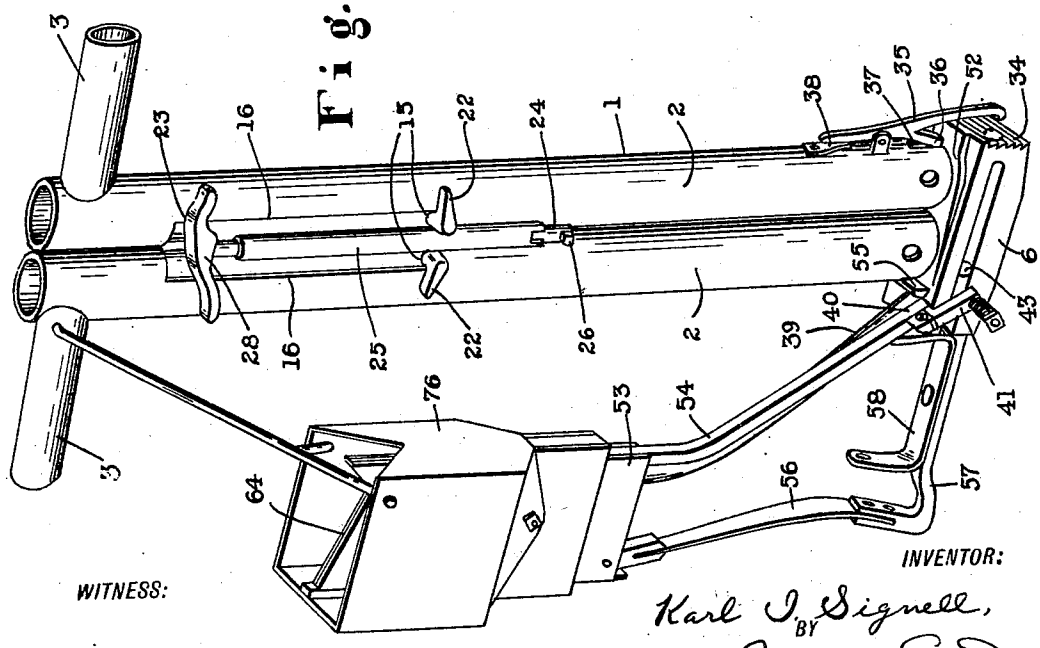


Fig. 2.

Fig. 1.



WITNESS:

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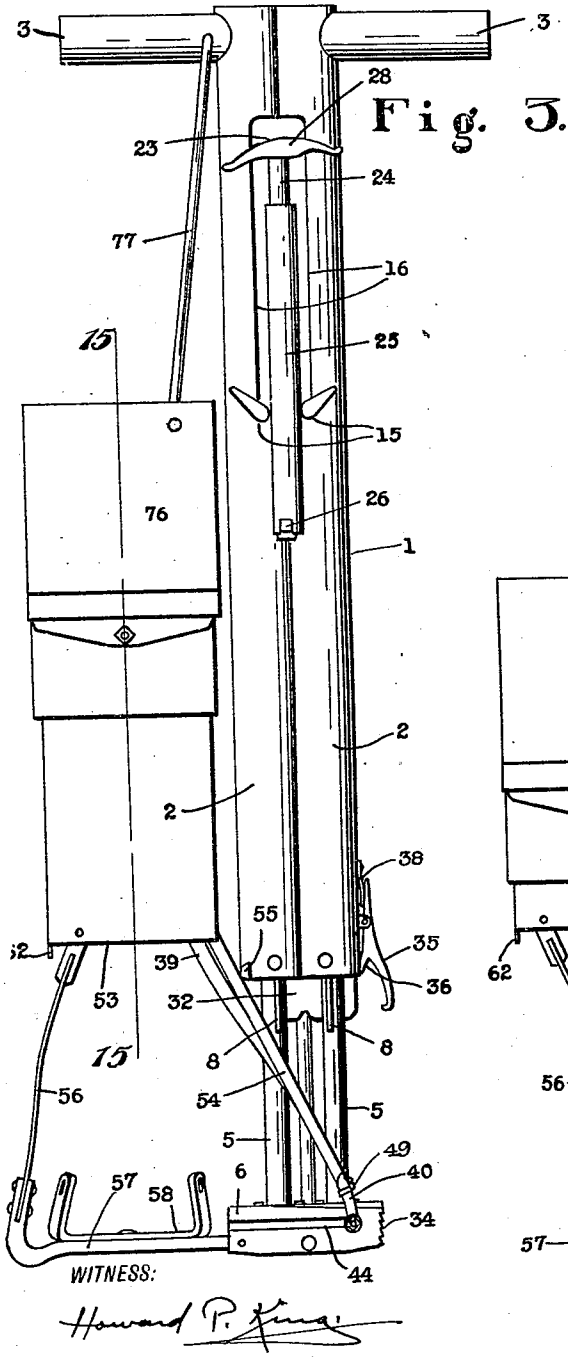
7 SHEETS—SHEET 2.

Fig. 3.



WITNESS:

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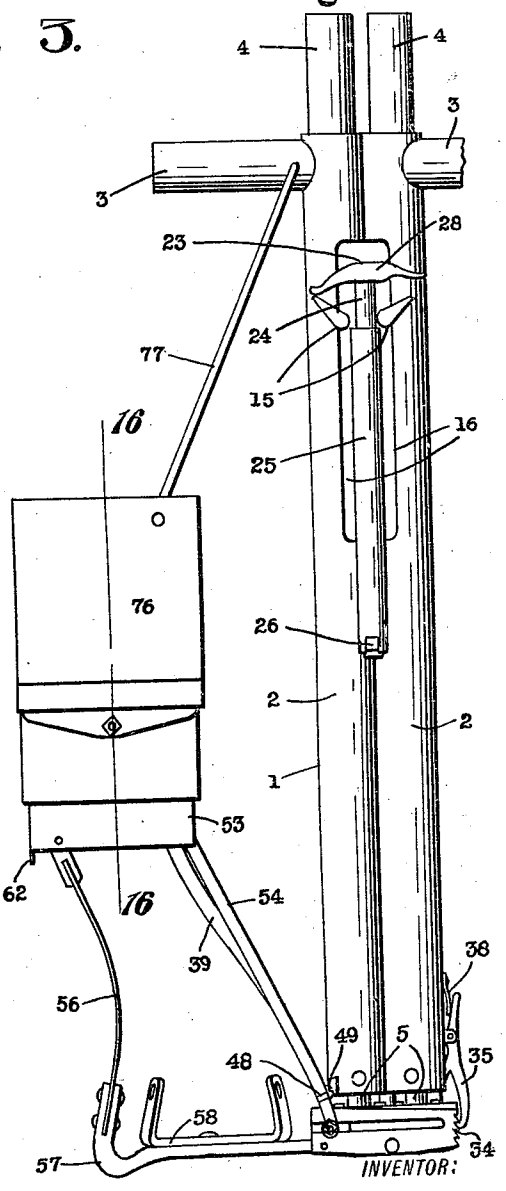
Fig. 4.



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7 SHEETS—SHEET 3.

Fig. 5.

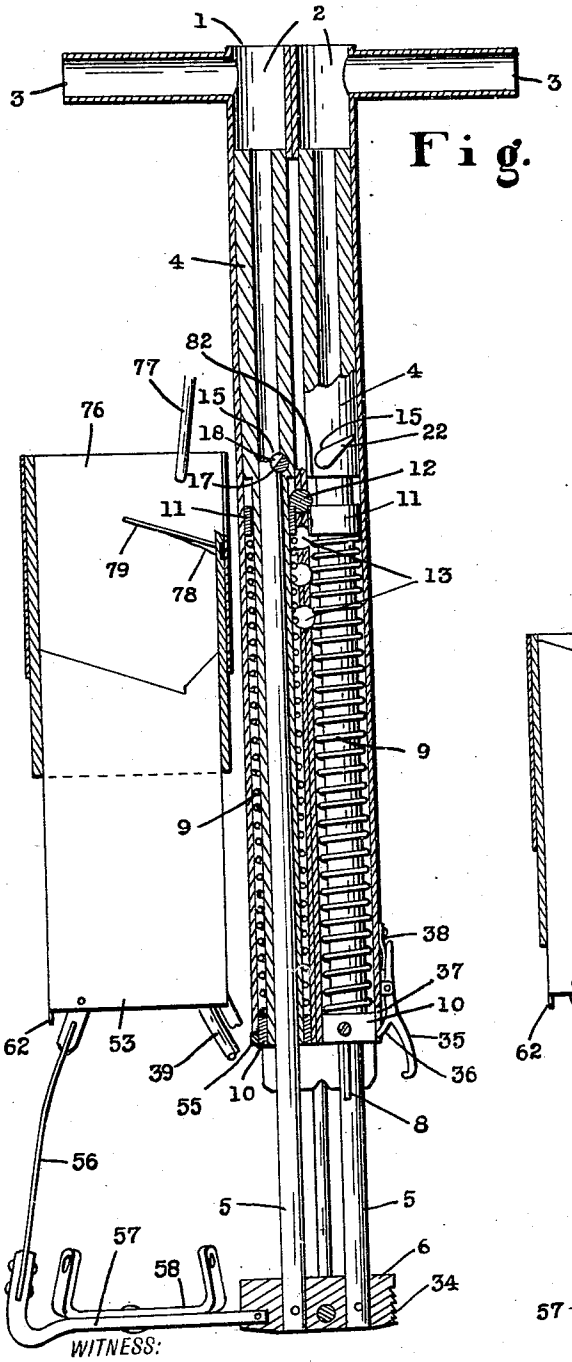
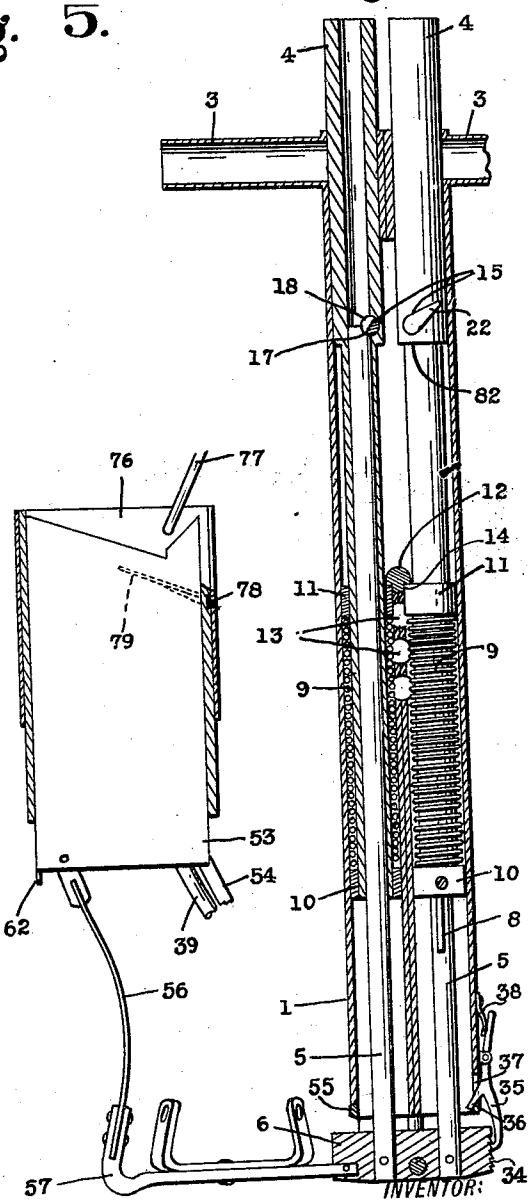


Fig. 6.



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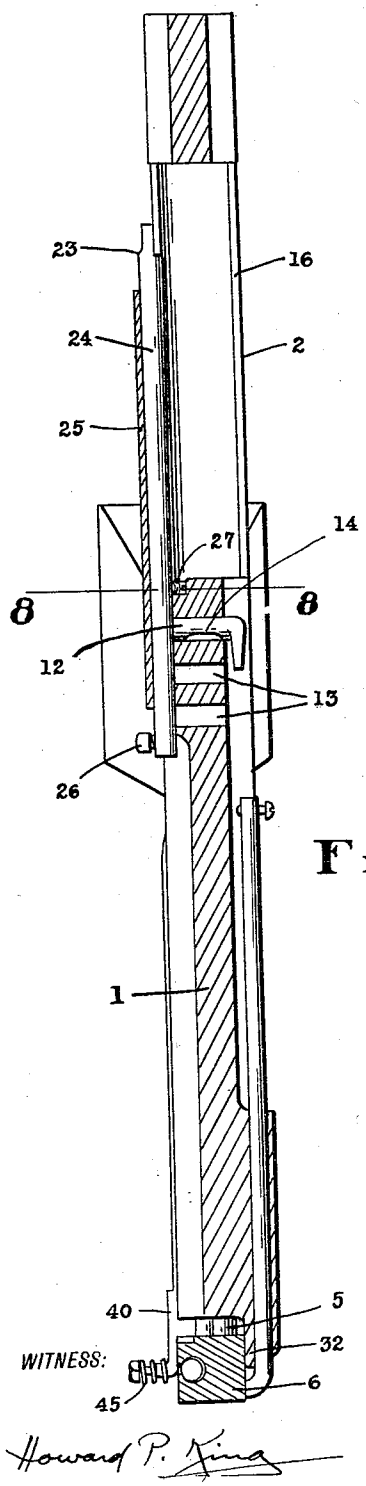

Fig. 7.

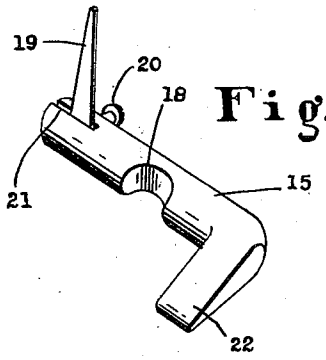

Fig. 9

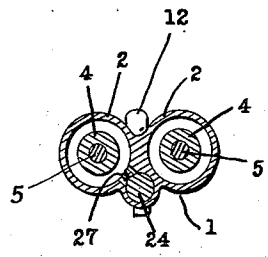

Fig. 8.

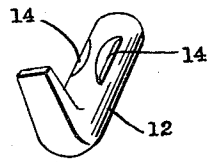

Fig. 10.

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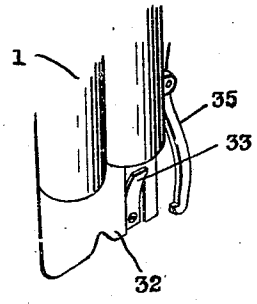

Fig. 11.

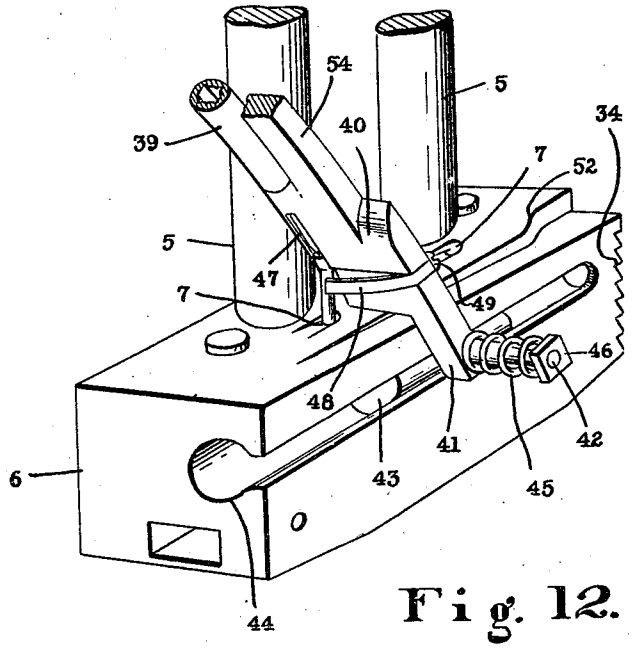

Fig. 12.

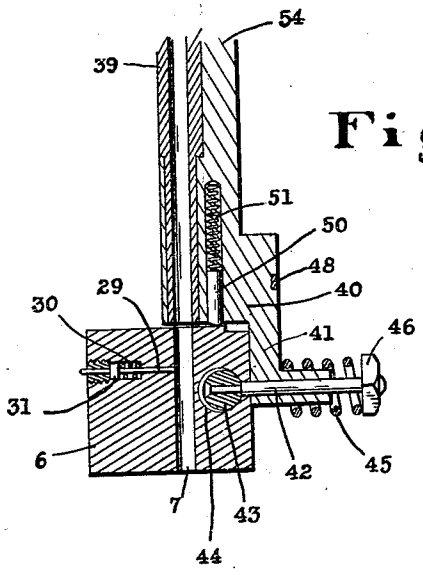

Fig. 13.

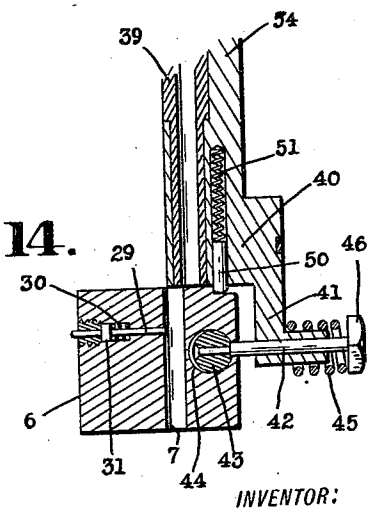

Fig. 14.

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7 SHEETS—SHEET 6.

Fig. 15.

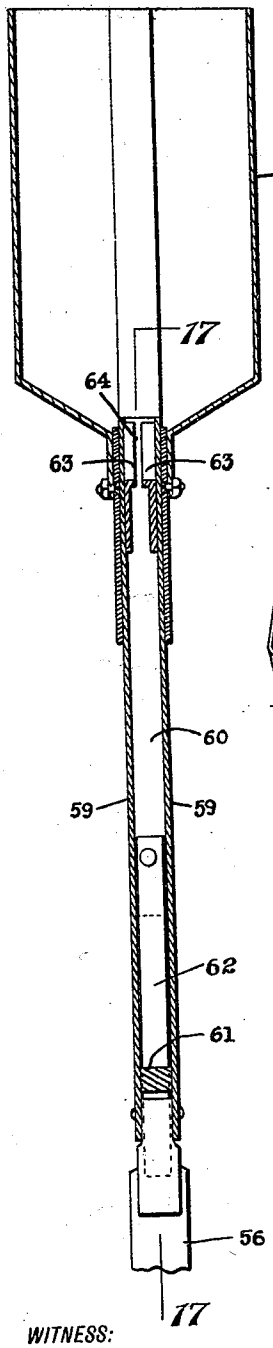
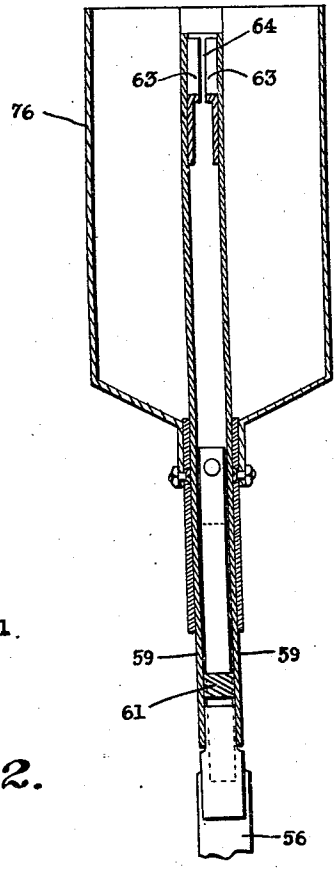


Fig. 16.



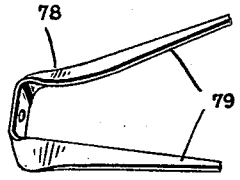


Fig. 21.

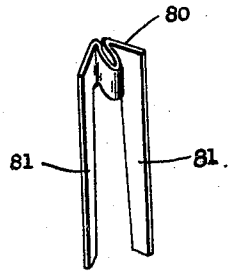


Fig. 22.

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7 SHEETS—SHEET 7.

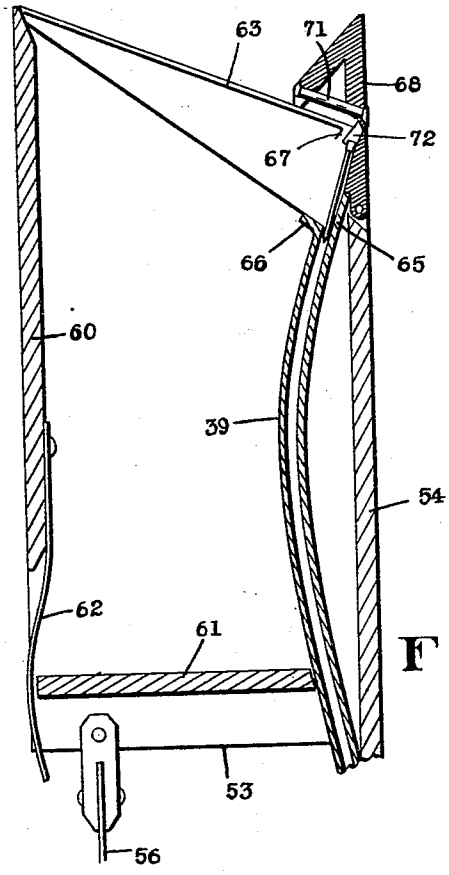

Fig. 17.

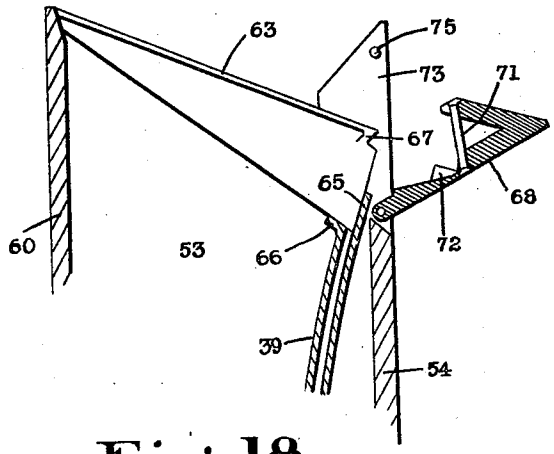

Fig. 18.

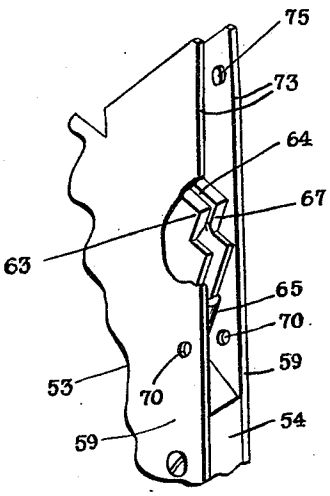

Fig. 19.

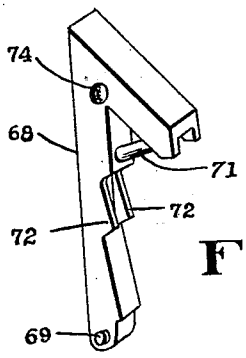

Fig. 20.

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UNITED STATES PATENT OFFICE.

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NAILING MACHINE.

1,409,419. Specification of Letters Patent. Patented Mar. 14, 1922.

Application filed February 6, 1918. Serial No. 215,684.

To all whom it may concern:

Be it known that I, KARL I. SIGNELL, a citizen of the United States of America, and a resident of West New York, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Nailing Machines, of which the following is a specification.

This invention relates more particularly to nailing machines which are portable, adapted to be carried in the hand and applied to the work wherever it may be, the machine disclosed being intended more especially to nail parquet floors.

The objects of this invention are to provide a nailing machine having a spring actuated hammer or plunger, and handle means adapted to be reciprocated in alinement with said hammer or plunger to operate the same; to enable the hammer to be retracted by movement of the reciprocating means in one direction and the spring compressed and tripped by movement in the other direction; to more particularly enable the spring to be compressed by movement in the same direction as the hammer moves in striking its blow; to thus utilize the pressure exerted in compressing the spring to hold the machine against its work; to thus enable the machine to be easily and positively positioned and the nails driven accurately; to drive a plurality of nails at one operation of the machine and at the same time avoid excessive jar due to simultaneous impact of the hammers; to this end to employ a plurality of hammers and trip them in succession; to enclose the hammers while descending; to prevent any nail of such a plurality being displaced by the impact of a blow driving a previous nail; to prevent the operator from making a retractive stroke during descent of the hammers and until the blows are struck; to permit the spring tension to be readily adjusted so as to drive the nails with the desired force; to provide nail feeding mechanisms which will pass beneath the hammers a they are raised and drop a nail in position under each hammer; to hold the nail chute or magazine out of registration with the nail receiving hole in returning said magazine to initial position; to provide improved means for feeding nails to the magazine in proper position from a receptacle containing a supply of them; to provide access to the upper end of the magazine for removing defective or deformed nails; to secure simplicity of construction and operation, and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings in which like numerals of reference indicate the same parts throughout the several views,

Figures 1 and 2 are perspective views of a nailing machine embodying my invention; looking at the same from opposite sides;

Figure 3 is an elevation showing the barrel raised;

Figure 4 is a similar elevation showing the barrel forced substantially down and the hammers retained in raised position;

Figures 5 and 6 are vertical sectional views showing the parts in the positions shown in Figs. 3 and 4 respectively;

Figure 7 is a central sectional view taken between the barrels;

Figure 8 is a cross-section on line 8—8 of Fig. 7;

Figure 9 is a detail perspective of the latch for holding the hammer raised while the spring is compressed;

Figure 10 is a detail perspective of the means for adjustably limiting displacement of one end of the spring;

Figure 11 is a detail perspective of the lower end of the barrel;

Figure 12 is a perspective view of the work engaging shoe and means for feeding the nails thereto;

Figure 13 is a cross-section of said shoe and longitudinal section of said nail feeding means in its normal feeding position;

Figure 14 is a similar sectional view showing the feeding means held out of registration from the nail-receiving hole or chamber in the shoe;

Figure 15 is a sectional view on line 15—15 of Fig. 3;

Figure 16 is a similar sectional view on line 16—16 of Fig. 4;

Figure 17 is a sectional view on line 17—17 of Fig. 15;

Figure 18 is a similar sectional view showing the gate opened through which defective or deformed nails are removed;

Figure 19 is a perspective view of the portion of the magazine normally closed by said gate, but with the gate omitted;

Figure 20 is a detail perspective view of said gate;

Figure 21 is a detail perspective view of an agitator for the nails, and

Figure 22 is a detail perspective view of a tool for holding the springs compressed while adjusting the key.

In general, my improved nailing machine comprises one or more hammers each adapted to be reciprocated upon a guiding rod and within a barrel which the operator slides toward and away from the work. In nailing parquet flooring this sliding is up and down, and therefore I shall use those terms in describing the invention, it being understood that they in no way restrict the use of the machine in other positions. A latch is provided to hold the hammer retracted, when brought to that position, while the operator slides the barrel down again and thereby compresses a spring within the barrel. Said spring when thus compressed tends to slide the hammer down to strike its blow, the latch being tripped automatically as the barrel reaches the lower part of its stroke and releasing the hammer to thus strike its blow. Nail feeding means are reciprocated transverse to the direction of movement of the hammer, as the barrel is raised and lowered, positioning a nail beneath each hammer between strokes.

In the specific embodiment of the invention illustrated in said drawings, the reference numeral 1 indicates the barrel, which, for a machine driving two nails, comprises a pair of tubes 2, 2 having handles 3, 3 adjacent their upper ends by means of which the operator may slide the barrel up and down. Slidably mounted within said tubes 2, 2 are hammers 4, 4 which are also tubular and are slidably mounted upon rods 5, 5 projecting upward from and fixed with respect to a work engaging shoe 6. It is to be understood that said rods 5, 5 are parallel to each other, and of the same length, and that the hammers slide preferably independent of each other upon said rods for purposes hereinafter described. The shoe 6 has one or more nail receiving holes or chambers 7 for each hammer, see Figures 12, 13 and 14, said chambers passing through the shoe from top to bottom in a direction parallel to the hammers. Drivers 8, 8 are provided on the hammers, see Figures 3, 5 and 6, projecting from the bottoms thereof so as to enter the chambers 7 in the shoe and drive nails dropped therein by the feeding mechanism. It may here be noted that the hammers 4, 4 are prevented from rotating upon the rods 5, 5 as a result of which the drivers will always be alined with respect to said chambers 7 so as to enter therein each time the hammers are lowered.

Within the tubes 2, 2 upon the hammers 4, 4 are helical springs 9, 9 bearing at their lower ends against collars 10, 10 fixed upon the lower part of the hammers above the drivers, see Figures 5 and 6. The upper ends of the springs bear against collars 11, 11 slidable upon the hammers. A key 12, see Figures 2, 5, 6, 7 and 10, is provided adapted to be inserted in any one of a plurality of apertures 13 between the tubes 2, 2 of the barrel, said key projecting partly within each of the tubes so as to overlie the said upper slidable collars 11, 11, and being notched at its under side, as at 14, so as to permit the collars to seat upward therein to hold the key from withdrawal until the collars are slid down out of the notches. With the hammers held in raised position downward movement of the barrel toward the work slides the collars 11, 11 toward the fixed collars thus compressing the springs. The desired tension may be obtained by adjusting the key, inserting it in a hole closer to the work-engaging end of the machine to obtain greater compression of the springs and consequently harder blows by the hammers.

For holding the hammers raised while the springs are being thus compressed, I provide latches 15, 15 one for each hammer, see Figures 1 to 6 and 9, which are adapted to lock the hammers with respect to the fixed rods 5, 5. These latches I have shown cylindrical, mounted in the hammers transverse to but offset axially from the axes of the hammers. The tubes 2, 2 are longitudinally cut away or slotted, as at 16, in which the ends of the latches projecting from the hammers may ride, thus permitting relative longitudinal movement of the hammers and barrel. These slots 16 are so arranged that the latches will engage side walls thereof and prevent rotation of the hammers. The rods 5, 5 preferably have notches 17 in which the latches may rest, see Figures 5 and 6. The latches also have notches 18, see Figures 5, 6 and 9, through which the rods may pass, so arranged that for one position of the latch the hammer may slide downward upon the rod, but for other positions of the latch it will hold the hammer raised. A leaf spring 19, see Figures 2 and 9, is held by a set screw 20 in a slot 21 in one end of each latch for normally rotating the latch so its notch 18 will turn out of registration with the rod and automatically lock the hammer in raised position when raised thereto.

In order to release the hammer after the spring 9 is compressed, I provide an arm 22 on the end of the latch opposite from the leaf spring 19, adapted, when pressed down, to rotate the latch so its notch 18 will turn into registration with the rod. Swinging of this arm 22 is automatically effected preferably as the barrel 1 approaches its lowest position, to which end I provide a suitable trip 23 upon the barrel, see Figures 1, 3, 4 and 7, adapted to engage and swing the arms

22, 22 of both latches. The trip shown comprises a stem 24 slidably mounted in a sleeve 25 fixed with respect to the barrel, preferably between the tubes, said stem being limited in upward movement by a screw 26 therein below the sleeve and limited in downward movement by a screw 27 therein projecting into the slotted portion 16 of the barrel and adapted to engage the lower end of said slot, see Figures 7 and 8. Upon the upper end of the stem is a cross-head 28 the opposite ends of which overlie the arms 22, 22, for swinging them as the barrel is lowered. Preferably the arms 22, 22 are so related with respect to the trip that one hammer is released in advance of the other in order to avoid excessive jar due to simultaneous impact of both hammers.

In order to prevent the impact of the hammer first descending from jarring the nail or nails from the chambers beneath the subsequently descending hammers, means are provided to frictionally engage such nail or nails. For a machine having two hammers, such as shown, it is necessary to have only one such friction means, and that for the nail to be driven by the hammer which operates last. The means as shown in Figures 13 and 14, comprises a stud 29 in the work engaging shoe transverse to the nail chamber, with one end adapted to enter said chamber and its other end adapted to protrude from said shoe. A spring 30 engages a collar 31 on said stud normally projecting the end from the shoe and retracting the other end from the nail chamber so the nail will fall freely therein. The barrel, see Figure 11 especially, has a lip 32 upon its lower end adapted to pass downward past the stud 29, a leaf spring 33 being carried by said lip to engage and slide said stud inward so its other end will engage a nail in the nail chamber.

Preferably means are provided for holding the barrel toward the work during the interval from tripping the first hammer to striking of the blow by the second hammer. One end of the work-engaging shoe 6 is shown with a plurality of ratchet teeth 34 extending thereacross having downwardly facing shoulders. A pawl 35 pivoted to the lower part of the barrel has its lower end shaped to engage and underlie said teeth thereby preventing the barrel from being lifted until said pawl is disengaged. As shown, the ratchet teeth and pawl are adjacent the hammer which descends last, and means are provided for releasing the pawl from the ratchets automatically by descent of said last descending hammer. To this end, an arm 36 is provided upon the pawl projecting into a slot 37 in the side of the barrel. As the hammer descends it engages said arm, forcing it outward and thus releases the pawl. A leaf spring 38 is arranged to normally swing the pawl toward the ratchet teeth.

Nails are fed, one to each nail chamber in the work-engaging shoe, between strokes of the barrel by a nail magazine operated by the barrel. This feeding means preferably provides a chute 39 down which the nails may slide end to end, said chute preferably having longitudinal grooves in its interior channel to accomodate irregularities, burrs or the like, in the nails. On the lower end of said chute 39 is a base 40 adapted to travel back and forth past the two rods 5, 5. The chute is removable from said base so another may be substituted when desired, as for different sized nails. The base has an extension 41 passing downwardly at the side of the work-engaging shoe and through which extension is slidably mounted a pin 42 the inner end of which is fixed in a rider 43, see Figures 12, 13 and 14 especially. This rider travels in a slideway 44 at the side of the work-engaging shoe, in which the rider is held against lateral displacement, said slot furthermore extending in the direction of movement of the base 40. A spring 45 is carried upon the pin 42 between a head 46 on the outer end thereof and the extension, thus tending to hold the base 40 normally toward the rods 5, 5 so the chute will pass across the upper ends of the nail chambers in registration therewith.

As the chute thus registers with a nail chamber, a nail drops from the chute into said chamber, the chute and base being longitudinally slotted adjacent their lower ends, as at 47, to permit the nail to drop vertically into the chamber as the chute moves on, see Figure 12. A leaf spring 48 held at one end by a screw 49 has its other end normally projecting across said slot to hold the nails in the chute until they start to fall into the nail chambers at which time said spring bows out as the chute moves on, snapping back to engage the next nail as it falls down.

It is preferable to pass the nail chute across in one direction so the chute will register with the nail chambers in passing, but to retract the nail chute in the other direction so it will not register with the nail chambers, thus supplying only one nail to each nail chamber for each cycle of operations. In the lower end of the base 40 is a guide pin 50, see Figures 13 and 14, normally projected by a spring 51 above it, and this pin slides at its lower end upon the top of the work-engaging shoe. At the outer part of the forward stroke of the base of the magazine the shoe is cut to provide a vertical shoulder 52, (Figures 1 and 12), past which said pin 50 will be projected. This shoulder slopes toward the side of the shoe along which the extension 41 travels as a

result of which the base will be slid outwardly by the pin 50 toward said side while being retracted. The bottom of the cut away portion to form said shoulder 52 slopes upwardly toward the other end of the shoe so that as the magazine is returned to initial position the pin 50 is forced back up into the base and finally the spring 45 bearing against the extension 41 forces said extension and base inward again toward the shoe so upon the next forward stroke the nail chute will again register with the nail chambers.

The portion 53 of the magazine from which the chute depends, see Figures 1 to 6 and 15 to 20, is preferably narrow with its upper part slotted to receive the nails, the lower portions of the nails hanging by their heads in said slot. The nails slide one by one from the slot into the chute as needed. From the lower part of this narrow slotted portion 52 which is toward the barrel depends a bar 54 by which said portion is supported and operated from the barrel. As shown, said bar slopes from the said slotted portion 53 of the magazine downwardly toward the barrel, terminating in the base 40 above described. A bracket 55 fast with respect to the barrel near its bottom end projects outwardly therefrom in engagement with the sloping side of the bar 54 so that as said barrel is moved downward the brackets will wedgingly operate against the bar 54 to retract the magazine. A leaf spring 56 is carried by the portion 53 of the magazine to actuate it upon its forward stroke, the lower end of the spring being attached to an extension 57 carried by the work-engaging shoe, which extension also carries a swiveled stirrup 58 for the operator's foot.

Preferably said portion 53 of the magazine comprises opposite separated plates 59 held apart at one edge of said portion 53 by the bar 54 and at their opposite edges by a strip 60 which terminates a distance from a bottom closure 61. Between the lower end of the strip 60 and the bottom closure 61 is a leaf spring 62 which may be sprung aside by the operator for permitting nails escaping from the slot at the top of the magazine to be removed. The top of said portion 53 slopes downwardly toward the feed chute 39 and strips or jaws 63 are secured to the inner sides of the plates 59 to provide the slot 64 in which the nails will hang, the slot thus formed being too narrow for the heads of the nails to pass through. By virtue of the slope of the jaws, the nails will slide down as needed, said nails sliding off the end of the jaws into the upper end of the chute.

The upper end of the nail chute is substantially a nail length below the end of the jaws, having on its side farthest from the nails an upwardly projecting lip 65 which the lower ends of the nails will engage as a stop so as to be above the channel in the chute when dropped from the jaws. Another lip 66 upon the other side of the chute underlies the points of the nails and guides them toward the channel in the chute as occasion requires. Preferably the ends of the jaws from which the nails slide extend downwardly toward the nail chute, as at 67, so as not to release the head of the nail until its lower end is low enough to be within the chute. Such nails as tilt enough so their points do not enter the chute will merely fall down between the plates to the bottom 61.

A gate 68 is provided at the ends of the jaws, adapted to be opened for removing deformed or defective nails which lodge there. This gate is hinged by pintles 69 thereon projecting into holes 70 in the plates 59 near the upper end of the chute. Said gate provides a portion 71 overlying the jaws to prevent the last several nails from jumping up and also provides side flanges 72 adjacent the downwardly directed portions 67 of the jaws to cooperate therewith to guide the head of the nail while the point enters the nail chute. The upper end of the gate is adapted to swing between portions bending toward each other so as to frictionally hold the gate closed. For greater security the gate has a socket 74 adapted to engage a protuberance 75 projecting inwardly from one of the portions 73 of the side plates.

A container 76 for the supply of nails is provided with a flanged slot at its bottom in which is slidably mounted the narrow portion 53 of the magazine, the container sliding up and down with the barrel. The upper slotted end of the magazine is thus part of the time below the level of the nails in the container and part of the time above such level, the nails being tumbled about by the up and down movement of the container and some thereby positioned to fall into the slot 64 of the magazine. It is found in practice that by attaching the container to the barrel, as by a link 77 the container will operate frequently enough to keep the slot 64 of the magazine amply supplied with nails. Preferably the bottom walls of the container slope inwardly downward toward the magazine to feed the nails positively toward the same. An agitator 78 is shown secured in the container to the side wall thereof with arms 79, 79 projecting inwardly upon opposite sides of the narrow slotted portion 53 of the magazine. Preferably one of these arms slopes upwardly and the other downwardly so as to positively engage any nails which lie crosswise on the top of the magazine as the container is lowered, and thereby cause such nails to drop off.

It may be here added that in order to adjust the key 12 in any one of the holes 13, a tool 80 is provided having legs 81, 81

adapted to be inserted within the barrel through the slot 16 when the collar 11 is slid downwardly on the hammer as shown in Figure 6. Permitting the barrel to rise again will seat the upper end of the tool against a shoulder 82 on the hammer above said collar and the collar will engage the lower end in the tool. The barrel and hammers may then be slid with respect to each other for a distance dependent upon the tool, which is of sufficient length to permit all of the sockets 13 to be raised above the movable collar 11 and permit the key 12 to be inserted in any one of them. When the key is thus adjusted, the tool is removed and the machine operated as before.

Obviously detail modifications and changes may be made in manufacturing my improved nailing machine without departing from the spirit and scope of the invention, and I do not wish to be understood as restricting myself except as required by the following claims when construed in the light of the prior art.

Having thus described the invention, what I claim is:

1. In a nailing machine, the combination with means for positioning a plurality of nails to be driven and a plurality of spring actuated hammers for driving said nails, of a barrel enclosing said hammers, and means for actuating said hammers in succession and driving the nails successively by reciprocating said barrel.

2. In a nailing machine, the combination with means for positioning a plurality of nails to be driven and a plurality of spring actuated hammers for driving said nails, of a barrel enclosing said hammers adapted to retract the same when moved in one direction and compress their springs and to release them successively when moved in the other direction.

3. In a nailing machine, the combination with means for positioning a plurality of nails to be driven, and a plurality of spring actuated hammers for driving said nails, of a reciprocating barrel enclosing said hammers, for compressing the springs of said hammers simultaneously and releasing said hammers successively.

4. In a nailing machine, the combination with means for positioning a plurality of nails to be driven, of a barrel, and a plurality of spring actuated hammers within said barrel adapted to be retracted by retraction of said barrel, the springs for said hammers being compressed simultaneously and released successively by sliding the barrel toward the work.

5. In a nailing machine, the combination with means for positioning a plurality of nails to be driven, of a barrel, a plurality of spring actuated hammers within said barrel adapted to both be retracted by retracting said barrel, the springs for said hammers being compressed simultaneously by sliding the barrel toward the work, and means for releasing said hammers successively.

6. In a nailing machine, the combination with means for positioning a plurality of nails to be driven, and a plurality of spring actuated hammers for driving said nails, of latches for retaining said hammers retracted, means for compressing the springs of the hammers, and means for successively operating said latches and thereby releasing the hammers successively.

7. In a nailing machine, the combination with means for positioning a plurality of nails to be driven and a plurality of spring actuated hammers for driving said nails, of means adapted to be reciprocated in substantially the same direction as said hammers and retract the same when moved in one direction and compress their springs when moved in the other direction, latches for retaining said hammers retracted during compressing of the springs, and means for automatically operating said latches so as to release the hammers successively.

8. In a nailing machine, the combination with a spring actuated hammer for driving a nail, of means for manually retracting the hammer without compressing its spring, and subsequently compressing said spring and releasing the hammer.

9. In a nailing machine, the combination of a stationary guide portion adapted to be held in place by the foot, a spring actuated hammer or plunger slidable with respect to said guide portion, and a hand operated barrel arranged and adapted to manually raise the spring-actuated hammer when moved in one direction and to tension the spring and release the hammer when moved in the other direction.

10. In a nailing machine, the combination with a spring actuated hammer for driving a nail, of means adapted to be reciprocated in substantially the same direction as the hammer, and means for connecting said hammer and reciprocating means so as to retract the hammer by retracting said reciprocating means and hold said hammer retracted while said reciprocating means is slid toward the work.

11. In a nailing machine, the combination with a spring actuated hammer for driving a nail, of a barrel adapted to be reciprocated in substantially the same direction as the hammer, and means carried by said hammer adapted to be engaged by said barrel to retract the hammer as the barrel is retracted and adapted to retain the hammer retracted while said barrel is slid toward the work.

12. In a nailing machine, the combination with a spring actuated hammer for driving

a nail, of a barrel adapted to be reciprocated in substantially the same direction as the hammer, means carried by said hammer adapted to be engaged by said barrel to retract the hammer as the barrel is retracted and adapted to retain the hammer retracted while said barrel is slid toward the work, and a trip for operating said means to release the hammer and permit it to strike its blow.

13. In a nailing machine, the combination with a spring actuated hammer for driving a nail, of a barrel having a longitudinal slot, said barrel adapted to be reciprocated in substantially the same direction as the hammer, and means carried by said hammer projecting into said slot preventing relative rotation of said hammer and barrel and permitting restricted relative longitudinal movement.

14. In a nailing machine, the combination with a spring actuated hammer for driving a nail, of a barrel having a longitudinal slot, said barrel adapted to be reciprocated in substantially the same direction as the hammer, and a latch projecting through said slot arranged and adapted to be engaged by one end of the slot for retracting the hammer as the barrel is retracted and engage the side of the slot for preventing relative rotation of said hammer and barrel, said latch adapted to automatically lock the hammer retracted so as to permit compression of the spring for said hammer, and means for operating the latch to release the hammer.

15. In a nailing machine, the combination of a guide rod and means for supporting it, a hammer slidable on said guide rod, and a transverse rotatable latch in said hammer having a notch adapted to slidably receive said rod as the hammer is slid, said latch adapted to be rotated when retracted beyond the end of the rod so as to engage said rod and thereby prevent the hammer from sliding thereon.

16. In a nailing machine, the combination of a guide rod and means for supporting it, a hammer slidable on said guide rod, a transverse rotatable latch in said hammer having a notch adapted to slidably receive said rod as the hammer is slid, said latch adapted to be rotated when retracted beyond the end of the rod so as to engage said rod and thereby prevent the hammer from sliding thereon, and an arm on one end of said latch for rotating said latch.

17. In a nailing machine, the combination of a guide rod and means for supporting it, a hammer slidable on said guide rod, a transverse rotatable latch in said hammer having a notch adapted to slidably receive said rod as the hammer is slid, and a spring for normally rotating said latch so a portion of said latch may be rotated to lie in the path of the rod as occasion permits and thereby prevent the hammer from sliding on said rod.

18. In a nailing machine, the combination of a guide rod and means for supporting it, a hammer slidable on said guide rod, a transverse rotatable latch in said hammer having a notch adapted to slidably receive said rod as the hammer is slid, a spring for normally rotating said latch so a portion of said latch may be rotated to lie in the path of the rod as occasion permits and thereby prevent the hammer from sliding on said rod, and means for rotating said latch to position the notch thereof in registration with the rod as desired to permit sliding of the hammer thereon.

19. In a nailing machine, the combination of a guide rod having a notch, means for supporting said rod, a hammer slidable on said rod, and a transverse rotatable latch adapted to be positioned in said notch of the rod for preventing the hammer from sliding on the rod.

20. In a nailing machine, the combination of a guide rod having a notch, means for supporting said rod, a hammer slidable on said rod, and a transverse latch adapted to be positioned in said notch of the rod for preventing the hammer from sliding on the rod, said latch being rotatable and also having a notch adapted to be brought into registration with the rod by rotating the latch and thereby permitting the hammer to slide upon the rod.

21. In a nailing machine, the combination of a slidable hammer, a spring for actuating said hammer, a barrel slidable in substantially the same direction as the hammer, and means for adjustably connecting the spring and barrel for obtaining different spring pressures with the same movement of the barrel.

22. In a nailing machine, the combination of a slidable hammer, a fixed collar on said hammer, a slidable collar on said hammer, a spring included between said collars, a barrel, and means for connecting the slidable collar with the barrel for compressing the spring by movement of the barrel in one direction.

23. In a nailing machine, the combination with a shoe, of a hammer slidable toward and away from said shoe, and a barrel slidable in substantially the same direction as the hammer adapted to enclose the end of the hammer toward the shoe as the hammer makes its stroke toward the shoe.

24. In a nailing machine, the combination with a shoe, of a spring actuated hammer slidable toward and away from said shoe, and a barrel slidable in substantially the same direction as the hammer adapted both to compress the hammer spring and enclose the end of the hammer toward the shoe as

the hammer makes its stroke toward the shoe.

25. In a nailing machine, the combination with a shoe, of a hammer slidable toward and away from the shoe, a barrel slidable toward and away from said shoe, and means for preventing retraction of said barrel while the hammer strikes its blow.

26. In a nailing machine, the combination with a shoe, of a hammer slidable toward and away from the shoe, a spring for actuating said hammer toward the shoe, a barrel slidable in substantially the same direction as the hammer arranged and adapted to compress the spring as said barrel is slid toward the shoe, and means for retaining said barrel slid toward the shoe during operation of the hammer toward the shoe under impulse of the spring.

27. In a nailing machine, the combination with a shoe, of a hammer slidable toward and away from the shoe, means for preventing retraction of said barrel while the hammer strikes its blow, and means for releasing the barrel so it may be retracted after the blow is struck.

28. In a nailing machine, the combination with a shoe having ratchet teeth, of a hammer slidable toward and away from said shoe, a barrel slidable in substantially the same direction as the hammer, and a spring actuated pawl on said barrel adapted to engage the ratchet teeth and prevent retraction of the barrel while said teeth are so engaged.

29. In a nailing machine, the combination with a shoe having ratchet teeth, of a hammer slidable toward and away from said shoe, a barrel slidable in substantially the same direction as the hammer, a spring actuated pawl on said barrel adapted to engage the ratchet teeth and prevent retraction of the barrel while said teeth are so engaged, and means on said pawl adapted to be engaged and swung by the hammer in striking its blow thereby disengaging said pawl automatically.

30. In a nailing machine, the combination with a shoe having ratchet teeth, of a plurality of hammers slidable successively toward the shoe, a barrel slidable in substantially the same direction as the hammer, means for preventing retraction of the barrel during operation of the hammers toward the shoe, and means operated by the last operating hammer for releasing the barrel so it may be retracted.

31. In a nailing machine, the combination with means for positioning a plurality of nails to be driven and means for driving said nails successively, of means for preventing movement of one of said nails in any direction in position to be driven while another nail is being driven.

32. In a nailing machine, the combination with means for positioning a plurality of nails to be driven and means for driving said nails successively, of a member for holding a later driven nail against displacement by the concussion of driving an earlier driven nail, and means for rendering said member idle during positioning of the nail.

33. In a nailing machine, the combination with means for positioning a plurality of nails to be driven and means for driving said nails successively, of a member for holding a later driven nail against displacement by the concussion of driving an earlier driven nail, and means for automatically and alternately rendering said member idle during positioning of the later driven nail and operative during driving of the earlier driven nail.

34. In a nailing machine, the combination with a shoe having a plurality of nail chambers, means for positioning nails in said nail chambers, and means for driving said nails successively, of a stud transverse to a chamber in which a nail is driven subsequent to another, said stud adapted to enter said chamber for frictionally engaging a nail therein, and means operated by the hammer control means for sliding the stud to so engage the nail before impact of the hammer upon another nail of the series.

35. In a nailing machine, the combination of a shoe, a hammer slidable toward and away from the shoe, a barrel slidable in substantially the same direction as said hammer for operating the same, means for engaging a nail for holding it in position to be driven, and a spring on said barrel for operating said nail engaging means after the nail has been positioned.

36. In a nailing machine, the combination of a shoe having a nail chamber, a hammer slidable toward and away from the shoe, a barrel slidable in substantially the same direction as said hammer for operating the same, means for positioning a nail in said nail chamber, a stud transverse to said chamber adapted to enter the same for frictionally engaging a nail positioned therein, means for normally holding said stud from projecting into said chamber, and means for entering the stud in the chamber as the barrel approaches its final position toward the shoe and before the hammer strikes its blow.

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