

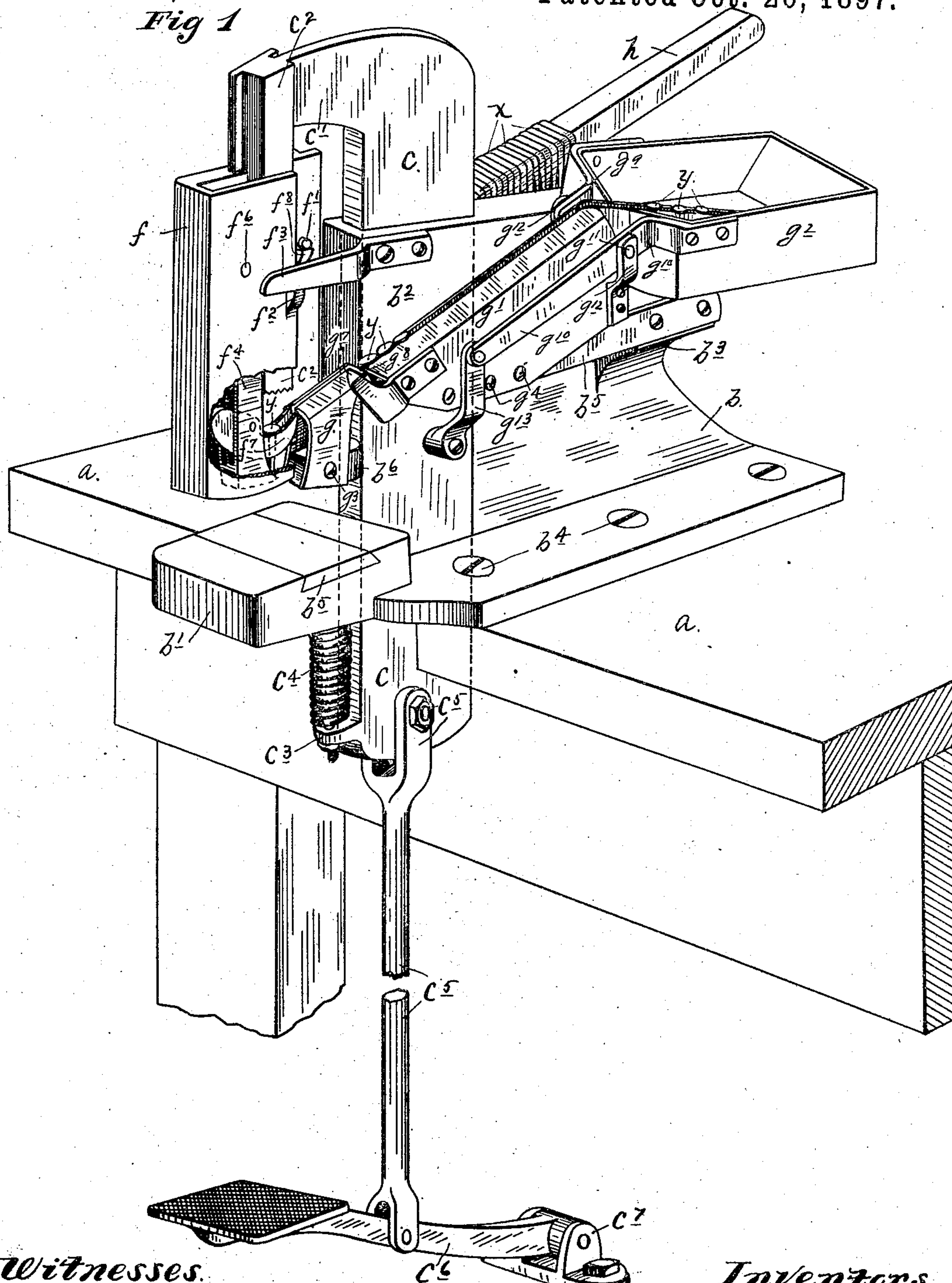
(No Model.)

4 Sheets—Sheet 1.

R. R. QUICKERT & K. LARSON.
NAILING AND STAPLING MACHINE.

No. 592,615.

Patented Oct. 26, 1897.



Witnesses.

C. F. Kilgus
A. D. Merchant

Inventors.
Reinhold R. Quickert,
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By their Attorney

Joseph F. Williamson

(No Model.)

4 Sheets—Sheet 2.

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Fig. 2.

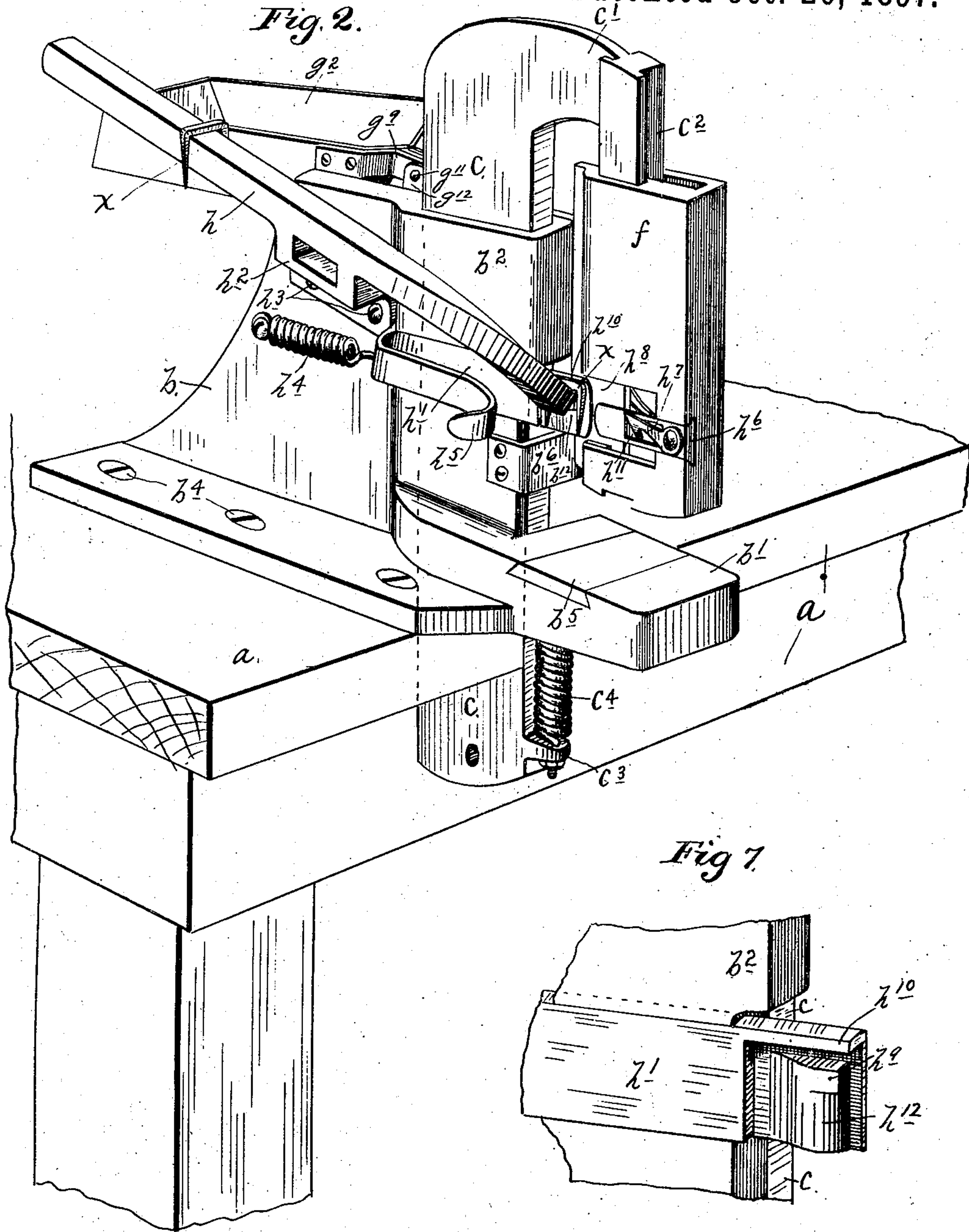
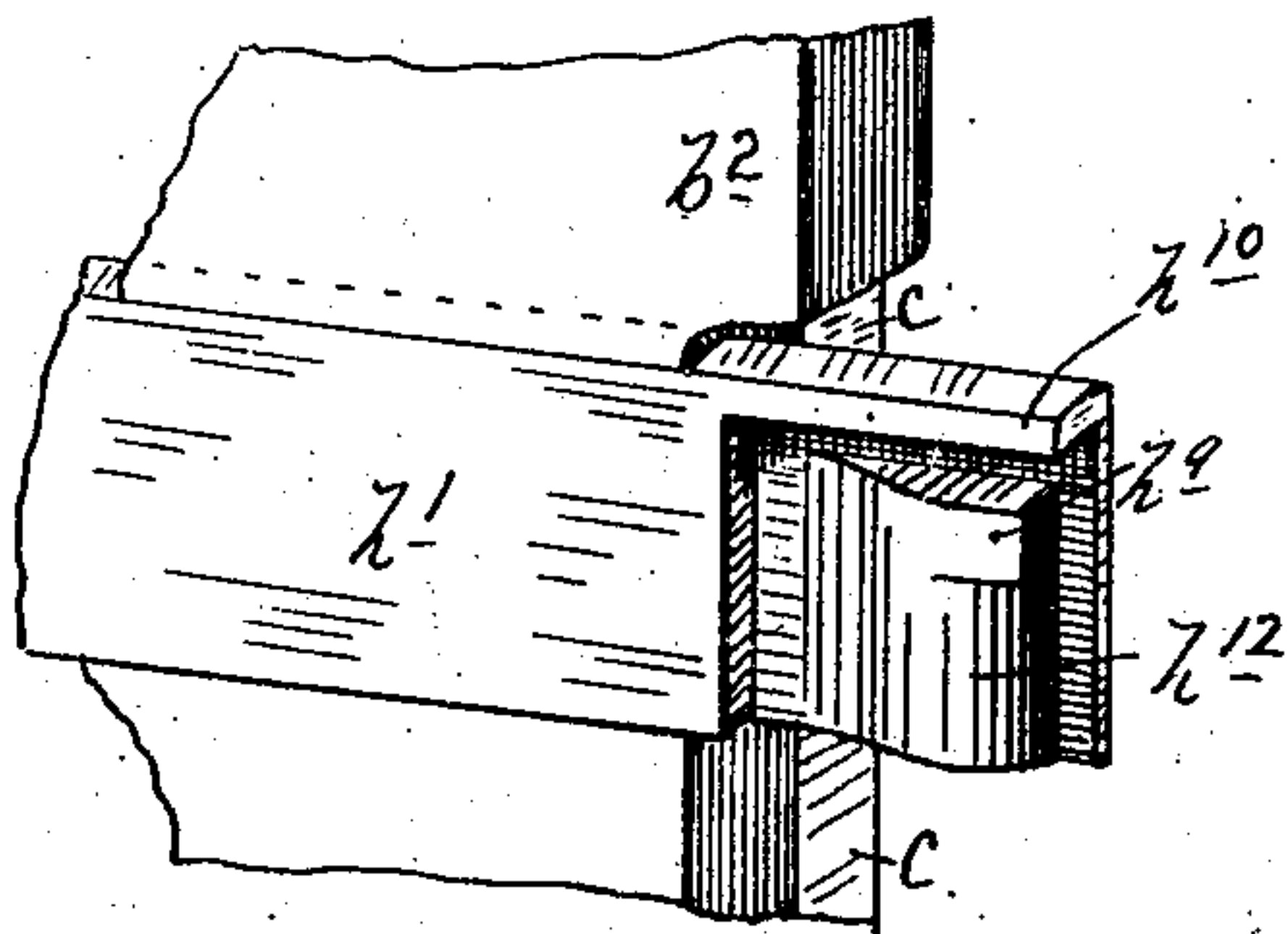


Fig 7.



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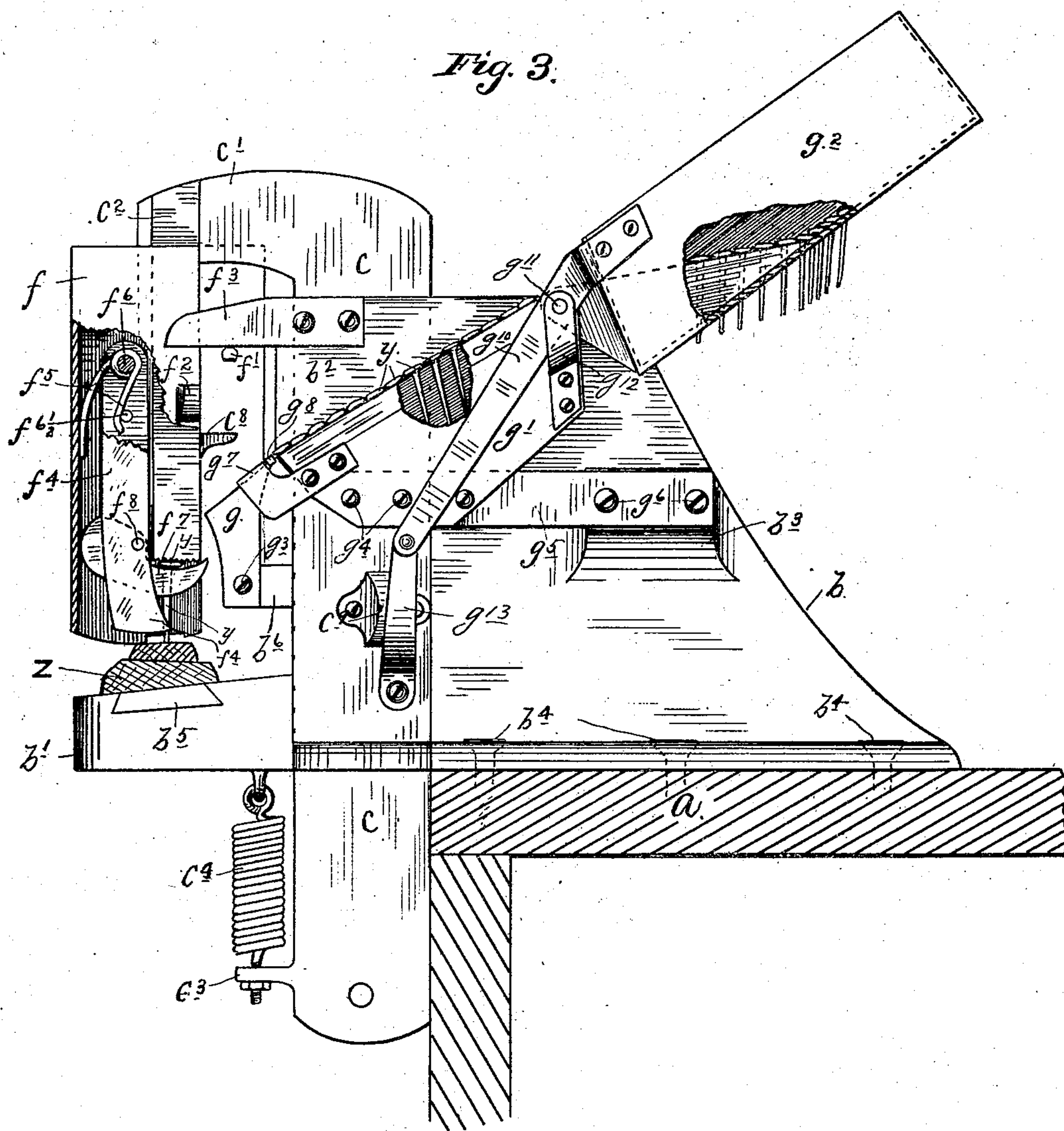
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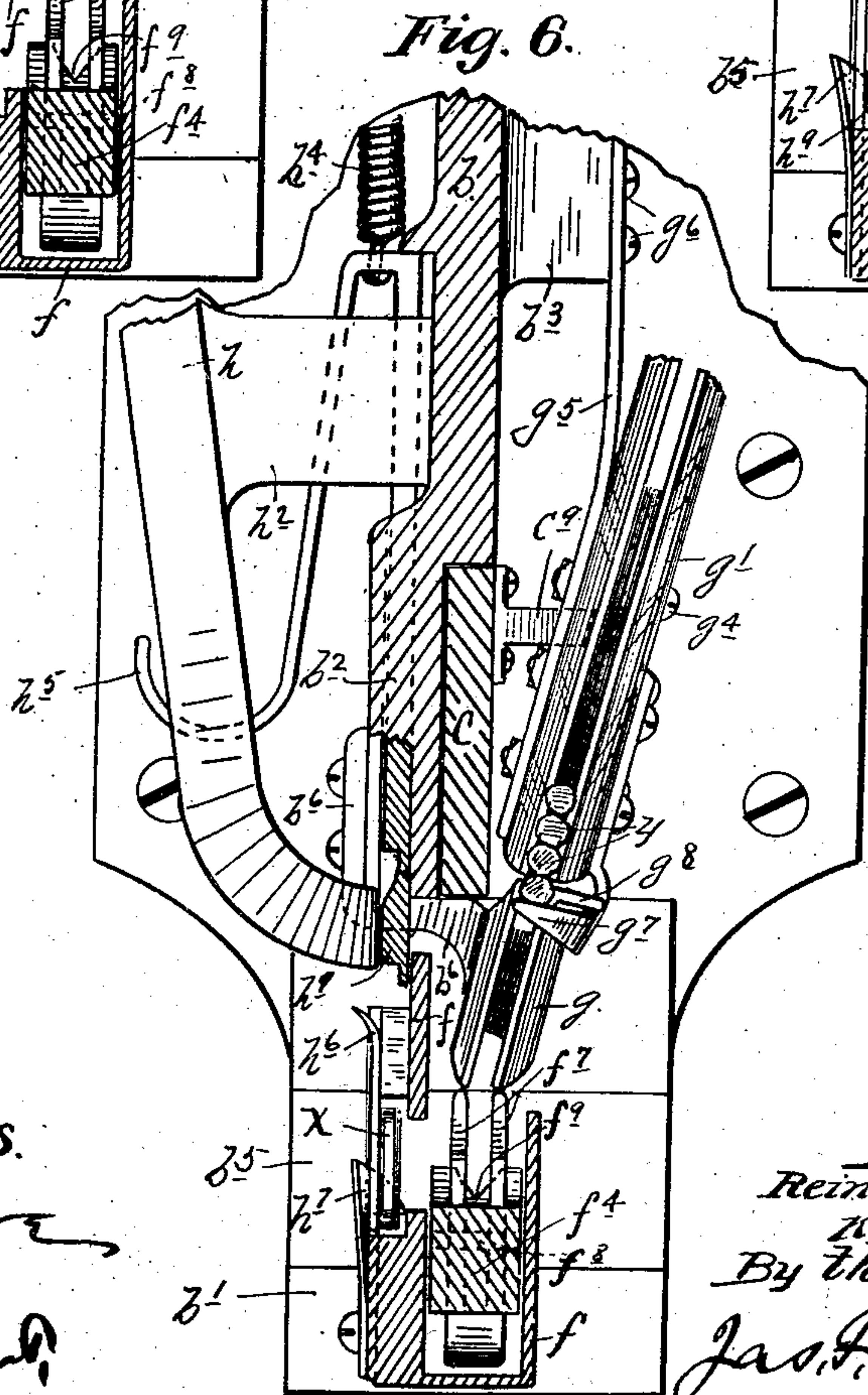
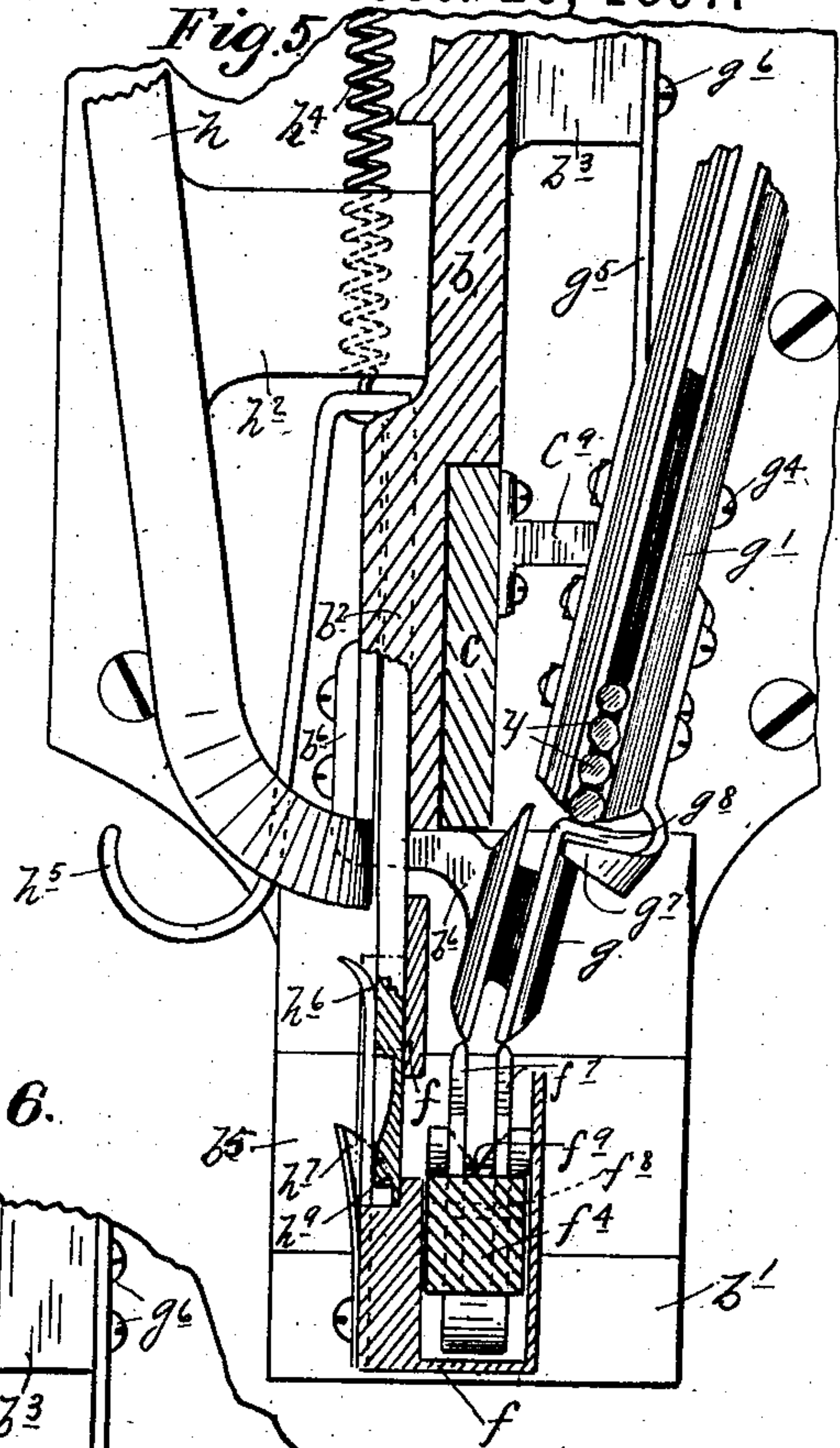
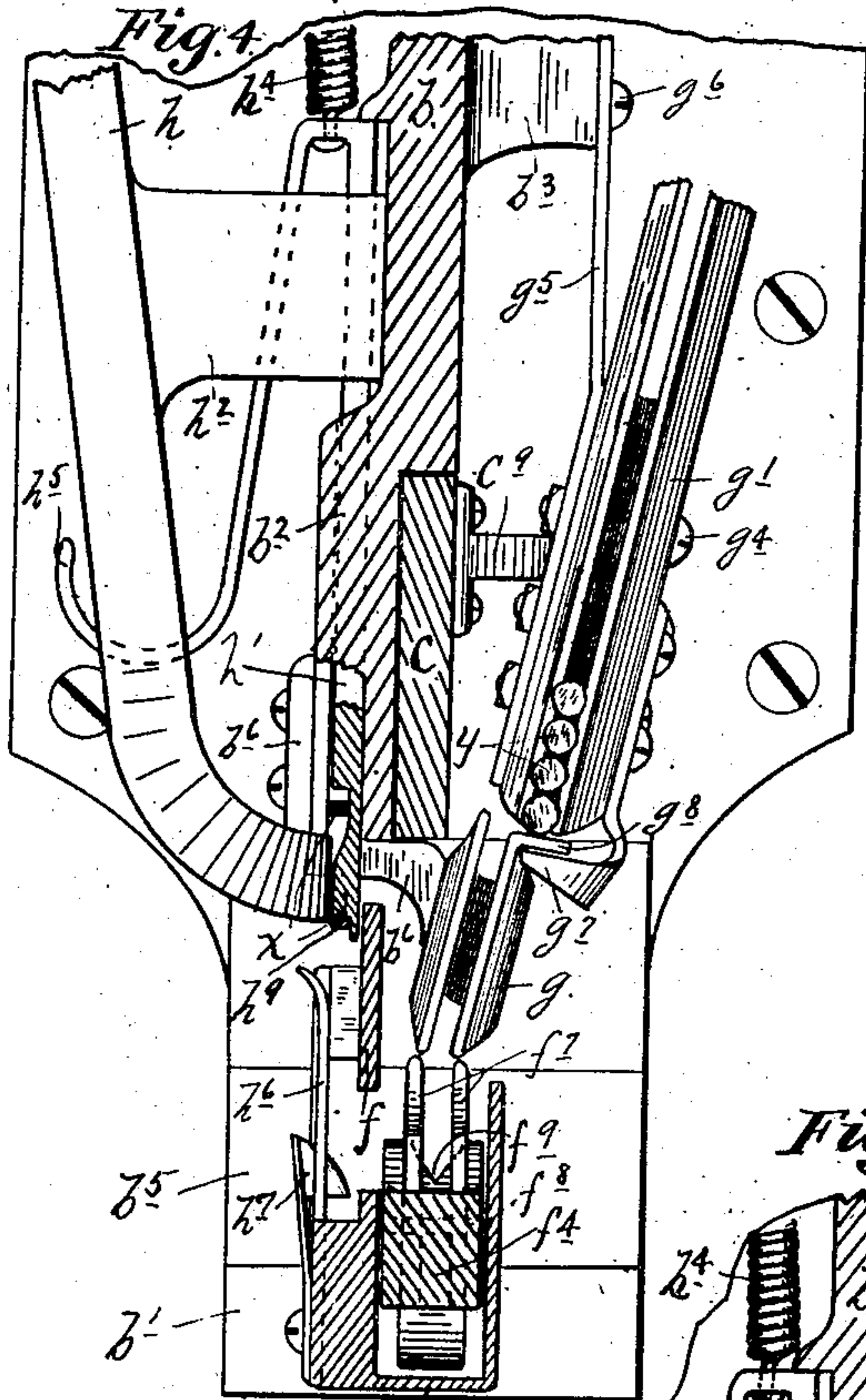
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UNITED STATES PATENT OFFICE.

REINHOLD R. QUICKERT AND KNUTE LARSON, OF MINNEAPOLIS,
MINNESOTA.

NAILING AND STAPLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 592,615, dated October 26, 1897.

Application filed May 6, 1896. Serial No. 590,467. (No model.)

To all whom it may concern:

Be it known that we, REINHOLD R. QUICKERT and KNUTE LARSON, citizens of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Nailing and Stapling Machines; and we 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.

Our invention relates to nail and staple driving machines for fastening the ends of hoops or other similar work, and has for its object to improve the construction with a view of increased convenience, economy, and capacity.

To these ends our invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout the several views—

Figure 1 is a perspective view of the machine, looking from the right, with some parts broken away. Fig. 2 is a perspective view of the machine, looking from the left. Fig. 3 is a right-side elevation of the machine with some parts broken away. Fig. 4 is a detail, partly in horizontal section and partly in plan, showing the relation of the nail and staple feeding devices to the devices for holding the same in driving position, with all of the said parts in their normal positions, as shown in Figs. 1 and 2. Fig. 5 is a view similar to Fig. 4, but with the staple-feed plunger in its outermost or delivering position. Fig. 6 is a view similar to Fig. 4, but with all the parts in the positions shown in Fig. 3 or as they would appear at the initial part of the driving action. Fig. 7 is a detail in perspective, showing the outer end of the staple-feed plunger.

a represents an ordinary work-bench or other suitable support for the machine.

b b' b² b³ represent the body portion or main frame of the machine, which is adapted to be made fast to the bench or other support in any suitable way, as by screws *b⁴*. The said body or frame portion of the machine is

made of cast metal and in the form shown, with the part *b'* projecting outward beyond the parts *b b²* at the front and serving as the anvil-bed or base of resistance to the driver in the nail or staple driving action. The said anvil-bed *b'* is provided with a removable anvil-plate *b⁵* of steel. The part *b²* of the frame-casting is formed with a vertical slot or passage, in which is mounted the blade or bar portion *c* of the driver *c c' c²*. The said part *c²* is the driver proper and is carried at the outer end of the angular or projecting part *c'* of the bar *c*. The bar *c* is provided at its lower end with a lug *c³*, which is connected by springs *c⁴* with the anvil-bed *b'* or other part of the fixed frame and tends to hold the driver in its uppermost or normal position. The lower end of the driver-bar *c* is pivotally connected by rod *c⁵* with a treadle-lever *c⁶*. The treadle-lever *c⁶* is pivoted to a suitable bearing *c⁷*, fixed to the floor or other suitable support within reach of the operator's foot.

It is obvious that under the coöperation of the spring *c⁴* and the treadle *c⁶* the driver may be given a vertical movement in the body-casting as a guide. The part *c²* is the hammer portion of the driver and overhangs the anvil-bed *b'* in line or substantially in line with the center of the anvil-plate *b⁴*. The said hammer *c²* has mounted thereon a holder-head *f*, which is held and guided by the said hammer with freedom for a limited sliding motion thereon, and the coöperating parts are arranged to carry the holder *f* with the hammer *c²* during only a part of the driver's stroke in each direction. For the holding and guiding action of the said parts *c²* and *f*, the hammer *c²* is flanged and works in a corresponding seat of the holder *f*, whereby the parts are made to interlock against lateral displacement, while permitting freedom for relative sliding motion. The holder tends by gravity to assume its lowermost position on the hammer *c²*, and is of a length to reach and be intercepted by the hoop *z* or other article to be nailed or stapled before the driver reaches the limit of its downward stroke, as shown in Fig. 3. The hammer *c²* is provided with a projection *c⁸*, extending rearward through a slot in the holder *f*, adapted to en-

gage with a lateral stud or lug f' on the rearwardly-extended part of the holder for moving the holder upward with the driver on its upward stroke into the position shown in Figs. 1 and 2 or sufficiently far to give the requisite clearance below the holder and over the anvil. The holder f is provided with a lateral lug f^2 , adapted to engage with a stop-finger f^3 , projecting forward from the keeper part b^2 of the frame-casting for intercepting the holder f on its upward movement with the hammer at the proper point for its required cooperation with the feeding devices, as shown in Figs. 1 and 2. The said holder f is suitably recessed, and within the same, directly forward of the hammer-body c^2 , is pivoted a swinging lever f^4 , which is normally held pressing rearward against the body of the hammer c^2 by means of a spring f^5 , shown as wound about the pivot-pin f^6 of the lever with one arm bearing against a stud f^{6a} on the lever, and the other bearing against the forward wall of the holder. The said lever f^4 carries near its lower end a bifurcated or two-pronged nail-holder f^7 , which works in a slot of the said lever f^4 and is pivoted thereon by a pin f^8 , so located with respect to the holder f^7 that gravity will tend to throw the bifurcated or pronged ends of said holder f^7 into their uppermost position, as shown in Fig. 1. The said lever f^4 is curved slightly rearward at its lower end and provided on the rearwardly-projecting portion thereof with a V notch f^9 for cooperation with the prongs of the holder f^7 to hold the nail y in its upright position, as shown in Fig. 3, when ready for the driving action of the hammer.

When all the parts are in their normal position, as shown in Figs. 1 and 2, the prongs of the holder f^7 will be in position to receive a nail from the stationary section g of the nail-feeding magazine $g g' g^2$. The said stationary section g is fixed by screw g^3 or otherwise to a lug b^6 , projecting from the frame-casting. The section g' of the nail-feeding magazine is secured by rivets g^4 or otherwise to the forward end of a stiff flat spring g^5 , the rear end of which is made fast by screws g^6 or otherwise to the projecting lug b^3 of the frame-casting. The said magazine-section g' and the said section g are set on an incline of substantially the same pitch and have top slots or guideways for the nails y , which are adapted to register with each other at the joint between the said sections $g g'$ when the driver is in its lowermost position or, more accurately stated, at all times except when the driver is in its uppermost position. The said spring g^5 thus tends to hold the lower end of the section g' in its inner position with the lower end of the nail-slot of said section g' in registration with the slot of the section g , but the driver-bar c is provided with a cam-lug c^9 on its right face, which under the upward movement of the said bar is adapted to engage behind the forward end of the sec-

tion g' or the flat spring g^5 , carrying the same, and thereby force the forward and lower end of said section g' outward into the position shown in Figs. 1, 4, and 5. The said section g' carries at its lower end a hook-shaped escapement-finger g^7 , the hook portion of which overlaps the top of the stationary section g directly below an outwardly-projecting abutment-finger g^8 on said section g . The said parts g^7 and g^8 cooperate to form a cut-off device operating with an escapement action to feed the nails y from the section g' to the stationary section g under the lateral movement of said section g' , produced by the driver-bar c and the spring g^5 . This action will be readily understood by comparing Figs. 1, 2, 4, and 5 with Figs. 3 and 6.

The upper magazine-section g^2 is of box-like form, having the forward portion of its bottom plate set on an incline and provided with a central slot or guideway for the nails which registers constantly with the upper end of the nail-slot in the section g' . The said box-section g^2 is provided at its forward end with a pair of bearing-lugs $g^9 g^{10}$, which are pivotally secured by pins or pivot-studs g^{11} to bearing-lugs g^{12} , fixed to the upper ends of the section g' . The bearing-lug g^{10} is in the form of a lever with its forward or long arm connected to the upper end of a link g^{13} , which is pivoted to and carried by the driver-bar c . Hence under the reciprocating motion of the driver the box-section g^2 of the magazine will receive an up-and-down pivotal motion on the centers g^{11} , which motion will insure the loading of the nail-slot in the section g^2 and the delivery of the nails therefrom to the section g' . Hence by the said nail-feeding devices above described the nails y will be delivered as required to the holding and the driving devices. Under the downward motion of the hammer c^2 in the driving action the holder f^7 and the lower end of the lever f^4 will be cammed forward in the proper time for releasing the nail to be driven and permitting the necessary clearance for the full stroke of the hammer required to drive the nail home into the hoop z or other article to which the same is being applied. Under the cooperation of the anvil-block b^5 with the hammer the driven nail will be clenched in its driven or working position.

For the purpose of simplicity of statement the devices for feeding, holding, and driving the nails y have been traced through to their final result without detailing the staple feeding and holding devices. These will now be specified.

To the left side of the frame-casting is fixed in an inclined position a staple-magazine, which is in the form of a guide-rail h , curving inward and downward at its lower end in position to deliver the staples x to the forward end of a horizontal feed-plunger h' . The guide-rail h for the staples x has formed integral therewith an angular lug h^2 , which is

made fast by set-screws h^8 or otherwise to the frame-casting as a means of supporting the rail h in proper working position.

The plunger h' is mounted and guided by a suitable horizontal seat in the frame-casting and is held from lateral displacement therein. The said plunger h' is normally held in its rearmost position by a spring h^4 , connecting the same to the frame-casting, but is provided with a finger-pull h^5 , by means of which it may be thrown forward against the tension of the spring h^4 for delivering the staples, one at a time, to the staple-holding devices $h^6 h^7$ on the holder-head f . The holder-head f has its left side plate cut away, as shown at h^8 in Fig. 2, for permitting the plunger h' to move outward therein when the driver and the holder-head are in their uppermost or normal position. The outer end of the plunger h' is provided on its left face with a raised surface h^9 of the proper size to receive one of the staples x and with a top lip or flange h^{10} , under which the staple rests when on the surface h^9 , as shown in Fig. 2. The space between the plunger h' and the delivery end of the rail h is such that only a single staple can be delivered at a time to the plunger. The surface h^9 on the plunger h' is set back a short distance from the outer end of the plunger, so as to permit the plunger readily to enter between the inner end of the spring-finger h^6 , carried on the holder-head, and pass behind the spring-hook h^7 , the hook end of which is curved laterally inward toward the center of the holder-head f and works through a slot h^{11} in the finger h^6 .

The raised part h^9 on the plunger h' is provided with a beveled or cam surface h^{12} , extending from its lower margin upward near to, but stopping short of, the upper corner of said surface h^9 , so as to leave the upper forward corner projecting outward beyond the cam-surface h^{12} . In virtue of the said details at the outer end of the plunger h' and the construction and relative position of the parts h^6 and h^7 on the holder-head f the said plunger h' can be made to deliver the staples x to the parts h^6 and h^7 . Under the outward movement of the plunger h' the staple will be carried in behind the finger h^6 and the spring-hook h^7 , the cam-surface h^{12} forcing the hook h^7 laterally outward through the slot h^{11} of the finger h^6 until the staple has passed by the intumed hook end of the part h^7 . Then when the said plunger h' is released by the operator and is retracted by the spring h^4 the intumed lip of the hook h^7 will ride against the surface h^{12} of the plunger and catch behind the outer leg of the staple, thereby preventing the staple from moving backward with the plunger. In order that the staple may thus be stripped off from the raised surface h^9 on the plunger h' , the said raised surface h^9 tapers rearward, so as not to present any projecting part which can engage with the rear leg of the staple.

In the manner thus described the staples can be delivered one at a time to the holding devices $h^6 h^7$, at the left side of the holder-head f , and the said staple will then be held by the said parts h^6 and h^7 in proper position for driving, as shown in Fig. 6. The lower end or head of the hammer c^2 is of sufficient width or area in cross-section to cover the staple and the nail when held on their respective holding devices within the holder-head f . Hence it is possible to drive a staple and a nail at one and the same time, and this use would be made of the machine at the last stroke of the driver when using the machine for making hoops. On the downward movement of the driver the hammer c^2 acts with a camming action on the hook h^7 , thereby causing the hook to release the staple or, more accurately stated, forcing the staple past the hook in the driving action.

With the said mechanism above described the staples may be fed to the staple-holders $h^6 h^7$ at the will of the operator and be driven in the same way as the nails by the common driver under the treadle action.

It is of course obvious that the staple-feeding mechanism is normally idle, and hence that under the treadle action nails will be driven without driving a staple except when the staple-feed device is operated by the hand of the operator. Nails may therefore be driven without driving the staples. By rendering the nail-feeding mechanism inoperative in any way it is also obvious that staples may be driven without driving nails. The nail-feed may be prevented without changing the mechanism by holding back the column of nails by hand, which can be readily done by simply placing a finger over the stationary section g of the nail-magazine. The nail-feed may, however, be readily rendered inoperative by simply removing the cam-lug c^9 , carried on the driver-bar c , for producing the lateral movement of the magazine-section g' . Hence with this machine nails and staples can either be simultaneously or independently driven at the will of the operator.

It will be understood that many of the details of the construction might be changed without departing from the spirit of our invention.

By actual usage we have demonstrated the efficiency of the machine herein disclosed for the purposes had in view.

What we claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a nailing and stapling machine, the combination with a driving device, of independent feeding and holding devices for the nails and the staples, respectively, whereby a nail and a staple may be driven at the same time or either can be driven alone, at the will of the operator, substantially as described.

2. In a nailing or stapling machine, the combination with holding and driving devices, of a three-section nail-feeding magazine, set

on an incline, with the lowermost section stationary, the middle section subject to sidewise motion, at its delivery end, for cooperation with said fixed section to feed the nails, one at a time, with an escapement action, and the upper section of box-like form and subject to an up-and-down pivotal motion, for loading the nail-slot therein and feeding the nails to the middle section, substantially as described.

3. In a nailing-machine, the combination with the holding and driving devices, of nail-feeding devices comprising the fixed magazine-section g , the sidewise-movable magazine-section g' , and the cut-off or escapement devices g^7 and g^8 with the latter carried by the fixed magazine g , and the former carried by the sidewise-movable magazine g' , and cooperating to effect the feed with an escapement action, substantially as described.

4. In a nailing-machine, the combination with the driving and the feeding devices, of the holding devices, comprising the head f , movable on the hammer c^2 , the pivoted lever f^4 carried by the head f and subject to the spring f^5 , the bifurcated holder f^7 , working in a slot of the lever f^4 and pivoted thereto, so that gravity will tend to throw its bifurcated end uppermost, the V-notch f^9 , in the lower end of the lever f^4 , the lug c^8 on the hammer-head, cooperating with the lug f^6 on the holder, and the lug f^2 on the holder, cooperating with the stop-finger f^3 , projecting from the frame-casting, all for cooperation, substantially as described.

5. In a stapling-machine, the combination with a driving device and an anvil, of staple-feeding devices comprising a staple-magazine, a plunger having a raised surface adapted to receive one staple at a time from said magazine and to carry the same into the path of said driving device, and a spring hook or detent adapted to engage said staple, when so moved, and to prevent the same from return movement with said plunger, substantially as described.

6. In a stapling-machine, the combination with a driving device and an anvil, of staple-feeding devices comprising a staple-magazine, positioned for gravity feed, a plunger having a raised profile-surface, shaped to be embraced by the staples, and adapted to receive the same from the magazine, one at a time, and holding devices carried by the driver, for receiving the staples from the said

plunger and holding the same in driving position, substantially as described.

7. In a stapling-machine, the combination with a driving device and an anvil, of the feed-magazine in the form of the inclined rail h , turned downward and inward, at its lower end, the feed-plunger h' , provided with the raised profile-surface h^9 , shaped to be embraced by the staples and adapted to receive the same from said rail h , one at a time, and having the undercut cam-surface h^{12} , at its forward edge, and the holding devices, comprising the holder-head f movable on the hammer c^2 , and provided with the spring-finger h^6 and the spring-hook h^7 having an inturned lip working through a slot, in the finger h^6 , and cooperating with the surface h^{12} of the plunger h' , to strip the staple from the plunger, and hold the same, in driving position, after the plunger is retracted, substantially as described.

8. The combination with the driver and the anvil, of the rail h , the plunger h' , subject to the spring h^4 , and having the finger-pull h^5 , the raised profile-surface h^9 , on the outer end of said plunger, shaped to be embraced by the staples tapering rearward and provided with the undercut cam-surface h^{12} , the lip h^{10} on said plunger, the holder-head f , provided with the guideway h^8 , for the feed-plunger h' , the finger h^6 on said head, projecting into the guideway h^8 and having the slot h^{11} , and the spring-hook h^7 , provided with an inturned lip, working through the said slot h^{11} of the finger h^6 , all for cooperation, substantially as described.

9. In a machine of the class described, the combination with a driving device and an anvil, of a staple-feeding device comprising a staple-magazine, a plunger or sliding part having a surface or device for receiving one staple at a time from said magazine and to carry the same into the path of said driving device, and a detent or catch adapted to engage said staple, when so moved, and to prevent the same from return movement with said plunger, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

REINHOLD R. QUICKERT.
KNUTE LARSON.

Witnesses:

JAS. F. WILLIAMSON,
E. F. ELMORE.