

No. 747,848.

PATENTED DEC. 22, 1903.

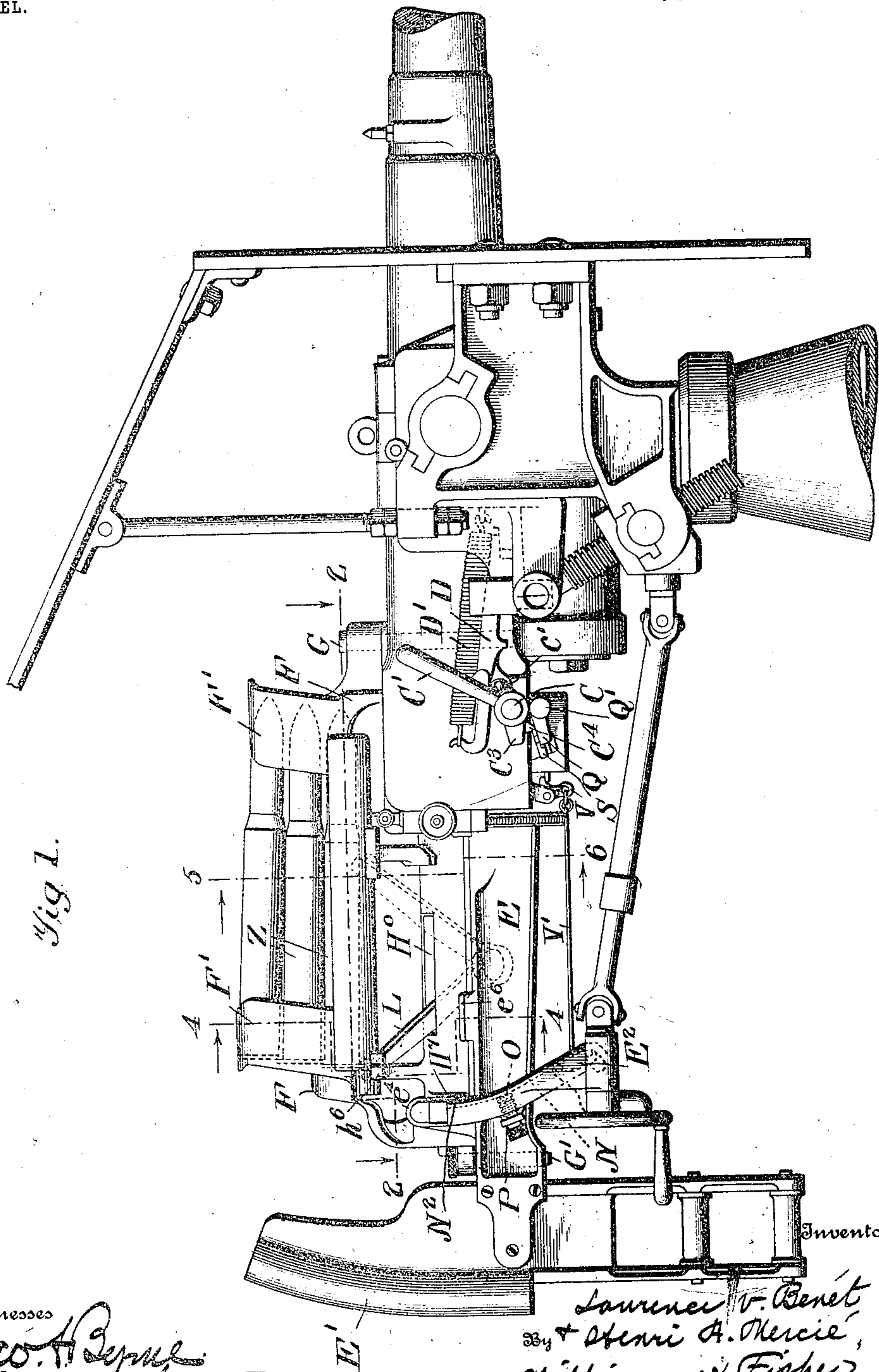
L. V. BENÉT & H. A. MERCIÉ.

AUTOMATIC OR SEMI-AUTOMATIC ATTACHMENT FOR QUICK FIRING GUNS.

APPLICATION FILED OCT. 30, 1902.

7 SHEETS—SHEET 1.

NO MODEL.



Witnesses

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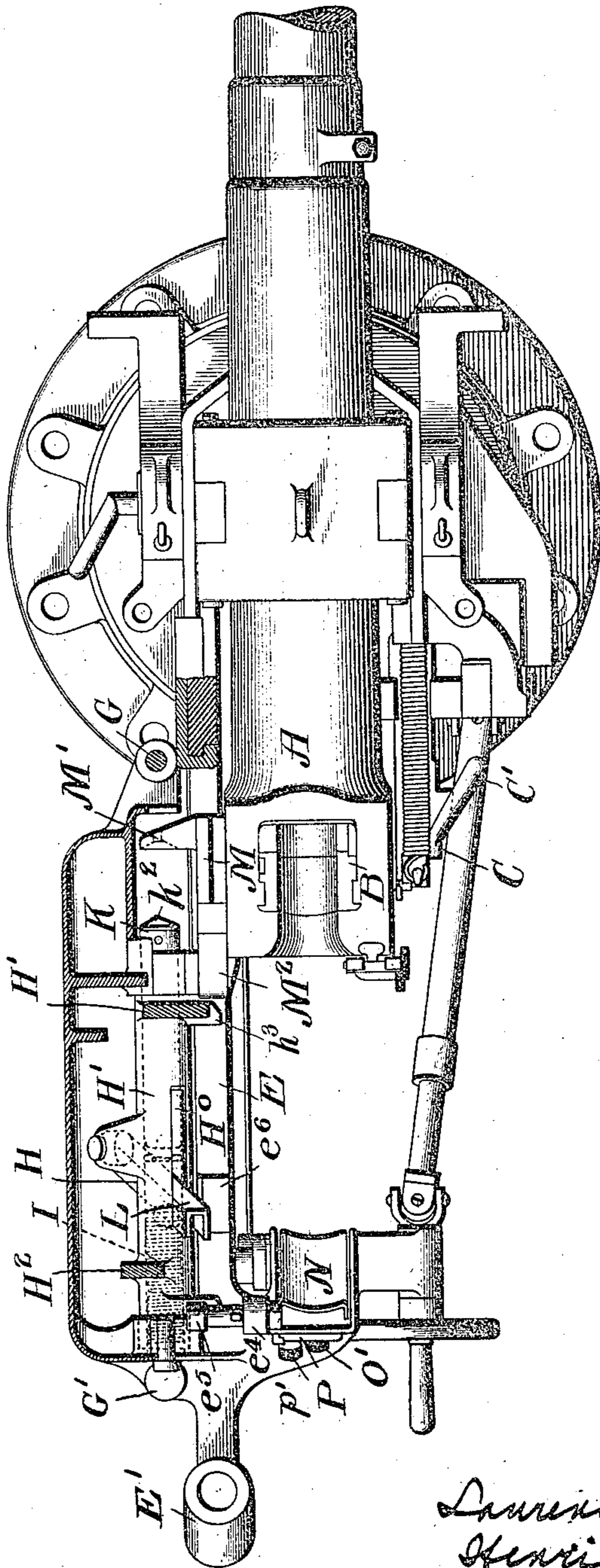


Fig. 2

Witnesses

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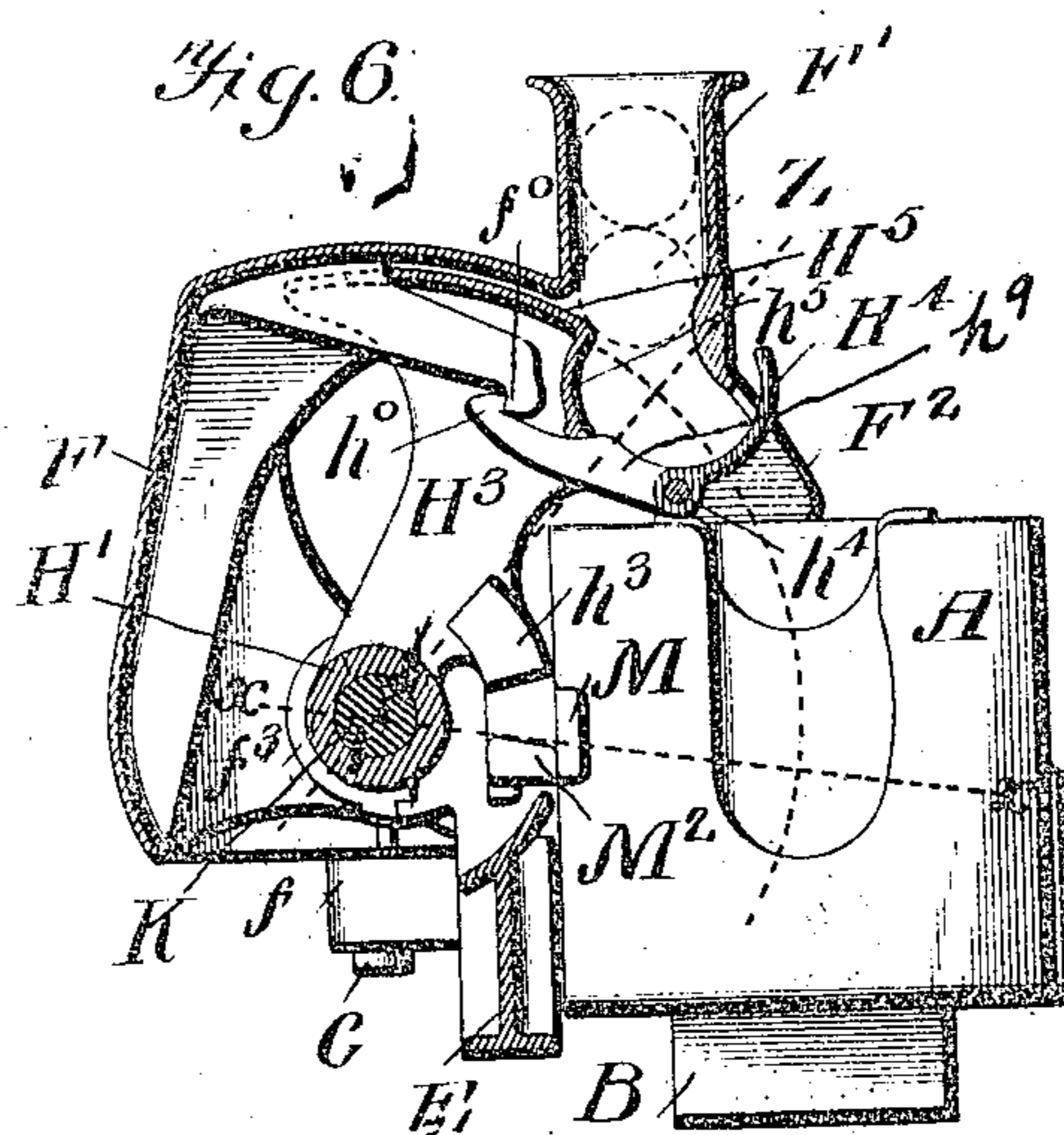
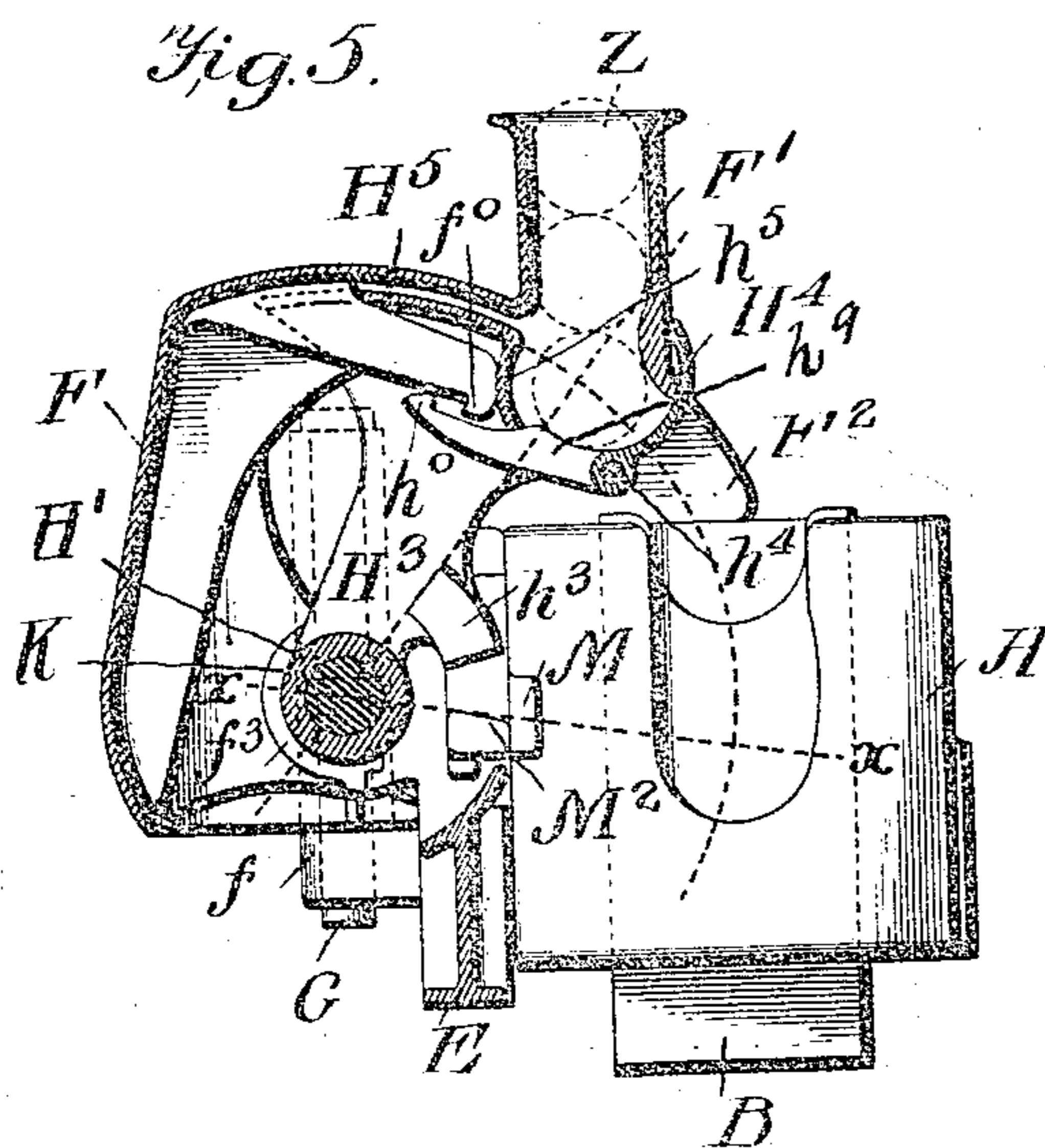
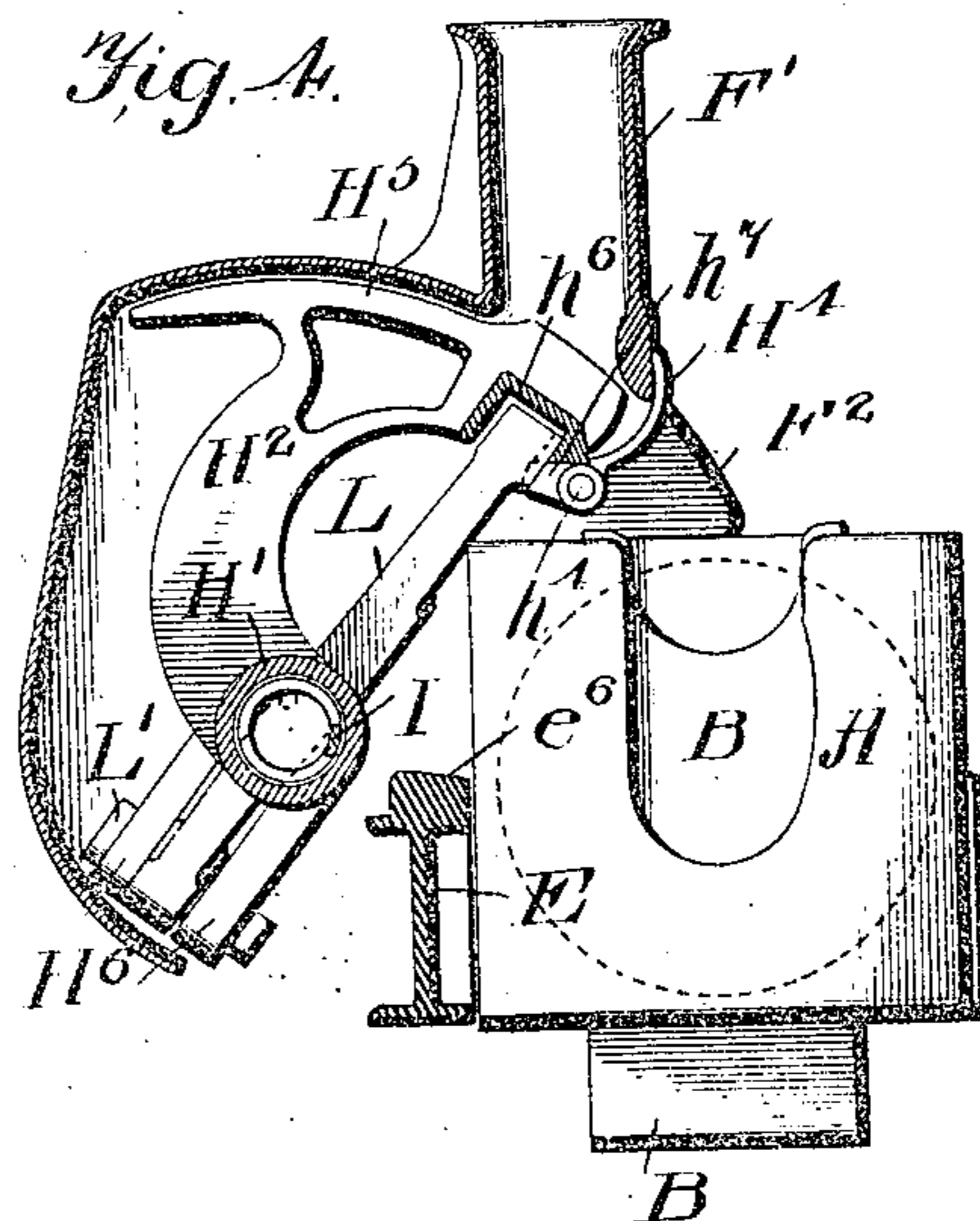
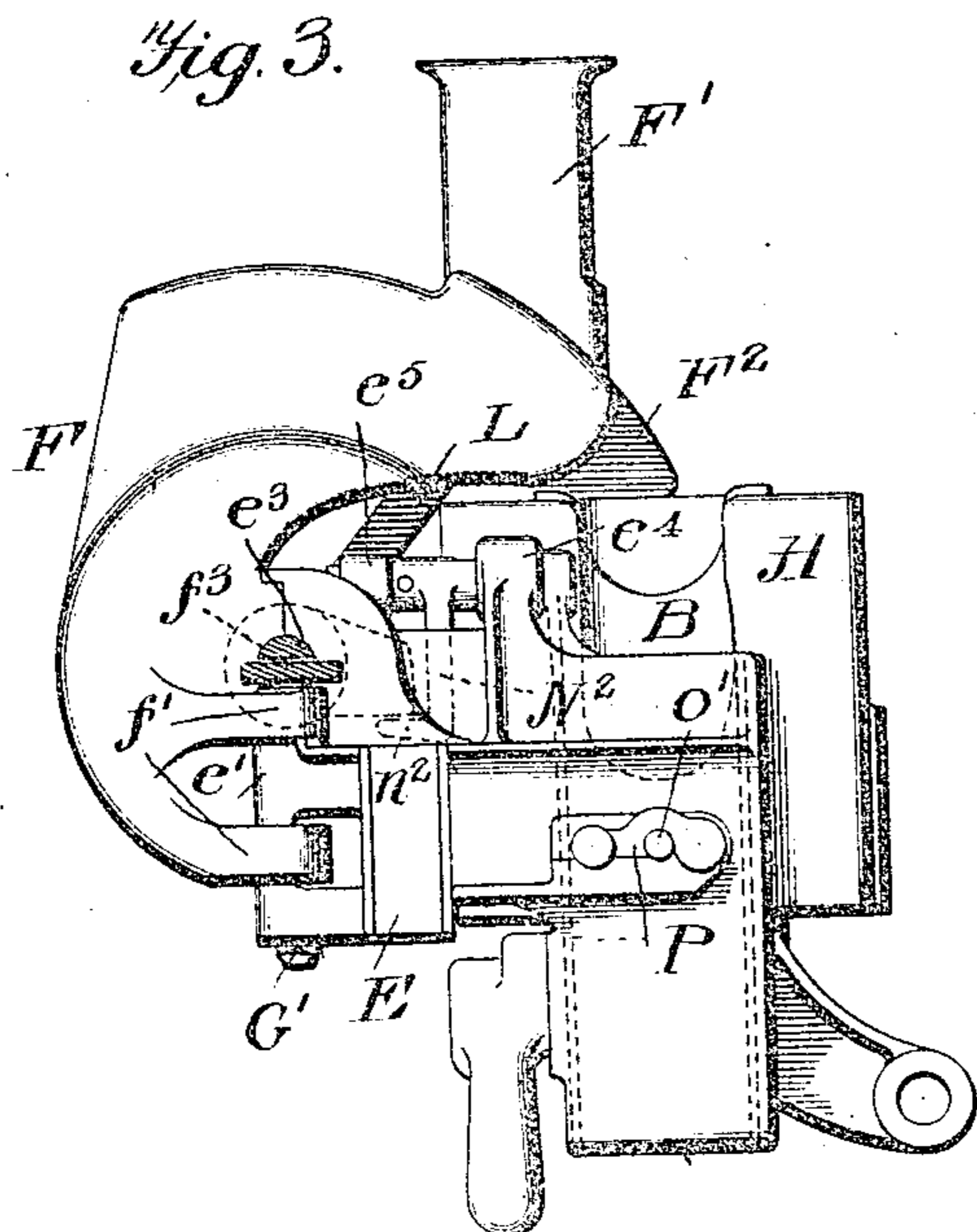
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7 SHEETS—SHEET 3.



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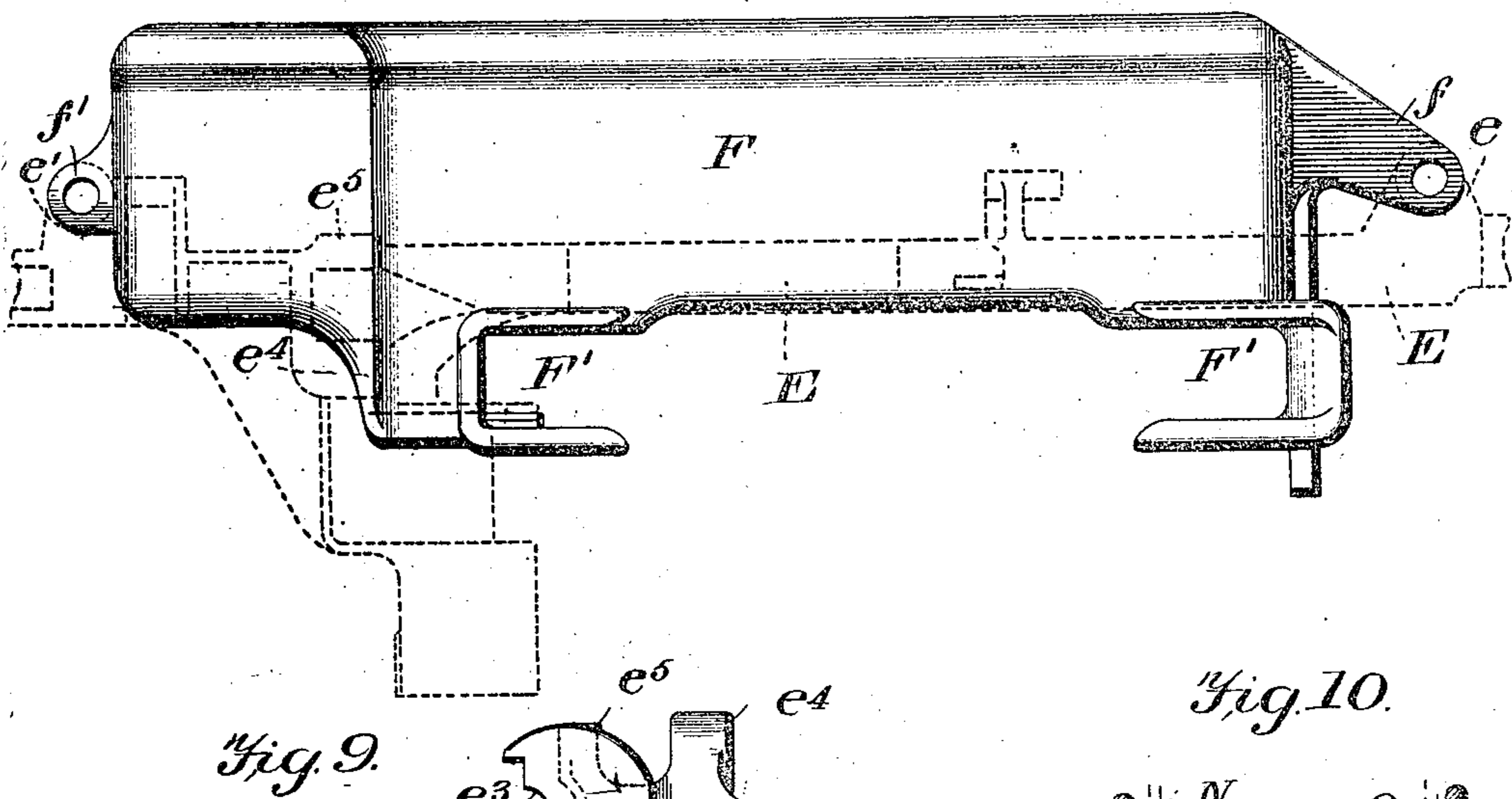
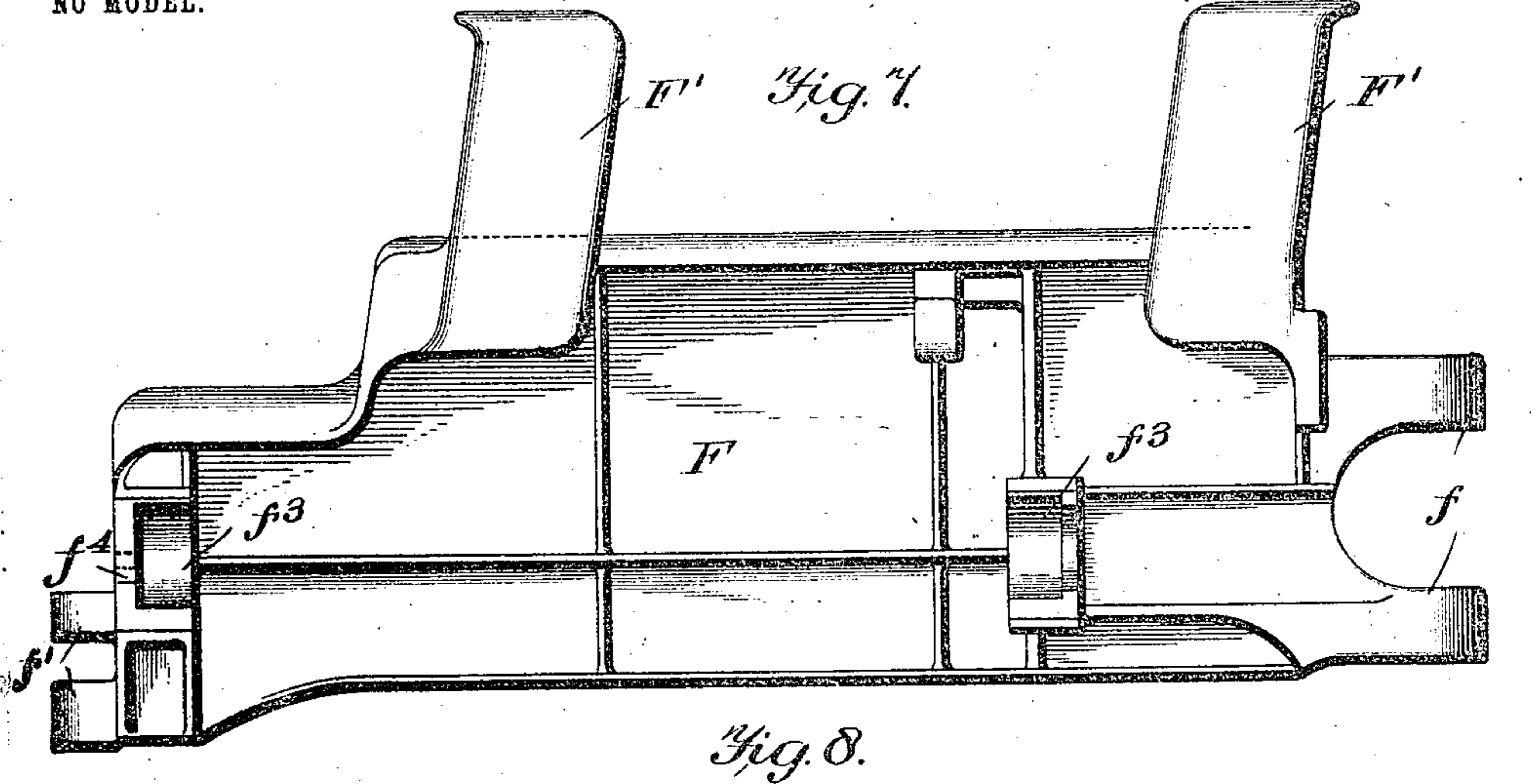
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NO MODEL.

7 SHEETS—SHEET 4.



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7 SHEETS—SHEET 6.

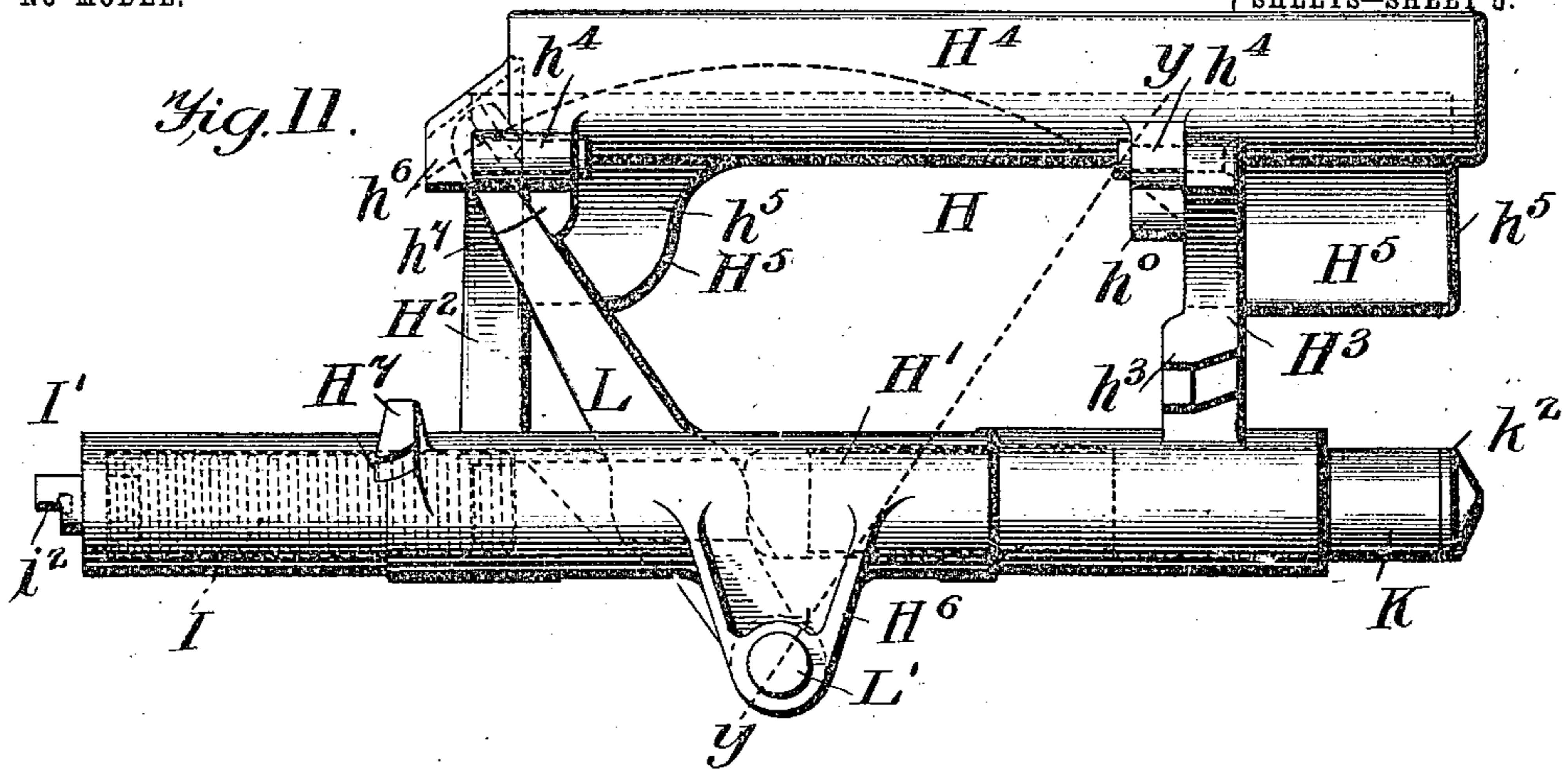


Fig. 11^a.

Fig. 11^b.

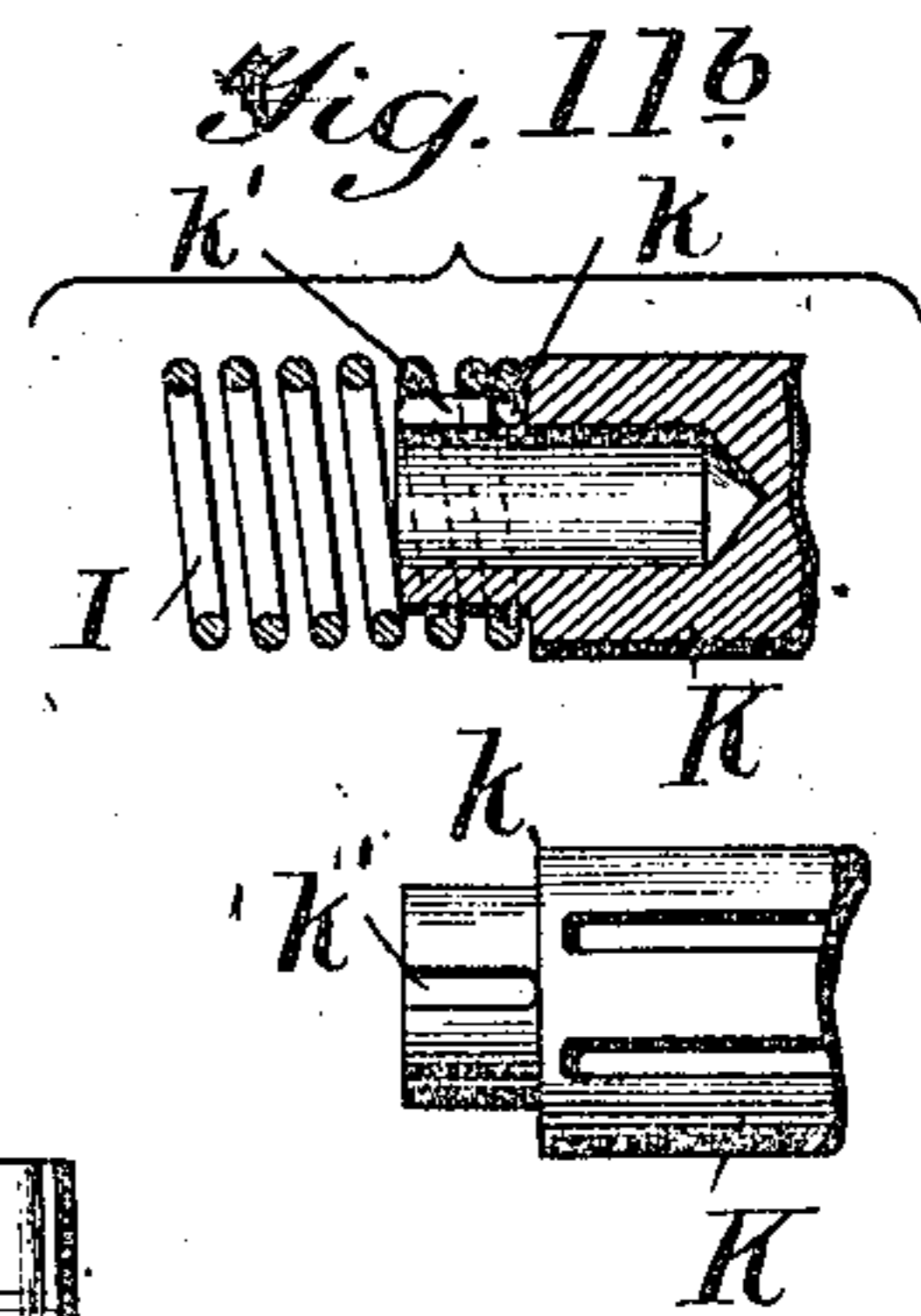
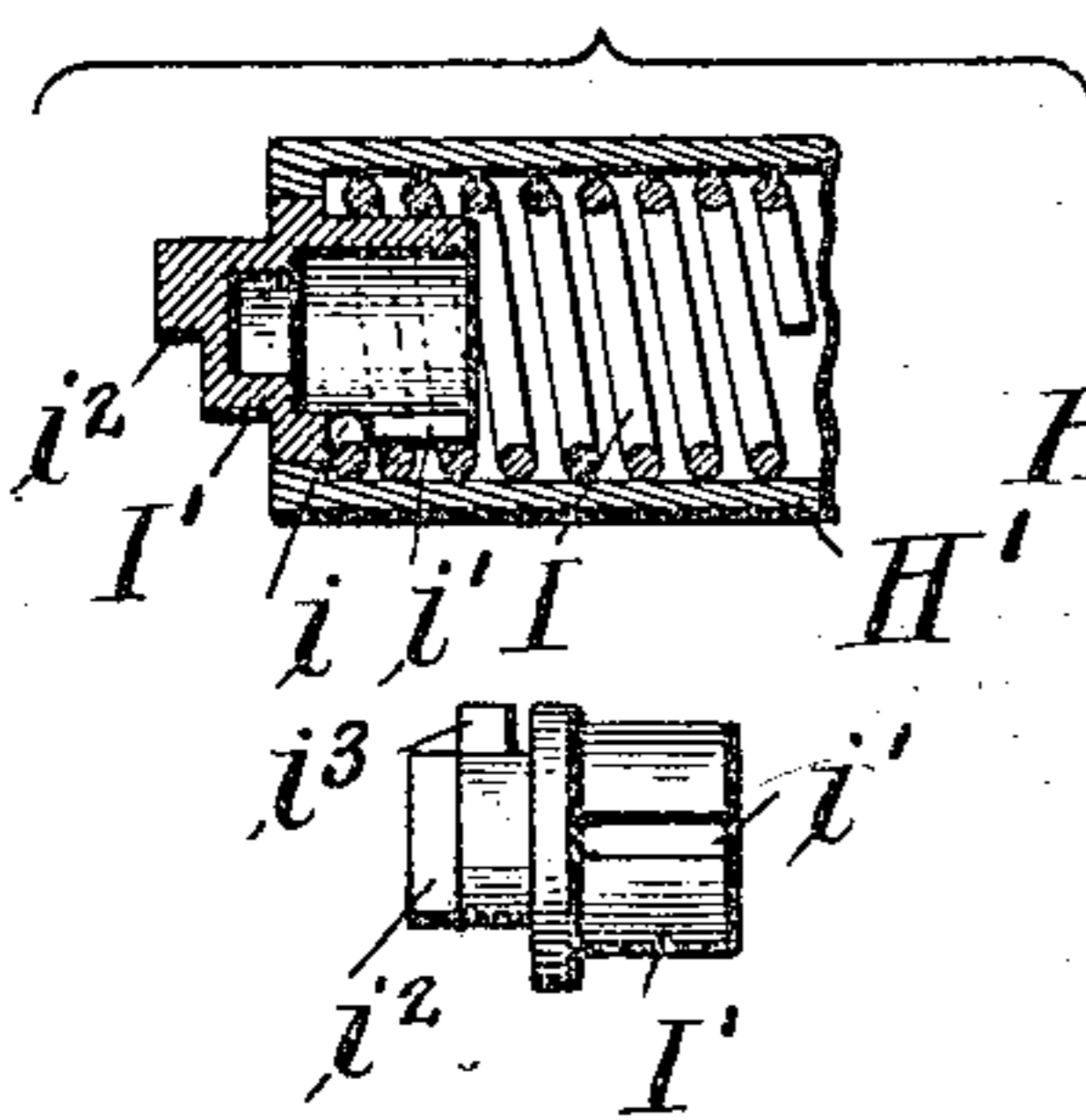


Fig. 14.

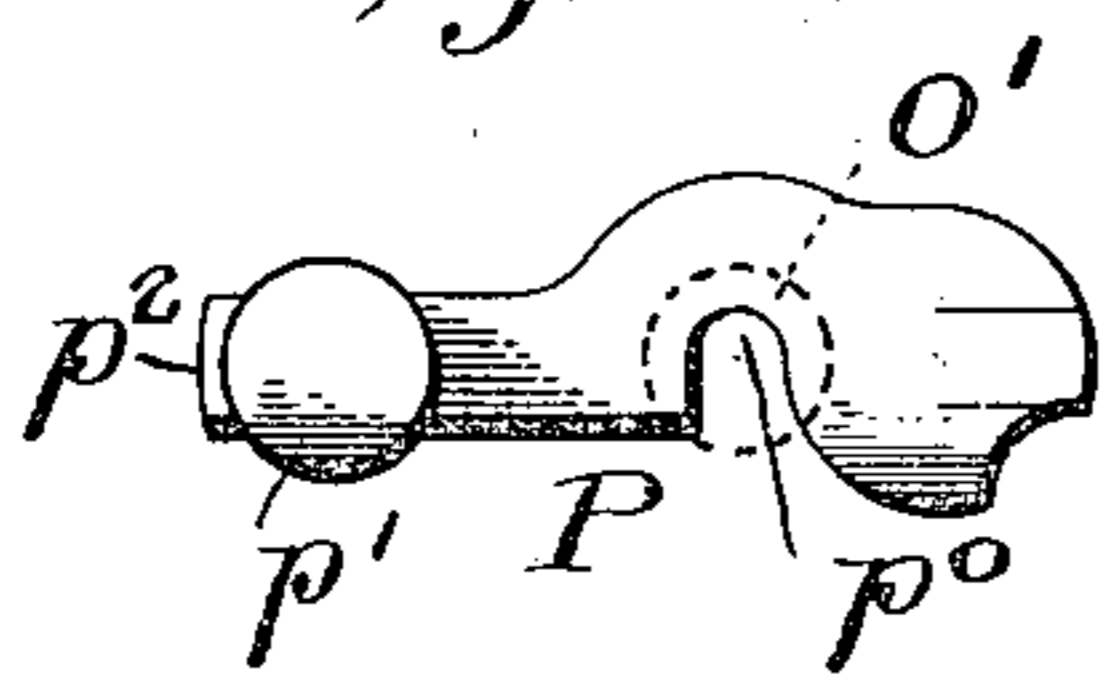


Fig. 15.

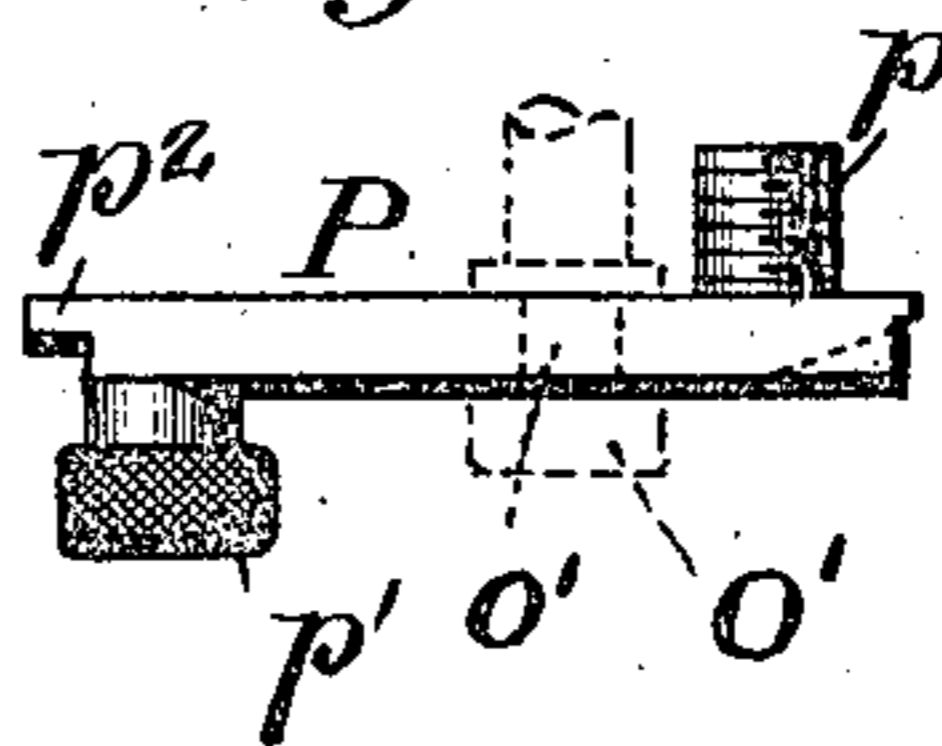
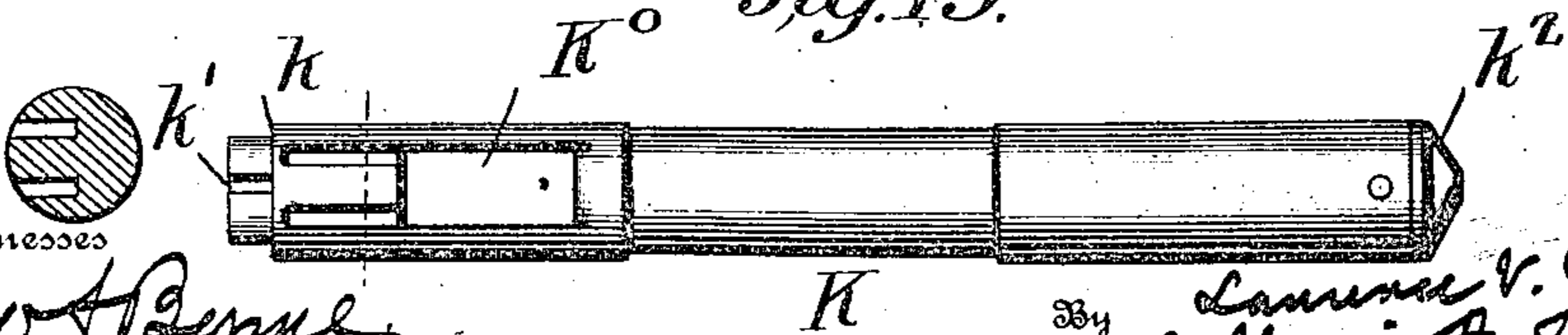


Fig. 13.



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Witnesses

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Fig. 16.

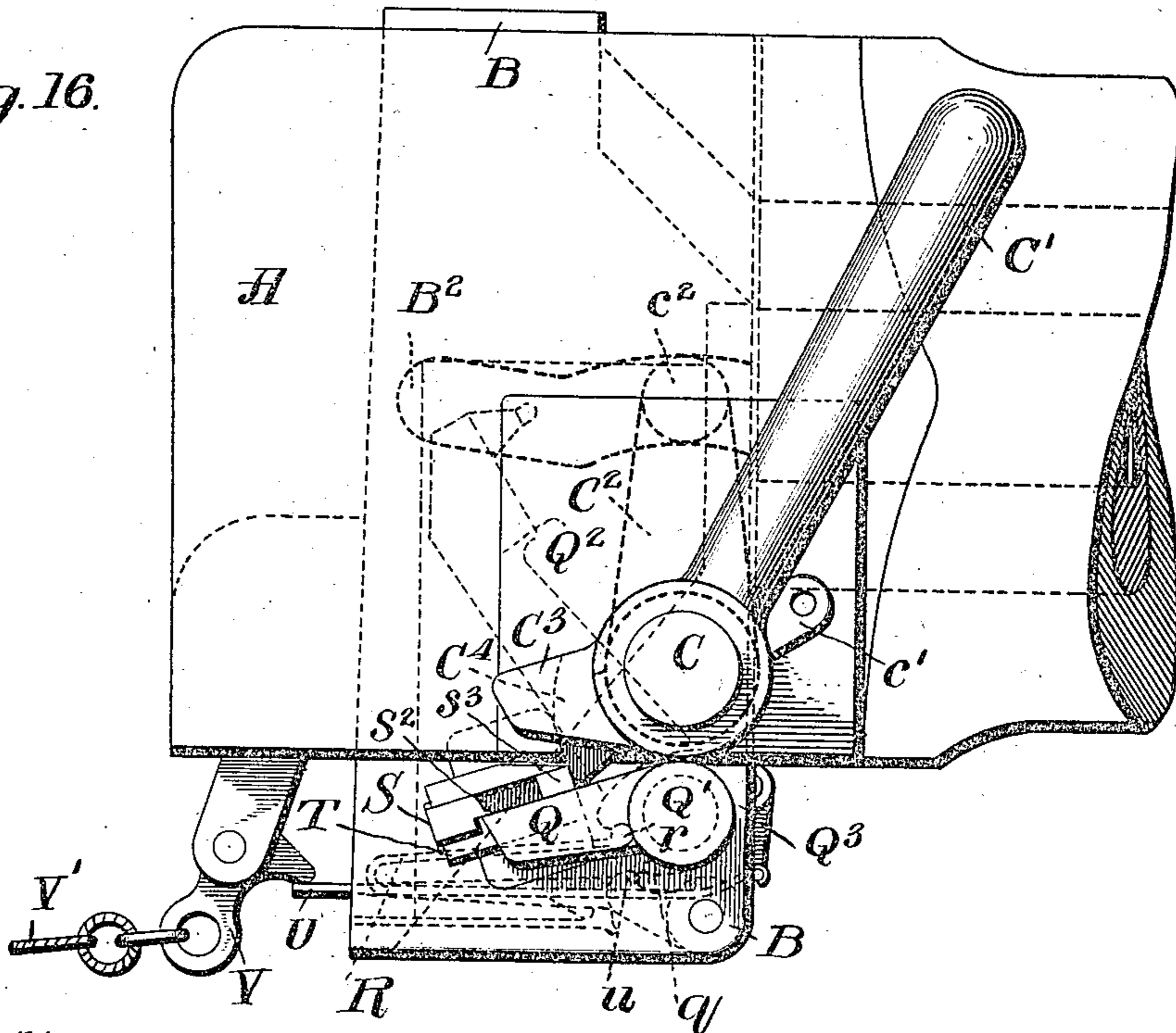


Fig. 17.

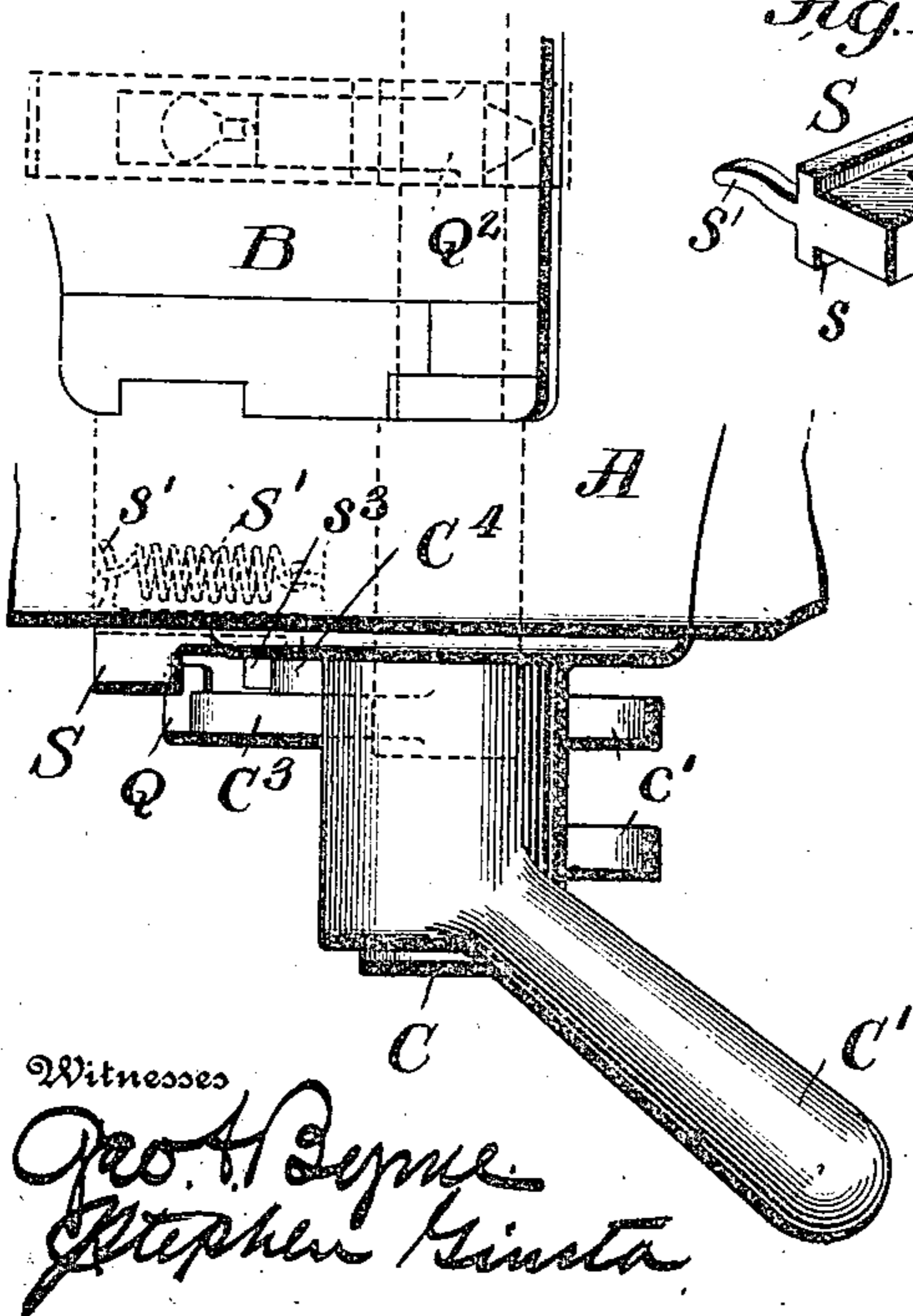


Fig. 19.

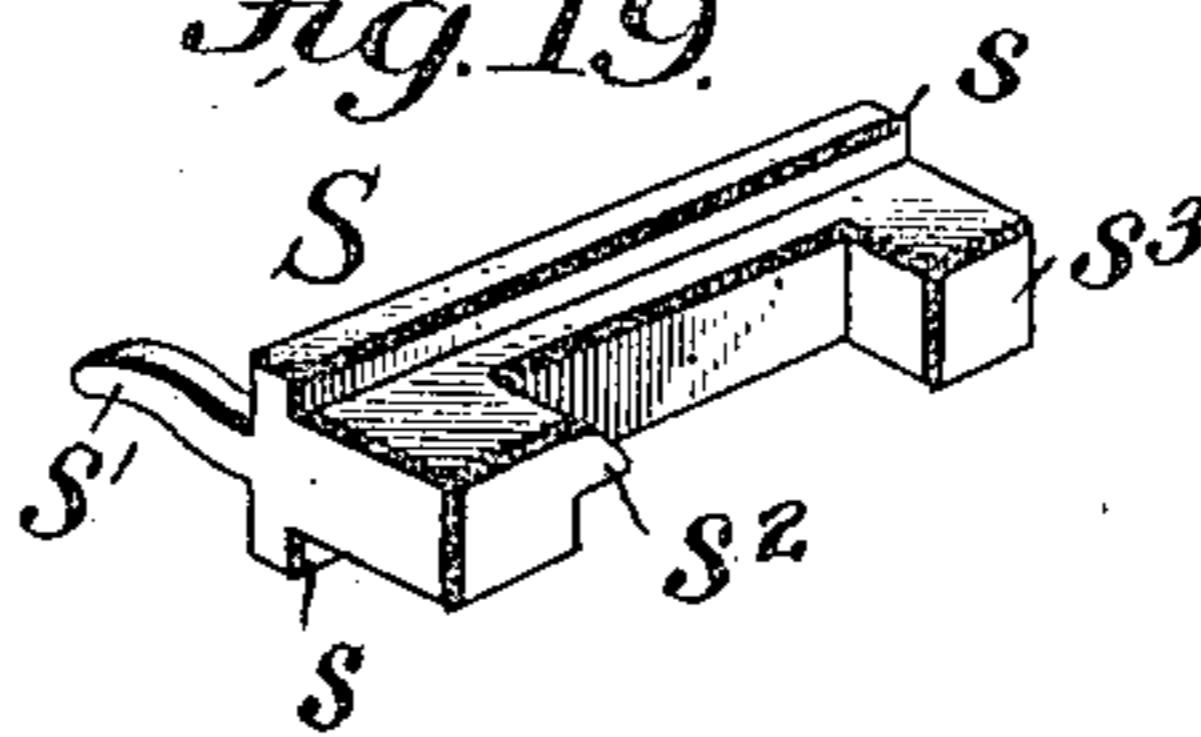
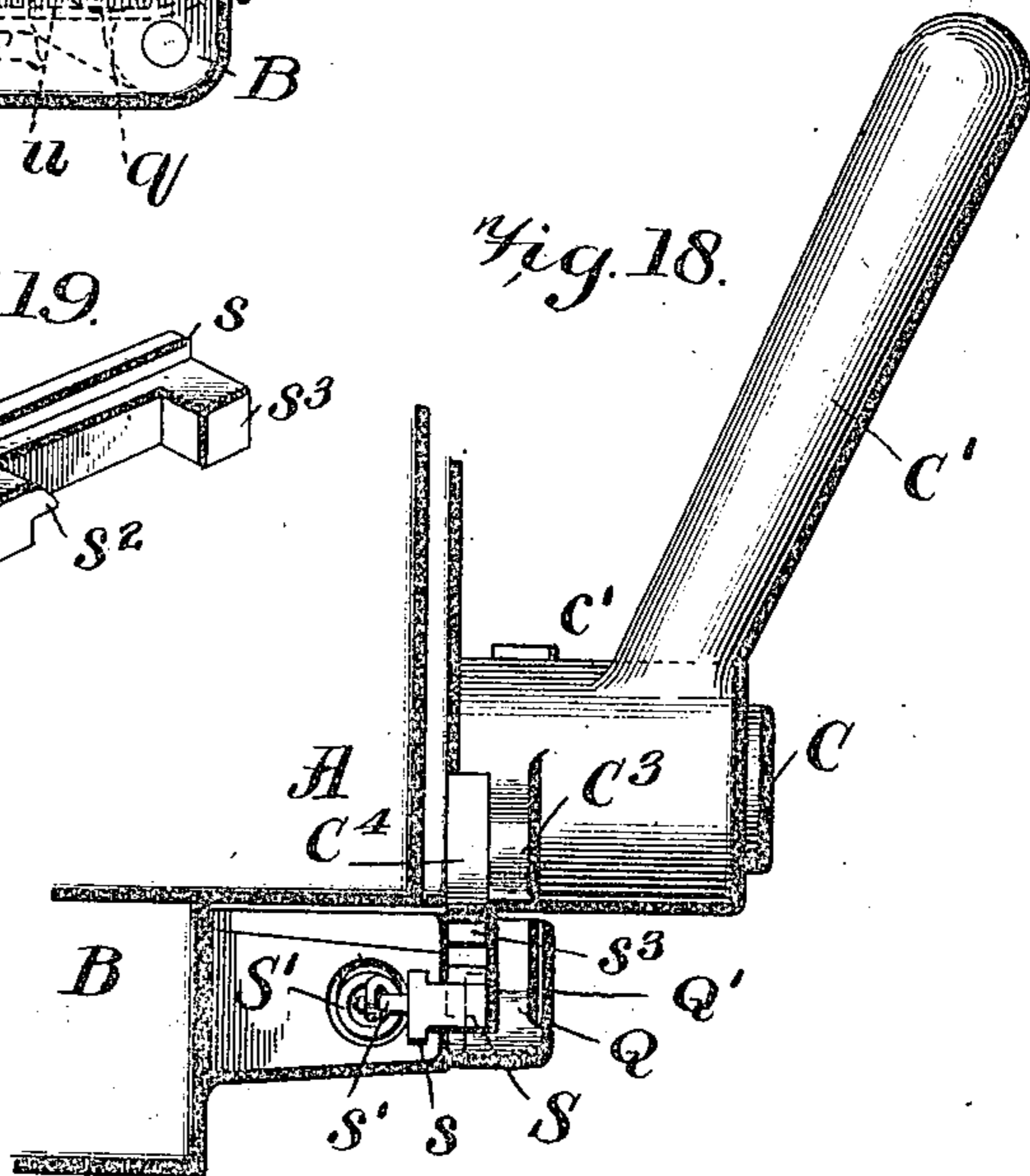


Fig. 18.



Witnesses

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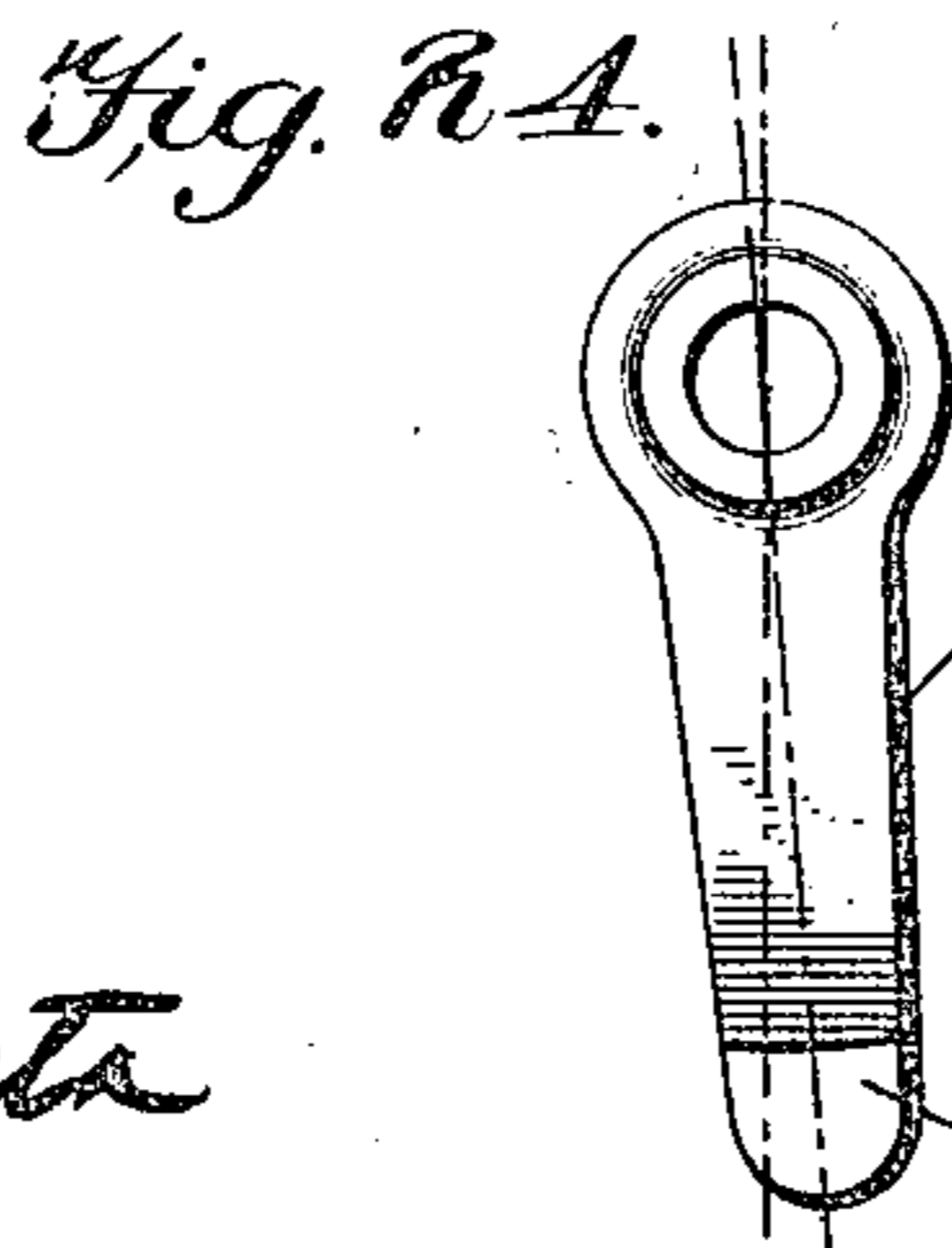
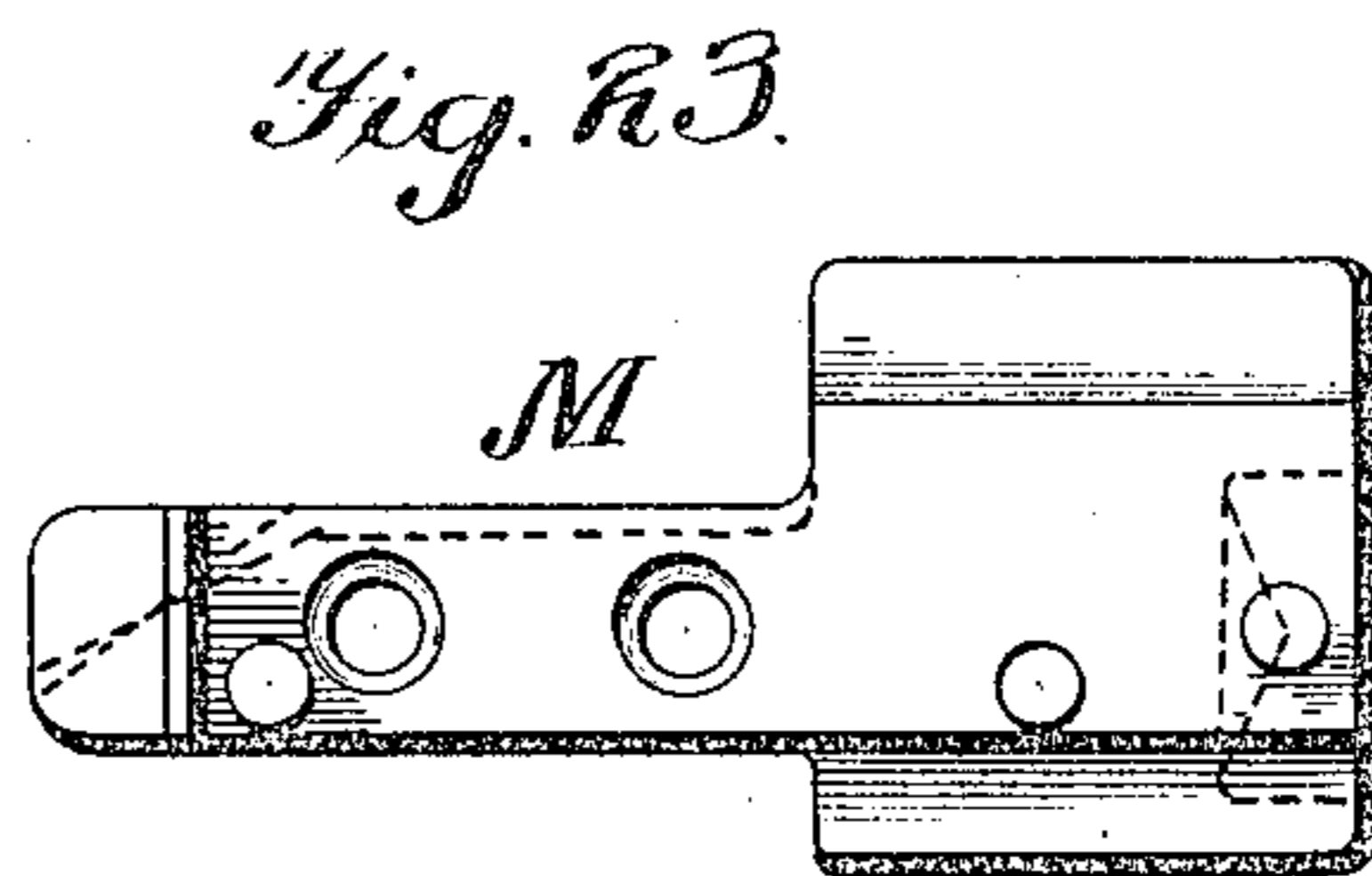
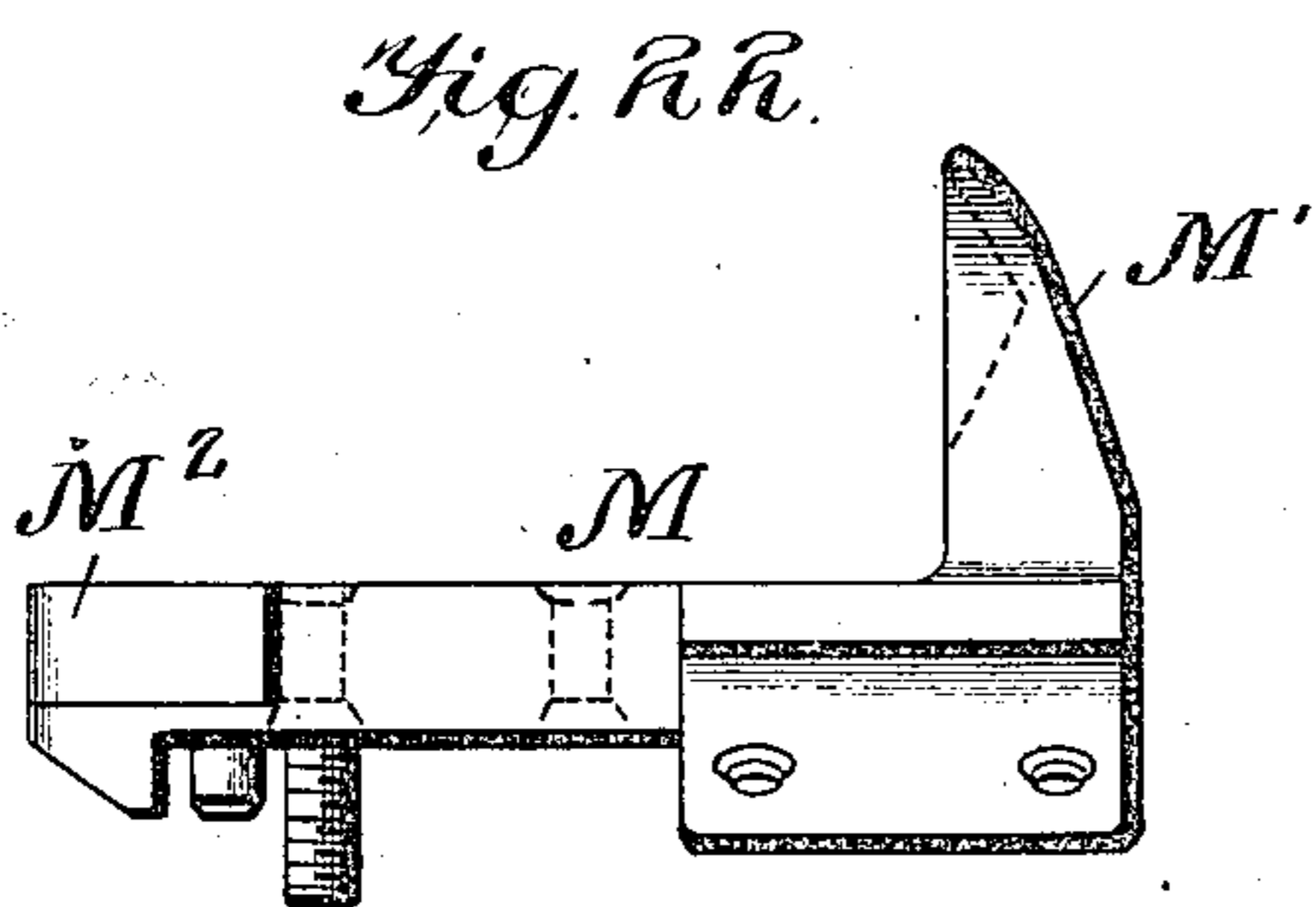
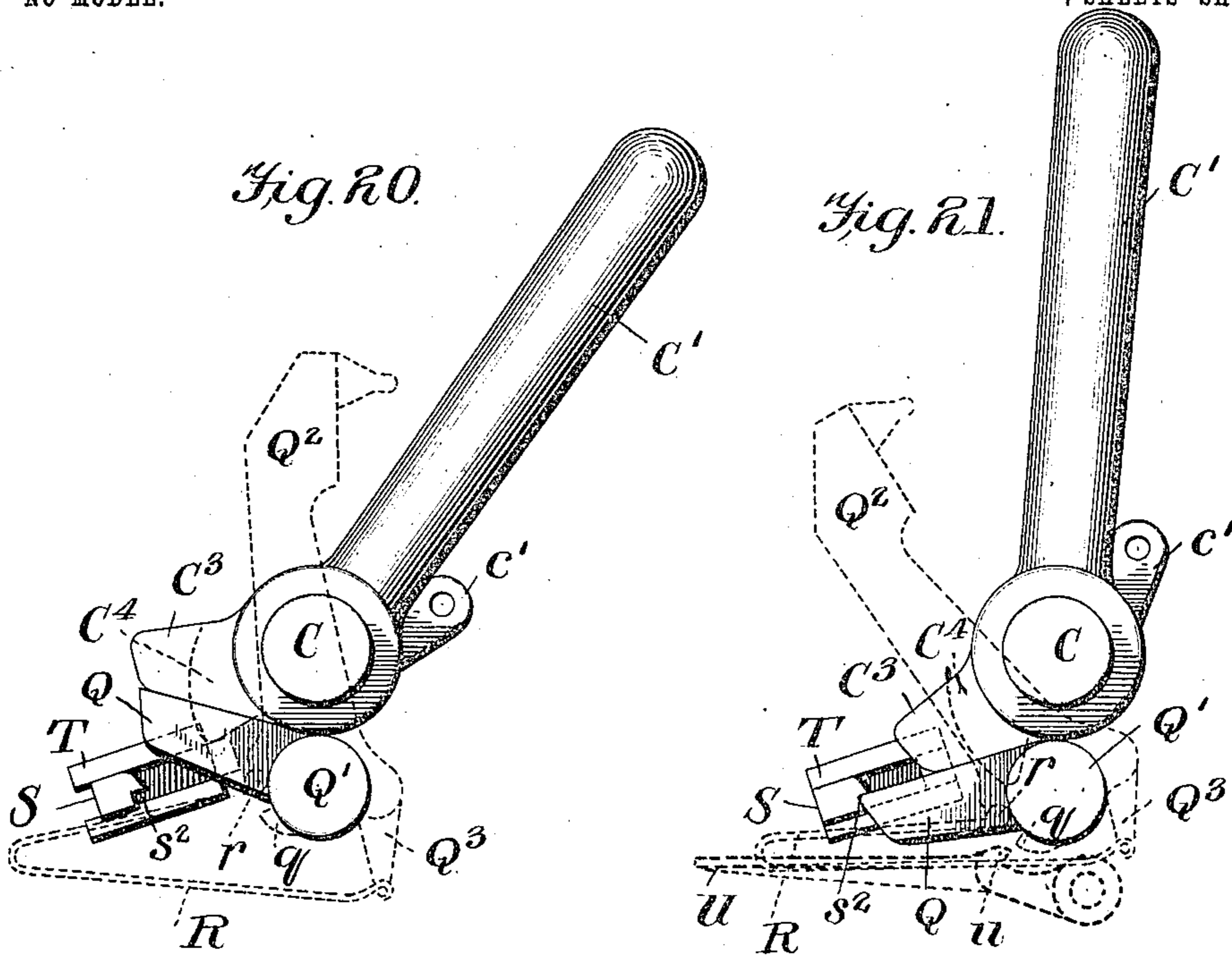
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NO MODEL.

7 SHEETS—SHEET 7.



Witnesses

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UNITED STATES PATENT OFFICE.

LAURENCE V. BENÉT AND HENRI A. MERCIÉ, OF PARIS, FRANCE.

AUTOMATIC OR SEMI-AUTOMATIC ATTACHMENT FOR QUICK-FIRING GUNS.

SPECIFICATION forming part of Letters Patent No. 747,848, dated December 22, 1903.

Application filed October 30, 1902. Serial No. 129,440. (No model.)

To all whom it may concern:

Be it known that we, LAURENCE V. BENÉT, a citizen of the United States, and HENRI A. MERCIÉ, a citizen of France, both residing at Paris, France, have invented certain new and useful Improvements in Automatic or Semi-Automatic Attachments for Quick-Firing Guns; 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 present invention relates to improvements in mechanism whereby a breech-loading cannon may be made to operate automatically or semi-automatically or may be fired "single shot" by hand, as may be preferred.

With the herein-described mechanism a gun may be loaded and fired by hand, the automatic and semi-automatic attachment being thrown out of operation, or the force of the discharge may be utilized to operate the breech mechanism, the cartridges being inserted either by hand or from a hopper. If continuous fire at maximum rapidity is desired, the gun may be caused to operate wholly automatically.

The invention, while applicable to most of the various types of breech-loading cannon, is shown as embodied in the gun of the well-known Hotchkiss type—such, for instance, as is shown in the patents to B. B. Hotchkiss, Nos. 270,589 and 270,590, granted January 16, 1883—and the semi-automatic gear is that shown in the patent to Benét and Mercié, No. 649,393, "Semi-automatic gun," granted May 8, 1900; but we do not mean to confine our invention either to this special type of ordnance or to this special type of semi-automatic gear, but simply refer to these as one embodiment of the invention.

The invention consists in an automatic mechanism which is applied to a semi-automatic gun and by which the above-mentioned objects are accomplished. The said mechanism is simple and strong and may be dismounted and assembled and removed or attached to the gun-mounting without the use of tools. It may be thrown in or out of action at will, thus permitting a given number of cartridges, say three, to be held in reserve, and it is so arranged that it becomes

automatically inoperative when the cartridges in the hopper have become exhausted. A feature of the mechanism is the arrangement by which it is inoperative until the empty case is extracted and fully ejected, thus avoiding any danger of jams or double loading. The said automatic mechanism being mounted on the shoulder-piece to the left of the gun, there is no interference with the sighting arrangement and the right of the gun is left quite clear for hand-loading.

The invention further consists in a device applied to the breech mechanism by which if the firing lanyard be held constantly to the rear and the sear thrown out of action the firing-hammer will be tripped at the moment that the breech is fully closed and locked, thus instantly firing the gun. This arrangement permits the delivery of continuous fire at the maximum rapidity.

In the accompanying drawings we have shown our improvements embodied in our system of semi-automatic gun hereinbefore referred to. The description of the gun, the mounting, and the semi-automatic gear itself will, however, be omitted, as all of these elements are well known.

Figure 1 is a side elevation of the gun complete, parts being broken away. Fig. 2 is a plan view of the gun, partly in section, along the broken line 2 2 of Fig. 1 and with the gun-shield removed. Fig. 3 is a rear view of the gun detached from the mount and with the shoulder-piece removed. Fig. 4 is a section through the casing, hopper, and shoulder-bar along the line 4 4 of Fig. 1, the breech of the gun being shown in elevation and looking in the direction of the arrows. Fig. 5 is a similar section along the broken line 5 6 of Fig. 1 and shows the carrier in the position of taking a cartridge. Fig. 6 is a similar section to that shown in Fig. 5 on the return of the carrier to its original position after the supply of cartridges in the hopper is exhausted and illustrating the mode of locking the automatic loading apparatus when there are no more cartridges in the hopper. Fig. 7 is a detail showing an interior view of the casing which constitutes the hopper and the casing for the loading apparatus. Fig. 8 is a plan view of the device shown in Fig. 7, and it also shows in dotted lines a comple-

mentary casting or frame which is rigidly attached to the cradle of the gun. Fig. 9 is a rear view of the frame shown in dotted lines in Fig. 8, and Fig. 10 is a section along the line 10 10 of Fig. 9 and looking in the direction of the arrows. Fig. 11 is a detail showing the carrier in side view as detached from the casing and also shows the rammer and the loading-piston. Figs. 11^a and 11^b are details showing the mode of assembling the spiral spring for rocking the carrier. Fig. 12 is a view seen from the left of Fig. 11, but with the deflector and deflector-lever added. Fig. 13 is a detail showing the slotted loading-piston. Figs. 14 and 15 are details showing the lock for the deflector. Fig. 16 is a side elevation of the breech of the gun, showing the automatic firing-gear. Fig. 17 is a plan of the automatic firing-gear shown in Fig. 16. Fig. 18 is a rear view of the automatic firing-gear shown in Figs. 16 and 17. Fig. 19 is a detail showing the sliding detent used in the automatic firing-gear. Figs. 20 and 21 show different positions of the automatic firing-gear. In Fig. 20 the hammer is in the firing position, and in Fig. 21 the hammer is in the cocked position. Figs. 22 and 23 are details of the bracket which is secured to the gun and operates the automatic loading mechanism, Fig. 22 being a side elevation and Fig. 23 being an inverted plan. Fig. 24 is a detail showing the deflector-lever as seen from the left of the position shown in Fig. 12.

35 A represents the gun. B represents the breech-block, which, as shown, is of the well-known Hotchkiss type and is operated by a stud c^2 on the arm C^2 , which is fast to the operating-shaft C and is rotated by the operating hand-lever C' (see Fig. 16) or by the automatic attachment D D', connected to the arm c' , as shown in Fig. 1. All of these details above described are shown in our Patent No. 649,393, already referred to, and need not be further described herein.

E represents a frame which is secured to the cradle and carries a shoulder-piece E' and performs other functions that will be hereinafter described.

50 F represents a casing which is preferably made as a single casting and is shown in detail in Figs. 3 to 8. This casing is provided with a hopper on its upper side, which is preferably composed of two guides F' to receive the ends of the cartridge Z. This casing is also provided with yokes f and f' , which are secured by pins G and G' to corresponding yokes e and e' on the frame E. The casing also has shoulders F², which rest on the breech of the gun. It will be seen that upon removing the pins G and G' the casing F and the contained mechanism may be removed from the gun.

65 H represents the carrier, which has a hollow rock-shaft or cylinder H', which is pivoted in the journal-bearings f^3 in the casing F and in corresponding bearings e^3 in the

frame E, the frame and casing thus forming a complete bearing for the hollow rock-shaft, as shown in Fig. 3. This hollow rock-shaft carries arms H² and H³, on which is pivoted the tray H⁴, as at h^4 . The arms H² and H³ are connected by a guard-plate H⁵, having curved lips h^5 . The purpose of this guard-plate is to arrest the shell and prevent loading when automatic action is not desired. By examining Fig. 6 it will be seen that the shell Z is prevented from passing into the tray by the guard-plate H⁵. The lips h^5 are to prevent the shell from rolling to the left after it gets into the tray and jamming the parts. The hollow rock-shaft H' is slotted at H⁶ to receive the rammer L, which is pivoted on the pin L' to the lugs H⁶, which are secured to or integral with the hollow rock-shaft H'. The upper end of the rammer projects into a recess h^6 in the end of the carrier and when in the locked position abuts against the stop h^7 . Inside of the hollow rock-shaft is a piston K and the torsional spring I. This spring is secured at one end, as at i , (see Fig. 11^a,) to the cylinder-head I', which is loosely mounted in the hollow rock-shaft H', but is provided with a stop-shoulder i^2 and a lug i^3 , which engage corresponding shoulders f^4 (see Fig. 7) in the casing, and thus the cylinder-head I' is prevented from turning, while the rock-shaft H' is free to rotate about said head. The other end of the spring I abuts against the shoulder k of the piston K and projects into the slot k' in said piston. This spring is both under compression and under torsional tension.

The piston K is provided with a slot K⁰ for the rammer L. This rammer passing through the slots K⁰ and H⁶ prevents the piston from rotating in the cylinder, and thus the torsional effect of the spring I tends to swing the cylinder or hollow rock-shaft and with it the carrier and tray. This tendency of the carrier to rotate downward to the position indicated by the dotted lines xx (see Figs. 5 and 6) is resisted by the arm n^2 on the deflector-lever N². (See Fig. 12.) This deflector-lever is rigidly attached to the shaft N', mounted in bearings e^4 and e^5 in the frame E, which shaft carries the deflector N, also rigidly attached thereto. This deflector is located in front of the part E² of the frame E, as shown in Fig. 10, and is normally pressed forward therefrom by the spring O, mounted on the pin O', which has an annular groove o' . (See Fig. 10.) This spring fits in a socket e^6 in the frame, as shown in Figs. 9 and 10. When the parts are in position for automatic action, a pressure on the deflector-plate, such as the ejection of an empty cartridge-case, will force the deflector backward against the action of this spring, and thus will disengage the arm n^2 on the deflector-lever from the arm H⁷ of the carrier and allow the carrier to swing over under the influence of the spring I. When it is desired to prevent this action, the pin O' is locked, as by means of a lock P,

having a screw p engaging in the threads e^2 (see Figs. 10, 14, and 15) and a notch p^0 engaging the annular groove o' on the pin O' . The other end of this lock P is provided with a catch p^2 , which engages in the recess e^6 , (see Fig. 10,) and the lock is provided with a knurled head p' for convenience in manipulation. When the lock P is in place, the deflector cannot move backward, and therefore the arm n^2 on the deflector-lever will prevent the carrier from swinging to the loading position. At this time the gun may be operated either by hand or semi-automatically, as preferred.

15. M represents a bracket fast to the gun, which is provided with a tang M' , adapted to strike the piston-head k^2 when the gun recoils, and it is also provided with a cam M^2 , adapted to engage the cam h^3 on the carrier and to rock the same back to the initial position before the breech opens.

The firing apparatus includes certain mechanism whereby the trigger and sear may be thrown out of action and the firing-hammer may be automatically tripped at the required moment by the breech mechanism of the gun itself. The device for accomplishing this result consists, broadly speaking, of a tripping mechanism which coacts with the cocking-lever of the breech mechanism and is automatically operated on its striking an abutment on the operating-lever of the breech mechanism the moment the breech-block has completed its closing movement. This device is partly outlined in Fig. 1 and is shown in detail on a larger scale in Figs. 16 to 21. In these figures the operating-bolt or shaft C carries, in addition to the hand-lever C' and the lug c' for the semi-automatic gear, a cocking-arm C^3 , which engages a cocking-lever Q on the shaft Q' . This shaft carries the firing-hammer Q^2 and also the catch q . (See Figs. 16, 20, and 21.)

S represents a sliding detent, (shown in Fig. 19) which is provided with a tail s' , to which is connected the spring S' , the other end of the spring being secured to the breech-block B . This sliding detent has guide-ribs, which travel in the frame T , mounted in the breech-block, and is provided with a catch s^2 and with a nose s^3 .

R represents the sear-spring, which abuts at one end r on the heel of the hammer Q^2 and is attached at the other end to the arm Q^3 , projecting from said hammer.

U represents the sear, which is connected to the catch u , which normally engages the catch q on the shaft Q' when the gun is loaded, but the firing mechanism is not cocked. This sear is pressed down by the bell-crank lever V , operated by the lanyard V' . When the gun is loaded, the breech closed, and the firing mechanism is locked, pulling on this lanyard will fire the gun. Now if this lanyard be kept pulled to the rear, as shown in Fig. 16, the automatic firing mechanism may be operated as follows: Assuming the gun to be

fired and the breech closed, the parts will be in the position shown in Fig. 20. Then turning the hand-lever to the position shown in Fig. 21 would cause the cocking-arm Q to press back the sliding detent S , causing the end of said arm to engage in the catch s^2 , and at the same time the sear-spring R would be compressed and the hammer would be cocked. On closing the breech the parts would remain in the position shown in Fig. 21 until the arm C and cam c^2 reach the position indicated in Fig. 16. A slight further movement of the hand-lever C' to the right will cause the lug C^4 on the shaft C to press back the nose s^3 of the sliding detent and will release the cocking-arm Q from the catch s^2 , allowing the sear-spring to throw the hammer to the firing position.

The operation of the entire apparatus is then as follows: Suppose the breech to be opened, the hopper to have one or more cartridges therein, the lock of the deflector to be disengaged, and the hand firing-lanyard to be drawn back. Then pull on the head of the deflector and let go. This will cause the deflector to rock, freeing the deflector-lever N^2 from engagement with the arm H^7 on the carrier, which will allow the carrier to swing to the right under the torsional effect of the spring I . As the carrier swings the rammer is held against the axial pressure of the spring I by the abutment h^8 in the recess h^6 . When the carrier has reached its downward position and the rammer is in line with the axis of the chamber of the gun, the rammer strikes the abutment e^6 on the shoulder-piece, Fig. 4, freeing it from the abutment h^8 and allowing it to move forward under the axial pressure of the spring I . This will force the cartridge into the chamber of the gun, and as the rim of the cartridge-case strikes the extractor the breech-block will be released and the semi-automatic gear will close the breech, as indicated in our patent, No. 649,393, aforesaid. Just after the breech-block is in the closed position the slight further rotation of the rock-shaft C will cause the arm C^4 to press back the nose s^3 of the sliding detent S , which will release the catch s^2 from engagement with the cocking-arm Q , and the shaft Q' will rotate under the influence of the sear-spring, causing the hammer Q^2 to explode the primer and fire the gun. When the gun has been fired, it will of course recoil in the cradle, and the cam M^2 on the bracket M , fast to the gun, will engage the cam-arm h^3 on the rock-shaft H' and will rock the carrier to the initial position. About the same time and during the recoil the tang M' will strike the piston-head k^2 and will drive the piston, and with it the rammer, back to the initial position, compressing the spring I and locking the rammer against the abutment h^8 in the recess h^6 . The loading apparatus will then be in the initial position and locked. The spring O' will in the meantime have restored the deflector to the initial position, causing the deflector-le-

ver to engage the arm H^7 and lock the carrier in the initial position. On counter-recoil the semi-automatic gear opens the breech and cocks the firing mechanism and the extractor throws the empty cartridge-case to the rear. This case strikes the deflector N, producing the same effect as the short pull by hand in the first instance, and the operation of loading and firing automatically is repeated. This cycle of operations is repeated indefinitely so long as the hopper contains one or more cartridges.

By referring to Fig. 6 it will be seen that if no means were provided to prevent it when the last cartridge in the hopper has been fired on the return of the gun to battery the breech would open and the loading mechanism would go through the motions of loading the gun, but without having any cartridge to load with. The result would be that the breech would be in an open position and the carrier would be in its downward position, resting on the top of the breech-block. Therefore in order to continue the fire it would be necessary to raise the carrier and cock the rammer by hand until they were held in place by the deflector-lever. To avoid this, we have arranged the mechanism shown in Fig. 6. When the carrier returns to its upper position, the tray H^4 strikes the side of the hopper F' , and the said tray revolves about its shaft h^4 , as shown in Fig. 5. This brings the hook h^0 in line with the catch or abutment f^0 , and as the carrier swings to the right again this hook h^0 engages the catch f^0 and locks the carrier in the position indicated in Fig. 6. When in this position, if the empty cartridge-case strikes the deflector when ejected the carrier is not released and does not swing down, as usual. Had there been a cartridge in the hopper on the return of the carrier to its upward position it would have fallen into the carrier, and resting on the projection h^9 , as shown in Fig. 5, would have tilted the hook h^0 , thus preventing it from engaging with the catch f^0 . If now the parts be in the position shown in Fig. 6 and one or more cartridges be put into the hopper, as indicated in dotted lines at Z, and pressed down by hand or by their own weight, the tray H^4 would swing to the left about its pivot h^4 , the hook h^0 would be disengaged from the catch f^0 , and the carrier would be unlocked and ready to take up its cycle of motion.

To fire semi-automatically, the gun may be loaded, the deflector-plate being locked and the cartridges supplied by hand, as described aforesaid; but of course the firing-lanyard must be released and pulled in the usual way, as when firing single shot by hand.

It will be seen that the automatic firing mechanism will not operate unless the firing-lanyard be kept permanently pulled back. If, on the other hand, it is desired to fire automatically, using the hopper and loading-tray, it is sufficient merely to release the firing-lanyard, when the gun will be automat-

ically loaded after each fire; but it will not be automatically fired or fired at all until the lanyard be pulled.

It will be seen that the device cannot be operated until the breech is opened and the empty cartridge-case removed.

It will be noted that the parts are so assembled that the automatic loading attachment, including the casing and hopper and the carrier and tray, may be quickly removed by simply taking out or putting in the bolts G and G'. It will also be evident that the automatic firing attachment is normally out of the way, is protected by the gun, and is inoperative except when the lanyard is pulled back. It will also be seen that the deflector and its attachments may be readily removed from the gun and replaced thereon when desired.

All of the foregoing assembling and disassembling of parts may be accomplished without the use of any special tools, which is especially desirable under the conditions in which cannon of this character are employed.

It will be obvious that various modifications of the herein-described apparatus might be made which could be used without departing from the spirit of our invention, and we do not mean to limit ourselves to details of construction or combinations or arrangements of parts, except as specifically stated in the claims.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a recoil-mount for breech-loading guns, the combination with the gun-body, of the cradle, a swinging loading-tray carried by said cradle, and mechanism operated by the recoil of the gun for rocking said tray to the loading position and for delivering the cartridge from the tray to the chamber, with a spring-impressed pivoted rammer swinging with the tray, substantially as described.

2. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a swinging loading-tray carried by said cradle, a pivoted rammer, swinging longitudinally of the gun, and mechanism operated by the recoil of the gun for rocking said tray to the loading position and for operating said rammer, substantially as described.

3. In a recoil-mount for breech-loading guns, the combination with the gun-body and the cradle, of a rocking carrier, a tray pivoted to said carrier, a catch carried by said tray and a hook on the frame engaging said catch until released by the weight of a cartridge, and mechanism operated by the recoil of the gun for rocking said carrier and thus swinging said tray to the loading position, with a spring-impressed pivoted rammer swinging with the tray, for delivering a cartridge from said tray to the chamber of the gun, substantially as described.

4. In a recoil-mount for breech-loading guns, the combination with the gun-body and

cradle, of the carrier pivoted to said cradle, a tray pivoted to said carrier, a hopper for delivering cartridges to said tray, a pivoted rammer swinging longitudinally of the gun, and a recoil-spring actuated by the recoil of the gun and rocking said carrier and thus swinging said tray to the loading position and operating said rammer, substantially as described.

5. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a swinging loading-tray carried by said cradle, means for feeding the cartridges *seriatim* to said tray, a pivoted rammer swinging longitudinally of the gun, and mechanism actuated by the recoil of the gun for rocking said tray to the loading position and for operating said rammer, substantially as described.

6. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a swinging loading-tray carried by said cradle, means for feeding the cartridges *seriatim* to said tray, a pivoted rammer swinging longitudinally of the gun, and a coil-spring under torsion and compression actuated by the recoil of the gun for rocking said tray to the loading position and for operating said rammer, substantially as described.

7. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a loading apparatus carried by said cradle and automatically operated by the recoil of the gun, and a deflector pivoted on the frame and operated by the empty cartridge-case with mechanism actuated by said deflector for releasing the loading apparatus, substantially as described.

8. In a recoil-mount for breech-loading guns, the combination with the gun-body, of the cradle, a swinging loading-tray hinged parallel to the axis of the bore and carried by said cradle, mechanism operated by the recoil of the gun for rocking said tray to the loading position and for delivering the cartridges from the tray to the chamber, a deflector pivoted on the frame, and mechanism operated thereby for releasing the loading apparatus when the empty cartridge-case is ejected, substantially as described.

9. In a recoil-mount for breech-loading guns, the combination with the gun-body, of the cradle, a swinging loading-tray carried by said cradle, mechanism operated by the recoil of the gun for rocking said tray to the loading position and for delivering the cartridges from the tray to the chamber, a deflector pivoted on the frame, and mechanism operated thereby for releasing the loading apparatus when the empty cartridge-case is ejected, substantially as described.

10. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a swinging loading-tray carried by said cradle, a pivoted rammer, a coil-spring under compression and torsion, actuated by the recoil of the gun for rocking said tray to

the loading position and for operating said rammer, and a deflector, and mechanism operated thereby for releasing the loading apparatus when the empty cartridge-case is ejected, substantially as described.

11. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a swinging loading-tray carried by said cradle, a pivoted rammer, a coil-spring under compression and torsion, actuated by the recoil of the gun for rocking said tray to the loading position and for operating said rammer, and a deflector pivoted to the frame, and mechanism operated thereby for releasing the loading apparatus when the empty cartridge-case is ejected, substantially as described.

12. In a recoil-mount for breech-loading guns, the combination with the gun-body and the cradle, of a rocking carrier, a tray pivoted to said carrier, mechanism operated by the recoil of the gun for rocking said carrier and thus swinging said tray to the loading position, and for delivering a cartridge from said tray to the chamber of the gun, and a deflector pivoted to the frame, and mechanism operated thereby for releasing the loading apparatus when the empty cartridge-case is ejected, substantially as described.

13. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of the carrier pivoted to said cradle, a tray pivoted to said carrier, a hopper for delivering cartridges to said tray, mechanism operated by the recoil of the gun for rocking said carrier and thus swinging said tray to the loading position, and for delivering the cartridge from said tray to the chamber of the gun, and a deflector pivoted to the frame, and mechanism operated thereby for releasing the loading apparatus when the empty cartridge-case is ejected, substantially as described.

14. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a spring-operated loading apparatus carried by said cradle and automatically controlled by the recoil of the gun, and a deflector pivoted to the frame, placed in the path of the ejected cartridge-case for releasing said loading apparatus when the cartridge is ejected, substantially as described.

15. In a recoil-mount for breech-loading guns, the combination with the gun-body, of the cradle, a spring-operated swinging loading-tray carried by said cradle, mechanism operated by the recoil of the gun for rocking said tray to the loading position and for delivering the cartridge from the tray to the chamber, and a deflector pivoted to the frame and placed in the path of the ejected cartridge-case for releasing said loading apparatus when the cartridge is ejected, substantially as described.

16. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a swinging loading-tray carried by

said cradle, a coil-spring under torsional strain rocking said tray, means for feeding the cartridges *seriatim* to said tray, a pivoted rammer also operated by said spring, and automatic mechanism for releasing said tray and allowing it to be swung under the action of said spring, substantially as described.

17. In a recoil-mount for breech-loading guns, the combination with the gun-body and cradle, of a swinging loading-tray carried by said cradle, a pivoted rammer, a coil-spring under compression and torsion operated by the recoil of the gun for rocking said tray to the loading position and for operating said rammer, and a deflector and mechanism operated thereby for releasing the loading apparatus when the empty cartridge-case is ejected, substantially as described.

18. In a recoil-mount for breech-loading guns, the combination with the gun-body and the cradle, of a rocking carrier, a tray pivoted to said carrier, a coil-spring under compression and torsion operated by the recoil of the gun for rocking said carrier and thus swinging said tray to the loading position, a rammer also operated by said spring for delivering a cartridge from said tray to the chamber of the gun, and a deflector and mechanism operated thereby for releasing the loading apparatus when the empty cartridge-case is ejected, substantially as described.

19. In a recoil-mount for breech-loading guns, an automatic loading apparatus comprising a bracket fast to the gun and provided with a tang and a cam, a rocking carrier pivoted to the cradle, a loading-tray carried by said carrier, a piston mounted in said carrier, a coil-spring under torsion normally tending to rock said carrier to the loading position and to project said piston forward, the piston-head being struck by the tang on the recoil of the gun, a pivotal rammer normally held in the rear position on said carrier against the forward pressure of said spring, and means for tripping said carrier and then releasing said rammer, substantially as described.

20. In a recoil-mount for breech-loading guns, a loading apparatus comprising a bracket fast to the gun and provided with a tang and a cam, a rocking carrier pivoted to the cradle and provided with a piston adapted to engage said tang when the gun recoils and with an arm adapted to engage said cam, of a coil-spring under torsion normally pressing forward on said piston and also tending to rock the carrier to the loading position, a pivoted rammer projecting through said piston and holding the same against the rotary action of said spring, means for normally holding the rammer in the rearward position, a loading-tray carried by said carrier, and means for releasing said rocking carrier allowing it to rock under the action of said spring and for tripping said rammer when the carrier rocks, substantially as described.

21. In a recoil-mount for breech-loading

guns, an automatic loading apparatus comprising a bracket fast to the gun and provided with a tang and a cam, a rocking carrier pivoted to the cradle, a loading-tray carried by said carrier, a catch on said tray for locking said carrier in the inoperative position except when there is a cartridge in the tray, a piston mounted in said carrier, a coil-spring under torsion normally tending to rock said carrier to the loading position and to project said piston forward, the piston-head being struck by the tang on the recoil of the gun, a pivoted rammer normally held in the rear position on said carrier against the forward pressure of said spring, and means for tripping said carrier and then releasing said rammer, substantially as described.

22. In a recoil-mount for breech-loading guns, a loading apparatus comprising a bracket fast to the gun and provided with a tang and a cam, a rocking carrier pivoted to the cradle and provided with a piston adapted to engage said tang when the gun recoils and with an arm adapted to engage said cam, of a coil-spring under torsion normally pressing forward on said piston and also tending to rock the carrier to the loading position, a pivoted rammer projecting through said piston and holding the same against the rotary action of said spring, means for normally holding the rammer in the rearward position, a loading-tray carried by said carrier, a catch on said tray for locking said carrier in the inoperative position except when there is a cartridge in the tray, and means for releasing said rocking carrier allowing it to rock under the action of said spring and for tripping said rammer when the carrier rocks, substantially as described.

23. In a recoil-mount for breech-loading guns, a loading apparatus comprising a bracket fast to the gun and provided with a tang and a cam, a rocking carrier pivoted to the cradle and provided with a piston adapted to engage said tang when the gun recoils and with an arm adapted to engage said cam, of a coil-spring under torsion normally pressing forward on said piston and also tending to rock the carrier to the loading position, a pivoted rammer projecting through said piston and holding the same against the rotary action of said spring, means for normally holding the rammer in the rearward position, means actuated by the empty cartridge-case, when ejected, for releasing said rocking carrier, and means for tripping said rammer when the carrier rocks, substantially as described.

24. In a recoil-mount for breech-loading guns, a loading apparatus comprising a bracket fast to the gun and provided with a tang and a cam, a rocking carrier pivoted to the cradle and provided with a piston adapted to engage said tang when the gun recoils and with an arm adapted to engage said cam, of a coil-spring under torsion normally pressing forward on said piston and also tending to

rock the carrier to the loading position, a pivoted rammer projecting through said piston and holding the same against the rotary action of said spring, means for normally holding the rammer in the rearward position, a spring-impressed deflector arranged in the path of the ejected cartridge-case and adapted to yield when struck thereby, and mechanism controlled by said deflector for releasing said rocking carrier and allowing it to rock, substantially as described.

25. In a recoil-mount for breech-loading guns, a loading apparatus comprising a bracket fast to the gun and provided with a tang and a cam, a rocking carrier pivoted to the cradle and provided with a piston adapted to engage said tang when the gun recoils and with an arm adapted to engage said cam, of a coil-spring under torsion normally pressing forward on said piston and also tending to rock the carrier to the loading position, a pivoted rammer projecting through said piston and holding the same against the rotary action of said spring, means for normally holding the rammer in the rearward position, a pivoted loading-tray carried by said carrier, a catch on said tray for locking said carrier in the inoperative position until a cartridge is inserted in said tray, means actuated by the empty cartridge-case, when ejected, for releasing said rocking carrier, and means for tripping said rammer when the carrier rocks, substantially as described.

26. In a recoil-mount for breech-loading guns, a loading apparatus comprising a bracket fast to the gun and provided with a tang and a cam, a rocking carrier pivoted to the cradle and provided with a piston adapted to engage said tang when the gun recoils and with an arm adapted to engage said cam, of a coil-spring under torsion normally pressing forward on said piston and also tending to rock the carrier to the loading position, a pivoted rammer projecting through said piston and holding the same against the rotary action of said spring, means for normally holding the rammer in the rearward position, a pivoted loading-tray carried by said carrier, a catch on said tray for locking said carrier in the inoperative position until a cartridge is inserted in said tray, a spring-impressed deflector arranged in the path of the ejected cartridge-case and adapted to yield when struck thereby, and mechanism controlled by said deflector for releasing said rocking carrier and allowing it to rock, substantially as described.

27. In a recoil-mount for breech-loading guns, the combination with the loading apparatus and automatic means for operating the same, of a spring-impressed deflector located in the path of the ejected cartridge-case and adapted to yield when struck thereby, tripping mechanism operated by said deflector for releasing the loading mechanism, with a lock for holding the deflector rigid against

the action of said cartridge-case when desired, substantially as described.

28. A deflector for use in guns of the character described, comprising a plate hinged to the gun-frame, a spring in rear of said plate, normally yielding when said plate is struck by the ejected cartridge-case, and means for locking said plate in a rigid position, when desired, substantially as described.

29. A deflector for use in guns of the character described, comprising a plate hinged to the gun-frame, a spring in rear of said plate, normally yielding when said plate is struck by the ejected cartridge-case, a stud projecting from the rear of said plate, and an adjustable lock for engaging said stud and locking said plate in the rigid position, when desired, substantially as described.

30. The combination with a deflector-plate hinged to the frame of the gun and a spring in rear of said plate, of an arm actuated by said plate and a hinged carrier having a lug normally engaging said arm, but released when said deflector is pressed backward, with means for rocking said carrier to the loading position, substantially as described.

31. The combination with a deflector-plate hinged to the frame of the gun and a spring in rear of said plate, of an arm actuated by said plate and a hinged carrier having a lug normally engaging said arm, but released when said deflector is pressed backward, with a coil-spring under torsion for rocking said carrier to the loading position, substantially as described.

32. The combination with a deflector-plate hinged to the frame of the gun and a spring in rear of said plate, of an arm actuated by said plate, and a hinged carrier having a lug normally engaging said arm, but released when said deflector is pressed backward, a rammer pivoted in said carrier, and means for rocking said carrier to the loading position and for operating said rammer, substantially as described.

33. The combination with a deflector-plate hinged to the frame of the gun and a spring in rear of said plate, of an arm actuated by said plate, and a hinged carrier having a lug normally engaging said arm, but released when said deflector is pressed backward, a rammer pivoted in said carrier, and a coil-spring under torsion and compression for rocking said carrier to the loading position and for operating said rammer, substantially as described.

34. A loading apparatus for guns of the character described, comprising a cylindrical case with lugs projecting on one side thereof, a slotted piston mounted in said case, a rammer pivoted in said lugs and projecting through said slotted piston, a coil-spring under torsion and compression mounted in rear of said piston, a swinging tray carried by said cylindrical case, means for holding the loading apparatus in the inoperative position

and for releasing same when desired, and means operated by the recoil of the gun for compressing said piston and so storing up energy in said spring, substantially as and for the purposes described.

35. A loading apparatus for guns of the character described, comprising a cylindrical case with lugs projecting on one side thereof, a slotted piston mounted in said case, a rammer pivoted in said lugs and projecting through said slotted piston, a coil-spring under torsion and compression mounted in rear of said piston, a swinging tray carried by said cylindrical case, means for normally holding the loading apparatus in the inoperative position, means operated by the ejection of the cartridge-case for releasing the loading mechanism, and means operated by the recoil of the gun for storing up energy in the spring and for restoring the parts to the initial position, substantially as and for the purposes described.

36. In a gun of the character described, the combination with a casing detachably connected to the cradle of the gun, of an automatic loading apparatus mounted in said casing and removable therewith from the cradle, substantially as described.

37. In a gun of the character described, the combination with the gun and cradle, of a casing, bolts detachably connecting said casing to said cradle, and loading apparatus mounted in said casing and removable therewith from said cradle, substantially as described.

38. The combination with the gun and cradle, of a casing detachably connected to said cradle, a loading apparatus removably mounted in said casing, and mechanism actuated by

the recoil of the gun for operating said loading apparatus, substantially as described.

39. The combination with the gun and cradle, of a casing detachably connected to said cradle, a hopper integral with said casing, a loading apparatus removably mounted in said casing, and mechanism actuated by the recoil of the gun for operating said loading apparatus, substantially as described.

40. The combination with the gun and cradle, of a casing detachably connected to said cradle, a loading apparatus, comprising a rocking carrier and a pivoted rammer, with a spring for operating the same removably mounted in said casing, and mechanism actuated by the recoil of the gun for operating said loading apparatus, substantially as described.

41. The combination with the gun and cradle, of a casing detachably connected to said cradle, a hopper integral with said casing, a loading apparatus, comprising a rocking carrier, a swinging tray pivoted thereto, a pivoted rammer rocking with said carrier, and a spring for operating said rammer and rocking said carrier, said carrier, rammer, and spring being connected together and removable as one piece from said casing, with mechanism actuated by the recoil of the gun for operating said loading apparatus, substantially as described.

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

LAURENCE V. BENÉT.
HENRI A. MERCIÉ.

Witnesses:

CHARLES KURER,
A. C. KOERNER.