

E. A. M. WELIN.
QUICK FIRING GUN.

(Application filed May 13, 1898.)

(No Model.)

4 Sheets—Sheet I.

Fig. 2.

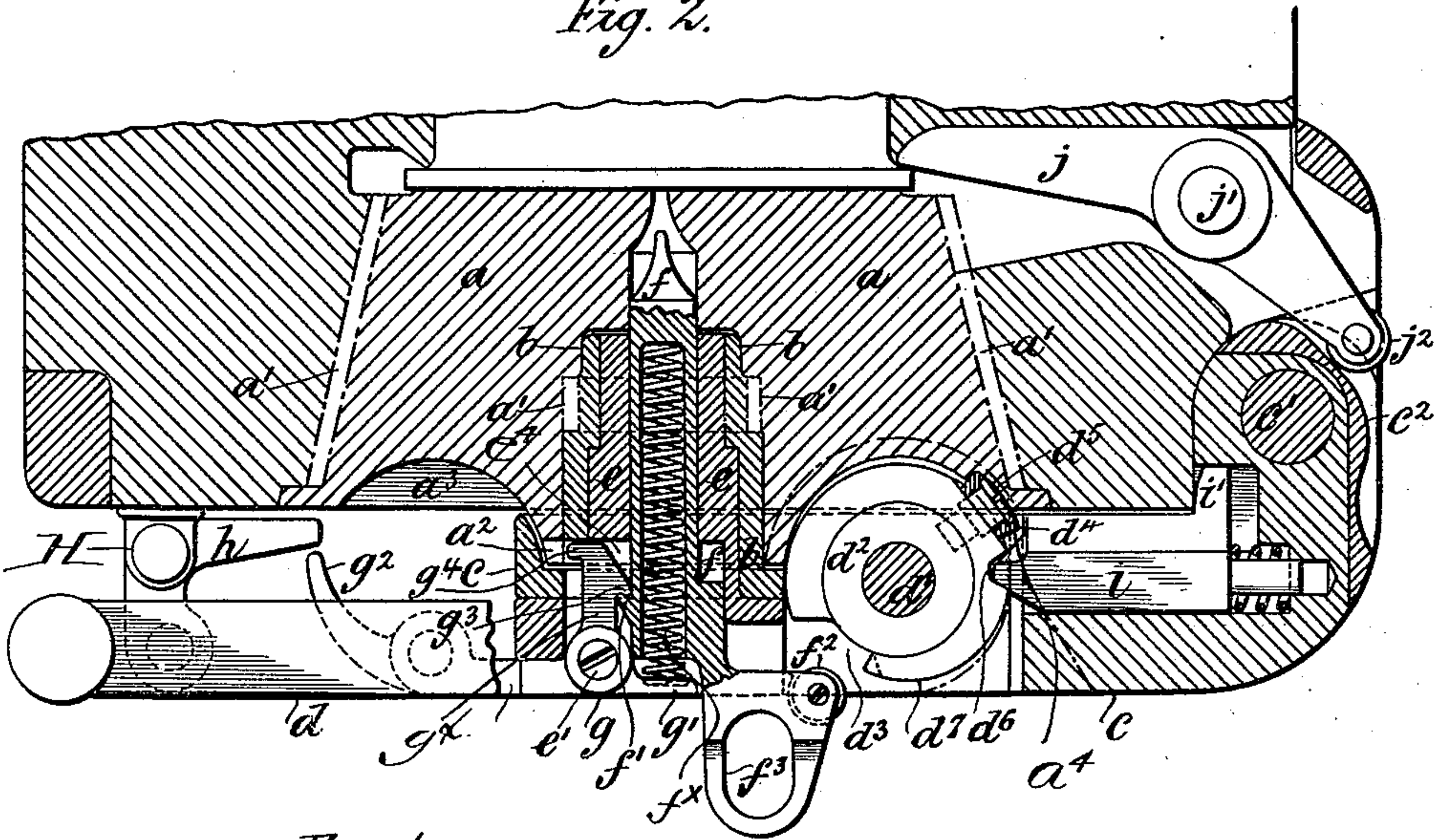
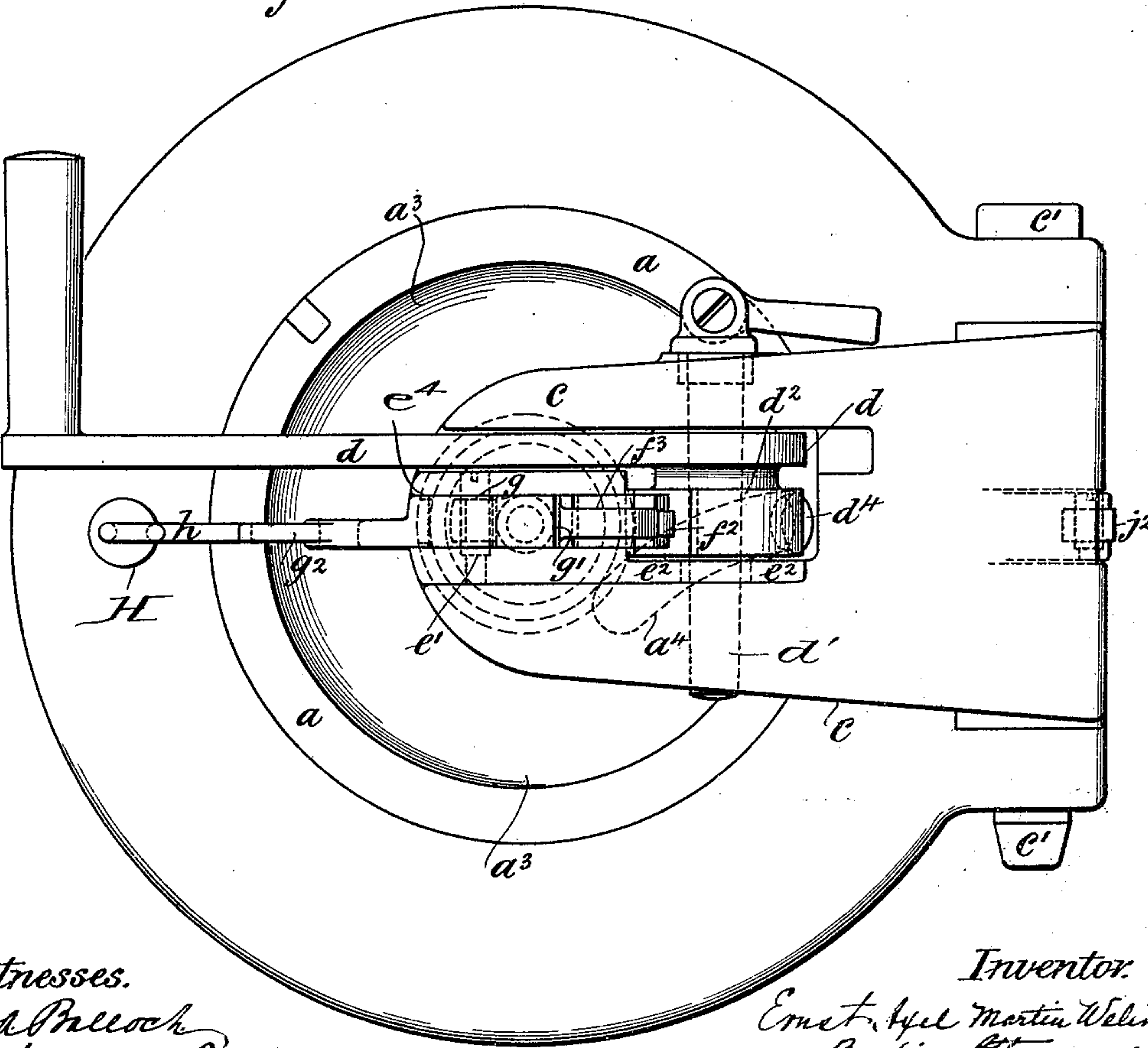


Fig. 1.



Witnesses.
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No. 614,414.

Patented Nov. 15, 1898.

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Fig. 3.

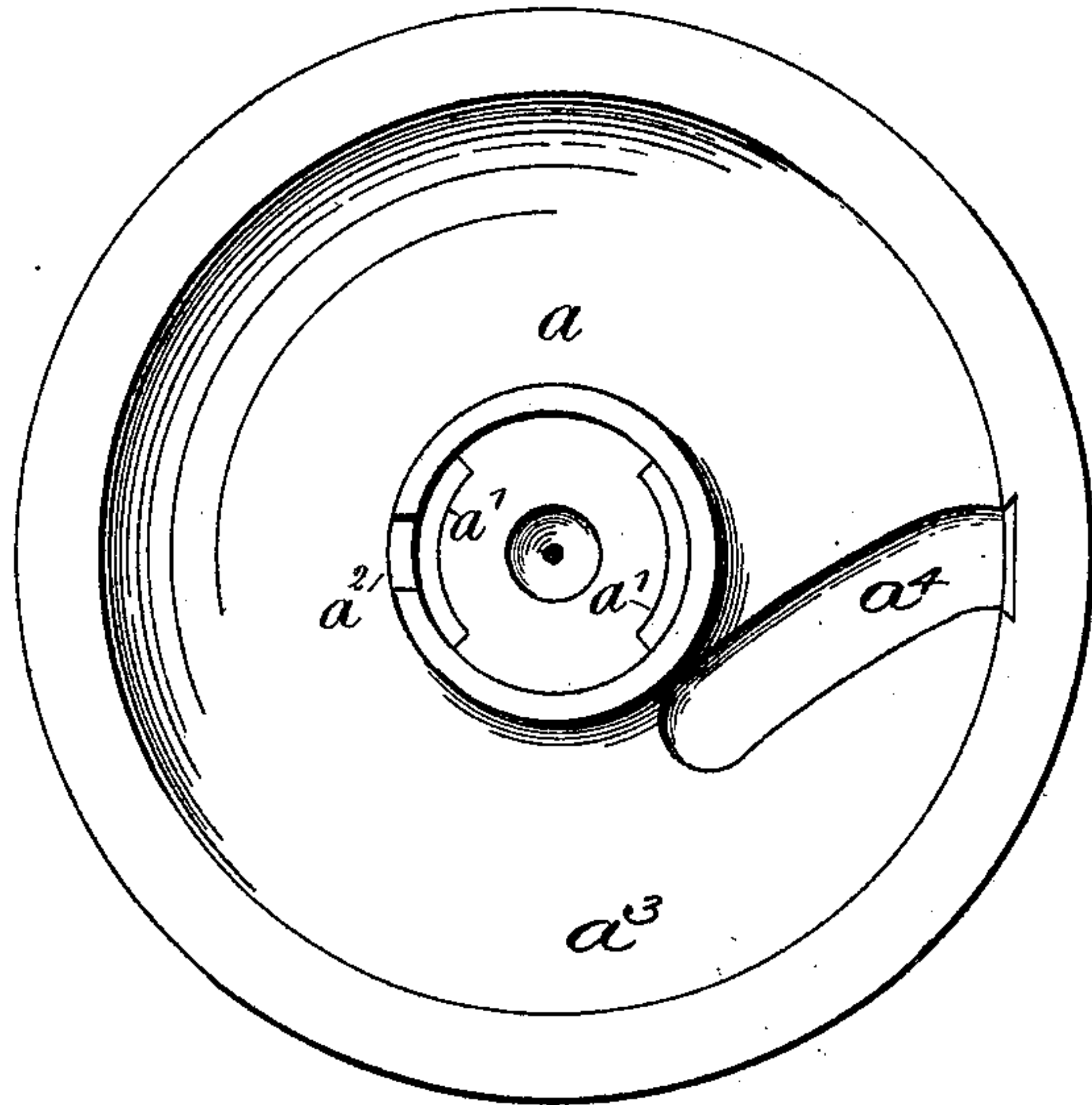


Fig. 4.

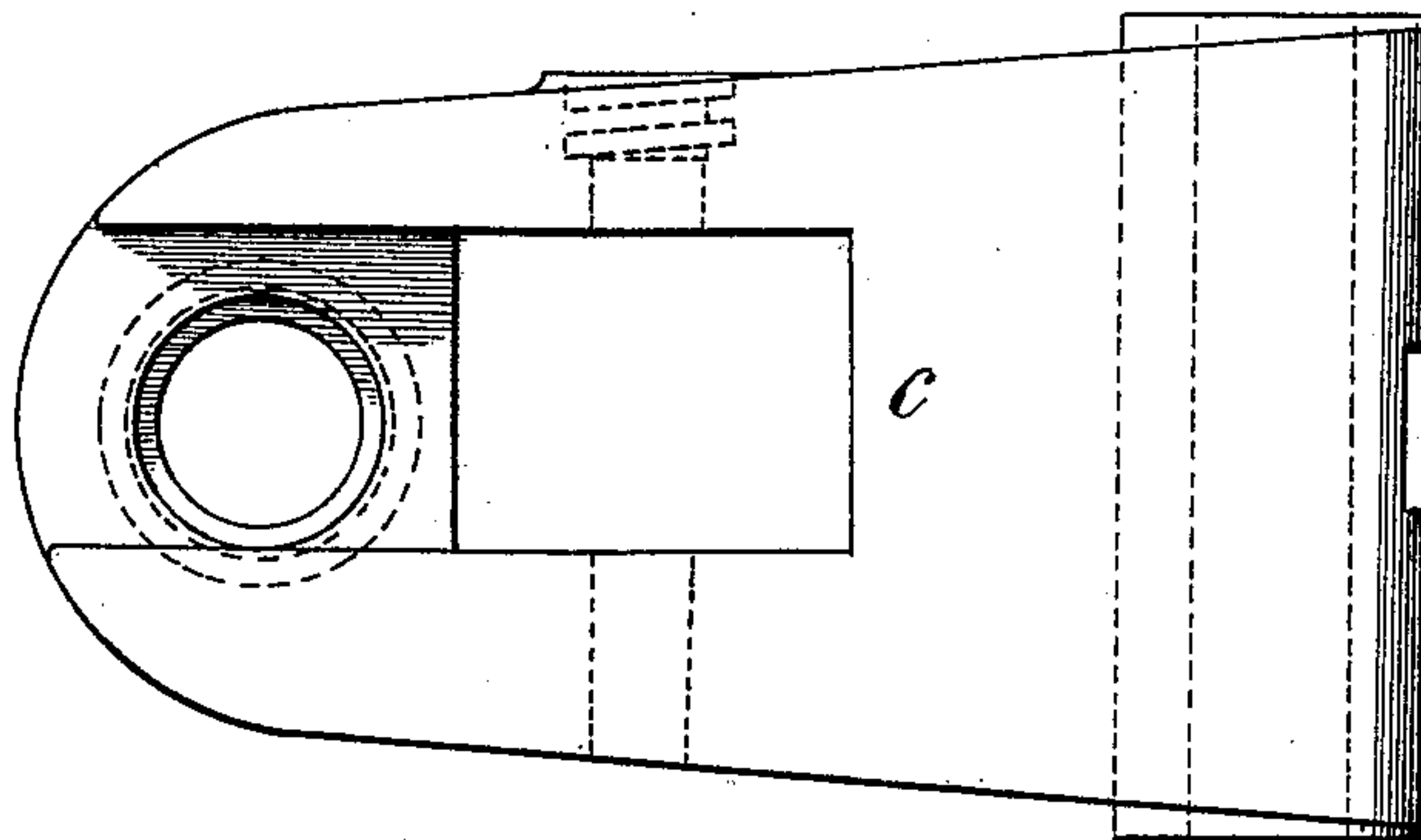
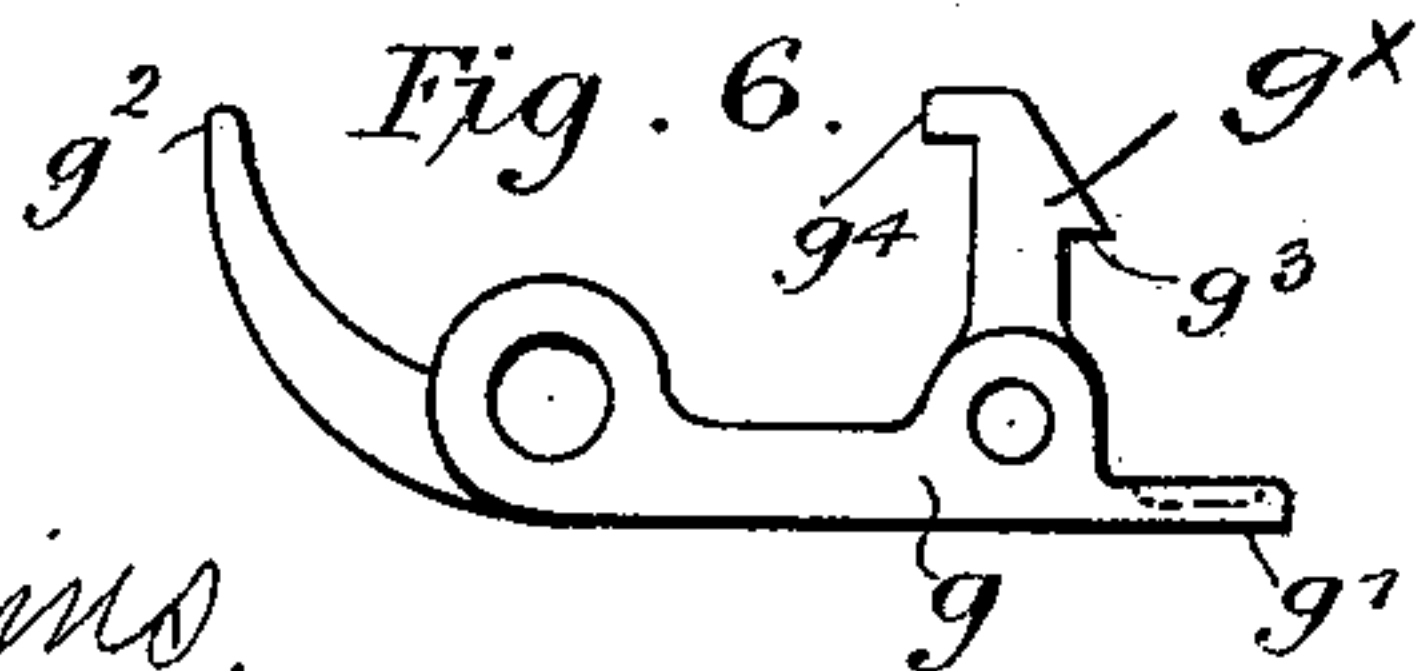
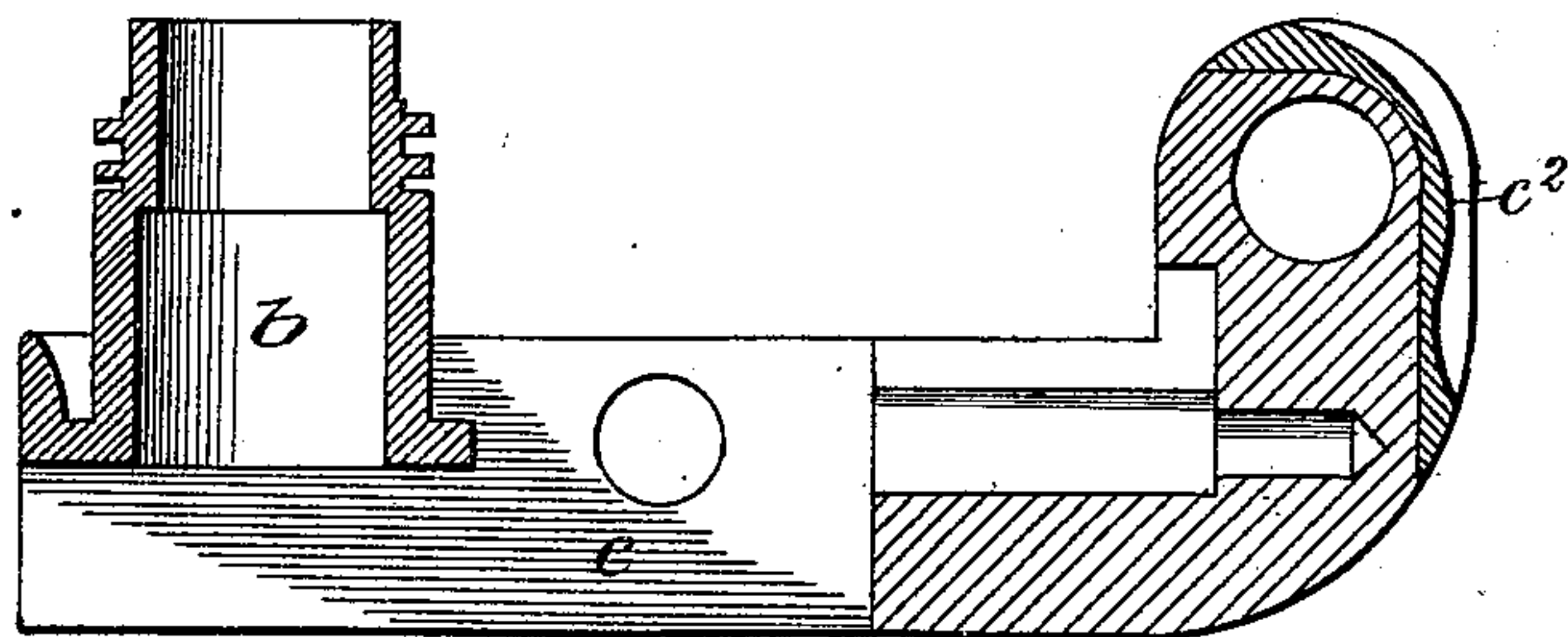


Fig. 5.



Witnesses.

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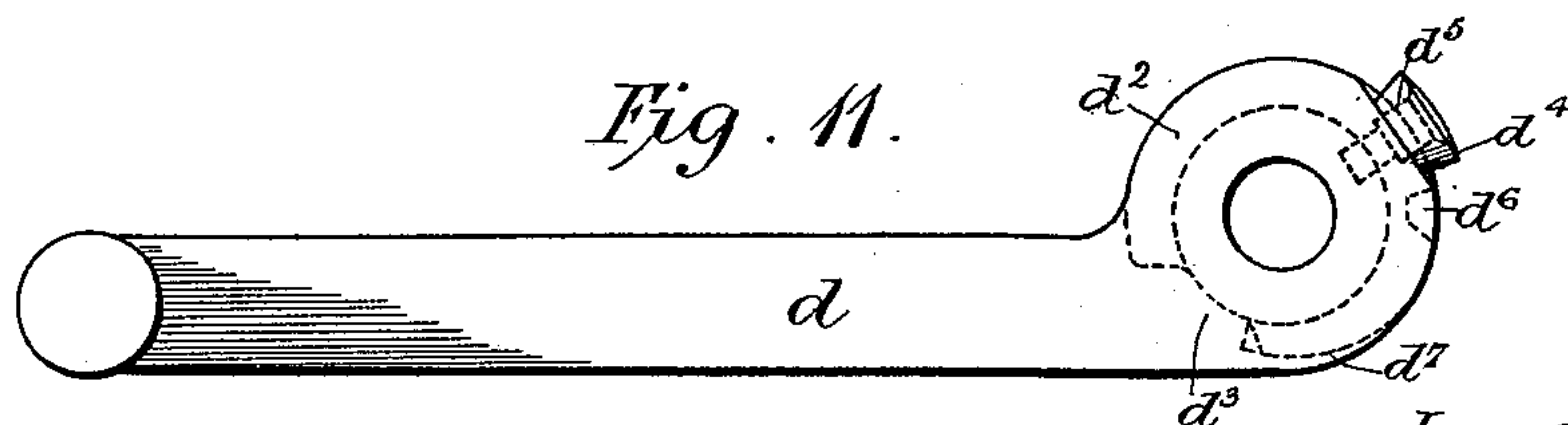
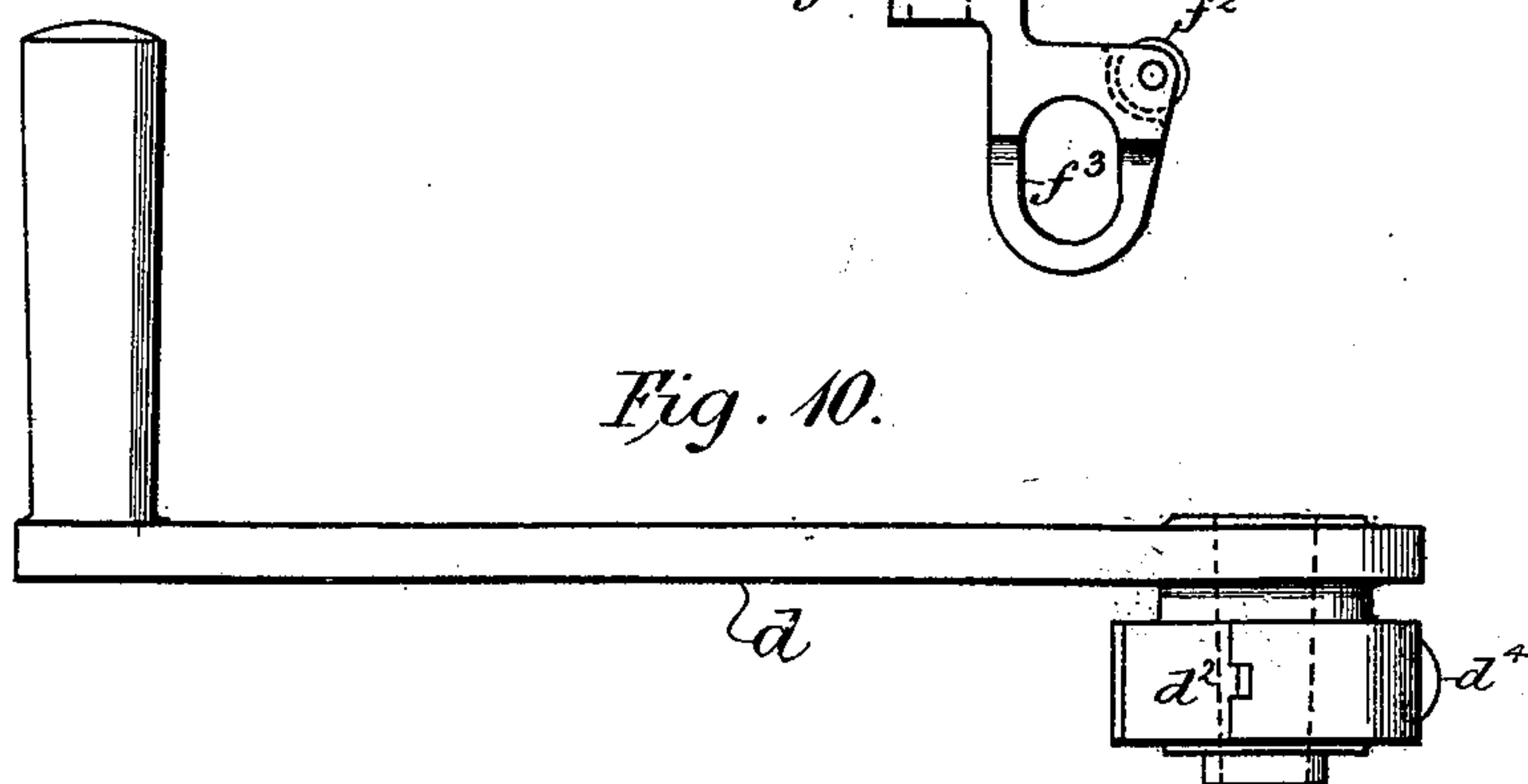
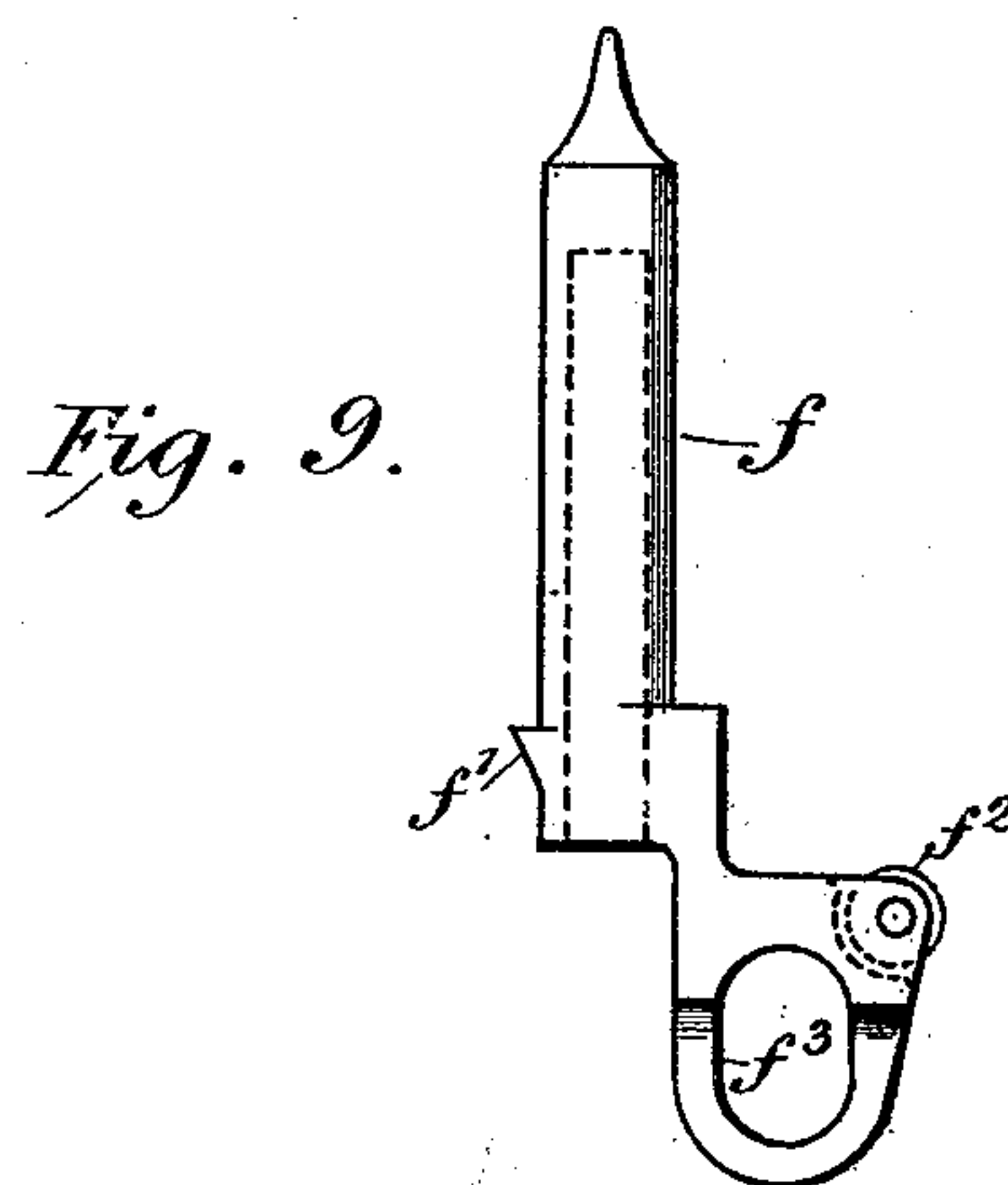
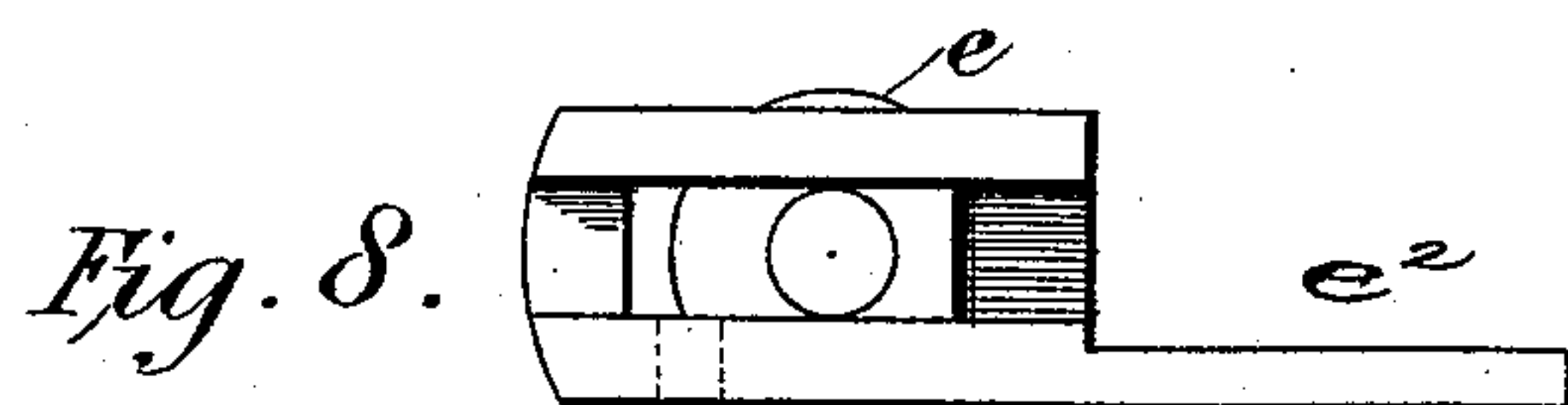
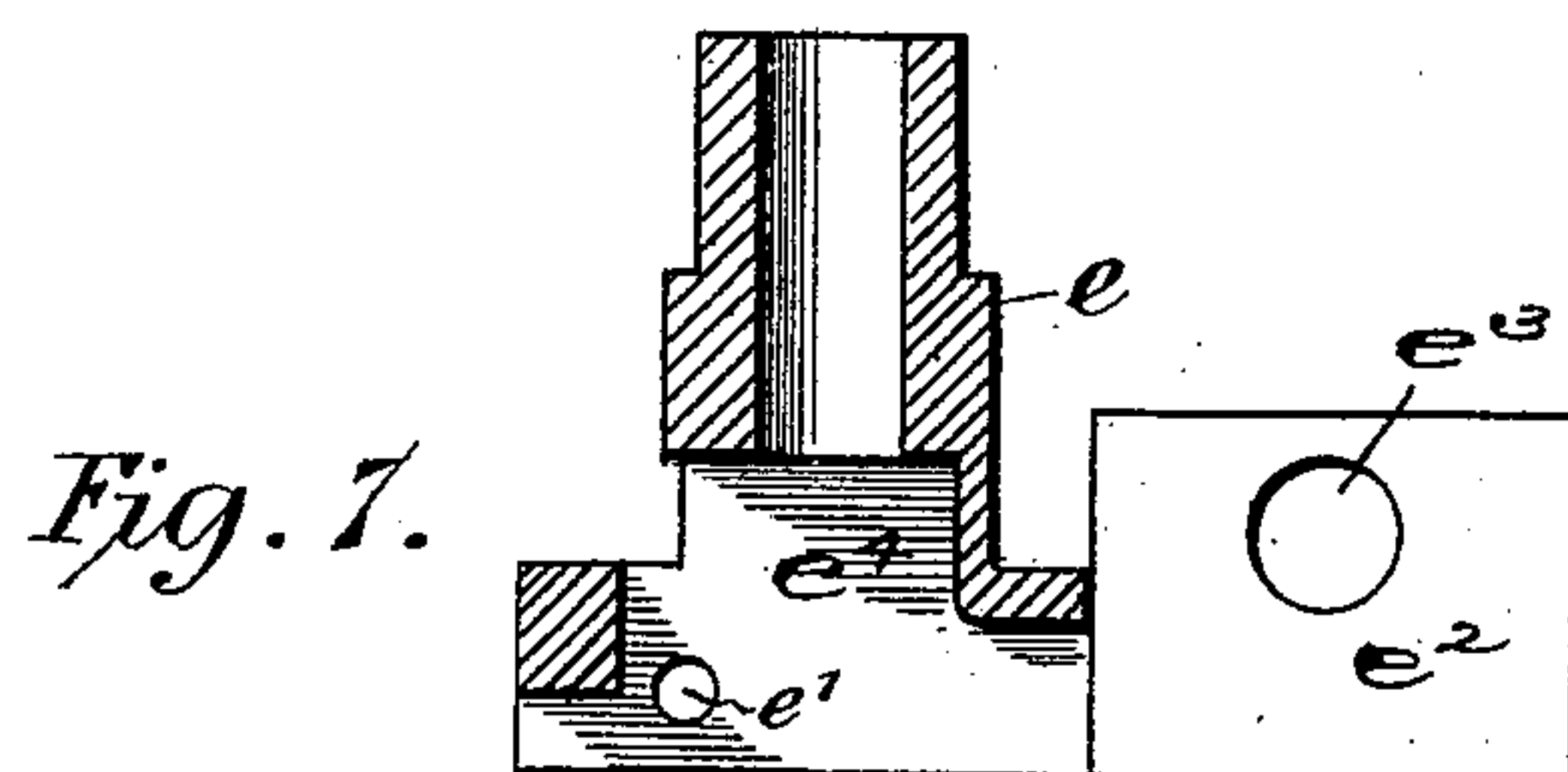
Patented Nov. 15, 1898.

E. A. M. WELIN.
QUICK FIRING GUN.

(Application filed May 13, 1898.)

(No Model.)

4 Sheets—Sheet 3.



Witnesses.

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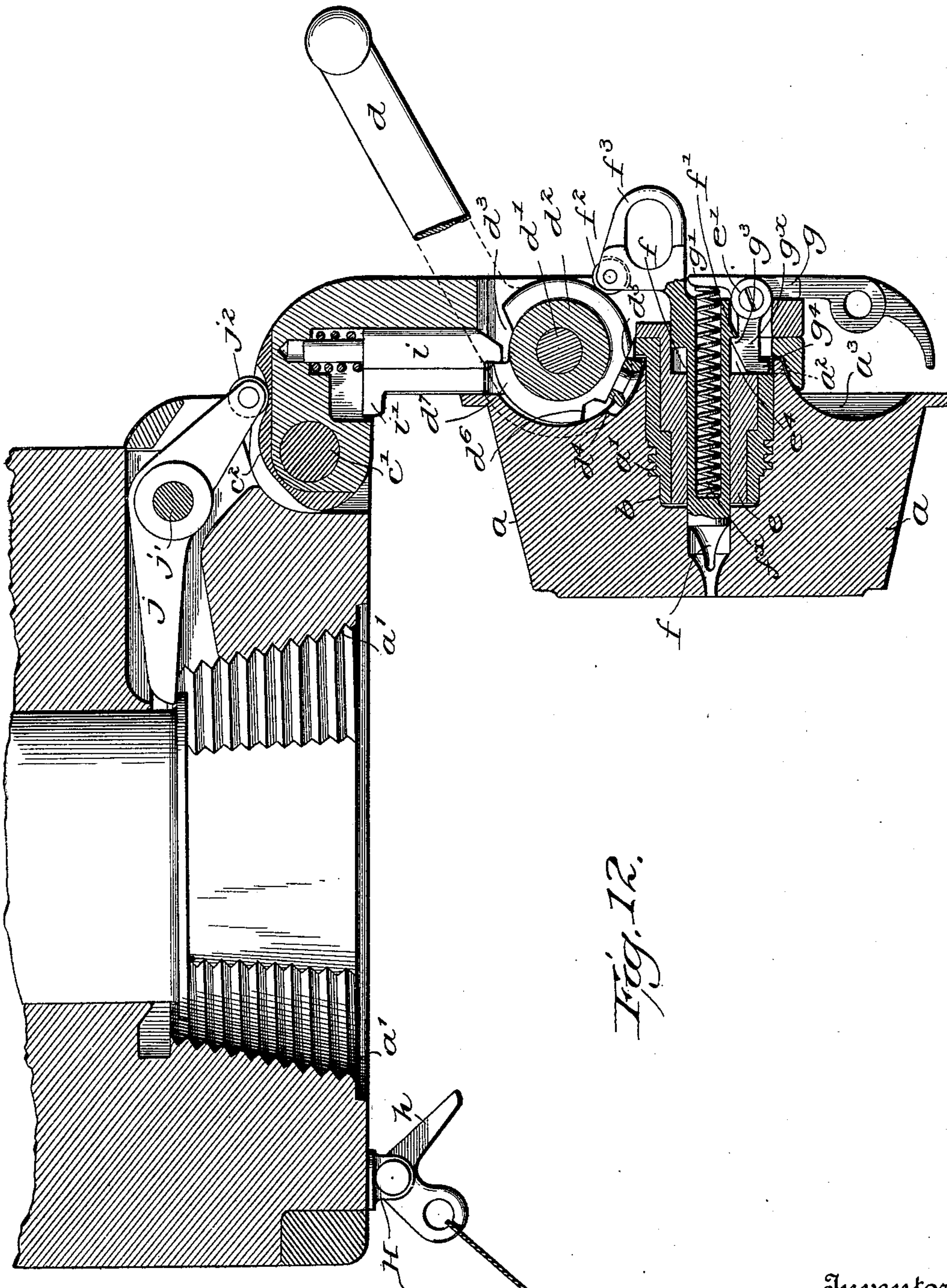


Fig. 12.

Witnesses
[Signature]
E. A. Balloch

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By his Attorneys,
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UNITED STATES PATENT OFFICE.

ERNST AXEL MARTIN WELIN, OF LONDON, ENGLAND.

QUICK-FIRING GUN.

SPECIFICATION forming part of Letters Patent No. 614,414, dated November 15, 1898.

Application filed May 13, 1898. Serial No. 680,626. (No model.)

To all whom it may concern:

Be it known that I, ERNST AXEL MARTIN WELIN, commonly known as AXEL WELIN, mechanical engineer, a subject of the King of Sweden and Norway, residing at No. 25 Fenchurch street, in the city of London, England, have invented certain new and useful Improvements in Quick-Firing Guns, of which the following is a specification.

My invention more especially relates to that class of quick-firing guns in which the breech-block swings laterally on a pivot to open and close the breech. Its objects are to increase the efficiency and exemption from accidents of the means employed for opening and closing the breech, for locking it in position, and for cocking and firing the gun. These ends I attain by certain novel combinations of instrumentalities hereinafter fully described, and specifically designated in the claims.

The accompanying drawings show all my improvements as embodied in one apparatus. Some of them, however, may be used without the others and in mechanism differing somewhat in the details of its construction from that herein shown. These drawings show so much only of the gun as is necessary to illustrate the subject-matter herein claimed.

Figure 1 is a rear elevation of a gun constructed in accordance with my invention; Fig. 2, a horizontal transverse section therethrough in the line of the firing-pin. The remaining figures show details of the apparatus, Fig. 3 being a rear elevation of the breech-block; Fig. 4, a rear elevation of the carrier-arm, and Fig. 5 a central horizontal section therethrough; Fig. 6, a plan of the trigger; Fig. 7, a central horizontal section, and Fig. 8 a rear elevation, of the central sleeve of the breech-block and its supporting-arm; Fig. 9, a plan view of the firing-pin; Fig. 10, a rear elevation, and Fig. 11 a plan, of the operating-lever. Fig. 12 is a horizontal transverse section through the rear end of the gun and the breech-block, with the breech-block open.

The breech-block a , as has heretofore been proposed, is shown as pivoted so as to be able to turn freely on a hollow spindle b , projecting from a carrier-arm c , swinging around a pivot c' at one side of the gun. The operating-lever d turns on a pivot d' , mounted on this arm. The breech-block and hollow spin-

dle are provided with the usual divided locking-screws a' .

Inside the hollow spindle b is a sleeve e , inside of which the firing-pin f moves. This firing-pin is hollow and contains a helical actuating-spring f^x .

The trigger g is shown as turning on a pivot e' on the carrier-arm c . It has a nose or stem g^x , which normally lies parallel with the firing-pin. This nose works in a slot e^4 in the sleeve e . The firing-pin, as before remarked, is hollow and contains a helical spring f^x , which acts both as the firing-pin spring and the trigger-spring, the forward end of this spring bearing against the forward end of the hollow in the firing-pin and the rear end against one of the arms, g' , of the trigger. The other arm, g^2 , of this trigger is actuated either directly or through a rocking bell-crank lever h by the firing-lanyard. This lever h is pivoted to a bracket H on the rear end of the gun. The firing-pin is provided with a projection f' , with which a hook g^3 on the nose of the trigger engages normally, thus preventing the firing-pin from moving forward until the trigger is released. The opposite side of the trigger-nose carries a projection g^4 , which when the breech-block is closed or screwed home is opposite a recess a^2 in the latter, thus permitting the trigger-nose to be retracted. The recess a^2 is somewhat wider than the tailpiece g^4 , so as to permit the parts to move easily. In all other positions of the breech-block the projection g^4 bears against the side of the slot or cylindrical hole in the block, and thus prevents the trigger from being moved and the gun fired when the breech-block is out of place.

The sleeve e has fixed to it at one side an arm e^2 , having in it a hole e^3 , through which the hinge-pin d' of the operating-lever d passes, thus holding the sleeve and firing mechanism in place; but on taking out the pin the sleeve and firing-pin can be withdrawn together. This lever d has on it a cylindrical boss d^2 , surrounding its hinge-pin d' , and in this boss is a recess d^3 to receive after the gun is fired a roller f^2 , carried by an arm f^3 , fixed to the firing-pin f . When the lever d is turned, the roller rides up the inclined side of the recess and cocks the gun before the breech-block is unscrewed.

The rear face of the breech-block a has around it an annular recess a^3 , whose cross-section is the arc of a circle, to receive the cylindrical boss d^2 , and in this recess is a cam-groove a^4 (shown in Figs. 1, 2, and 3) to receive a roller d^4 on a pin d^5 , projecting radially from the cylindrical boss d^2 . As the operating-lever d and boss d^2 are turned the roller d^4 , bearing on the side of the groove a^4 in the breech-block, turns and unlocks the breech-block in a way that will be readily understood. The first part of the cam-groove a^4 is shown as horizontal, or nearly so, and its inclination afterward gradually increases, so that while great leverage is obtained for starting the block the speed augments as the block is turned. The travel of the roller also being inward toward the surface of the block produces the same effect. Owing to the conical form of the outer cam-groove, the roller d^4 , which is also conical, also acts as a bolt, locking the breech-screw when closed.

A spring-bolt i , arranged in a suitably-shaped recess in the carrier-arm c , is adapted to enter the recess d^3 or d^6 in the cylindrical boss d^2 when the breech-block is fully home or fully unscrewed and prevents any accidental movement of the operating-lever; but the sides of the recesses and the faces of the ends of the bolt are inclined, so that with a little force the lever can be turned, pressing back the bolt. This bolt has a lug i' on it which comes against the side of the gun and withdraws the bolt from the notch d^3 , and the bolt is then further forced back by an incline d^7 on the cylindrical boss.

It will be observed that the operating-lever and carrier-arm are locked together by the bolt i after the breech-block is unscrewed and swung back, and they remain thus locked during the first inward swinging movement of the carrier-arm to close the breech. During the latter part of the inward movement of the carrier-arm, however, the lug i' presses against the adjacent shoulder on the breech of the gun and the bolt i is drawn back out of the recess d^3 , leaving the operating-lever free to be turned on its pivot, and thus turn the breech-block and lock it in position.

An extractor j , pivoted at j' to the gun, carries a roller j^2 , which bears on the surface c^2 on the carrier-arm to extract the cartridge as the breech is opened, as has heretofore been proposed. The movement given to the extractor j is but a slight one. When a new cartridge is to be inserted, the inner end of the extractor is in the path of the flange of the shell, and when the shell is fully inserted and the breech-block closed the extractor will assume the position shown in Fig. 2.

The following is a description of the operation: Fig. 2 shows the parts in position ready for firing. When the trigger is pulled, the nose g^3 on the trigger is released from the projection f' on the firing-spindle f and the spring thrusts the pin forward to fire the gun. This movement throws the trigger-roller f^2

into the notch d^3 . When the operating-lever d is retracted to open the breech, it swings around on its pivot d' , and the boss d^2 thereon bears against the roller f^2 , forcing it outward and cocking the gun, the nose g^3 slipping over the projection f' as the firing-pin is retracted. The trigger may be cocked by hand at any time by means of a ring f^3 on the firing-spindle. This backward movement of the operating-lever also causes the roller d^4 to move radially inward in the cam-groove a^4 and turns the breech-block, so as to release the divided locking-screws. The continued pull on the operating-lever then swings back the carrier-arm, opening the breech and causing the extractor j to throw out the shell. When the breech is locked in its closed position by the spring-bolt i , Fig. 2, it takes into the recess d^6 on the boss. As the operating-lever starts to move backward the inclined side of this recess, acting on the inclined nose of the bolt, shoves it out of the way and permits the roller d^4 , above mentioned, to rotate the block. When the operating-lever is swung backward to its full extent, this locking-bolt enters the recess d^3 in the boss d^2 , which recess has now been put into line with it, and serves to hold the breech in its open position. The shell is then inserted and the operating-lever moved, causing the carrier-arm and breech-block to swing into their closed position, and the reversed movement of the roller d^4 in the cam-groove locks the breech-block and hollow spindle together, as before.

The arrangement of the trigger in its recess, as above described, is such as to prevent its being accidentally released until the parts are in proper position. I thus by my improvements am enabled to secure rapid, efficient, and safe operation of the various parts.

Having thus fully described the construction and operation of my improved quick-firing gun, what I claim therein as new and as of my own invention is—

1. The combination, substantially as hereinbefore set forth, of a gun, a breech-block therein having an annular recess, a^3 , in its rear end, and a radial cam-groove, a^4 , in this recess, a carrier-arm, an operating-lever pivoted on the carrier-arm and having a cylindrical boss extending into the annular groove and turning therein while the breech-block is being turned, a roller carried by the boss extending into the radial cam-groove, a spring-bolt carried by the carrier-arm and a cam on the boss with which the bolt engages.

2. The combination, substantially as hereinbefore set forth, of a gun, a breech-block therein having a radial undercut cam-groove in its rear end, a carrier-arm for the breech-block, an operating-lever pivoted to the carrier-arm and a conical roller carried by the operating-lever extending into the cam-groove.

3. The combination, substantially as hereinbefore set forth, of a gun, a breech-block therein having a radial cam-groove in its rear end, a carrier-arm for the breech-block, an

operating-lever carried thereby and a roller on the operating-lever extending into the cam-groove and interlocked therewith, the arrangement being such that as the operating-lever is turned the roller moves radially toward the axis of the breech-block, and also pulls the breech-block open as the lever and carrier-arm are swung out.

4. The combination, substantially as hereinbefore set forth, of a gun, a carrier-arm pivoted thereto, a breech-block connected with the carrier-arm, an operating-lever pivoted on the carrier-arm, a cylindrical boss on the lever, recesses, d^3 , d^6 , on the boss, and a locking spring-bolt on the carrier-arm, adapted to engage said recesses.

5. The combination, substantially as hereinbefore set forth, of a gun, a carrier-arm pivoted thereto, a spindle on the carrier-arm, a breech-block free to turn on this spindle, an operating-lever pivoted on the carrier-arm, a cylindrical boss on the lever, a roller on the boss, a cam-groove in the breech-block in which this roller traverses, recesses, d^3 , d^6 , having inclined sides, on the boss, and a locking spring-bolt on the carrier-arm.

6. The combination, substantially as hereinbefore set forth, of a gun, a carrier-arm pivoted thereto, a hollow spindle on the carrier-arm, a breech-block, a firing-pin moving therein, a trigger pivoted to the carrier-arm and engaging with the firing-pin, a spring interposed between the firing-pin and trigger, an operating-lever pivoted to the carrier-arm, a cylindrical boss on the pivot of the lever, a recess in the boss, and a roller on the firing-pin adapted to engage with the boss, so that the trigger may be cocked as the breech opens.

7. The combination, substantially as hereinbefore described, of a gun, a carrier-arm pivoted thereto; a hollow spindle on the carrier-arm, a breech-block free to turn on this spindle, a firing-pin moving therein, a trigger pivoted to the carrier-arm, a spring interposed between the firing-pin and trigger, and a pro-

jection on the nose of the trigger working in a recess in the breech-block when closed, but held locked by the walls of the breech-block when open, thus preventing accidental firing.

8. The combination, substantially as hereinbefore set forth, of a gun, a carrier-arm pivoted thereto, a hollow spindle, on the carrier-arm, a breech-block free to turn thereon, a sleeve also on the carrier-arm inside the spindle, a firing-pin moving in the sleeve, a trigger pivoted to the sleeve and engaging with the firing-pin, and a spring interposed between the firing-pin and trigger, and actuating both of them.

9. The combination, substantially as hereinbefore set forth, of a gun, a carrier-arm pivoted thereto, a hollow spindle on the carrier-arm, a breech-block free to turn on the spindle, a firing-pin moving therein, a trigger pivoted to the carrier-arm, and engaging with the firing-pin, a spring interposed between the firing-pin and trigger, an operating-lever pivoted to the carrier-arm, a cylindrical boss on the lever, an annular recess in the breech-block receiving the boss, a cam-groove in the recess, and a roller on the boss moving radially in the cam-groove.

10. The combination, substantially as hereinbefore set forth, of a gun, a carrier-arm pivoted thereto, a hollow spindle on the carrier-arm, a breech-block free to turn thereon, a sleeve, also on the carrier-arm inside the spindle, a firing-pin moving in the sleeve, a trigger pivoted to the sleeve and engaging with the firing-pin, a spring interposed between the firing-pin and trigger, an operating-lever pivoted to the carrier-arm, a cylindrical boss on the lever, an annular recess in the breech-block receiving the boss, a cam-groove in the recess, and a roller on the boss moving radially in the cam-groove.

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Witnesses:

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