

No. 840,007.

PATENTED JAN. 1, 1907.

L. H. MULLIKIN.
COMBINED LOCK AND LATCH.

APPLICATION FILED OCT. 12, 1906.

4 SHEETS—SHEET 1.

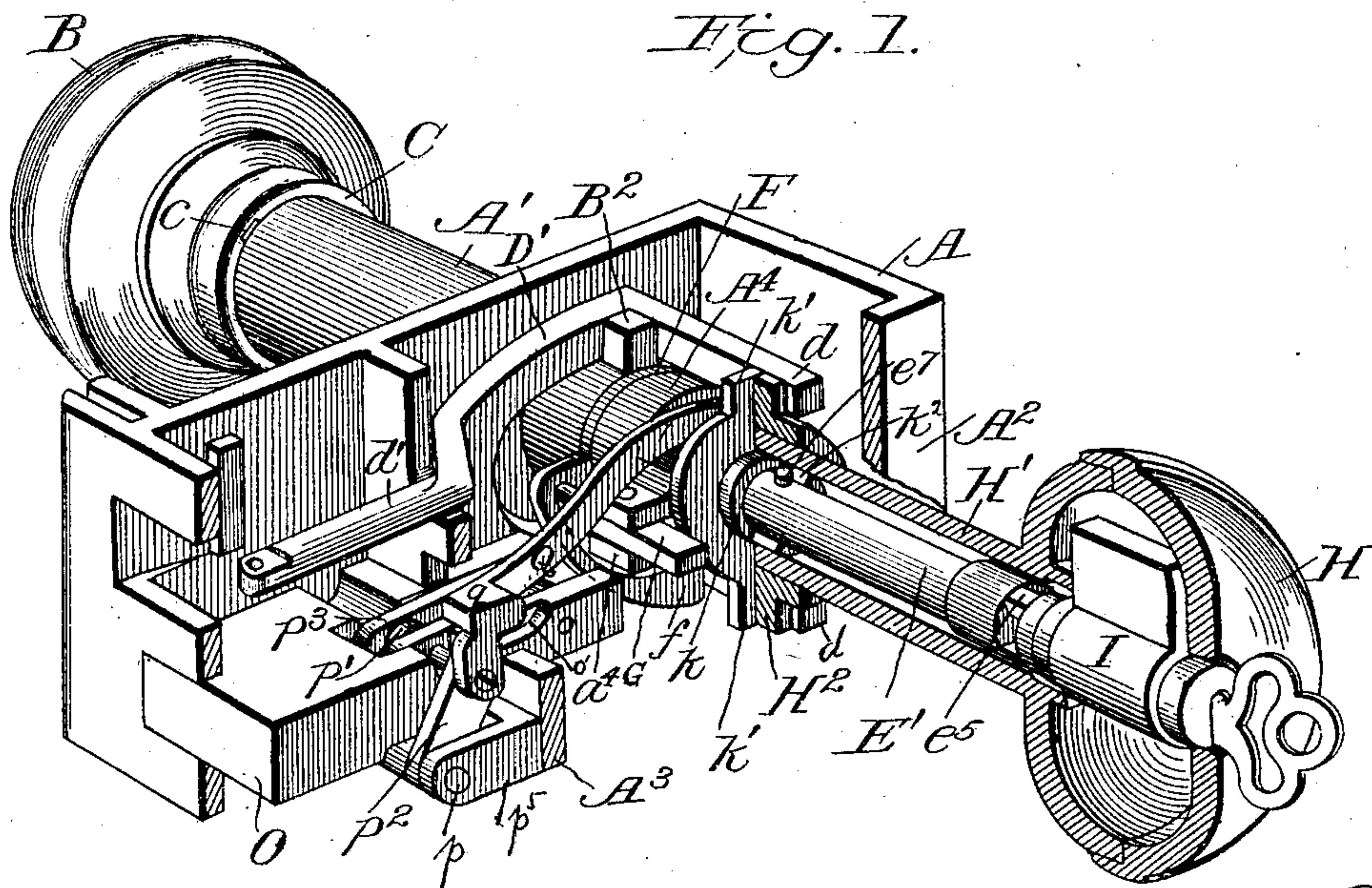


Fig. 3.

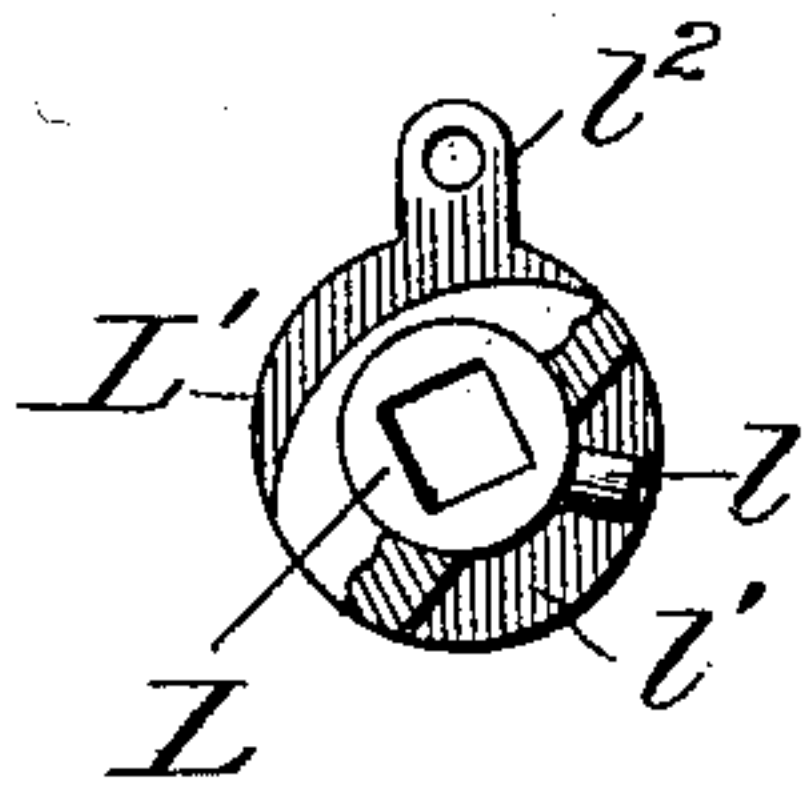


Fig. 2.

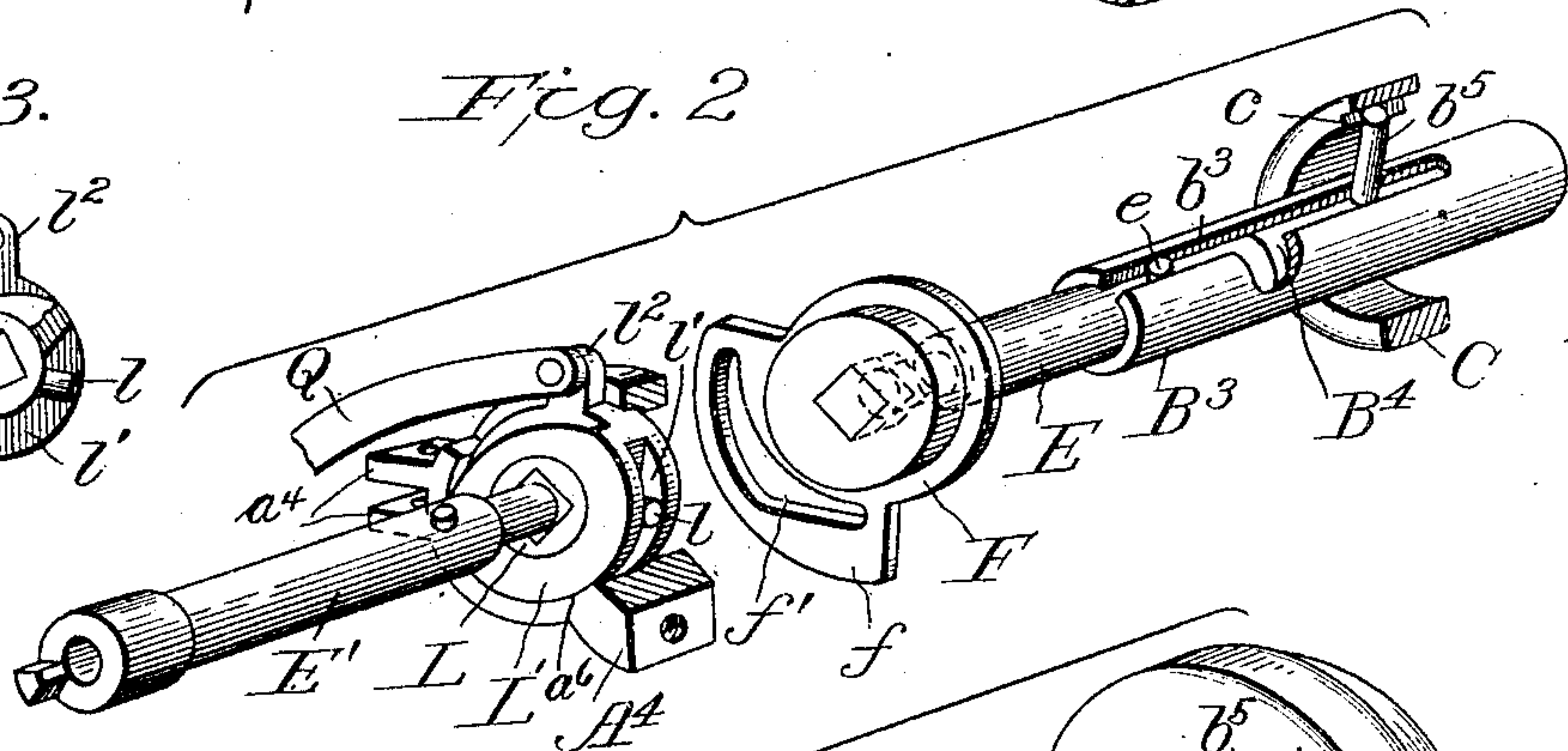
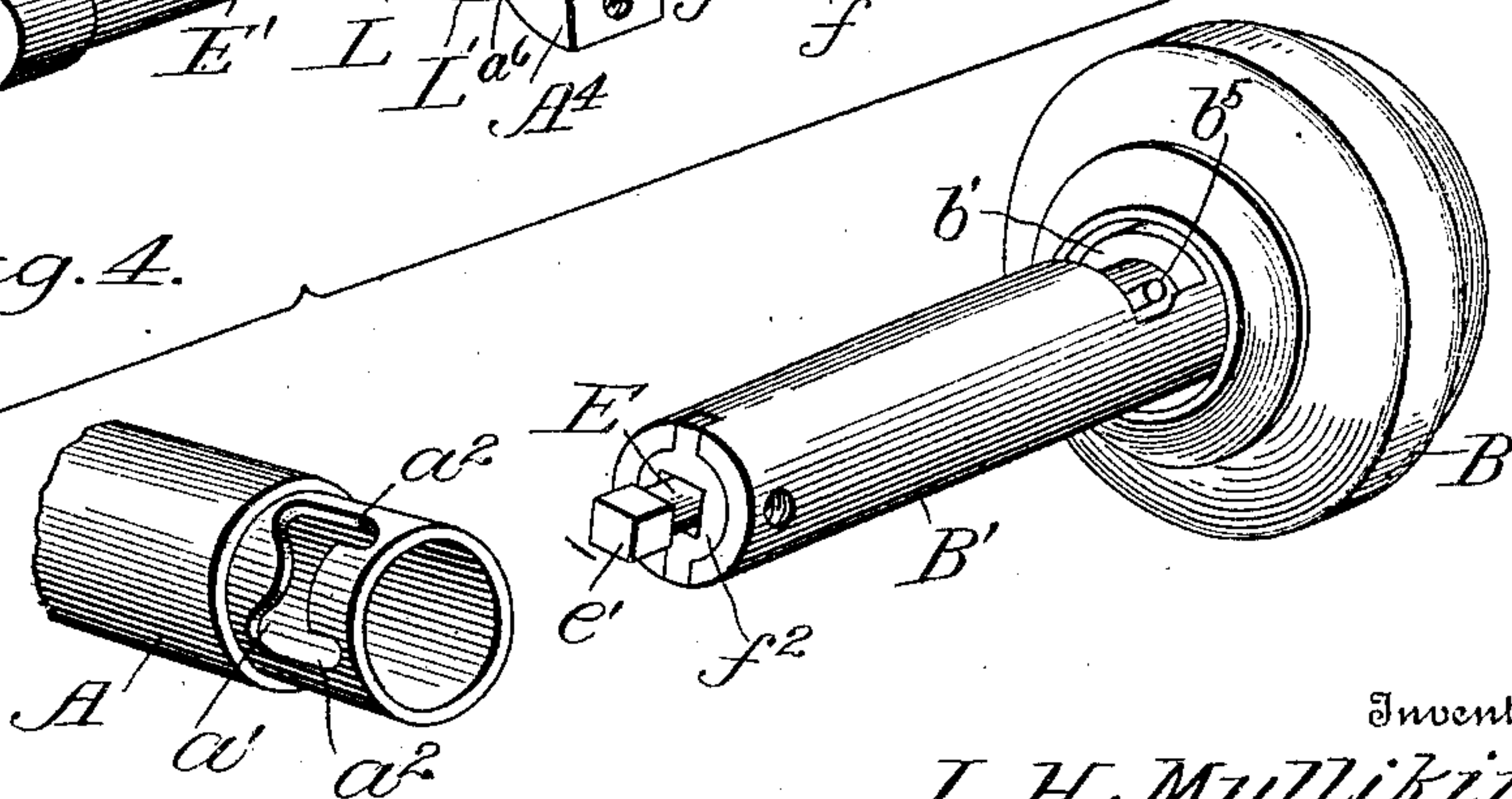


Fig. 4.



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4 SHEETS—SHEET 2.

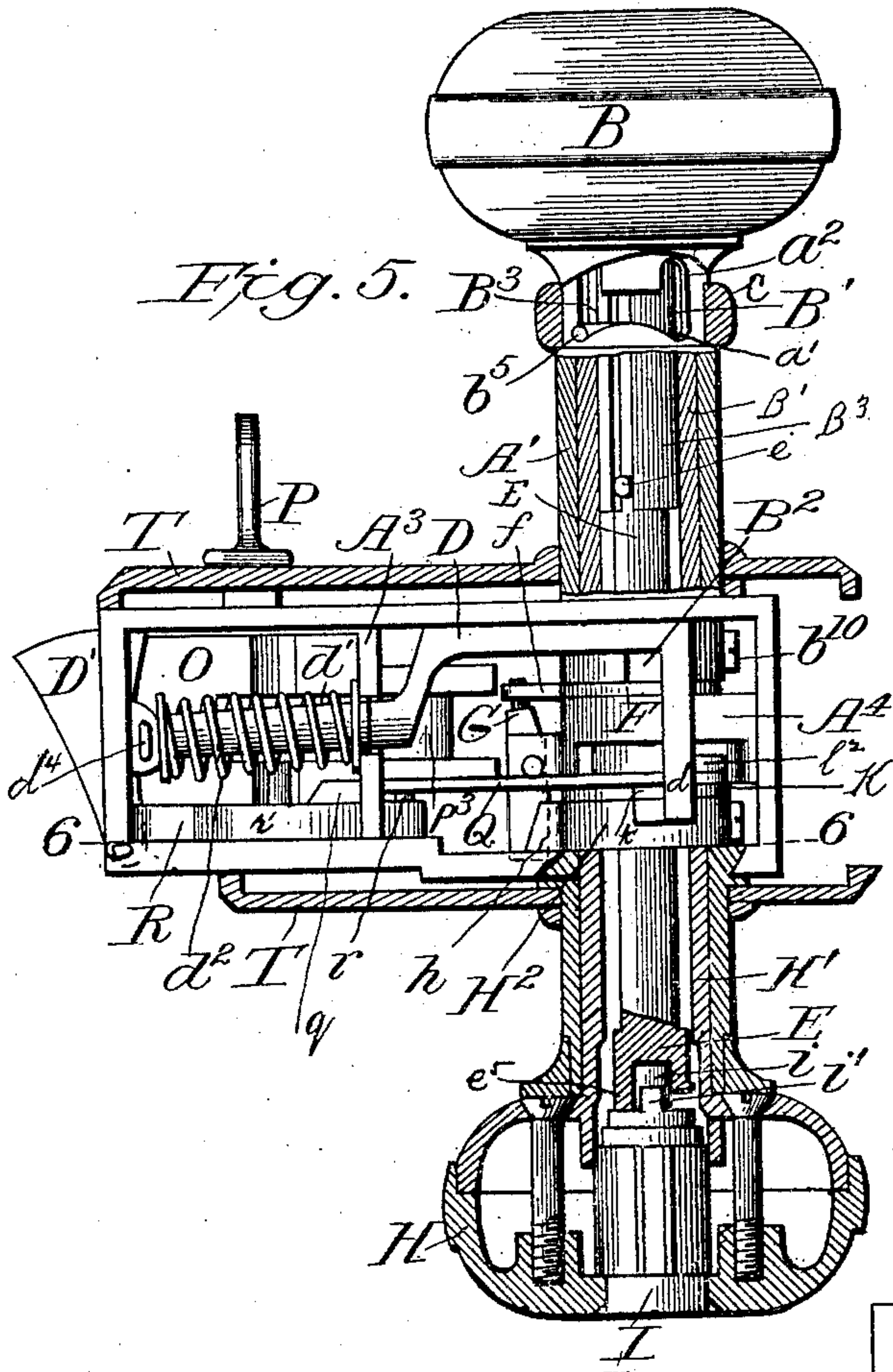


Fig. 7.

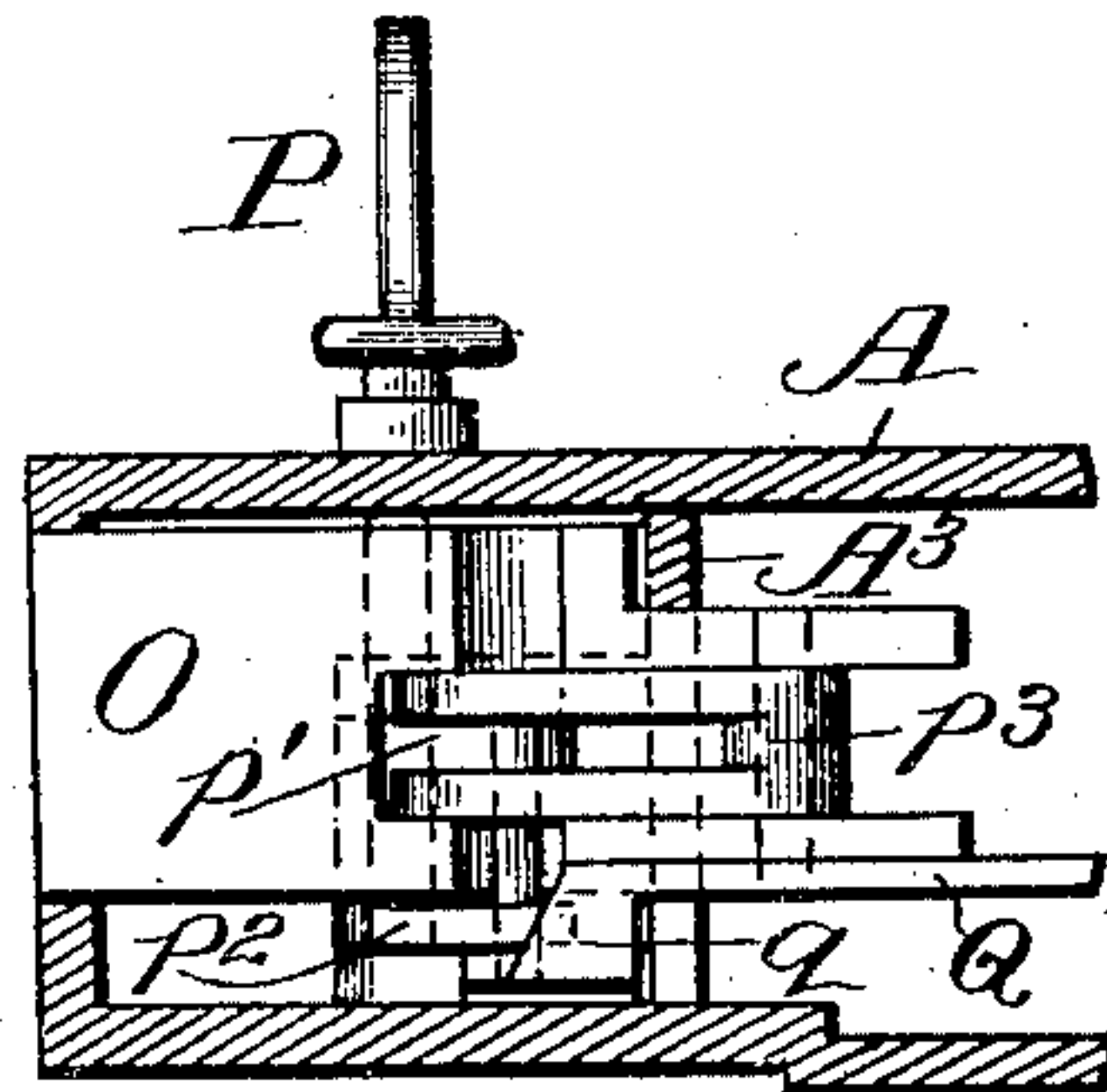


Fig. 8.

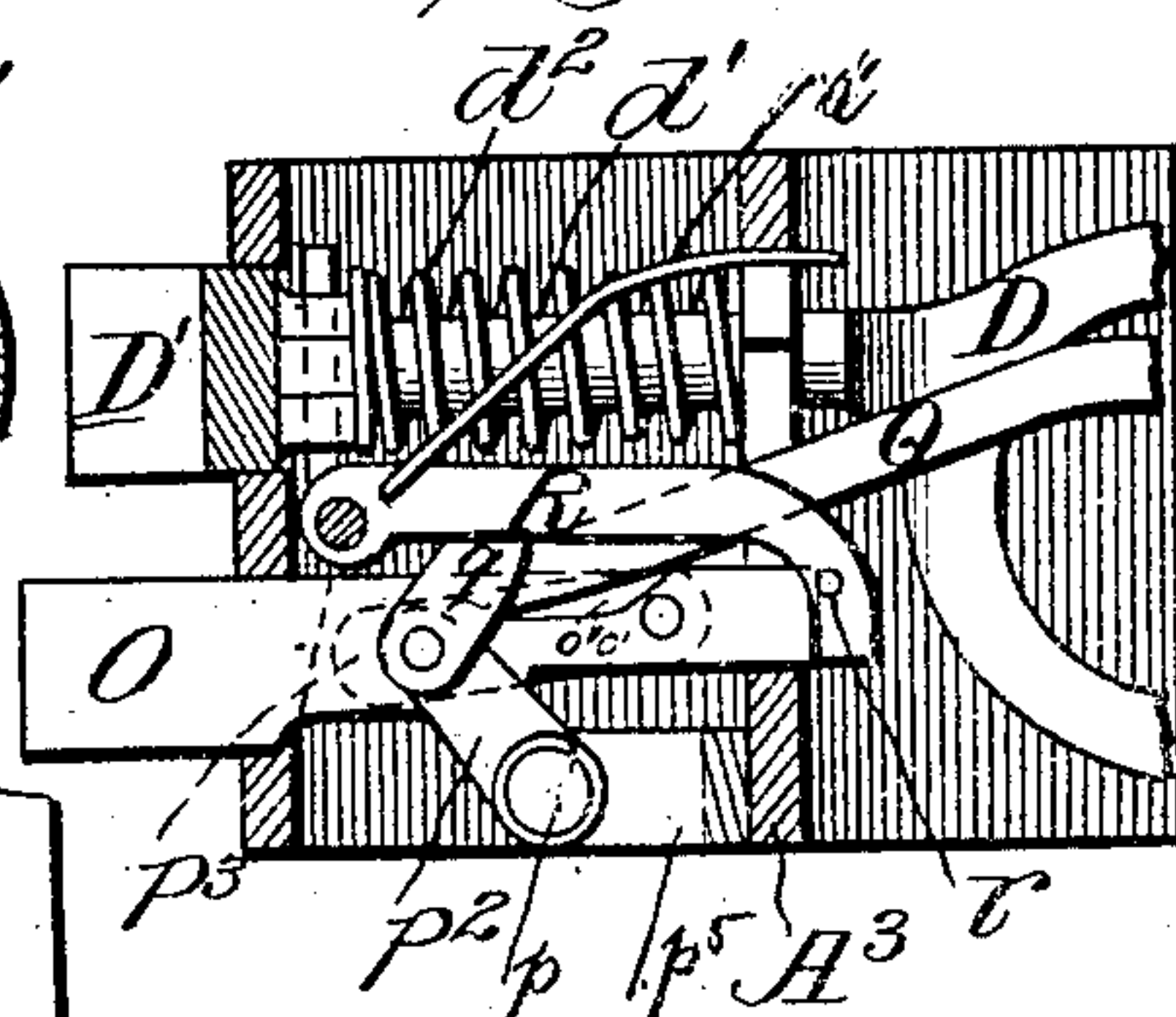
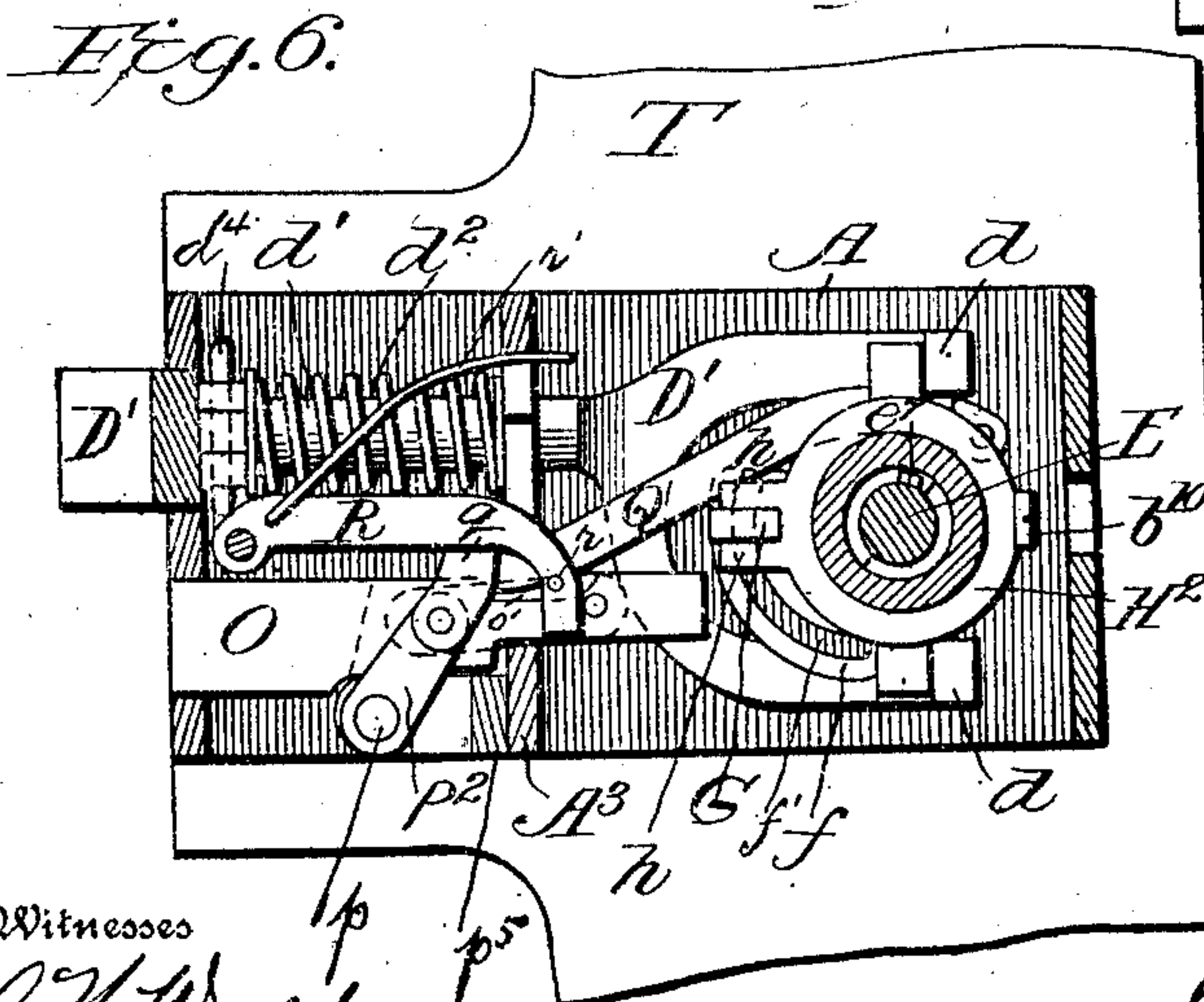
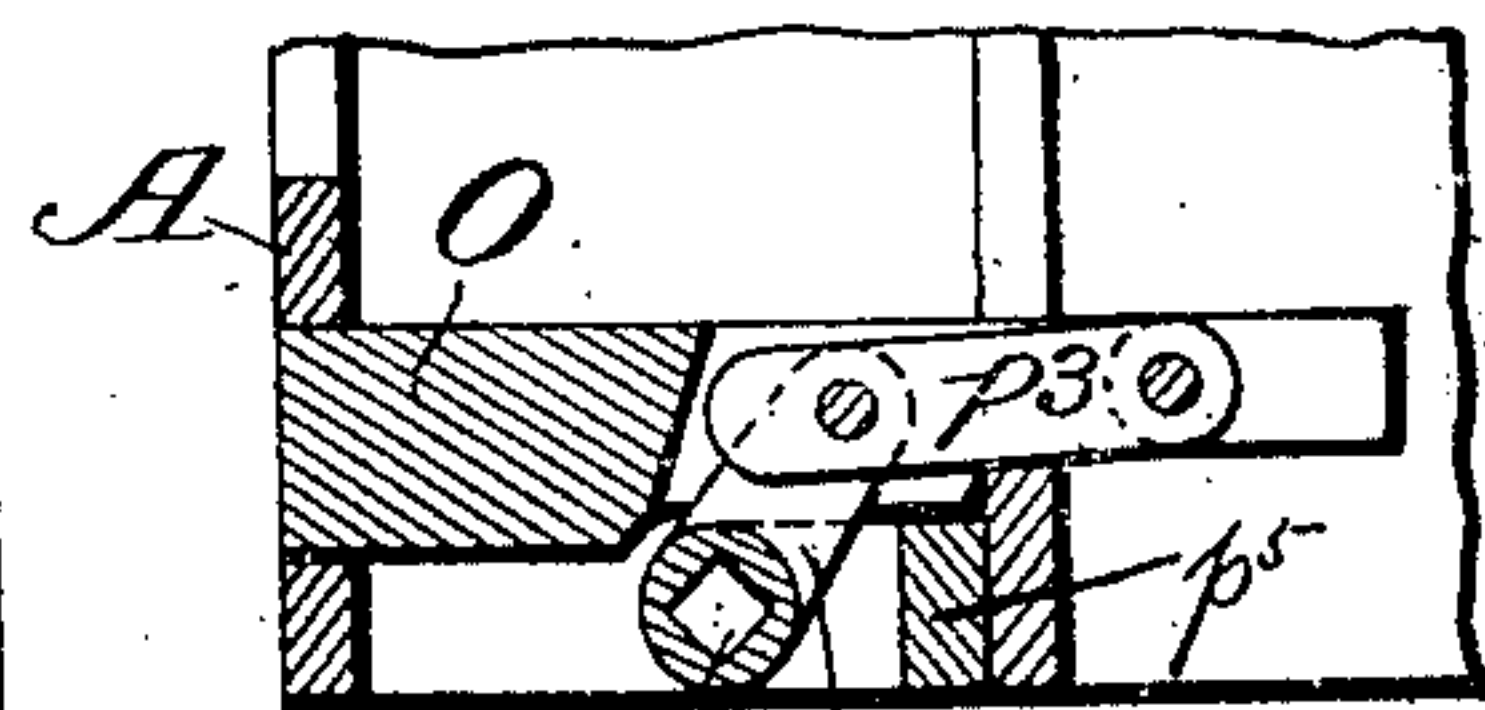


Fig. 9.



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Fig. 10.

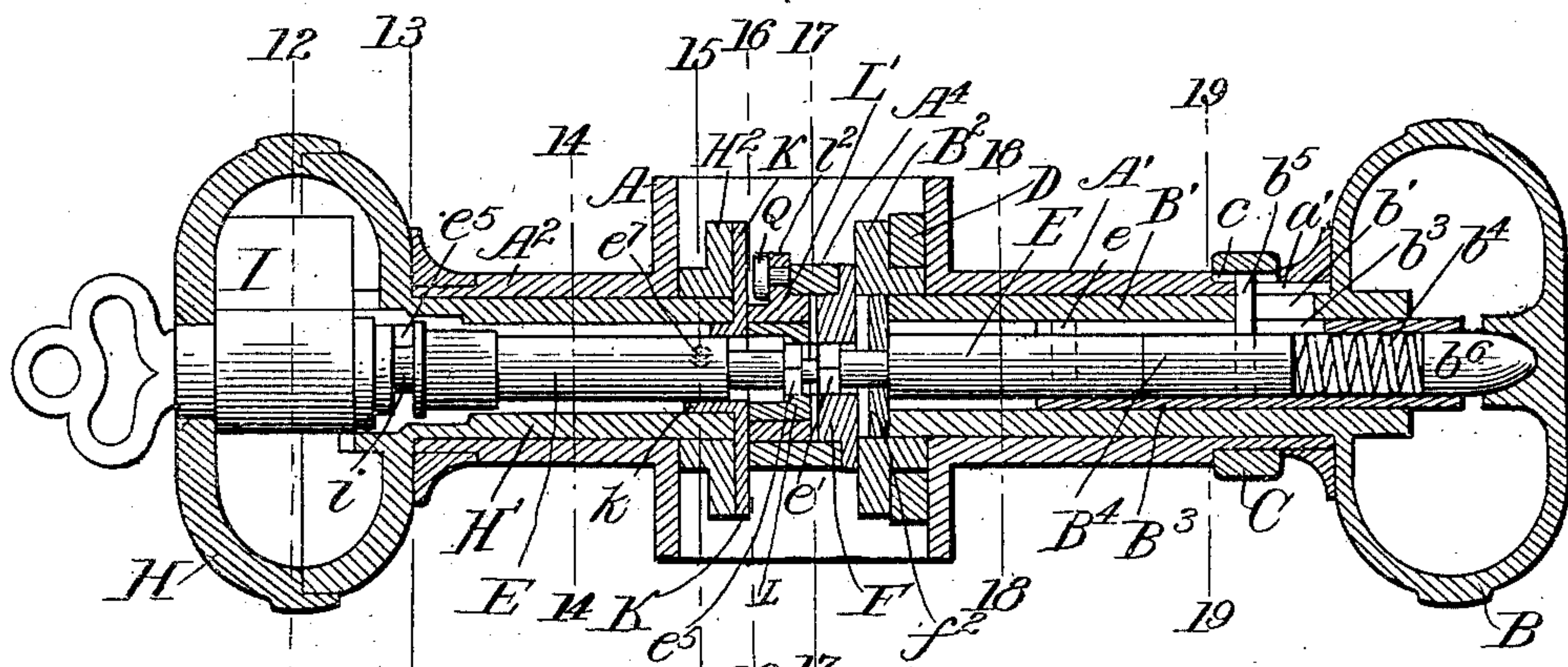


Fig. 11.

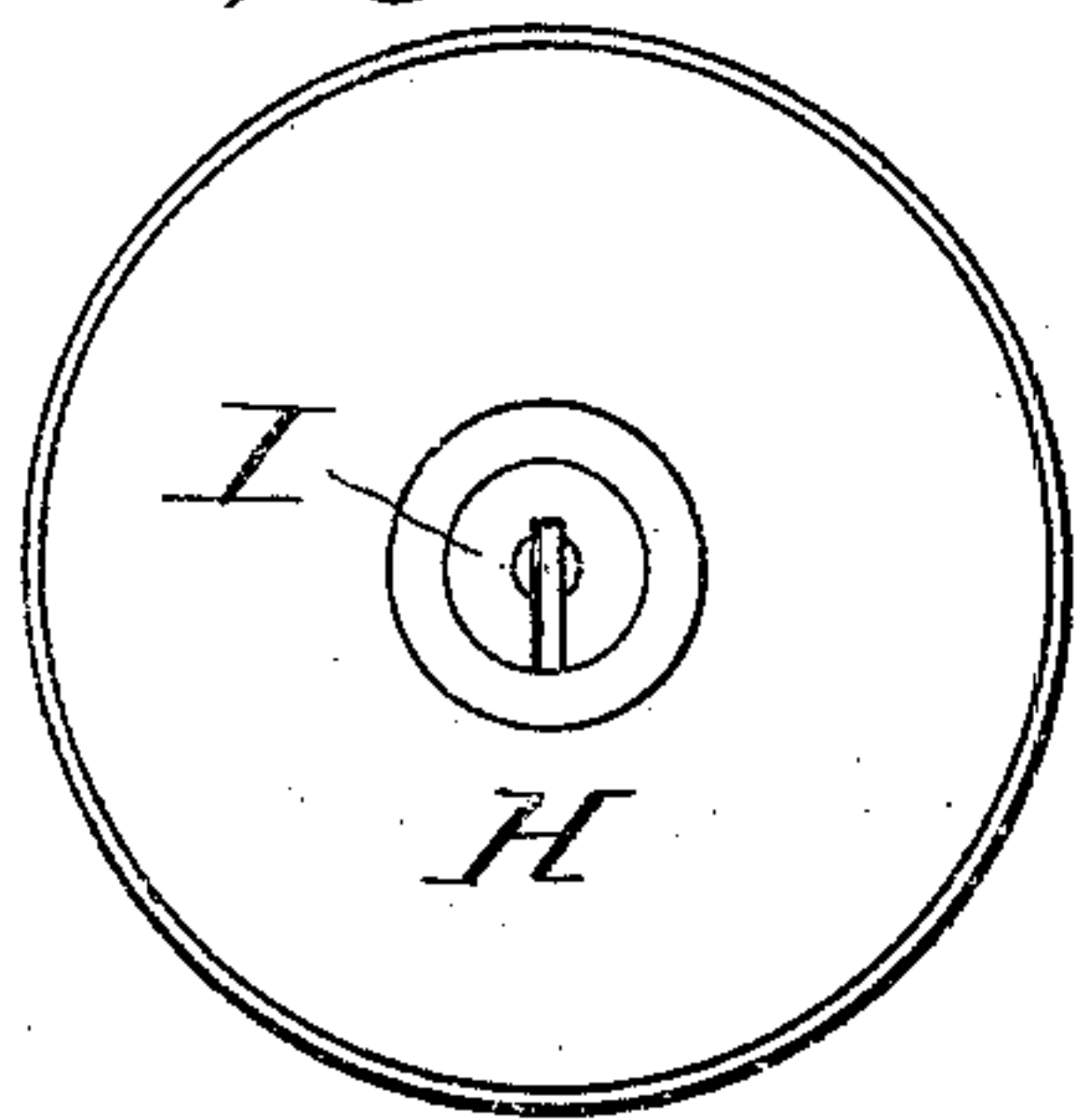


Fig. 12.

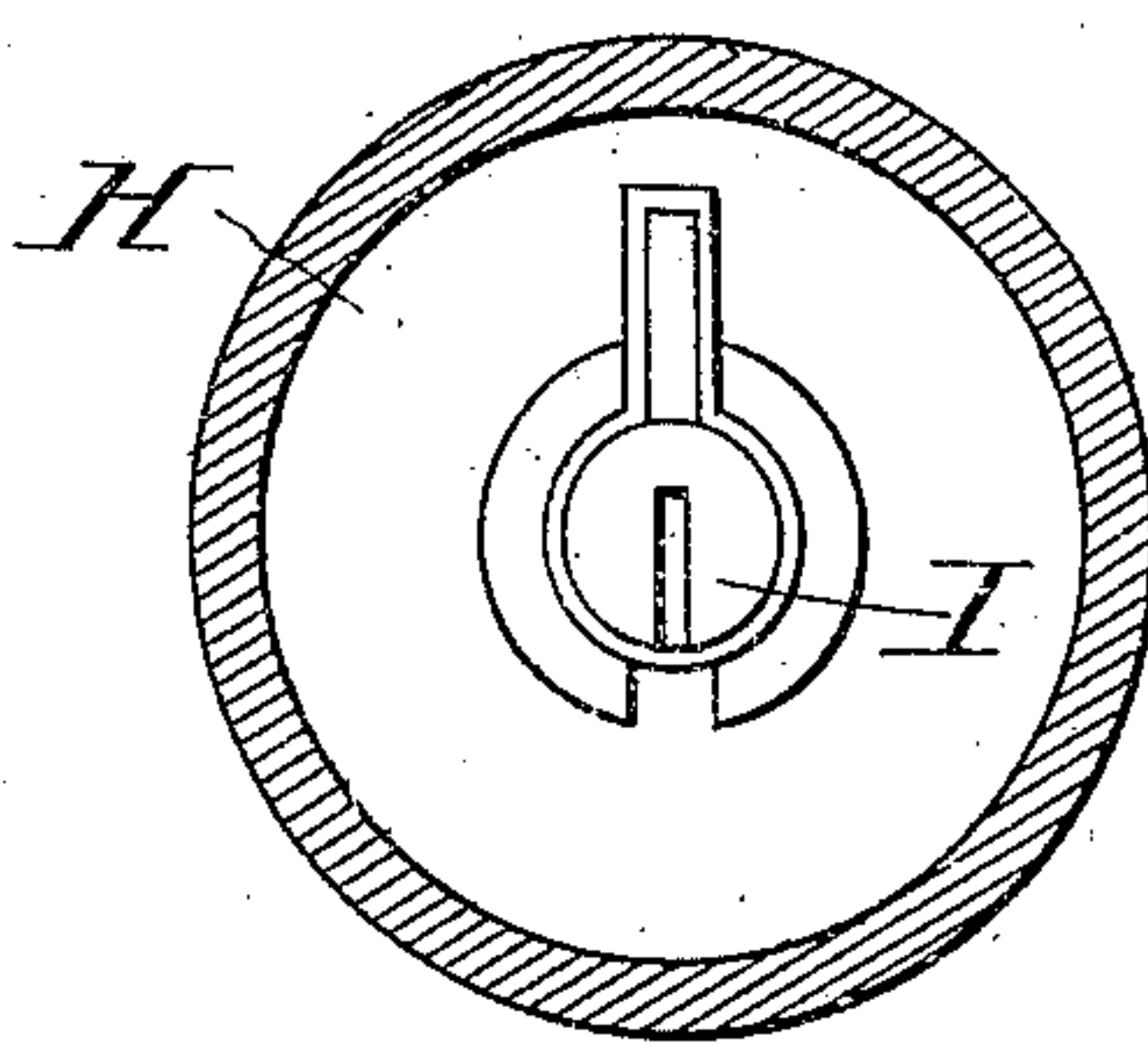


Fig. 13.

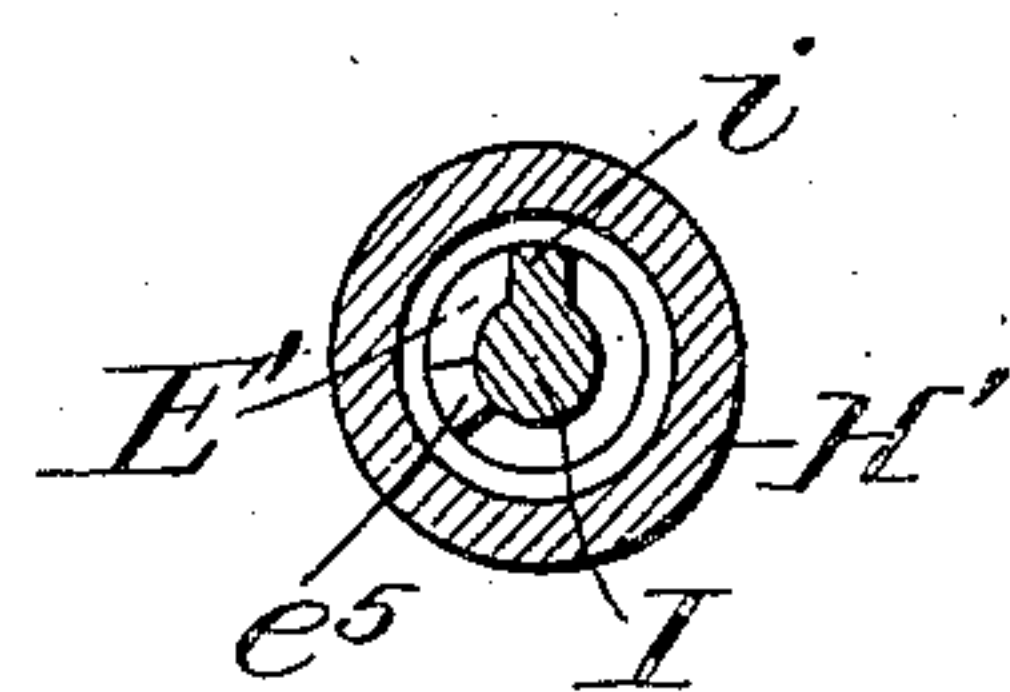


Fig. 14.

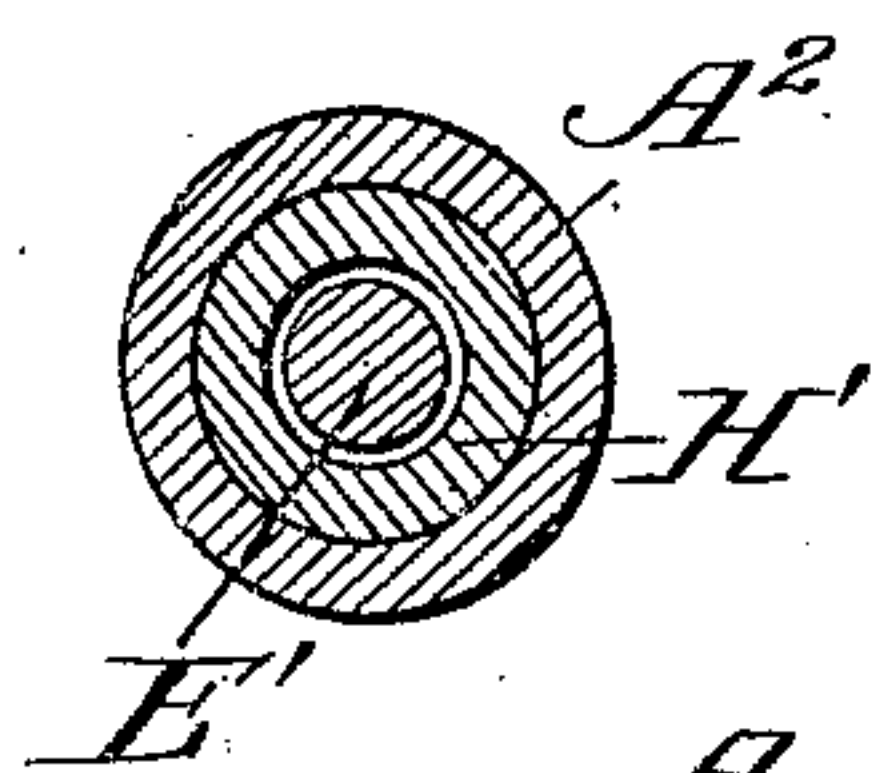


Fig. 15.

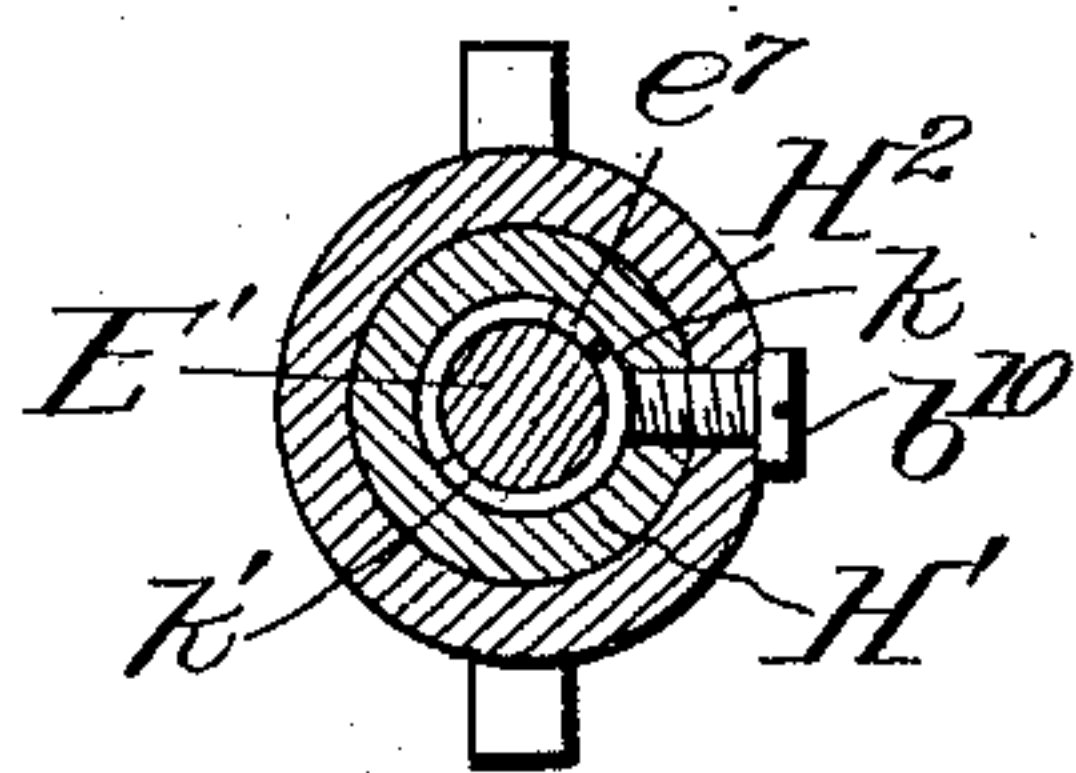


Fig. 16.

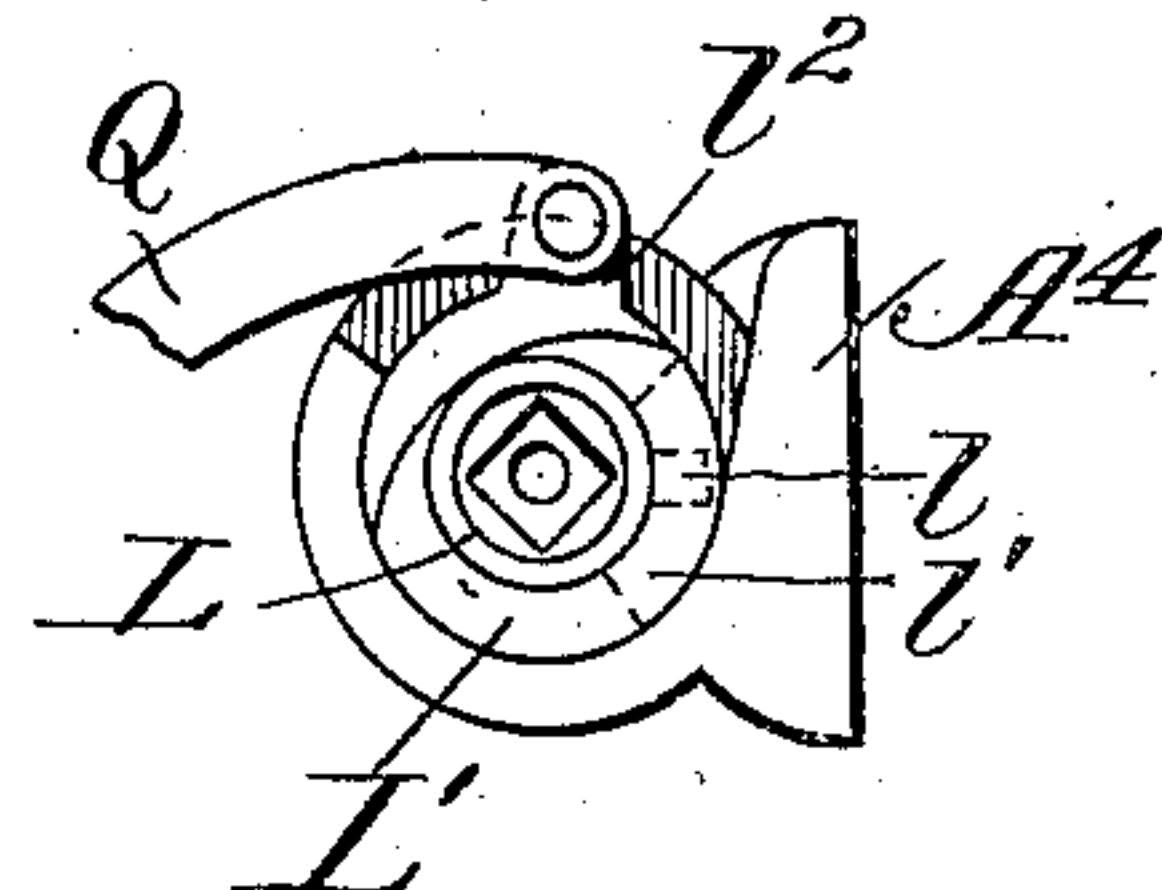


Fig. 17.

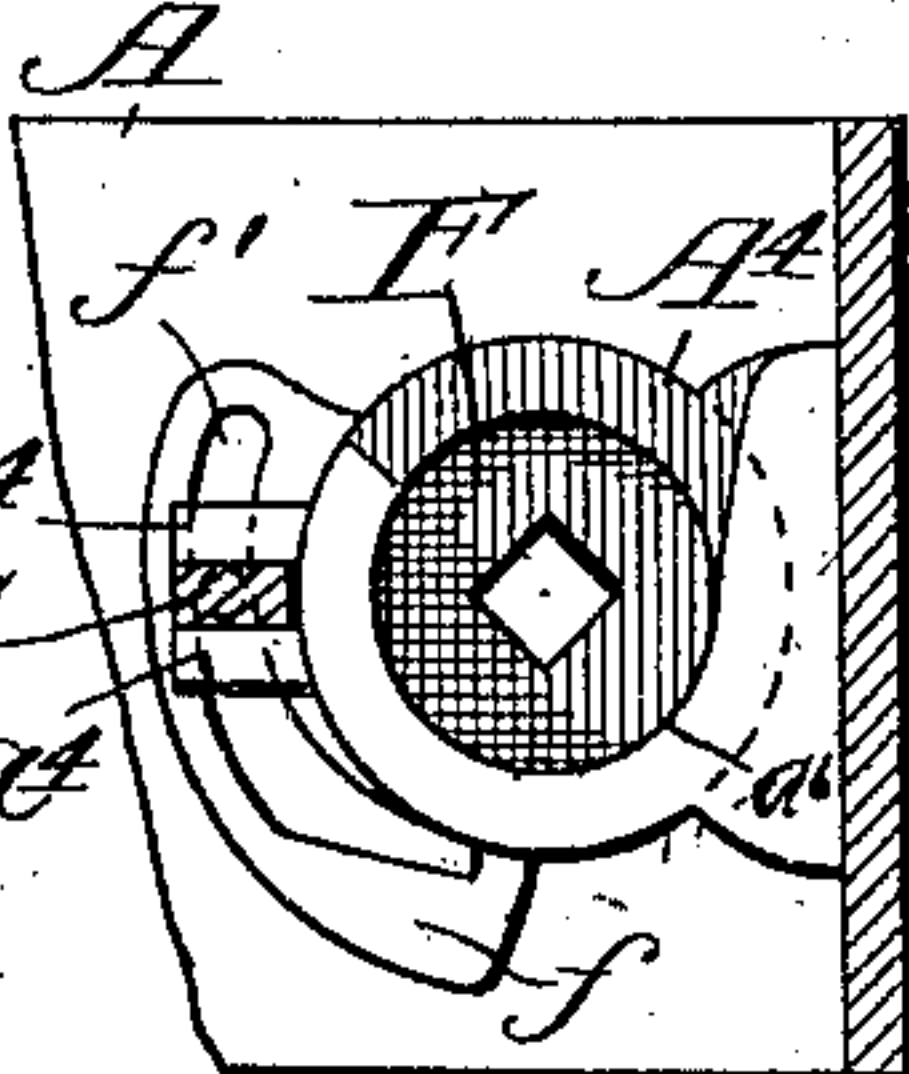
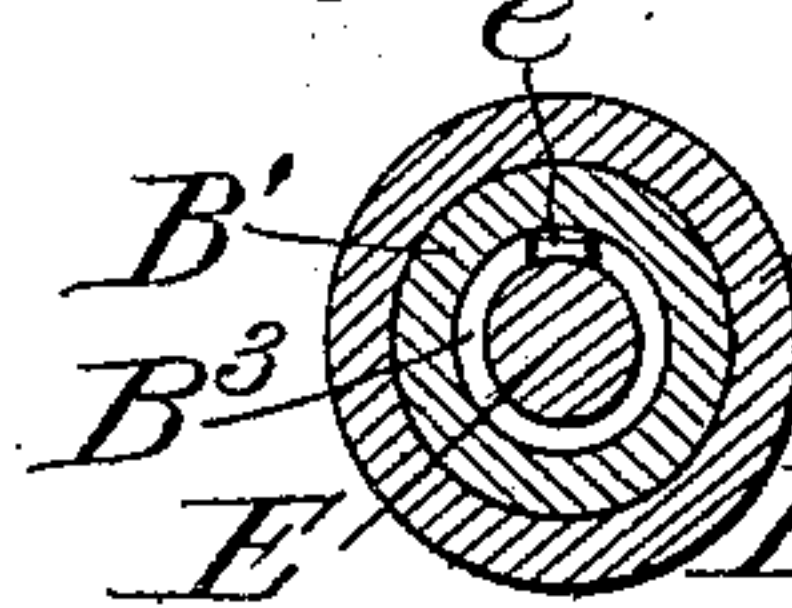


Fig. 18.



Witnesses
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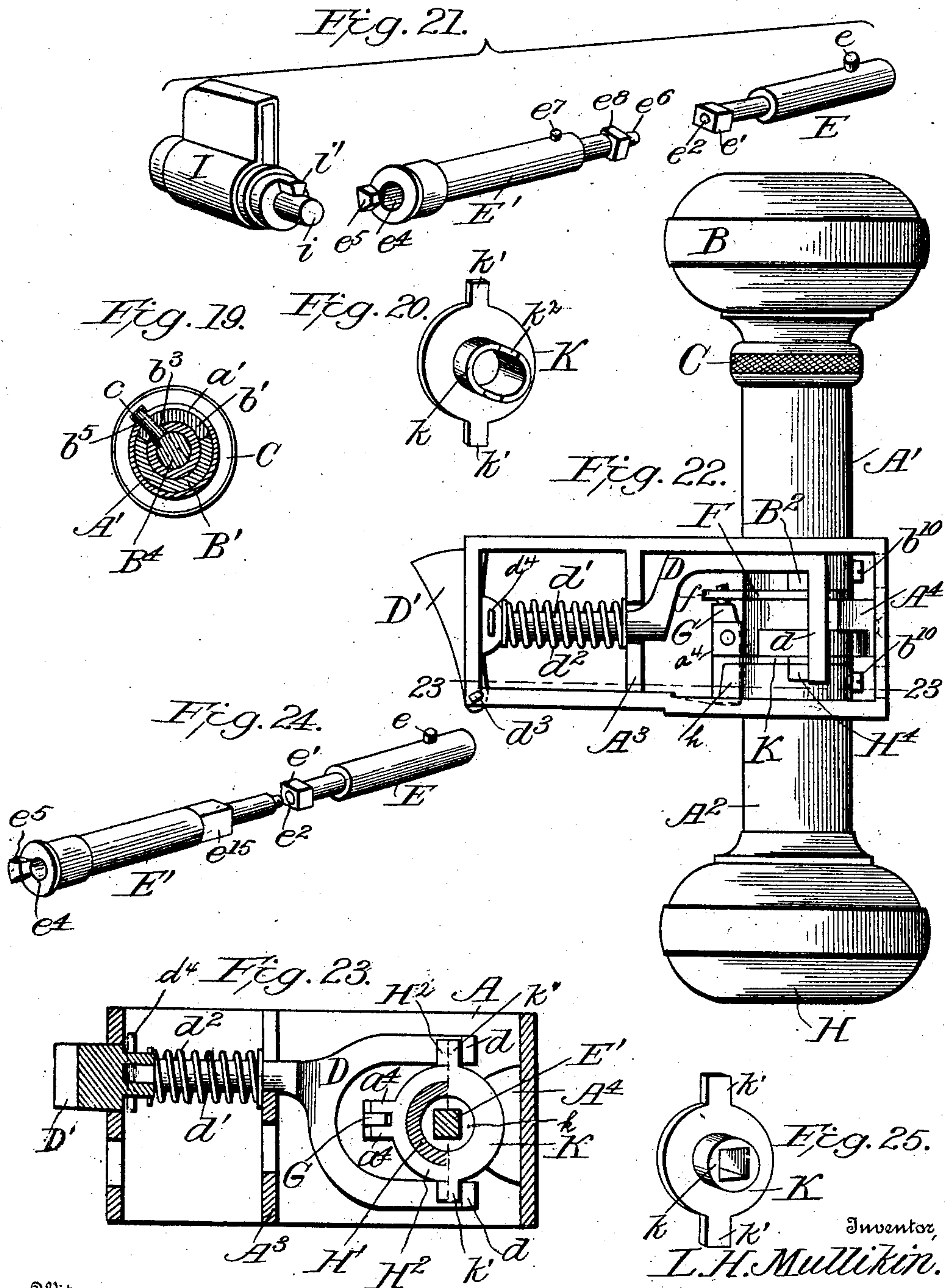
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4 SHEETS—SHEET 4.



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LEVIN H. MULLIKIN, OF TRAPPE, MARYLAND.

COMBINED LOCK AND LATCH.

No. 840,007.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed October 12, 1906. Serial No. 338,574.

To all whom it may concern:

Be it known that I, LEVIN H. MULLIKIN, a citizen of the United States, residing at Trappe, in the county of Talbot and State of Maryland, have invented new and useful Improvements in a Combined Lock and Latch, of which the following is a specification.

My invention relates to a combined lock and latch in which the latch may be locked from the inside and retracted by a key-actuated mechanism in the outer knob and in which the bolt may be thrown by a finger-piece on the inside and retracted from said key-actuated mechanism.

The objects of the invention are to provide such a lock with a third roll-back or rocker actuated by the said knob-contained key mechanism; also, to provide a collar for actuating the bolt and having an actuating-hub loose therein and adapted at its extreme movements to rotate or rock the said hub to actuate the collar; also, to provide a detent for locking the bolt in its thrown or projected position, which detent is released by the rod connecting the said collar with the bolt; also, to provide a novel locking mechanism for the outside knob to prevent its rotation. These objects I accomplish by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a sectional perspective of a lock containing my improvements with the bolt-engaging detent omitted. Fig. 2 is a perspective of the key-actuated rod, the collar and hub for actuating the bolt, and the means for operating the outside-hub locking mechanism. Fig. 3 is a detail sectional view of the bolt-operating collar and its loose actuating-hub. Fig. 4 is a detail perspective of the inside knob. Fig. 5 is a sectional plan view. Fig. 6 is a section on line 6 6 of Fig. 5, the bolt being retracted. Fig. 7 is a detail sectional plan of the bolt. Fig. 8 is a sectional side elevation similar to Fig. 6 with the bolt thrown or projected. Fig. 9 is a detail longitudinal section through the bolt to show its operating-link. Fig. 10 is a longitudinal vertical section through the lock from knob to knob. Fig. 11 is a face view of the outside knob. Figs. 12 to 19, inclusive, are sections through Fig. 1 on the lines corresponding to their numbers. Fig. 20 is a detail perspective of the third or key-actuated roll-back or rocker. Fig. 21 is a perspective of the operating-rods and key device separated. Fig.

22 is a plan of the lock with the bolt and its actuating mechanism omitted. Fig. 23 is a section on line 23 23, Fig. 22. Fig. 24 is a perspective of the two rods or spindles, showing a slight modification in the key-actuated spindle. Fig. 25 is a perspective view of a key-actuated rocker.

A designates the lock-case, of general open rectangular form, provided at opposite sides with tubular extensions or hubs A' A² and provided with a transverse partition A³. The rear wall of the case is provided with a central inwardly-projecting bracket A⁴, having an opening a⁶ in horizontal alinement with the hubs A' A².

The inner knob B is provided with a tubular shank B', extending into the lock-case A and there provided with a two-armed roll-back or rocker B² to actuate the latch-retracting yoke D, as will be further described.

Within the tubular knob-shank B' is a longitudinally-slotted tube B³, and in this tube B³ is a plunger B⁴, pressed inwardly by a spring b⁴, which bears at its outer end against a plug b⁶ in the end of said tube. Extending at right angles from the plunger B⁴ is a pin b⁵, which passes through the longitudinal slot b³ in the tube B³ and also through a transverse slot b' in the knob-shank B' into a curved or cam-shape slot a' in the hub A'.

The projecting end of the pin b⁵ is received within a transverse groove c in the inner wall of a ring C, mounted to turn on the hub A' adjacent to the knob B. The ends of the slot a' have extensions a² toward the knob. When the ring is turned to the right, the pin b⁵ will be carried over the high part of the middle of slot a' to the position shown in Fig. 5, where it will be held by the pressure of spring b⁴ to prevent accidental rotation of the ring C, and also when the ring C is turned in the opposite direction the pin b⁵ will be carried over to the opposite end of the slot in line with a groove a². In this position by first removing the screw b¹⁰, which secures the knob-shank B' to the rocker B², the knob-shank may be pulled out beyond the ring C to bring the pin b⁵ into the slot a², when it may be pulled out by pliers to separate the parts, or in this position the pin may be inserted when the parts are being assembled. By having the ring mounted to turn on the hub A' independent of the knob-shank B' the rotation of the knob-shank has no effect whatever on the ring, which is held

from accidental turning by the pin b^5 , held in the end of slot a' by the spring, as before described.

Within the inner end of the tube B^3 is an actuating-rod E , abutting against the plunger B^4 and having a pin e , which projects into the slot b^3 of the tube B^3 to prevent it from turning in the tube when the tube is rotated by turning the ring C . The inner end of this rod E is reduced and has a squared extremity e' , which enters a squared opening in a collar F , which rotates in the bracket A^4 and is provided with a flange f , having a cam-slot f' . The reduced portion of the rod E is provided with a guide-collar f^2 , which works in the central opening of the rocker B^2 , as shown in Figs. 4 and 10.

G is a locking-lever pivoted between the ends in ears a^4 on the front end of the bracket A^4 , one end of the lever entering the cam-slot f' of collar F and the other end adapted to enter a notch h in the yoke-actuating rocker H^2 of the outside-knob spindle H' , which is mounted in the outside case-extension or hub A^2 . (See Figs. 1, 5, and 6.) It will be seen, therefore, that when the ring C is turned to the position shown in Fig. 5 the rod E will, through its squared portion e , have turned the cam f down, (see Figs. 1 and 17,) and so have thrown the free end of lever G into the notch h in the outside rocker H^2 . This rocker will thus be locked and rendered inoperative by the outside knob H until the reversal of the ring C .

In order that the latch D' may be retracted from the outside, I provide the outer knob H with a rotary pin-controlled keyhole-barrel I , which, being of the usual Yale type, need not be further described. The inner end of the barrel I is provided with a longitudinally-projecting round extension i and a lug i' . This extension i enters an opening e^4 in the end of a rod E' , which is also provided with a lug e^5 , so that by turning the barrel I the rod E' may be rotated in either direction, owing to the lug i' engaging with lug e^5 . The inner end of the rod E' has a reduced round extension e^6 , which enters loosely an opening e^2 in the end of the rod E , so that the two may have independent rotary movement, but be held in proper alinement. The rod E' is also provided near its inner end with a pin e^7 , which works in a cut-away portion on the hub k of a third or key-actuated rocker K , lying alongside the outside-knob rocker H^2 , with its arms $k' k'$ engaging the latch-yoke D . This hub k enters and turns in the inner end of the outer-knob shank or spindle H' , so that when the rod K is actuated, by moving the key to the right, the pin e^7 will engage shoulder k^2 at the upper cut-away portion of the hub k and turn the rocker K , so as to engage the yoke D and retract the latch D' . The cut-away portion of the hub k allows the rod and its pin e^7 free

play when turned to the left. The rod E' is further provided with a squared portion e^8 , which enters an actuating-hub L , mounted to turn within a collar L' , which rotates in the bracket A^4 at the opposite side from the collar F , before described.

The actuating-hub L has lost motion within the collar L' by means of a pin l , which projects from it through a slot l' in the collar. When the rod E' is turned far enough in either direction, it will rotate the hub L in the collar L' until the pin l contacts with either end wall of the slot l' , after which, on continuing the rotation of the rod, movement will be imparted to the collar L' , and it will be rotated either forwardly or backwardly, as the case may be. The lost motion of the actuating-hub L' is afforded in order that the key-actuated rocker K may have an extent of movement sufficient to actuate the latch. In other words, the roll-back or rocker K may be actuated without actuating the collar L' , and vice versa, and both the collar and the roll-back may be actuated without having to turn the key but the part of a revolution.

The bracket A^4 is cut away at its upper side to permit a lug or ear l^2 to project up and work back and forth therethrough and actuate the bolt O , as will be presently described.

The latch-yoke D has two horizontal arms $d d$ at its rear ends, which extend behind both arms of the roll-backs or rockers B^2 , H^2 , and K , (see Figs. 1, 5, and 22,) and the shank d' is surrounded by a spring d^2 , which lies between the front of the case and the partition A^3 , in which the yoke-shank slides. The latch D' is pivoted at d^3 to the case and is pivoted at d^4 to the yoke-shank.

The bolt O is mounted in the lower part of the case and is operated from the inside by a rotary finger-piece P , the shaft p of which is mounted in a bracket p^5 and carries two arms $p' p^2$, and the arm p' is pivotally connected to the forked rear end of the bolt by forked link p^3 , by which the bolt is operated. The arm p^2 is pivotally connected to the ear l^2 of the collar L' by means of a connecting-rod Q , so that when the collar L' is rotated by a key inserted in the barrel I , with the parts in the position shown in Fig. 8, the rod Q will pull on the arm p^2 and retract the bolt, as shown in Fig. 6, and continued movement in the same direction will turn rocker K and retract the latch. An opposite movement will of course project the bolt. This connecting-rod Q has a laterally-projecting offset q , which underlies a pivoted detent R , adapted to lock the bolt against retraction.

The detent R is pivoted to the case at its forward end just over the forward end of the bolt O and has a downwardly-curved rear end, which carries a laterally-projecting pin r , which rests in an inclined recess o' in the upper edge of the bolt when the bolt is re-

tracted; but when the bolt is projected by the forward movement of the rod Q the offset q thereof will raise the detent R, and when the rod and arm p^2 reach their forward throw the offset r will again descend and allow the detent R to be forced down by its spring r' , and the pin r will drop behind the rear end of the bolt and prevent it from being retracted until rod Q is pulled to the rear.

10 When the outside knob H is locked and the bolt O projected, the outside knob H cannot be turned to retract the latch, and in order to open the door the key S must be inserted, as in Fig. 10, when by turning it to 15 the right the lug i' will engage the lug e^5 and rotate the rod E', the squared end e^8 of which will rotate the collar L' through its loose actuating-hub L and pull the rod Q inwardly, which rod will lift the detent R and rock the 20 arms p^2 p' inwardly, and so retract the bolt. By now turning the key still farther in the same direction the latch-actuating rocker K will retract the latch.

Where a locking-bolt is not considered 25 necessary, as in Figs. 22 and 23, the hub k of rocker K is formed with a squared opening and the rod E' has a squared portion e^{15} entering the hub, so that when the key is inserted and turned the rocker K will retract 30 the latch. Of course the pin e^7 will operate against the shoulder k and operate the rocker K without any change whatever; but I prefer the hub with a square opening where a locking-latch alone is to be manufactured.

35 It will be seen that the locking of the outside-knob shank from within the room does not prevent the snapping of the latch when the person leaves the room, nor does it prevent the retracting of the latch by turning 40 the inside knob, as the two knob mechanisms are wholly independent and the key-actuated third roll-back or rocker is independent of both of the knob-rockers.

T and T' are the inner and outer finishing- 45 plates which lie against the surfaces of the door.

I do not restrict myself to the particular mechanism herein, as the same may be considerably varied without departing from the 50 spirit of my invention.

What I claim is—

1. A lock comprising, a frame or case, a latch mounted therein, independent knob-actuated mechanisms for retracting the latch, a locking device independent of said knob-actuated mechanisms for the locking 55 outside-knob shank, means for actuating said locking device from the inside-knob shank, a key-actuated mechanism in the 60 outside-knob shank, and an independent latch-retracting device actuated by the key mechanism.

2. A lock comprising, a frame, a latch and its independent knob-actuated retracting 65 devices, a locking device to lock only the out-

side-knob mechanism, a rotary cam for actuating the said locking device, a rod or spindle extending from the inside-knob shank to said cam, means at the said inside-knob shank for turning the said rod or spindle, whereby the latch may be retracted at all times by turning the inside knob. 70

3. A lock comprising, a frame, a latch mounted therein, independent knob-actuated retracting devices for the latch, a locking 75 device to lock only the outside-knob mechanism, a rotary cam for actuating the locking device, a rod or spindle extending from the inside-knob shank to said cam, means at the inside-knob shank for turning 80 the spindle, an independent latch-retracting device, and a key-actuated mechanism therefor in the outer-knob shank.

4. The combination with a latch and its knob-actuated retracting devices, of a locking 85 device for the outside knob, a rod or spindle extending from the inside-knob shank and provided at its inner end with means to actuate said locking device, and a ring concentric with the inside-knob spindle and connected to said rod to rotate it and actuate 90 the locking device for said outside knob.

5. A lock comprising, a frame, a latch mounted therein, inner and outer knobs having shanks provided at their inner ends with 95 independent fixed roll-backs or rockers to actuate the latch, a locking device within the case to lock the outside-knob shank against rotation, an actuating means for the locking device at the inside-knob shank, a key-actuated 100 rod or spindle in the outer-knob shank and an independent roll-back at the inner end of the key-actuated rod or spindle to retract the latch when the outer-knob shank is locked. 105

6. A lock, comprising a frame or casing having tubular extensions, tubular knob-spindles therein and having independent roll-backs or rockers at their inner ends, a latch actuated by said roll-backs or rockers, 110 a key-actuated spindle or rod in the outer-knob shank, an independent third roll-back at the inner end of said spindle or rod, and engaging the latch to retract it, a rod or spindle turning in the inner-knob shank, a ring 115 turning on the inner frame extension and operatively connected to said rod or spindle to turn it, a cam on the inner end of said last-named rod or spindle, a pivoted locking-lever engaged at one end by said cam and at its 120 opposite end adapted to engage the inner end of the outer-knob shank.

7. The combination with a latch and its knob-actuated retracting devices, of a locking-lever for the outside-knob shank, a rod 125 extending from the inside-knob shank and provided at its inner end with a flange having a cam-slot receiving one end of said locking-lever, an actuating-ring concentric with the inside-knob shank for rotating said rod, 130

and a key-actuated means in the outside knob having a roll-back at its inner end, for retracting the latch independently of its knob-actuated devices.

8. The combination with a frame having a tubular extension provided at its outer end with a transverse curved or cam-shaped slot, a latch, an inside knob having a tubular shank turning in said extension and provided with a transverse slot, a longitudinally-slotted sleeve within the said shank, a spring-pressed plunger in the sleeve having a pin extending out through all three slots, a ring turning on the extension and having a transverse groove engaging the outer end of the pin, an outer-knob mechanism having means for retracting the latch, a locking device for the outer-knob shank, a rod mounted in said sleeve and having a pin entering said slot therein, and operative connections between the inner end of the rod and the said locking device for the outer-knob shank.

9. The combination with a casing having a tubular extension provided with a transverse curved or cam-shaped slot having an outward extension at one end, a latch, an inside knob having a tubular shank turning in said extension and provided with a transverse slot, a spring-pressed sliding and turning plunger having a pin extending through said slots and insertible and removable through said outward extension of the curved or cam-shaped slot, a ring turning on the said tubular extension and having a recess engaging said pin, an outside-knob mechanism for actuating the latch, means for locking the same, and operative connections between said locking means and the said ring-rotated plunger.

10. The combination with a latch and its inner and outer operating knob mechanisms, of a locking means independent of the knob mechanisms for the outside knob, an operating mechanism therefor at the inside knob, a key-actuated roll-back independent of the knob mechanisms for retracting the latch when the outside knob is locked, a bolt having an operating button or finger-piece at the inner side of the base, a key-actuated mechanism in the outside knob operatively connected with the bolt to project and retract it and also connected to said key-actuated roll-back.

11. The combination with the latch and its operating knob mechanisms, of a locking mechanism for the outside-knob shank, an actuating device therefor at the inner side of the lock, a key-actuated mechanism in the outside-knob shank including a rotary rod, a roll-back having an arm engaging the latch and connected to said rod for operation thereby, a collar having a lost-motion operating-hub also engaged by said rod, a bolt provided with means for actuating it from the inner side of the lock and also having an operative

connection with said collar, whereby it may be operated by said key-actuated rod from the outside.

12. A combined lock and latch comprising a casing having tubular extensions at its opposite sides, tubular knob-shanks mounted therein and provided at their inner ends with latch-engaging roll-backs, a longitudinally-slotted sleeve in the inside-knob shank; said inside-knob shank and the tubular extension having registering slots, a spring-pressed plunger in said sleeve provided with a pin projecting out through said three slots, a ring on the said extension engaging the pin to rotate the plunger and sleeve together, a central bracket in the case, two collars mounted in said bracket, a rod having a pin engaging said slot in the sleeve and at its inner end engaging the inner one of said collars, a locking device for the outside-knob shank actuated from said inside collar, a bolt actuated from the outside collar, a lost-motion actuating-hub in the outside collar, a key-actuated rod in the outside-knob shank and engaging at its inner end said lost-motion hub to operate the bolt, a latch-operating rocker having a cut-away hub, a pin on the said key-actuated rod engaging said hub to actuate the key-actuated roll-back.

13. A combined lock and latch comprising a frame or case, outer and inner knob shanks or spindles, a latch, a bolt, said latch being operated independently of the bolt, a means for locking the outer-knob shank from the inner side of the frame or casing, a key mechanism having lost-motion actuating connections with the said bolt and with the said latch to permit successive actuations thereof by a partial rotation of the key.

14. A combined lock and latch comprising a frame or case, a bolt, an inside finger-piece therefor, outer and inner knob shanks or spindles, a latch actuated independently therefrom, a locking device for the outside-knob shank, actuating means therefor at the inner knob; a collar operatively connected to the bolt, a lost-motion actuating device for the collar, a latch-actuating key-operated spindle or rod in the outer-knob shank engaging at its inner end said lost-motion actuating device, and having a pin near its inner end and a roll-back engaging the latch and having a shoulder or projection in the path of said pin.

15. A combined lock and latch comprising, a frame or case, a bolt, an inside finger-piece therefor, outer and inner knob shanks or spindles, a latch actuated independently therefrom, a locking device for the outside-knob shank, actuating means therefor at the inner knob, a slotted collar journaled in the frame and operatively connected to the bolt, a hub in the collar and having a pin projecting into the slot to engage its end walls and turn the collar, a third roll-back engaging

the latch and having a hub turning in the inner end of the outer-knob shank and provided with a shoulder, and a key-actuated rod in said outer-knob shank engaging with its inner end the collar-actuating hub and having a pin to engage the shoulder on the roll-back hub.

16. A combined lock and latch comprising a frame, or case, a bolt, an inside finger-piece therefor, outer and inner knob shanks or spindles, a latch actuated independently therefrom, a locking device for the outside-knob shank, actuating means therefor at the inner knob, a collar operatively connected to the bolt, a lost-motion actuating device for said collar, a third roll-back for the latch, a rod or spindle in the outside-knob shank connected at its inner end to the said lost-motion device and having a pin to engage said third roll-back, a key-actuated barrel in the outer knob and lugs or projections on the adjacent ends of said key-actuated barrel and rod.

17. The combination with the locking-bolt and its actuating mechanism including a connecting-rod, of a detent to engage the bolt when thrown and overlying a portion of said connecting-rod to be moved thereby out of engagement with the bolt.

18. The combination with the locking-bolt, a rock-shaft, a finger-piece at one side connected to said rock-shaft, an outside key-actuated mechanism having a rod pivotally connected to said rock-shaft, a detent to engage the bolt when thrown and overlying a portion of said connecting-rod to be moved thereby out of engagement with the bolt.

19. The combination, in a lock of the character described, with the locking-bolt and a finger-piece for operating it from the inside, of a key-actuated rod or spindle in the outer knob, means for operating the bolt from said rod or spindle including a connecting-rod, a detent for locking the bolt in its projected position and engaged by the said connecting-rod for retraction thereby.

20. The combination with the locking-bolt having a finger-piece for actuating it from the inside, a key-actuated mechanism for actuating it from the outside and includ-

ing a connecting-rod, and a vertically-swinging detent to hold the bolt projected and overlying a portion of the connecting-rod to be lifted thereby from the bolt.

21. The combination with the locking-bolt and a rock-shaft having two arms one of which is operatively connected to the bolt, a finger-piece for operating the rock-shaft from the inside, of a key-operated rod extending inwardly from the outside-knob shank, means including a connecting-rod connecting the inner end of the key-operated rod with the other of said rock-shaft arms, and provided with an offset, a detent for locking the bolt when projected and overlying said offset to be lifted thereby away from the bolt.

22. In a lock, a frame, an outer and an inner knob shank or spindle, a bolt, a finger-piece independent of the knob mechanisms for operating the bolt from the inside, said latch being operated independently of said locking-bolt, a detent to lock the bolt projected, and key mechanism having a connection through said outer spindle with operating means including a connecting-rod connected to the bolt and its detent to release the detent at the first movement of the said operating means.

23. The combination in a lock of the character described, of the bolt having a forked shank, a rock-shaft having an inside finger-piece, and provided with two arms one of which extends up into the fork of the shank, a link pivoted at its rear end in the said fork and at its front end pivoted to the upper end of the rock-shaft arm therein, a key mechanism in the outside-knob shank, a collar at the inner end thereof, a rod connecting said collar with the other one of said rock-shaft arms, and a detent to lock the bolt and in turn engaged by said connecting-rod at the beginning of its rearward movement to move it away from the bolt.

In testimony whereof I affix my signature in presence of two subscribing witnesses.

LEVIN H. MULLIKIN.

Witnesses:

ELMA FLEMING,
GEO. W. WILSON.