

No. 619,026.

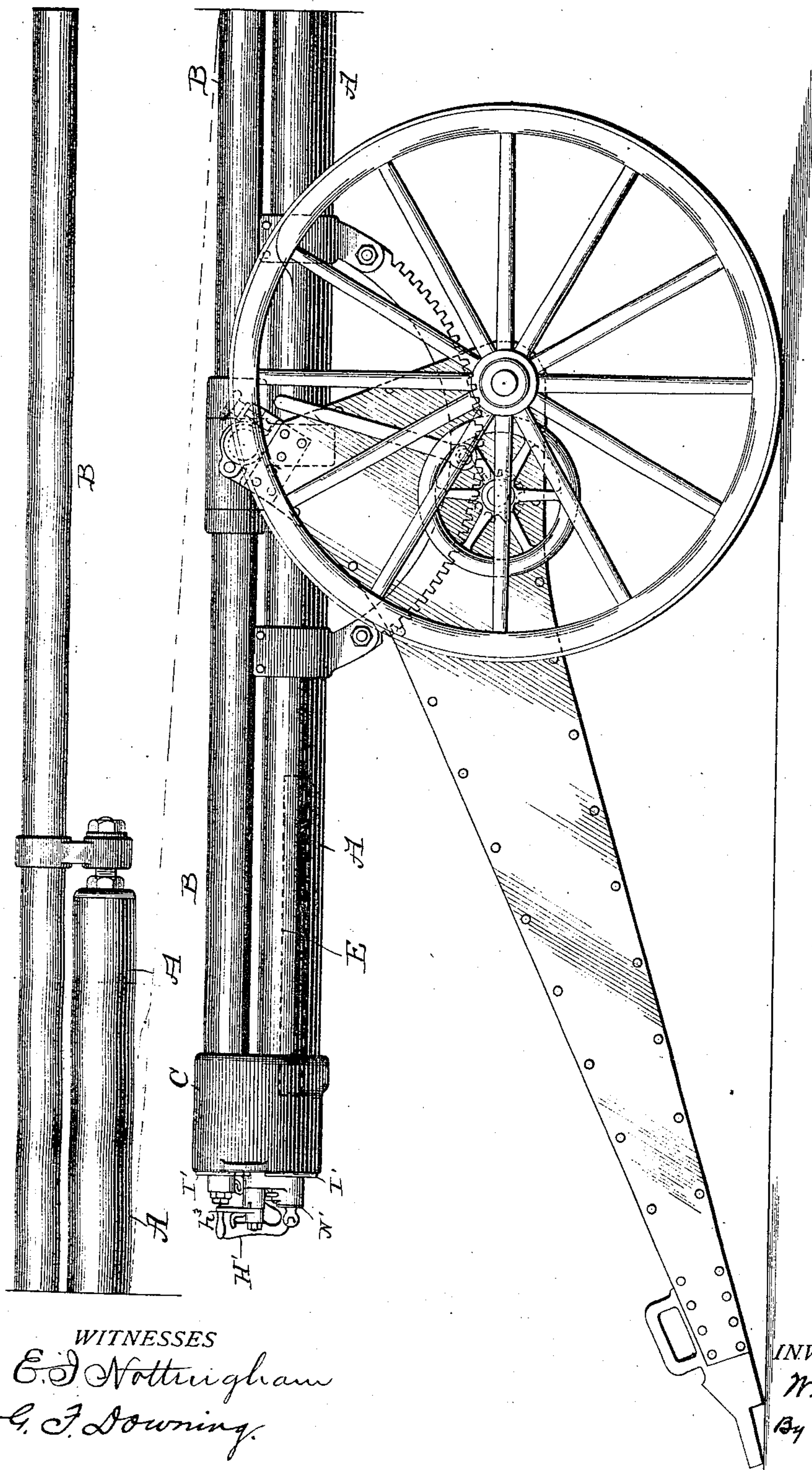
Patented Feb. 7, 1899.

W. S. SIMS.  
BREECH MECHANISM FOR GUNS.

(Application filed June 24, 1898.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES  
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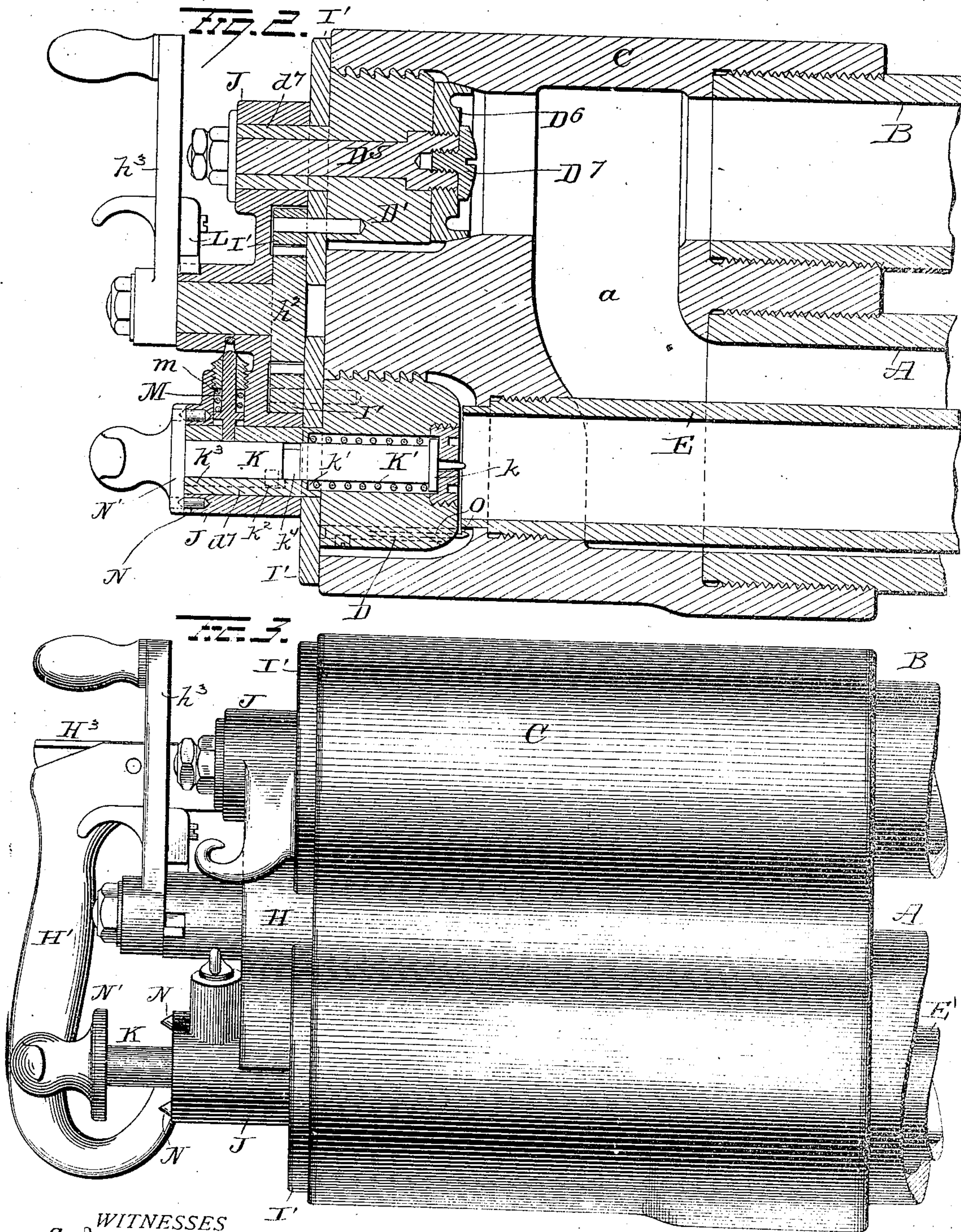
**W. S. SIMS.**

# BREECH MECHANISM FOR GUNS.

(Application filed June 24, 1898.)

(No Model.)

**5 Sheets—Sheet 2.**



*WITNESSES*

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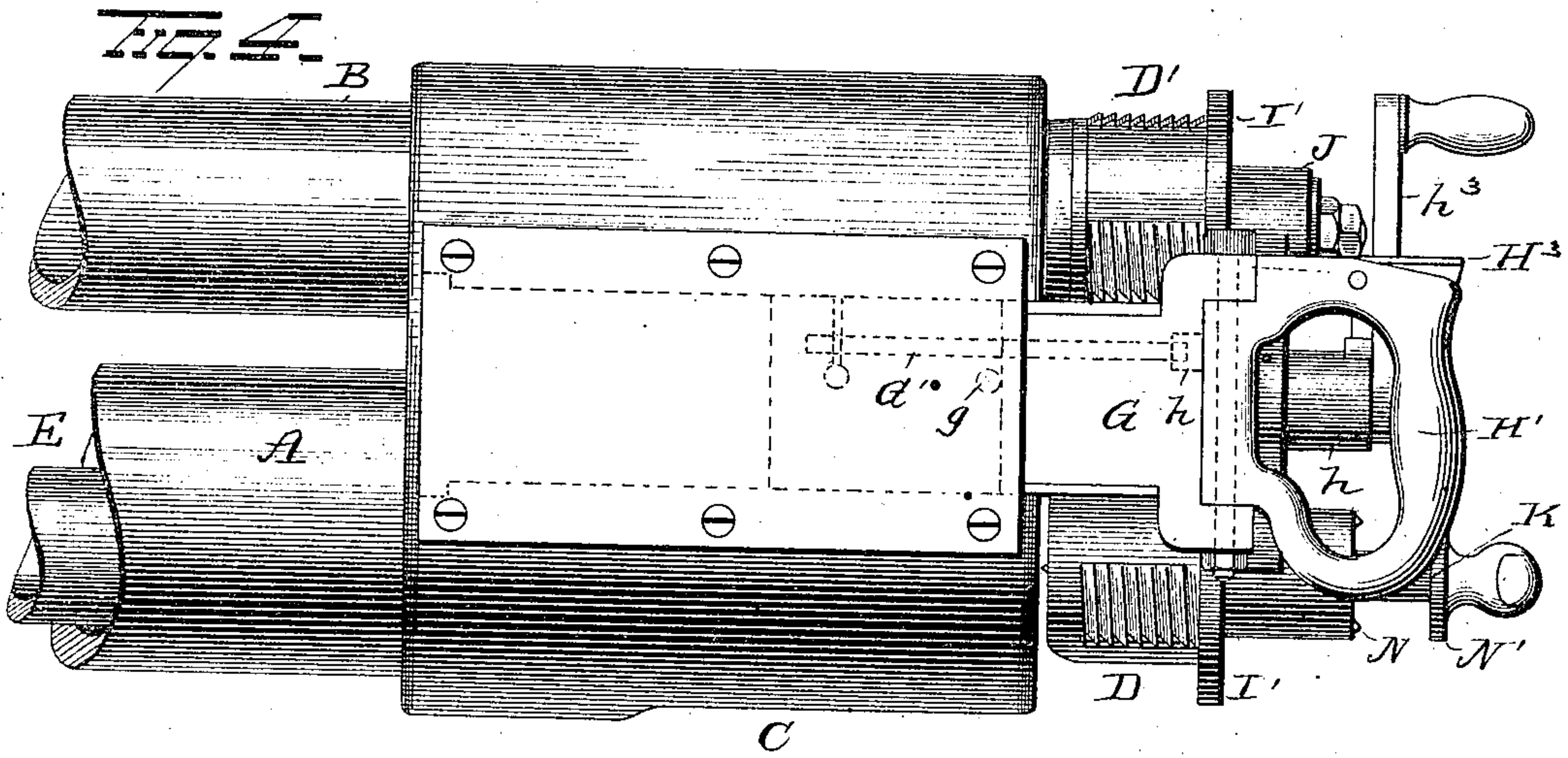
**W. S. SIMS.**

# BREECH MECHANISM FOR GUNS.

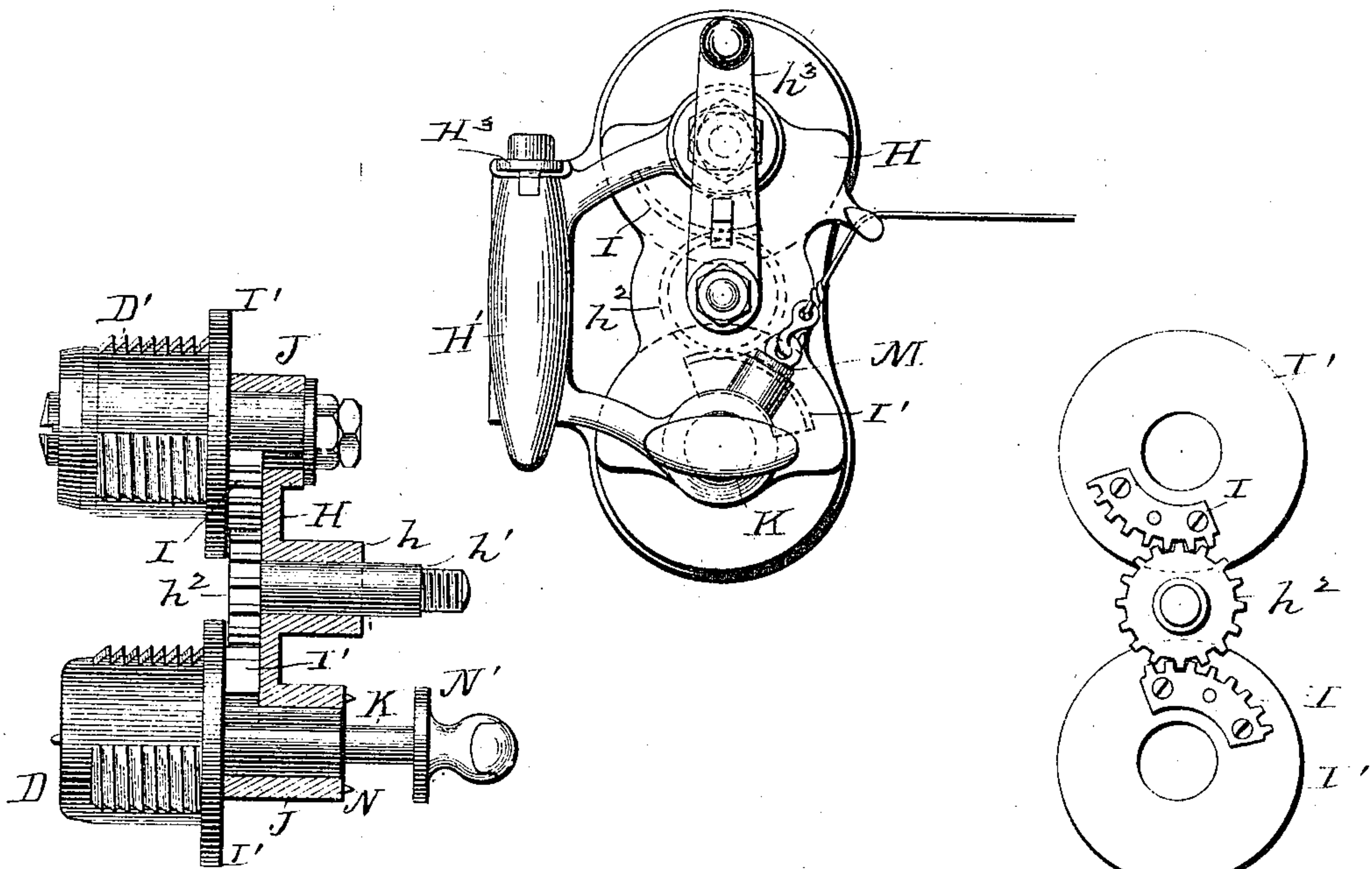
(Application filed June 24, 1898.)

(No Model.)

**5 Sheets—Sheet 3.**



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WITNESSES

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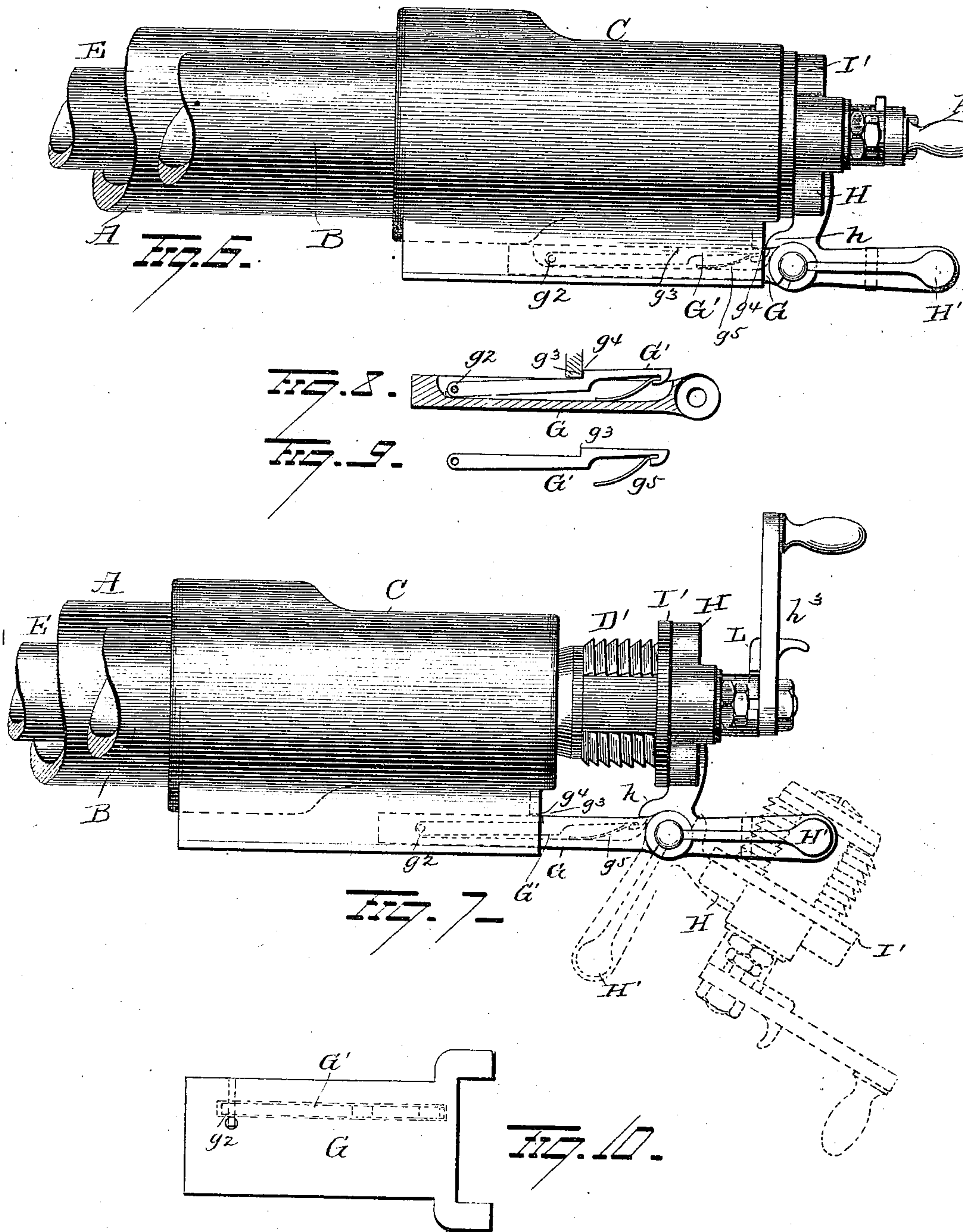
**Patented Feb. 7, 1899.**

# BREECH MECHANISM FOR GUNS.

(Application filed June 24, 1898.)

(No Model.)

**5 Sheets—Sheet 4.**



*WITNESSES*

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BREECH MECHANISM FOR GUNS.

(Application filed June 24, 1898.)

(No Model.)

5 Sheets—Sheet 5.

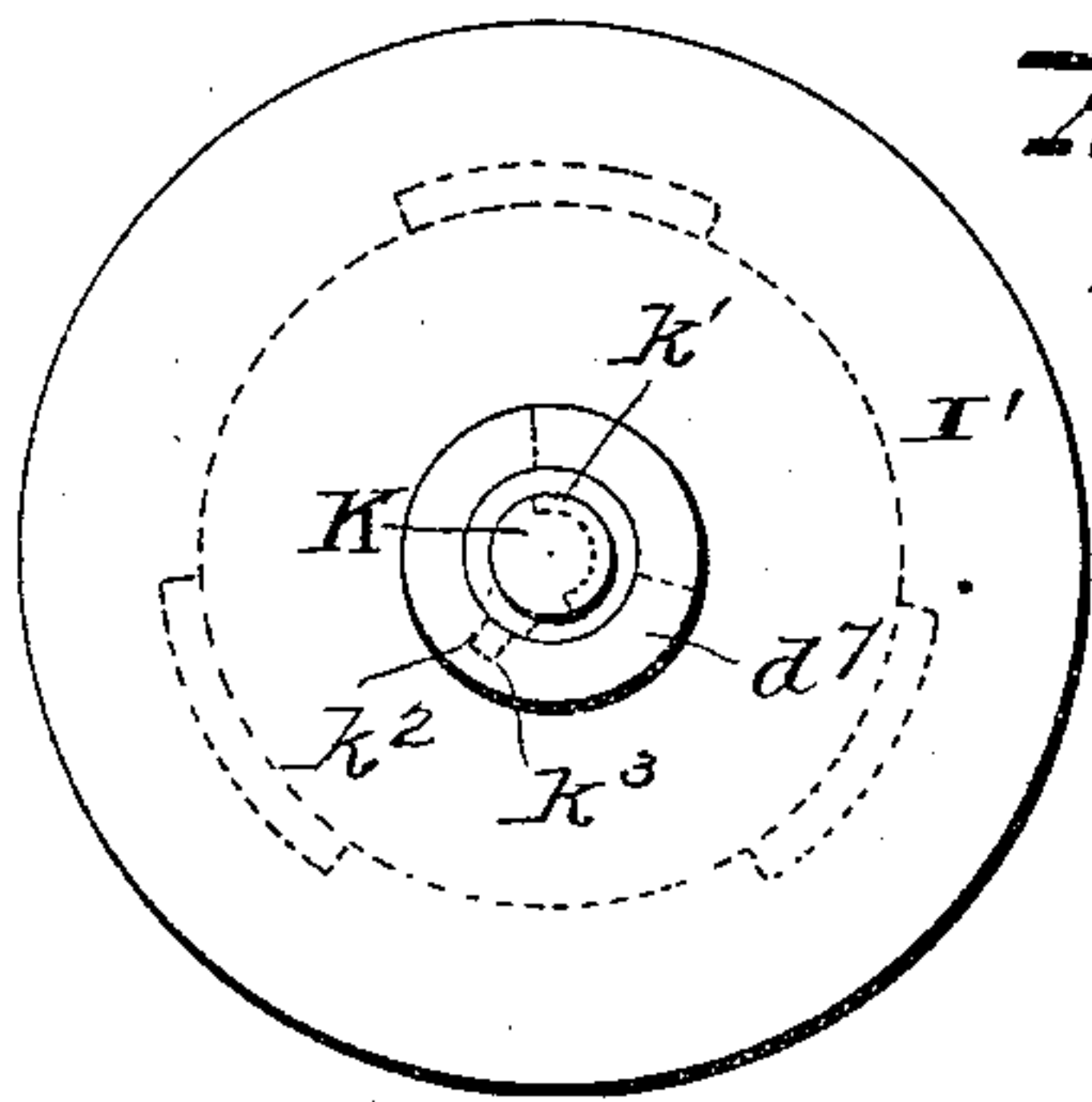


FIG. 13.

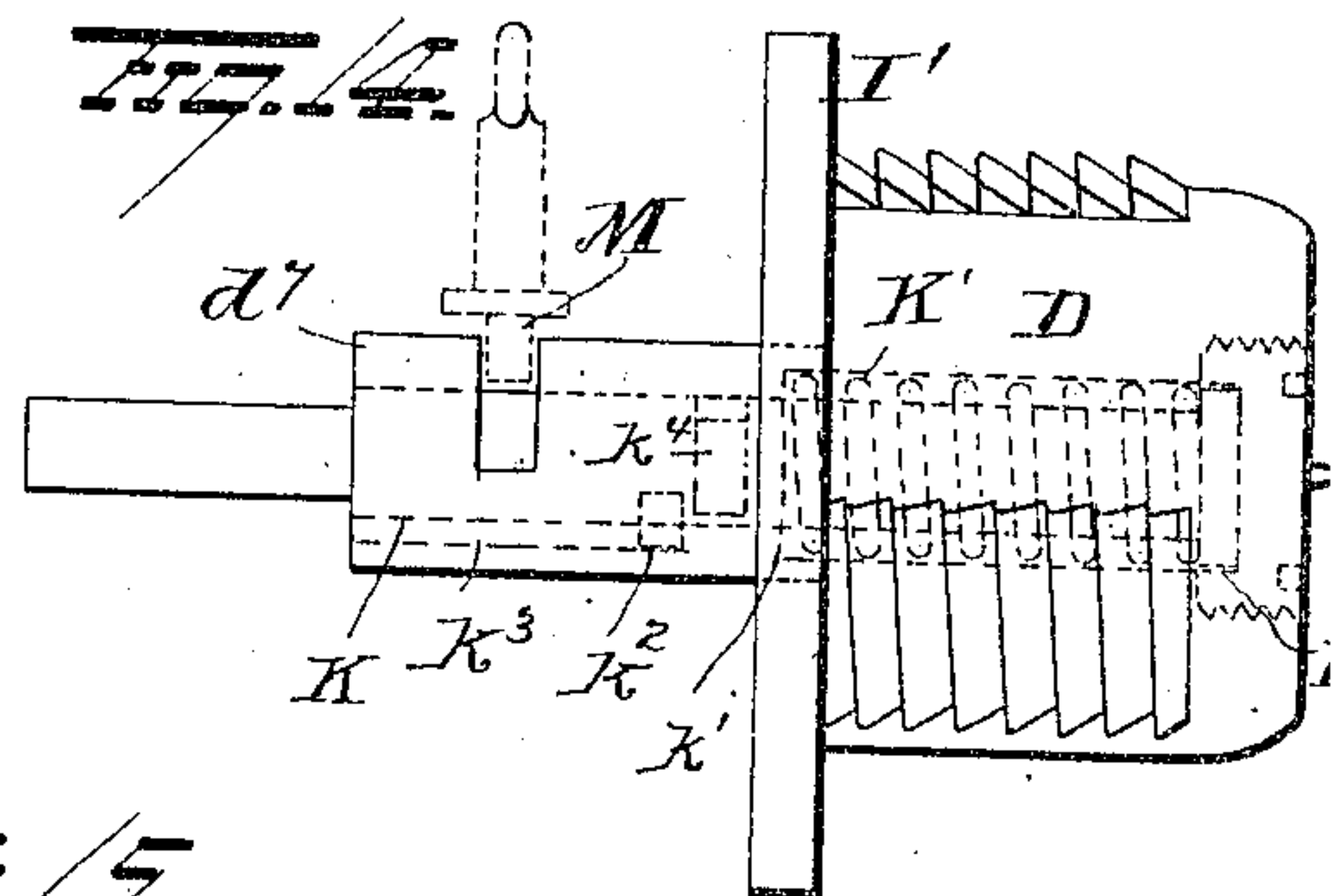


FIG. 14.

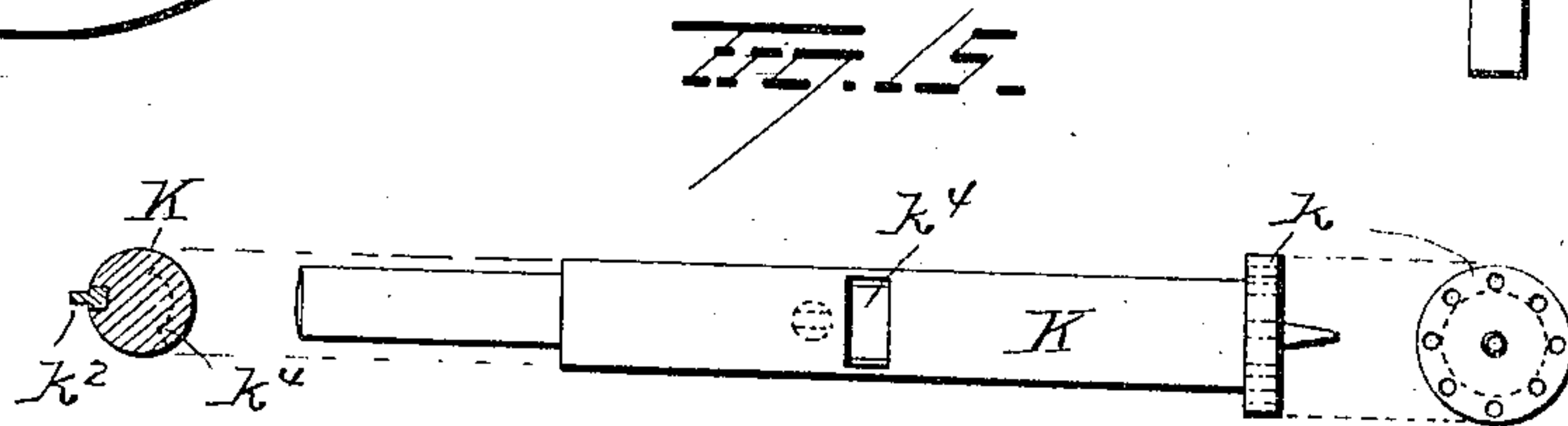


FIG. 15.

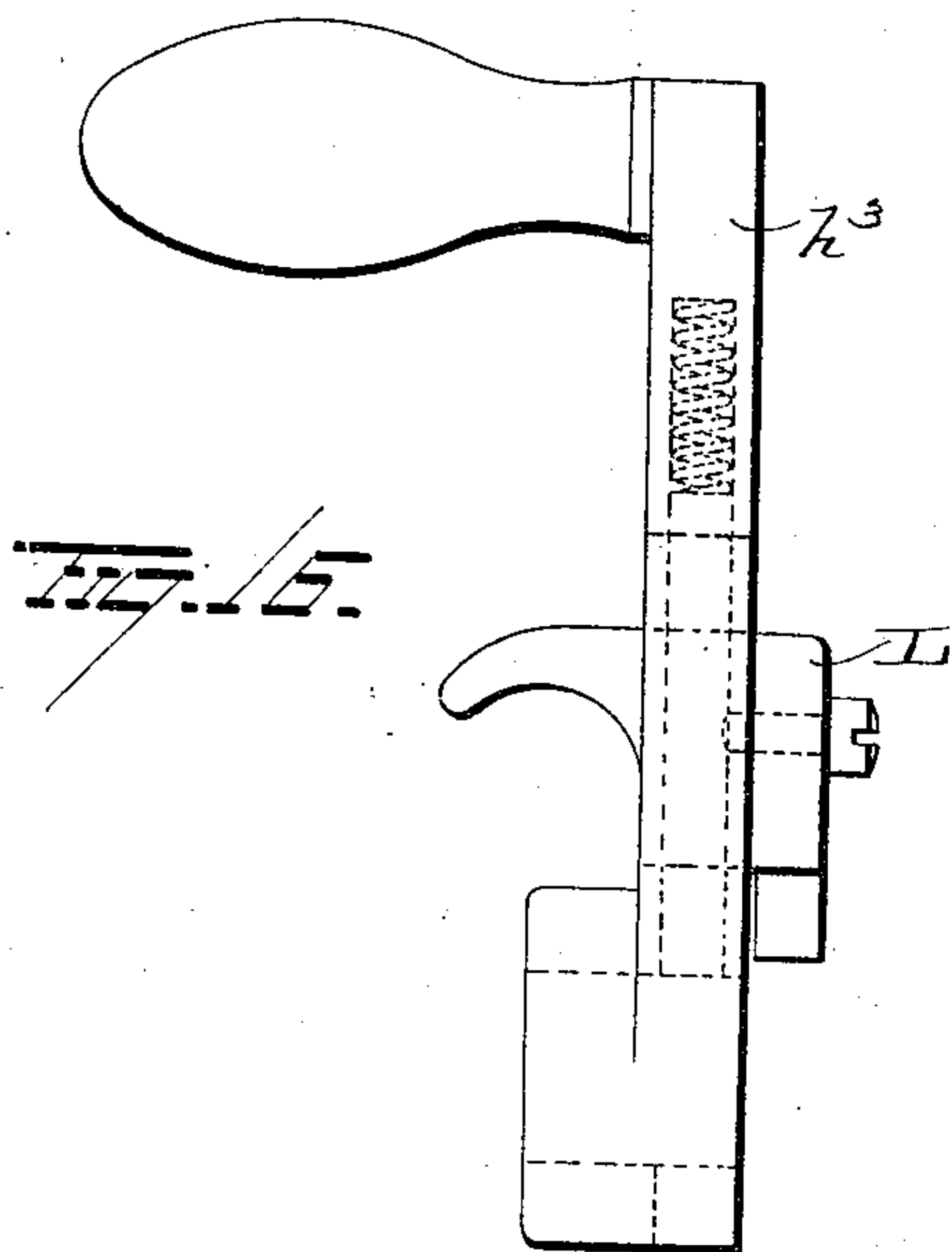


FIG. 16.

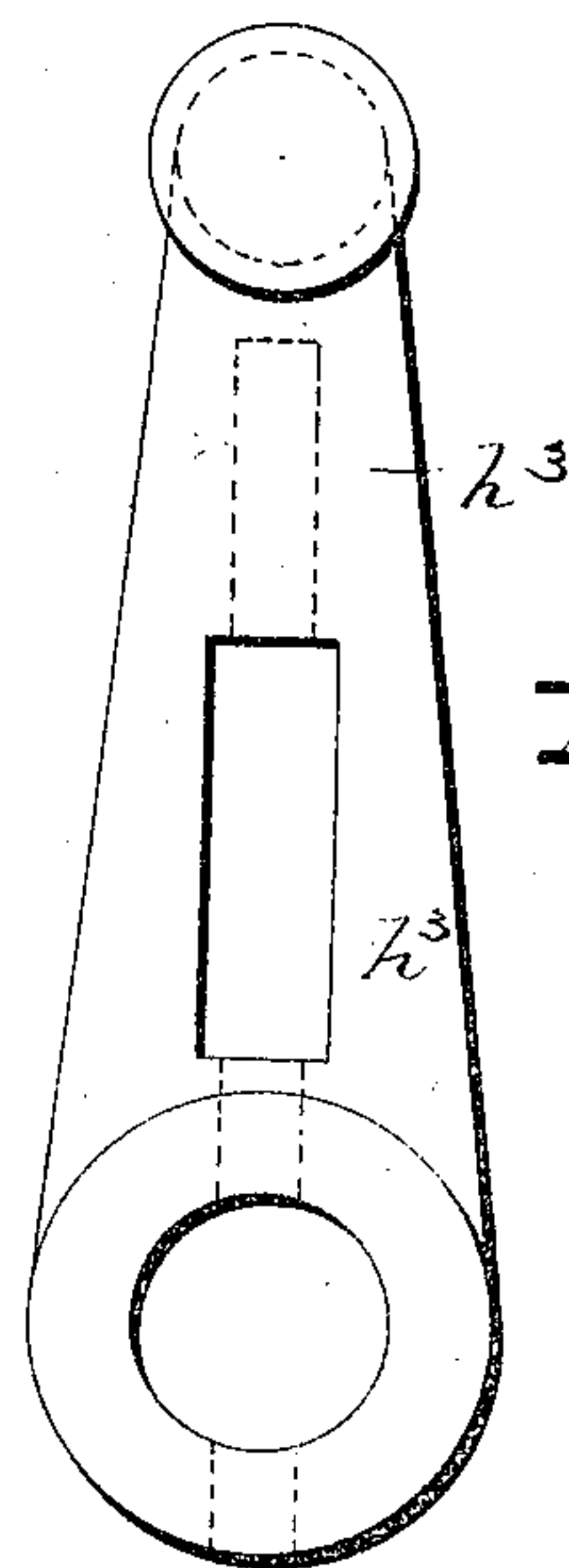


FIG. 17.

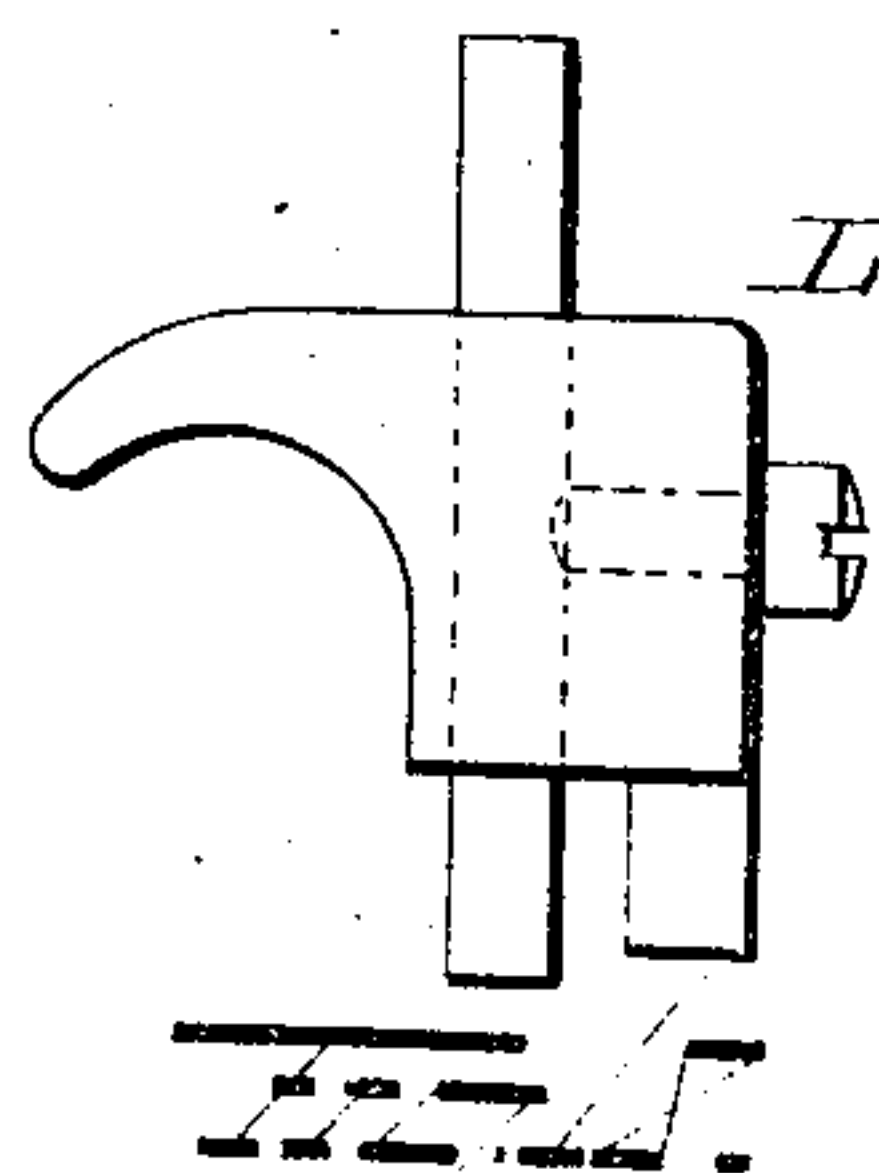


FIG. 18.

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# UNITED STATES PATENT OFFICE.

WINFIELD SCOTT SIMS, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE  
SIMS-DUDLEY DEFENSE COMPANY OF NEW YORK, N. Y.

## BREECH MECHANISM FOR GUNS.

SPECIFICATION forming part of Letters Patent No. 619,026, dated February 7, 1899.

Application filed June 24, 1898. Serial No. 684,348. (No model.)

*To all whom it may concern:*

Be it known that I, WINFIELD SCOTT SIMS, of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Breech Mechanism for Guns; and I 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.

My invention relates to an improvement in guns, and more particularly to powder pneumatic guns designed for throwing high explosives; and it consists, primarily, in certain features and details of construction of the breech mechanism, as will be more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of a gun embodying my invention. Fig. 2 is a view in longitudinal section of the breech end of the gun. Fig. 3 is a view in elevation of the breech end of the gun. Fig. 4 is a similar view from the opposite side, showing the breech-blocks withdrawn. Fig. 5 is a view in end elevation of the breech mechanism. Fig. 6 is a view in plan of same. Fig. 7 is a similar view showing the breech-blocks withdrawn and also showing by dotted lines the breech-blocks turned to the side. Fig. 8 is a plan view of the breech-block carrier. Fig. 9 is a view of the stop-latch on said carrier. Fig. 10 is a view of the outer face of the carrier. Fig. 11 is a view showing the gearing for turning the breech-blocks. Fig. 12 is a view of the breech-blocks and gearing detached. Fig. 13 is an end view of the breech and block of the firing-tube. Fig. 14 is a side elevation of the firing-tube block. Fig. 15 is a view of the firing-pin, and Figs 16, 17, and 18 are views of the breech-mechanism crank.

My improved gun consists of a breech C, carrying a projectile-tube B, a combustion tube or chamber A, and a firing-tube E, the firing-tube E being located within the combustion chamber or tube and secured to the breech C.

Connecting the combustion and projectile tubes is the port *a*, located within the breech C and at a point in rear of the muzzle end of

the firing-tube, so that the flame and gases from the firing charge pass from the firing-tube into the combustion-tube and striking the closed forward end of the latter rebound and force out the cooler air adjacent to the port *a*, through said port into the projectile-tube, and, acting against the projectile, ejects same from the projectile-tube.

The breech C is open at points immediately in rear of the projectile and firing tubes, and these openings are closed by the breech-blocks D and D', each of which is provided with interrupted threads, and as the breech is also provided with interrupted female threads it follows that a partial rotation of the blocks is sufficient to release the blocks, which are then free to be withdrawn by a backward pull. Each block is provided with three equidistant interruptions in its threads, and as the screws in the breech are similarly interrupted it will be seen that a one-sixth revolution of each block is sufficient to release it from its seat.

My invention relates to the breech mechanism, and for convenience is shown in connection with my improved gun, which is more fully described in my pending application, Serial No. 683,330, filed June 13, 1898.

Mounted in a bearing or support on one side of the breech C is the breech-block-carrier slide G. This slide G is adapted to move longitudinally within its support, as shown in Fig. 4, and is provided with a stop *g*, which, engaging shoulders on the support, limits the outward movement of the slide. This slide carries the latch G', pivoted at *g*<sup>2</sup> to the slide and provided with a lip *g*<sup>3</sup>, adapted when the slide is in its extended position to take over the shoulders *g*<sup>4</sup> on the breech C and prevent the slide G from being forced in, thus preventing movement of the slide when the breech-blocks are in their open position.

Journaled on the outer end of the slide G is the carrier H. This carrier is provided with a handle H', by which the slide is moved back and forth, and is also provided with a lug *h*, which when the carrier is turned to bring the breech-blocks in line with their respective seats in the breech engages the end of the latch G and, forcing the same inwardly against the action of the spring *g*<sup>5</sup>, re-



leases the lip  $g^3$  from the shoulder and allows the slide to be pushed in. The handle  $H'$  of the carrier  $H$  is provided with a spring-latch  $H^3$ , adapted to engage a notch in the slide  $C$  for locking the handle in line with the slide, and with a second notch for locking the handle in the position shown in dotted lines in Fig. 7. With this construction the breech-blocks, which are carried by the carrier, are held against swinging movement when the blocks are withdrawn for loading and are held in proper position for entering their respective seats during the act of closing the breech of the gun.

The carrier  $H$  is simply a frame carrying the breech-blocks and the mechanism for turning the blocks and is provided centrally with a bearing  $h$  for the shaft  $h'$ , carrying the pinion  $h^2$  on its inner end and the crank  $h^3$  on its outer end. The pinion  $h^2$  meshes with the toothed segments  $I$ , rigidly secured to the plates  $I'$ , which latter in turn are rigidly secured to the outer faces of the breech-blocks  $D$  and  $D'$ . Each breech-block is provided with a rearwardly-extending stem or shank  $d^7$ , which latter passes through the plates  $I'$  and rest in the hubs or bearings  $J$ , formed integral with the carrier. The upper breech-block  $D'$ , which closes the rear end of the projectile-tube, is secured to the carrier  $H$  by the bolt  $D^5$ , which passes through the block and carrier and is locked by a nut and washer. Secured to the inner end of this bolt and against the inner face of the block  $D'$  is the gas-check  $D^6$ , which latter is also locked against displacement by the bolt  $D^7$  and operates to tightly seal the breech in line with the end of the projectile-tube and prevent the escape of any gases or compressed air through the breech at this point. The stem or shank  $d^7$  of the breech-block  $D$  passes through its hub or bearing  $J$  and is made hollow for the reception of the firing-pin  $K$ . The firing-pin is provided with a sharpened or needle-pointed end which is adapted to be projected through an opening in the inner face of the block  $D$  and contact with the fulminate or cap on the cartridge carried in the firing-tube  $E$ . This firing-pin is actuated by the spring  $K'$ , which latter bears at one end against the rim  $k$  of the pin, near its inner end, while the opposite end of the spring rests against the shoulder  $k'$  on the stem of the breech-block.

The crank  $h^3$  carries the spring-catch  $L$ , which latter engages notches in the hub in which the crank-shaft rests and locks the shaft in the two extremes of its movement. Hence by the engagement of the catch with one notch when the breech-blocks are in their locked position the blocks are locked against movement, and by the engagement of the catch with the other notch when the blocks are in their unlocked positions, or before the blocks have been turned to cause the threads thereon to engage the female threads in the breech, the blocks cannot be turned without

first deliberately disengaging or releasing the catch, which, as before stated, locks the shaft  $h'$  against movement.

From the foregoing it will be seen that by releasing the catch  $L$  and turning the crank  $h^3$  a part revolution the pinion on the crank-shaft, engaging the segments on the breech-blocks, turns both breech-blocks in a position to disengage the threads thereon from the threads on the breech, and when this is accomplished the blocks are free to be withdrawn. By now grasping the handle  $H'$  and pulling thereon the slide carrying the breech-blocks is withdrawn, carrying with it the breech-blocks, and when the latter are clear of the gun the handle is swung around, as shown in dotted lines in Fig. 7, so as to remove the breech-blocks to one side, and thus permit of the quick introduction of the projectile and the firing charge or cartridge.

After the projectile and cartridge have been placed in their respective tubes the handle is first turned so as to bring the blocks in line with their respective tubes and is then pushed home, and by turning the crank  $h^3$  back to its normal position the breech-blocks are locked.

The firing-pin  $K$ , which has been heretofore referred to, is provided with a feather  $k^2$ , which slides in a groove  $k^3$  in the stem of the block  $D$  for the purpose of preventing any independent rotary motion of the breech-block and firing-pin. Hence when the breech-block is rotated the firing-pin is rotated. The firing-pin is provided with a transverse slot  $k^4$ , in which the trigger  $M$  enters when the firing-pin is drawn to a cocked position. This trigger is mounted in the hub  $J$ , carrying the stem of the block  $D$ , and is held with its inner end in contact with the firing-pin by the spring  $m$ . The firing-pin also passes through the stem or shank of the block  $D$ , and in order to permit the block to have a rocking or rotary motion, before described, the opening through which the trigger passes is necessarily elongated, as shown in Figs. 13 and 14.

Secured in the end of hub  $J$  of block  $D$  are the pins  $N$ . These pins have slightly beveled ends, which enter corresponding recesses formed in the inner face of the cap  $N'$  of the firing-pin  $K$ . As the hub is stationary and as the firing-pin turns with its block  $D$ , it will be seen that while the firing-pin is in its normal position it is impossible to turn the breech-blocks. Hence in order to load or reload the gun it is first necessary to withdraw the firing-pin to its cocked position. This disengages the pins  $N$  from the firing-pin and leaves the blocks free to be turned by the mechanism already described. The same is true in closing the breech, as the blocks cannot be turned to be either locked or released until the firing-pin has been cocked. This construction removes an element of danger which would be present if the breech-block could be forced home with the firing-pin in contact with the percussion-cap of the



cartridge and also prevents the firing-pin from engaging the percussion-cap of the cartridge until the block shall have been forced home, for until the block has been forced home the pins N remain out of alinement with their recesses in the firing-pin and absolutely prevent the firing-pin from striking the cartridge. The breech-block D also carries the extractor O, which latter engages the flange of the cartridge-shell and positively extracts same from the firing-tube by the withdrawal of the breech-block from its seat.

From the foregoing it will be seen that the parts are so constructed and arranged that the breech-blocks are inserted and removed simultaneously, thus enabling the gun to be readily and quickly handled. Again, the construction is such that until the breech-blocks are screwed home the firing-pin is held out of the reach of the cartridge, thus preventing accidents by the premature explosion of the firing charge.

It is evident that many slight changes might be resorted to in the relative arrangement of parts herein shown and described without departing from the spirit and scope of my invention. Hence I would have it understood that I do not wish to confine myself to the exact construction of parts herein shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a powder pneumatic gun, the combination with a combustion-tube and a projectile-tube, of two breech-blocks, one for closing the breech of each tube, and means for simultaneously actuating both of said blocks.

2. In a powder pneumatic gun, the combination with a combustion-tube and a projectile-tube, of a carrier, a breech-block for each tube on said carrier and means for simultaneously actuating said blocks.

3. In a powder pneumatic gun, the combination with a combustion-tube and a projectile-tube, of a carrier adapted to move rearwardly and laterally, two breech-blocks on said carrier, and means for simultaneously rotating said breech-blocks.

4. In a powder pneumatic gun, the combination with a combustion-tube and a projectile-tube, of a rearwardly and laterally movable carrier, means for locking the carrier against lateral movement, two breech-blocks on said carrier and means for simultaneously rotating said blocks.

5. In a powder pneumatic gun, the combination with a combustion tube or chamber, and a projectile-tube, of a rearwardly and laterally movable carrier, means for limiting said rearward movement, means for locking the carrier at the end of said rearward movement, two breech-blocks on said carrier and means for simultaneously rotating said breech-blocks.

6. In a powder pneumatic gun, the combination with a combustion-tube and a project-

ile-tube, of a rearwardly and laterally movable carrier, means for locking said carrier at its limit of rearward movement, means for locking it against lateral movement, two breech-blocks and means for simultaneously rotating said blocks.

7. The combination with a breech and combustion-tube and a projectile-tube secured to said breech, of a slide mounted on the breech, a carrier journaled to said slide and two breech-blocks carried by said carrier.

8. The combination with a breech, and a combustion-tube and a projectile-tube secured to said breech, of a slide mounted on the breech, a carrier journaled to said slide, a handle secured to the carrier and two breech-blocks carried by said carrier.

9. The combination with a breech, and a combustion-tube and a projectile-tube secured to said breech, of a slide mounted on said breech, a carrier journaled to the slide, two breech-blocks mounted on the carrier and means for simultaneously rotating the breech-blocks.

10. The combination with a breech and a combustion-tube and a projectile-tube secured to said breech, of a carrier mounted on the breech, two breech-blocks on the carrier, a crank-shaft and means connecting the crank-shaft and breech-blocks whereby they are rotated simultaneously.

11. The combination with a breech, and a combustion-tube and projectile-tube secured to said breech, of a carrier, two breech-blocks carried by said carrier, a crank-shaft journaled in said carrier, means for locking said shaft against rotation and means connecting said shaft and blocks whereby the shaft and both blocks are rotated simultaneously.

12. The combination with a breech, and a combustion-tube and a projectile-tube secured to said breech, of a slide mounted on the breech, a spring-latch for locking the slide at the extreme of its rear movement, a carrier journaled on said slide, two breech-blocks mounted on said carrier and means for simultaneously rotating both breech-blocks.

13. The combination with a breech, a breech-block carrier and a breech-block, of a firing-pin carried by the breech-block and means for preventing rotation of the breech-block while the firing-pin is in an uncocked position.

14. The combination with a breech, a breech-block carrier, and a breech-block, of a firing-pin mounted in the breech-block and connected thereto so as to revolve therewith, and means for locking the breech-block against rotation while the firing-pin is in an uncocked position.

15. The combination with a breech, a breech-block carrier and a breech-block, of a firing-pin mounted in the breech-block and adapted to slide in said block and connections between the firing-pin and breech-block carrier which permit of the rotation of the breech-block only when the firing pin is cocked.



16. The combination with a breech, a breech-  
block carrier and a breech-block mounted in  
the carrier, of a sliding firing-pin mounted in  
the breech-block, and pins or lugs on the car-  
rier engaging recesses in the head of the fir-  
ing-pin, whereby the breech-block can be ro-  
tated, only when the said pins or lugs and re-  
cesses are disengaged.

17. The combination with a breech, a slide  
thereon and a carrier journaled on the slide,  
of two breech-blocks mounted on the carrier,  
a firing-pin carried by one breech-block, a  
shaft journaled in the carrier, gearing con-  
necting the shaft and breech-blocks where-  
by the latter are rotated simultaneously and  
means for preventing rotation of the breech-  
blocks when the firing-pin is in an uncocked  
position.

18. The combination with a combustion-

tube chamber, a firing-tube therein, a pro-  
jectile-tube and a port connecting the com-  
bustion tube or chamber and the projectile-  
tube, of a carrier, two breech-blocks thereon,  
one for closing the breech of the projectile-  
tube and the other for closing the breech of  
the combustion tube or chamber and firing-  
tube, a shaft journaled to said carrier and  
means connecting said shaft and breech-  
blocks whereby they are rotated simultane-  
ously.

In testimony whereof I have signed this  
specification in the presence of two subscrib-  
ing witnesses.

WINFIELD SCOTT SIMS.

Witnesses:

L. B. LE VAKE,  
E. R. LE VAKE.