DE W. C. FARRINGTON.

Machine Gun.

No. 241,130.

Patented May 10, 1881.

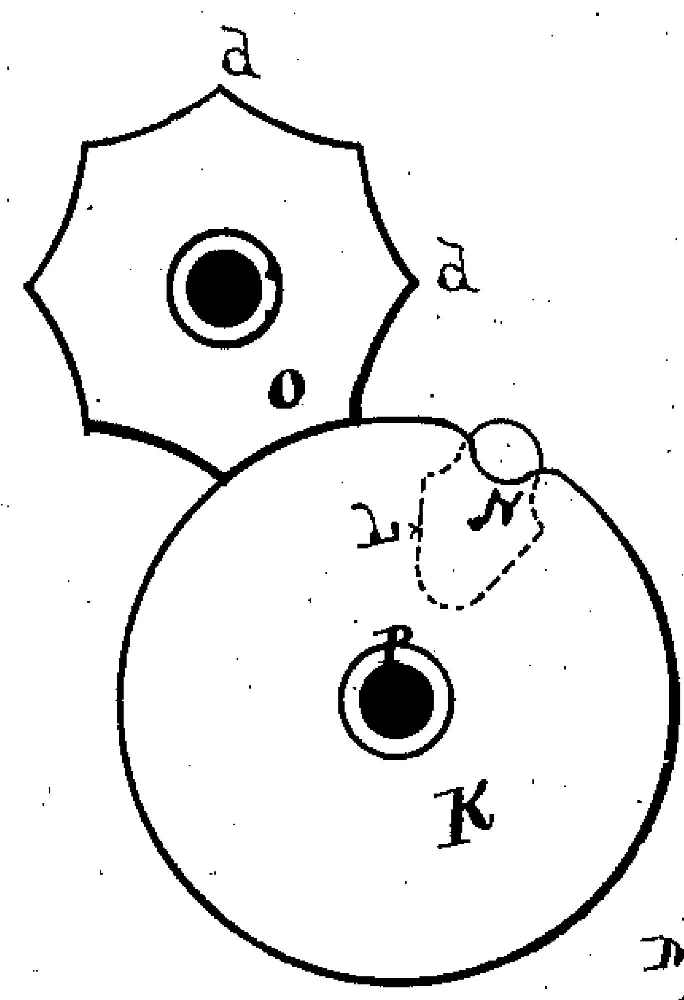


Fig 3

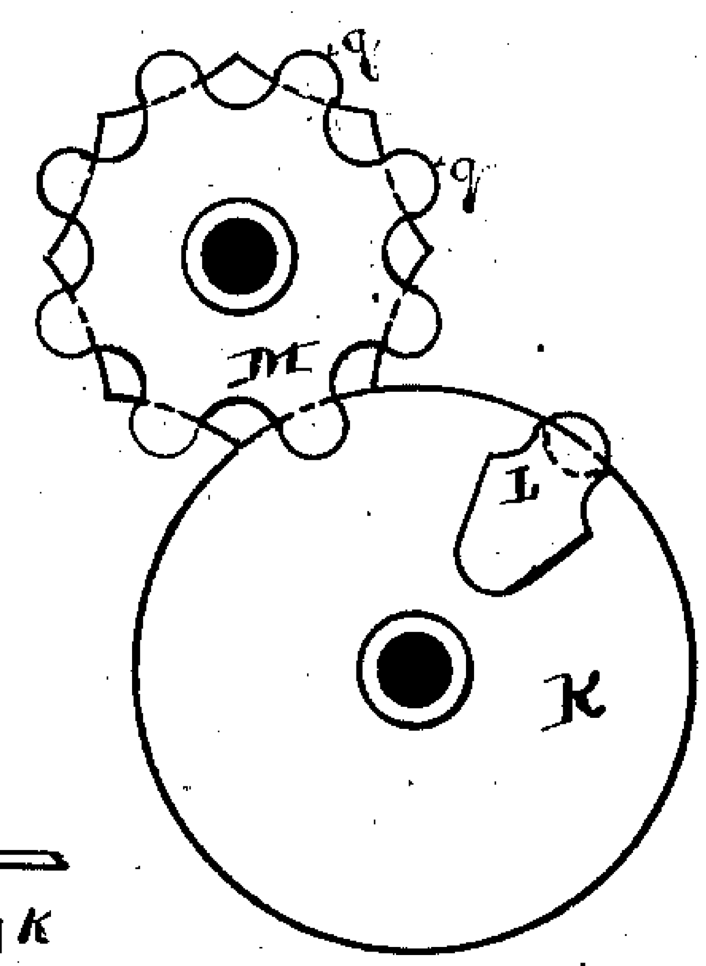
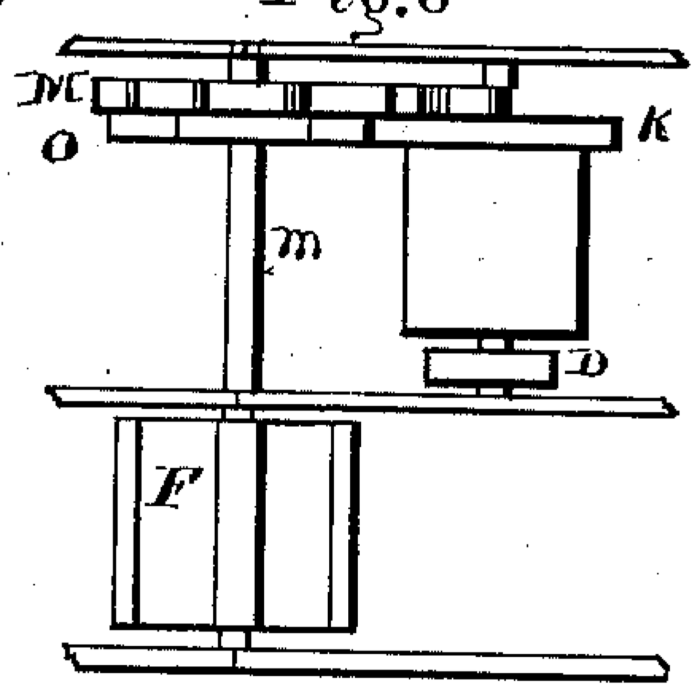


Fig 4

Fig. 6



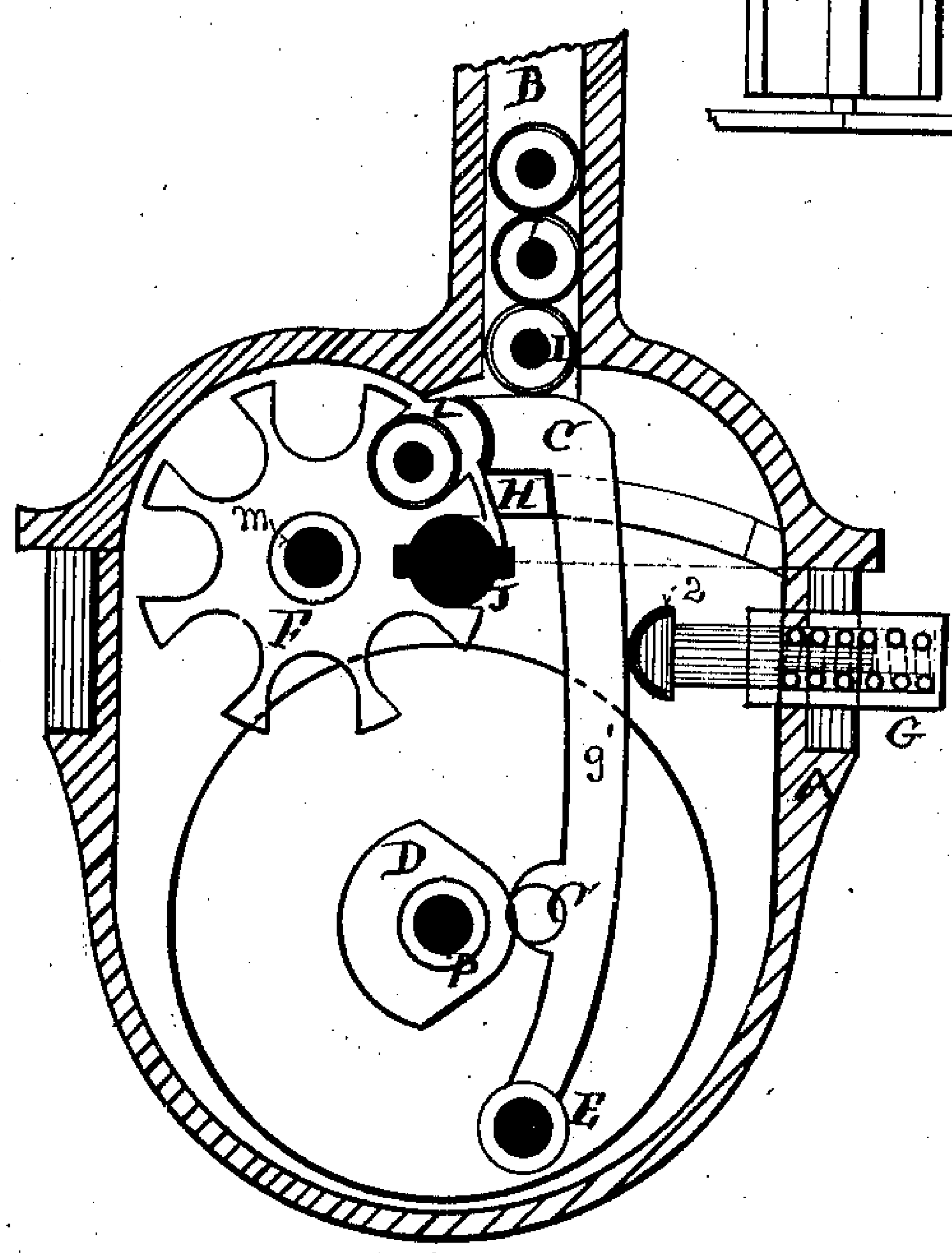


Fig 1

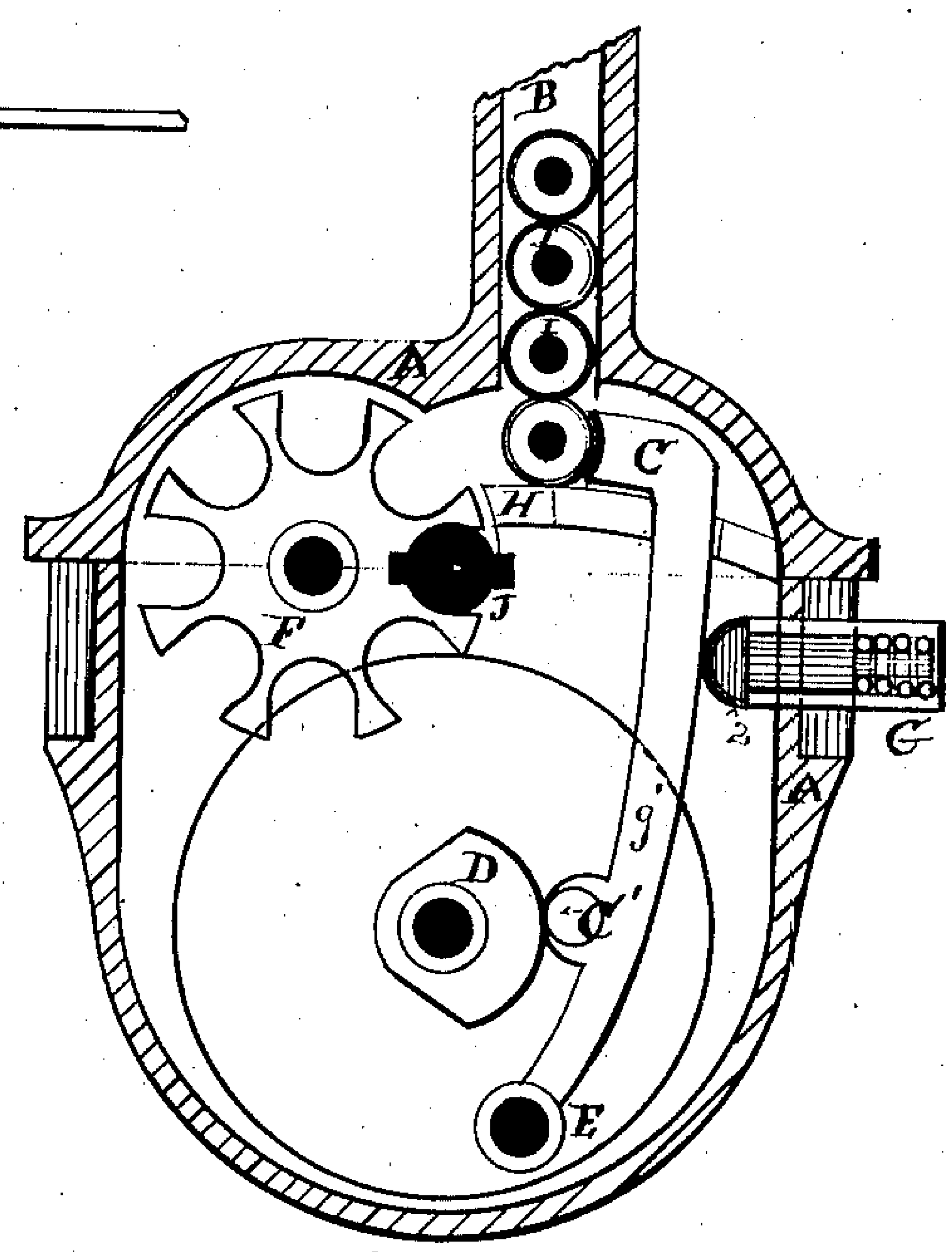


Fig 2

Witnesses

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2 Sheets—Sheet 2.

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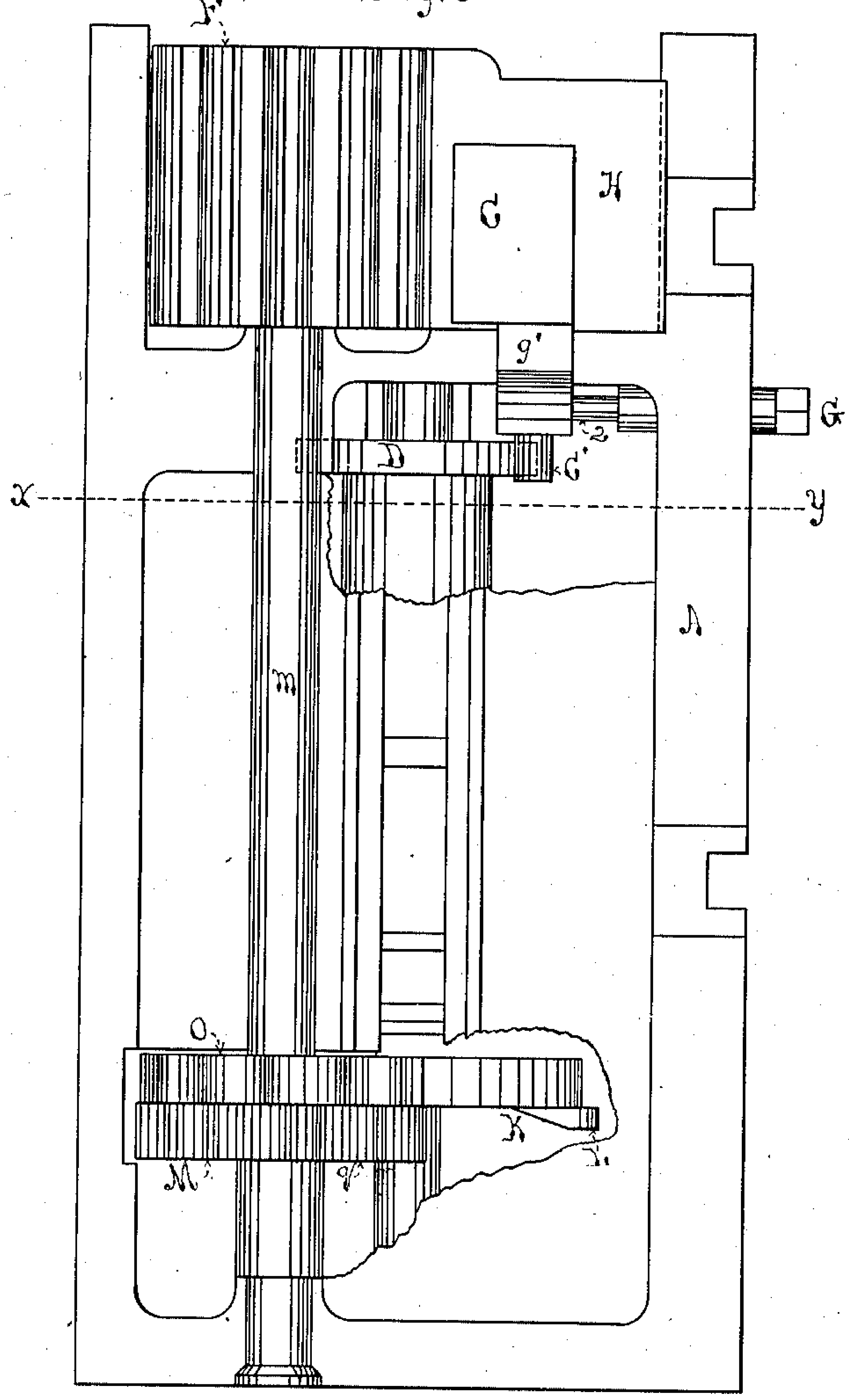
Fig. 5



Witnesses

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UNITED STATES PATENT OFFICE.

DE WITT C. FARRINGTON, OF LOWELL, MASSACHUSETTS.

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 241,130, dated May 10, 1881.

Application filed May 19, 1879.

To all whom it may concern:

Be it known that I, DE WITT C. FARRINGTON, of Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a new and useful Improvement in Machine-Guns, of which the following is a specification.

My invention is an improvement upon the mechanism for which Patent No. 165,318 was issued to me.

The object of my invention is to provide a mechanism for the gun described in said patent which shall operate with certainty and without liability to choke up; and it consists of, first, a single cartridge-carrying roll, which is substituted in place of the two cartridge-carrying rolls, for transferring the cartridge from the hopper to alignment with the bore of the gun-barrel, as formerly used, and combining it with a feed-table which shall receive the cartridge directly from the hopper and allow the cartridge to be transferred from the feed-table to the carrying-roll by an automatically-reciprocating finger suitably arranged and actuated, in combination with the other parts for that purpose; second, in providing an automatic yielding reciprocating finger which has a motion to and from the carrying-roll, but which can accommodate itself in its forward movement to any obstruction or failure in the operation of the other parts of the machine without interrupting their continued action; third, in providing a new form of mechanism to lock and hold the carrying-roll in position for firing and unlock the same to allow it to bring forward a fresh cartridge without jar, liability to get out of order, or multiplicity of parts; fourth, in providing a mechanism in which the parts shall be so adjusted and proportioned that the cartridge shall be moved less than once its diameter to pass from the hopper to the path of the carrying-roll.

In the accompanying drawings, in which similar letters and figures of reference indicate like parts, Figure 1 is a cross-section, looking forward on line $x\ y$ of Fig. 5, showing the reciprocating loading-finger in one position. Fig. 2 is a view on same line showing loading-finger in another position. Fig. 3 is an elevation of two of the locking-wheels taken from the case. Fig. 4 is an elevation of the moving and locking wheels removed from the case. Fig. 5 is a plan view of the device. Fig. 6 is a side elevation.

My first improvement is shown in the drawings, Figs. 1, 2, 5.

A is the frame of the machine, *m* is the shaft of the rotary cartridge-carrier, F is the rotary carrier, and M is their driving-wheel. These parts operate similarly in a general way to those of corresponding construction in my former patent, heretofore referred to.

In lieu of the second rotary carrier operating with the first, I place a platform or table, H, slightly above the horizontal plane of the center of the rotary carrier F. Above the table is placed the cartridge-hopper B, so that the cartridges descend successively upon the table or platform H, which may be slightly hollowing to receive them. Sufficient space is left between the hopper B and platform H to allow a cartridge to be pushed sidewise from the table into the chambers of the rotary carrier F, and the carrier F is placed so near the hopper B that but one cartridge can lie upon the table at a time. This construction and arrangement prevent any cartridge from becoming jammed in this passage, for should any cartridge rebound from the chamber of the carrier it will be forced back after the finger hereinafter described by the periphery of the carrier, and, passing under those in the hopper, sustain them until it is again pushed forward toward the carrier.

Working back and forth just above the upper surface of the table H is the reciprocating feed-finger C. It is pressed forward toward the rotary carrier by the bolt 2 acting by a spring behind it in the case or tube G upon the arm g', to which the feed-finger is attached, and which is pivoted at E. In the side or face of the arm g' is fixed a pin or lug, C′, which, being operated against by the cam D as it rotates, serves to alternately move the arm and feed-finger to and fro with the aid of the bolt which holds lug C′ against cam D. The cam D is attached to the main shaft P of the gun mechanism, which, near its other end, has attached to it the wheel or disk K, and its attached tooth L, which engages with the wheel M. The cam D is so located as to reciprocate the feed-finger C at every advance of the rotating feed-carrier, and, cartridges being placed in the hopper, it will push them off the platform H into the chambers of the rotary carrier successively as the latter are presented by rotation. On the cartridges being deposited in the rotary carrier-chamber, as described, each single movement of the rotary carrier forward carries the chamber and its cartridge downward past the edge of the platform H to a position in a horizontal plane with the axis of the rotary carrier, which brings the cartridge into line with the gun-barrel, when it is driven forward into the gun-barrel and discharged, as described in my former patent mentioned.

The advantages found in my present improvement are that all liability of the cartridges getting into the rotary carrier in a position to clog them is avoided. With the two rotary carriers acting in conjunction, as described in my former patent, the movement was positive and unyielding, and if any cartridge failed to descend quickly into the chambers of the rotary carriers it was liable to be caught between the edges of the partitions between the cells, and, becoming jammed and bent, would go neither back into the hopper nor forward into the gun-barrel, and the machine would have to be taken to pieces to extract the injured cartridge; while with the platform and feed-finger above described the spring-bolt 2 allows the feed-finger to have a yielding pressure against the cartridge, and permits the latter to fly back, if not properly received in its chamber, at one movement of the rotary carrier, and be presented to the next chamber without stopping the machine or danger of injury to the cartridge.

My second improvement relating to locking, unlocking, and moving the carrier-roll shaft, is shown in Figs. 5 and 6, in which the mechanism consists of a circular disk or plate-wheel, K, having its periphery concentric with the shaft P, which carries it, and which wheel K revolves in close contact with a wheel, O, which has depressions in its periphery segmental to the disk or plate-wheel K, and in which depressions the edge of the disk or plate-wheel moves. This disk or plate-wheel has a notch or depression, N, in one place in its periphery, (shown by the dotted line behind the tooth L in Fig. 4,) which, when brought in line with the axis of the wheels K O, is deep enough to permit of the revolution of the wheel O. The disk K is provided with a tooth, L, which overlaps or extends beyond its circumference and engages with the toothed wheel M, which has teeth whose centers are on the same plane of radiation from its shaft as are the centers of the segmental depressions formed in the periphery of the wheel O. The tooth L is placed on the wheel K in the same plane of radiation from the shaft P as is the notch N, so that at the same time that one of the points *d* of the wheel O is brought opposite the notch N the tooth L is brought into contact with the wheel M, and by the rotation of the wheel K the wheels O and M will be moved until the tooth L passes out from between the teeth *q*, when the notch N, having also passed the wheel O, can move no farther, and the remainder of the revolution of the wheel K will be made while the wheels O M do not revolve. Thus at every revolution of the wheel or disk K the wheels O M are rotated one tooth of M, which movement occurs in a small part of the time of the revolution of the wheel K, while at all other times the wheel O is firmly locked or held by the wheel K without the use of other parts. By this means wheels O M are locked while the discharge of the arm takes place, and the feed-carrier F being set upon the shaft *m* in proper relation to the wheels O M the movements of the latter impart the proper alternate rotation and rest to the feed-carrier.

The advantages of this locking and unlocking and moving device are that it operates certainly and smoothly, without jar or disturbance of the other parts of the gun, and the use of ratchets or other small moving parts, which are liable to be annoying and troublesome when in use, or when the parts are being removed for examination, is dispensed with.

What I claim as new and of my invention is—

1. The combination of the feed-platform H, feed-finger C, carrier F, and hopper B, constructed and arranged substantially as and for the purpose described.

2. The combination of the feed-platform H, feed-finger C, and carrier F, constructed and arranged substantially as and for the purpose described.

3. In combination with the feed-finger C, provided with the arm I′, the spring-bolt 2, cam D, carrier F, and platform H, substantially as described.

4. The combination of the carrier F, platform H, feed-finger C, and spring-bolt 2 with the cam D, placed upon the driving-shaft P, which is connected by suitable mechanism with the rotary carrier-shaft, and which, through such mechanism and the cam and spring-bolt, gives the feed-carrier and feed-finger alternately each their proper movement, substantially as described.

5. The combination of the carrier F, placed on the shaft with the wheels M and O, the cam D, placed on the shaft with the wheel K, which is provided with the tooth L, with the finger C, provided with the arm I′, the wheels K, M, and O, and cam D, being so adjusted that the movement of the feed-finger toward

the carrier will be made in the interval between the movements of the carrier, substantially as described.

6. The combination, with the hopper B and carrier F, of the feed-finger C and platform H, the finger being adjusted to move the cartridges sidewise less than twice their diameter, and the carrier and hopper being so adjusted that the cartridges as they fall upon the platform will be in position, when moved sidewise, to be received into the carrier, substantially as described.

DE WITT CLINTON FARRINGTON.

Witnesses:

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