

4 Sheets—Sheet 1.

J. P. TAYLOR.
MACHINE-GUN.

No. 177,030.

Patented May 2, 1876.



WITNESSES:

Chas. H. Gooch
Wm. H. Pearce

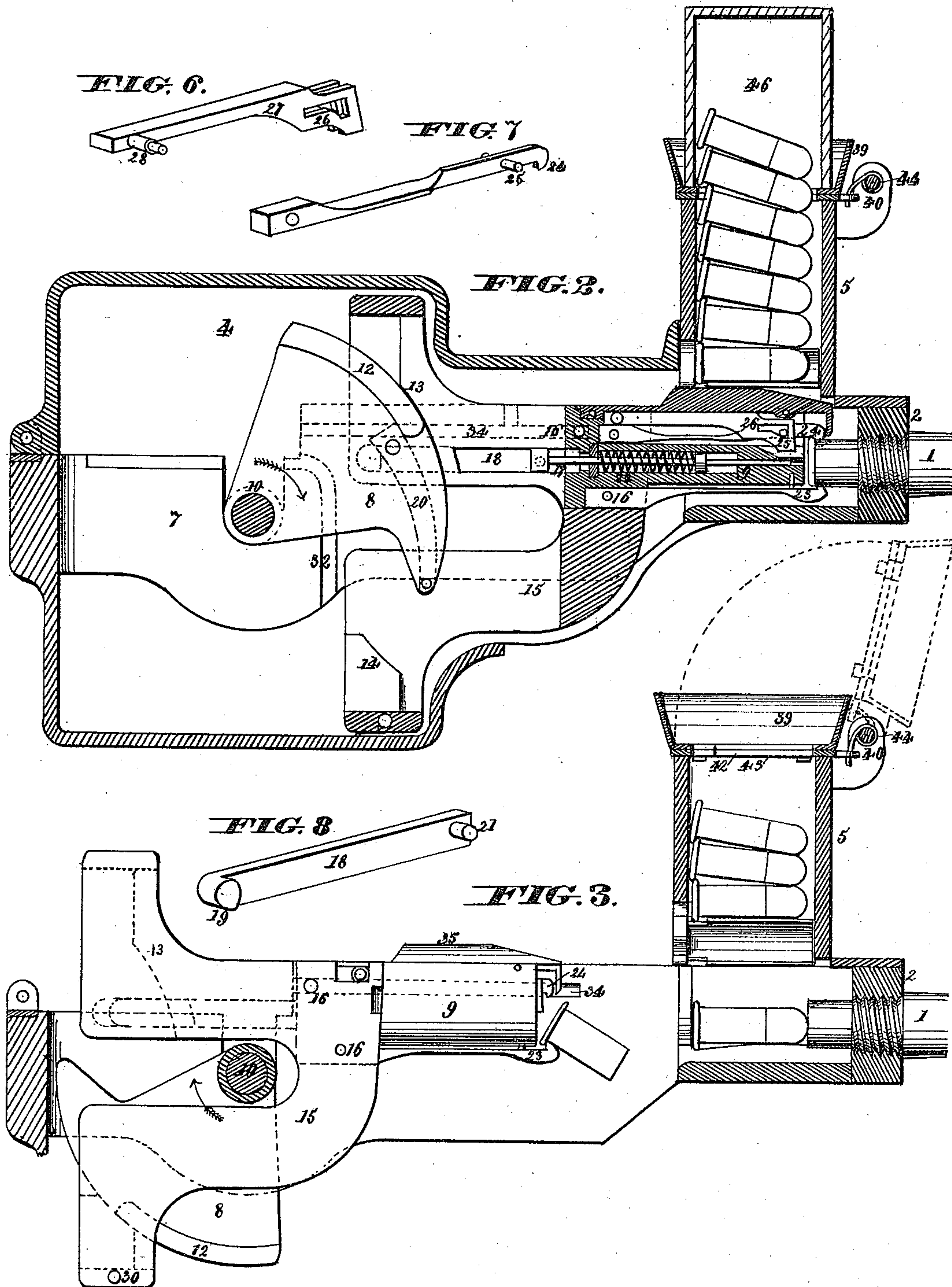
INVENTOR

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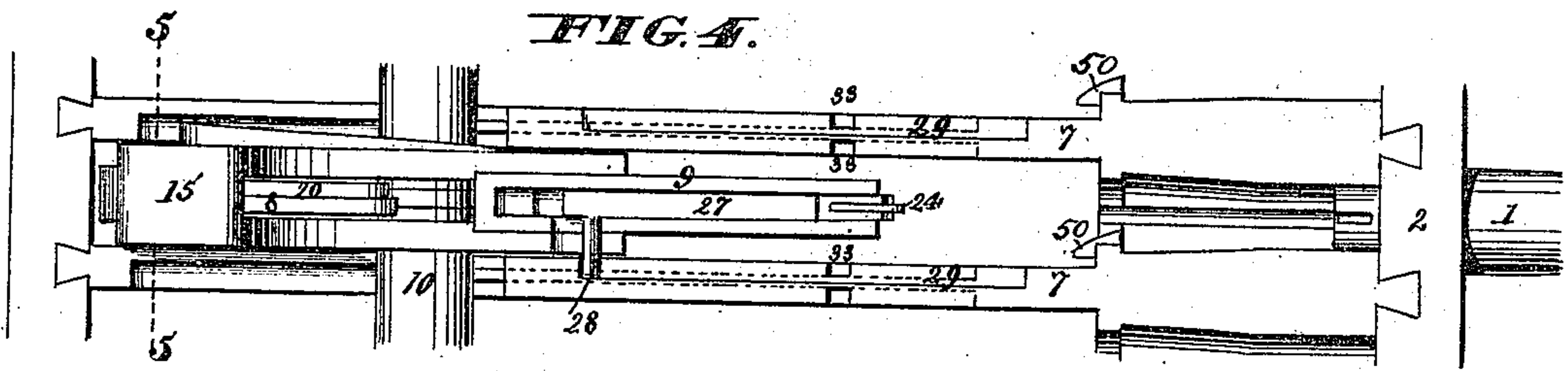


FIG. 5.

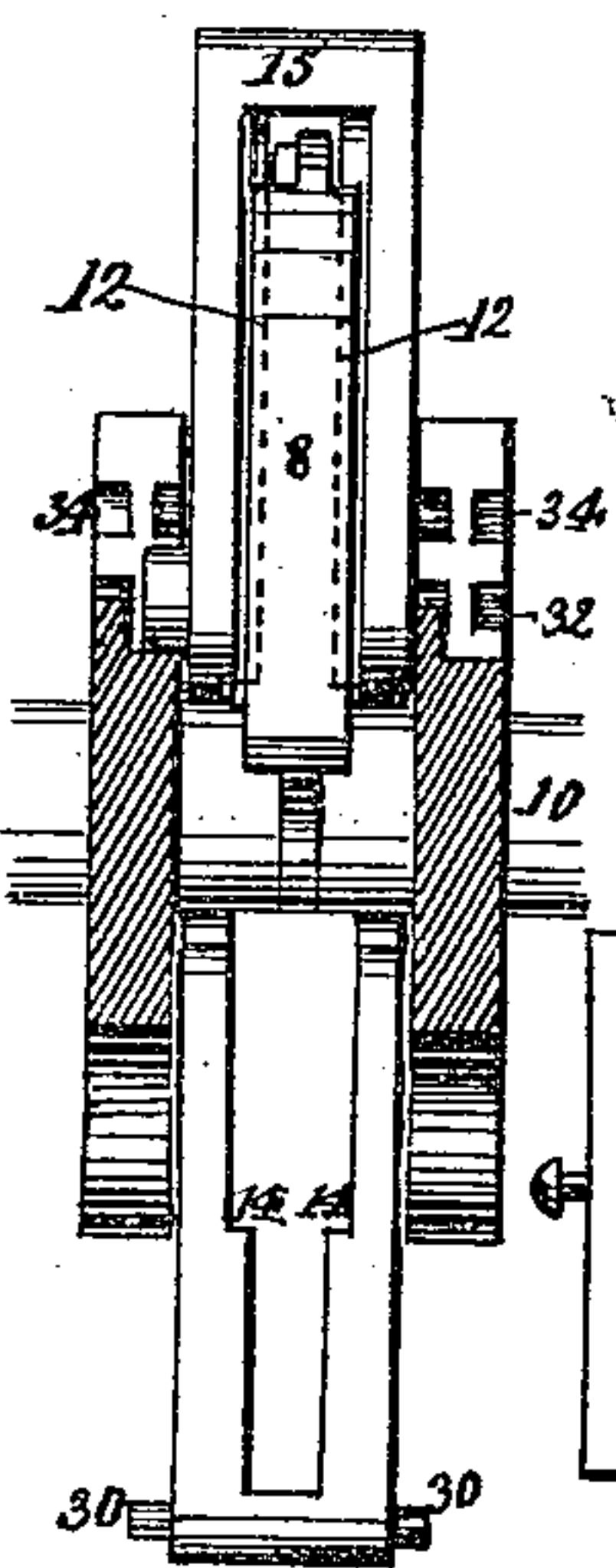


FIG. 11.

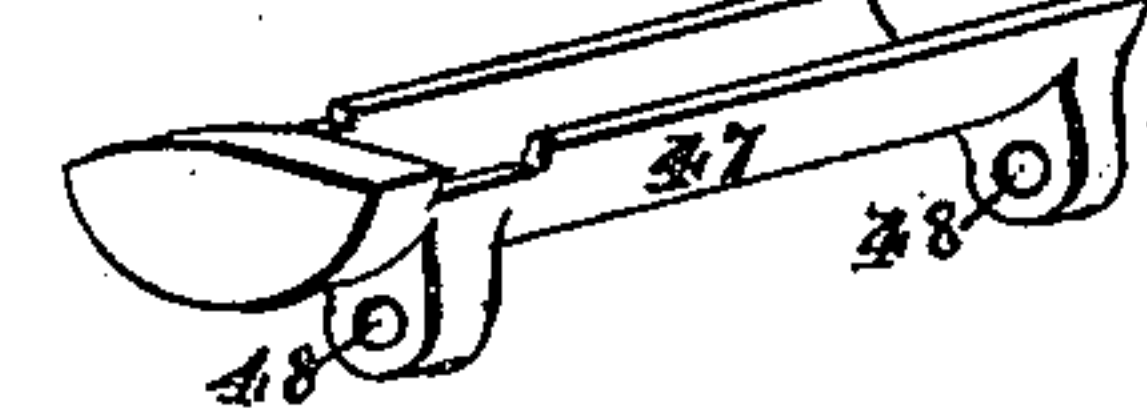


FIG. 12.

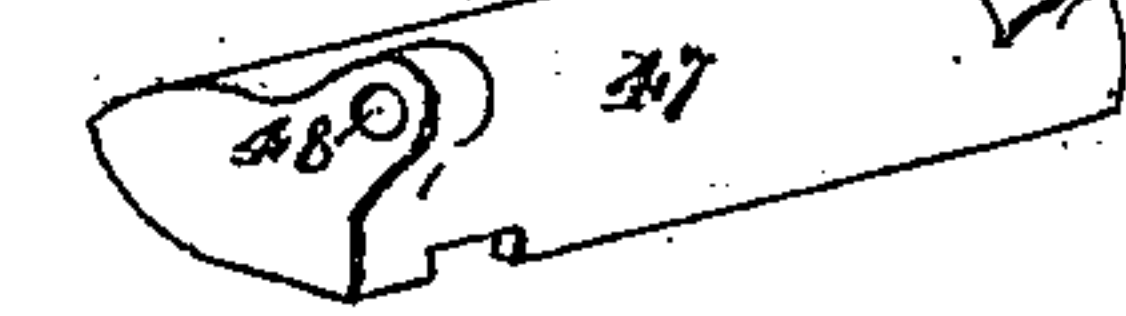
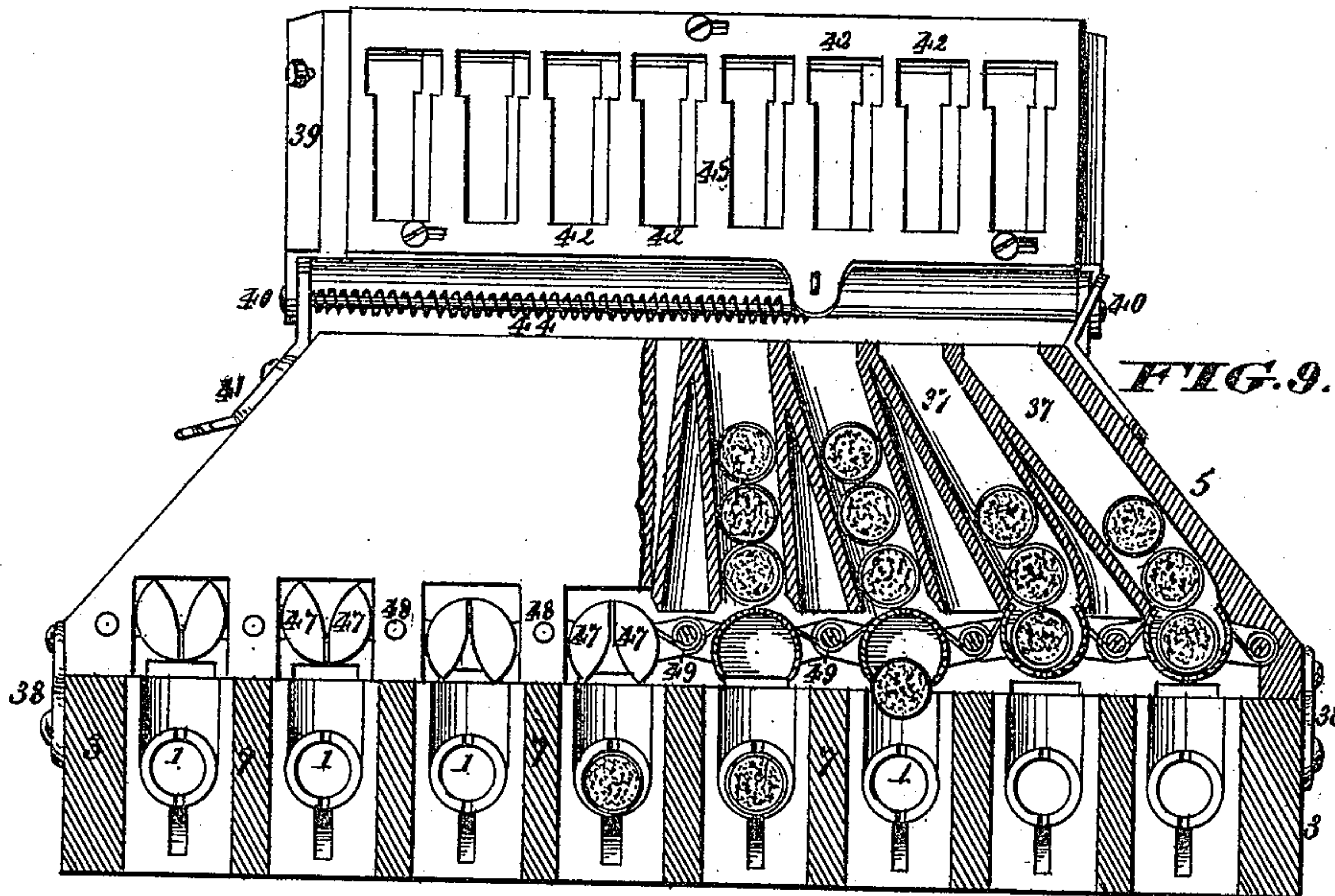
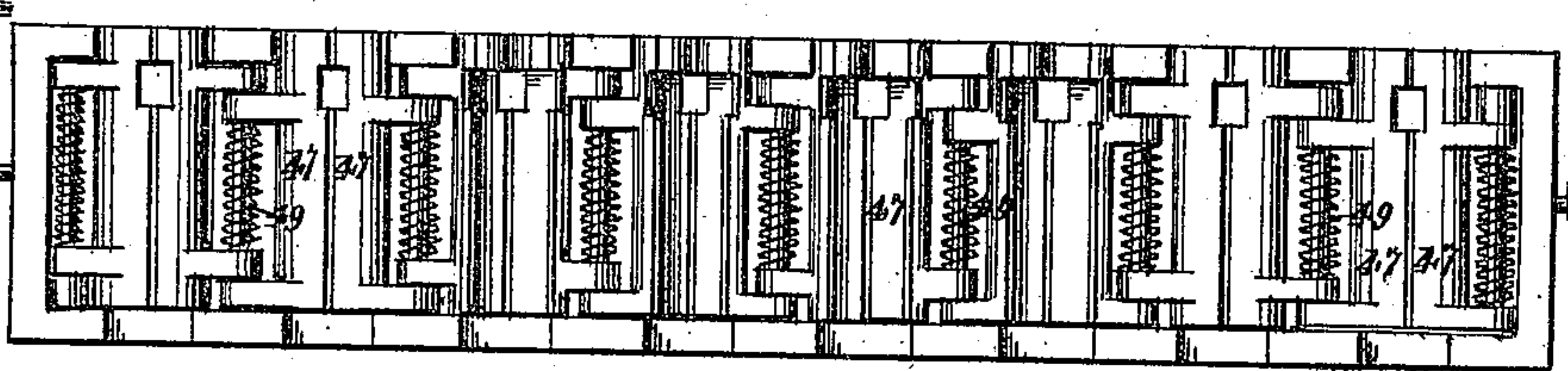


FIG. 10.



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FIG. 13.

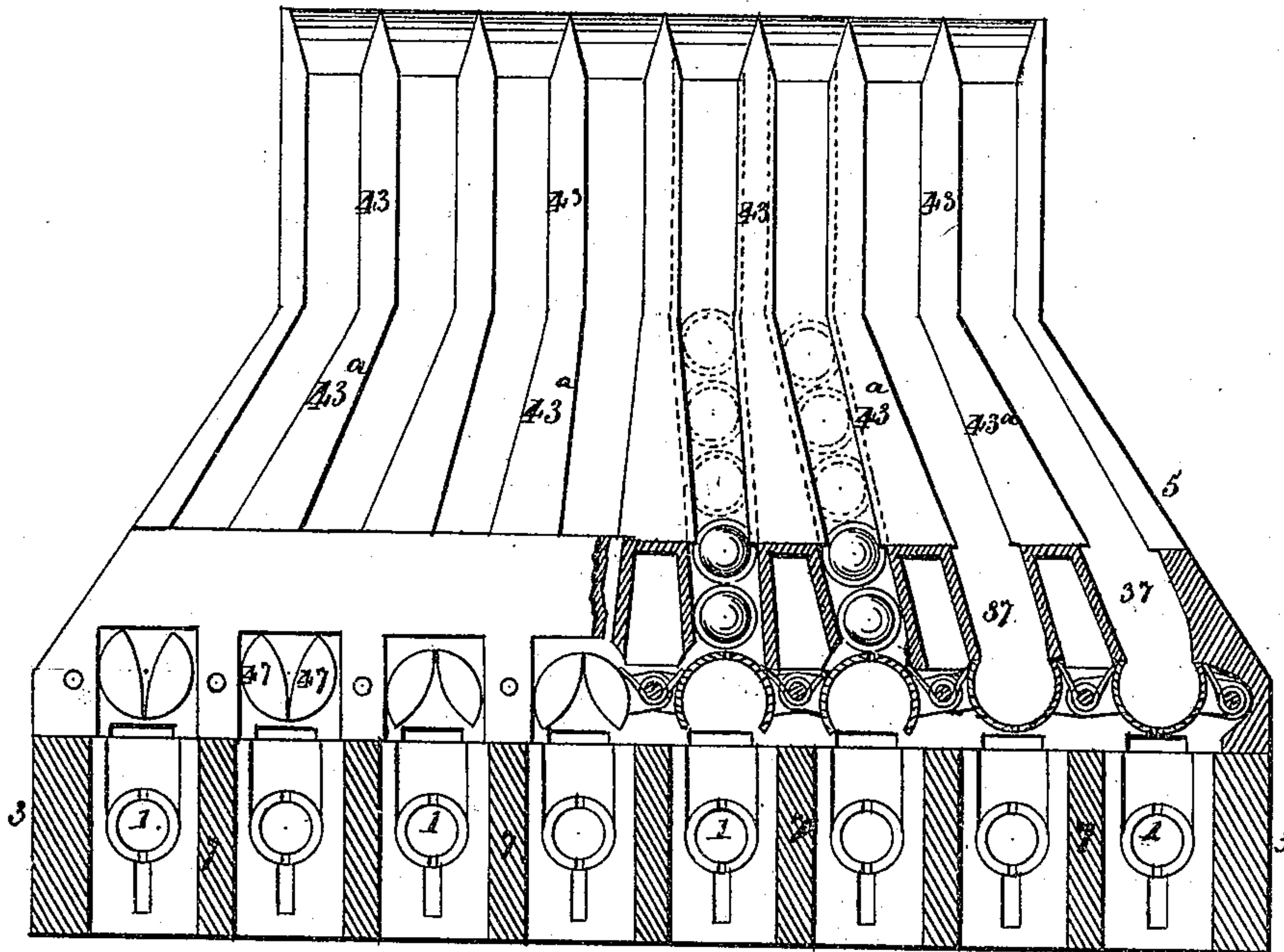


FIG. 14.

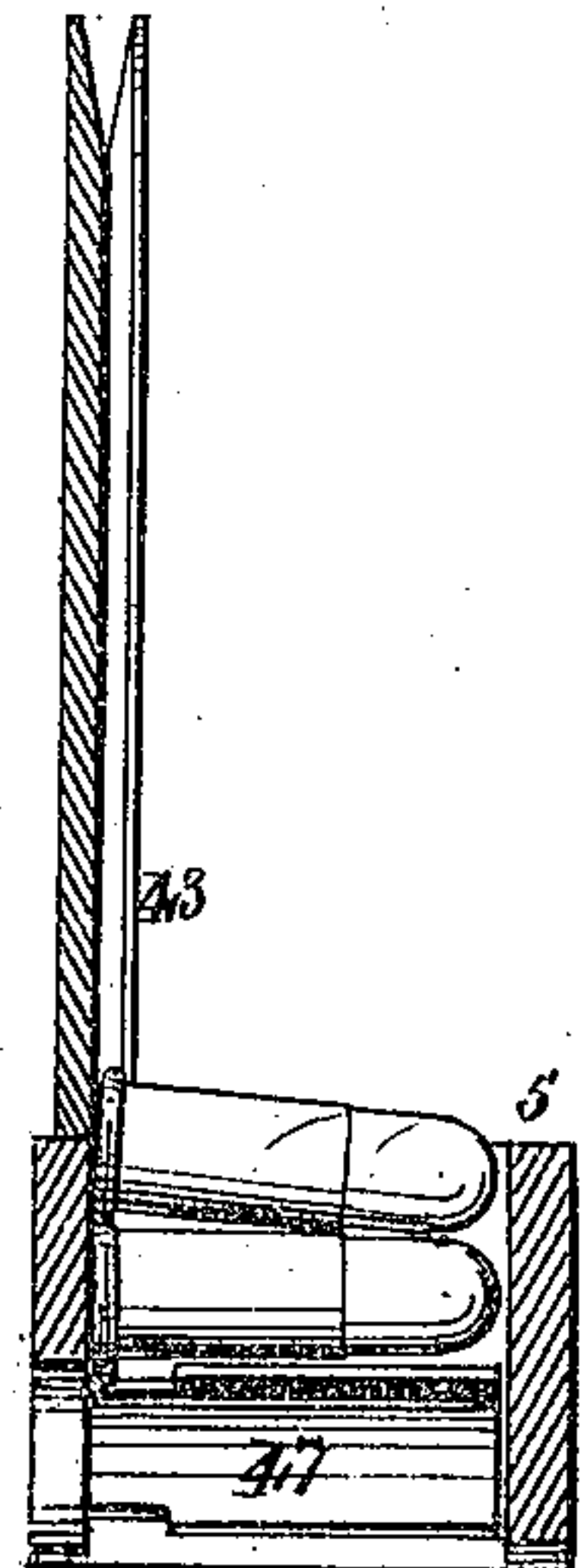
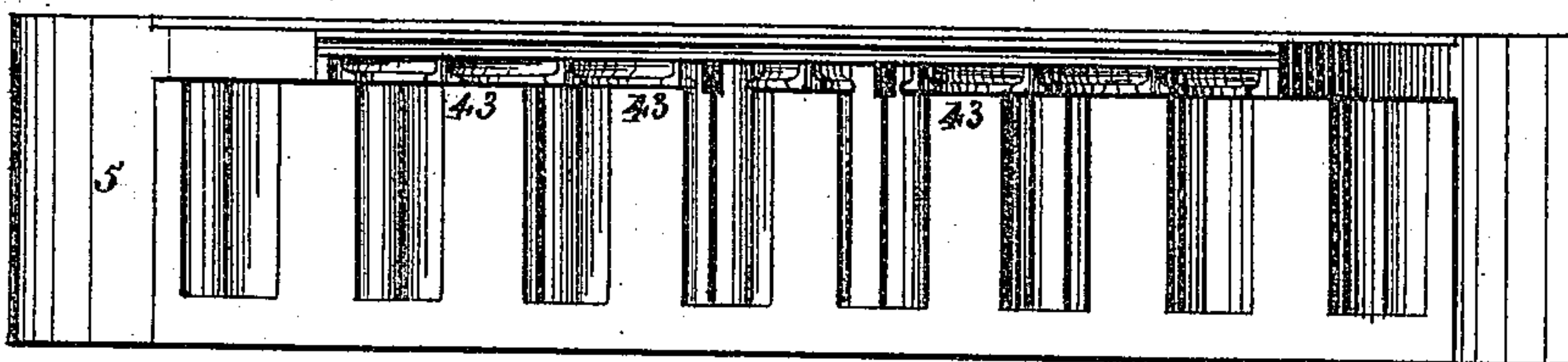


FIG. 15.



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UNITED STATES PATENT OFFICE.

JAMES P. TAYLOR, OF ELIZABETHTON, ASSIGNOR OF ONE-HALF HIS RIGHT
TO JOHN BAXTER, OF KNOXVILLE, TENNESSEE.

IMPROVEMENT IN MACHINE-GUNS.

Specification forming part of Letters Patent No. 177,030, dated May 2, 1876; application filed
April 5, 1876.

To all whom it may concern:

Be it known that I, JAMES PATTON TAYLOR, of Elizabethton, in the county of Carter and State of Tennessee, have invented certain new and useful Improvements in Machine-Guns, of which the following is a specification:

My improvements embrace, first, a new movement for operating the sliding plungers, by which the cartridges are introduced into the firing-chambers and the empty shells discharged therefrom; second, a new device for feeding ammunition from the supply-hopper into the breech-chamber; third, a new device for supplying ammunition from its packing case or box into the feeding-hopper; fourth, a novel construction of breech-chamber.

In the accompanying drawings, Figure 1 is a plan view, partly in section, of a gun illustrating the invention. Fig. 2 is a vertical longitudinal section, on a larger scale, of the breech portion on the line 2 2, Fig. 1, showing the parts in position for firing. Fig. 3 is a vertical longitudinal section, showing a lock-plunger retracted in the act of discharging, and a new cartridge in position to be thrust into the chamber of the barrel by the next forward movement of the plunger. Fig. 4 is a plan view of the feeding and firing mechanism of one barrel with the cap removed. Fig. 5 is a vertical section of the same on the line 5 5, Fig. 4. Figs. 6 and 7 are perspective views of two portions of the cartridge-retractor. Fig. 8 is a perspective view of a rod for retracting the firing-pin. Fig. 9 is a transverse section on the line 9 9, Fig. 1, with the hopper tipped forward. Fig. 10 is an under-side view of the entire hopper, showing the feeding-valves. Figs. 11 and 12 are perspective views of one pair of feeding-valves detached and in different positions. Fig. 13 is a front view of a feeding device, illustrating a modification in the construction of my divergent conducting-throats. Fig. 14 is a longitudinal section of the same. Fig. 15 is a plan or top view.

A horizontal range of any desirable number of barrels, 1, are fixed in a breech-frame, 2 3, which is provided with a cap-plate, 4, to cover

the operating mechanism. The cartridges are introduced through a hopper, 5, of peculiar construction. 6 are the trunnions on which the breech and barrels are supported and adjusted for elevation or range. The breech is constructed, preferably, in the form of a simple solid trough, with a number of longitudinal bars, 7, forming guides for the sliding locks or followers 9, by which the cartridges are thrust into the firing-chambers and the empty shells retracted and discharged. The reciprocating locks 9 are advanced and retracted by cams 8 of novel construction, carried by a horizontal shaft, 10, having its bearings in the longitudinal bars 3 and 7 of the breech-frame, and receiving a continuous rotary motion by a crank, 11, or other means. The cams 8 are so arranged on the shaft 10 as to actuate the locks or followers 9 in regular succession, and thus discharge the barrels in rapid succession, and no two of them at precisely the same moment.

Each of the driving-cams 8 takes the form of the sector of a circle and has laterally-projecting shoulders or flanges 12 on its periphery, which engage with flanges 13 14 on a horizontally-bifurcated and vertically-slotted lock-carrier, 15, the bifurcation serving to straddle the shaft 10, while the vertical slot permits the free passage of the driving-cam. This construction admits of imparting to the lock-carrier a stroke equal to nearly double the radius of the driving-cam. The contact or bearing points between the cam and the lock-carrier are, as shown, on the inside of the carrier above and below the bifurcation. The lock-carrier is cast in steel in two parts, and connected to the lock or follower 9 by pins 16. The firing-pin 17 is attached to a slide, 18, which works within the lock-carrier 15, and is provided with a laterally-projecting lug, 19. The cam 8 carries a tapering flange, 20, on one face to engage with the lug 19. This flange 20 may be adjustable on a pivot at its point, so as to regulate the length of the stroke of the firing-pin, as desired. 21 is a lug on the forward end of the slide to engage with the rear of the firing-pin, as shown in Fig. 2. The slide is shown detached in Fig. 8 to illus-

trate its construction. 22 is the spring which drives the firing-pin forward when released from the flange 20. The cartridge-extractor is constructed with a lower spring-jaw, 23, and an upper spring-jaw, 24, the latter of which is formed with horizontal projecting pins 25, to fit within angular slots 26 in the forward end of the retractor-slide 27.

The upper retractor and its slide are shown detached in Figs. 7 and 6, respectively. The slide 27 is also formed with a stud, 28, which projects laterally through the face of the lock-carrier, and works in a groove, 29, prepared for it in the bars 3 and 7 of the frame. The said groove is of so much less length than the stroke of the lock or follower as to arrest the motion of the slide slightly before that of the lock, and therefore cause a slight relative movement between them at the termination of each stroke. The effect of this is, by reason of the angular shape of the slots 26, to lower the jaw at the forward termination of the stroke of the lock or follower, to cause it to catch the flange of the cartridge, and to raise it at the termination of the back stroke to release the cartridge-shell.

To provide for the ready insertion and removal of the sliding locks and their carriers while securely retaining them in position and guiding them in their longitudinal motion the carriers are provided with laterally-projecting studs, 30 and 16, the former of which pass down below the bars 3 through grooves 32 therein. The studs 16 pass through vertical grooves 33 into horizontal guiding-grooves 34.

By this device the lock is rendered detachable vertically. The relative longitudinal motion of the retractor-slide 27 at the termination of the backward stroke of the lock causes it to project beyond the forward face of the lock, so as to throw the cartridge therefrom at the same time that it is released by the elevation of the upper hook 24.

35 represents an inclined cap-plate applied on top of each sliding lock or follower to permit the descent of cartridges one by one from the hopper, as hereinafter described, as the lock recedes, and to pass beneath the hopper-valves hereinafter described as the lock thrusts the next cartridge into the firing-chamber of the barrel.

The hopper 5 is constructed with diverging throats 37 equal in number to the barrels of the gun, and adapted to convey the cartridges from a suitable box or case, from which they are discharged into the hopper in a proper position to be thrust into the barrels. By the use of divergent throats I am enabled to conduct the cartridges from compact cases in which they are packed without loss of room to any desirable number of barrels, which are arranged side by side at the requisite distance apart to afford room for the thickness of the material of the barrels themselves, and for the other parts of the gun.

The hopper is detachable from the gun, being secured thereto while in action by any suitable means. The hooks 38 illustrate a device for this purpose.

The hopper is constructed with a cap, 39, hinged at 40, and secured in its closed position on top of the hopper by hooks 41, or other proper means. This cap is provided with slots corresponding in number and position with the openings of the throats 37. It is further constructed with a sliding plate, 45, forming a second or false bottom, which is slotted to correspond with the slots 42 in the bottom of the cap. A spring, 44, moves the plate 45 endwise, so that the slots therein are thrust slightly out of register with those in the cap-bottom until the cap is pressed downward into its normal position over the hopper, when an oblique lug or ear, projecting upward from the hopper in position to receive the contact of the projecting end of the plate, presses it backward, so as to bring its slots in register with those of the cap-bottom, and permit cartridges to drop from the bottom into the throats of the hopper. The same spring, 44, which is employed to press the sliding plate outward, may also serve to throw the cap 39 up from the hopper when it is released from the hook 41. The sliding false bottom 45 prevents the escape of the cartridges from the box in which they are supplied to the gun, until such box is completely inverted, and the cap 39 closed down over the hopper, so as to cause the cartridges to pass directly into the proper throats of the hopper. This device greatly facilitates the work of supplying ammunition to the gun, and reduces the risk of accidents with rapid handling.

46 represents a cartridge-box of simple construction, which may be made of paper, wood, sheet metal, or other cheap material, and is constructed with chambers corresponding in number and position with the upper openings of the hopper-throats, the latter being brought close together to adapt them to receive the ammunition from closely-packed boxes, as before stated. The cartridges are shown at 46. They are discharged in succession from the lower ends of the hopper-throats by means of paired concave valves 47, which are pivoted at 48, and when free are turned downward so as to be opened below by means of springs 49 on their pintles 48, the effect of this movement being to drop the cartridge, which is held between the valves, and at the same time prevent the next above from entering between them. The valves are thrust upward to receive a new cartridge from above by the contact of the inclined cap-plate 35, at the termination of the forward stroke of the lock or follower.

In Fig. 4, 50 represents a spring-catch applied at the side of the trough of the breech, and serving the important office of preventing the cartridge from slipping backward when the gun is pointing at an elevation.

This catch is pressed back by the advance of the sliding lock or plunger, and does not interfere with the retraction of the shell with said plunger; but it operates to detain the new cartridge when the plunger recedes.

In Figs. 13, 14, and 15 I have illustrated an embodiment, under a modified form, of my invention of diverging conductors to convey cartridges from a box or case, in which they may be closely packed, to positions in line with the barrels, the centers of which are necessarily farther apart than are the centers of closely-packed cartridges. This modification is adapted for use in connection with cases in which cartridges are packed with their flanged butts projecting, as I have described in an earlier application for Letters Patent.

The feeding device consists of a plate, from the face of which project a set of T-shaped flanges, 43, the grooves between which are equal in number to the barrels to be loaded.

The T-shaped flanges, for the purpose of drawing the cartridges from the packing-cases by their flanged butts, are not claimed in this application, because they are described in an earlier application, as before stated. They are here shown for the purpose of showing the applicability to them of my invention of using diverging guides to conduct the cartridges to their proper places in rear of the respective barrels.

It is preferred to make the guiding-grooves parallel, as far from the top as the depth or vertical width of the case from which the cartridges are taken, so that all the cartridges of each tier in said case may be introduced freely and at once into the guiding-groove. The cartridges being then drawn from the case, will descend through the diverging portions 43^a of the grooves to their proper positions behind the respective barrels or into throats 37 in the hopper of the gun, by which they are conducted to the supply-chambers, under control of suitable feeding devices.

Operation: Fig. 2 shows the position of the parts when one of the sliding locks or followers, 9, has just reached the forward termination of its stroke, and has driven a cartridge into the firing-chamber of the barrel. The retractor-claws are seen engaged with the flange of the cartridge. The continued rotation of the cam 8 continues to hold the follower 9 securely in this position, and affords an efficient bearing for the recoil. As soon as the circular face of the cam 8 occupies the whole length of the arc 13 on the lock-carrier, the flange 20 releases the firing-pin slide 18 and discharges the load. The extremity of the cam then strikes the flanges 14, commencing the retraction of the follower, and with it the empty cartridge-shell. Fig. 3 shows the follower at or near the end of its backward stroke, and the shell released by the elevation of the claw 24, and driven off by the projecting end of the slide 27.

The following are among the advantages of my present improvements:

First, by the use of the bifurcated and slotted lock-carriers and the cams operating upon them, in the manner I have described, I impart to the followers a stroke in excess of the radius of the operating cams. I am thus enabled to give an ample stroke to the followers while reducing the diameter of the circle described by the driving-cam, and consequently the diameter of the breech.

Second, by imparting to the followers a stroke considerably in excess of the radius of the operating-cams, I obtain ample space for feeding the cartridges, and the subsequent retraction and discharge of the exploded shells without requiring any opening beneath the trough or chamber in which the cartridges are received in the rear of the firing-chamber of the barrel.

Third, by the use of a solid floor in the rear of the firing-chamber, I am enabled to transfer the feeding-valves to the hopper, where they properly belong.

Fourth, the length of stroke of the sliding followers affords ample space for the retraction of the exploded shells, and their expulsion from the gun.

Fifth, the construction and combination of the lock-carrier and operating cam afford a considerable dwell to the sliding lock or follower after the insertion of the cartridge in the firing-chamber, and during its discharge, and afford an efficient abutment against the recoil.

Sixth, my mode of constructing the lock-carriers separately from the sliding locks, and connecting them therewith, enables me readily to repair or replace the parts most subject to injury and wear.

Seventh, the mode of introducing cartridges from a case or box to the hopper by means of the hinged hopper-cap, and its sliding plate prevents all danger of spilling, and avoids the necessity of careful manipulation of the parts.

Having thus described my invention, the following is what I claim as new and desire to secure by Letters Patent:

1. The combination of a series of cams carried by a through-shaft and a series of followers, bifurcated to pass the said shaft when operated by the cams, as explained.

2. The cam 8, constructed with shoulders 12, in combination with the lock-carriers 15, and shoulders 13 14 acted on by the said cam 8, in substantially the manner described.

3. The sliding lock-carrier 15, having a bifurcation to adapt it to pass the shaft, and a vertical slot for the passage of the operating cam in the manner described.

4. The combination of the operating cam, the lock-carrier, and the sliding lock or plunger, constructed, connected, and operated substantially as and for the purpose set forth.

5. The feeding-hopper 5, provided with the oscillating valves 47, in combination with the sliding lock or follower 9, and plate 35, for operating the said valves, in the manner substantially as described.

6. The combination of the firing pin 17 and the removable slide 18, constructed and operating as described.

7. The hinged hopper-cap 39, in combination with the hopper 5 and slotted sliding plate 45, to receive and deliver the cartridges from a suitable case or box, in the manner substantially as set forth.

8. The catch 50, employed in the manner described, to retain the cartridge within the breech-trough when the gun is pointed at an elevation.

In testimony of which invention I hereunto set my hand this 15th day of March, 1876.

JAMES PATTON TAYLOR.

Witnesses:

OCTAVIUS KNIGHT,
LE BLOND BURDETT.