

No. 693,386.

Patented Feb. 18, 1902.

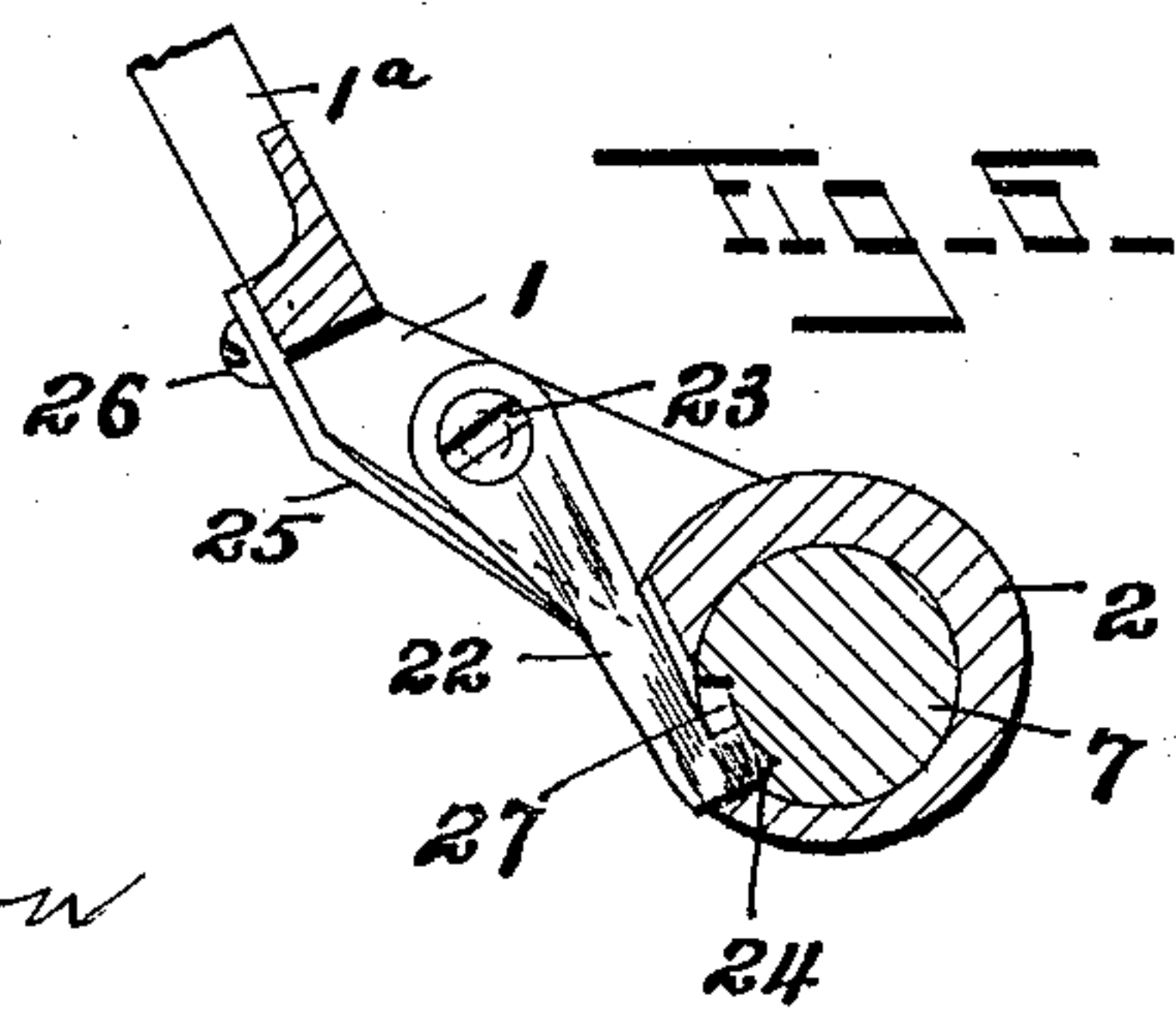
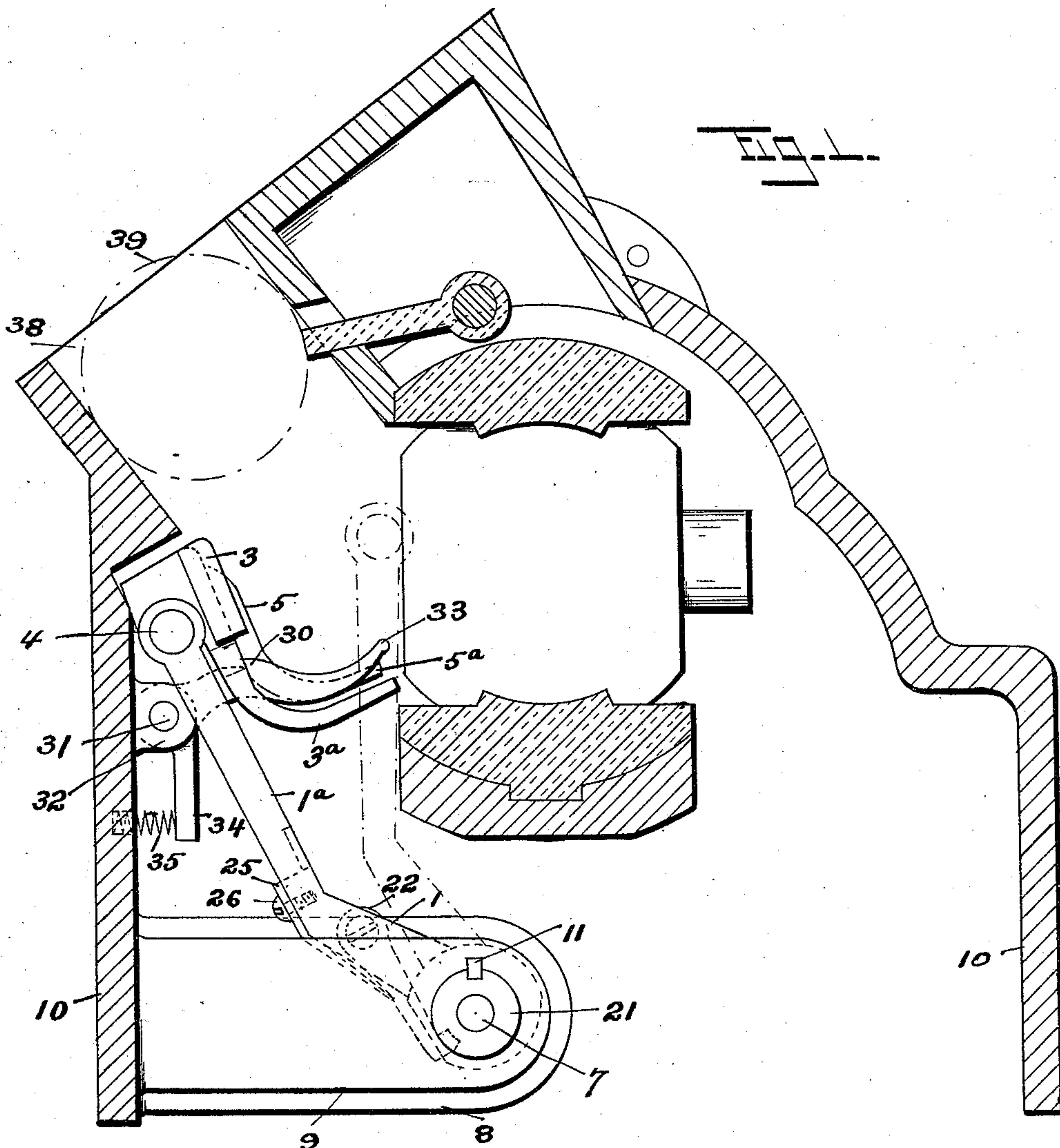
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CARTRIDGE CARRIER MECHANISM FOR AUTOMATIC GUNS.

(Application filed Feb. 20, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.

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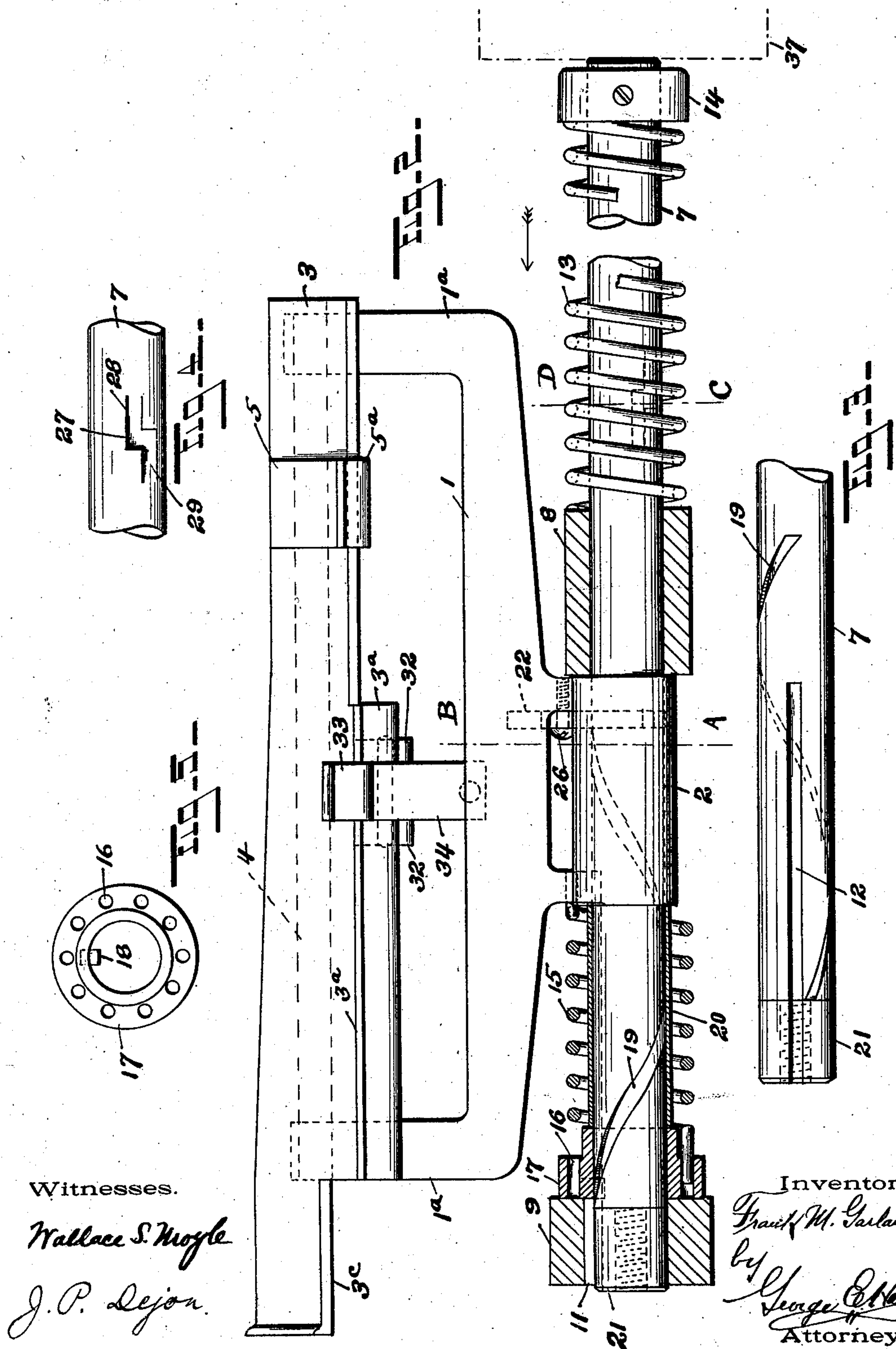
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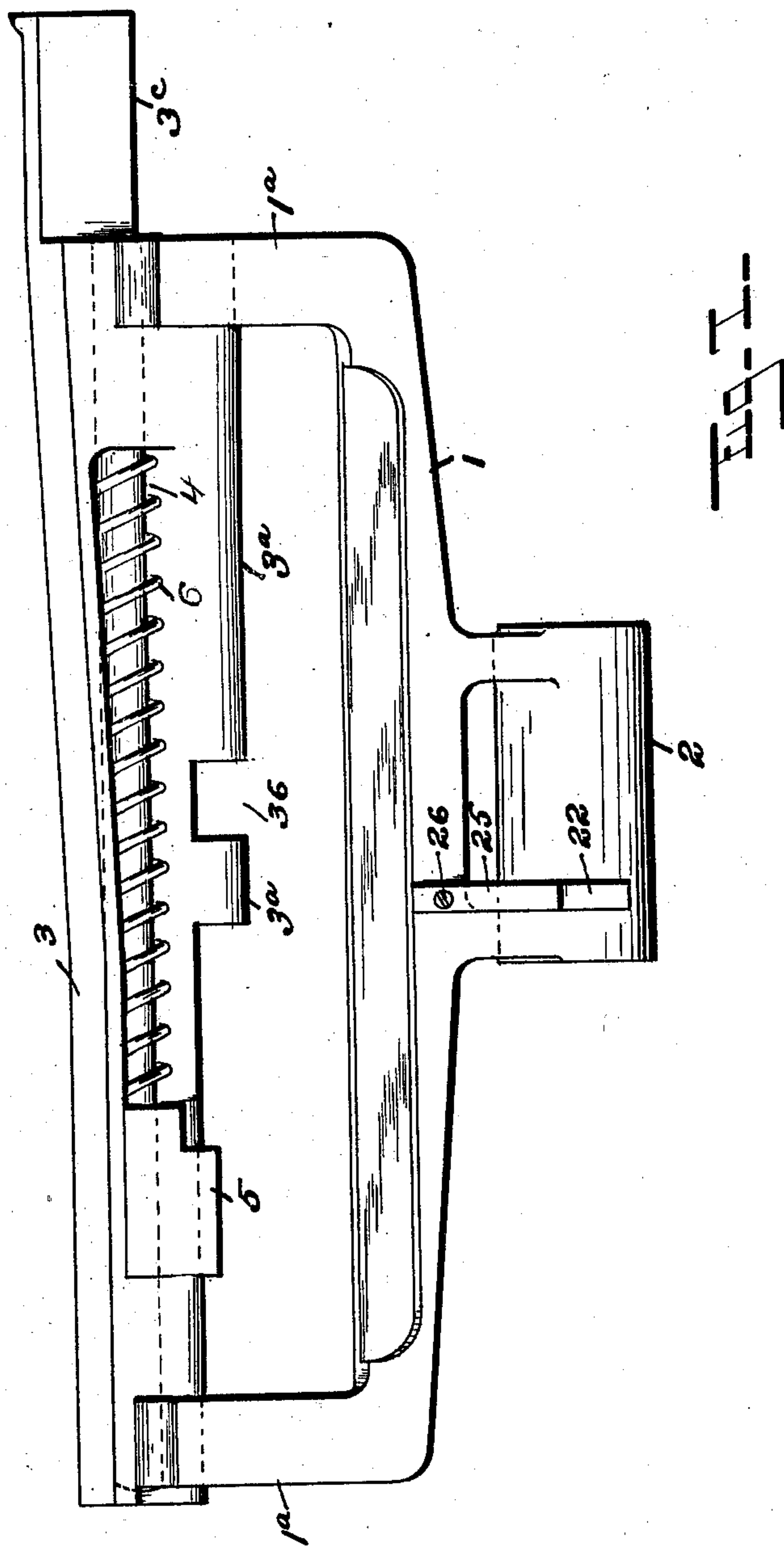
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UNITED STATES PATENT OFFICE.

FRANK M. GARLAND, OF NEW HAVEN, CONNECTICUT.

CARTRIDGE-CARRIER MECHANISM FOR AUTOMATIC GUNS.

SPECIFICATION forming part of Letters Patent No. 693,386, dated February 18, 1902.

Application filed February 20, 1901. Serial No. 48,161. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. GARLAND, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Cartridge-Carrier Mechanism for Automatic Guns, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in cartridge-carrier mechanism for automatic guns, the function of said mechanism being to receive a loaded cartridge and thence place it automatically between the extractor-fingers upon the breech-block.

It is the object of my invention, among other things, to construct a carrier that will be actuated directly by the recoil of the barrel, as distinguished from a carrier that is actuated from the breech mechanism, and, further, to construct the device with the minimum number of parts, which can be economically constructed and readily assembled.

To these and other ends my invention consists in the carrier mechanism having certain details of construction and combination of parts, as will be hereinafter described, and more particularly pointed out in the claims.

Referring to the drawings, in which like numerals designate like parts in the several views, Figure 1 is a transverse section of the body of a machine-gun, showing the breech-block in its forward or home position and the carrier mechanism in position to receive a loaded cartridge. Fig. 2 is a detailed view of the carrier mechanism looking from the center of the gun, some of the parts being in section. Fig. 3 is a plan view of one end of the carrier-rod. Fig. 4 is a side view of a portion of the carrier-rod as seen from the left of the gun. Fig. 5 is an end view of the spring-collar. Fig. 6 is a fragmentary sectional view of the carrier-frame, taken upon line A B, and of the carrier-rod upon line C D, of Fig. 2; and Fig. 7 is a side view of a portion of the carrier mechanism as seen from the left of the gun.

It has been customary heretofore to actuate the carrier mechanism of the machine-gun through the medium of the breech-block; but this has been found objectionable, owing

chiefly to the fact that the increased friction upon the breech-block necessary to operate the carrier mechanism has frequently disarranged the parts thereof and caused serious injury to the gun. By my improved mechanism the carrier is moved toward and away from the center of the gun by spring mechanism connected with a rod which is moved in one direction by the recoil of the gun-barrel and in the opposite direction by spring mechanism. It is apparent, therefore, that the carrier mechanism acts independently of the breech-block, which permits the use of a lighter breech-block, and as the gun-barrel is heavier than the breech-block the strain, therefore, upon the barrel is practically nothing as compared with the strain upon the breech-block in the old forms.

Referring to the drawings, the numeral 1 designates the carrier-frame, which is preferably U shape, having a hub 2 midway of its length and upwardly-projecting arms 1^a 1^a, to the upper ends of which is rigidly secured a tray 3 by means of a rod 4. The tray 3 is formed with a laterally-projecting bottom portion 3^a for a portion of its length and an overhanging lip 3^b. To economize space, I have provided a tray 5, having a bottom portion 5^a, which is mounted and movable upon the rod 4, Fig. 7, against the action of the coil-spring 6, surrounding said rod. When the tray 5 is engaged by a part of the gun, it will be moved against the action of the spring 6, and when the pressure against the tray is removed the spring will then return it to its normal position, (shown in Fig. 2,) wherein one side of the tray 5 will abut against a shoulder upon the rear of the tray 3, Fig. 7.

The particular form or construction of the carrier frame or tray is immaterial to my invention, and I do not therefore confine myself to the exact construction herein shown, as any other form or style can be used equally as well.

The carrier-rod 7 is mounted in the lugs 8 9, connected with the gun-casing 10 and held against rotation by a feather 11, fixed in the lug 9 and entering the straight spline 12. Surrounding one end of the carrier-rod is the coil-spring 13, the ends of which abut against the lug 8 and the collar 14, fixed to the rod. Another coil-spring 15 surrounds the opposite

end of the carrier-rod, the ends of said spring being outwardly turned and one entering a hole in the carrier-frame 1 and the other one of a series of holes 16 in the spring-collar 17.

5 Secured to the spring-collar 17 and projecting into the bore thereof is a feather 18, which is fitted into and movable in a spiral groove 19 around the exterior of the carrier-rod. Endwise movement of the carrier-frame upon

10 the carrier-rod is prevented by a sleeve 20, which is inserted between the spring-collar 17 and the hub 2 of the carrier-frame. To avoid the running together of the spiral groove 19 and the spline 12, the groove 19 is

15 terminated a short distance from the end of the carrier-rod, Fig. 3, and although the splines can be cut without the use of a false piece upon the end of the rod I prefer to use one, as it cheapens the cost of manufacture. In

20 the drawings this false piece is designated 21 and consists of a nut threaded upon the end of the carrier-rod, as shown in Figs. 2 and 3. Pivotaly mounted to the carrier-frame 1 by the screw 23 is a pawl 22, having a trip-finger

25 24, held in engagement against the periphery of the carrier-rod 7 by the spring 25, fastened by the screw 26 to the carrier-frame 1. In the carrier-rod 7 is a trip-recess 27, into which the finger 24 of the pawl 22 is adapted to enter, and having axial recesses 28 and 29 leading therefrom, said recesses being inclined and running out from the bottom of the trip-recess 27 to nothing on the surface of the rod.

30 The carrier-frame is held in its outward position by a catch 30, having a trip-arm 33 and a downwardly-depending spring-arm 34, the catch being pivotaly mounted upon a pintle 31 between two ears 32 32, preferably integral with the casing 10. A recess 36, Fig. 7, in

40 the tray 3 permits the trip-arm 33 to pass therethrough. Between the spring-arm 34 and the side of the casing 10 is a spring 35, which spring tends to throw the trip-arm 33 upward and hold the catch 30 in engagement

45 with the tray 3, as shown in Fig. 1.

The operation of my device is as follows, it being understood that the position of the carrier-frame as shown in Fig. 1 is its outward position, wherein it is ready to receive

50 a cartridge, the gun-barrel being in its forward position ready to be discharged. In this position the carrier-frame is held against movement by the engagement of the latch 30 with the tray 3. When the gun-barrel, which

55 is designated by the broken lines 37 in Fig. 3, recoils, it abuts against the end of the carrier-rod 7 and moves the same in the direction of the arrow, the carrier-rod being held against rotation by the feather 11, entering the spline 12, as before described. It is im-

60 material to my invention whether the gun-barrel itself abuts against the end of the carrier-rod or a part connected therewith, for in some cases I provide a collar or a yoke surrounding the barrel, which engages with and actuates the carrier-rod. The longitudinal

65 movement of the carrier-rod 7 causes the

spring-collar 17 to rotate by the engagement of the feather 18 with the spiral groove 19, which rotation winds the spring 15, and the

70 increased tension upon the carrier-frame tends to throw the same inwardly or toward the center of the gun. The rearward movement of the carrier-rod continues until the

75 finger 24 upon the pawl 22 enters the trip-recess 27 opposite the recess 29 and is there held by the spring 25. When the carrier-frame is in the position shown by full lines in Fig. 1, the pawl-finger 24 is in line with the recess 29. If the recoil of the barrel continues to

80 move the carrier-rod rearwardly after the pawl-finger 24 has entered the recess 27, the said pawl-finger rides through the recess 29 onto the surface of the carrier-rod, and after the force of the recoil is spent the spring 13

85 draws the carrier-rod forward, and the pawl-finger 24 rides downwardly through the recess 29 into the recess 27 again and the carrier-rod is held against further forward movement. The gun-barrel can now be drawn forward

90 into its home position and the breech-block be manipulated as desired. To load the gun, a cartridge (designated by the broken lines 39) is dropped through the passage 38 in the

95 case 10 after the barrel is home onto the trip-arm 33, which is depressed, permitting the cartridge to rest upon the bottom 3^a of the tray 3 and the bottom 5^a of the movable tray 5. The depression of the trip-arm 33 frees the latch 30 from the tray 3, releasing the car-

100 rier, and the spring 15 throws the carrier inwardly, which movement places the cartridge in position in the breech-block. This inward position of the carrier-frame is shown by the broken lines in Fig. 1. The carrier-rod 7 be-

105 ing held against rotation and the hub 2 of the carrier-frame 1 being given a rotary movement about the carrier-rod causes the pawl-finger 24 to be drawn circumferentially through the trip-recess 27 out of line with

110 the recess 29 and into line with the recess 28. There being nothing now to hold the carrier-rod in its rearward position the spring 13 draws said rod to its original forward position, the pawl-finger 24 riding through the recess

115 28 into the surface of the carrier-rod. The forward movement of the carrier-rod causes a reverse rotary movement of the spring-collar 17, and hence a reverse winding movement of the spring 15, which throws the car-

120 rier outwardly again until the spring-catch 30 engages the tray 3, being thrown into position by the spring 35, and the parts are held against movement, as before described, with the carrier ready for a new cartridge.

125 The spring 15 is dead at about the middle of the stroke of the carrier-rod 7, with the maximum inward tension of the spring 15 upon the carrier when the pawl 24 is in register with the circumferential recess 27 and the

130 maximum outward tension when the carrier-rod 7 is in its extreme forward position. When the carrier-rod is being returned by the spring 13, the first part of the movement of the col-

lar 17 causes the unwinding of the spring to its dead condition, and the balance of the movement winds the spring in the reverse direction to that given when the carrier-rod is actuated from the gun-barrel. The tension of the spring is now exerted toward throwing the carrier-frame outwardly and remains so while the parts occupy the positions as shown in Fig. 2, thereby relieving the strain upon the latch 30. When the carrier-rod is actuated from the gun-barrel, the spring is first unwound, relieving the spring-pressure which holds the carrier-frame in its outward position and then winds the spring in the reverse direction, the tension of which is exerted toward throwing the carrier inwardly to the center of the gun. It will be apparent from this description that the carrier is actuated entirely by a longitudinally-movable rod and spring mechanism, the means for moving the rod longitudinally being preferably either the gun-barrel or parts connected therewith, thus avoiding the many objections heretofore contended with, wherein the carrier has been actuated from the breech-block and other delicate parts.

There are minor changes and alterations that can be made within my invention, and I would therefore have it understood that I do not limit myself to the exact construction herein shown and described, but claim all that falls fairly within the spirit and scope of my invention.

What I claim as new is—

1. In an automatic gun, the combination with a longitudinally-movable rod engaged by the barrel in its recoil; of a transversely-movable cartridge-carrier rotatably mounted thereon; of spring mechanism connected therewith; and means actuated by the movement of the said rod for varying the tension of said spring mechanism so that the said spring mechanism will actuate the cartridge-carrier in either direction according to the direction of movement of said rod.

2. In an automatic gun, the combination with a longitudinally-movable rod having a peripheral groove therein; of a rotatably-mounted cartridge-carrier; of spring mechanism surrounding said rod and having connection with said cartridge-carrier; and means having connection with said spring mechanism and said peripheral groove for varying the tension of said spring mechanism, whereby the movement of said rod will actuate the aforesaid cartridge-carrier in either direction through said spring mechanism.

3. In an automatic gun, the combination with a longitudinally-movable, non-rotatable rod having peripheral spiral grooves therein; of a cartridge-carrier rotatably mounted upon said rod; a collar having a detent entering said spiral groove; and a coil-spring having connection at one end with the aforesaid carrier and at the other end with said collar.

4. In an automatic gun, the combination with a non-rotatable rod having a peripheral

groove therein; of means for imparting a longitudinal movement to said rod; a collar having a detent connected therewith and entering the said peripheral groove; a coil-spring having connection with the said collar at one end and a movable part at the other end, the said spring being so held by the said collar that the movement of the said rod in either direction winds and unwinds the said spring.

5. In an automatic gun, the combination with a longitudinally-movable carrier-rod; of a transversely-movable carrier mounted thereon; a collar upon said rod; a coil-spring having connection at one end with said collar and at the other end with the said carrier; and means whereby the said carrier may be actuated in either direction from the said rod through the said coil-spring and collar.

6. In an automatic gun, the combination with a longitudinally-movable carrier-rod; of a transversely-movable carrier mounted thereon; a collar upon said rod; a coil-spring having connection at one end with said collar and at the other end with said carrier; means whereby the said carrier may be actuated in either direction from the said rod through the said coil-spring and collar; and latch mechanism for holding said carrier in its outward position.

7. In an automatic gun, the combination with a longitudinally-movable carrier-rod; of a transversely-movable carrier mounted thereon; a collar mounted upon and rotated by the movement of said rod; a coil-spring having connection at one end with said collar and at the other end with said carrier; and mechanism surrounding one end of said rod for moving the same in one direction.

8. In an automatic gun, the combination with a longitudinally-movable carrier-rod 7; of a carrier-frame 1 having a tray 3 connected therewith; a spring-collar 17 mounted upon said carrier-rod and rotated thereby; coil-spring 15 having connection at one end with said spring-collar and at the other end with said carrier; latch 30 and coil-spring 13.

9. In an automatic gun, the combination with a longitudinally-movable carrier-rod having trip-recesses therein; a transversely-movable carrier having a pawl connected therewith which is adapted to enter said trip-recess and limit the movement of said rod in one direction; a coil-spring for actuating the said carrier; means connected with the gun-barrel for moving the said carrier-rod in one direction; and a coil-spring surrounding one end of said rod for moving the same in the opposite direction.

10. In an automatic gun, the combination with a longitudinally-movable carrier-rod engaged by the barrel in its recoil having a circumferential recess in one side thereof and axial recesses leading from either end of said circumferential recess; a transversely-movable carrier mounted thereon and having a pawl connected therewith which is adapted to enter said trip-recess and limit the move-

ment of said rod in one direction; and a coil-spring surrounding said rod for moving the same in counter-recoil direction.

11. In an automatic gun, the combination
5 with a longitudinally-movable carrier-rod engaged by the barrel in its recoil having a circumferential recess in one side thereof and axial recesses leading from either end of said circumferential recess, said axial recesses being inclined and running out from the bottom of the said circumferential recess to nothing on the surface of the rod; a transversely-

movable carrier mounted thereon and having a pawl connected therewith which is adapted to enter said trip-recess and limit the movement of said rod in one direction; and a coil-spring surrounding said rod for moving the same in counter-recoil direction. 15

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

FRANK M. GARLAND.

Witnesses:

GEORGE E. HALL,
F. E. HUBBARD.