

No. 765,491.

PATENTED JULY 19, 1904.

R. H. KJELLMAN.
RECOIL OPERATED FIREARM.

APPLICATION FILED JAN. 23, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

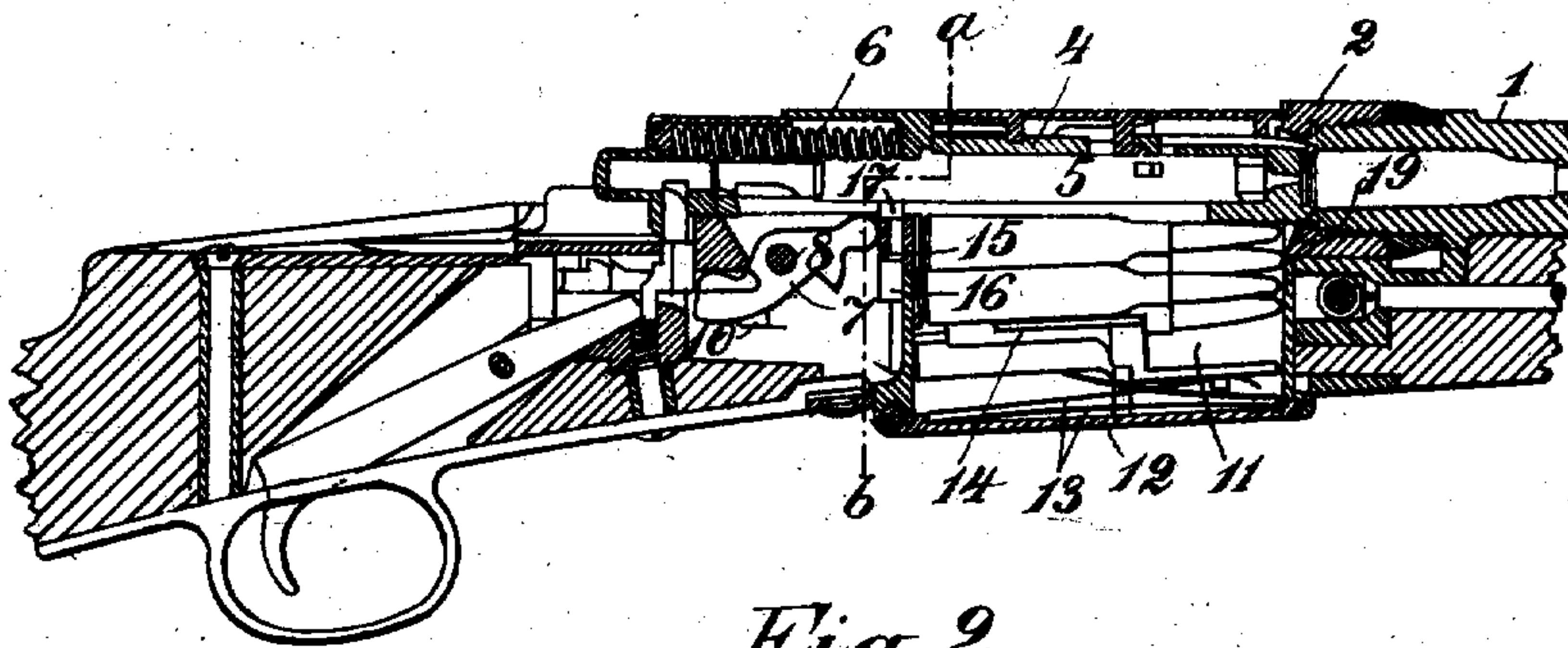


Fig. 2.

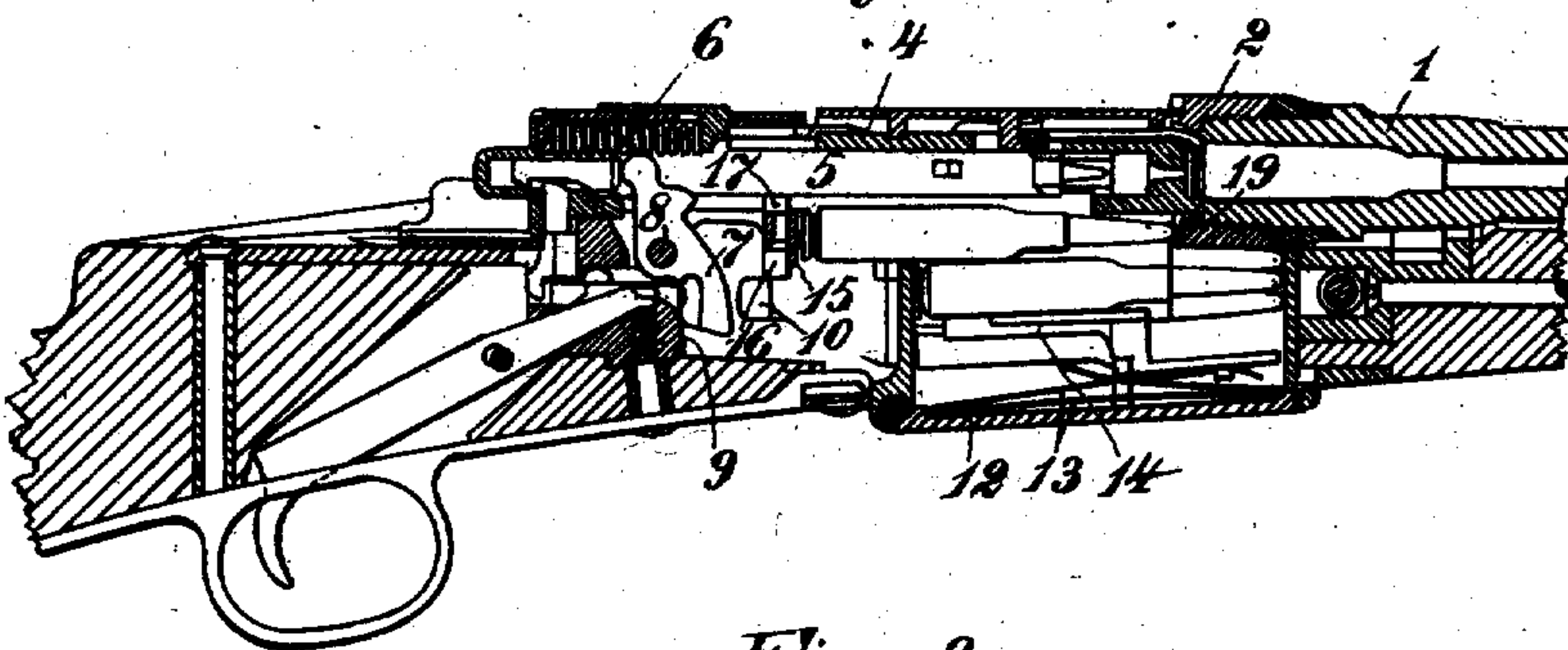
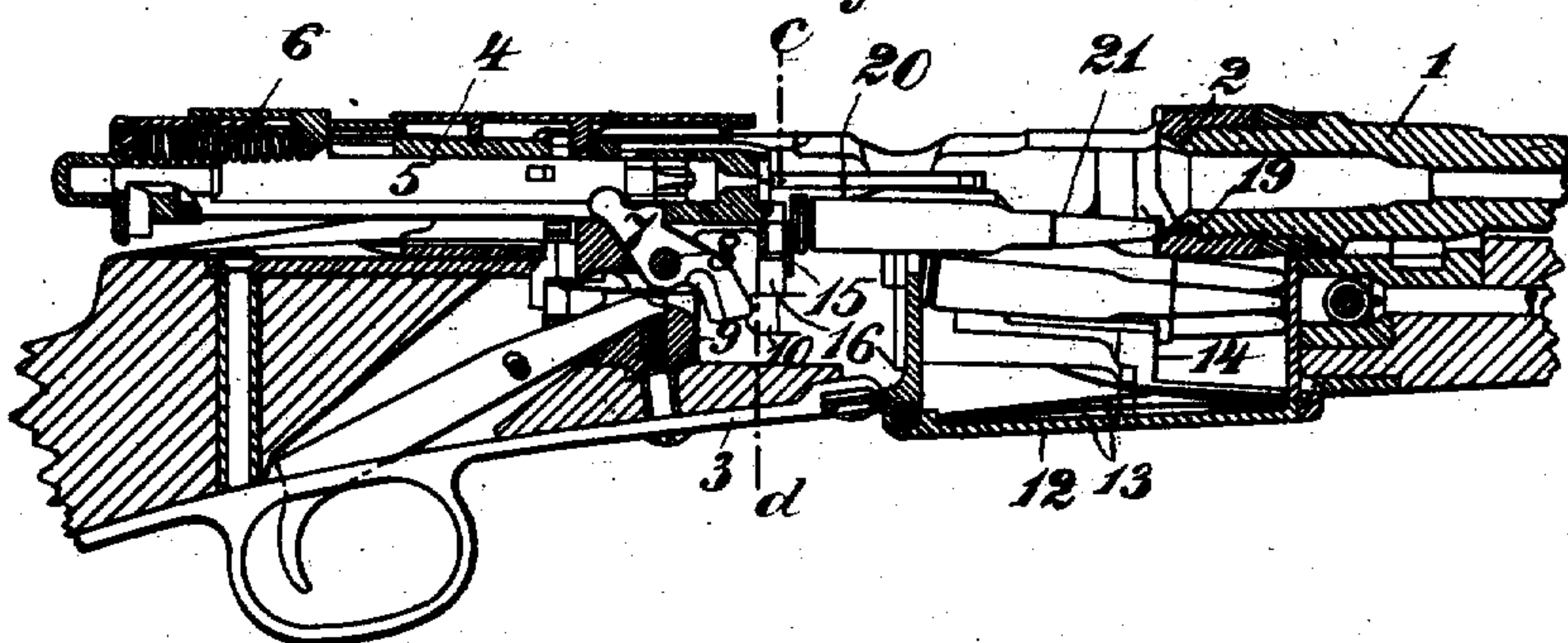


Fig. 3.



Witnesses
E. H. Hines
William J. Firth

Inventor
Rudolf H. Kjellman
By *his* Attorney *Herbert Connors*

No. 765,491.

PATENTED JULY 19, 1904.

R. H. KJELLMAN.
RECOIL OPERATED FIREARM.

APPLICATION FILED JAN. 23, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 4.

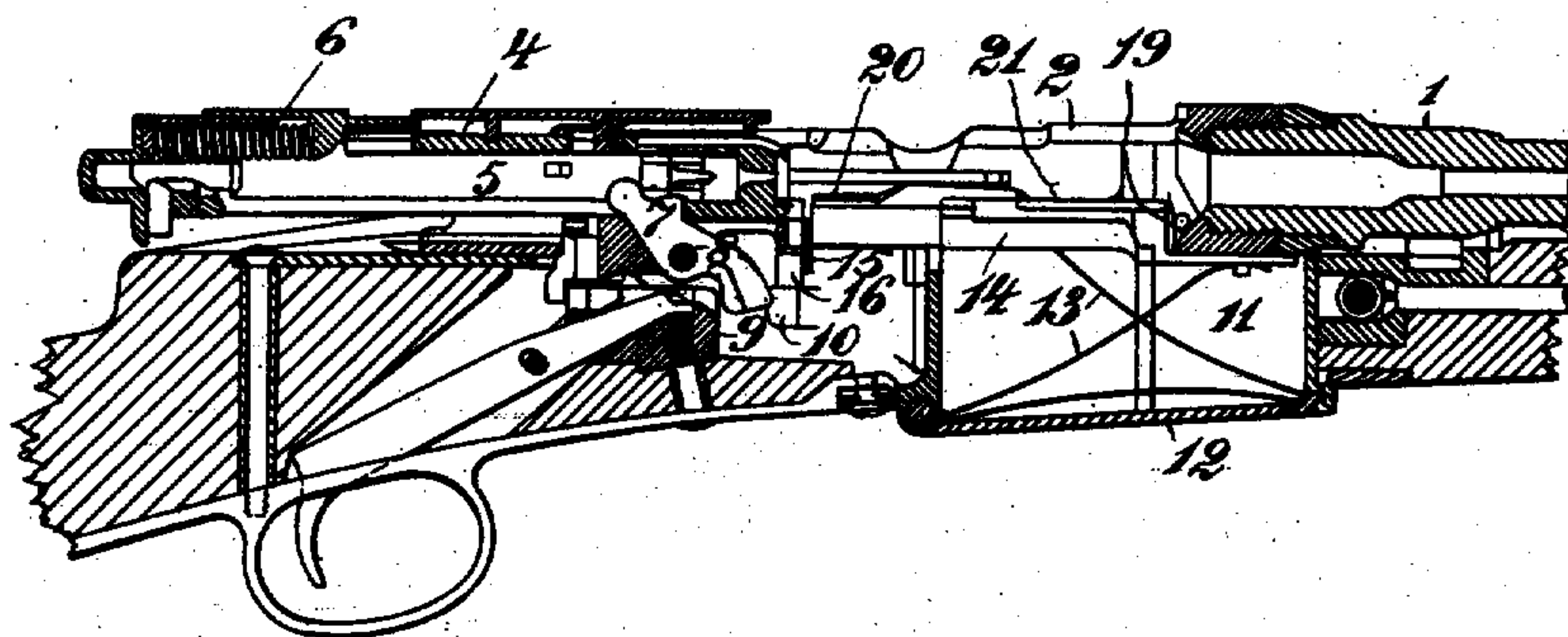


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

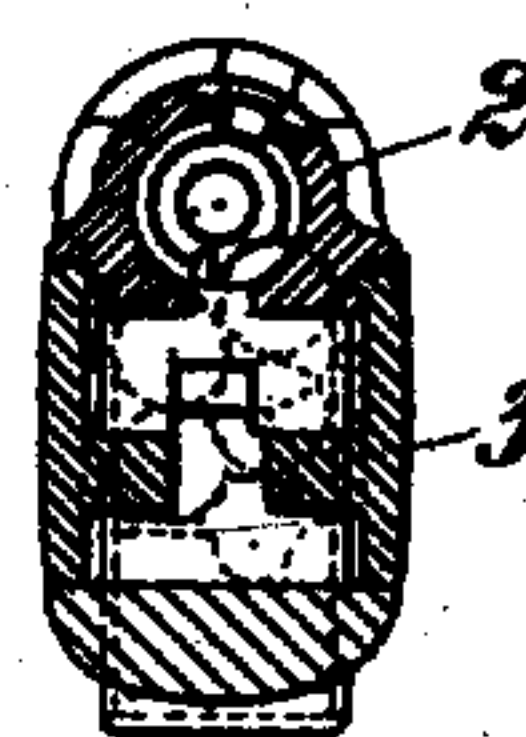
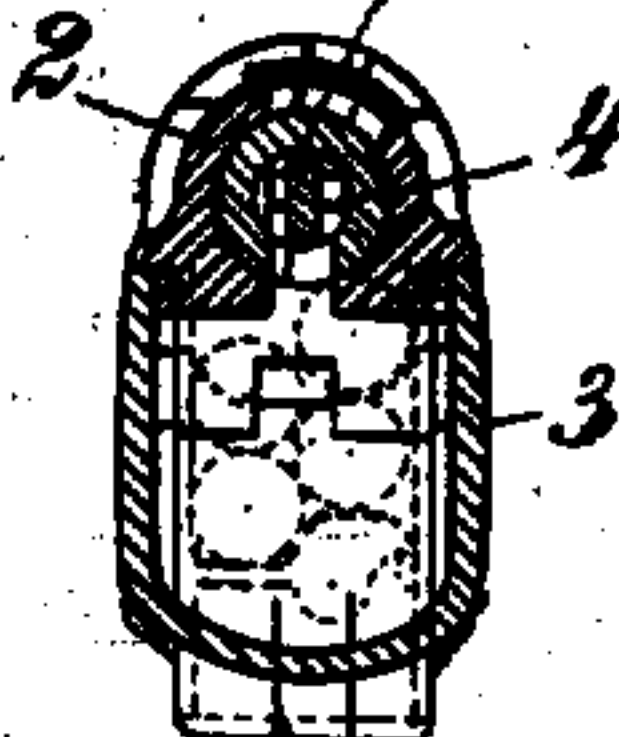


Fig. 9.

Fig. 10.

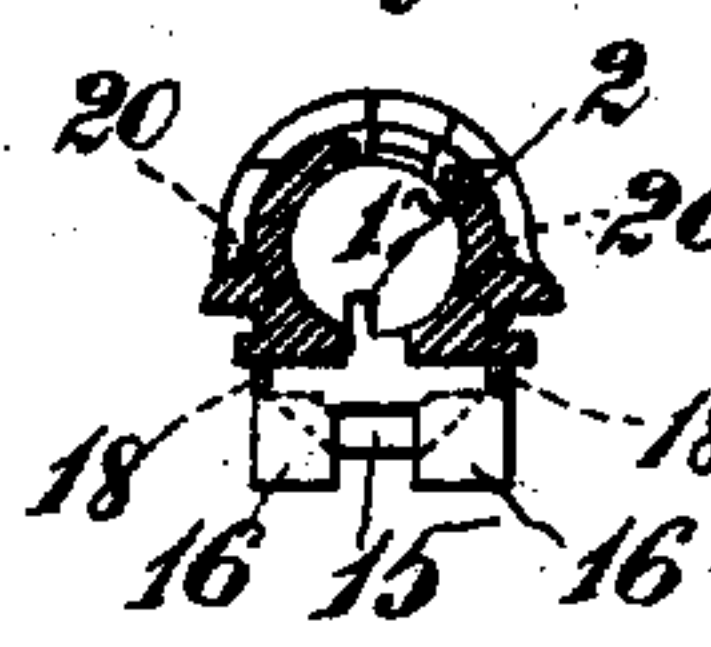
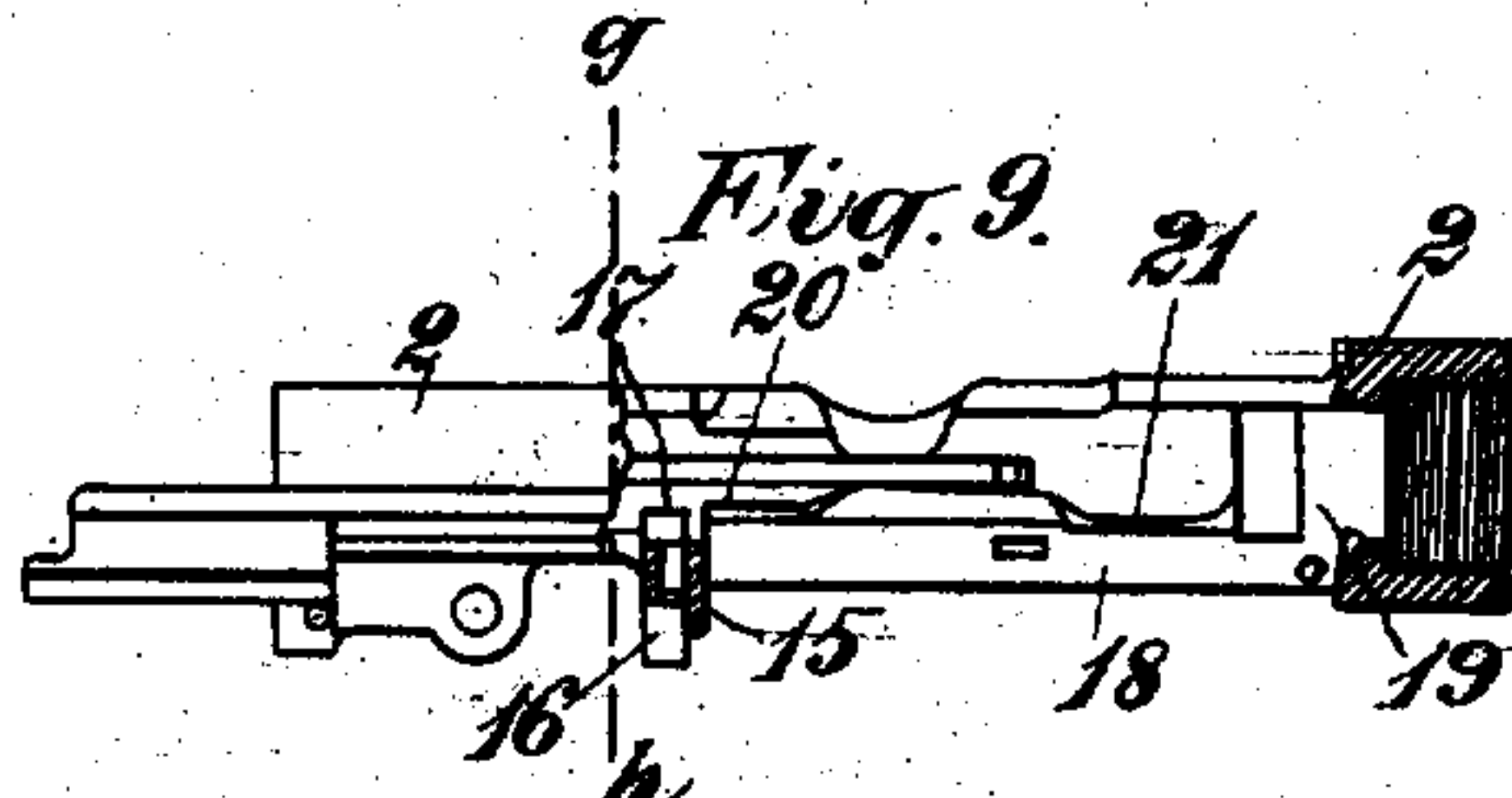
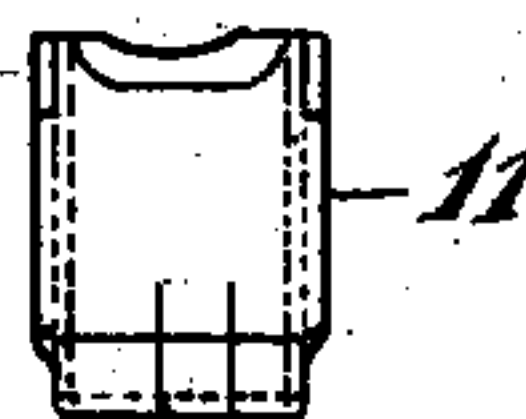
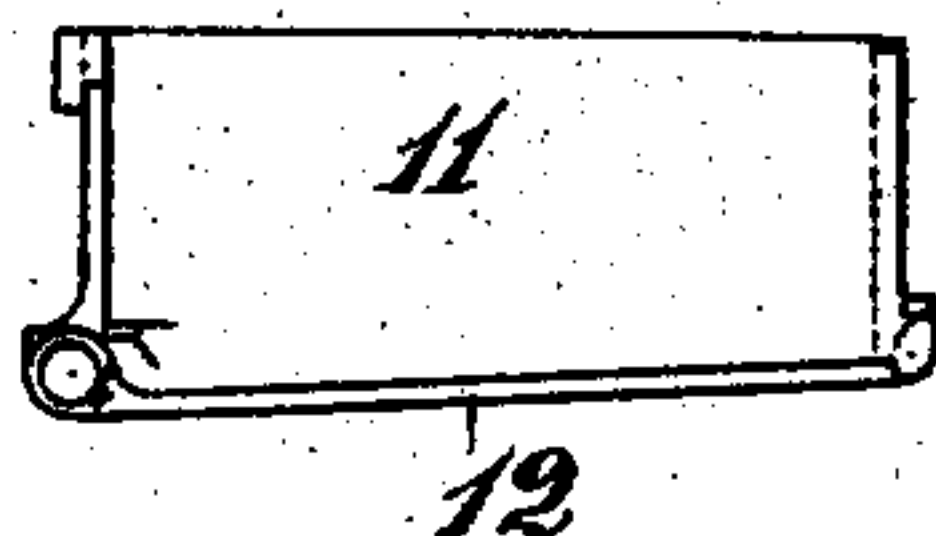


Fig. 11.

Fig. 12.



Witnesses
J. M. H. H. H.
William J. H. H.

Inventor
Rudolf H. Kjellman
By his Attorney Henry Connors

UNITED STATES PATENT OFFICE.

RUDOLF HENRIK KJELLMAN, OF STOCKHOLM, SWEDEN, ASSIGNOR TO
AKTIEBOLAGET STOCKHOLMS VAPENFABRIK, OF STOCKHOLM,
SWEDEN.

RECOIL-OPERATED FIREARM.

SPECIFICATION forming part of Letters Patent No. 765,491, dated July 19, 1904.

Application filed January 23, 1903. Serial No. 140,234. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF HENRIK KJELLMAN, engineer, a subject of the King of Sweden and Norway, and a resident of Handtverkaregatan 37, Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in or Relating to Automatic Firearms, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in automatic firearms; and the object of my improvement is to provide a comparatively short breech mechanism, and thus to reduce the weight of the firearm in the same degree. The said object is attained by a certain arrangement of the cartridge-box. Up to the present time the said cartridge-box has sometimes been fixed to the barrel, so that the box takes part in the motion of the barrel when recoiling. This arrangement involves an inconvenience consisting in that the weight of the recoiling body changes with the reduction of the number of cartridges inclosed by the box, springs and other parts being thus subjected to variable pressure. Besides, the throwing forward and backward of the cartridges in the box has an injurious effect on the cartridges. For these reasons attempts have been made to employ a stationary cartridge-box—i. e., a cartridge-box fixed not to the barrel, but to the frame—which does not take part in the recoil, the cartridges being fed up from the said box and placed in front of the breech-bolt. This arrangement is, however, dependent on a certain extreme rearward position of the box if the cartridge is to be fed up directly from the box into the position on the level with the firing-line, the mechanism-case in which other parts of the mechanism are to be inclosed behind the cartridge-box being thus comparatively long. In order to avoid this disadvantage, the cartridge-box is according to my invention fixed to the frame, room being, however, provided for the top cartridge under the breech-bolt in the receiver. The top cartridge lying in this space is able to take part in the rearward movement of the

barrel and the receiver, while the other cartridges will remain in the box. The said space is provided by the fact that the cartridge-box is, so to say, divided horizontally substantially on a level with the lower side of the top cartridge, which bears against the closed breech-bolt, that part of the box situated above the said level being fixed to the barrel or the receiver. Thus the top cartridge, embraced by the movable top part of the box, will take part in the rearward motion during the recoiling of the barrel, while the other cartridges remain in the stationary bottom part of the said box. The top cartridge will, however, be moved backward only to such a degree that it will still rest to some extent on the remaining cartridges. When the breech-bolt has been opened, all the cartridges will be lifted by the springs situated below the lifter, the top cartridge being thus placed in the path of the breech-bolt, so as to be pushed into the barrel at the advancing of the breech-bolt.

In the accompanying drawings the breech mechanism is shown in Figures 1, 2, 3, and 4 in longitudinal section and in Figs. 5 and 6 in cross-section. Fig. 1 shows the said mechanism in closed position. Fig. 2 shows the barrel not fully recoiled and the top cartridge retracted. Fig. 3 shows the barrel fully recoiled, the breech-bolt opened, and the top cartridge retracted and lifted. Fig. 4 shows the barrel and the receiver in the last-mentioned position after the firing of the last cartridge. Fig. 5 is a cross-section on the line *a b* of Fig. 1, and Fig. 6 is a cross-section on the line *c d* of Fig. 3. Fig. 7 is a side view, and Fig. 8 an end view, of the cartridge-lifter. Fig. 9 is a longitudinal section of the receiver, and Fig. 10 is a cross-section of the same on the line *g h* of Fig. 9. Fig. 11 is a side view, and Fig. 12 an end view, of the cartridge-box.

To the barrel 1 is firmly screwed the receiver 2. 3 is the frame; 4, the breech-bolt; 5, the firing-pin; 6, the spring of the latter, and 7 a lever having its pivot 8 journaled in the receiver. The upper end of said lever engages the firing-pin and the breech-bolt, the lower end of the lever being in a position to

be acted upon by lugs 9 10, located in the frame and oscillated during the backward and forward motions of the barrel and receiver. The forward motion of the barrel and receiver is effected by a spring. (Not shown in the drawings.)

The foregoing construction is not new, and therefore needs no further description.

The cartridge-box 11 is provided, as usual, with a swinging bottom plate 12 and with a bottom piece or cartridge-lifter 14, upon which the cartridges rest and which is pressed upward by springs 13. The front end of the cartridge-box is situated just below and behind the rear opening of the barrel when occupying its firing position and is covered by the closed breech-bolt, which moves in over the same like a lid. The cartridges are disposed in the box in two vertical rows in the usual manner, overlapping to some extent, as shown in Fig. 5. The top cartridge bears against the lower side of the breech-bolt. Substantially on a level with the lower side of the cartridge last mentioned the box is divided horizontally, and the top part is fixed to the receiver or parts belonging thereto. The stationary bottom part of the box is shown in Figs. 11 and 12. The movable top part of the box has a rear wall 15, provided on its rear side with projections 16, in which is mounted the lug 17, forming an abutment for the spent cartridge-case for the ejection of the same. The side walls of the said movable part consist of flanges 18, extending downward from the receiver, Figs. 9 and 10, and fitting to the upper edges of the side walls of the box shown in Fig. 11. The front wall of the movable part is formed by the bottom part 19 of the annular end of the receiver, into which the barrel is screwed. Thus the said parts 15, 18, and 19 form a frame inclosing the top cartridge. This frame moves the top cartridge backward into the position shown in Fig. 2 as the barrel and receiver recoil to the position shown in that figure. During the movement the cartridge slides upon the two neighboring cartridges, one of which supports the top cartridge from below and the other also from below, but in an oblique or side-wise direction, while the flanges 18 form a lateral horizontal support for the same. The breech-bolt forms an abutment to the upper side of the top cartridge. The barrel, the breech-bolt, and the top cartridge then continue in their receding motion for a short distance, (compare Fig. 3,) during which movement the breech-bolt is forced farther backward by the lever 7. As soon as the breech-bolt has receded completely the top cartridge is lifted to the position shown in Fig. 3 by the pressure exerted from below by the other cartridges and the springs 13. Two lugs 20 and 21, located at each inner side of the receiver, prevent the cartridge

from rising to a higher level than that shown in Fig. 3. The said lugs are so situated as to form abutments for the ends of the cartridge while the pressure on the lower side of the cartridge is acting substantially at the center of the same, Fig. 3. In this manner the cartridge will be accurately positioned. It may properly be explained here that the lugs 21 form no hindrance to the entrance of the cartridge into the receiver, for the reason that the cartridges are piled in a zigzag manner, as clearly indicated by the dotted circles in Fig. 5, and the topmost cartridge, which is at one side, rests only against the lug 21 at that side. In the movement forward there is consequently no difficulty in the cartridge entering the flared bore in the barrel. A slight cross movement of the cartridge takes place at the time its forward end enters the barrel. Support from below is furnished by the cartridge underneath the uppermost one. The cartridge is now in the path of the breech-bolt, (compare position of the top cartridge shown in Fig. 6,) the point of the cartridge being so elevated that the cartridge can be pushed into the barrel. When the barrel and the receiver are advanced into the position shown in Fig. 1, the cartridge is inserted into the barrel by the breech-bolt, the latter being moved forward in the receiver. During its motion the cartridge will gradually occupy a more central position, guided partly by the lug 21, beveled on its under side, and partly by the barrel, until it is fully inserted into the latter, Fig. 1. An arrangement of the cartridge-lifter is shown in Fig. 4 whereby the said lifter is able to raise the last cartridge into the position shown in Fig. 3 directly without being prevented by the barrel and the receiver occupying their rear position. This is attained substantially by providing the lifter with a low part 22, Fig. 7, making room for the barrel and the receiver in the manner illustrated in Fig. 4. When the barrel and the receiver have been advanced to the position shown in Fig. 1 by the recoil-spring, the cartridge-box can be filled from the top with fresh cartridges. A special device, such as a latch or the like, (not shown in the drawings,) is provided preventing the breech-bolt from moving forward in the receiver from the position shown in Fig. 4 when the box is emptied. The breech-bolt can obviously be withdrawn by hand, this being necessary for enabling the filling of the cartridge-box from the top.

The frame-like upper part of the cartridge-box causing the top cartridge to take part in the backward movement of the receiver need not be complete, as material may be omitted where its presence is not necessary for supporting and guiding the cartridge.

The walls 15 19, preventing the cartridge from moving longitudinally to the receiver

until having been raised into the position shown in Fig. 3, and the flanges 18 are the principal parts of the said receiver.

In the drawings the cartridges are provided with an annular notch for the engagement of the extractor. If cartridges provided with a flange of greater diameter than the shell are employed, the receiver may be provided with internal lugs engaging the cartridge, so that the said flanges bear upon the same, and the lugs will then move each cartridge to the position shown in Fig. 2.

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

1. An automatic firearm, having a stock, a recoiling barrel, a receiver secured to and moving with the barrel, a breech-bolt, an operating-lever for the breech-bolt, said lever being fulcrumed in the receiver, a cartridge-magazine having a fixed portion below the receiver and a movable portion secured to the receiver and forming a frame which embraces the uppermost cartridge in the magazine when the barrel is in its forward resting position, and a cartridge-lifter in the fixed portion of the magazine which, on the opening of the breech-bolt, raises the uppermost cartridge which has been displaced to the rear by the movement of the receiver.

2. An automatic firearm, having a stock, a recoiling barrel, a frame fixed in the stock, a receiver secured to and moving with the barrel, a cartridge-magazine, the main lower portion of which is rigidly fixed in the frame, means in said lower portion of the magazine for lifting or elevating the cartridge, an upper portion of the cartridge-magazine fixed to and moving with the receiver and adapted to embrace the uppermost cartridge in the magazine and shift it at the recoil, and lugs 21 on the receiver which arrest the cartridges when lifted and limit their upward movement, substantially as set forth.

3. An automatic firearm, having a stock, a frame, a recoiling barrel and receiver connected and slidable in the frame, a breech-bolt slidable in the receiver and alined with the barrel, means carried by the receiver for moving back the uppermost cartridge for a part of its length at the recoil, a fixed receptacle for the cartridges, and an automatic lifter for the cartridges, said lifter being mounted in the receptacle and having a low part at its front end which extends under the rear end of the barrel, substantially as and for the purpose set forth.

4. The combination of the sliding barrel, the cartridge-box firmly connected with the frame, a top part of the cartridge-box firmly connected with the barrel and moving the top cartridge backward during the recoil, a cartridge-lifter situated in the cartridge-box and lugs located at the inner side of the receiver and arresting the cartridge, when being raised in front of the retracted breech-bolt, in such a position as to be in the path of the same, substantially as described.

5. The combination of the sliding barrel, the cartridge-box firmly connected with the frame, a movable top part of the said box firmly connected with the barrel and moving the top cartridge backward and a cartridge-lifter situated in the cartridge-box and provided with a low part, enabling the cartridge-lifter to raise the top cartridge into the path of the breech-bolt without being prevented in its operation by the barrel, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

RUDOLF HENRIK KJELLMAN.

Witnesses:

ERNST SVANQVIST,
ROBERT APELGREN.