

No. 804,506.

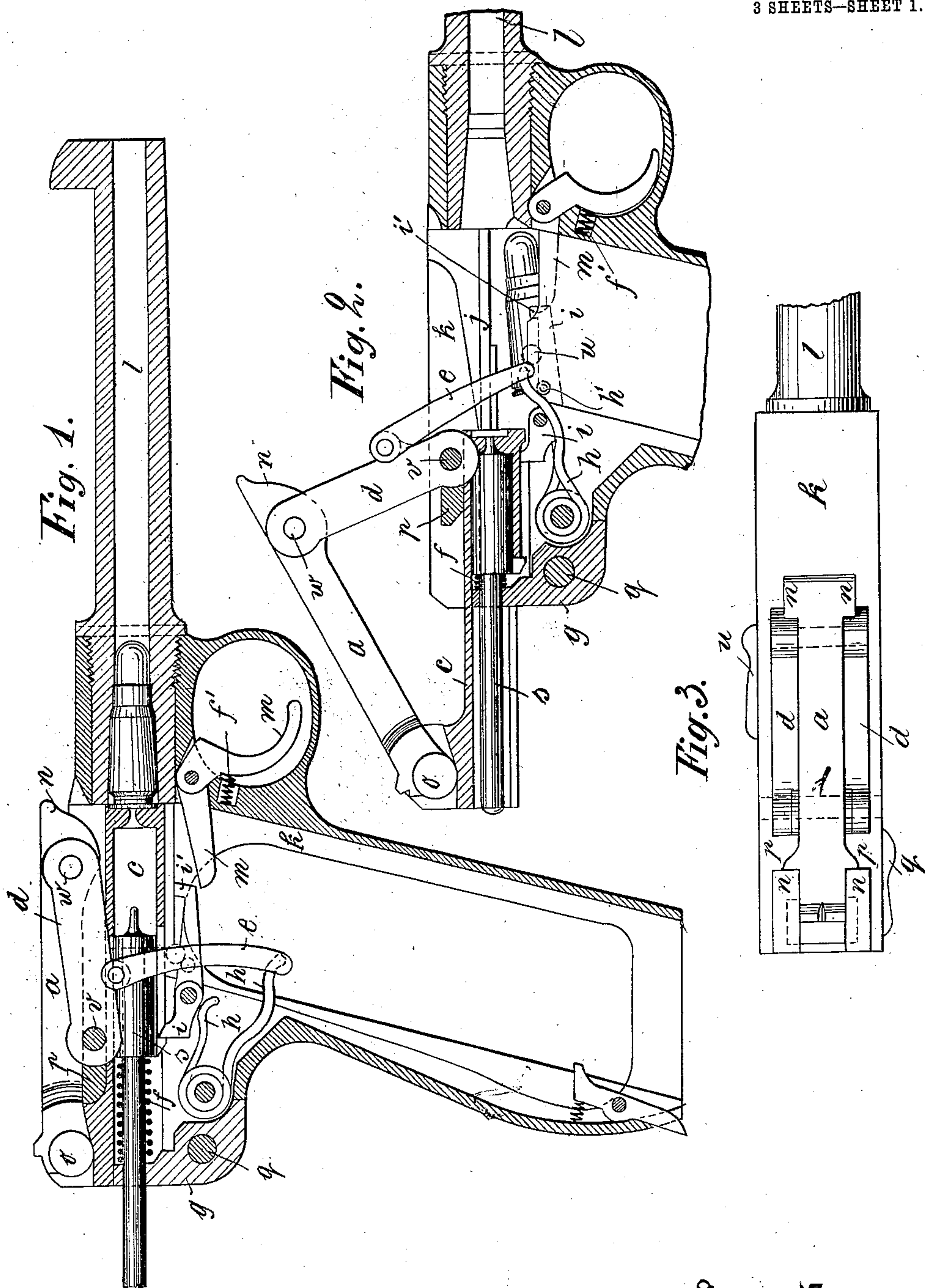
PATENTED NOV. 14, 1905.

A. W. SCHWARZLOSE.


TOGGLE LINK LOCK FOR RECOIL LOADING GUNS.

APPLICATION FILED DEC. 21, 1901.

3 SHEETS--SHEET 1.



Witnesses -
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3 SHEETS—SHEET 2.

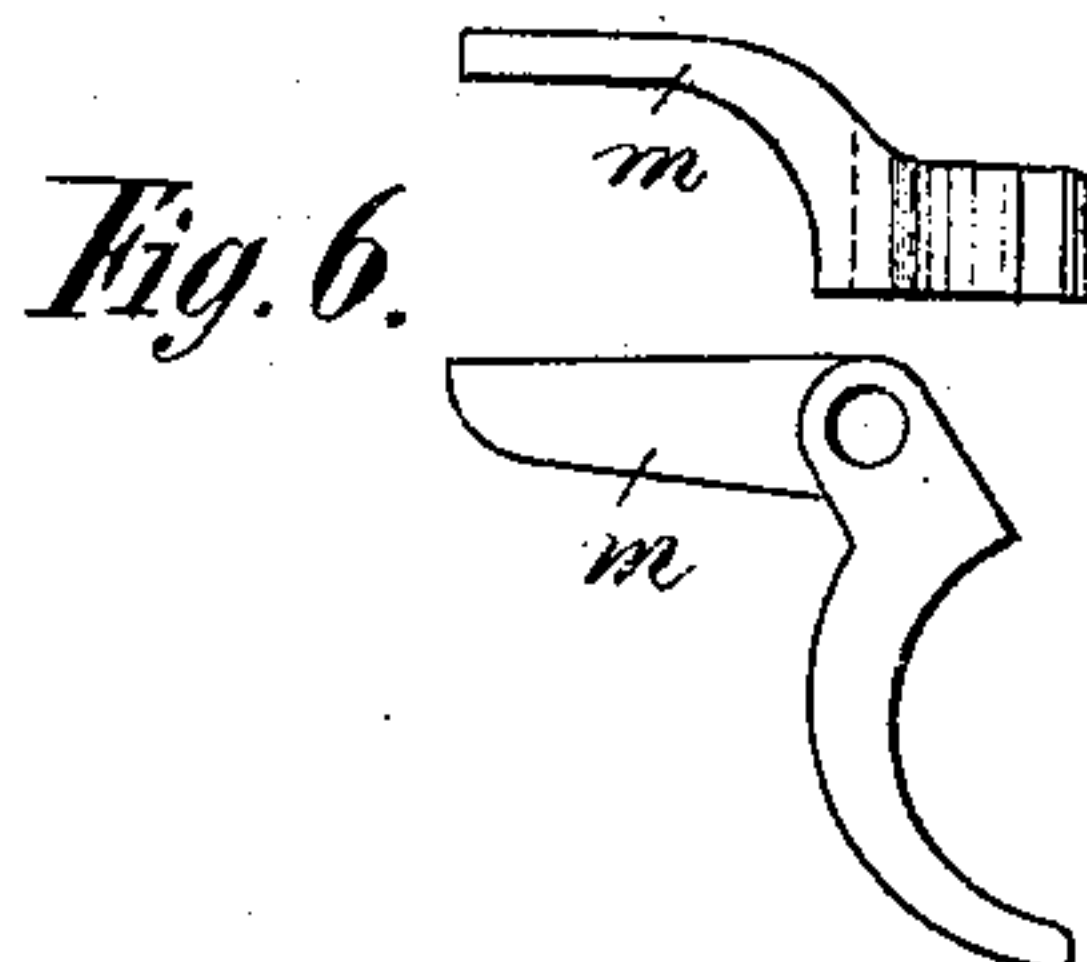
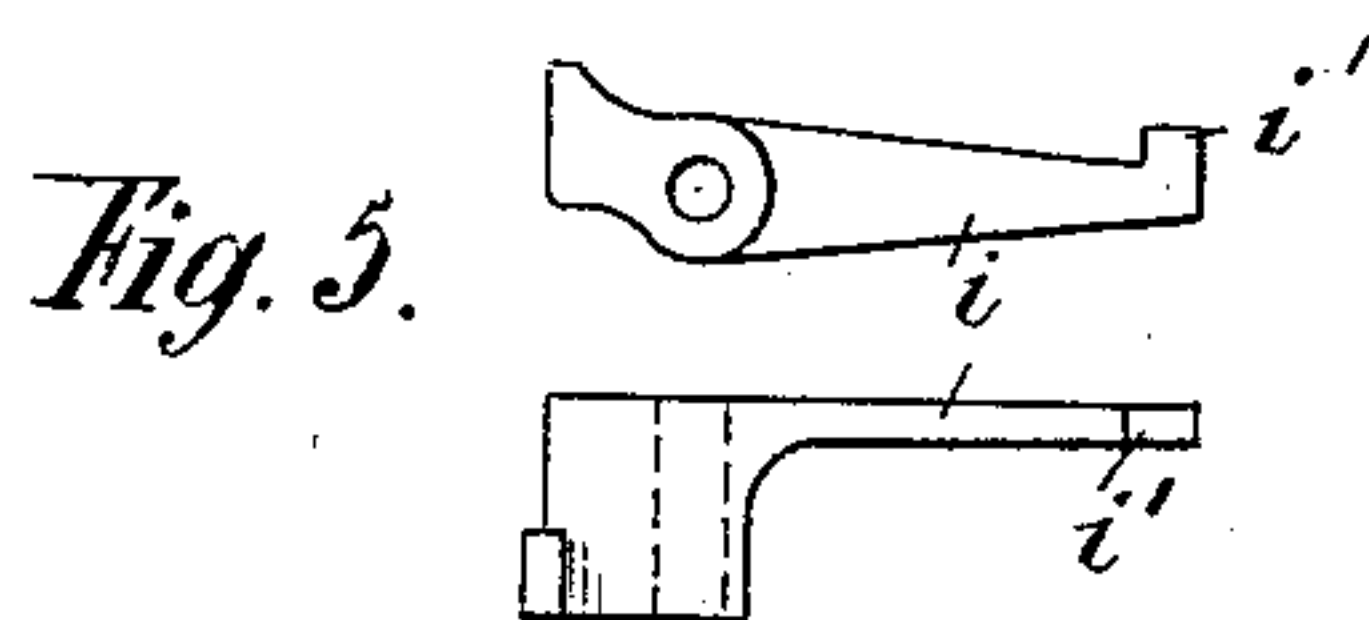
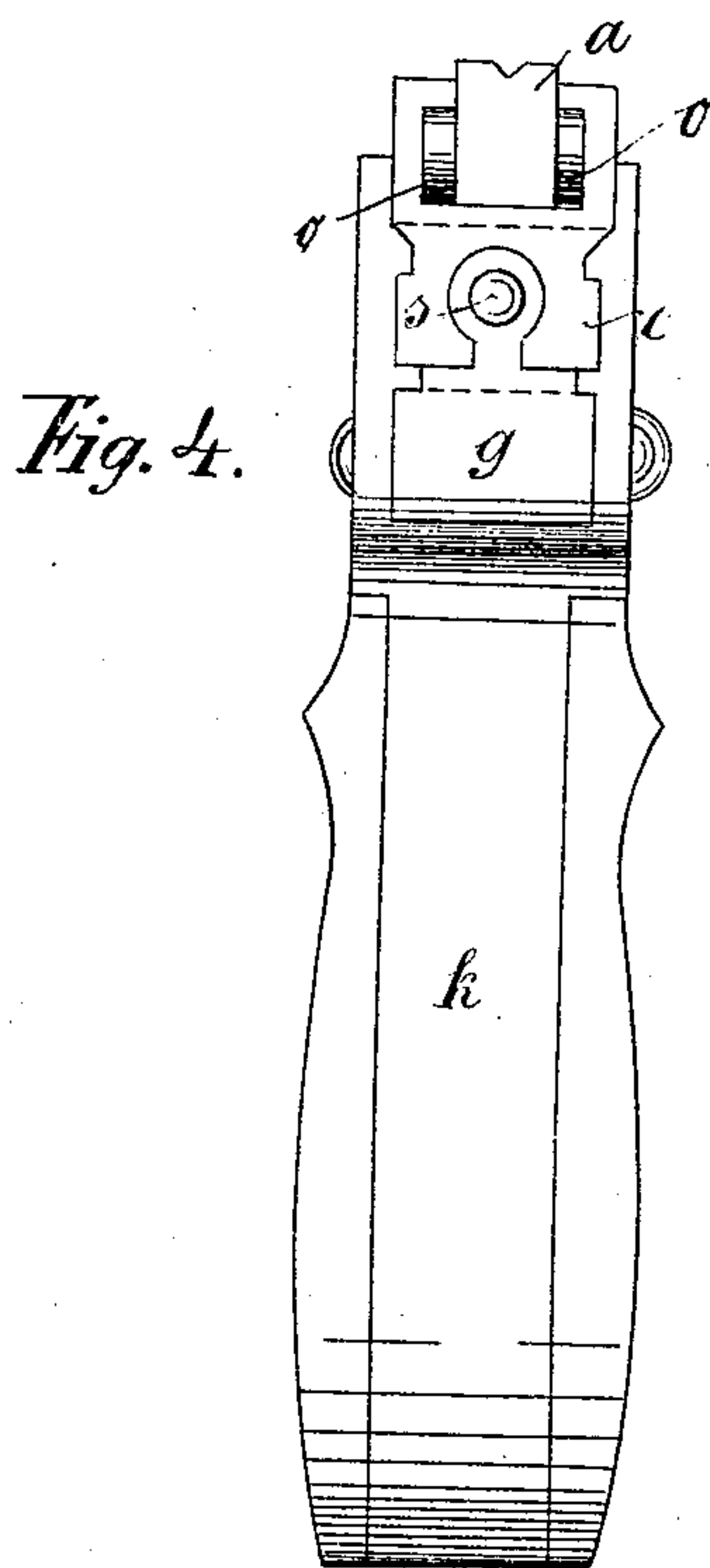


Fig. 7

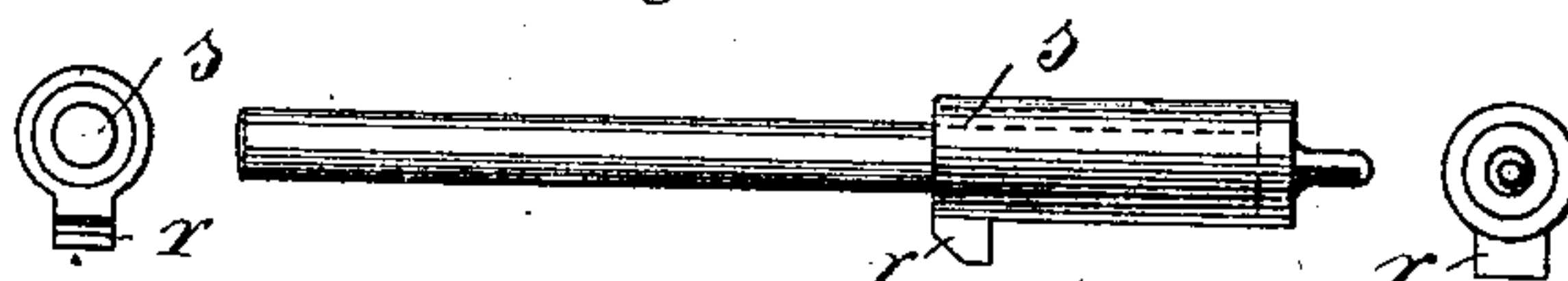


Fig. 8.

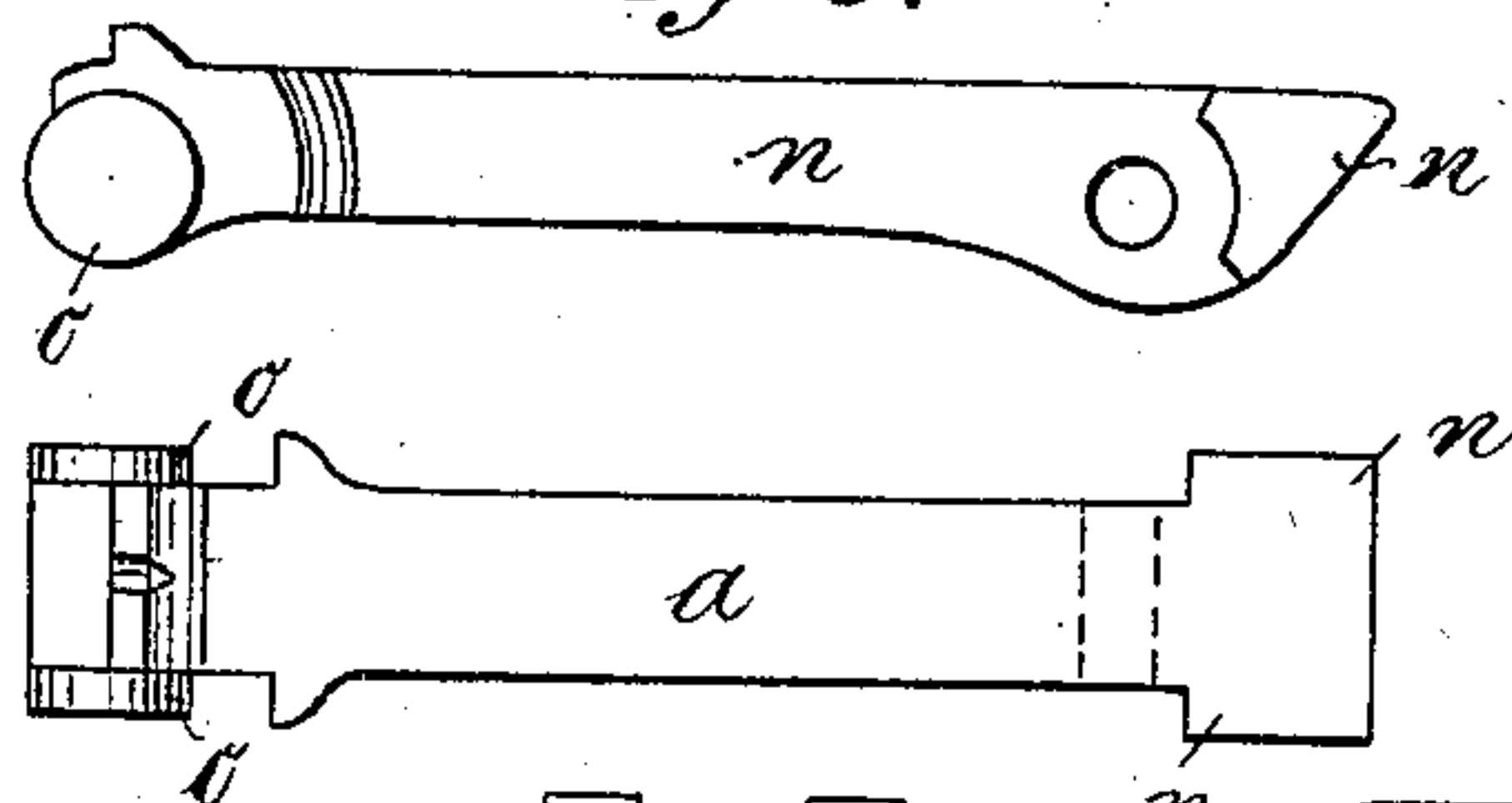
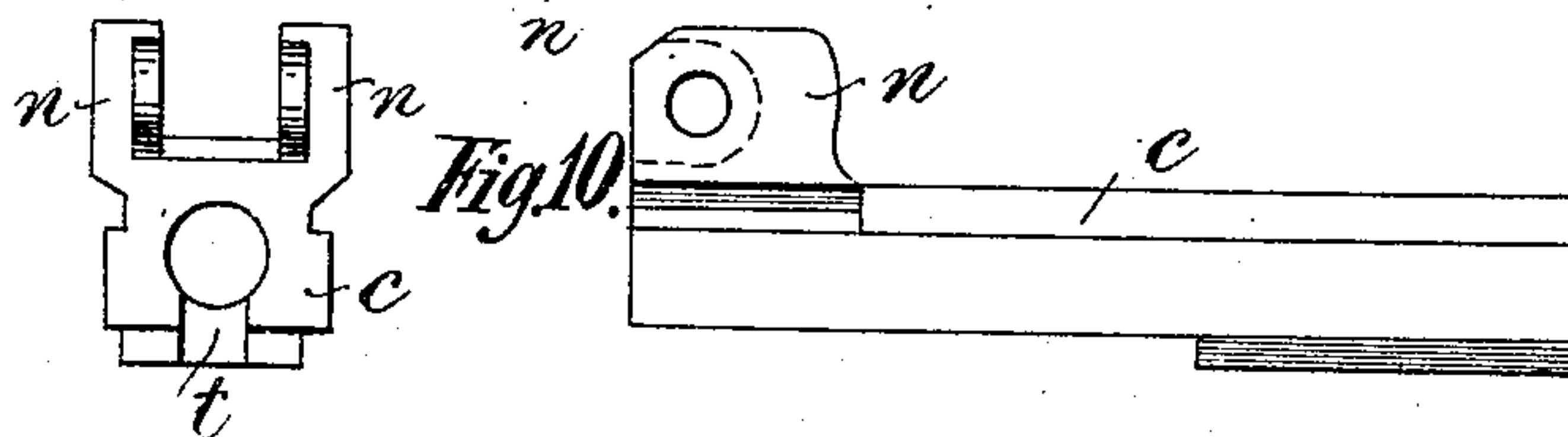
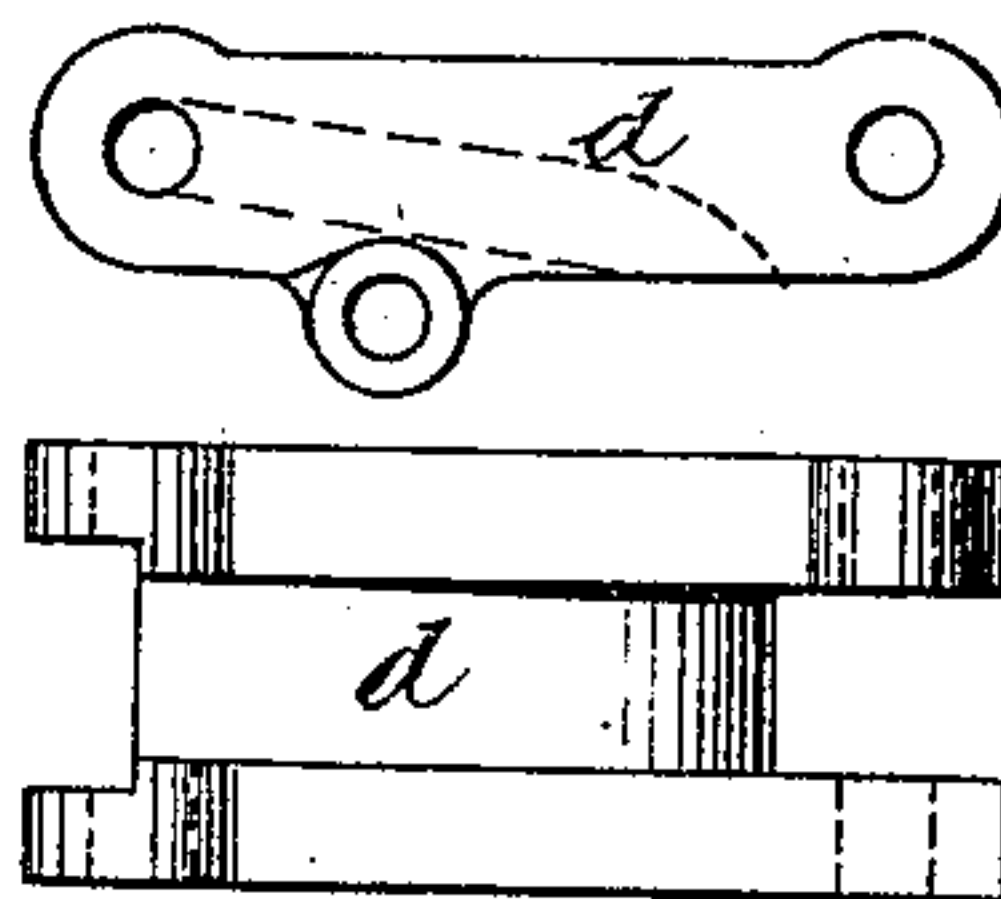
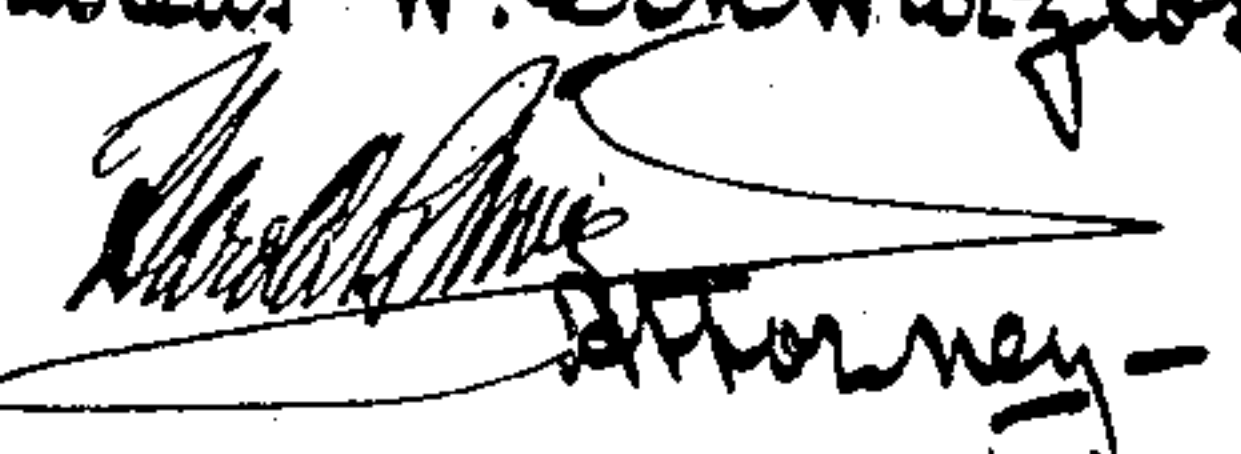


Fig. 9.



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3 SHEETS—SHEET 3.

Fig. 11.

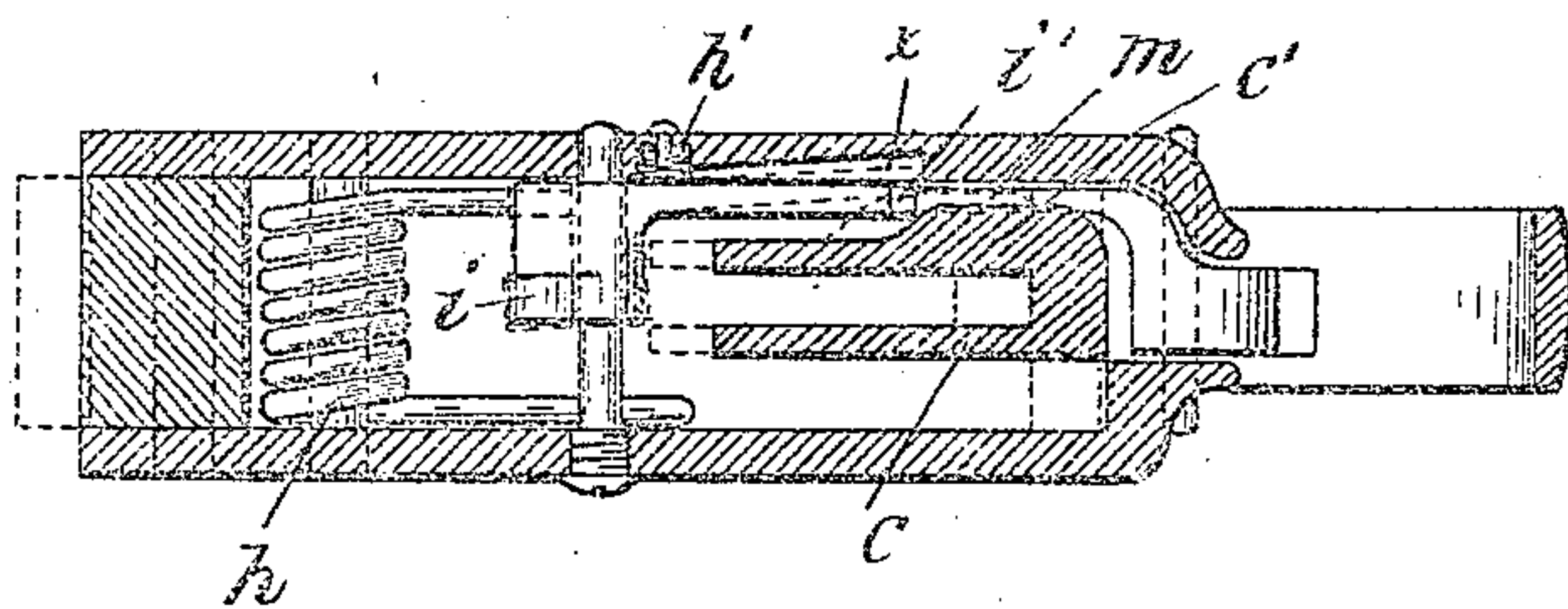
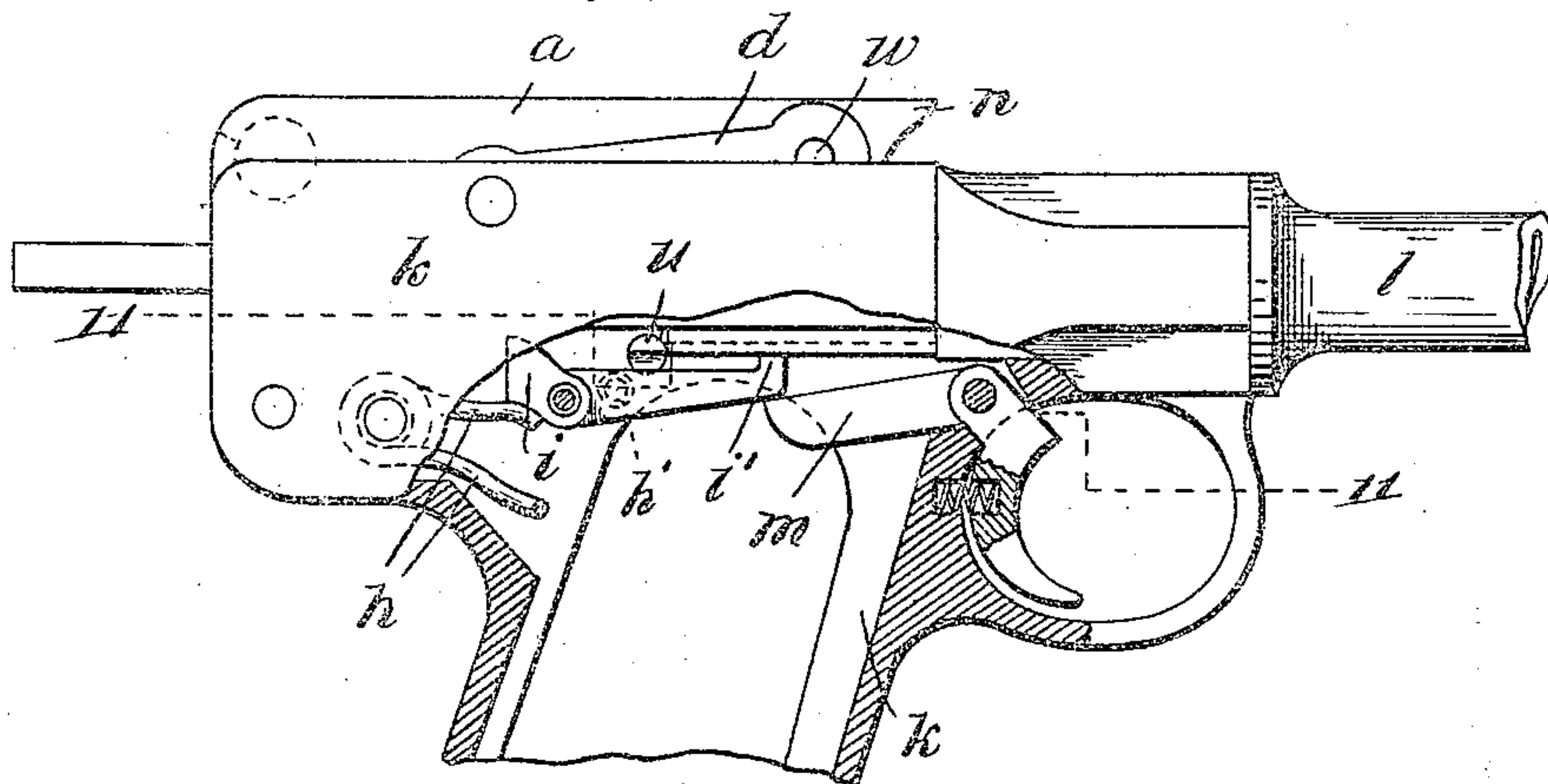


Fig. 12.



Witnesses
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UNITED STATES PATENT OFFICE.

ANDREAS WILHELM SCHWARZLOSE, OF SUHL, GERMANY.

TOGGLE-LINK LOCK FOR RECOIL-LOADING GUNS.

No. 804,506.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed December 21, 1901. Serial No. 86,807.

To all whom it may concern:

Be it known that I, ANDREAS WILHELM SCHWARZLOSE, engineer, a subject of the German Emperor, residing at Suhl, in the Empire of Germany, have invented certain new and useful Improvements in and Relating to Toggle-Link Locks for Recoil-Loading Guns, of which the following is a specification.

This invention relates to a recoil-loading gun with a toggle-link lock in which the parts of the links lie one within the other when in the locked position, and has for its object to improve locks as hitherto used. Such locks require two separate and dissimilar movements to close them. The toggle-links are turned up, and thereupon the lock is drawn backward. Consequently when the lock is opened automatically by the pressure of the gas the bolt is drawn back by the energy stored in the locking-links only until the middle link is at right angles to the bolt, which occurs when the bolt has completed one-half of its return movement. The further backward movement of the bolt is then effected entirely by the energy imparted to it in the meantime by the link, while the link itself has then a retarding action on the bolt, since in the initial movement it cannot swing farther, but must be drawn back by the bolt, thereby causing a considerable loss of power. Now these disadvantages are obviated by the present new lock, which has also a more suitable form for hand-firearms. Such a lock is shown in the accompanying drawings applied to a pistol.

Figure 1 is a longitudinal section through the weapon with the locking-links in elevation, the lock closed, and the striker cocked. Fig. 2 is a similar section showing the lock completely open. Figs. 3 and 4 are a plan and an end view, respectively, of the weapon with the lock closed and the cartridge discharged; and Figs. 5 to 10 are views of details. Fig. 11 is a horizontal sectional view substantially on the line 11-11 of Fig. 12. Fig. 12 is a vertical longitudinal section of the trigger mechanism and parts shown in Fig. 11.

The barrel 1 is screwed to the fore-end of the lock-casing *k*, which is formed as a stock. The lock-casing is provided at the upper part in the axis of the barrel with a rectangular guideway for the bolt *c* and the bridge *p* for the outer link *d*, Fig. 9. The bolt *c*, Fig. 10, has a longitudinal hole for the striker *s*, Fig. 7, with the firing-spring *f*, which bears at its rear end against the guide-piece *g*,

which is connected to the casing by a cranked spindle *q*, while the bolt slides freely with its longitudinal groove *t* over the guide-piece. The locking of the bolt in firing—*i. e.*, the actual closing of the barrel—is then effected by the inner link *a*, Fig. 8, in combination with the outer link *d*, Fig. 9, in the following manner: The outer link *d* is connected by the pin *v* to the lock-casing *k*, while the inner link *a* has two pins *o* at the rear end, which are inserted into locking-recesses *n* on the bolt. The free ends of the links are connected by the pins *w*, Figs. 1 and 2. When the lock is closed, Fig. 1, the pressure exerted by the gases on the bolt when the weapon is fired is consequently transmitted from the bolt to the middle link *a* through the rear pins *o*. The middle link *a* bears, with the forward projections, on the outer link *d*, which in its turn bears on the bridge *p* of the lock-casing. Now if, as in the present case, the lock for recoil-loading guns is used with a fixed barrel the arrangement is such that the forward pin *w* is located higher when the lock is closed than the plane passing through the axis of the rear pins *o* and the rear axis of rotation of the link *d*. In this case it is obvious that the pressure of the gases is taken up by the locking-links; but at the same time the forward end of the link swings upward and backward in consequence of this pressure, and the lock is opened. Now as the forward end of the link that effects the opening of the lock is moved continuously in one direction until the lock is completely open all the energy stored will therefore be utilized exclusively for opening the lock and compressing the corresponding springs. When the locking parts are swung upward, the coiled spring *h*, which is made with upwardly-turned ends, is simultaneously compressed by means of the link or stirrup *e*, attached to the link *d*, and the firing-spring *f* is compressed. These two springs combine to move the bolt forward after the counter-pressure ceases until the firing-pin is caught by the sear *i*, whereupon the spring *h* effects the completion of the closing alone. The before-mentioned sear *i*, Fig. 5, is mounted on a pin that passes through the casing. The rear end of the sear *i* is constantly pressed upward by the second free end of the spring *h*, Fig. 1. The releasing of the sear, and consequently the discharging of the shot, is effected by means of the trigger, Fig. 6, which is provided with an outwardly-bent arm *m*. When the trigger is

pulled backward against the action of the spring f' , its arm m presses the forward end of the sear i upward, so that its rear arm, which is in engagement with the projection r of the striker s , is lowered and disengaged from the projection r , so as to enable the striker to spring forward against the percussion-cap. By this movement the boss i' on the sear is raised into the path of the bolt. When subsequently the bolt is moved rearward, an inclined surface c' , Fig. 11, thereon bears on the boss i' and presses the forward arm of the sear laterally into a recess x in the adjacent wall of the casing to such an extent that it passes off from the arm m of the trigger. When in the position just described, which is shown in dotted lines in Fig. 11, the forward arm of the sear is no longer supported by the trigger and its rear end is under the influence of the spring h moved upward sufficiently far to engage the stop r before the trigger has been released, as shown in Fig. 2. To enable the sear to effect the before-described lateral movement, it is mounted on its pin with some play, while a small laterally-acting coiled spring h' (seen in dotted lines in Figs. 1 and 2) acts upon the sear in such a way that its forward arm comes again over the trigger as soon as the said trigger is released and swings downwardly.

A safety-lock u , Figs. 2, 3, and 12, is provided to insure the safety of the weapon. This lock extends with its flattened screw-spindle inward over the sear. If the cranked portion on the left-hand side of the lock-casing is moved upward, the unflattened portion of the spindle bears on the sear so that it cannot swing upward—i. e., it cannot be drawn away from the striker.

The cartridge-magazine (not shown) is inserted from below into the stock of the pistol and is held therein by means of a spring-catch of known construction.

The weapon acts in the following manner: In order to load the weapon, the magazine filled with cartridges is first inserted into the stock until the spring-catch on the stock engages in a corresponding notch on the magazine. Thereupon the locking-link is completely drawn back by means of the suitably-armed portion n of the inner link and is subsequently released. The bolt then springs automatically forward and pushes the upper cartridge into the barrel, while the locking-link simultaneously locks the barrel and the weapon is ready for firing. When the trigger is pulled, the striker s springs forward under the pressure of the spring f and fires the cartridge. The pressure exerted on the

bolt by the gases generated in firing is transmitted in the above-described manner to the locking-link. When the pressure has overcome the inertia of the link and the power of the springs f and h , the link swings upwardly and backwardly and automatically opens the lock while compressing the springs f and h . At the same time the empty cartridge-case is removed from the barrel by the extractor, which is not shown in the drawings, and is thrown out in an upward direction by the ejector j . Furthermore, the bolt presses the boss i' of the sear outwardly, so that the sear is removed from the trigger and is at once moved upward again by the spring h . When the backward movement ceases, the springs f and h force the bolt again forward. In this case the bolt pushes into the barrel the upper cartridge, which has been forced upward in the meantime into its path by the spring of the magazine. The striker s is caught halfway as it springs forward by the sear i , so that the spring f retains the necessary compression for firing, while the closing-spring h alone moves the bolt forward and closes it by means of the link. When the trigger is released, its spring f' forces it again forward, so that the arm m again moves downward, whereupon the spring h' presses the forward arm of the sear i inward and places it again above m . A renewal of pressure on the trigger therefore releases the following shot, and the hereinbefore-described operation is repeated.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a recoil-loading gun with a toggle-link lock, the striker, the sear engaging and holding the striker retracted, and means for releasing the sear from the detent during the passage of the shot, such means comprising an inclined surface on the breech-block and a boss on the sear engaged thereby, whereby the sear-arm is then pressed outwardly, substantially as and for the purposes set forth.

2. In a recoil-loading gun with a toggle-link lock, the combination of the sear i , and a coil-spring h , having one end connected with the toggle-link d , by a link or stirrup, and its other end engaging and pressing the sear upward, substantially as and for the purpose set forth.

Signed this 9th day of December, 1901, at Coburg, Germany.

ANDREAS WILHELM SCHWARZLOSE.

Witnesses:

ERNEST GUMPERT,
MAX SCHUSTER.