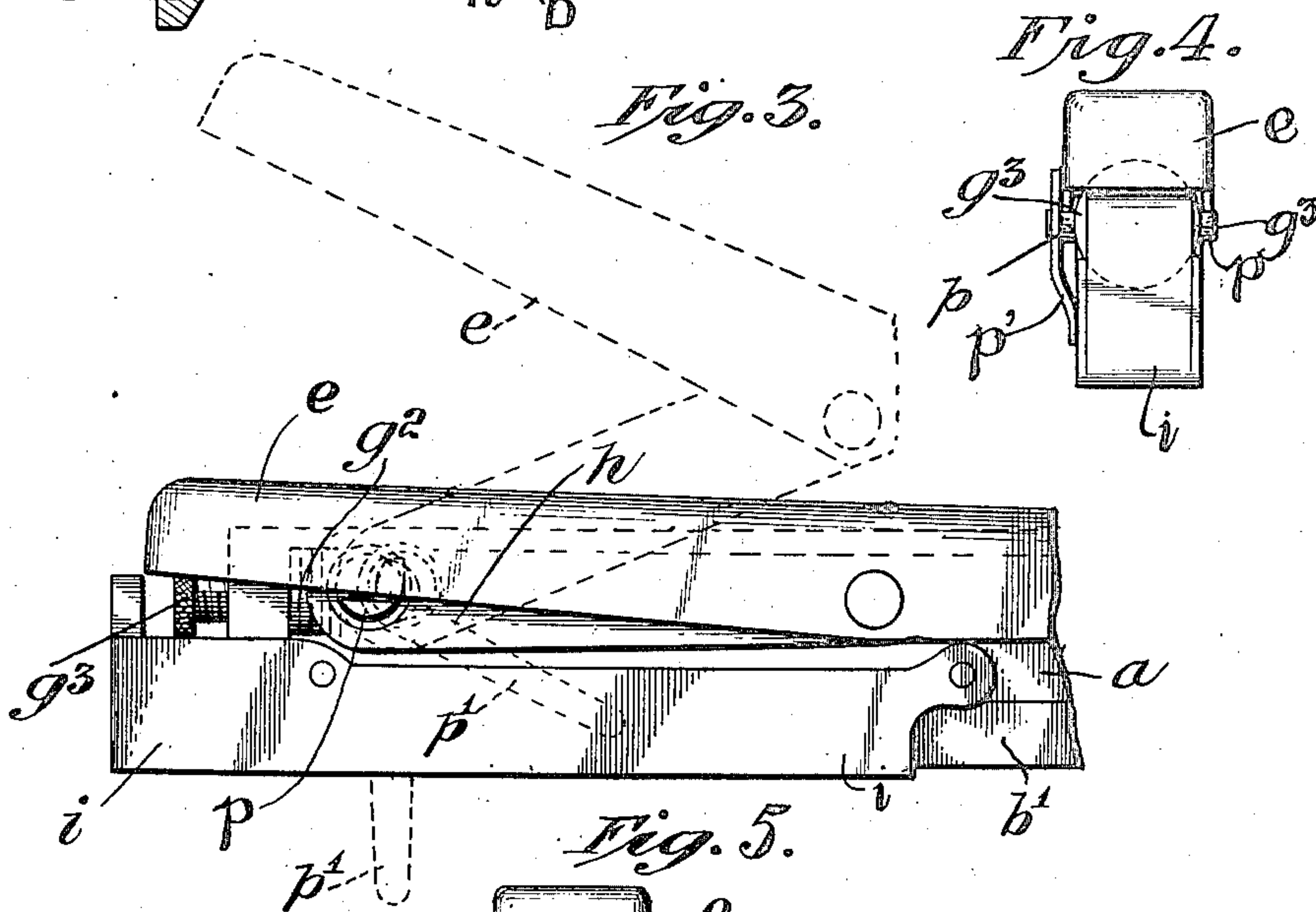
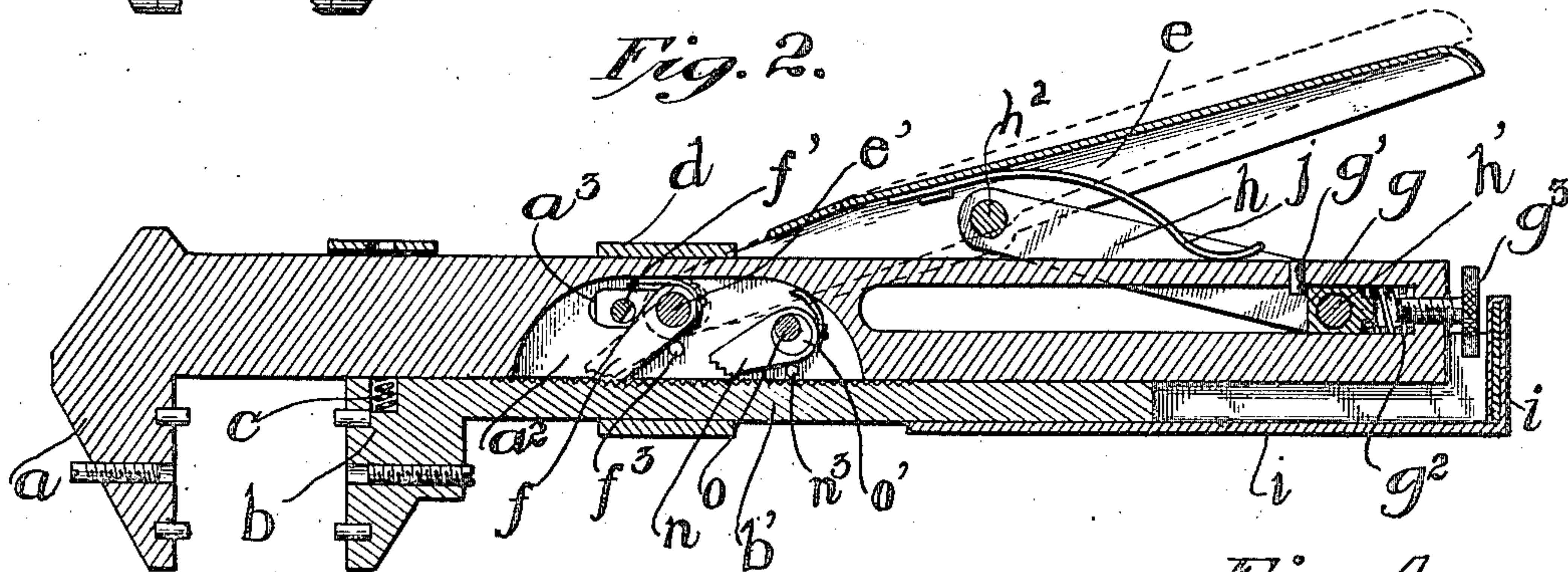
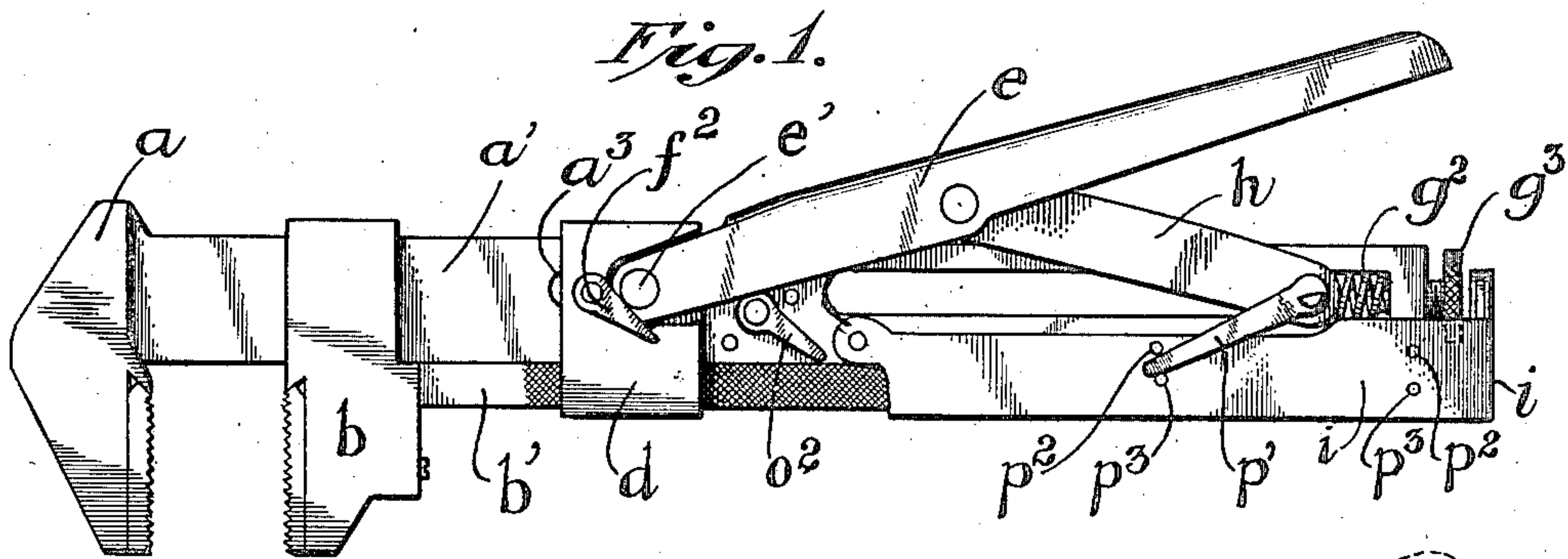


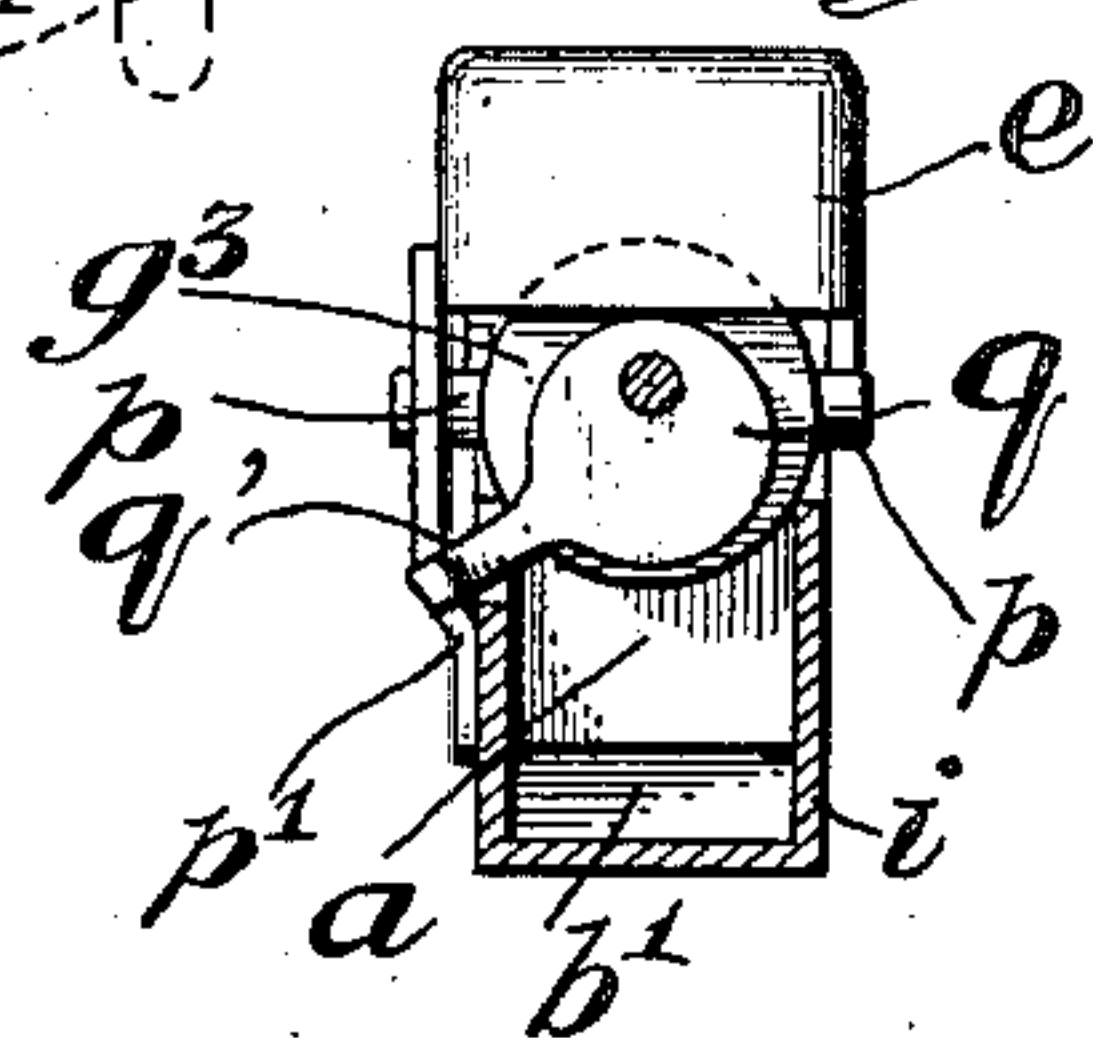
G. A. McINTIRE.
WRENCH.
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952,079.

Patented Mar. 15, 1910.



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UNITED STATES PATENT OFFICE.

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WRENCH.

952,079.

Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed December 14, 1908. Serial No. 467,359.

To all whom it may concern:

Be it known that I, GEORGE ALEXANDER McINTIRE, a citizen of the United States, residing at Port Chester, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Wrenches, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to wrenches and more particularly to improvements in a wrench of the general type patented to me in and by Letters Patent of the United States, No. 858,357, dated under June 25th, 1907. Under most conditions of use, jaws of wrenches of this type will be set sufficiently hard to cause a substantial binding of the locking mechanism, thus making the release of the jaws difficult by reason of the strength necessary to be exerted and the inaccessibility of the operating handle.

The main object of my invention is to provide in a wrench of this character a simple, and convenient attachment for disengaging the members of the locking mechanism from each other, and thus permit the free oscillation of the operating handle to accomplish a full disengagement of the jaws from the work.

A further object is to provide such an attachment adjacent to the operating handle when the jaws are set, not only in order that the jaws may be released by the thumb of the operator, while the operating lever is under control, but that the leverage of the operating handle may be utilized to effect this release.

A still further object is to provide such an attachment which will multiply the force applied thereto, and thus insure ease and reliability in the operation thereof.

A still further object is to provide an attachment which, if desired, may be so applied to the wrench as to have the two-fold function of a releasing member for the jaw setting mechanism, and a pivot for connecting one toggle lever to the oscillating block, thus reducing the number of parts. And a still further object is to provide in a wrench of this character, a throw off, or jaw releasing mechanism, which will reverse the

operation of setting the jaws through the same mechanism, thus utilizing the same mechanism for both setting and releasing the jaws.

The invention consists in the combination in a wrench of a fixed jaw and a movable jaw, an oscillating lever, means actuated by said lever whereby said jaws may be set and locked, and a releasing attachment acting on said lever; and in such other novel features of construction and combination of parts as are hereinafter set forth and described and more particularly pointed out in the claims hereto appended.

Referring to the drawings:—Figure 1 is a side elevation of a wrench embodying my invention; Fig. 2 is a longitudinal section thereof; Fig. 3 is a side elevation on a larger scale showing the end of the handle, the operating lever, the resilient and rigid abutments, and the releasing attachment. Fig. 4 is an end view of the parts shown in Fig. 3, and Fig. 5 is an end sectional view of the handle showing a modified form of the releasing, or throw off attachment.

Like letters refer to like parts throughout the several views.

In the drawings, *a* indicates the fixed jaw, and *a'* its shank. Mounted on the shank *a'* is the sliding jaw *b* with its rack bar *b'*. The friction spring carried by the sliding jaw *b* for preventing the jamming of the said jaw on the shank *a'* and its return with the clutch mechanism, is shown at *c*. The shank *a'* has a chamber *a²* and oppositely disposed elongated slots *a³* to permit the feeding movement of the sleeve *d*. The clutch mechanism comprises a spring pressed pawl *f* carried by a pivot pin *e'* mounted in the sleeve *d*, and adapted to automatically engage the rack *b'* which pin also acts as a pivot for the oscillating lever handle *e*. The pawl *f* has an eccentric locking pin *f'* positioned forwardly of the pin *e'* and controlled by the lever handle *f²*, by means of which the pawl may be locked in engagement with the rack bar *b'* by preventing an upward movement of said pawl. The pin *f²* is for disengaging the pawl *f* from the rack bar when the sleeve *d* is moved toward said pin,

to prevent the backward movement of the jaw with said sleeve, and to permit the sliding jaw if desired, to be set by hand.

Seated in a way in the shank a' is a reciprocating block g seated between a fixed forward stop g' and a stiff spring g^2 bearing against the end of the said way. This spring g^2 causes the sliding jaw to be fed forward under its tension only until the resistance encountered by the jaw overcomes the same, a rigid abutment g^3 being used to lock the jaws and exert the final pressure. To vary this pressure the abutment g^3 takes the form of an adjusting screw.

To secure the desired feeding movement through the lever e and pawl f , I employ a toggle lever h one end of which is pivoted intermediate the ends of the lever by the pivot h^2 and the other end of which is connected to the block g by means of the pivot h' . The pivots e' and h' are always in substantial alinement.

The casing i not only forms a protected way for the bar b' , but acts as a base for use when the tool is used as a lifting jack.

The lever e is reciprocated against the tension of the spring j and is returned by said spring when relieved from pressure, or released in the manner to be hereinafter described.

Any type of jaws, interchangeable or otherwise, may be used with the tool, as this invention is not directed in any way to such jaws, those shown in the accompanying drawings being old and well known in the art.

The spring pressed holding pawl n may be thrown into or out of engagement with the rack bar b' by means of the pin o , eccentric o' and the lever handle o^2 carried by said eccentric.

In this wrench, the jaw b is fed forward intermittently by means of the toggle lever e , h , through the oscillating handle of the former, the sleeve d carrying the pawl f sliding on the shank a' . Up to the period of the engagement of the jaw b with the work, this feeding movement is accomplished against the tension of the spring g^2 , but thereafter the forward thrust of the lever e and sleeve d is checked, and the spring g^2 compressed, to compensate for the subsequent movement of the lever handle. As the levers e h are brought into substantial alinement with each other, the block g will engage the rigid stop g^3 which may be adjusted to regulate the final pressure exerted, and be locked against a return of the handle under the spring j . This locking will be in part through a frictional binding of parts, and in part through the dropping of the pivot connecting the levers e h below the center of the pivots e' h' . When so locked, it requires considerable strength to release the reciprocating lever handle so as to permit the jaws to be separated,

and great difficulty is encountered when the work is somewhat inaccessible. To obviate this difficulty, I provide means acting directly on the oscillating lever handle, whereby the long leverage afforded by said handle may be utilized to throw said handle away from the shank a' to overcome that friction holding the lever in the closed position. In the preferred form of the invention shown in Figs. 1 to 3, this means consists of a plurality of eccentrics p having a flat face as shown in the drawings formed on the pivot h' , in substantial engagement with, or in close juxtaposition to which the lever handle e is forced to lock the jaws. Said pivot at one end projects beyond the casing i and extending downwardly from said end is a long lever handle p' . This handle p' fits close to the casing i so as to be out of the way of the hand in operating the handle e and extends toward the jaws so as to be conveniently reached by the thumb while the hand is grasping the end of the wrench. I provide stops p^2 p^2 , limiting the movement of the lever handle p' and stops p^3 p^3 acting as a latch to hold the lever handle p' against movement when in the open or the closed position.

It will be observed that the force applied at the pivot h^2 is at a long leverage, the eccentrics acting on the lever handle e adjacent to the end thereof. Incidentally, the short leverage at which the eccentrics p act, and the length of their lever handle p' , so compounds the leverage that the handle e may be thrown upward readily.

In the modification shown in Fig. 5, I mount an eccentric or cam q on the end of the casing i directly below the end of the oscillating lever handle e so that when said lever is depressed to the full extent to lock the jaws, it will contact therewith or come into close juxtaposition thereto. This eccentric or cam q has a handle q' extending beyond the casing i by means of which the eccentric or cam may be turned. While broadly considered, this cam q is the equivalent of the eccentrics p , the latter is preferable as affording greater leverage and being more conveniently located.

The operation of the preferred form of the invention in so far as has not heretofore been described is as follows: Before the jaws a b are locked upon the work, the handle p' is swung into the position shown in full lines Fig. 1, bringing the flat faces of the eccentrics p parallel to the shank a' . As the lever handle is brought downward to lock the jaws it will come to rest directly upon or above said faces. When it is desired to release the jaws the handle p' is swung downwardly by the thumb of the hand holding the wrench if desired. The force thus applied is transferred directly to the pivot h^2 through the lever handle e , the

eccentrics or cams p and the lever handle p' . The short radius of the cams or eccentrics interposed between the two longer levers compounds the force and insures ease in the operation of the throw off.

The operation of the modification shown in Fig. 5 is substantially the same as that of the preferred form differing therefrom in that the cam q cannot be turned with the same hand that holds the tool, and the shorter radius of the operating lever handle affording less leverage. The latter is compensated for in part, however, by the greater leverage at which the handle e acts. When the cams or eccentrics have thrown the toggle lever off center, the spring j will accomplish the further release, by actuating the handle so as to either release the pawl f or draw the jaw backward with it.

In the use of the tool, care need be exercised to position the cams or eccentrics p q so that they will not block the locking of the jaws.

When it is desired to use the wrench as a lifting jack, the eccentrics p q may be so set as to prevent the locking of the jaws, thus facilitating the use of the tool in this manner.

It is not my intention to limit the invention to the specific form of wrench, nor to the detailed construction and arrangements of parts shown in the drawings, it being apparent that such details may be varied without departing from the spirit and scope of the invention.

Having described my invention, what I claim as new, and desire to have protected by Letters Patent, is:—

1. A wrench comprising a fixed jaw, a movable jaw, an oscillating lever, means actuated by said lever, adapted to operatively engage and set said movable jaw, a toggle lever carrying the fulcrum for said oscillating lever, means limiting the movement of said toggle lever whereby said movable jaw will be set and locked when said toggle and said oscillating levers are alined, and a movable releasing member adapted to throw said levers out of alinement and release said movable jaw.

2. A wrench comprising a fixed jaw, a movable jaw, an oscillating lever, means actuated by said lever adapted to operatively engage and set said movable jaw, a toggle lever carrying the fulcrum for said oscillating lever, means limiting the movement of said toggle lever whereby said movable jaw will be set and locked when said toggle and said oscillating levers are alined and a positively acting member of short radius acting on a long radius of said oscillating lever, whereby said levers will be thrown out of alinement to release said movable jaw, and the releasing power will be compounded.

3. A wrench, comprising a fixed jaw, a movable jaw, an oscillating lever, means actuated by said lever, whereby said jaws may be set and locked, a cam adapted to act on said lever to release the jaws and a lever handle whereby said cam may be turned.

4. A wrench comprising a fixed jaw having a shank, a sliding jaw mounted on said shank, a sliding clutch mechanism mounted on said shank and adapted to engage said sliding jaw, a lever handle pivotally connected with said clutch mechanism, a toggle lever carried by said shank and pivotally connected to said lever handle, means limiting the movement of said toggle lever whereby said movable jaw will be set and locked when said toggle lever and said lever handle are alined, and a movable releasing member mounted on said shank and adapted to act positively on said lever handle to throw said toggle lever and said lever handle out of alinement to release said sliding jaw.

5. A wrench comprising a fixed jaw having a shank provided with a way therein, a sliding jaw mounted on said shank, a sliding clutch mechanism mounted on said shank and adapted to engage said sliding jaw, a lever handle pivotally connected to said clutch mechanism, a rigid buffer carried by said shank, a reciprocating block mounted in said way, a toggle lever having its opposite ends pivotally connected to said lever handle and said block respectively whereby when said lever handle and said toggle lever are alined or past the point of alinement, the sliding jaw will be set and locked, and a movable releasing member pivotally mounted on said shank and adapted to act positively on said lever handle to throw said toggle lever out of alinement to release said sliding jaw.

6. A wrench comprising a fixed jaw, having a shank provided with a way, a sliding jaw mounted on said shank, a sliding clutch mechanism mounted on said shank, and adapted to engage said sliding jaw, a lever handle pivotally connected with said clutch mechanism, a rigid buffer carried by said shank, a reciprocating block mounted in said way, a toggle lever, two pivots connecting the opposite ends of said toggle lever with said lever handle, and said block respectively, a plurality of cams or eccentrics formed on said pivot in said block adapted to engage said lever handle and a lever handle whereby said cam or eccentric may be turned to act as a throw off to said first mentioned lever handle.

7. A wrench comprising a fixed jaw having a shank provided with a way, a sliding jaw mounted on said shank, a sliding clutch mechanism mounted on said shank and adapted to engage said sliding jaw, a lever handle pivotally connected with said clutch mechanism, a casing carried by said shank,

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a rigid buffer carried by said shank, a recip-
rocating block mounted in said way, a toggle
lever, pivots connecting the opposite ends of
said toggle lever with said lever handle and
5 said block respectively, a plurality of cam
surfaces or eccentrics formed on said pivot in
said block, adapted to engage said lever han-
dle, a lever handle whereby said cams or
eccentrics may be turned to act as a throw
10 off to said first mentioned lever and a plu-
rality of stops and a plurality of latches car-

ried by said casing whereby the throw of
said last mentioned lever handle is limited,
and is held against accidental movement.

In witness whereof I have hereunto affixed 15
my signature, this 18th day of November,
1908, in the presence of two witnesses.

GEORGE ALEXANDER MCINTIRE.

Witnesses:

DANIEL E. KELLY,
MAE FITZGIBBONS.