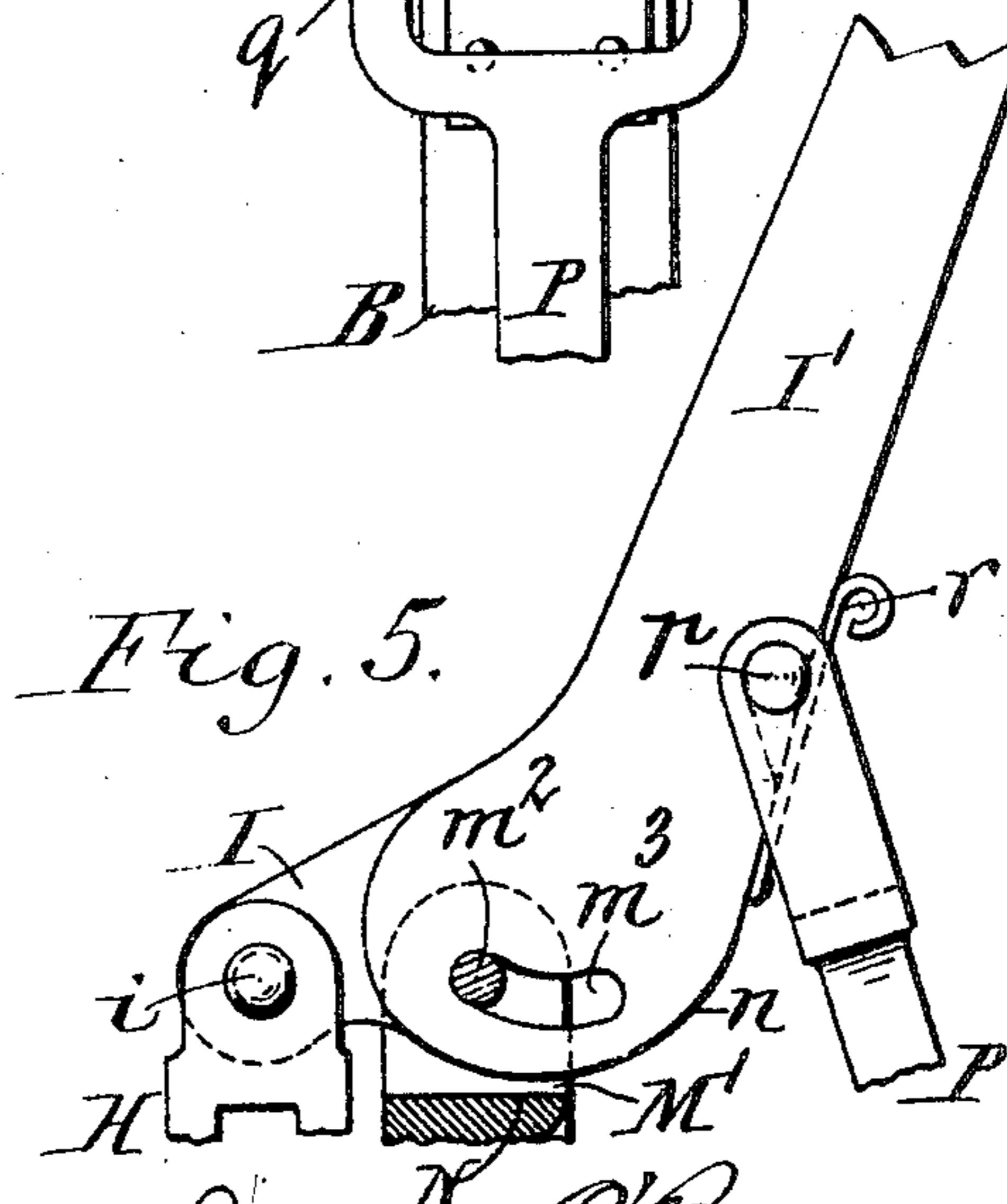
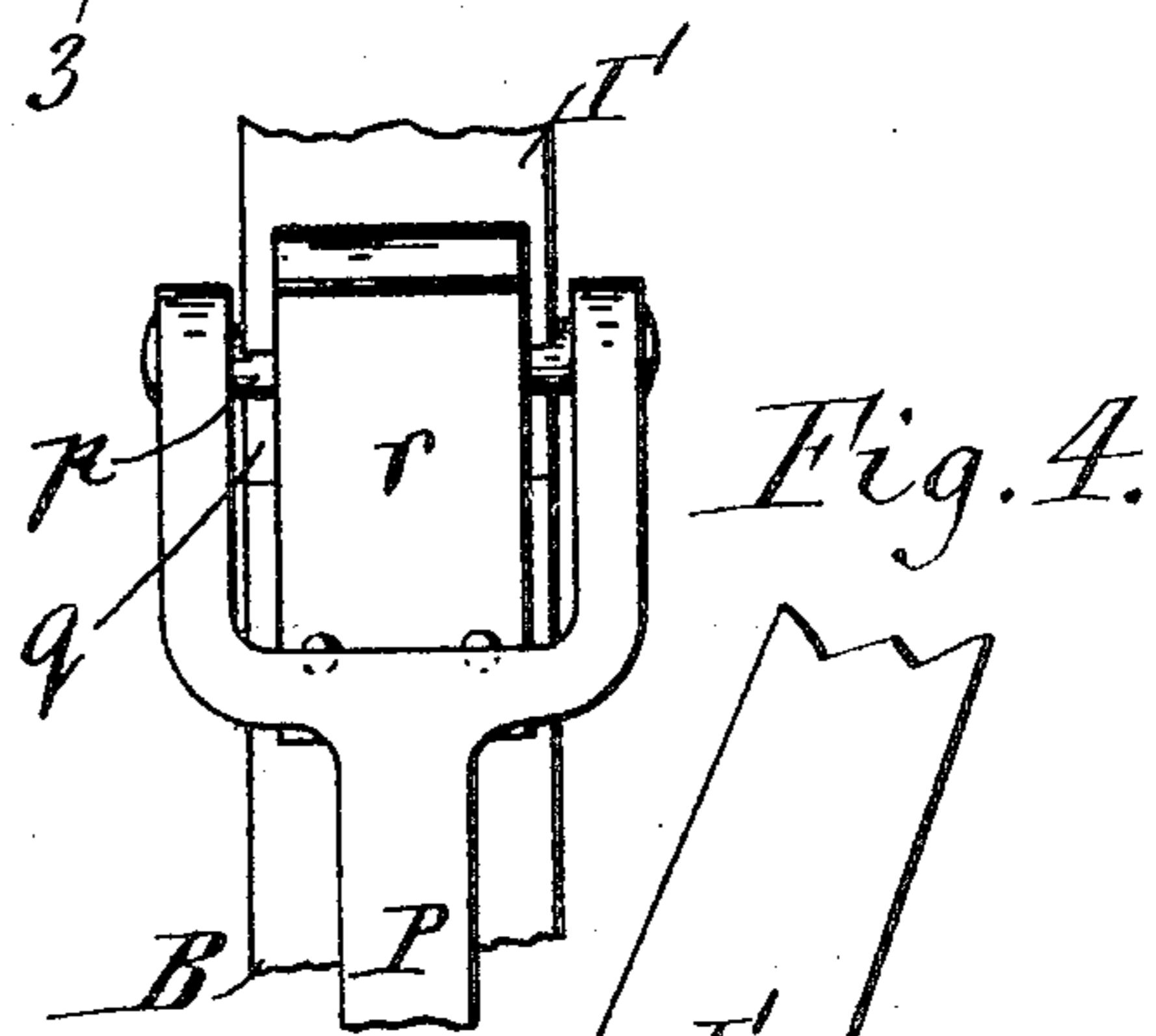
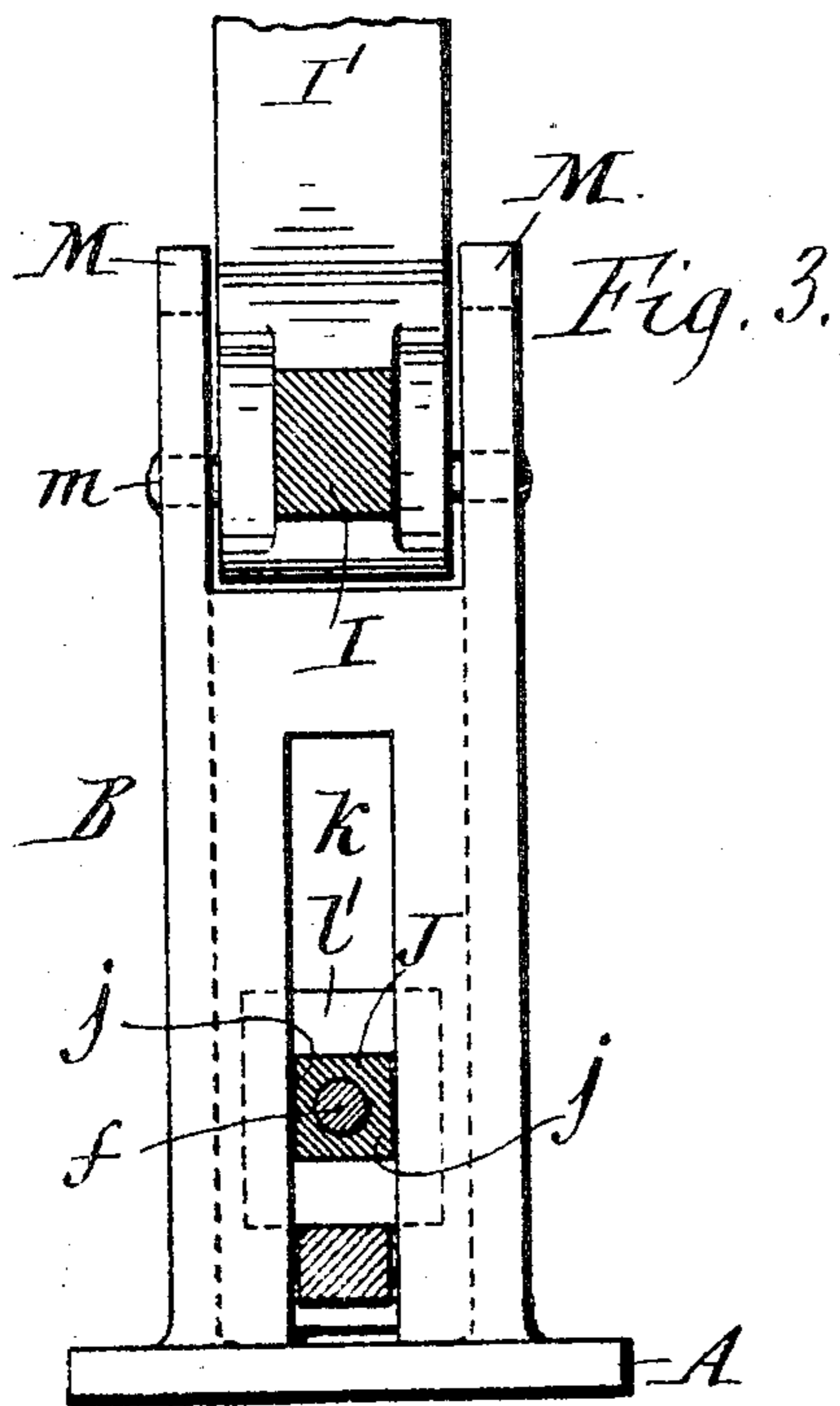
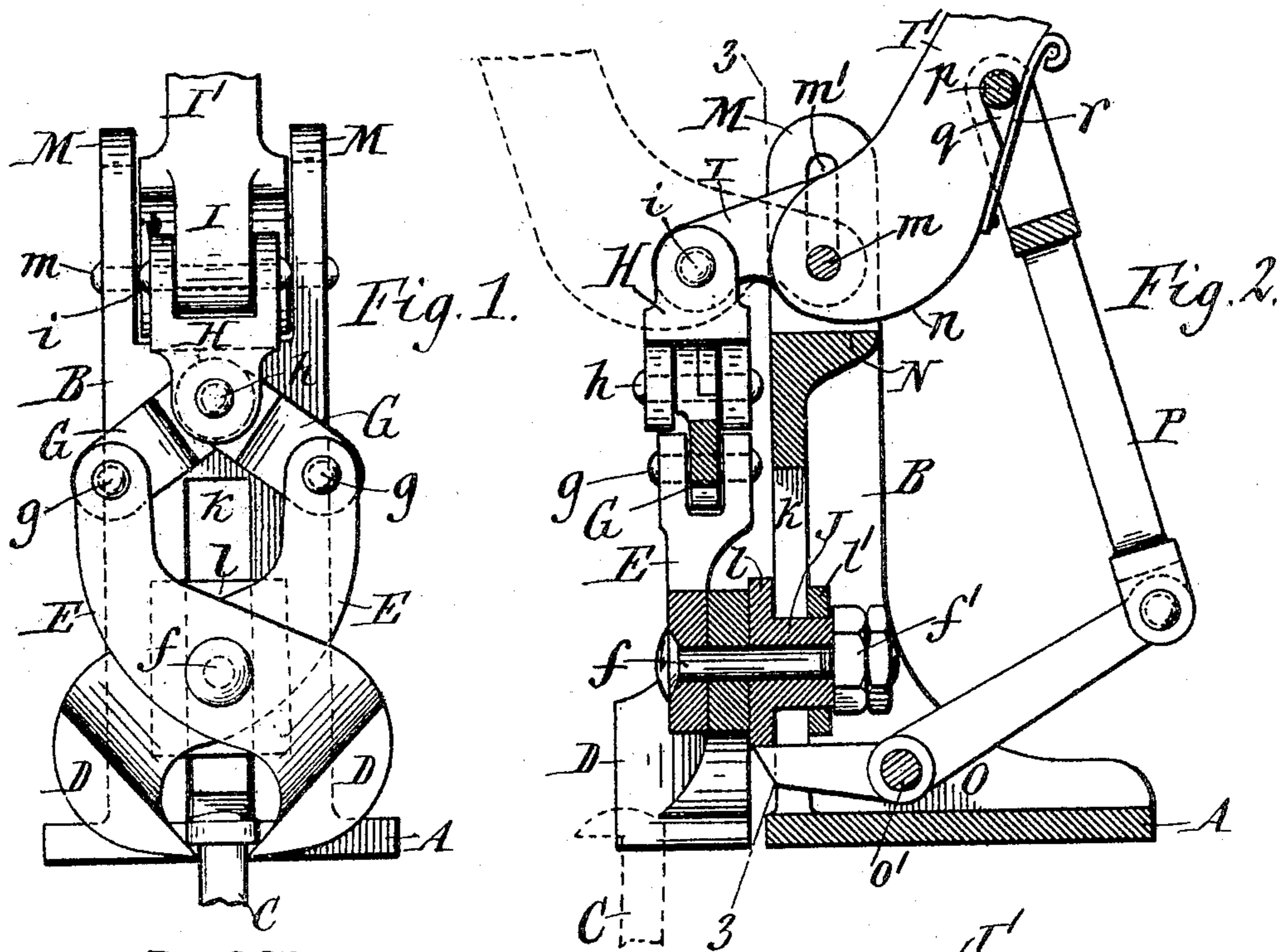


No. 798,058.

PATENTED AUG. 22, 1905.

D. O'BRIEN.
SPIKE PULLER.

APPLICATION FILED MAR. 1, 1905.



Witnesses:
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UNITED STATES PATENT OFFICE.

DANIEL O'BRIEN, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-FOURTH
TO JUSTUS MOELLER, OF BUFFALO, NEW YORK.

SPIKE-PULLER.

No. 798,058.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed March 1, 1905. Serial No. 247,868.

To all whom it may concern:

Be it known that I, DANIEL O'BRIEN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Spike-Pullers, of which the following is a specification.

This invention relates to an implement for extracting spikes, nails, and the like from the wood or other body into which they are driven.

In repairing railways the spikes are withdrawn from the ties to permit of renewing the rails. The means heretofore employed for withdrawing these spikes were undesirable, because they bent the spikes and necessitated straightening them before they could be used again.

The object of this invention is to produce a simple spike-puller for this purpose which permits of easily pulling the spikes in a perfectly straight condition, so as to avoid the expense of straightening the same.

In the accompanying drawings, Figure 1 is a front elevation of my improved spike-puller. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a vertical cross-section of the same in line 3-3, Fig. 2. Fig. 4 is a fragmentary rear elevation of the spike-puller. Fig. 5 is a fragmentary longitudinal section showing a modified construction of my invention.

Similar letters of reference indicate corresponding parts throughout the several views.

The supporting foot or frame of the spike-puller consists, essentially, of a horizontal base A and a standard B, rising from the front end of the base.

The spike or nail C to be pulled is grasped on opposite sides by a pair of cooperating jaws D D, formed on the lower arms of a pair of gripper-levers E. The latter are crossed centrally like a pair of pincers or tongs and are pivotally connected by a transverse pin or bolt *f*, passing horizontally through the overlying parts of the levers.

G G represent a pair of links, each of which is pivotally connected at its lower end by a pin *g* with the upper bifurcated arm of one of said gripper-levers. The upper ends of both links are pivoted by a single pin *h* to the lower bifurcated end of a swivel or clevis H. The latter is pivoted by a pin *i* to the short front arm I of a hand-lever, which is pivotally supported on the upper end of the standard, so as to turn in a vertical plane. Upon raising the long rear arm I' of the hand-lever when

the parts are assembled, as shown in Fig. 2, its front arm and the parts connected therewith are depressed, and at the same time the links G G turn the gripper-levers in the direction for spreading or opening their jaws. While in this position the jaws are placed on opposite sides of the spike to be pulled, and then the rear arm of the hand-lever is swung downwardly. During the first part of this movement of the hand-lever the jaws are engaged with the spike, and during the continued movement of this lever in that direction the spike is pulled out of the wood in which it is driven. In order to prevent the spike from being bent while being drawn, the gripper-levers are guided on the standard so as to be compelled to move in a straight line parallel with the spike. The preferred means for thus guiding the gripper-levers is shown in the drawings and is constructed as follows: J represents a guide-block which moves vertically in an upright slot *k* in the central part of the standard and which has flat faces *j j* on horizontally-opposite sides for engaging with the sides of the slot, as shown in Fig. 3, and preventing the guide-block from turning. The gripper-levers are connected with the guide-block by extending the pivot-bolt *f* rearwardly through a horizontal opening in the block and confining these levers loosely against the front side of the block by screw-nuts *f'*, applied to the rear end of the bolt and bearing against the rear side of the block, as shown in Fig. 3. The guide-block is confined against endwise movement in the slot of the standard by a head *l*, fixed on the front end thereof and bearing against the standard on opposite sides of its slot, and a washer *l'*, arranged loosely on the rear end of the block and interposed between the rear side of the standard and the front side of the screw-nuts *f'*. As the gripper-levers rise with the spike the guide compels the same to move vertically and avoids the objectionable bending of the spike. If desired, the spike may be drawn out part way by one pull of the lever, after which one or more new holds may be taken on the spike for completing drawing of the same by a pumping action. In order to permit of drawing the spike in this manner, the jaws of the gripper-levers are extended forwardly, as shown in Fig. 2, to permit the spike to pass upwardly along the front side of the levers and clear the same.

For the purpose of enabling the spike to be withdrawn with a single stroke of the hand-

lever means are provided for shifting the lever upward bodily and increasing the amplitude of its effective movement as the pulling of the spike progresses. The preferred means for this purpose (shown in Figs. 1, 2, and 3) consist of a horizontal pivot-pin m , passing through the hand-lever, and vertical slots m' in lugs or ears M , arranged on the upper end of the standard on opposite sides of the hand-lever, and a cam n , arranged on the under side of the hand-lever adjacent to the pivot-pin m and adapted to bear against a shelf or abutment N on the upper part of the standard between said ears. During the first part of the downward movement of the hand-lever for closing the gripper-jaws on the spike and starting the extraction of the spike the pivot-pin rests in the lower ends of the slots m' , as shown in Fig. 2. After the first part of the lifting movement of the spike has been thus effected the cam n during the continued forward or extracting movement of the lever bears against the shelf N and causes the lever to be raised bodily, thereby increasing the lifting effect of the same and permitting of drawing an ordinary spike with one operation. During the bodily upward movement of the hand-lever its pivot-pin rises in the slots of the ears M .

Instead of arranging the pivot-pin on the hand-lever and the slots for guiding the same on the standard, as shown in Fig. 2, this construction may be reversed, as shown in Fig. 5, in which the pivot-pin m^2 is fixed in lugs M' on the standard and passes through a slot m^3 in the lever, thereby obtaining the same result as in the first-mentioned construction.

For the purpose of enabling the operator to obtain a more favorable leverage and also to permit of operating the hand-lever more conveniently in a standing position the rear arm or handle of the hand-lever is so arranged that its general direction is at an oblique angle to a line drawn through the pivot of this lever and its pivotal connection with the gripper-operating devices. This construction of the hand-lever also permits of reversing the same, so that a spike can be pulled either by a downward or an upward movement of its rear arm or handle. When the hand-lever is fulcrumed between its arms on the standard and pivotally connected at the end of its short arm with the gripper devices, as shown in full lines in Fig. 2, the spike is pulled by a downward movement of its handle; but when the hand-lever is pivoted on the standard at the end of its short arm and pivotally connected between its arms with the gripper devices, as shown by dotted lines in Fig. 2, the pulling of the spike is effected by an upward movement of the handle. By this means the spike can be pulled from either side of the standard as may be most convenient or as circumstances may require. When the hand-lever is operated with a lifting movement of its

handle, the advantage of moving the lever upward bodily is not obtained, as the cam n and shelf N do not coöperate in this changed position of the parts.

When spikes are rusted in the wood, they stick much faster than when newly driven, and therefore require more power for extracting them. In order to permit of exerting a greater pulling effect on spikes of this character, the spike-puller is provided with an attachment whereby the power of the same may be increased when necessary. The means for this purpose shown in the drawings are constructed as follows: O represents a starting-lever pivoted between its arms to the lower part of the standard by a transverse pin o' and engaging its front arm with the guide-block, preferably with the under side of its front head, as shown in Fig. 2. P represents an upright link which connects the rear arm or handle of the hand-lever with the rear arm of the starting-lever. Upon depressing the handle or long arm of the hand-lever the front arm of the starting-lever rises and engages with the guide-block and lifts the latter, together with the gripper-jaws and spike grasped thereby, at the same time that these parts are being lifted by the hand-lever. The rear arm of the starting-lever O is longer than the distance from the pivot m to the pivot p on the main lever. It follows from this that when the starting-lever is in use the same will exert a more powerful lifting effect on the gripper-levers than by using the main lever alone. The differential of motion between the main and starting levers during the initial part of the pulling movement is compensated for by the pin-and-slot connection between the main lever and the standard, whereby the main lever is enabled to hold the grippers in a closed position while the starting-lever is effective. By this means the starting movement of the spike is effected by the combined action of the hand-lever and starting-lever and the final extracting movement thereof is effected solely by the hand-lever.

For the purpose of enabling the tool to be used without the auxiliary lifting attachment when pulling easy spikes or when using the tool with the hand-lever in the position shown in dotted lines in Fig. 2 means are provided for disconnecting the attachment from the tool. This is effected by making the pivot-pin o' of the starting-lever removable from the standard and detachably connecting the upper end of the link P with the handle of the hand-lever by engaging a cross-bar p on the bifurcated upper end of this link with a socket, notch, or shoulder q in the under side of the handle and confining this bar in said notch by a spring-keeper r , which is secured to the handle and extends over the mouth of said notch.

My improved implement pulls spikes hav-

ing heads or no heads with equal facility, thus rendering the same especially desirable for railroad work, in which the spike-heads are frequently broken off, so that the same can be removed only with great difficulty or must be abandoned.

I claim as my invention—

1. A spike-puller comprising a standard, a pair of gripper-levers, a guide-block movable on said standard, a single pin or bolt pivotally connecting said gripper-levers with each other and with said guide-block, and a handle-lever pivotally supported on said standard and operatively connected with said gripper-levers, substantially as set forth.

2. A spike-puller comprising a standard having a vertical slot, a pair of crossed gripper-levers, a guide-block movable vertically in said slot and having a head at one end and a washer at the other end which bear against opposite sides of the standard, a pin or bolt pivotally connecting said gripper-levers with each other and with said guide-block, and a hand-lever pivotally supported on said standard and operatively connected with said gripper-levers, substantially as set forth.

3. A spike-puller comprising a standard having a vertical slot, a guide-block movable vertically and having flat faces on its opposite sides which engage with the opposite sides of said slot, a pair of cross gripper-levers pivotally connected with said block, and a hand-lever pivotally supported on said standard and operatively connected with said gripper-levers, substantially as set forth.

4. A spike-puller comprising a standard, a guide-block movable vertically on said standard, a pair of crossed gripper-levers, a pin pivotally connecting said levers with each other and also with said guide-block, links connected with the upper arms of said levers, and a hand-lever pivoted on said standard and having one of its arms pivotally connected with said links while its other arm is arranged at an angle to a line drawn through the pivots connecting the hand-lever with the standard and said links, substantially as set forth.

5. A spike-puller comprising a standard, a pair of gripper-levers, a guide-block sliding vertically on said standard, a pin pivotally connecting said gripper-levers with said block, a hand-lever operatively connected with said gripper-levers, means for loosely pivoting said hand-lever on the standard, and a cam arranged on said lever and engaging with an abutment or shelf on said standard, substantially as set forth.

6. A spike-puller comprising a standard, a pair of gripper-levers, a guide-block sliding vertically on said standard, a pin pivotally connecting said gripper-levers with said block, a hand-lever operatively connected with said gripper-levers, a pivot-pin arranged on the hand-lever, a pair of lugs arranged at the upper end of the standard and provided with

vertical slots which receive said pivot-pin, and a cam formed on the under side of said lever and adapted to engage with an abutment or shelf on the upper end of the standard, substantially as set forth.

7. A spike-puller comprising a standard, a pair of gripper-levers, a hand-lever pivotally supported on the standard and operatively connected with the gripper-levers, and an auxiliary starting device operatively connected with said gripper-levers and said hand-lever, substantially as set forth.

8. A spike-puller comprising a standard, a guide-block movable on said standard, a pair of gripper-levers pivoted on said block, a hand-lever pivotally supported on said standard and operatively connected with said gripper-levers, a starting-lever pivoted on the standard and engaging its front arm with said block, and a link connecting the rear arm of said starting-lever with the hand-lever, the length of the rear arm of said starting-lever being greater than the distance from the pivot of said hand-lever to its connection with said link, substantially as set forth.

9. A spike-puller comprising a standard, a guide-block movable on said standard, a pair of gripper-levers pivoted on said block, a hand-lever pivotally supported on said standard and operatively connected with said gripper-levers, a starting-lever pivoted on the standard and engaging its front arm with said block, and a link connected at one end with the rear arm of the starting-lever and detachably connected at its opposite end with said hand-lever, the length of the rear arm of said starting-lever being greater than the distance from the pivot of said hand-lever to its connection with said link, substantially as set forth.

10. A spike-puller comprising a standard, a guide-block movable on said standard, a pair of gripper-levers pivoted on said block, a hand-lever pivotally supported on said standard and operatively connected with said gripper-levers, a starting-lever pivoted on the standard and engaging its front arm with said block, a link connected at its lower end with the rear arm of the starting-lever and provided at its upper end with a cross-bar which engages with a notch in the under side of the hand-lever, and a spring-keeper secured to the hand-lever across the mouth of said notch for releasably confining said cross-bar therein, the length of the rear arm of said starting-lever being greater than the distance from the pivot of said hand-lever to its connection with said link, substantially as set forth.

Witness my hand this 28th day of February, 1905.

DANIEL O'BRIEN.

Witnesses:

JUSTUS MOELLER,
THEO. L. POPP.