

J. W. LOVERING.
COTTER PIN EXTRACTING TOOL.
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1,153,849.

Patented Sept. 14, 1915.

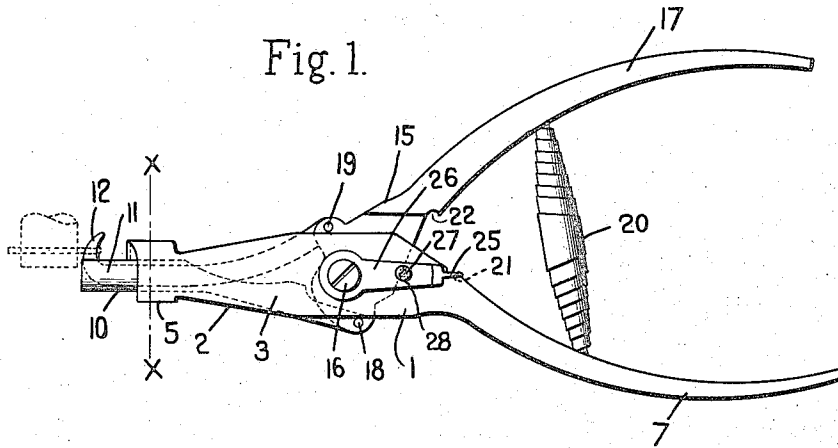
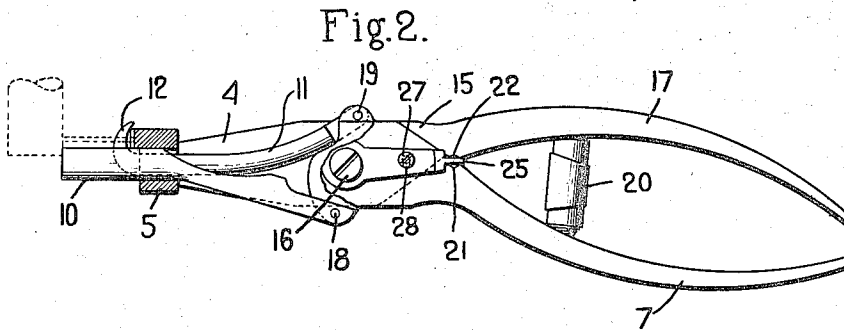
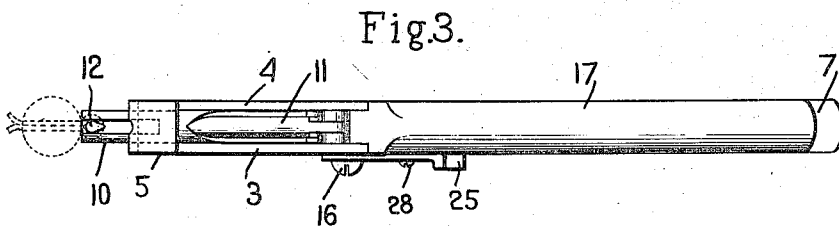
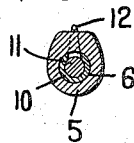


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

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COTTER-PIN-EXTRACTING TOOL.

1,153,849.

Specification of Letters Patent.

Patented Sept. 14, 1915.

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To all whom it may concern:

Be it known that I, JOHN W. LOVERING, a citizen of the United States, residing at Sandown, county of Rockingham, State of New Hampshire, have invented an Improvement in Cotter-Pin-Extracting Tools, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to new and useful improvements in extracting tools, and is particularly applicable to tools for withdrawing cotter pins from shafts and for straightening the shanks of such cotter pins after they have been withdrawn.

Cotter pins which are ordinarily used in securing parts of machinery together are ordinarily composed of a half round bar of metal bent in the middle so as to form an eye with parallel shanks extending from said eye portion, the flat surface of the half round bar being located adjacent each other so that the shanks of the pin when in position form a substantially cylindrical stem. When these cotter pins are inserted in the apertures provided for their reception the ends thereof are spread apart to hold the pin firmly in place.

Cotter pins are frequently used in places which are difficult of access to the ordinary extracting tools, so that the engaging member of the tool cannot be applied properly to the head or eye of the cotter pin, or the tool cannot be withdrawn a sufficient distance to remove the cotter pin from its seat.

One of the objects of this invention is to provide a tool for withdrawing cotter pins, and for like purposes, which can be conveniently applied to the head of the pin, although the same may be in a position difficult of access to ordinary tools.

Another object of the invention is to provide a tool in which the extracting members have a relatively long extracting movement, so that it will withdraw the cotter pin sufficiently to compress the spread end portions, and permit the pin to be easily removed from its seat.

Another object of the invention is to provide an extracting tool, in which the members have a relatively long extracting move-

ment, which is capable of being operated through hand grips having such leverage as to provide for easily extracting the pins, although the ends thereof may be spread widely apart.

Other objects of the invention will more fully appear from the annexed description and drawing and the following claims.

In the drawings: Figure 1 is a side elevation of an extracting tool embodying my invention, showing the handles spread apart, and the engaging member inserted in the eye of a cotter pin seated in a shaft; Fig. 2 is a side elevation partly in section showing the handle members pressed together and the cotter pin extracted from the shaft; Fig. 3 is a plan view of the tool engaging the cotter pin, as shown in Fig. 1, and Fig. 4 is a sectional view on lines $x-x$, Fig. 1.

A preferred form of the invention in which my invention is embodied is illustrated in the drawing as comprising a body member 1 having a forwardly extending barrel portion 2 having parallel sides 3 and 4, and terminating in a substantially cylindrical portion 5, having an aperture 6 through which the operative extracting members are adapted to extend. The rear portion 7 of the body member is preferably made in the form of a hand grip for purposes hereinafter to be explained.

The extracting members comprise a hollow substantially cylindrical member 10 which is slidably mounted in the cylindrical portion 5 of the body member, and a solid cylindrical member 11 slidably mounted within the member 10 and provided at its end with a pin engaging device, preferably a hook. The members 10 and 11 are given longitudinal movement relatively to the barrel member and also relatively to each other by a lever 15, which is mounted upon a pivot 16, secured in the sides of the body member 1, and has a rearwardly extending hand grip 17, the member 10 being attached to the lever 15 by a pivotal connection 18, and the member 11 being connected to said lever upon the opposite side of the pivot 16 by a pivotal connection 19.

By reason of the fact that the members 10 and 11 are pivoted to the lever upon opposite sides of its pivotal point or fulcrum

16 it will be obvious that when the hand levers 7 and 17 are compressed together the member 10 will be extended, and simultaneously therewith the hooked member 11 will be retracted. As shown in the drawings the points of attachment 18 and 19 of the members 10 and 11 to the lever 15 are equally distant from the fulcrum 16, and therefore each member is moved the same distance relative to the body member but in opposite directions. The total amount of movement, therefore, which is effective in extracting a cotter pin is the sum of the extent of movement of the separate parts relative to the body member, for example, in a tool of the size shown in the drawing, which is substantially half the size of an automobile tool, the hook member is adapted to be retracted approximately $\frac{1}{4}$ inch and at the same time the surrounding member 10 is adapted to be extended $\frac{1}{4}$ inch, making an effective pull for extracting a pin of $\frac{1}{2}$ inch. It is obvious that the extent of movement; the amount of leverage and the size and arrangement of parts may be varied to suit the uses to which the tool is to be applied. A helical spring 20 is provided to normally maintain the handles separate and the hook or engaging member projected into the position in which it is adapted to engage the eye of the cotter pin.

In operation the hook 12 of the member 11 is inserted in the eye of the cotter pin and the tool so held that the end of the part 10 rests upon the shaft, or other member through which the pin is inserted. The handles 7 and 17 are then drawn together by a grip of the hand, thus causing the withdrawal of the member 11, and at the same time projecting the member 10 against the shaft. This joint action causes a pull upon the cotter pin substantially in line with its axis which readily withdraws the pin from its seat. The shanks of cotter pins which have thus been removed from their seats are usually bent apart at the ends and before the same can be used again it is necessary to straighten them so that the cotter pin stem will assume its substantially cylindrical form. The means provided for effecting this result in the present structure which comprise a pair of ledges preferably concaved to fit the contour of the cotter pin, one of said ledges 21 being upon the handle 7 of the body portion, and the other ledge 22 upon the corresponding portion of the handle 17. Upon pressing the levers 7 and 17 together the ends of the shanks of the cotter pin will be forced toward one another. There is, however, usually sufficient resilience in the metal of which the cotter pins are constructed to prevent the stem of the cotter pin from resuming its original cylindrical form. I have therefore found it desirable to provide a fulcrum over which

the shanks of the cotter pin will be bent to straighten the same. In the preferred form of the device illustrated in the drawings herein, this fulcrum consists of a flat member or wedge 25 which is positioned at the end of the straightening ledges 21 and 22 above referred to. This wedge is preferably the end of an arm 26 which is mounted upon the pivot 16, and is maintained in position in any suitable manner. As illustrated herein the arm is provided with a slot 27 through which a screw 28 projecting from the body portion extends. By such arrangement a slight motion is permitted to the fulcrum 25 so that it will be positioned centrally of the ledges when a cotter pin of any size is placed in position to be straightened.

In operation the shanks of the cotter pin are inserted at 1 on each side of the wedge or fulcrum 25 into the path of the ledges 21—22. The handles 7 and 17 are then gripped and the cotter pin shanks by being bent about the fulcrum 25 are effectively straightened and prepared for use again. This fulcrum is preferably retained above the plane of the ledge 21 which adapts it to be used in connection with said ledges to straighten lateral bends in cotter pin shanks, bends in nails, wires, etc.

It is to be understood that while I have described this invention in connection with a tool for extracting cotter pins, it is capable of general usage and may be embodied in various other forms of tools and apparatus. It is also to be understood that different forms of engaging means for the articles to be extracted may be applied.

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

1. A tool of the class described, comprising a body portion, extracting members each of which is movable relatively thereto, and means adapted to move said members longitudinally in opposite directions.

2. A tool of the class described comprising a body portion, extracting members each of which is movable relatively thereto, and means adapted to move said members longitudinally simultaneously in opposite directions.

3. A tool of the class described comprising a body portion, a pair of concentrically arranged extracting members mounted in said body and movable relatively thereto, and means adapted to move said members simultaneously in opposite directions.

4. A cotter pin extracting tool comprising a body portion, a movable hooked extracting member, and a thrust member movable relatively thereto and to said body portion, and means for moving said hooked and thrust members longitudinally in opposite directions.

5. A cotter pin extracting tool comprising a body portion, a hooked member slidably mounted in said body portion, a sliding member telescopically arranged in respect to said hook member, a lever connected to said members and adapted to move the same in opposite directions.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN W. LOVERING.

Witnesses:

C. E. WHITNEY,
CHARLES E. POTTER.