

No. 680,300.

Patented Aug. 13, 1901.

E. E. WELSH.
SPIKE EXTRACTOR.

(Application filed May 7, 1901.)

(No Model.)

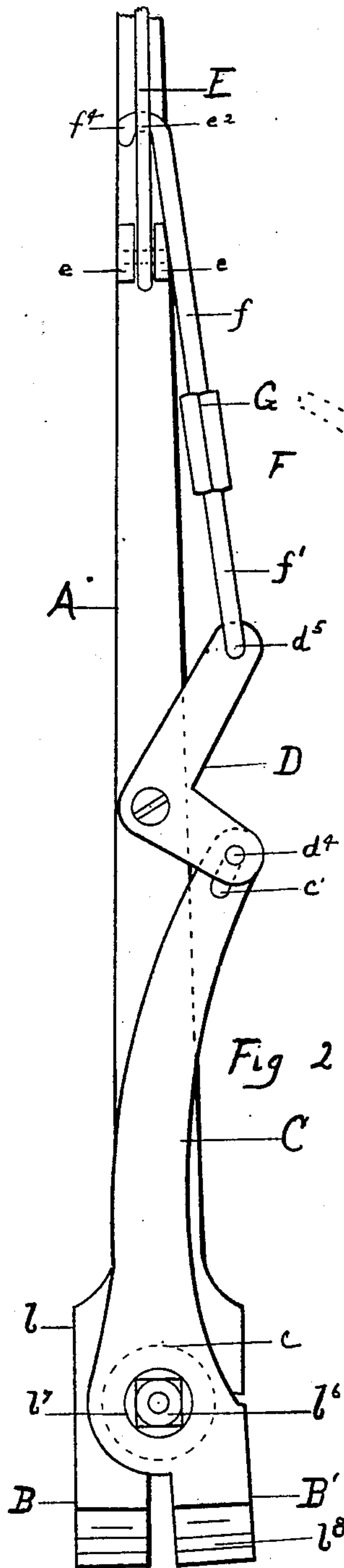


Fig 2

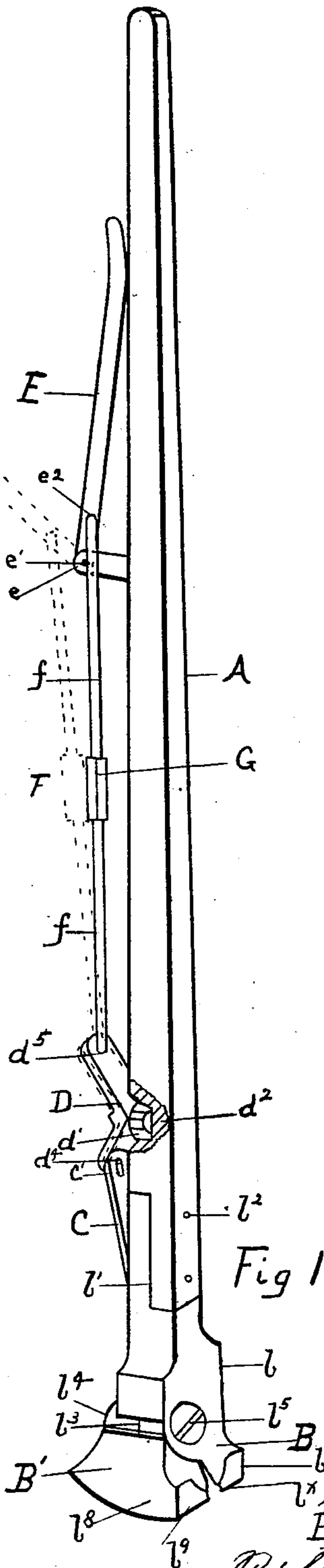


Fig 1

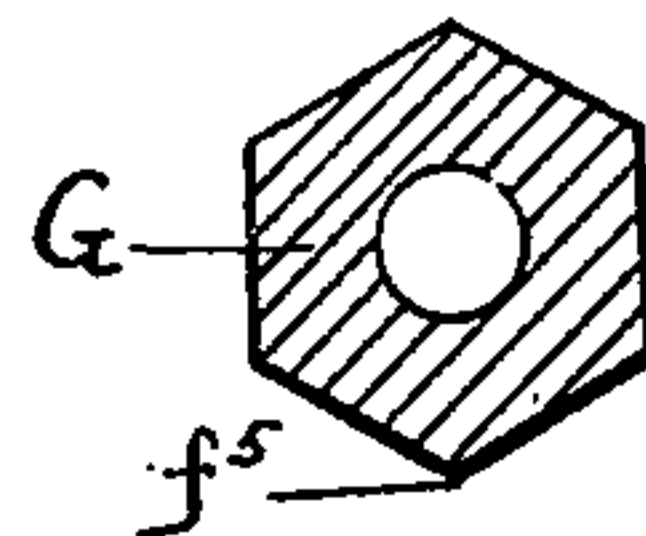


Fig 4

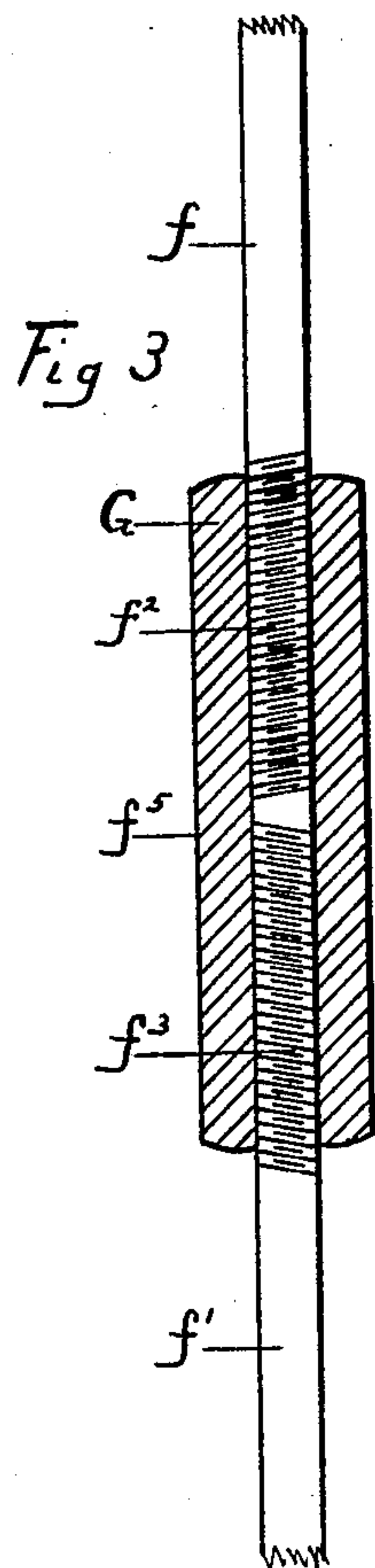


Fig 3

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UNITED STATES PATENT OFFICE.

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SPIKE-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 680,300, dated August 13, 1901.

Application filed May 7, 1901. Serial No. 59,157. (No model.)

To all whom it may concern:

Be it known that I, ELMER E. WELSH, a citizen of the United States of America, residing at Lawrence, in the county of Douglas and State of Kansas, have invented certain new and useful Improvements in Spike-Extractors; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The objects of my invention are, first, to increase the power of the lever actuating the devices for opening and closing the spike-grasping jaws, and, second, to adapt the increased power to an adjusted position of the spike-grasping jaws.

The invention consists in the novel construction and combination of parts, such as will be first fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a view in perspective of a spike-extractor, showing the invention applied thereto. Fig. 2 is a rear view of the spike-extractor, showing in detail the jaw-operating lever, the main bar, the bell-crank lever, and the novel devices upon the bar for increasing power and adjusting the grasping position of the jaws. Fig. 3 is a detail broken view of the separate parts of the rod connected with the bell-crank lever, showing the adjusting-sleeve in section. Fig. 4 is a sectional view of the sleeve.

Similar letters of reference indicate corresponding parts in all the figures of the drawings.

Referring to the drawings, A represents the main operating-lever of the improved spike-extractor, which consists of a flat bar of the required length to afford leverage in extracting the spike, the forward and rear edges of which bar from the jaws upwardly being inclined inwardly, thus decreasing the width of the upper end of the bar for convenient manipulation.

B B' are the respective stationary and movable spike-grasping jaws, which are of the ordinary construction. The stationary jaw B is provided with a body portion *b*, which extends upwardly from the jaw a considerable distance and is cut away transversely or

halved at *b'*. The lower end of bar A is also cut away or halved to fit the halved portion of the body *b*, and said parts are connected by the rivets or screws *b²*. The body of the jaw B' is provided with an annular recess *b³*, and in said recess is fitted the curved portion *b⁴* of the body of the said jaw. Through the body *b* of the stationary jaw B extends the screw-bolt or pivot *b⁵*, which has a head at one end. The other end of said bolt extends through the body of the movable jaw, and upon the said end of the bolt is a nut *b⁶*, which is countersunk at *b⁷* in the rear portion of the body of the movable jaw. The under or bearing sides of each jaw B B' are curved in the arc of a circle, as at *b⁸*, and the ends of said jaws extend a short distance beyond the front and rear sides of the body portions *b³* of said jaws. The portions so extended beyond the front side of the said body portions form the spike-grasping portions *b⁹* of said jaws and as usually constructed are depressed rearwardly, as at *b^x*, to receive the head of the spike.

With the rear end of the body of the movable jaw B' is rigidly connected the lower end *c* of the jaw operating or vibrating lever C, the upper end of which lever extends a short distance above the halved portions of the bar A and the body *b* of the stationary jaw and is bent in a curved line laterally and extended a slight distance beyond the plane of the side of bar A and to a position nearly in a vertical plane with the outer side of the movable jaw B'. In the upper end of the lever C is a longitudinal slot *c'*.

D is a bell-crank lever which is arranged in position upon bar A directly above the upper end of the vibrating lever C and is provided with a circular bearing or pivot *d*, which enters a socket *d²* in the rear side of bar A. In the lower arm of lever D is a pivot *d⁴*, which enters the slot *c'* in the upper end of lever C. In the upper arm of lever D is an opening *d⁵*.

E represents the power-transmitting lever for actuating the opening and closing of the movable jaw B', which consists of a short bar the upper end of which is curved outwardly in a slight degree. Upon the rear side of the bar A, at a point about one-third the distance downwardly from the upper end of said bar, are separate lugs *e e*, which are rigidly con-

connected with the bar and extend a short distance outwardly therefrom. Between the lugs e e is pivotally connected or fulcrumed the lower end of the power-conveying lever 5 E, the pivot e' extending transversely through said lugs at a point from the bar A toward the outer ends of said lugs. In the lower end of lever E, a short distance above the pivotal point of said lever, is an opening e^2 .

10 F represents the jaw-adjusting device, which consists of two rods f f' of nearly-equal length. The upper end of rod f is bent at right angles and extended through the opening e^2 in the power-transmitting lever E, from 15 one side of the lever, and also bent downwardly at f^4 upon the opposite side of the lever, as seen in Fig. 2. The lower end of the rod is provided with a right-hand screw-thread f^2 . The lower end of rod f' is bent at 20 right angles and extended through the opening d^5 in the upper arm of the bell-crank lever D. The upper end of the rod f' is provided with a left-hand screw-thread f^3 .

G represents an adjusting nut or sleeve 25 which is provided with internal right and left hand screw-threads and which is connected with the respective lower end of rod f and the upper end of rod f' . The outer side f^5 of the sleeve G is made hexagonal in cross-section, so as to readily be seized and turned by 30 the hand or an instrument suitable for the purpose.

In operation the free end of lever E is moved outwardly from the bar A into the 35 position indicated in dotted lines in Fig. 1, which action of the said lever causes the lower arm of the bell-crank lever D to move the upper end of lever C inwardly to a position within the lines of the rear edges of the bar 40 A as the pivot d^4 moves within the slot c' and the jaw B' is moved outwardly from the stationary jaw B nearly its full extent. The sleeve G is then turned upon the rods f f' , so as to set the jaw B' at the relative distance 45 from the stationary or fixed jaw B to grasp a spike of the usual thickness, and which is attained by placing the grasping parts b^9 b^9 of said jaws upon each side of the spike to be drawn and then adjusting the nut or sleeve 50 G so that the inner ends of said parts will grasp the sides of the spike below the head of the spike. In this position the free end of lever E is moved upwardly by the hand, the tension on the rods f f' closing the parts 55 of the jaws against the spike and as soon as the upper pivoted end of rod f passes in the arc of a circle and concentric with the fulcrum or pivot e' of lever E and to a position nearer the bar A than the fulcrum or 60 pivot e' of said lever, and consequently causing the grasping parts b^9 b^9 of the jaws to be slightly embedded in the sides k of the spike under the strong leverage obtained on lever E, and also under the leverage locking the 65 lever in position against the side of bar A, the resulting power of the grasp of the jaws B B' in the spike holding the lever firmly

against the said bar. In this movement the pivotal upper end of the adjustably-connected rods f f' passes the fulcrum of the lever E 70 in the direction of the main lever and relieves the crushing strain on the jaws, which is of great importance to obviate, as this strain has the tendency when the power is applied to extract the spike to break the jaws. The bar 75 A is then rocked backwardly upon the bearing-surface b^8 b^8 of the jaws B B' and the spike readily extracted. The free end of lever E is then moved outwardly from bar A and the jaw B' opens to the proper extent to 80 seize a spike of a corresponding thickness. Should the grasping position of the jaws B B' be required for the extraction of bolts having a thickness greater in cross-section than the spike or nails with a smaller thickness 85 in cross-section, the sleeve G is turned on the rods f f' to meet each emergency, after which the bolts or nails of the same thickness are successively grasped and extracted without further adjustment of the sleeve G on the 90 rods f f' , the action of which, as is readily observed, increases and decreases the length of the combined rods f f' . The connection of rod f near the fulcrum of lever E affords a leverage of great efficiency and power upon the 95 movable jaw and forces the steel-tempered parts of the jaws into the spike.

The lever E may be connected with the forward edge of the main operating-lever A instead of the rear edge, as shown, if preferred. 100

In the Letters Patent No. 672,927, granted to me on the 30th day of April, 1901, an adjusting-lever is employed to close the jaws, upon which is a tooth engaging with a notched segment-plate. In each adjustment of the 105 tooth with the notched plate there is a space between contiguous notches, over which the tooth passes without locking, and this point is frequently the one at which the tooth should bite, and in placing the tooth back of the required position an unnecessary strain ensues upon both bar and the jaws. In the present invention the sleeve can be adjusted to a hair's breadth. Hence strains are eliminated and the jaws can be set to better advantage. 115

The invention is applied to the various forms of spike-grasping implements, and is especially of great service upon the spike-extractors, capable of being manipulated between adjacent track-rails where the space is 120 limited for operation.

Such modifications of the invention may be employed as are within the scope of the invention.

Having fully described my invention, what 125 I now claim as new, and desire to secure by Letters Patent, is—

1. In an implement for extracting spikes, &c., the combination with a main operating-lever and pivoted spike-grasping jaws upon 130 said lever of a separate lever operating one of said jaws lugs rigidly connected with and extending outwardly from one side of the main lever, and a power-conveying lever piv-

5 oted at its lower end in the outer ends of said lugs and an adjustable connecting device pivotally connected at one end with the power-conveying lever and concentric with its fulcrum and having said pivotal end movable in the arc of a circle past said fulcrum in the direction of the main lever and also pivotally connected at the other end with the lever operating one of said jaws.

10 2. In an implement for extracting spikes, &c., the combination with separate fixed and movable spike-grasping jaws of a main operating-lever connected with the body of the fixed jaw and a vibrating lever connected with
15 the body of the movable jaw lugs rigidly connected with one side of the main lever and extending outwardly therefrom and a power-

conveying lever pivotally connected at its lower end with the outer ends of said lugs a bell-crank lever on the main lever pivotally 20 connected with the vibrating lever and separate rods adjustably connected with each other one of which rods is pivotally connected with the bell-crank lever and the other rod with the power-conveying lever and having 25 its pivotal end concentric with the fulcrum of said power-conveying lever and movable in the arc of a circle past said fulcrum in the direction of the main operating-lever.

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Witnesses:

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