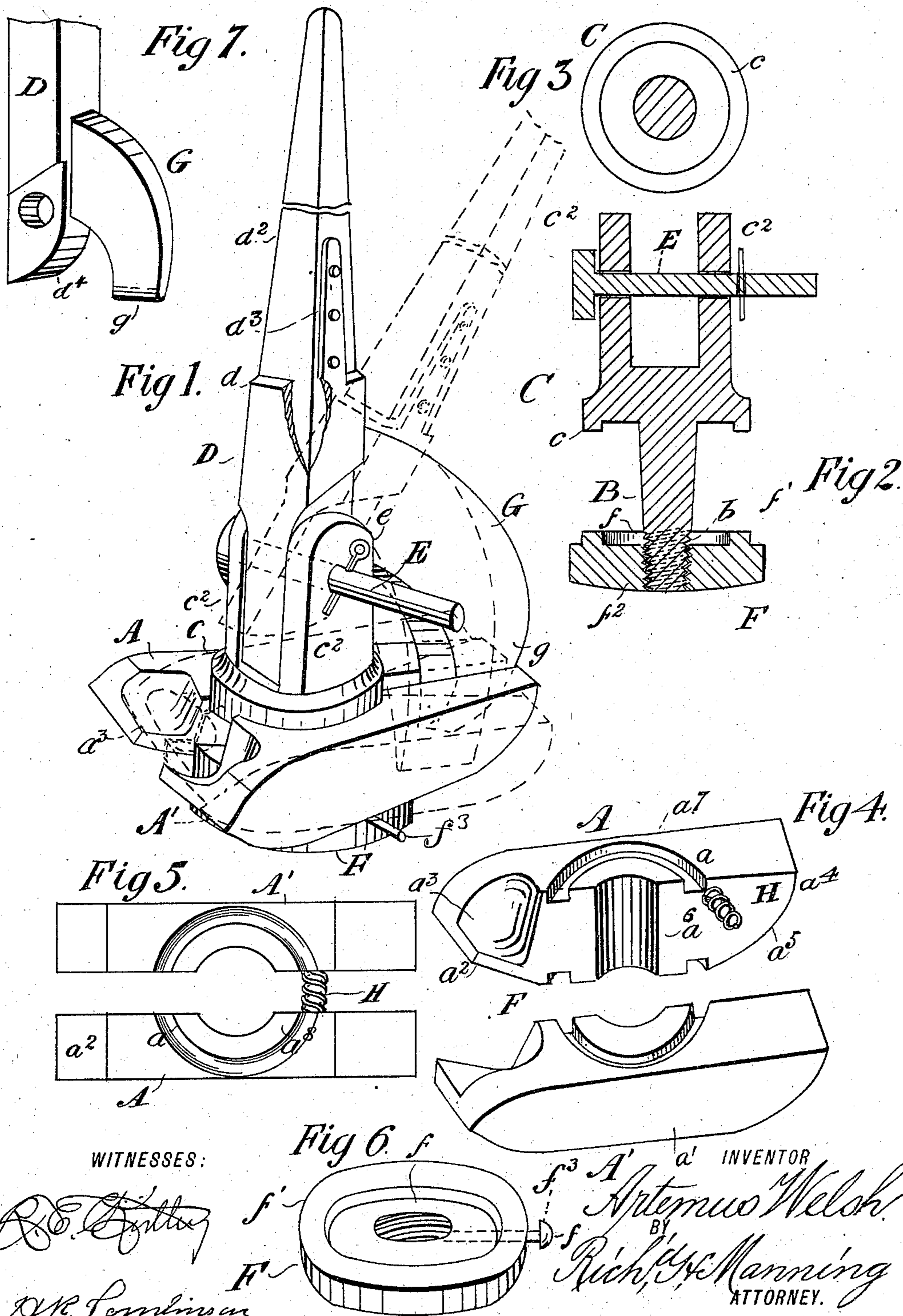


(No Model.)

A. WELSH.
SPIKE EXTRACTOR.

No. 573,943.

Patented Dec. 29, 1896.



UNITED STATES PATENT OFFICE.

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SPIKE-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 573,943, dated December 29, 1896.

Application filed August 14, 1896. Serial No. 602,802. (No model.)

To all whom it may concern:

Be it known that I, ARTEMUS WELSH, a citizen of the United States, 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 object of the invention is, first, to increase power of the lever in closing the oscillating jaws upon the spike, and, second, to prevent the action of the jaws from being retarded when the leverage is applied to extract the spike.

My invention consists in the novel construction and assemblage 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 the improved spike-extractor. Fig. 2 is a detail view of the fulcrum-post shown in vertical section, also showing the circular groove in the cap and the pivots between the oscillating jaws and the annular flanged circular nut on the pivot. Fig. 3 is a view of the under side portion of the cap beneath the fulcrum-posts, showing the circular groove. Fig. 4 is a detail view in perspective of the separate oscillating jaws of the spike-extractor, showing the grooves in the upper and lower side portions and the circular nut within the groove of one of the jaws. Fig. 5 is a view of the under side portion of the oscillating jaws, showing the grooves in each jaw. Fig. 6 is a detail view in perspective of the circular nut on the end of the pivot. Fig. 7 is a detail view of the lower end of the operating-lever.

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

Referring to the drawings, A A' are the separate oscillating spike-extracting jaws, which are arranged substantially in parallelism side by side. The jaw A consists of a straight bar, comparatively short in length, the upper and under sides having flat surfaces a a' , respectively. The forward end of the bar A, upon its under side, is inclined up-

wardly and forwardly at an oblique angle to the surface a' and forms a bearing when the spike is grasped by the jaws. In the forward end of the bar, directly above the inclined portion, is a recess a^3 for the head of the spike, which extends from the forward end of the bar in the direction of the rear end a short distance and from the under side of the bar to within a short distance of the outer side of said bar. At the extreme rear end portion of the bar A the inner side portion extending from the upper surface is inclined downwardly at an angle to said upper surface, as at a^4 , for the purpose hereinafter explained. Said rear end of bar A is also inclined downwardly and inwardly in a curved line from the upper surface of the bar, as at a^5 , on the inner side of the bar A. At a point equidistant from opposite ends of said bar is a groove a^6 , extending from the upper surface a to the lower surface a' of bar A and conforming to the arc of a circle.

In the upper surface a of bar A is a groove a^7 , which describes an arc of a circle upon a line concentric with the groove a^6 and from the same central point upon which said arc a^6 is drawn, said groove a^7 being extended from the inner side of bar A to a point near the outer side of said bar.

In the under surface a' of the jaw A is a groove a^8 , which is of the same depth and is made in the arc of a circle described from the same center and extending the same distance toward the outer edge of the bar as described of the groove a^7 .

The companion jaw A' is constructed in precisely the same manner as described of the bar A and the jaws arranged to present the spike-grasping recesses opposite in position.

The jaws A A' are hinged together in the following manner: Between the jaws A A' in the respective grooves a^6 in each jaw is a pivot B, of considerable diameter, so as to keep the jaws A A' a sufficient distance apart and enable said jaws to oscillate. On the upper end of the pivot B is rigidly connected a circular cap-plate C, upon the outer edge portion of which cap-plate is a downwardly-extended annular flange c , which is fitted to and enters the respective grooves a^7 in the upper surface a of the respective bars or jaws A A'. To the upper side of the cap-plate C is rigidly

connected the separate uprights or fulcrum-posts $c^2 c^2$, which extend in a vertical direction a short distance and near the upper ends are perforated transversely.

5 Between the fulcrum-posts $c^2 c^2$ is arranged the lower end portion of the operating-lever D, and through said lever and the perforations in the pivot-posts is inserted the fulcrum pin or bolt E, one end of which is provided with a head and the other end extended
10 beyond the outer side portion of the fulcrum-posts, so as to form a bearing for the foot in operating the spike-extractor. Said bolt is held in the perforations by means of a split
15 key e . The lower end portion b of the pivot B extends a short distance below the line of the under surface a' of the respective jaws A A' and is screw-threaded. To said screw-threaded end of the pivot B is fitted a circular
20 nut F. In the center of the nut is a screw-threaded opening f , which fits the screw threaded on the pivot B. Upon the outer edge of the nut F is an annular flange f' , which is fitted to and extends within the groove a^8 in
25 the under surface a' of the respective jaws A A'. The outer surface of nut f is curved so as to afford a rocking bearing-surface. In the nut F is a set-screw f^3 , which contacts with the pivot B and prevents turning.

30 The lever D is composed of separate parts, the lower parts connected with the fulcrum-bolt E, extending a short distance in a vertical direction. In the upper end of the part of lever D connected with the fulcrum-post
35 is a socket d , in which is fitted the lower end of a vertical wood extension d^2 , said extension being secured by the side straps d^3 on the lower part of the lever. The lower end of lever D, which contacts with the upper side
40 of the cap C at its forward edge or in the direction of the end of the jaws A A', having the recesses a^3 , is inclined from said edge upwardly and rearwardly, as at d^4 , so as to permit the rearward movement of the lever. To
45 the rear side portion of lever D, at a point a short distance above the line of the upper end of the fulcrum-posts $c^2 c^2$, is attached rigidly the upper end of the rib G, the other end of which rib extends outwardly and downwardly
50 in a curved line to a position between the inner inclined surfaces of the rear ends of the jaws A A' and is inclined on each side downwardly to one edge, forming a wedge g .

Between the jaws A A' and the rear ends
55 of said jaws is a spiral spring H. One end of said spring is inserted in the inner side of the jaw A near the pivot B and the other end inserted in the inner side of the jaw A'. Said spring tends to throw the forward ends of
60 the jaws A A' together.

In the operation of the improved spike-extractor the rear ends of the jaws A A' are drawn together by the hand, the wedge being nearly out of contact with the inner
65 surface of the jaws, and the forward ends of the jaws being open are inserted beneath the head of the spike. In this position of

the jaws, which rest upon the forward inclined ends a^2 , the lever D is also thrown forward. As soon as the head of the spike
70 enters the recesses a^3 in the jaws A A' the rear end of the jaws is released and the spring H acts to close the jaws upon the spike. The lever D is then seized by the hand and power applied thereto, the foot being applied to the
75 bolt E and the jaws prevented from slipping. This movement of the lever D throws the wedge between the rear ends of the jaws A A', and the grasp of the forward end of the jaws is complete. As the spike is drawn
80 from the seat in which it is embedded, the bearing is transferred to the nut F, and the friction removed from the inner side of the jaws A A', so that by the further closing of the jaws, or when the grasp is increased by the
85 wedge entering to its full extent between the rear ends of the jaws, the action of the jaws is not retarded, the hinged portion of the jaws turning readily upon the flanged portions of the cap C and nut F. The jaws are then oscillated upon the rear ends and the spike removed.

The hinged connection enables me to lubricate the jaws and facilitate their action, the oil being retained in the nut F in sufficient
95 quantity. The lever being pivotally connected near the jaws, a greater power is afforded to draw the spike. The separate parts of the spike-extractor being detachable are also removable, and as connected may be employed
100 under circumstances which require great application of power without danger of breakage. For the nut I use a fixed head or bearing.

The nut F may be locked in any other manner than herein described. 105

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

1. In a spike-extractor composed of oscillating spike-grasping jaws, an intermediate
110 hinged connection consisting of an intermediate vertical pivot, a cap-plate upon the upper end of said pivot, and a nut upon the lower end, and jointed circular grooves and flanges upon the upper and lower surfaces of
115 said jaws and the inner surface of said cap and nut respectively, as and for the purpose described.

2. A spike-extractor composed of oscillating spike-grasping jaws, and an intermediate
120 pivot, a cap upon the upper end of said pivot and a nut on the lower end, a fulcrum-post on said cap, and an operating-lever pivotally connected with said fulcrum-post, a rib on said lever having a wedge at its extremity
125 extending between the rear ends of said oscillating jaws, and jointed circular grooves and flanges on the upper and lower surfaces of the said jaws and the respective inner surfaces of said cap and nut, as and for the purpose described. 130

3. In a spike-extractor, the combination with the oscillating spike-grasping jaws having grooves in the upper and lower surfaces

of said jaws in the arc of a circle, an intermediate vertical pivot concentric at its circumference with said grooves, a cap-plate upon the upper end of said pivot, and a nut 5 on the lower end, and a fulcrum-post on said cap, and an operating-lever having its lower end extending to the upper surface of said cap, and its rear edge inclined rearwardly and upwardly, and a rib on the said lever extending in the direction of and between the 10 rear ends of said jaws, having oppositely-inclined sides, annular flanges on the under side of said cap-plate and the upper side of said nut extending within the grooves in the 15 upper and lower surfaces of the respective jaws for the purpose described.

4. In a spike-extractor the combination with the oscillating spike-grasping jaws having downwardly and rearwardly inclined

bearing-surfaces at their forward ends, and 20 an intermediate vertical pivot, a cap-plate upon the upper end of said pivot, a fulcrum-post upon said cap-plate, an operating-lever pivotally connected with said fulcrum-post, a rib connected with the lower end of said 25 lever and extending between the rear ends of said jaws, said jaws having circular grooves in their under surfaces, and a bearing for said jaws connected with the lower end of said pivot, and an annular upwardly-extended 30 flange on the upper side of said bearing, extending within the circular grooves in the respective jaws, as and for the purpose described.

ARTEMUS WELSH.

Witnesses:

CHAS. C. ADAMS,
A. L. GREER.