

(No Model.)

F. HARDINGE.
WATCH MAKER'S ROLLER EXTRACTOR.

No. 438,416.

Patented Oct. 14, 1890.

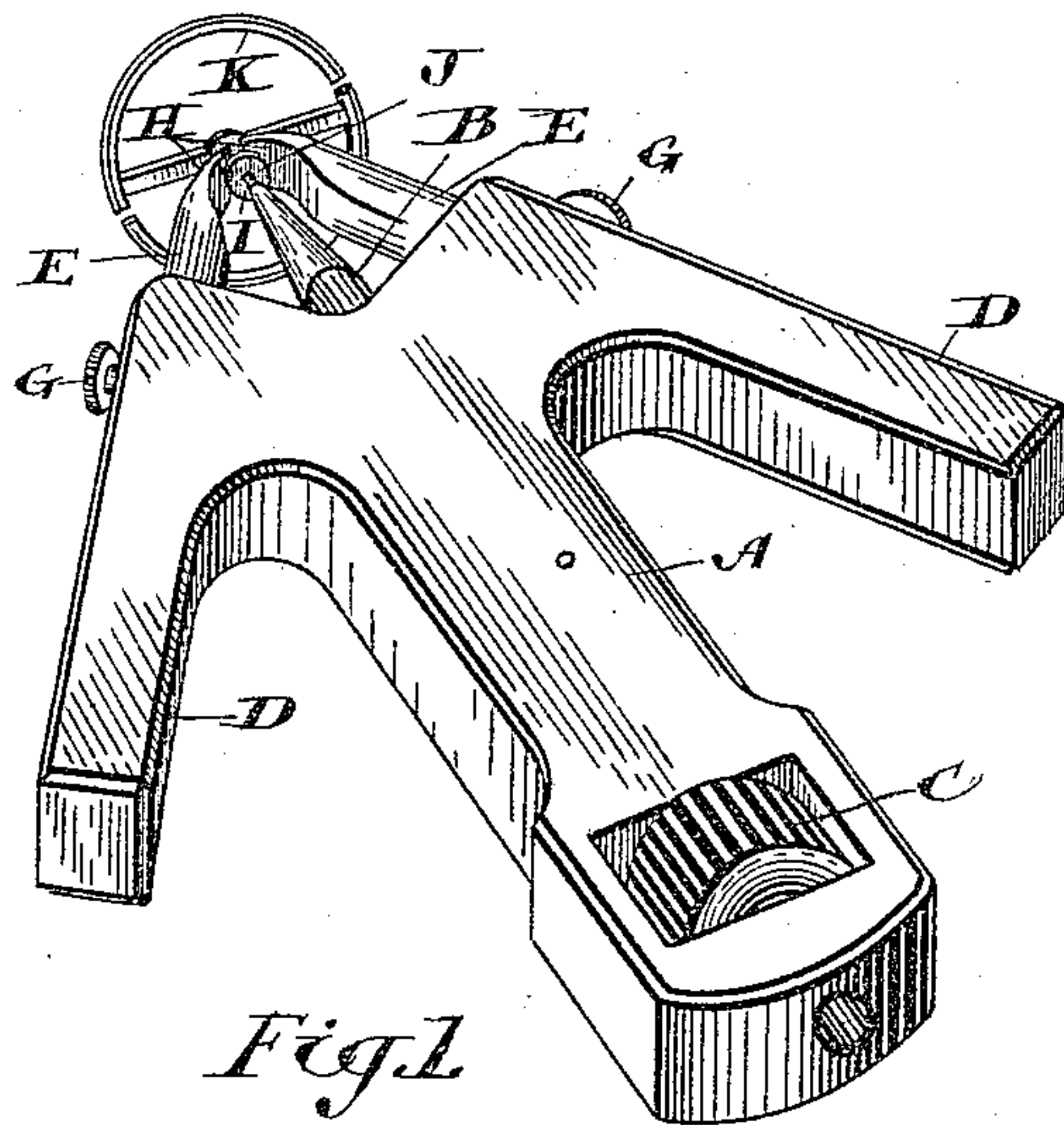


Fig. 1

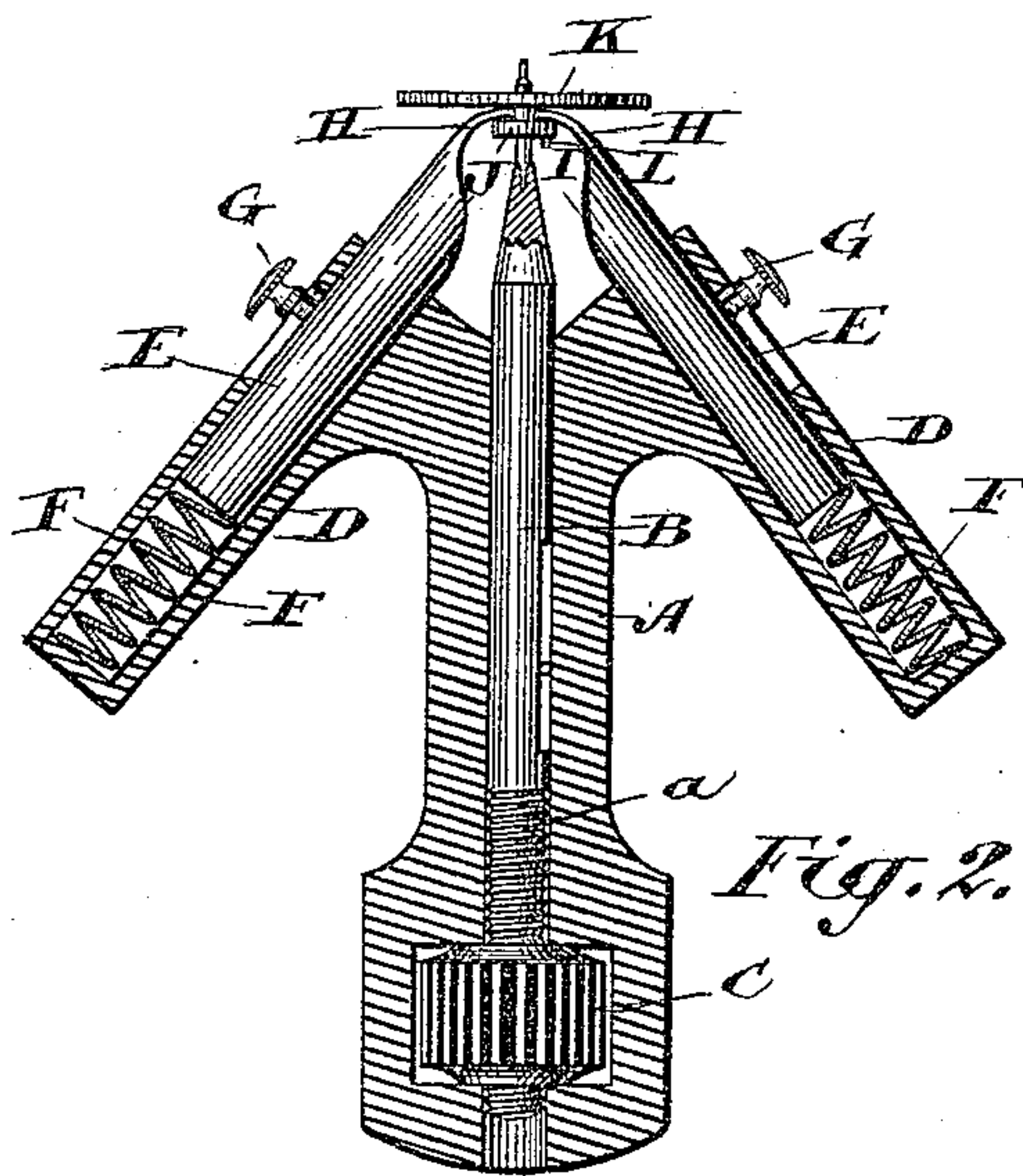


Fig. 2.

Witnesses.

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FRANKLIN HARDINGE, OF TORONTO, CANADA.

WATCH-MAKER'S ROLLER-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 438,416, dated October 14, 1890.

Application filed January 24, 1890. Serial No. 337,979. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN HARDINGE, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented a certain new and Improved Roller-Extractor, of which the following is a specification.

The object of the invention is to design a roller-extractor in which the jaws for gripping the roller are independently adjustable and will accurately grasp a roller of any size, so as to bring the balance-staff exactly on a center line with the punch; and it consists of two jaws connected to or forming part of two arms angularly supported by two sleeves attached to or formed in the body of the tool which contains the balance-staff punch, the center line of the said punch passing through the center of the parting between the two jaws, which are curved to fit behind the roller and are elastically held in position by spiral springs, substantially as hereinafter more particularly explained.

Figure 1 is a perspective outside view of my improved roller-extractor. Fig. 2 is a sectional elevation of same.

A is the body of the roller-extractor, through the center of which a hole is made to receive the punch B. A screw *a* is cut upon the punch B and passes through the nut C, held in a recess made in the body A, as indicated, so that by turning the said nut the punch B will be longitudinally adjusted. The sleeves D form part of the body A and are set at an angle, so that their center lines shall intersect each other at the point where the center line of the punch B passes. Within these angularly-set sleeves D, I place the arms or bars E, and between the bottom of each arm E and the bottom of its respective sleeve D, I place a helical spring F. I also provide for each arm or bar E a knob G, which passes through an elongated hole made in the sleeve D, as indicated. A jaw H is attached to or formed upon the end of each arm or bar E, the ends of the said jaws H being bent, so that their points shall meet in a horizontal plane.

As this tool is designed for the purpose of extracting the roller with its ruby-pin from

the balance-staff, I show for the purpose of this description a balance-staff I, seated on the point of the punch B, and the curved jaws H, inserted between the roller J and the balance K. When in this position, it is merely necessary to turn the nut C, so as to force the point of the punch B upwardly, and thus force the staff I out of the roller J, which may thus be easily extracted without injuring it or the ruby-pin L, which is so desirable to retain.

Owing to the shape of the jaws H and the angular position in which they are held, they will fit behind the roller J, no matter how closely to the balance K it may be located. For the same reason the jaws H cannot be spread open, no matter how great the pressure of the punch B may be against the end of the staff I—in fact, the greater the pressure the more securely will the jaws hold the roller J.

Owing to the action of the springs F and to the angular position of the arms or bars on which the jaws H are formed, the said jaws are readily adjusted so as to fit behind any sized roller J, and they will automatically adjust themselves so that the center line through the punch B will pass through the point where the center lines of the arms E intersect each other. Consequently the staff I will be held perfectly straight with the center line of the punch B.

I should have mentioned that the knob G, screwed into each arm or bar E, may be used as a pinch-screw to lock its respective arm or bar when it has been properly adjusted to suit any particular size of roller.

What I claim as my invention is—

1. In a roller-extractor, a body A, having bearings or sleeves D, bars E, having curved jaws H and sliding longitudinally in said bearings, and the punch B, moving in said body between the bearings, substantially as described.

2. The curved jaws H, fixed to or formed upon the arms or bars E, and the angularly-located sleeves D, formed to receive the bars E, in which the helical springs F are inserted, in combination with the adjustable punch B, located so that its center line shall pass through

the intersection of the center lines of the arms E, substantially as and for the purpose specified.

3. In a roller-extractor, a body A, having a
5 central bearing for a punch and two side sleeves D, arranged on each side of the punch-bearing and approximately at right angles to each other, a punch B, working in said bear-

ing, and arms E, having jaws H, movable in said sleeves, substantially as described.

Toronto, December 31, 1889.

FRANKLIN HARDINGE.

In presence of—

CHARLES C. BALDWIN,
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