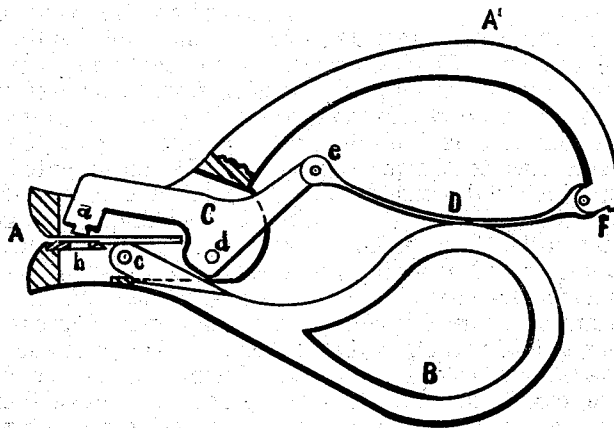


G. C. MORGAN & S. REID.

Punches.

No. 156,231.

Patented Oct. 27, 1874.



Witnesses
L. L. Bond
O. W. Bond.

Inventors:
George C. Morgan
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UNITED STATES PATENT OFFICE.

GEORGE C. MORGAN AND SAMUEL REID, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN PUNCHES.

Specification forming part of Letters Patent No. **156,231**, dated October 27, 1874; application filed April 17, 1874.

To all whom it may concern:

Be it known that we, GEORGE C. MORGAN and SAMUEL REID, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Punches, of which the following is a full description, reference being had to the accompanying drawings, in which the figure is a side view, partly in section.

The object of this invention is to make a punch easy in its movements and powerful in its operation; and its nature consists in operating the punch by means of a curved spring, having the action of a toggle-joint, and in the combination of parts hereinafter claimed.

In the drawings, A represents the head; A', the fixed arm; B, the hinged or movable arm; C, the lever; D, the curved spring; *a*, the punch; *b*, the cutter; *c*, *d*, *e*, and *f*, pivots. The parts A and A' are made in one piece, and are made of brass or any untempered metal, as is also the movable arm B. We usually make the parts C, D, and *b* of steel, and temper the cutter-plate *b* and the punch *a* of the part C. The parts made of steel may all be tempered, if desired. By making the head A of one piece we are able to place the pivot *d* of the lever C below a line drawn from the punch *a* and the pivot *e*, so as to give a better action to the lever, and the form of the spring D gives the lever C a better action, as it moves the inner end in the arc of a proper circle, so that the power is not spent to any considerable degree on the pivot *d*. The spring D is only slightly curved, as shown, so that it can be made sufficiently stiff to

withstand the thrust or end pressure, and so that it does not require much pressure to bring it to the straight or neutral line, and in passing from the curved to the neutral line its power is great. A light pressure upon the pivoted arm B gives the punch *a* a powerful thrust. The die or plate *b* is fitted into a suitable recess, and is provided with a hole fitting the punch *a*. A larger opening is made below the hole in the plate *b*, so that there is no clogging of the chips. The arm B is not necessarily made of the form shown. Any form which will depress the spring will be sufficient. The form shown is of the size usually known as the conductor's punch, but we propose to make them of various sizes, and adapted to various uses, such as office-punches, leather-punches, light sheet-metal punches, &c.

What we claim as new, and desire to secure by Letters Patent, is—

1. The arm A' and lever C, in combination with the spring D, the spring being pivoted to both the arm and lever, forming a toggle-joint, substantially as and for the purpose specified.

2. The spring D, pivoted to both the arm A' and lever C, in combination with the arm B, said spring operating the punch in both directions, substantially as and for the purpose described.

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