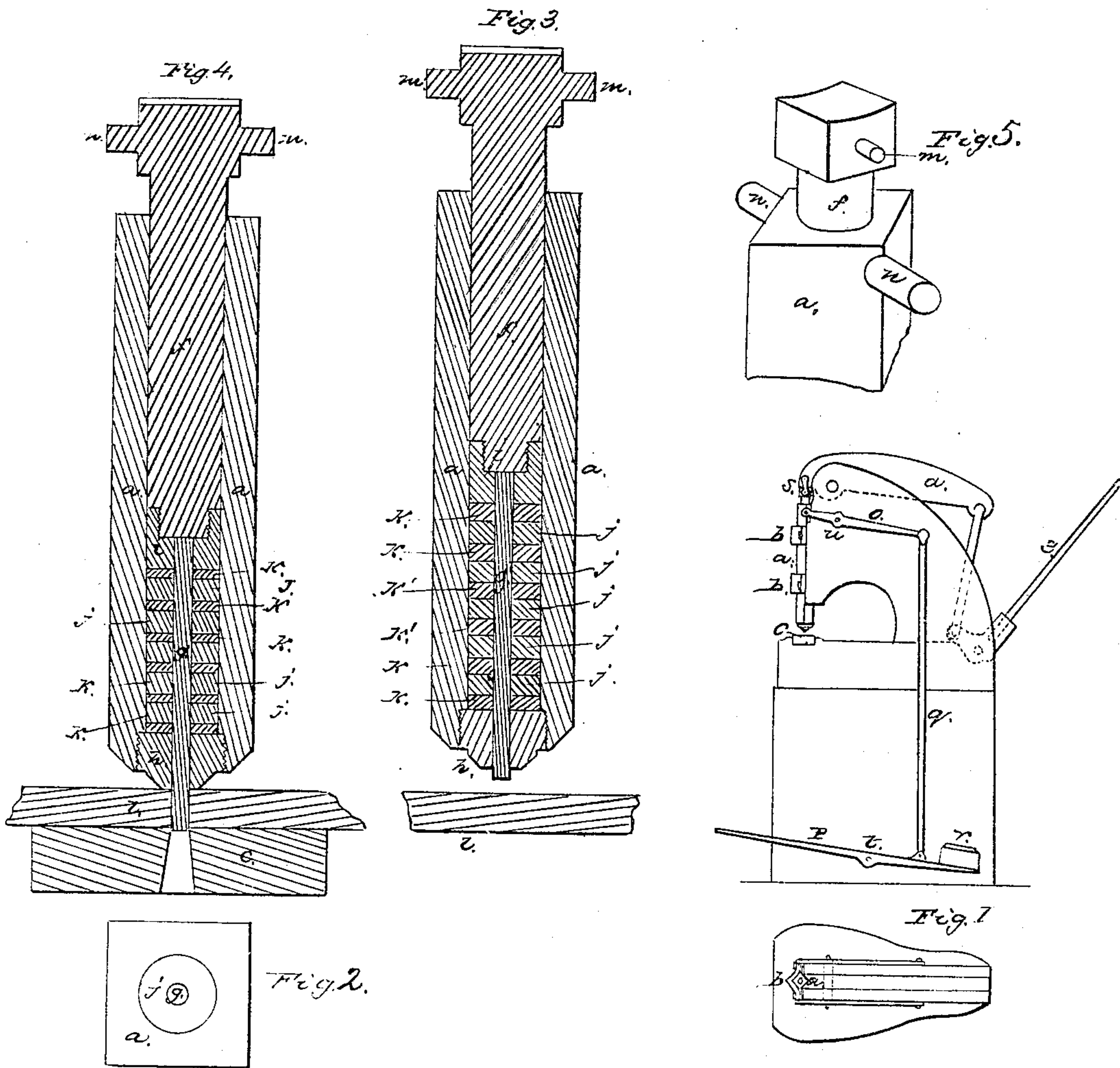


W. I. GRANGER.  
METAL PUNCH.

No. 20,846.

Patented July 6, 1858.



# UNITED STATES PATENT OFFICE.

WASHINGTON I. GRANGER, OF CHICAGO, ILLINOIS, ASSIGNOR TO D. I. LAKE  
AND C. B. BROWN, OF SAME PLACE.

## IMPROVED PUNCH FOR PERFORATING METAL.

Specification forming part of Letters Patent No. 20,846, dated July 6, 1858.

*To all whom it may concern:*

Be it known that I, WASHINGTON I. GRANGER, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Mode of Constructing Punches for Perforating Metal; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The nature of my invention consists in arranging a series of rings of metal and india-rubber or other elastic substance alternately around the punch, such rings being of equal diameter and fitted in a metallic tube, thereby preventing the punch from springing under extraordinary pressure.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation, reference being had to the drawings, where—

Figure 1 represents a side and top view of a common hand punching-machine, where *a* is the sliding stock secured by and moving in the boxes *b b*. The die is shown at *c*, the compound levers at *d e*. I then take the common stock *a* and bore it in the direction of its length, making it tubular, as shown in the cross-section of the stock at Fig. 2 and vertical sections, Figs. 3 and 4. I then make a cylinder of steel, fitting the tube, as shown at *f* on Figs. 3 and 4. (Also shown at *f* in the perspective view at Fig. 5.)

The punch is shown at *g*.

*h* represents a plug of hardened steel screwed into and filling the lower end of the tube. I then fit a nut of hardened steel on the lower end of the follower *f*, as shown at *i*.

*j j j* represent any number of steel rings or washers fitting the tube and also fitting the punch.

*k k k* represent circular springs of india-rubber, metal, or other elastic substance.

The upper end of the punch is fitted in a hole in the nut *i*, so that the follower *f* rests on the head of the punch, a hole being made in the plug *h*, through which the punch passes and is exactly fitted.

*l*, Fig. 3, represents a plate of metal on which the punch is to operate, and *l*, Fig. 4, the same plate, showing the punch passed through it.

*m m* are pins inserted in the head of the follower *f*, and *n n* are pins inserted in the upper part of the stock *a*.

*o* and *p* are compound lever connected by the rod *q*.

The operation of this machine is as follows: The metal to be perforated is placed upon the die *c*, Fig. 1. The operator with his foot depresses the lever *p*, which has its fulcrum at *t*. The connecting-rod *q* gives motion to lever *o*, which has its fulcrum at *u*. The lever *o*, by the pins *n n*, causes the stock *a* to pass downward until the plug *h* rests firmly upon the metal to be perforated, as shown on Fig. 4. Then the lever *e* is depressed, which gives motion to the lever *d*, which presses on the head of follower *f* and forces it downward, causing the punch *g* to pass through the plate *l*, as desired. The springs *k k* are now depressed or condensed, as shown on Fig. 4. The rings *j j j* are brought closer to each other and prevent the punch from buckling or springing. Then, by elevating the lever *e*, the follower *f* being attached to lever *d* by the strap shown at *s* connecting the pins *m*, the punch is drawn upward, and the operator removing his foot from lever *p* the weight *r* elevates the stock *a*, which completes the operation. The advantage this method has over all others is that punches of small diameter can be forced through a greater thickness of metal with safety to the punch, thereby punching holes in such thickness of metal as heretofore were drilled.

I do not claim the employment of springs for the purpose of elevating the punch and retaining it in place; but

What I do claim as new and of my own invention, and desire to secure by Letters Patent, is—

The arrangement of a punch with a series of slides *j*, accurately fitting both punch and tube and retained in their places by springs *k* or their equivalents, substantially as set forth, for affording a lateral support to enable the punch to withstand strain while operating.

W. I. GRANGER.

Witnesses:

GEO. PATTEN,  
JAS. D. CLARY.