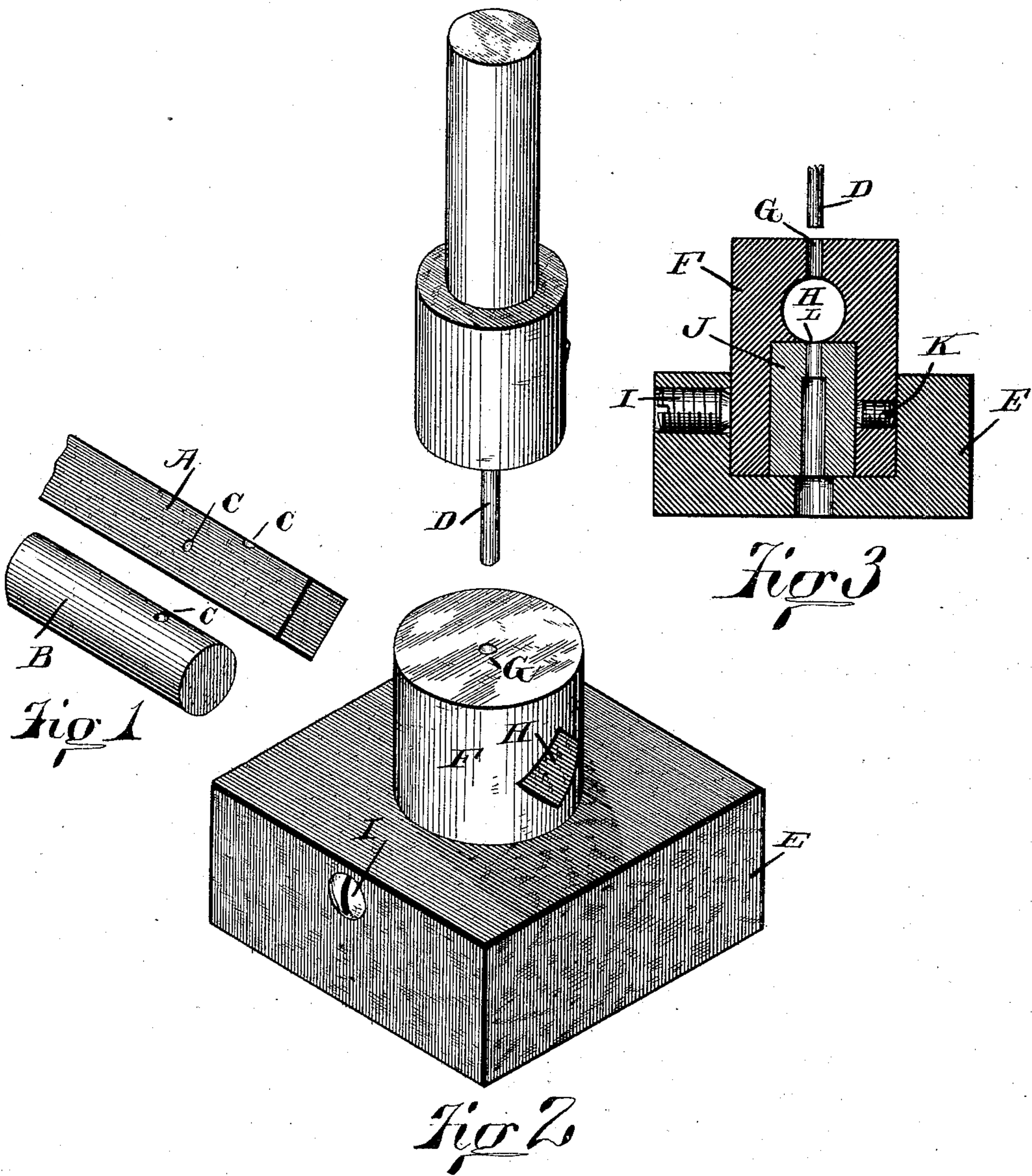


(No Model.)

J. M. LONG.
PUNCHING DEVICE.

No. 316,470.

Patented Apr. 28, 1885.



Witnesses:

W. A. Sedward
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UNITED STATES PATENT OFFICE.

JOHN M. LONG, OF HAMILTON, OHIO.

PUNCHING DEVICE.

SPECIFICATION forming part of Letters Patent No. 316,470, dated April 28, 1885.

Application filed December 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. LONG, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Punching Devices, of which the following is a specification.

This invention relates to a device for punching small holes transversely through metal bars, and the device will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 represents, in perspective, a round bar of metal and a square bar of metal with punched transverse holes, illustrating the product of my invention. Fig. 2 represents, in perspective, the punch and die adapted for use with square bars of metal, and Fig. 3 a vertical central section of the die when adapted for use with round bars of metal.

In the drawings, A represents a square bar of metal; B, a round bar of metal; C, holes disposed transversely through the bars; D, an ordinary punch, adapted for use in an ordinary punching-machine; E, an ordinary die-block similarly adapted; F, the die secured in the die-block; G, the punch-receiving aperture of the die; H, a bar-receiving aperture through the die transverse to the line of punch travel, and intersecting the same; I, a set-screw in the die-block for securing the die; J, a sub-die secured in the die below the aperture H; K, a set-screw in the die for securing the sub-die, and L the punch-receiving aperture below the bar-receiving aperture.

In the manufacture of machinery and metal work innumerable instances arise in which small holes are to be made transversely in metallic bars, as illustrated in Fig. 1, in which will be seen a hole through a round bar, a hole squarely through a square bar, and another hole cornerwise through a square bar, the holes in all cases being very small, not exceeding in diameter one-fourth the length. To produce these small holes through thick bars with cheap labor by punching process has heretofore been classed as impracticable, the work representing the most refined class of punching operations, one not to be thought of

in connection with work of the rougher and cheaper sort.

By means of my device the kind of punching illustrated in Fig. 1 becomes moved from the refined and extraordinary class to the common and ordinary class.

The bar-receiving aperture H is preferably made of a shape and size to fit the bars being operated upon, the aperture in Fig. 2 being shown as arranged for punching a square bar cornerwise, while in Fig. 3 the aperture is arranged to receive a round bar. The bar to be punched is passed through the aperture H, and the punch moved downward through the top of the die, through the bar, and a trifle into the lower part, L, of the punch-receiving aperture, the part L of the vertical aperture being really the cutting-die proper, while the part G serves as a guide above the bar, the walls of the aperture H serving to prevent movement or spread of the bar. The work produced is as clean and sharp as drilling. The aperture H need not necessarily conform to the shape of the bar being punched unless exceedingly neat work is required.

I have in practice made the aperture H square, and used the device so provided for both square and round bars. The die-block E forms no part of the improvement, it being an ordinary die-carrying device of a punching-machine. Its substitute may be found in any of the die-holding devices of the punching-machines.

For many, and, in fact, most kinds of work the sub-die J as a separable element will be omitted.

For many kinds of work, however, it is very desirable, inasmuch as it permits the cutting portion L to be readily sharpened by grinding at the top of the sub-die when removed, and it also permits the use of different sub-dies with the same die, the different sub-dies being, if desired, provided with differently-shaped cross-grooves adapted to the surface of round and square bars. In other words, the top of the sub-die may be notched or otherwise adapted to fit either round or square bars, while the aperture H remains unchanged for the different bars. The set-screw K serves to

keep the sub-die from falling out of the die when the parts are removed and being handled. When the parts are in position, this screw has no office and is not needed so long as the sub-die has a fair footing in the die-block or other die-holding device.

For extra fine examples of punching in finished bars, I contemplate having the aperture H of a form fitting closely to the bar and provided with keen sharp entrance-edges, whereby the bar being punched requires a slight forcing through the aperture, resulting in the cleaning of all punch-burrs from its surfaces.

I also contemplate the vertical splitting of the top of the die in line with the aperture H, and the provision of means for opening and closing the aperture upon the bar being punched, whereby I will effect a tight and perfect clasping of rough bars during punching operations.

I claim as my invention—

1. A die with a punch-receiving aperture through it, and with a bar-receiving aperture transverse to and intersecting the punch-receiving aperture.

2. A die with a punch-receiving aperture

through it, and a bar-receiving aperture transverse to and intersecting the punch-receiving aperture, the bar-receiving aperture having a form and size adapted to closely fit the bar to be punched.

3. A die having a punch-receiving aperture through it, a bar-receiving aperture through it transverse to and intersecting the punch-receiving aperture, and a sub-die inserted separably in the die, and carrying a portion of the punch-receiving aperture and reaching to the bar-receiving aperture, combined substantially as set forth.

4. The combination of the die with two apertures, the separable sub-die, and a set-screw in the die engaging the sub-die, substantially as set forth.

5. The combination of the die-block and its set-screw, the die with its two apertures, and the sub-die within it, the foot of the sub-die being supported by the die-block, substantially as set forth.

JOHN M. LONG.

Witnesses:

W. A. SEWARD,
J. W. SEE.