A. WATKINS.

METAL PUNCHING-MACHINE.

No. 185,991. Patented Jan. 2, 1877.

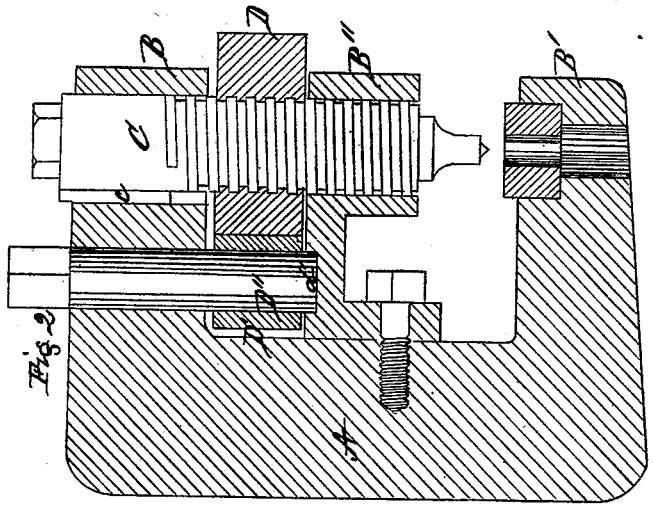

Fig. 2.

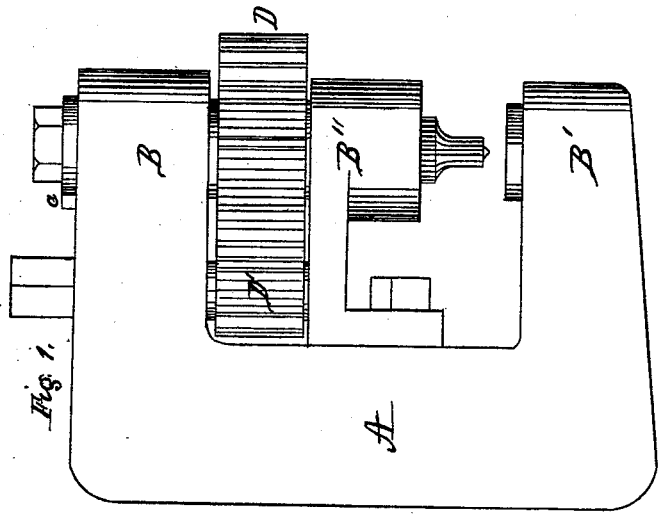

Fig. 1.

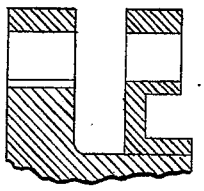

Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

ARTHUR WATKINS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF AND THOMAS G. AINSCOUGH, OF SAME PLACE.

IMPROVEMENT IN METAL-PUNCHING MACHINES.

Specification forming part of Letters Patent No. **185,991**, dated January 2, 1877; application filed April 28, 1874.

To all whom it may concern:

Be it known that I, ARTHUR WATKINS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Compound Screw-Punch; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is an elevation of my improved punch. Fig. 2 is a vertical longitudinal section of the same, and Fig. 3 is a reduced sectional view of the plain brackets through which the screw-punch passes.

My invention relates to that class of apparatus known as "compound screw-punch," used for punching boiler-plates and similar articles.

By my method of construction but one portion of the machine is liable to wear, said portion being the screw-nut hereinafter described, which is easily replaced.

I will now proceed to describe my invention, so as to enable others to construct and use the same.

A indicates the frame, which may be of the usual construction, or of the form shown in the drawing, having brackets B B″, through which pass the screw C, and also the die-bracket B′. The guides or openings through which the screw passes are made smooth, devoid of thread, and of a diameter just sufficient for the easy passage of the screw. C indicates the screw, the greater portion of its length of the usual construction, but supplied with a feather, *c*, which enters a recess in the upper bracket, so as to prevent the screw from turning. The lower bracket may also be provided with a recess, and a feather may be placed on the lower portion of the screw for the same purpose; or the feather may be on the inner side of the guides and the recess upon the screw. In any case, as the prevention of the revolution of the screw is to be attained, some sufficient means must be provided.

D represents a screw-nut, circular in form, cogged upon its outer surface, and supported upon the intermediate bracket B″. The thread on the inner side of this screw-nut corresponds with the screw, and is the means by which the same is raised or lowered. D′ indicates a pinion, the end of the shaft *d′* thereof being stepped on the bracket B″, the pinion gearing with the cog-nut D. The punch is of the usual form, shouldered, and secured to the screw by a spindle passing through the center of the same.

The bracket B″ serves as a support for the screw-nut and pinion by which the screw is operated, forms an additional guide for the screw-nut, and is extended downward for such a distance as will just leave sufficient space between the lower side of the bracket and the die for the introduction of the material to be punched, so as to cause the punch, in rising, to free itself from the metal.

The operation of my machine is as follows: Power, being communicated through shaft D″ and pinion D′ to the screw-nut D, causes said nut to revolve. The thread thereon, acting on the thread of the screw C on the principle of an incline or wedge, forces down said screw in a vertical line, the screw being prevented from rotating or turning by the feather *c* and recess, as above specified.

The advantages gained by the above construction are as follows: First, the frame or guides being plain, there is no liability to wear, such as occurs where they are threaded. The screw will not be liable to vibrate, and the punch can never strike and injure the die or be injured itself; nor can the screw be so spread by the collar of the punch that it will not rise, there being no corresponding thread in the guides to resist its upward movement. The peculiar method of gearing enables me to obtain great power at little expense of labor, and to operate the punch in a much smaller space than has been heretofore required, as, by means of the intermediate gearing, a two-foot leverage will give as much power as has heretofore been obtained from a lever three times that length.

All the wear of this machine is upon the screw-nut, which is of best cast-steel, and easily replaced.

Having thus described my invention, I claim—

The combination, with the frame A, brackets B B′, and intermediate bracket B″, of the splined screw-punch, the die, the cogged nut, and the pinion, all arranged and operating substantially as described.

In testimony whereof I, the said ARTHUR WATKINS, have hereunto set my hand.

ARTHUR WATKINS.

Witnesses:
W. N. PAXTON,
JAMES I. KAY.