

(No Model.)

C. P. O'NEILL.

PUNCH FOR PERFORATING SHEET METAL.

No. 389,404.

Patented Sept. 11, 1888.

Fig. 1.

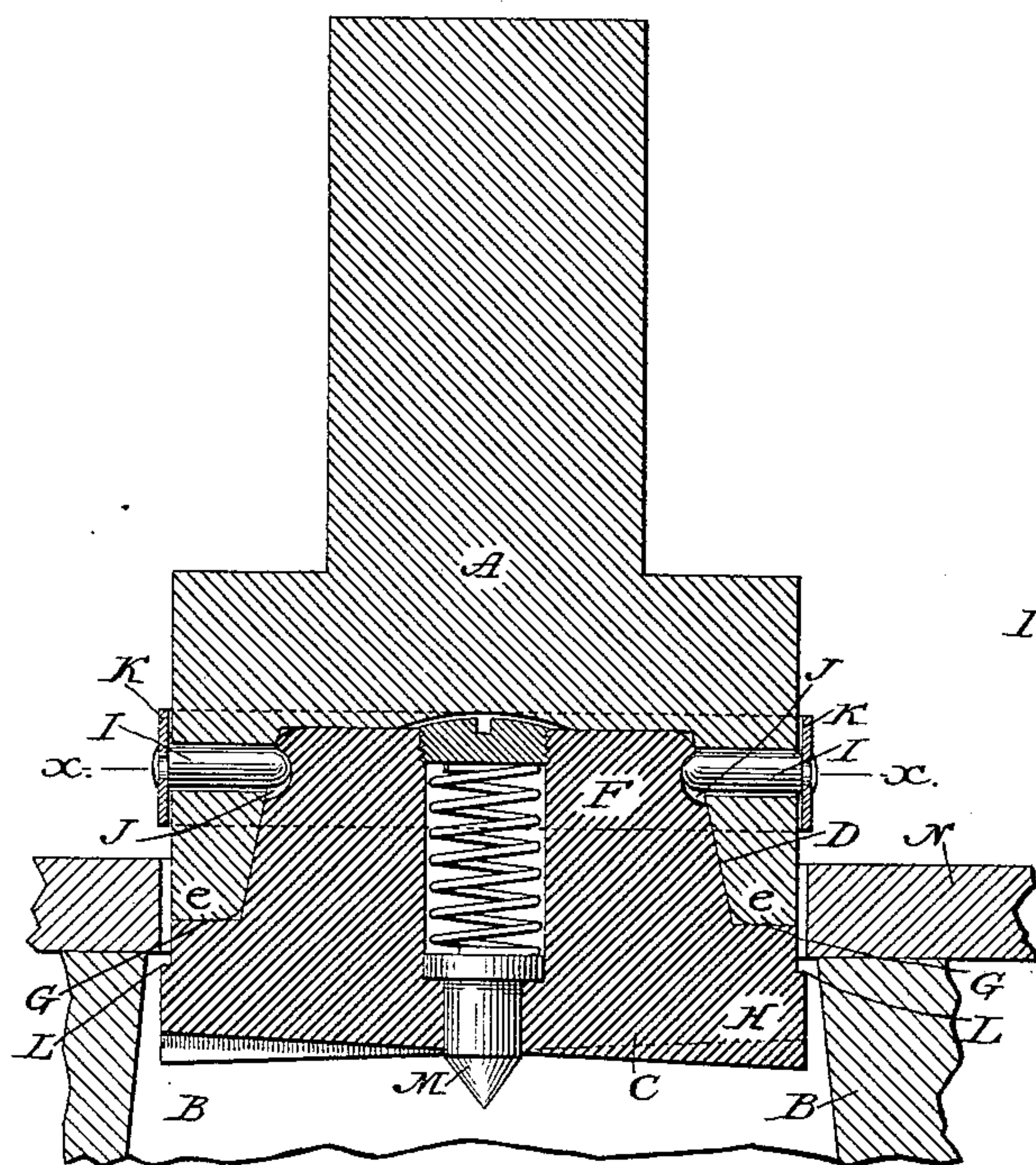


Fig. 2.

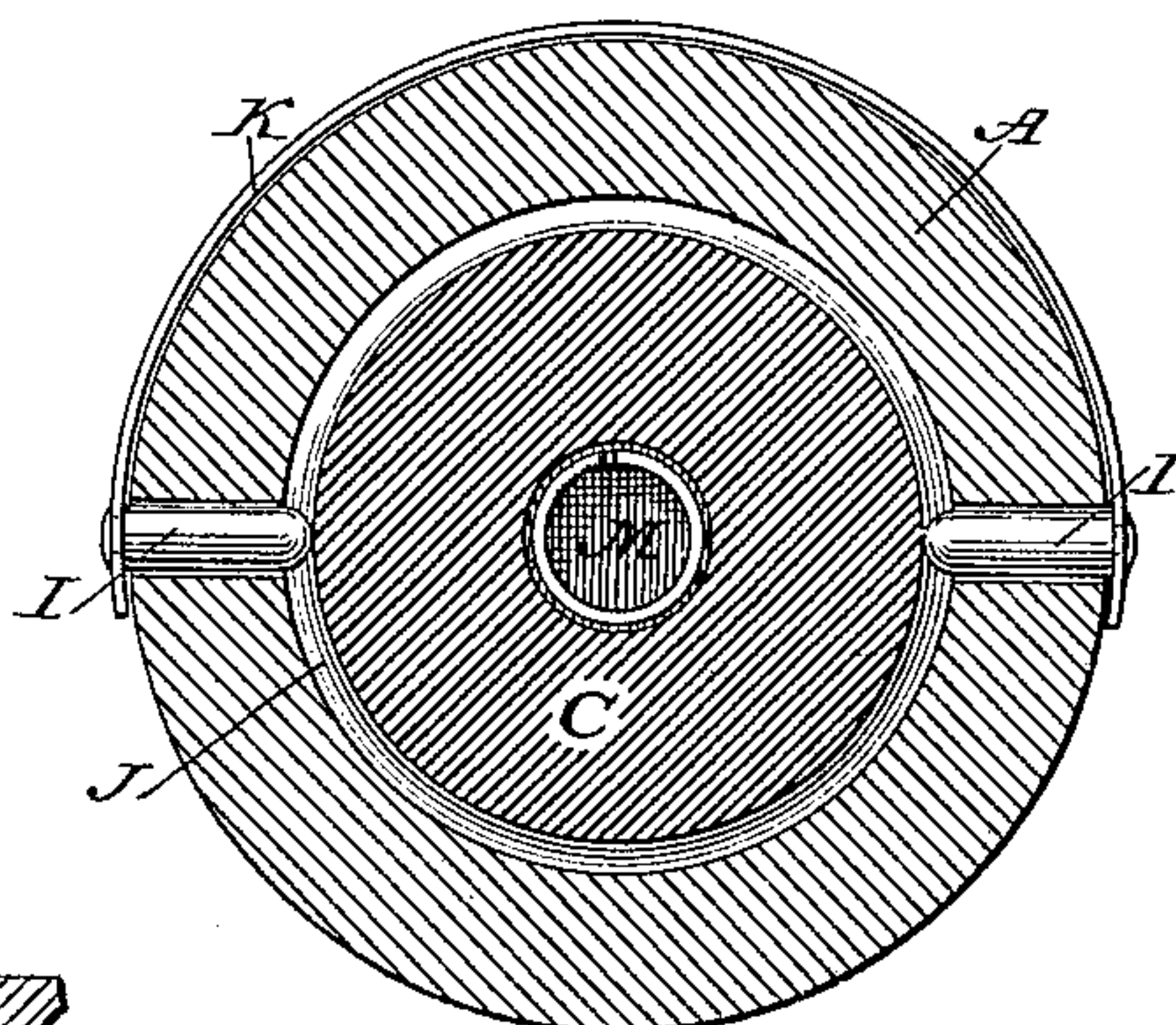
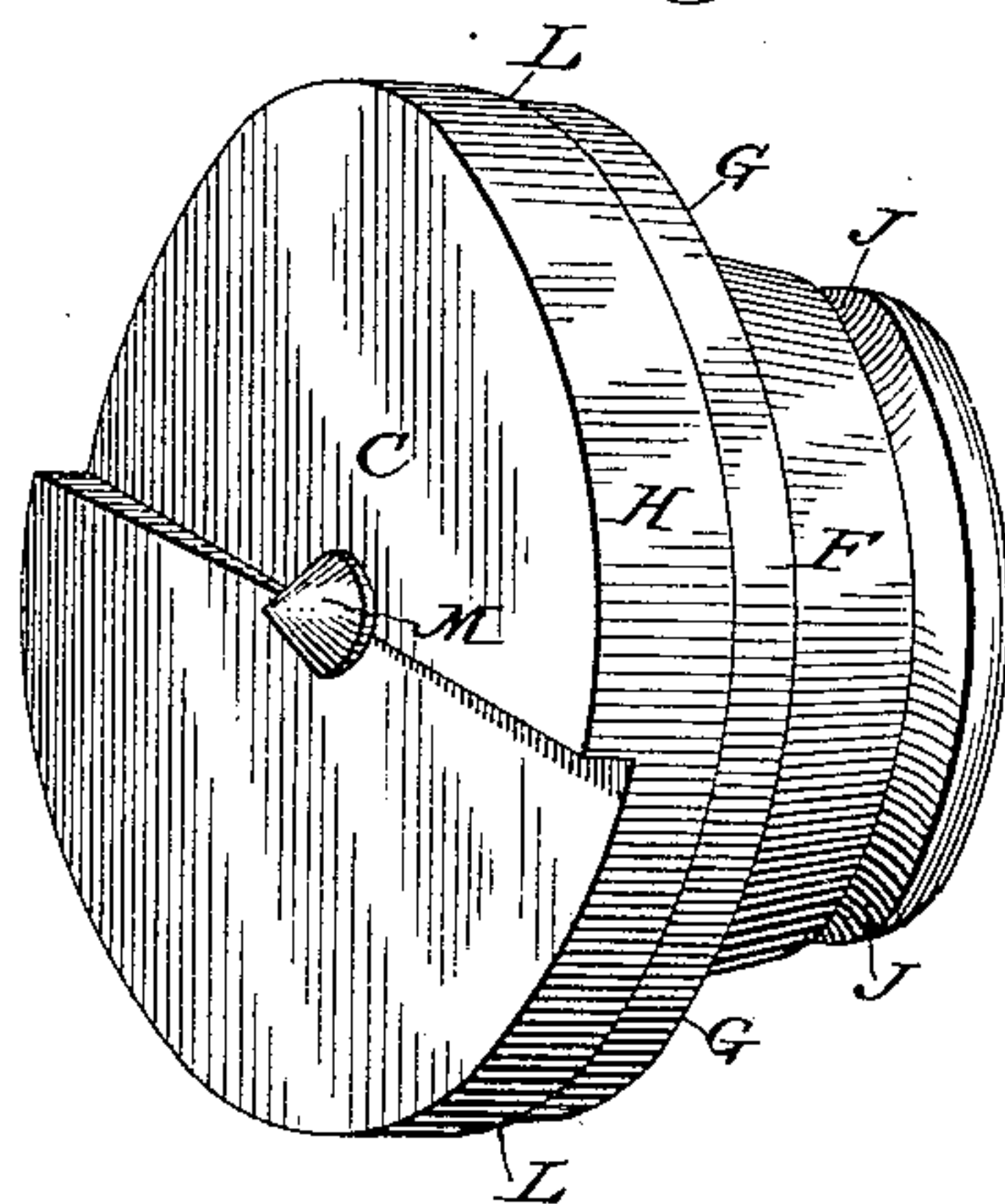


Fig. 3.



Attest:

A. N. Jesbira
E. M. Watson.

Inventor:

Charles P. O'Neill
By David A. Burr
Atty.

UNITED STATES PATENT OFFICE.

CHARLES P. O'NEILL, OF BROOKLYN, NEW YORK.

PUNCH FOR PERFORATING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 389,404, dated September 11, 1888.

Application filed March 21, 1888. Serial No. 267,970. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. O'NEILL, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Punches for Perforating Sheet 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, making a part of this specification, in which—

Figure 1 is a central vertical section of a punch-holder carrying my improved detachable punch, illustrating the punch in position after it has been forced through an iron plate. Fig. 2 is a transverse section in line *xx* of Fig. 1, and Fig. 3 a view in perspective of the punch detached from its holder.

My invention relates to punches used for perforating boiler-plates and other pieces of heavy sheet metal.

In punching holes in steel and iron plates in the usual manner with the customary forms of punches the tool after passing through the plate is drawn back out of the hole which it has pierced. This withdrawal is attended with more or less difficulty, because of the binding of the punch in the hole, and necessitates holding fast the plate, and also the exercise of considerable force and the loss of much time in feeding the punch.

The object of my invention is to expedite and facilitate the work by obviating the necessity for a retraction of the punch through the aperture pierced thereby; and it consists in the combination, substantially as is hereinafter described and claimed, of a self-detachable punch with a suitable head or holder, whereby after the punch has been driven through the metallic plate into the die it will be released from its head as the head rises and be left free to drop through the die.

In the accompanying drawings, A represents a suitable punch head or holder adapted to be attached to and operated by a power-press in any approved manner, and B the die fitted in the press under the head. As the press constitutes no part of my invention, it is not shown in the drawings. The under side of the head A is recessed, as shown in Fig. 1, to form an inwardly-tapering seat or socket, D, for the

reception of the punch C, leaving an annular face, *e*, encircling it.

The upper end of the punch C is formed with a tapering stem, F, the counterpart of the socket D, to fit snugly therein, and with an annular shoulder, G, to bear against the annular face *e* of the head. The diameter of the cutting-face H of the punch is made slightly larger than the diameter of the head A, so as to give proper clearance, and this enlargement of the diameter of the punch produces a slight circumferential shoulder, L, about its periphery, as shown in Figs. 1 and 3.

The punch is secured within the seat or socket D, provided for it in the head A, by means of two or more pins or catches, I I, which play loosely in radial apertures in the head, and whose inner ends enter and engage an annular groove, J, cut in the periphery of the stem F of the punch, the engagement of these pins with said groove being enforced by means of a semicircular spring, K, (see Fig. 2,) secured to the outside of the head, so that its ends shall bear against the outer end of each pin I and operate with an elastic pressure to force it inward.

As an equivalent for a single flat curved spring, K, I contemplate the use of a spiral spring coiled around each pin and seated in the head in manner to force the pin inward. Various other means for retaining the punch within its seat in the head by an elastic or yielding pressure sufficient to prevent its accidental withdrawal, but which will permit it to be readily detached, will suggest themselves to a skilled mechanic and need not herein be enumerated.

The punch C is provided, as is customary, with a yielding spring-actuated center point, M, seated in a central axial recess in the punch to project beyond its cutting-face, as shown in Figs. 1 and 2.

In the use of my improved punch it is inserted in its seat or socket in the head or holder A and retained therein by the engagement of the spring-actuated pins I I with the groove J, encircling the punch. The punch is then driven in the customary manner through the metal plate, N, to be perforated and into the die B, over which the plate has been placed. When the head A in the operation of the press is

lifted from the plate, the engagement of the annular shoulder L of the punch with the edge of the hole through which it has passed will hold the punch sufficiently to cause the spring-actuated pins or catches I I to yield and release the punch from the head. The punch thus set free will drop through the die, and may then be readily refitted in the head in readiness to be used again.

10 I claim as my invention—

1. The combination, in a punching machine, with its operating head, of a self-detachable punch secured to the head by a yielding catch, substantially in the manner and for the purpose herein set forth.

2. The combination, substantially as herein described, of the head or punch holder having a socket in its lower end, a punch having a stem adapted to fit in said socket, and an interposed yielding catch supporting the punch in manner to allow of its automatic detachment.

3. The combination, substantially as herein set forth, of the head having a socket in its lower end, the punch having a stem adapted to fit in said socket and encircled by an annular groove, transverse pins fitted loosely in the head to engage said annular groove, and a spring actuating said pins to enforce their engagement.

4. The combination of the head, the punch attached to the head by a yielding catch, and the hollow die through which the punch will drop when detached from the head, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES P. O'NEILL.

Witnesses:

A. N. JESBERA,
E. M. WATSON.