

R. Wood

Metal Punch

N^o 25,599.

Patented Sep. 27, 1859.

Fig: 1.

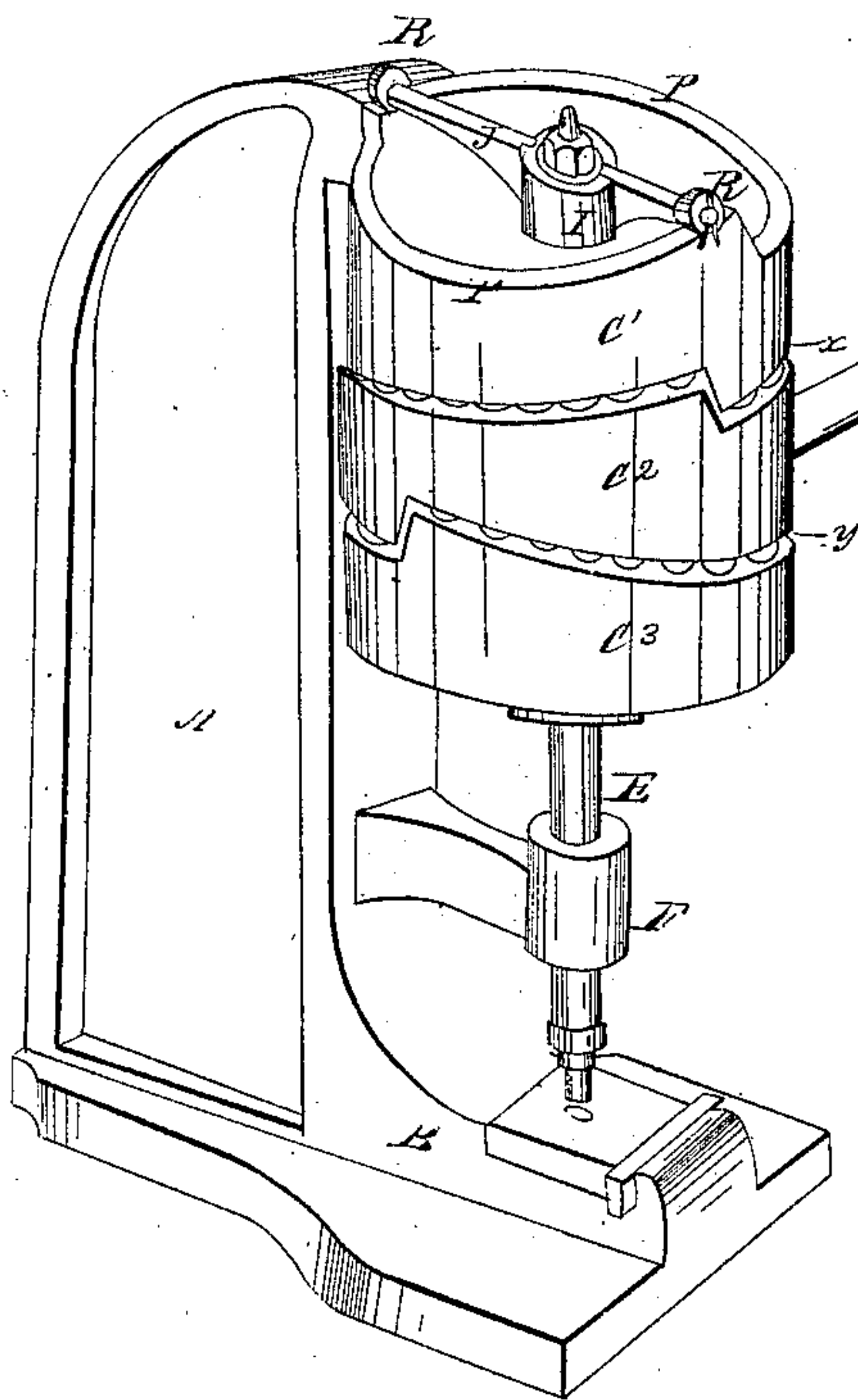
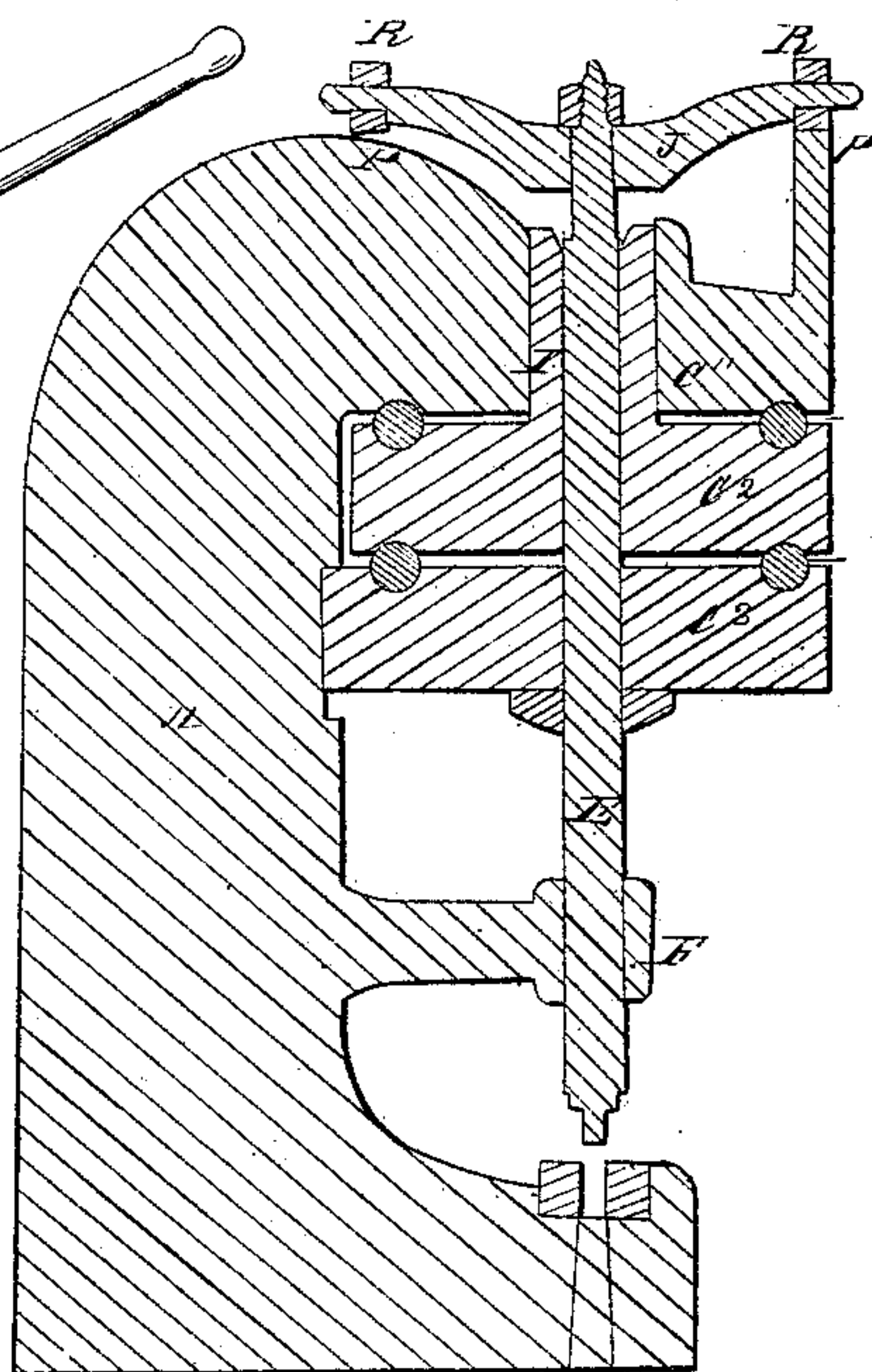


Fig: 2.



Witnesses:

*L. Bradley
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Inventor:

Reuben Wood

UNITED STATES PATENT OFFICE.

REUBEN WOOD, OF GRAND LEDGE, MICHIGAN.

HAND-PUNCH.

Specification of Letters Patent No. 25,599, dated September 27, 1859.

To all whom it may concern:

Be it known that I, REUBEN WOOD, of Grand Ledge, in the county of Eaton, in the State of Michigan, have invented a new and
5 useful Improvement on a Machine for Punching or Shearing Metals by Hand; and I do hereby declare that the following, is a full, clear, and exact description of the construction and operation of the same,
10 reference being had to the annexed drawings, making a part of the specification in which—

Figure 1, is a perspective view. Fig. 2, is a vertical section.

15 Similar letters indicate corresponding parts in both the drawings.

This improvement consists of two separate devices for depressing and elevating the punch by alternate motions of a lever, and consists in the use of a series of inclined planes, arranged in such manner that the wear of their contact surfaces shall be equal and uniform by causing the extent of such surfaces to vary in exact ratio with the
20 varied resistance or pressure experienced in making the cut, and in so connecting the lever with a cross bar that traverses two inclines at the upper end of the machine that the punch or other tool will be drawn
25 back with force and certainty by a reverse motion of the lever; the several parts being arranged relatively with each other in the manner I am now about to describe.

A represents the frame of the machine, of
35 cast iron, to the lower end of which a stout bracket B is cast, which projects forward horizontally to receive a die block that is secured in a socket under the punch, in the usual manner; viz. by keys or set bolts.

40 C', C², C³ are strong circular shaped plates, or in other words, short vertical solid cylinders, one of which viz. C', forms in fact a portion of the frame A, as it is cast on its extreme upper end, and further
45 strengthened by an overlapping arch on top, so that its whole diameter projects in line and parallel with the bracket B, and its center stands exactly opposite the center of the die block in said bracket.

50 The plates C² and C³ are placed below (C² being intermediate) and rest on a collar D, of the punch bar E, which is made to pass freely through the centers of all the plates and is steadied below in the bearing
55 F cast or bolted to the edge of the frame.

The bottom plate C³ is prevented from

turning around the punch bar, by a tongue on its edge which fits a groove in the edge of the frame so as to allow it to rise and fall with said bar.

Each line of contact between the faces of the plates as indicated by the letters *x*, *y*, consists of two equal and corresponding inclined planes formed on each contact face, the summits of which inclines are opposite
60 and in line with the center; but the summits of the inclines in the line *x* stand at right angles with those in the line *y*, and the angle of inclination is in a reversed position.

To diminish friction in machines for
70 heavy work, conical rollers may be interposed near the outer edge, or balls in sockets with a corresponding groove above the same.

L is a lever inserted in a socket, in the edge of the middle plate C², which turns
75 freely, around the punch bar E.

For the purpose of holding the two loose plates and punching bar in suspension and lifting the same by a reverse motion of the lever, I use the following means: A central
80 tube I is cast on the upper side of the middle or rotating plate C², which passes through the center of C', with freedom to turn in it. The upper end of this tube I is slotted across the middle and the bore is
85 enlarged where it projects above the plate, to receive the arm and eye boss of a cross bar J, which reaches from one side to the other, and is furnished at each extremity with a roller, marked R, R, which travel as
90 the cross bar rotates, on two equal inclined planes of an angle equal to the rise and fall of the punch bar, which passes through the tube I and through the eye of the said cross bar J, to which it is attached by a screw nut.
95

When the cross bar and rollers are at the summit of the inclined planes, and the punch bar is consequently at the highest point of elevation, a freedom must be left in the slot, tube and countersink in the (cross bar) to
100 allow the cross bar to sink in the said tube, a distance equal to one half the travel of the punch bar.

The operation of this machine is as follows: The lever L, being in a convenient
105 position for starting, when the surfaces of all the inclined planes are in full contact with their opposites, is pulled around by hand a distance equal to the incline which is half way around the circle, minus a small
110 amount for lap. This carries around with it the intermediate plate C², which acting like

a double wedge forces downward the plate C^3 , which abutting on the collar D drives down with it the punch bar E a distance equal to the sum of both inclines, at the same time preserving four opposite and intermediate points of resistance or contact between said inclines which diminish gradually in extent toward the end of the stroke. As the slotted tube I communicates a similar motion to the cross bar J, to which the punch bar is connected, said bar with its rollers descend the inclines P, P, with the punch, and reascend, drawing the punch up, by a reversed motion of the lever L.

15 In punching and many other operations on metals, the greatest amount of resistance is experienced at the beginning of the stroke, as a large amount of metal must be displaced at once; while toward the close, it becomes gradually less, and therefore, the within described arrangement of inclined planes for depressing the punch, has been found specially applicable, as the extent of rubbing or rolling surface diminishes in exact ratio with the pressure, which is applied uniformly, at four points equidistant around the punch bar.

The device for lifting the punch, unlike a spring, does not detract from the power

of the lever in making the cut, while it acts with great efficiency in extricating the punch from the hole, which is very liable to stick fast, if it is a little out of order as such tools are extremely apt to be.

I do not claim as new the use of a continuous inclined plane for producing pressure, as that is the principle of a screw, and wedge, but

What I do claim as my invention, and desire to secure by Letters Patent, is;

1. The peculiar relative arrangement of the two series of inclined planes, on the contact faces of the circular plates C' , C^2 , C^3 , to be used either with or without interposed balls, or rollers, in the manner and for the purposes, substantially as specified.

2. I claim the use of the slotted tube I, in combination with the two inclined ways P, P and cross bar J, (with or without the rollers R, R,) constructed and arranged substantially as herein described for the purpose of extricating and lifting a punch or other tool in the bar E, by a reversed motion of the lever.

REUBEN WOOD.

Witnesses:

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GEORGE JOHNSON.