J. NORTH.

PRESS FOR STRIKING UP METAL.

No. 51,960. Patented Jan. 9, 1866.

Fig. 3.

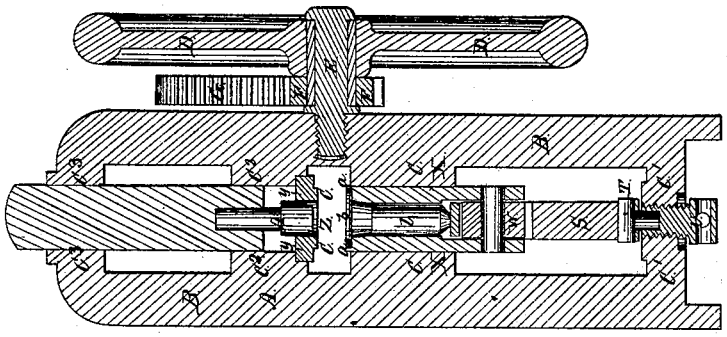


Fig. 4.

Fig. 2.

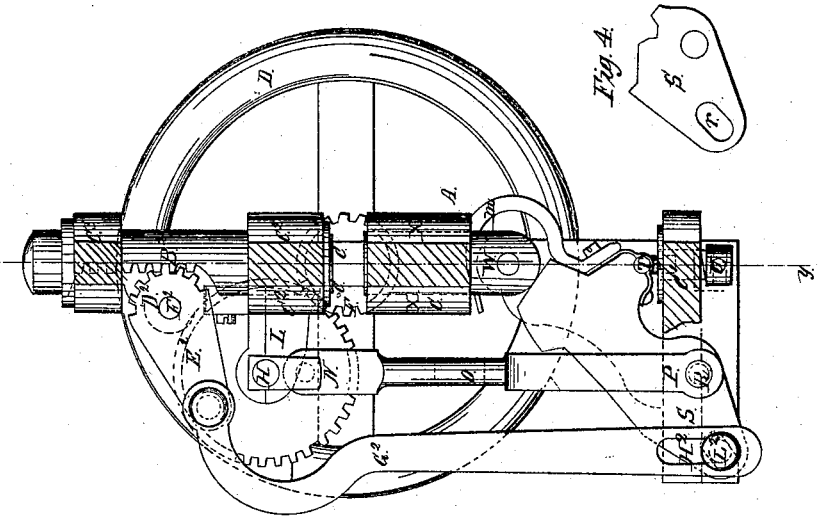
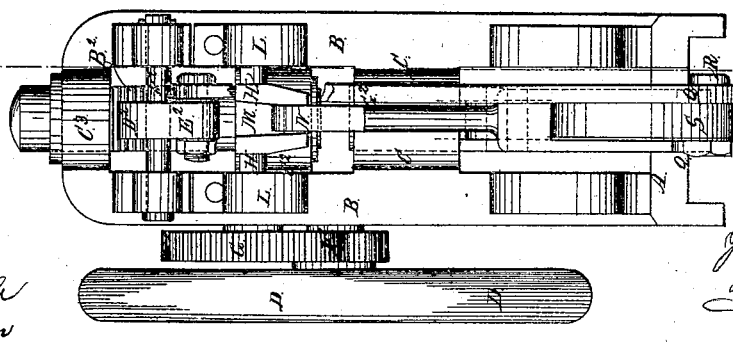


Fig. 1.



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UNITED STATES PATENT OFFICE.

JOHN NORTH, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PRESSES FOR STRIKING UP METAL.

Specification forming part of Letters Patent No. **51,960**, dated January 9, 1866.

To all whom it may concern:

Be it known that I, JOHN NORTH, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Press or Machine for Raising Metal; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The principal object of the present invention is to hold the metal plate in such a manner while being struck or raised up by the punch or die used that the portion of the metal so raised shall be perfectly free from all creases or wrinkles and of an even and smooth surface for its whole extent, both upon its outside and inside; and it consists in holding the edge or edges of the metal plate by and between a fixed collar of the machine and a movable hollow plug or shaft, so arranged and operated with regard to the said collar that when the plate has been properly placed or inserted upon the upper end of the shaft it (the shaft) shall then be made to travel up and toward the fixed collar, bringing the edge of the plate up and against the same, where it is held with sufficient tightness and pressure that as it is drawn or pulled out therefrom by the punch or die used, which is then brought to bear against it for raising or striking up, no wrinkles or creases shall be formed thereon, its raised surface being even and smooth throughout its whole extent, both upon its inside and outside, the hollow shaft, after the punch has thus performed its work, being then made to travel away from the fixed collar, carrying with it the so struck-up metal plate, while at the same time the punch is withdrawn and a suitably-shaped follower or ejector arranged upon the inside of the hollow shaft brought to bear against the plate for throwing it out or ejecting it from the same, when the machine or press is ready for another similar operation, first, however, having placed another metal plate within the same, as before described.

The peculiar arrangement of mechanical devices by which the above-described movements of the hollow plug, punch, and ejector are accomplished will now be explained in detail, reference being had to the accompanying plate of drawings, of which—

Figure 1 is an elevation of the back or rear side of the press or machine; Fig. 2, a vertical section taken in the plane of the line *x x*, Fig. 1; and Fig. 3, a transverse vertical section taken in the plane of the line *y y*, Fig. 2.

A A in the drawings represent the frame-work of the machine or press, consisting of two upright parallel standards, B B, placed a short distance from each other, and connected together by cross bars or braces C C at suitable points thereof, the said frame-work being made of sufficient strength and of the proper metal to withstand the powerful strains to which they are subjected in striking up metal plates therein, as will be presently described.

D is the balance-wheel of the machine, placed in a vertical position upon the outside of one of the standards B, and turning upon a short horizontal shaft, E, inserted therein, upon the inner face of which wheel, and revolving in conjunction with it upon its shaft E, is a small gear-wheel, F, interlocking by its teeth with the teeth of another and larger gear-wheel, G, the shaft H of which extends across from one standard to the other, turning in suitable bearings of the projecting portions L L thereof. The portion M of this shaft H, between the two standards, is made of a double-crank shape, on which is hung the upper end, N, of a connecting-rod, *o*, passing therefrom and secured at its lower end, P, between its arms Q Q by a pivot, R, to the cam-shaped bar or plate S, placed in a vertical position and turning upon a hinge-joint, T, at its lower edge, of the adjustable set-screw or plug U inserted within the lower cross-bar, C′, of the frame-work.

On the upper or cam edge of the plate S rests the rounded and lower end of a hollow plug or shaft, W, placed in a vertical position and moving in the cross guide-bar X of the standards, the upper end of which hollow plug has a raised lip or edge, *a*, entirely around the same, in which the metal plate which is to be struck or raised up is placed or laid, as shown in Fig. 3 at *b*.

Above the hollow plug, and a short distance therefrom in the same vertical plane, within the lower side of the cross-bar C^2 of the standards, is inserted and fixed, in any suitable manner, a ring or collar, Y, the lower surface of which, and extending entirely around its opening Z, is formed with a raised edge or shoul-

der, *c*, of such a shape and size as to fit within and around the raised lip of the hollow plug before referred to when the plug is brought up and against the collar, as will be presently explained.

A^2 is the punch or die, placed in the same vertical plane with the hololw shaft or plug W, and moving in and through the fixed collar Y and the upper cross-bar, C^3, of the standards. The lower end of this punch is made of a conical or tapering shape for a short distance of its length, corresponding to which in shape, but of a little larger diameter, the upper end of the hollow plug is rimmed out or formed as plainly shown in Fig. 3.

Upon the back or rear side of the punch-shaft, between the cross-bar C^3 and the next lower one, C^2, on which the collar Y is fixed, a toothed rack, B^2, is formed, with the teeth of which engage the teeth formed upon the end D^2 of the crank-arm E^2 of a transverse horizontal shaft, F^2, turning at each end in bearings of the standards B B, the outer end of said crank-arm being connected through a vertical connecting-rod, G^2, with the cam-plate or bar S, before referred to, by a short vertical slot, H^2, in the lower end of said rod moving upon and over a pin, L^2, inserted in the face of the cam-plate at or near its rear portion.

The operation of the machine, arranged as above described, is as follows: The metal plate which is to be struck or raised up is first placed upon the upper end of the hollow plug or shaft W, as before explained, when, the balance-wheel D being turned in the direction represented by a red arrow in the drawings, the hollow plug, through the devices connecting it therewith, is made to travel up and toward the fixed collar, against which it brings the edges of the said plate, where it is tightly held while the punch descends and acts against it, drawing it out therefrom and raising or striking it up into a form corresponding to it, the hollow plug holding it against the fixed collar with sufficient pressure to prevent it from being creased or wrinkled as it is so formed by the punch, and the cam-surface of the plate being of such a shape as to thus raise the hollow plug and retain it against the fixed collar during the said movement of the punch, when, the revolution of the balance-wheel being continued, the hollow plug and the punch both travel back to their original positions, and the press is ready for another and similar operation, the plate thus struck or raised up in the same being first withdrawn or removed.

To remove the plate from the press after having been struck up as above explained, I insert within the hollow plug, and concentric therewith, a loose follower or ejector, *l*, under which, as the plug travels back from the fixed collar, the outer end of a curved-shaped arm, *m*, secured to the cam-plate moves, the said arm being of such a shape as to cause the said follower or ejector to be raised sufficiently within the hollow plug as to throw out the struck-up plate in its upper end.

To adjust the pressure or tightness with which the metal plate is held against the fixed collar, it is only necessary to raise or lower the set-screw or plug to which the cam is hinged, according as it is desired to have the pressure greater or lesser, as is evident without further explanation.

In Fig. 4 one end of the cam-plate S is shown with a slot, *r*, in the same, through which the pin of the connecting-rod G^2 passes, whereby the leverage of the operating devices for the punch or die upon it (the punch) can be increased or decreased at pleasure by simply setting the said pin farther from or nearer to the fulcrum of the cam-plate.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the stationary collar Y, movable plug or shaft W, cam S, and adjusting-screw U, all constructed, arranged, and operated in the manner set forth.

2. In combination with the above, the punch A^2, constructed and operating as described.

3. Operating the punches A^2 and W by means of the cam S, constructed and arranged substantially as described.

4. The cam-plate S, hollow plug or shaft provided with a follower or ejector operated by the curved arm of said cam, or its equivalent, arranged and connected together and with the driving-power used, substantially in the manner described, and so as to operate with regard to the fixed collar of the machine, as and for the purpose specified.

The above specification of my invention signed by me this 18th day of August, 1865.

JOHN NORTH.

Witnesses:

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