

W. Churchill.

Metal Punching Mach.

N^o 89,851.

Patented May 11, 1869.

Fig. 1.

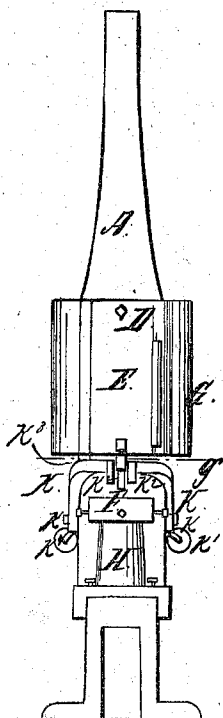


Fig. 2.

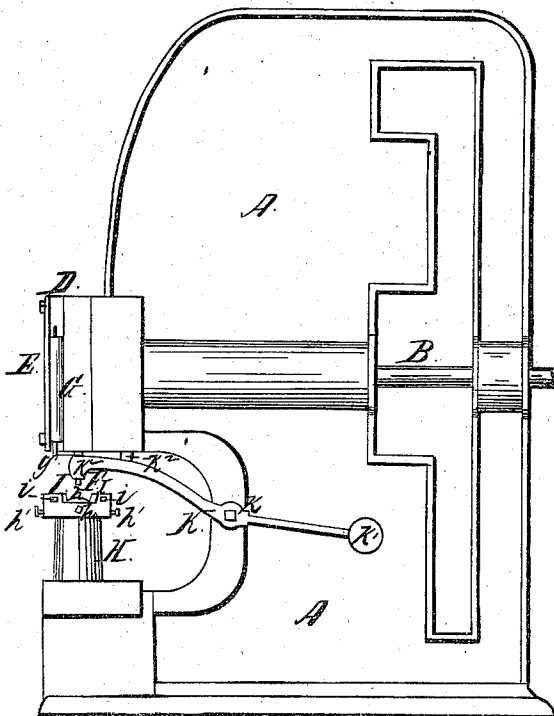
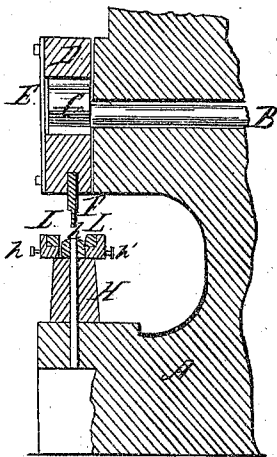


Fig. 3.



Witnesses:
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WILLIAM CHURCHILL, OF ST. LOUIS, MISSOURI.

Letters Patent No. 89,851, dated May 11, 1869.

IMPROVED PUNCHING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM CHURCHILL, of St. Louis, in the county of St. Louis, and State of Missouri, have made certain new and useful Improvements in Machines for Punching and Straightening Bars of Iron and Similar Metals; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of this invention relates to the adaptation of guiding and straightening-plates, in such position, with reference to the die of a punching-machine, that said straightening-plates shall not only keep the bars which are being punched "true" and straight, but that in the compressive action performed in punching, the bars shall be made true, if sprung or curved on their longitudinal edges; and the nature hereof relates, furthermore, to such an arrangement of the "take-off," or frog, which is used ordinarily to strip the punched bar off the punch, when the latter is on the up-stroke, as will again true the plate which is being punched by straightening its horizontal surfaces; and the special advantage hereof is in preventing the usual very tight engagement of the bent, or curved plate on the punch itself, while the general advantage of the several features of this invention is in avoiding the usually necessary process of straightening and truing up the bars after punching.

To enable those skilled in these arts to make and use my said improvements, I will now describe the same more fully, referring to the accompanying

Figure 1 as a front elevation, and

Figure 2 as a side elevation, and

Figure 3 as central sectional elevation, showing the adaptation of my said improvements to the ordinary punching-machines.

I construct the housing, or frame A, of the usual form, and generally of cast-iron, supporting in and upon said frame the operating parts hereinafter described.

The driving-shaft B runs centrally across the frame A, being journaled therein in the usual manner. Said shaft is driven by gearing, in any of the usual modes.

At the forward end of said shaft B is the driving-eccentric C, which produces a reciprocating motion of the slide D.

This slide is guided in V-shaped side slides of the housing A, in the usual manner.

A front plate, E, may be arranged on the slide D, secured by screws e, so that when removed the wearing-surfaces of the eccentric C and slide D may be oiled and refitted.

To the lower end of the slide the punch F is secured in the usual manner.

In order to oil the punch F, I arrange the oil-vessel G on the slide D, having at its lower end the tube g, of such fineness of bore that drop after drop of oil may flow therefrom to the punch. The tube g extends to upper edge of the punch F, and there may

be a slot arranged in the side of the upper rectangular part of the punch F for the downward flow of the oil to the cutting-edges.

The impetus imparted to the oil by the punch in descending will aid its freer discharge at the time of punching, and thus an economical and efficacious application of lubrication will be achieved.

On the lower part of the housing A, I support the die-block H. This carries the die h, the block and die being arranged with the usual vertical slot for discharge of the punchings or chips. The upper surface of the die h will usually be rounded or otherwise shaped, to conform to the surface of the plate which is to be punched, and to give the same a firm support.

The set-screws h' are arranged for adjusting the die laterally in its position in the vertical line of traverse of the punch.

It is well known that ordinarily, in punching metallic plates, owing to various causes—such as inequalities in the texture of the material, unequal support of the plate while being punched, unequal lubrication during the cutting, &c.—the punched plate warps and springs, and these plates must therefore ordinarily be straightened after punching. To avoid said warping and springing, I have arranged in the manner following:

In the direction of the greatest length of the plate to be punched, and usually in the direction of the line of motion in which the plate is moved forward in punching the consecutive holes, I arrange the straightening-plates I. These are usually of steel, and are secured adjustably in the die-block H by set-screw i, fitting nicely to the longitudinal edges of the punched plate.

The said plates I, have slightly bevelled inner edges, and may be of any other form of edge corresponding to the adjacent bearing-edge of the plate to be punched.

As the punch descends, the plate thereunder is pressed between said guide-plates I, being straightened and held in its correct form while under the action of the punch.

When the punch rises, the plate must be stripped off of it. This is done by the "take-off," or frog K, which is hinged to the main frame at k, and is arranged with the weights k', in order that it may remain up, and allow a new plate to be inserted, or the punched plate to be moved as required.

The said frog K has two prongs k², which are arranged like forks about the punch F; and to prevent the prongs k² from rising too high, the lip k³ is arranged on the upper edge of K, so that it may strike the frame A, and being then prevented from rising higher, the punch will withdraw from the punched plate in its further upward motion.

In order, however, that the plate being punched, may not bend, I arrange the prongs k² so that the slide D, in passing down, and forcing the punch through the plate, shall press the said prongs upon the plate being punched, and thus hold it from springing.

In order that these parts may be adjusted to various

sizes of plate, lining-strips of thin sheet-iron may be placed on the upper edges of the prongs k^2 .

It will be seen, then, that in punching the ordinary flat bar-iron, the longitudinal edges will be held true by the guide-plates I, and that these plates, under the compressive action of the punch F and the prongs k , will moreover act to straighten and "true up" any warps, or bends which might be originally in such bars; and, again, the prongs k^2 will not only straighten the flat surfaces of the plate being punched, but will hold it in a true horizontal position, thus preventing the plate from bending on the punch, and tightening on it at the upper plate-surface, and thus it becomes easy to strip the said plates from the punch in the up-stroke thereof.

The latter consideration is important, since a bent plate is forced tightly around the punch, on its upper

surface, so that it requires great power to strip the plate off.

The special application of the said invention is in punching the tie or fish-bars now used in the so-called fish-joint for railroad-rails, but the general application is to all similar work of punching.

Having thus fully described my said invention, What I claim, is—

1. The hinged and weighted take-off K, and its prongs k^2 , operating with the slide D to hold the plate when being punched, substantially as set forth.

2. The die h , straightening-plates I, punch F, and take-off K, arranged and combined substantially as set forth.

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