(No Model.) 2 Sheets—Sheet 1.

F. B. MILES.

METAL PUNCHING MACHINE.

No. 262,082. Patented Aug. 1, 1882.

FIG. 1

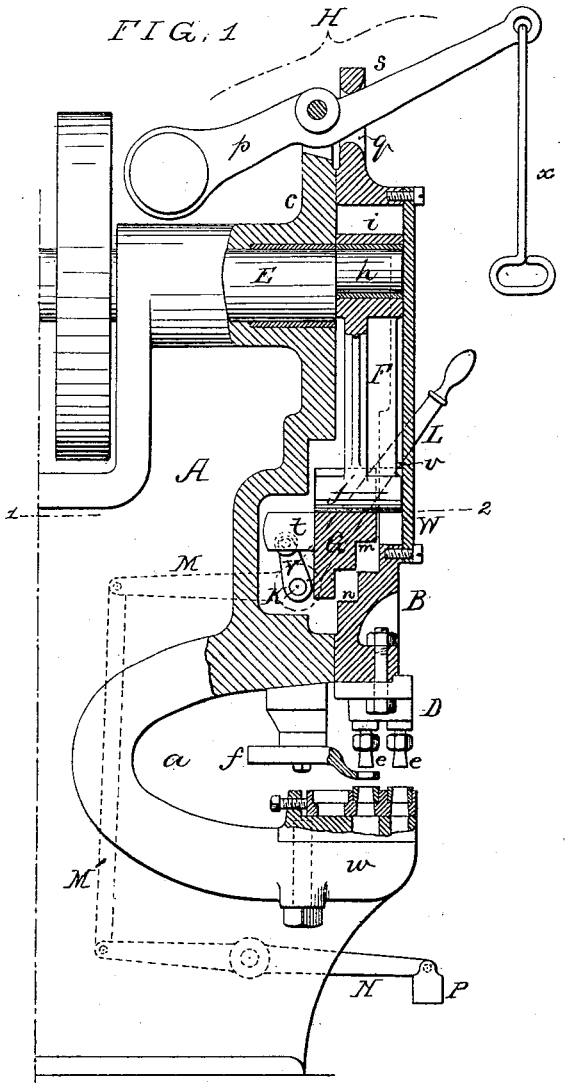
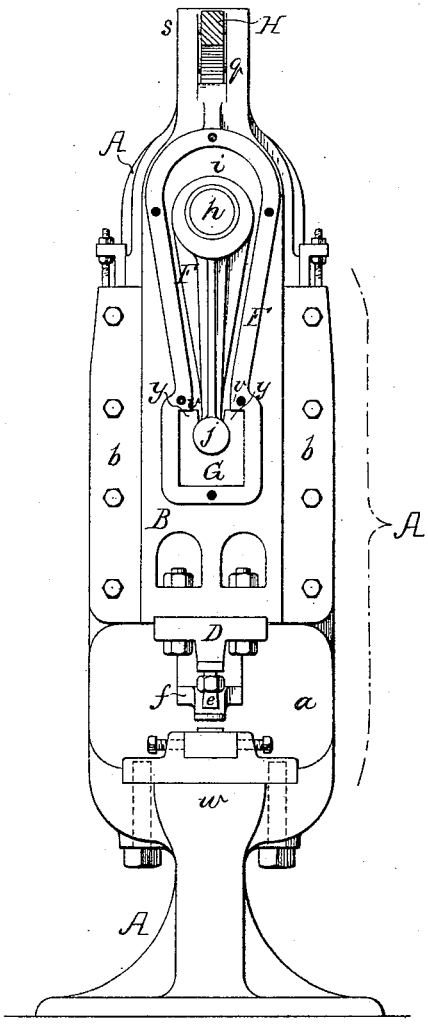


FIG. 2.



Witnesses
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Inventor:
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by his Attorneys.
Howson and Sons

(No Model.) 2 Sheets—Sheet 2.

F. B. MILES.

METAL PUNCHING MACHINE.

No. 262,082. Patented Aug. 1, 1882.

FIG. 3.

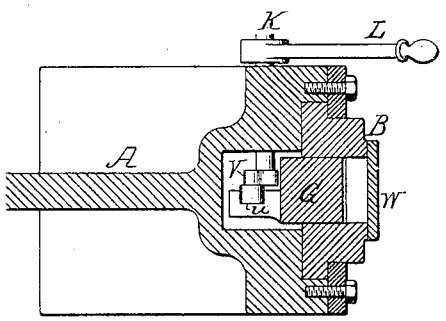


FIG. 4.

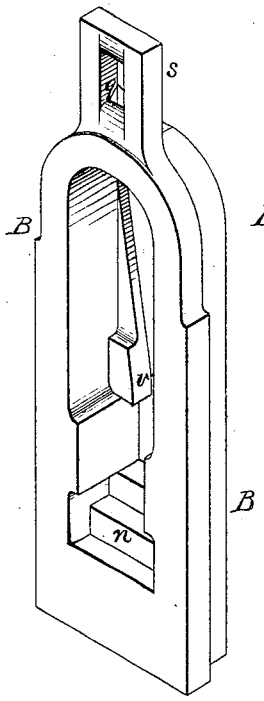
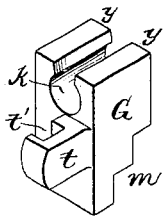


FIG. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK B. MILES, OF PHILADELPHIA, PENNSYLVANIA.

METAL-PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 262,082, dated August 1, 1882.

Application filed September 27, 1881. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK B. MILES, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Metal-Punching Machines, of which the following is a specification.

My invention consists of a punching-machine constructed in the peculiar manner fully described hereinafter, for the purpose of enabling the operator to adjust the punches to a marked plate or other object to be perforated before the power of the machine is exerted to force the said punches through the metal.

In the accompanying drawings, Figure 1, Sheet 1, is a side view, partly in section, of a portion of a punching-machine illustrating my invention; Fig. 2, a front view; Fig. 3, Sheet 2, a sectional plan on the line 1 2; and Figs. 4 and 5, perspective views, illustrating detached parts relating to my improvements.

The main frame A of the machine is recessed at *a*, as in other punching-machines, for receiving the plate or other object to be punched, and has vertical guides *b b* for the main slide B, which is shown in perspective in Fig. 4, and to the lower end of which is secured the punch-carrier D, provided in the present instance with two punches, *e e*. The projecting portion *w* of the frame supports the dies on which the object to be punched rests, and between the punches and the dies is the usual stripper, *f*.

E is the driving-shaft, adapted to suitable bearings in the upper portion of the main frame, and having an eccentric or crank pin, *h*, which passes through and fits snugly in the upper end, *i*, of the connecting-rod F. Instead of hinging the lower end of this rod directly to the punch-carrying slide, as in other punching-machines, it is connected to a block, G, the rod having a horizontal cylindrical end, *j*, so adapted to a recess, *k*, in the block G that the latter can be moved to or fro on the said cylindrical end, which, however, is free to vibrate in the block, the latter having a vertical reciprocating movement commensurate with the eccentricity of the pin *h* in respect to the driving-shaft.

It will be seen on referring to Figs. 1, 4, and 5 that the under side of the block consists of a series of steps, *m*, and that the bearing for the block within the slide also consists of steps *n*.

A lever, H, is pivoted to an extension, *c*, of the frame A, one arm, *p*, of this lever being weighted and the other arm passing through an opening, *q*, in an extension, *s*, of the slide B, the tendency of which is to rise, owing to the said weighted arm *p* of the lever H.

The connecting-rod F is contained within an opening in the slide of sufficient size to permit the free lateral vibrating of the said rod and the free vertical movement to a limited extent of both rod and slide independently of each other, the opening in the slide extending so far upward that when the said slide is at the limit of its downward movement the upper end of the connecting-rod, as it is operated, will be clear of the upper end of the said opening.

The block G has at the rear a projection, *t*, Fig. 5, into a vertical slot, *t'*, in which projects a pin, *u*, Fig. 3, on an arm, V, secured to a shaft, K, which has its bearings in the frame of the machine. To this shaft is secured a lever, L, and an arm, M, connected by a rod, M', to one arm of a lever, N, which is pivoted to the frame, and the other arm of which is provided with a stirrup, P, the lever M, rod M', and part of the lever N being shown by dotted lines in Fig. 1.

It will be seen on referring to Figs. 1 and 4 that there are in the slide two internal projections, *v v*, for the portions *y y*, Fig. 5, of the block G to bear against under the circumstances explained hereinafter. When the driving-shaft is rotated and the block G is in the position shown in Fig. 1 it will be reciprocated without imparting any motion to the punch-carrying slide B, as the steps of the block clear those of the slide, and as the upper end of the block is clear of the above-mentioned projections *v v*. The operator introduces the marked plate between the dies and the stripper-plate, and by means of the rod *x*, suspended from the long arm of the lever H, lowers the slide B until the punches are in contact, or nearly so, with the plate, which the operator now adjusts so that its marks coincide exactly with the said punches. After this adjustment the operator, by manipulating the lever L or depressing the stirrup P with his foot, moves the block G forward until its steps *m* are directly above the steps *n* in the slide and the upper portions, *y*

y, of the said block are beneath the projections *v v* of the said slide, which will now be depressed by the eccentric pin *h*, the punches passing through the plate at the marked points. On the return or upward movement of the block it is retained in the last-mentioned position, so that the upper end of the said block, bearing against the internal projections, *v v*, will raise the slide and strip the punches from the plate, and when this has been effected the block can be at once moved back to its first position, where it ceases to control the slide, the punches of which can be adjusted to other hole-marks in the plate prior to a repetition of the above-described operations.

It is not essential that the machine should be provided both with the lever L for operating the block G and with devices for operating it by the foot; but both are generally furnished, so that the operator can select either of the two devices.

The arrangement of the under side of the block and the bearing for the same in steps is for the purpose of restricting the movement of the block without any diminution of its bearing-surface or that of the slide. A plain block without steps might be used; but this would demand an inconveniently-extended movement of the block if its bearing-surface should be as extended as circumstances require.

A plate, W, Fig. 1, is secured to the slide in front of the opening in the same, and serves to maintain the connecting-rod F in place, this plate being omitted in Fig. 2.

I claim as my invention—

1. The combination, in a punching-machine, of a punch-carrying slide and mechanism for raising and lowering the same independently of the driving-shaft of the machine, with an adjustable reciprocating block, G, operated from the driving-shaft, and with mechanism whereby the said block may be adjusted to the slide, so as to control the same, or from the slide, so as to free the same from the control of the said block, all substantially as set forth.

2. The combination of the connecting-rod F, adapted at its upper end to the eccentric pin *h* of the shaft E, and terminating below in a horizontal cylinder, *j*, with a block, G, adapted to and adjustable on the said cylinder, all substantially as set forth.

3. The combination of the vertically reciprocating and adjustable block G with a slide having bearings for the under side of the block and projections *v v* for the upper side of the said block, substantially as specified.

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

FREDK. B. MILES.

Witnesses:

HARRY DRURY,

HARRY SMITH.