

1,048,560.

2 SHEETS—SHEET 1.



E. B. Gilchrist
H. B. Sullivan

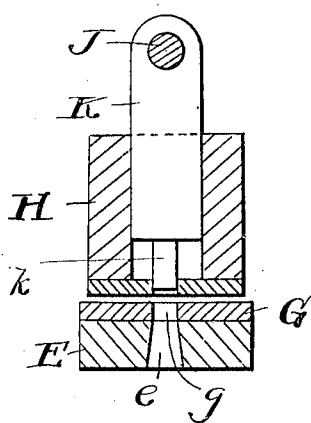
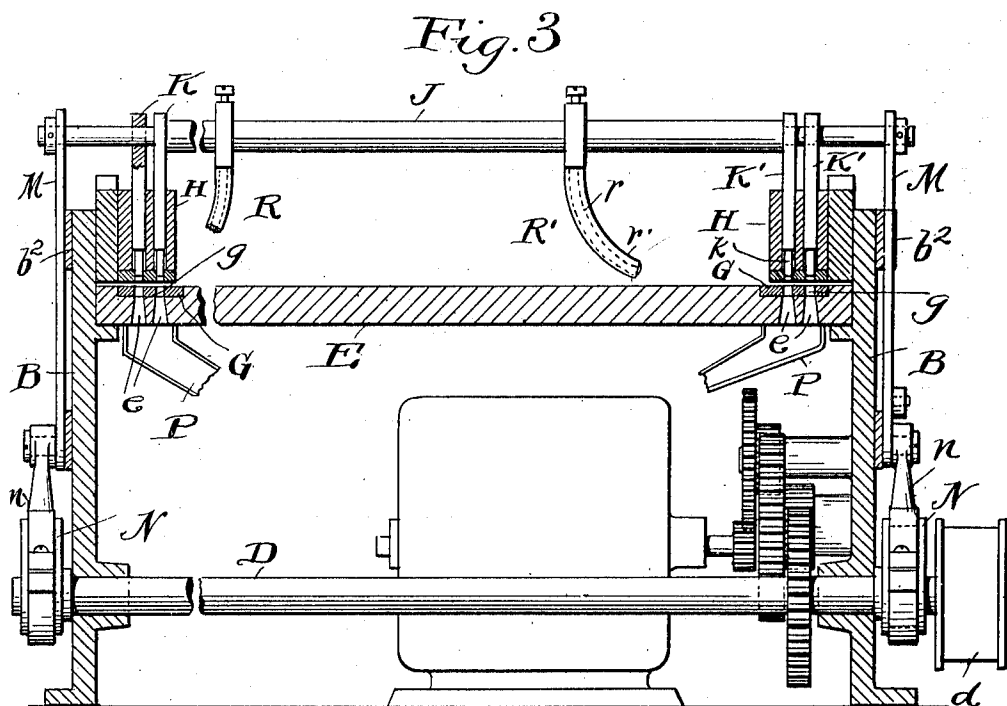
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T. A. McCALL.
PERFORATING MACHINE.
APPLICATION FILED MAR. 8, 1912.

1,048,560.

Patented Dec. 31, 1912.

2 SHEETS-SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS A. McCALL, OF CINCINNATI, OHIO, ASSIGNOR TO THE NATIONAL AUTOMATIC TYPEWRITER COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

PERFORATING-MACHINE.

1,048,560.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed March 8, 1912. Serial No. 682,499.

To all whom it may concern:

Be it known that I, THOMAS A. McCALL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Perforating-Machines, of which the following is a full, clear, and exact description.

The object of this invention is to provide simple mechanism which will act automatically to form, rapidly and at absolutely regular intervals, driving perforations in and near the longitudinal edges of a long paper strip which is to be subsequently perforated so as to be capable of serving to control the action of mechanism, such as typewriting operator mechanism, piano players, and the like.

The invention consists in the construction and combinations of parts hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is a plan view thereof. Fig. 3 is a transverse sectional view in the plane indicated by line 3—3 on Fig. 2; and Fig. 4 is a sectional view of one of the punches and the parts associated therewith.

A represents a roll on which is wound the paper strip to be perforated, which roll is hung loosely in bracket arms *b* fixed to the frame members B of the machine.

C represents a roll on which the perforated paper strip S is finally wound, which roll is hung in other fixed brackets *b'*. The spindle *c* of this latter roll has a pulley *c'*, over which the belt F runs. This belt runs also over a pulley *d* fixed to a driving shaft D, which extends transversely and is mounted in bearings in the two side members of the frame. The belt is sufficiently loose to enable it to slip, if necessary, but sufficiently tight to enable it to turn the receiving roll C as much as is necessary to take up the slack of the paper.

A horizontal cross bar E extends between and is fixed to the side frame members. Near its ends, hardened die plates G are inset into its upper surface, which die plates have holes *g* registering with holes *e* below

them in the bar E. Punch guide blocks H are fixed to the side frame members, and each of these has two vertical guide holes in which the reciprocating punch bars K, K' and K', K' are guided for vertical movement. The punches *h* on the lower ends of these punch bars are adapted when the said punch bars are moved downward to enter the holes *g* in the die plate. These four punch bars K, K, K', K' are secured to a vertically movable horizontal bar J which extends transversely across the machine, its ends being connected with the upper ends of the two slides M, M, which are mounted for vertical endwise movement in guideways *b²* fixed to the side frame members. On the shaft D and at opposite ends thereof are the two eccentrics N, N, whose eccentric straps *n, n*, are pivotally connected with the lower ends of the bars M. When the shaft D is rotated, the four punches will, through the described mechanism, be moved up and down, said punches *h* descending far enough to punch holes in the paper strip which runs across the bar E. Below the holes *e, e*, chutes P are fixed to receive the paper disks punched from the paper, and to carry them to a scrap receiver.

The paper strip S passes over the bar E, as stated, and its edges pass likewise beneath the lower ends of the punch guides H, which lower ends are placed pretty close to the bar E, so that the paper is prevented from buckling or crinkling at the points where the perforations are to be made. To keep the paper straight, however, entirely across the bar while the perforations are being made, four resilient pressure bars R, R, R', R' are employed, the two pressure bars R, R, at the left side being curved to the left, and the two pressure bars R', R', near the left side being curved to the left. These four bars are fixed to the reciprocating bar J. Each of these pressure bars consists preferably of a flat spring *r* over which a rubber sheath *r'* is drawn. When the bar J descends, these spring pressure bars will strike the paper at the merest instant before the punches strike it, and will press it down upon the bar and by resisting bending will tend to push it in both directions laterally,

so that when the punches descend this paper will be entirely flat.

Two levers *T* are pivoted to the side of the frame, and a roller *t* is mounted in their outer ends, which roller rests on top of the paper roll, serving to keep the paper flat, and acting as a brake to prevent the too rapid unwinding of the paper from the roll. This roller has also two collars *t' t'*, which by engaging the edges of the paper, help to guide it, and to keep the roll of paper in the proper position.

Two levers *U* are respectively pivoted to the frame which is composed of the two levers *T*, and roller *t*, and hang at an angle downwardly therefrom, and a roller *u* is mounted in their ends. This roller rests upon the paper strip and automatically takes up any slack therein, and holds it taut. After leaving the roller *u*, the paper strip passes over a guide roller *w* and thence over the bar *E*.

The feed mechanism consists of a roll *Q* whose spindle is mounted in the side frame members. This roll has near each end two circumferential rows of radially projecting driving spurs *q*. The ratchet *q'* is fixed to one end of this feed roll spindle. A bell crank lever is pivoted to one of the side frame members, and it carries a pawl *v'* for engagement with this ratchet,—a spring *v²* acting to preserve this engagement. In the horizontal arm of this bell crank lever is a slot *v³* which embraces a pin *m* fixed to one of the vertical movable bars *M*. Every time this bar moves up, it rocks this bell crank lever, and this lever, through pawl *v'*, acting on ratchet *q'*, turns the feed roll through a definite arc. A spring *y* engaging with this ratchet acts as a brake to prevent the feed roll from turning too far, and also acts as a dog to prevent it from turning backward while the pawl is moving backward. A curved plate *Z* is fixed to the side frame members adjacent to the feed roll and prevents the paper strip from becoming disengaged from the said feed roll.

The drawing shows by dotted lines in Fig. 1 an electric motor, and in Fig. 2, together with the dotted lines in Fig. 1, is shown a train of mechanism for transmitting motion from this motor to the driving shaft.

Having thus described my invention, I claim:

1. In a perforating machine, the combination of fixed perforated die plates, punch guides located above them, punch bars vertically movable in said punch guides, a cross bar connected with said punch bars, two vertically movable bars connected at their upper ends with said cross bar, a rotating shaft, means carried thereby for moving the vertically movable bars up and down, a feed roll having feeding spurs, and mechanism operated by said vertically movable bars

while they are moving upward to turn said feed roll through a definite arc.

2. In a perforating machine, the combination of fixed perforated die plates, punch guides located above them, punch bars vertically movable in said punch guides, a cross bar connected with said punch bars, two vertically movable bars connected at their upper ends with said cross bar, a rotating shaft, means carried thereby for moving the vertically movable bars up and down, a feed roll having feeding spurs, and having a ratchet secured to it, a bell crank lever pivoted to a fixture, a spring pawl carried thereby for engaging said ratchet, said lever having a slot and one of said vertically reciprocating bars having a pin projecting into said slot.

3. In a perforating machine, the combination of fixed perforated die plates, punch guides located above them, punch bars vertically movable in said punch guides, a cross bar connected with said punch bars, two vertically movable bars connected at their upper ends with said cross bar, a rotating shaft, means carried thereby for moving the vertically movable bars up and down, a feed roll having feeding spurs, and having a ratchet secured to it, a bell crank lever pivoted to a fixture, a spring pawl carried thereby for engaging said ratchet, said lever having a slot, and one of said vertically reciprocating bars having a pin projecting into said slot, and a spring dog engaging said ratchet.

4. In a perforating machine, the combination of a fixed perforated die plate, a cross bar in which said die plates are secured, vertically reciprocating punches, mechanism for operating them, a feed roll having feeding spurs, means for turning said feed roll periodically through a definite distance, a freely rotatable paper roll, a frame carrying a roller which rests upon said paper roll, and a second frame pivoted to the first and conveying a roller which rests on the paper cross bar.

5. In a perforating machine, the combination of a fixed perforated die plate, a cross bar in which said die plates are secured, vertically reciprocating punches, mechanism for operating them, a feed roll having feeding spurs, means for turning said feed roll periodically through a definite distance, a freely rotatable paper roll, a frame carrying a roller which rests upon said paper roll, and a second frame pivoted to the first and carrying a roller which rests on the paper strip as it passes from the paper roll to the cross bar, a receiving roll, and slip belt driving mechanism therefor.

6. In a paper perforating machine, the combination of perforated die plates, vertically reciprocating punch bars, a cross bar extending between and connected with said

punch bars, means for reciprocating said cross bar, and a spring pressure finger fixed to said cross bar near one end thereof and extending therefrom downward and toward
5 the corresponding side of the machine, and another spring pressure finger fixed to said cross bar near the opposite side of the machine and extending from the cross bar

downward and toward the adjacent side of the machine.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

THOMAS A. McCALL.

Witnesses:

SAMUEL ASSUR,

HELEN N. RUPPERT.