(No Model.)

E. B. STIMPSON, Jr.

PERFORATING MACHINE.

No. 370,986. Patented Oct. 4, 1887.

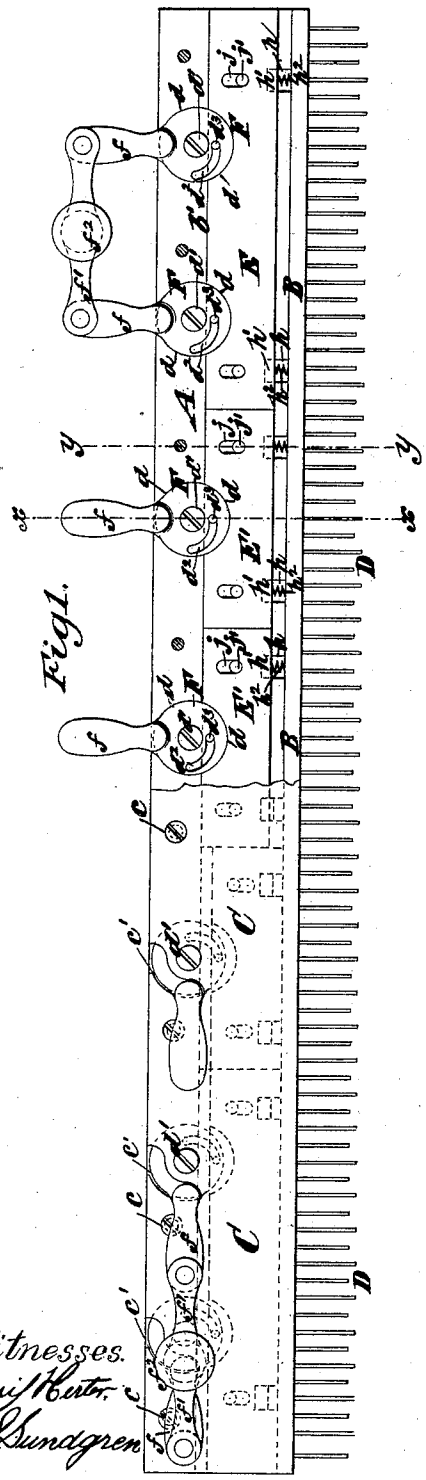


Fig. 1.

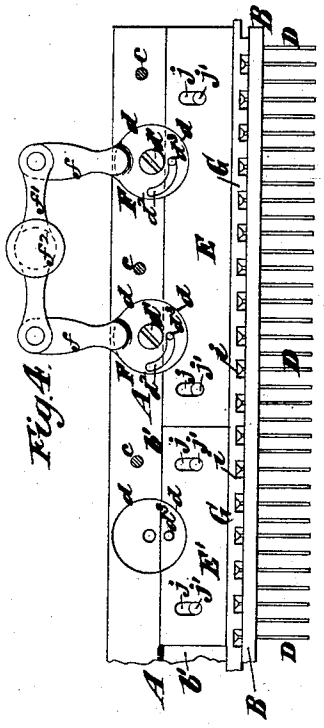


Fig. 4.



Fig. 5.

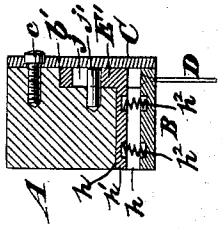


Fig. 3.

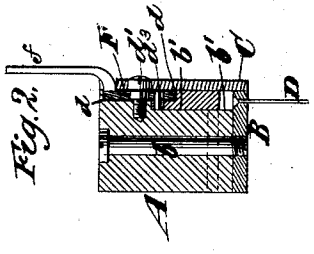


Fig. 2.

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UNITED STATES PATENT OFFICE.

EDWIN B. STIMPSON, JR., OF BROOKLYN, NEW YORK.

PERFORATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,986, dated October 4, 1887.

Application filed September 16, 1886. Serial No. 213,719. (No model.)

To all whom it may concern:

Be it known that I, EDWIN B. STIMPSON, Jr., of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Perforating-Machines, of which the following is a specification.

My invention relates to machines which are largely employed for perforating paper, and which severally comprise a row or line of fine punches arranged near together and carried by a punch-head, which is rigidly secured to a vertically-reciprocating cross-head or plunger. Such machines are largely used for perforating paper along lines in which it is to be torn, and it is often desirable to render the punches throughout a greater or less length of the line or row inoperative, so that when the punch-head descends those punches which are not held down will be allowed to rise in the punch-head as soon as they strike the paper or other material to be perforated and will not perforate. The punches are usually also of uneven length, or have their points presented in an irregular line, in order that they will not strike the paper all at once, and very frequently in machines of this character alternate punches have been made slightly shorter than the intermediate punches. In order to sharpen the punches after use, they are adjusted so that their ends will be in the same horizontal plane, and are then filed off. In order to so hold the punches, which are of unequal length, with the outer ends in the same horizontal plane for filing, it has been customary to introduce into the punch-head above the punches a strip of metal which has at intervals in its length recesses or round holes for receiving the heads of the longer punches, and by practice it is found that frequently the punch-heads stick in such round holes or recesses and render it difficult to withdraw the evening-strip from the punch-head after the punches have been sharpened by filing.

My invention relates to the means employed for holding down the punches in operative position in the punch-head, so that any desired number of punches in the line or row may be rendered inoperative when desired; and the invention also relates to a novel construction of the evening-strip, which is introduced into the punch-head to hold the punches with their ends in the same plane preparatory to sharpening them by filing them off.

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

In the accompanying drawings, Figure 1 is a front elevation of a punch-head and appurtenances embodying my invention, a cap-plate which covers the punch-head at the front being shown as removed or broken away throughout a portion of its length. Figs. 2 and 3 are vertical transverse sections upon the planes indicated by the dotted lines *x x* and *y y*, Fig. 1. Fig. 4 is a front view of a portion of the punch-head and appurtenances, showing the punches adjusted for filing; and Fig. 5 is an inverted plan of a portion of an evening-strip embodying my invention.

Similar letters of reference designate corresponding parts in all the figures.

A designates the punch-head, which consists of a horizontal bar of proper dimensions, and which is ordinarily secured to a reciprocating cross-head or plunger in a well-understood manner. Secured upon the bottom or under side of the punch-head, by screws *b*, is a punch plate or holder, B, which projects forward beyond the portion of the face of the punch-head which is immediately above it. In the face of the punch-head A, and extending upward from the punch-plate B, is a rabbet, *b'*, and the forward edge of the punch-plate B will usually be about coincident or in the same vertical plane with the portion of the face of the punch-head A which is above the rabbet *b'*.

C designates a cap-plate, which covers the whole front of the punch-head and appurtenances, and which may be secured in place by screws *c*.

In the portion of the punch-plate B which projects beyond the back of the rabbet *b'* are held a series of punches, D, which may be of wire or other forms of metal, and which are arranged in a line or row throughout the length of the punch-head A. In order that the points of the punches shall not all strike the paper or other material to be perforated at the same time, it is desirable to make the punches of unequal lengths, and, as here shown, alternate punches are slightly shorter than the intermediate punches.

It is often desirable to render a number of punches at one or more points in the length of the punch-head inoperative, or, in other words, to permit them, on striking the paper or other material at the downward movement of the punch-head, to rise in the punch-head, while those punches which are held against upward movement in the punch-head are moved downward to the full stroke of the punch-head and are caused to perforate the paper or material. According to my invention, the punches D are held down by a vertically-movable follower, which consists of sections arranged end to end in the rabbet b', and as best shown in Figs. 1 and 4. These sections may be of any desired length, and may be of uniform length, or they may be of unequal lengths. I have here represented at each end of the punch-head a follower-section, E, of considerable length, and between such long sections are arranged other sections, E′, which are shorter. The follower-sections E E′ have their lower edges plane and flat; and hence, when the follower-sections are forced down upon the punch-heads, their plane flat edges bear solidly upon the punch-heads and hold the punches securely. When any section E is forced and held downward upon the punch-plate B, it comes directly in contact with and upon the heads of the punches which are arranged within its length, and thereby holds the punches rigidly in the punch-head and prevents their rising in the punch-head. When any section E or E′ of the follower is raised up, as shown at the right hand of Fig. 1, its lower surface will be lifted out of contact with and above the punch-heads, and when the punch-head A is moved downward all the punches which are then within range of such lifted follower-section will be allowed to rise on striking the paper or material and will not perforate.

The means here employed for forcing down the follower-sections E E′ upon the heads of the punches and holding them in such position consist of cam-levers F, each comprising a circular disk portion and a handle, f, projecting from it and offset in a forward direction from the plane of such disk portion. The disk portions of the locking-levers F are received within circular seats d, formed partly in the face of the punch-head A, above the rabbet b', and partly in the upper portion of the face of the follower-sections E E′. In Fig. 4 I have shown the locking-lever F, which operates one of the short follower-sections E′, as removed, in order to illustrate more clearly the segmental recesses of the punch-head A and follower-section E′, which are coincident, but which combine to form the circular seat or recess d for the cam-lever F. Each cam-lever F may be pivoted by a screw, d', to the portion of the punch-head A above the rabbet b', and each lever is constructed with a cam-shaped or eccentric slot, d^2, which receives a pin, d^3, projecting forward in the seat d from the faces of the follower-section E or E′.

When the cam-levers F are turned into a vertical position, as shown in Fig. 4 and at the right hand of Fig. 1, the follower-sections E E′ will be lifted or allowed to rise, and the punches which are within range of such follower section or sections will be rendered inoperative. When the locking-levers F are swung down so that their handles are presented in horizontal position, as shown at the left hand of Fig. 1, the cam-slots d^2, by acting upon the pins d^3, will force downward the follower-sections E E′, and will hold them in contact with, but directly upon, the heads of the punches D, thereby rendering operative such punches as are covered by such follower-sections.

The cap c may be notched, as at c', from its upper edge downward, in order to permit the handles of the locking-levers F to be swung into the horizontal position shown, and the disk portions of such levers are inside the cap-plate C, while their handle portions f may be swung down outside and beyond the outer face of the cap-plate.

A single locking-lever F may suffice for each of the shorter follower-sections E′, but for the longer sections E it may be found necessary to employ two levers F, and in such case the two levers controlling each follower-section E may be connected by a rod, f', provided with a knob or hand-piece, f^2, whereby the two levers F, with which it is connected, may be operated simultaneously.

I have represented the punch-head A as provided with guiding notches or grooves h, extending transversely across its bottom from its under side upward, and I have shown the follower-sections E E′ as provided with tongues h', which are received in these notches, and springs h^2 may be arranged, as shown in Fig. 3, between the tongues h' and the punch-plate B, and will serve to lift the follower-sections E E′ when the levers F are turned or swung to permit the sections to be so lifted.

In order to enable the punches D to be adjusted and held with their points or ends in the same plane preparatory to sharpening them by filing off their ends, I employ an evening-strip, G, which is shown in Figs. 4 and 5. This evening-strip is of such thickness that it may be introduced between the follower-sections E E′ and the punch-plate B, when said follower-sections are raised, and it has in its face transverse notches or recesses i, which extend entirely across it from side to side, and which are formed at the same distance apart as are the longer punches in the punch-head. When the punches are to be filed off, the follower-sections E E′ are raised, the packing or evening strip G is introduced between the follower-sections and the punch-plate B, and when the punch-head is inverted the longer punches D drop down into the recesses i of the strip G. The advantage of making the recesses i in the form of notches which extend entirely across and from side to side of the evening-strip G is that the strip

G, after use, may be removed by withdrawing it directly laterally from the punch-head. Where the recesses in the evening-strip have been made in the form of round holes, as heretofore, the heads of the punches D were liable to stick and to be retained in such holes, and thus prevent the evening-strip from being withdrawn laterally, as can the strip G, having the notches *i* extending entirely across its face.

In order to aid in guiding the follower-sections in their upward and downward movement, I have represented said sections as having vertical slots *j*, which receive pins *j'* projecting from the back of the rabbet *b'* in the punch-head A.

The springs h^2 are not indispensable to my invention; but I find it advantageous to use them, even though the connection of the cam-levers or locking devices F with the follower-sections E E' be by means of the pins and eccentric slots d^3 d^2. The springs serve to keep the follower-sections to their highest position when not pressed down, and to maintain the surface of the follower-sections—as, for example, the pins d^3, on which the cams bear—tightly pressed against the operative portion of the cams—as, for example, against the upper surfaces of the eccentric slots d^2. Consequently the springs take up all lost motion due to wear. The notches or grooves and tongues *h h'* are useful, not only in adapting the device for the application of the springs h^2, but they guide and steady the follower-sections in their upward and downward movements, and maintain them parallel with the punch-head.

I am aware that in machines of this class having punches of different lengths it is not new to employ a packing-strip, as G, having small recesses sunk in its lower surface to receive the heads of the longer punches; but the punches may get stuck in such recesses and prevent the lateral withdrawal of the strip. When the strip has transverse notches *i* extending entirely across from edge to edge, there is no difficulty in laterally withdrawing the strip.

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

1. The combination, with a punch-head and a punch-plate projecting from the front thereof and perforated to receive a row of punches, of a vertically-movable follower composed of sections arranged end to end upon the face of the punch-head and having plane and flat lower edges, springs for raising the follower, and locking devices whereby the follower may be forced down to bring the flat and plane lower edges of its sections directly upon the punch-heads, substantially as herein described.

2. The combination, with a punch-head rabbeted in its face, and a punch-plate projecting forward from the under side of the punch-head and carrying a row of punches, of a vertically-movable follower composed of sections arranged end to end in the rabbet, a cap-plate covering the entire face of the punch-head and follower, and cam-levers engaging the follower-sections within the cap-plate, and having operating-handles which are outward of the face of the cap-plate and swing in notches formed in the cap-plate, substantially as herein described.

3. The combination, with a punch-head provided with guiding notches or grooves, and a punch-plate secured to the under side of and projecting forward beyond the punch-head and perforated to receive a row of punches, of a vertically-movable follower composed of sections arranged end to end on the face of the punch-head and having plane and flat lower edges, and rearwardly-projecting tongues received in the guiding notches or grooves of the punch-head, and locking devices for forcing the follower-sections down to bring their lower edges directly upon the punch-heads, substantially as herein described.

4. The combination, with a punch-head having a punch-plate projecting forward beyond its face and perforated to receive a row of punches of uneven lengths, of a vertically-movable follower arranged on the face of the punch-head, locking devices for forcing the follower down in contact with and directly upon the punch-heads to make the punches operative, and an evening-strip of a thickness to be introduced between the punch-heads and the follower when the latter is raised, and having transverse notches or grooves *i*, extending entirely across its face from edge to edge to receive the heads of the longer punches, substantially as herein described.

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Witnesses:
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