(No Model.) 3 Sheets—Sheet 1.

E. B. STIMPSON.

PERFORATING MACHINE.

No. 313,383. Patented Mar. 3, 1885.

Fig 1.

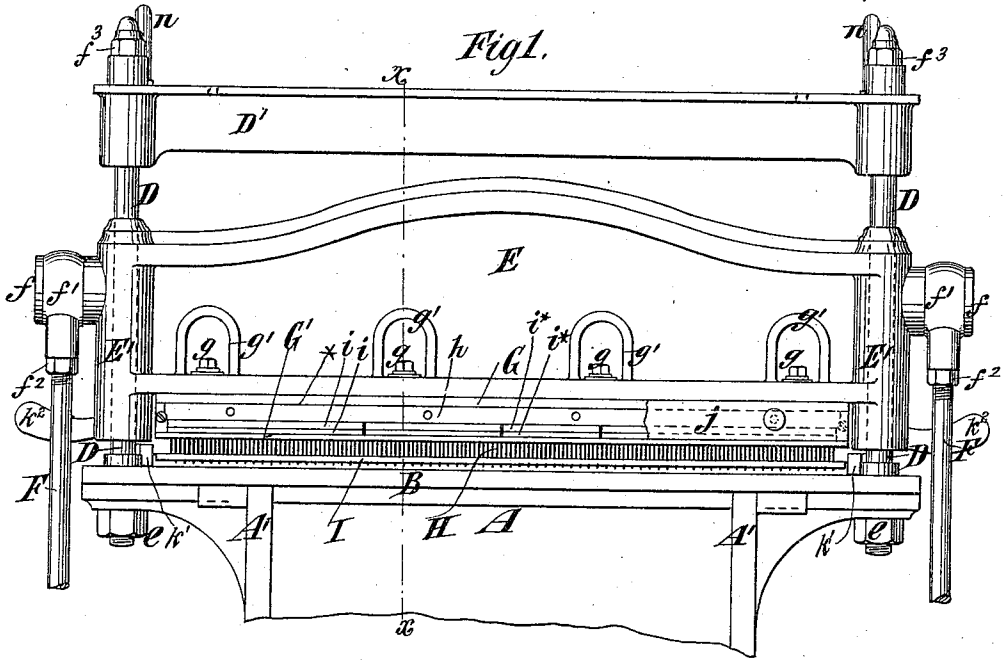


Fig 2.

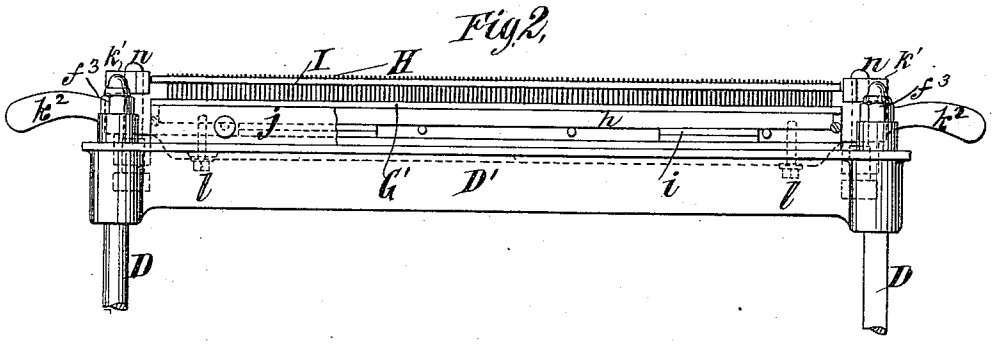
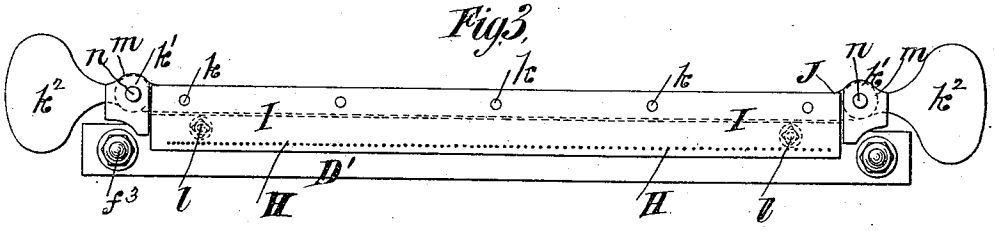


Fig 3.



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Fig. 4.

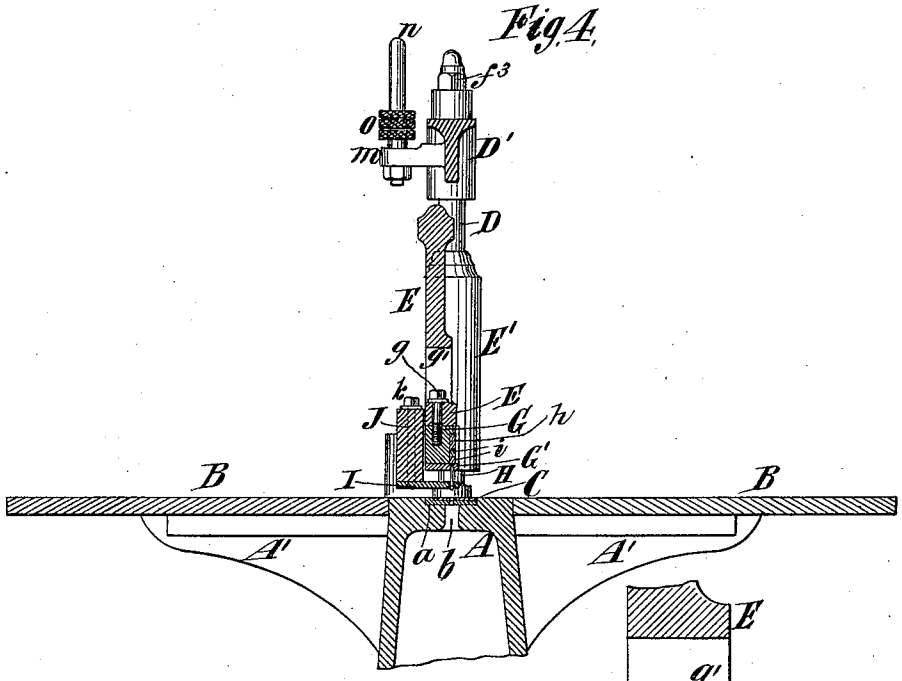


Fig. 5.

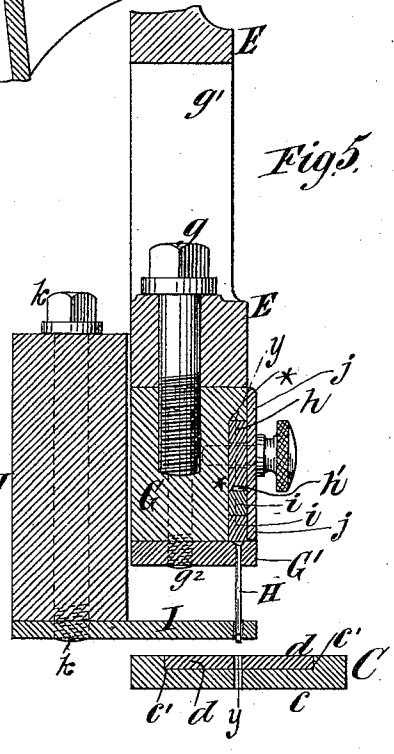
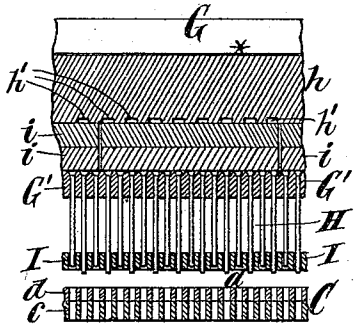


Fig. 6.



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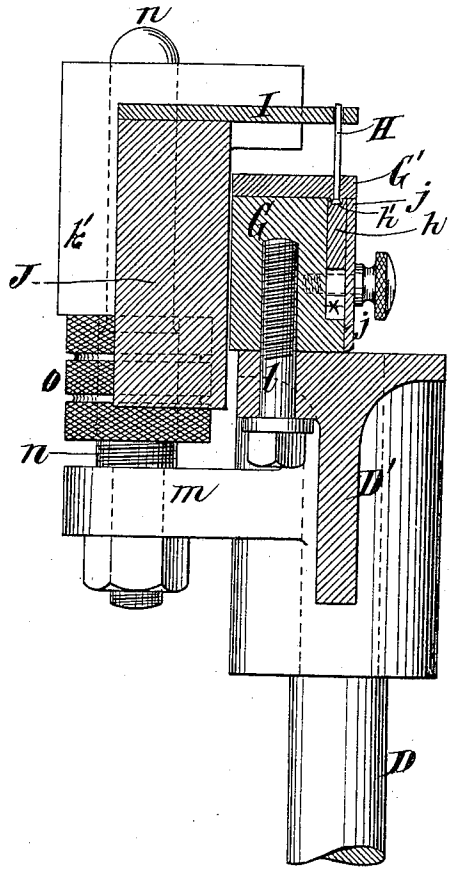
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Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWIN B. STIMPSON, OF BROOKLYN, NEW YORK.

PERFORATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 313,383, dated March 3, 1885.

Application filed March 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, EDWIN B. STIMPSON, 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.

The invention relates to machines having punches set very close together in one or more rows for perforating checks, stubs, labels, and other papers. In machines of this class the punches are in a row often twenty or thirty inches in length for making long lines of perforations, and they are secured on a vertically-movable cross-head, and work through a stripper or stripper-plate arranged just above the die, and between which and the die the papers are placed to be perforated. The work has often to be done on lines so short that only a comparatively small number of punches are required; and one object of my invention is to afford provision for readily rendering a greater or lesser number of the punches inoperative, so that when the cross-head descends only such punches as are needed will be forced through the paper, while the others will be allowed to rise in the cross-head when they strike the paper, the means whereby the punches are held down for operation being of such nature that they can be removed and replaced at will.

In perforating-machines it is of great advantage to have the punches of slightly-different lengths, alternate punches being slightly longer than the intermediate punches, so that only half of the punches shall strike the paper simultaneously, thus requiring only half the power to operate which would be necessary if the punches were all of a length. A further object of my invention is, therefore, to provide means for holding the punches of different lengths in the cross-head, and at the same time to enable the points of all the punches to be brought into line when they are to be sharpened by filing off their ends, and to enable the stripper to be adjusted so that the punches will project but a trifle beyond its surface and so that it will serve as a gage for filing off the punches. These latter objects I accomplish by removing the punch-holder, stripper-beam, and stripper together from the machine and inverting them upon a cross bar or brace, which permanently and rigidly connects the upper ends of the cross-head guides, and after the punch-holder has been bolted securely in its inverted position I adjust the stripper vertically at its two ends, so that all the punches project evenly and but a very trifle above the surface of the stripper.

In the accompanying drawings, Figure 1 is a front elevation of the upper portion of my improved machine. Fig. 2 is a front elevation showing the cross-head guides, the upper cross bar or brace, and the punch-holder, stripper-beam, and stripper, secured in an inverted position upon said cross bar or brace, for filing off the puncher. Fig. 3 is a plan of the parts shown in Fig. 2. Fig. 4 is a vertical section on the dotted line *x x*, Fig. 1, the parts being in position for operation. Fig. 5 is a transverse vertical section of the die, the punch-holder, a portion of the cross-head, and the stripper-beam and stripper upon a large scale, or full size. Fig. 6 is longitudinal section on the dotted line *y y*, Fig. 5, the parts being in position for operation; and Fig. 7 is a transverse vertical section, on the same scale as Figs. 5 and 6, of the cross bar or brace connecting the upper ends of the cross-head guides, and a similar section of the punch-holder, the stripper-beam and stripper secured thereon and adjusted into position for filing off the ends of the punches to sharpen them.

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

A designates the bed of the machine, which is formed upon a suitably rigid frame, and on opposite sides of which extends a table, B, the two portions of which are supported by arms or brackets A′ on the frame.

In the bed A is a channel or seat, *a*, in which is placed the die C, and below the die the bed is slotted at *b*, so that the scrap or waste may fall into a receptacle which is provided in the frame, but not here shown. The die C is best shown in transverse section in Fig. 5, but also in Fig. 4. It preferably consists of a plate or bar of iron, *c*, channeled at *c′* in its upper surface, and in the channel *c′* is fitted and permanently secured a thin plate or strip of steel, *d*, the two plates or pieces *c d* being correspondingly perforated for the punches. The steel plate *d* is snugly fitted in the channel *c′*,

and is then permanently secured therein by numerous rivets or screws before the operation of hardening is performed.

Upon the bed A are erected upright posts or columns D, which are secured therein by nuts *e*, or otherwise, and which form guides for the cross-head E, said guides being shown as round.

The cross-head E consists of a casting having considerable depth to give it the necessary strength and rigidity, and provided at the ends with deep or long eyes or slides E′, which receive through them and are accurately fitted to the guides or posts D, so as to enable the cross-head to work up and down smoothly and without binding or cramping.

At the ends of the cross-head E are wrists or pins *f*, with which are connected rods F, whereby the cross-head is reciprocated, and these rods are provided at their upper ends with eyes *f′*, with which the rods proper have a screw-connection, and in which the rods may be secured against movement by lock-nuts f^2 after adjustment. The rods F are connected at their lower ends with a treadle or other device for operating the cross-head, but not here shown, as it forms no part of my invention. The rods F being adjustable in length, I am enabled to maintain accurately the horizontal position of the cross-head E. The upper ends of the guides or posts D are connected by a cross bar or brace, D′, secured thereon by nuts f^3.

To the under side of the cross-head E is secured the punch-holder G by bolts or screws *g*, which are inserted downward through the lower part of the cross-head and screwed into the holder G, as shown best in Fig. 5.

In the cross-head are openings *g′*, which provide for the ready insertion and removal of the bolts or screws *g*. The front side of the punch-holder G is rabbeted at *, and to the under side thereof a punch-plate, G′, is secured by screws g^2, as shown in Fig. 5. This punch-plate constitutes a part of the punch-holder and is perforated near its front edge for the reception of the punches H, which are of steel wire of proper gage, and in the top of the plate G′ are slight countersinks to receive the heads of the punches H. These punches might all be of the same length, if desired, but preferably the alternate punches are slightly longer than the intermediate punches, and when their heads are all held down their points will present an irregular line, as shown in Fig. 6.

The rabbet * in the punch-holder G is of such depth relatively to the length of the punches that the punches may be all removed from the punch-plate G′ and reinserted therein without detaching the latter from the punch-holder G, and in order to hold the punches down for operation I employ a continuous strip or bar, *h*, fitted in the upper part of the rabbet *, and one or more packing strips or pieces, *i*, below said strip or bar *h*, two strips or pieces, *i i*, being preferably employed one above another. The pieces *h i i* completely fill the rabbet *, and when in place, as shown in Figs. 5 and 6, the punches H are all held down and caused to operate. The packing-pieces *i i* and piece *h* are all held in place by a guard or covering-plate, *j*, secured to the front of the punch-holder G. The packing-pieces *i i* are not continuous throughout their length like the piece *h*, but are made in sections of different lengths, as shown in Fig. 1, in which figure the guard or covering plate *j* is partly removed.

It is often desired to perforate on short lines or to leave certain portions of a paper unperforated, and this I accomplish by removing the desired section or sections of the packing-pieces *i i*, so that a number of punches corresponding to the length of the pieces *i i* will be allowed to rise when they strike the paper; but as the strip or piece *h* is continuous the punches cannot rise or jump up sufficiently to escape from the punch-plate G′. Supposing, for example, that the sections of packing-pieces marked *i* i** in Fig. 1, or one of them, be removed, all the punches covered by said section or sections will not be held down, and will rise and be inoperative, while all the remaining punches will be operative.

By making the packing-pieces *i i* in various lengths I provide, by shifting them round, for rendering inoperative any desired number of punches at any point in the length of the punch-holder G.

In lieu of two sectional packing strips or pieces, one piece of twice the thickness might be used; but where two pieces are inserted the lower one may be used to strike down the heads of the punches H, after which the second piece, *i*, may be inserted above it. A single piece would be more difficult to insert above the punches than the two pieces *i i* here shown.

I designates a stripper or stripper-plate, which is accurately drilled for the passage of the punches H through it, and is rigidly secured to the under side of a stripper-beam, J, by means of screws *k* or otherwise. The stripper-beam J is provided near opposite ends with eyes or holes *k′*, through which bolts may be inserted for securing it in an operative position to the bed A of the machine, and the stripper and stripper-beam occupy, when operative, the position shown in Fig. 5. Beyond the eyes or holes *k′*, and at the ends of the stripper-beam J, are handles or hand-pieces k^2, whereby it may be raised from the bed of the machine.

I will now describe how the punches of different lengths may be adjusted while still in the holder G, so that their ends will all be in line and even, and how the stripper I is made to serve as a gage for filing them off to sharpen them.

The punch-holder G may be removed from the cross-head E by taking out the screws *g*, and the stripper-beam J may likewise be removed from the bed A by removing the bolts from its eyes or holes *k′*.

When the punches H are of two different

lengths, as described, the under side of the piece or strip *h* is not even, but opposite alternate punches, which are longer, has formed in it recesses or depressions *h'*, which receive the heads of said longer punches when the holder is inverted, and the depth of which recesses is equal to the difference in length between the longer and shorter punches. Consequently, when the punch-holder G is inverted and the strips or packing pieces *i i* are removed and placed below or on the opposite side of the piece *h*, as shown in Fig. 2, the punches are held by their heads bearing on the lower edge of the strip or piece *h*, and the heads of the longer punches enter the recesses or depressions *h'*. The ends of all the punches will then be even and in line.

The cross-bar D', above referred to, has a flat upper surface and constitutes a support on which the punch-holder G may be placed when inverted, and to which the punch-holder may be secured by bolts *l*. (Shown in Fig. 2.)

At the ends of the cross-bar D' are laterally or rearwardly projecting lugs or ears *m*, on which are erected screw-threaded pins or studs *n*, to which are fitted nuts *o*, which are preferably circular and knurled, or provided with projections, so that they may be readily turned by hand. The stripper-beam J is detached and inverted with the punch-holder G, and the holes or eyes *k'* in the said beam fit upon or receive the pins or studs *n*, as shown in Figs. 3 and 7, and the nuts *o* form vertically-adjustable supports, on which the stripper-beam rests and by which it may be raised until the surface of the stripper is only a trifle below the ends of the punches, as shown in Fig. 7. The stripper then constitutes a gage to which the punches may be filed, and steadies and supports their ends while filing. The cross bar or brace, therefore, not only serves to connect the guides D and maintain them in proper relation, but it also serves to support the punch-holder in an inverted position while filing the punches.

In lieu of inverting the punch-holder upon the cross-bar D', I might provide a support independent of the machine, and combine with it adjustable supports for the stripper-beam, and this combination of a rigid support for the punch-holder and vertically-adjustable supports for the stripper-beam is very desirable, whether the punches be of different lengths or not, as by its use the stripper may be made to serve as a gage for filing off the ends of the punches.

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

1. In a punch-holder, the combination, with a bar or body having a rabbet in its side, of a plate secured to the under side of the bar or body, and receiving headed punches through it, and packing-pieces fitted to said rabbet and serving to prevent upward movement of the punches, substantially as herein described.

2. The combination, with the headed punches H, of the punch-holder consisting of the plate G' and the bar or body G, to the under side of which the said plate is secured, and in the point of which is a rabbet, *, of such depth that the punches may be withdrawn entirely from the plate G' by an upward movement, and packing-pieces fitted to said rabbet and serving to prevent the rising of the punches, substantially as herein described.

3. The combination, with the punch-holder composed of the bar or body G, having a rabbet, *, in the front, and the plate G', secured to the bottom of said bar or body, of the punches H, a continuous packing-strip fitted to the rabbet, and a packing strip or strips fitted between said continuous strip and said plate, and composed of separately-removable sections, substantially as herein described.

4. The combination, with a punch-holder composed of the bar or body G, rabbeted at the front, and the plate G', secured thereto, of the punches H, a continuous packing-piece fitted in said rabbet, and a packing piece or pieces, *i*, fitted between said continuous piece and the said plate, and composed of separately-removable sections of different lengths, substantially as herein described.

5. The combination, with the punch-holder composed of the bar or body G and the plate G', of the punches H, of different lengths, a packing-piece, *h*, provided in its edge with recesses or depressions *h'*, opposite the longer punches, and a packing piece or pieces removably fitted between said piece *h* and the punches, substantially as herein described.

6. The combination, with a punch-holder and stripper capable of being removed together from the perforating-machine and inverted, of a support upon which said punch-holder may be secured when inverted, and supports for the inverted stripper capable of adjustment to bring the stripper to a position in which it will serve as a gage for sharpening the punches, substantially as herein described.

7. The combination, with the cross-head and vertical guides of a perforating-machine, of a cross-bar connecting said guides at their upper ends, a punch-holder and stripper capable of being together removed from the machine and inverted, the punch-holder being supported on said cross-bar, and the latter having supports for the stripper capable of vertical adjustment to bring the stripper into position to serve as a gage for sharpening the punches, substantially as herein described.

8. The combination, with the cross-head E, guides D, and cross-bar D', provided with studs or pins *n* and nuts *o*, of an invertible punch-holder, and invertible stripper and stripper-beam provided with eyes *k'*, removable together from said machine, substantially as herein described.

9. The combination, with a punch-holder provided with punches of different lengths, a packing-piece provided in its under side with

recesses or depressions opposite the longer punches, and a stripper fitted to the punches, said punch-holder and stripper being together removable from the perforating-machine and capable of being inverted, of a support for the punch-holder when inverted, and supports for said stripper capable of adjustment to raise and lower the stripper relatively to the ends of the punches, substantially as herein described.

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