(No Model.)

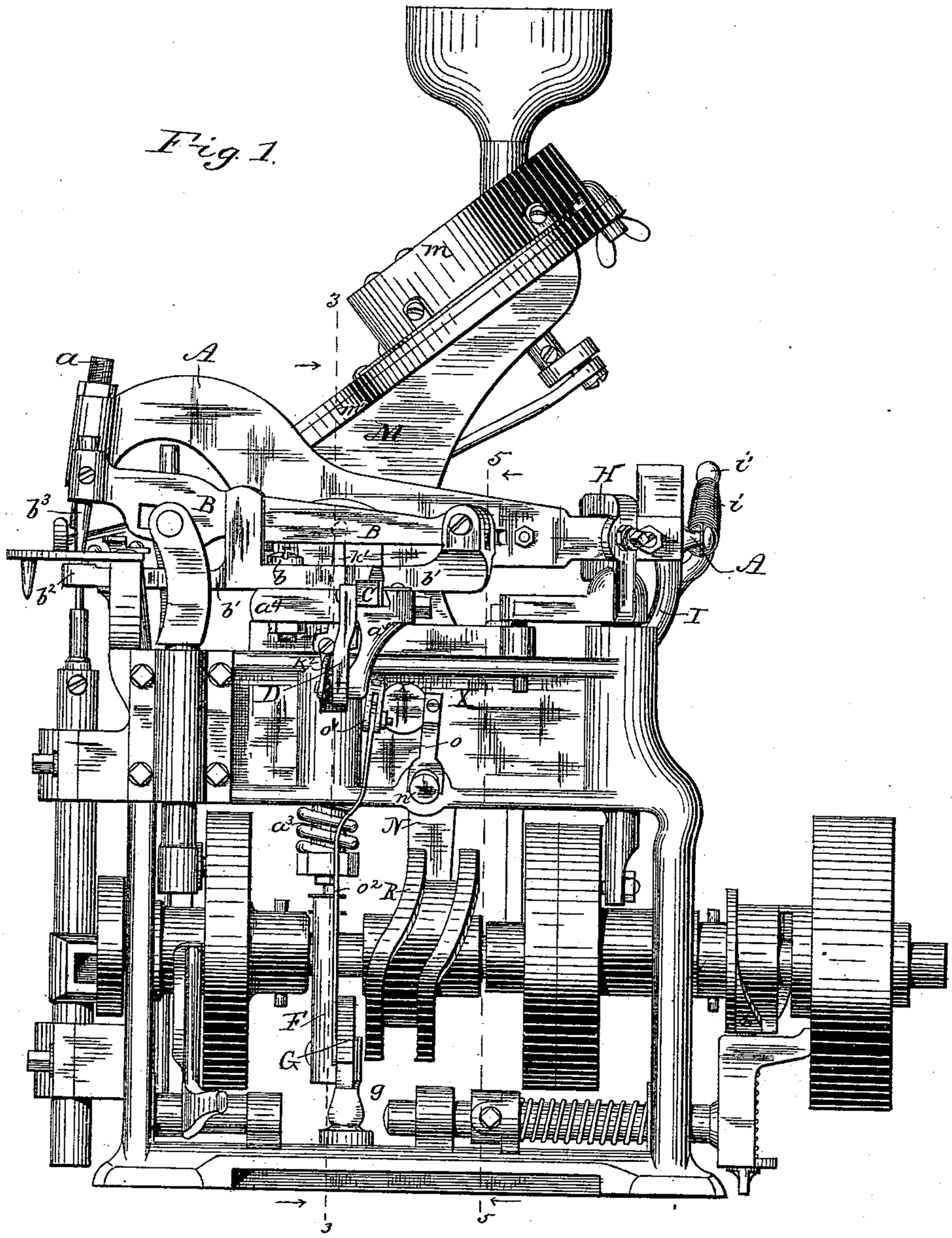
4 Sheets—Sheet 1.

L. C. EMERSON.

EYELETING MACHINE.

No. 332,334. Patented Dec. 15, 1885.

Fig. 1.



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(No Model.)

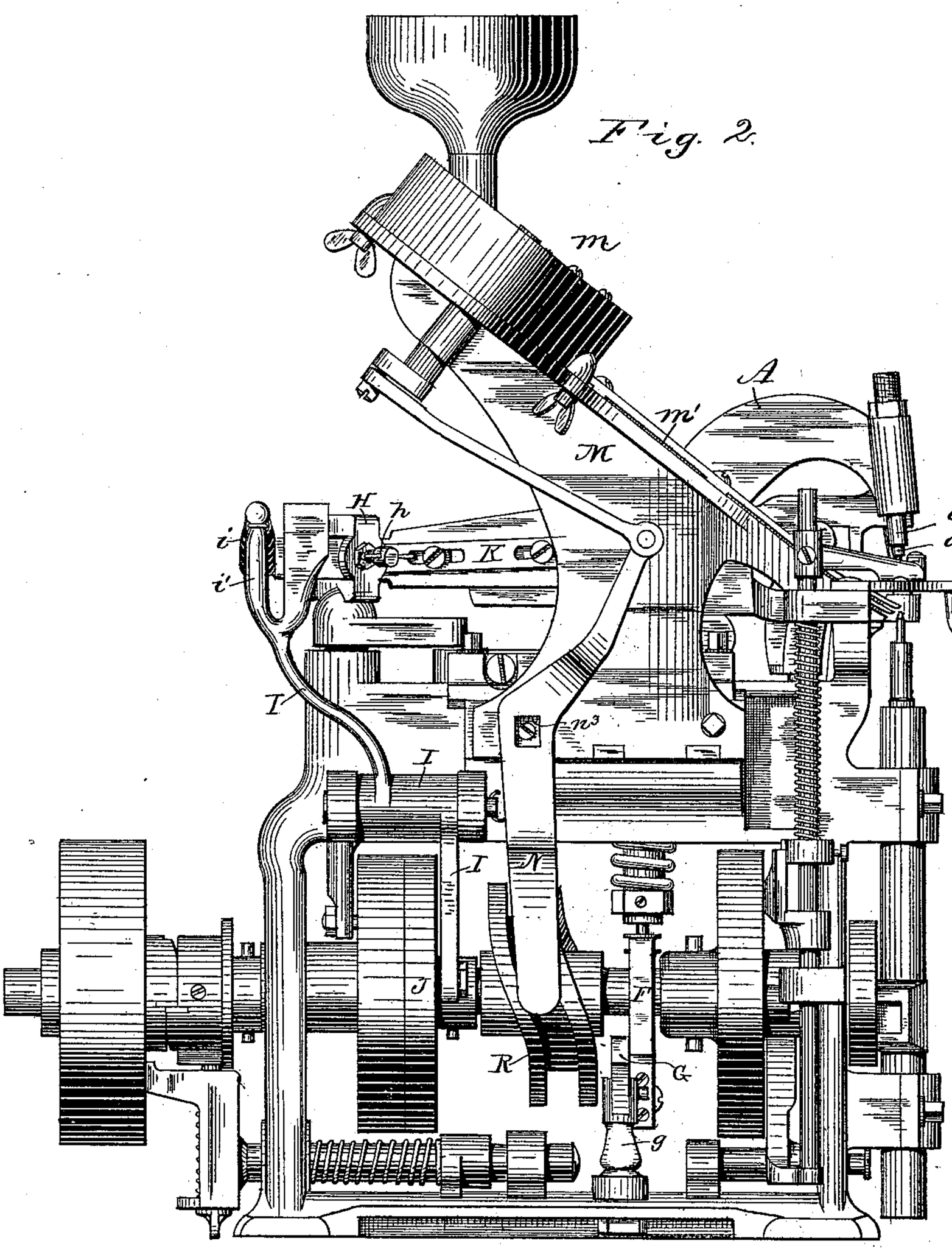
4 Sheets—Sheet 2.

L. C. EMERSON.

EYELETING MACHINE.

No. 332,334. Patented Dec. 15, 1885.

Fig. 2.



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(No Model.)

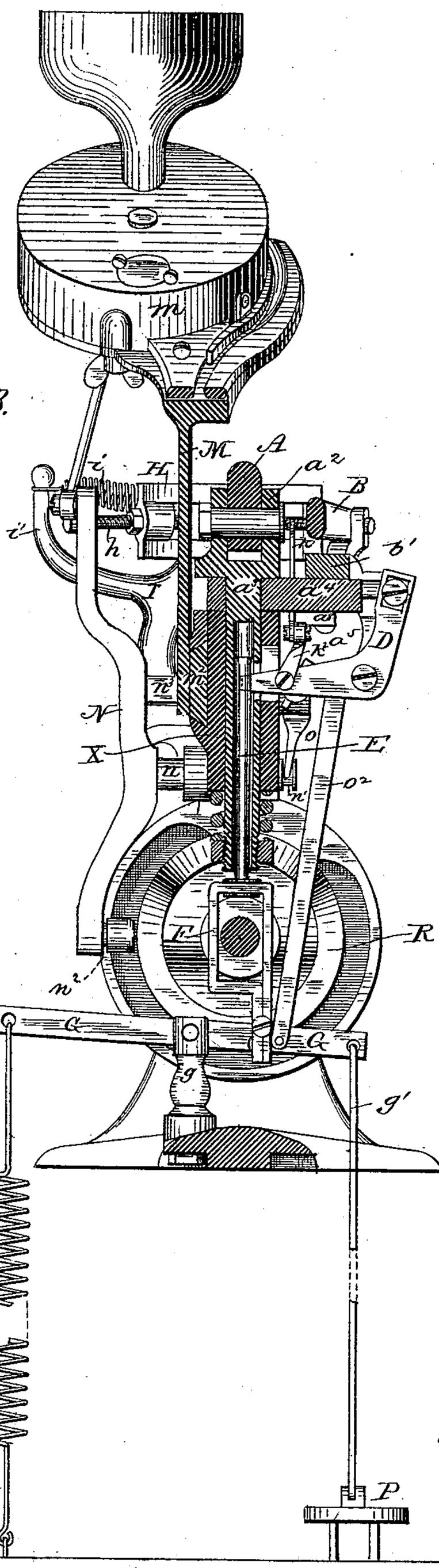
4 Sheets—Sheet 3.

L. C. EMERSON.

EYELETING MACHINE.

No. 332,334. Patented Dec. 15, 1885.

Fig. 3.



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4 Sheets—Sheet 4.

L. C. EMERSON.

EYELETING MACHINE.

No. 332,334. Patented Dec. 15, 1885.

Fig. 4.

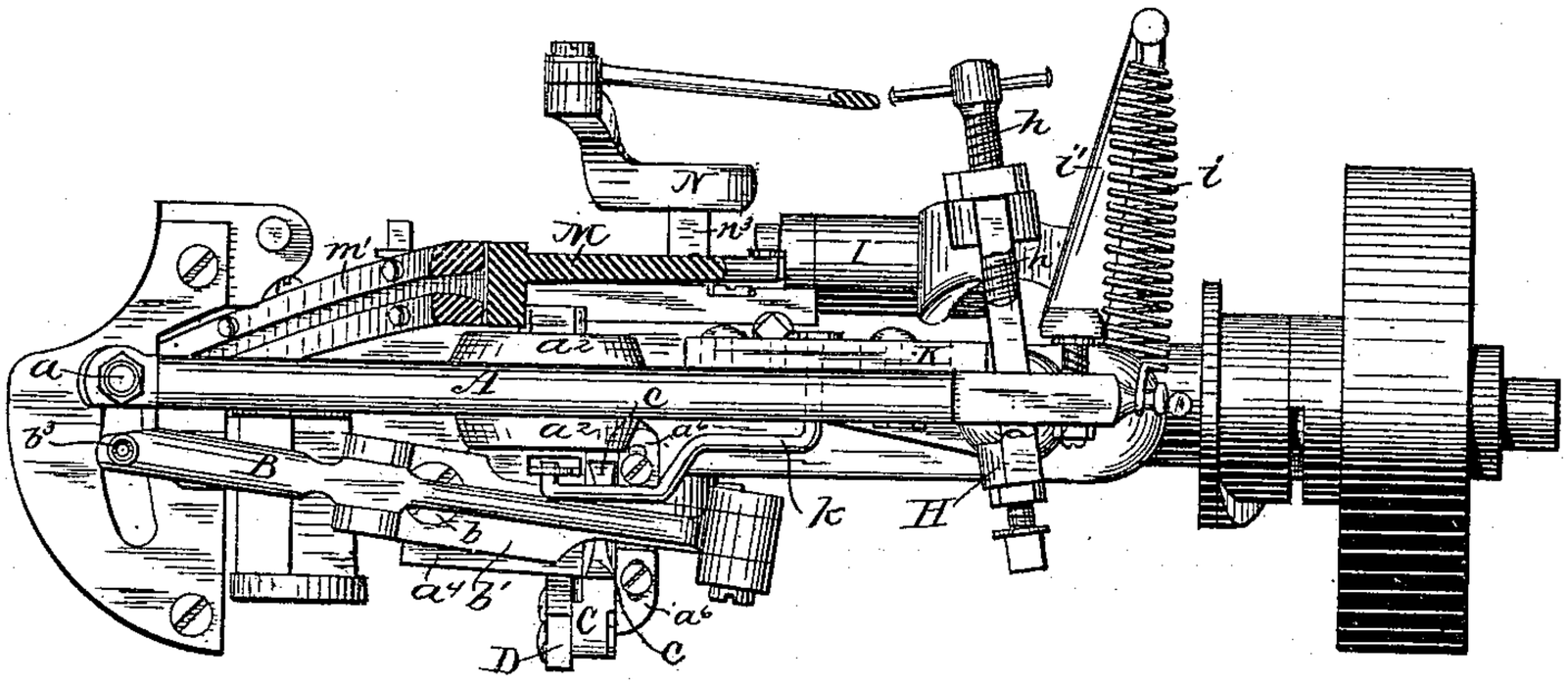


Fig. 5.

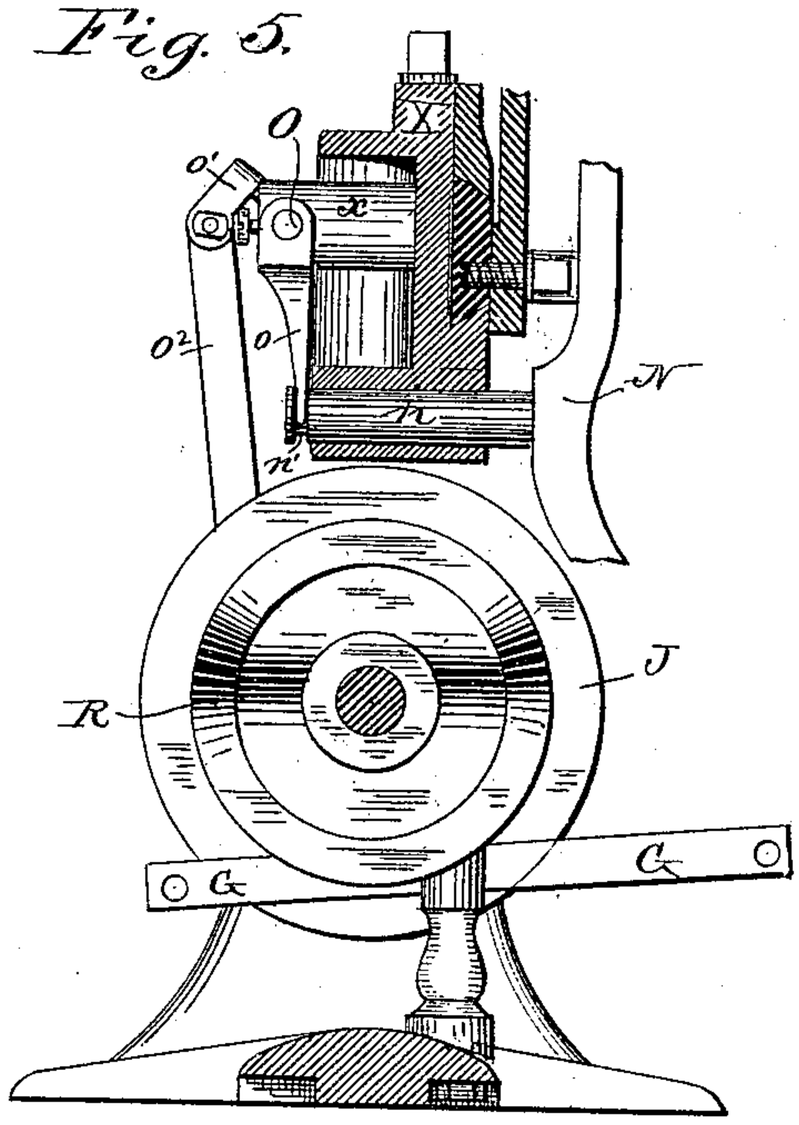
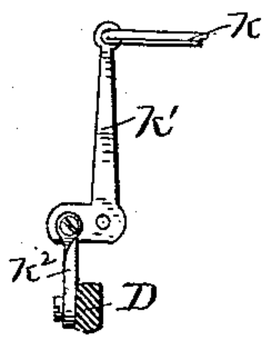


Fig. 6.



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UNITED STATES PATENT OFFICE.

LOENDER C. EMERSON, OF NORTH GRAFTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO CHARLES H. NELSON, OF SAME PLACE.

EYELETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 332,334, dated December 15, 1885.

Application filed September 21, 1885. Serial No. 177,716. (No model.)

To all whom it may concern:

Be it known that I, LOENDER C. EMERSON, a citizen of the United States, residing at North Grafton, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Eyeleting-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a well-known form of eyeleting-machine, in which the several operations of punching the eyelet-holes, inserting and upsetting an eyelet in each hole, and feeding the work are automatically effected. The feeding is accomplished by a lateral movement of the top set, while the finger thereof is inserted in the work before the latter is brought into position to receive the eyelet, the machine to which I have applied my invention being fully described in Patent No. 272,382, February 13, 1883, to L. D. Hawkins.

The object of my invention is to extend the range of work of the class of machines above referred to by providing mechanism whereby the operator, by the movement of a treadle, may instantly suspend the feeding of the eyelets, and at the same time cause the holes to be punched a greater distance apart than normally, the feed of the work being at the same time correspondingly increased. By this operation the machine will be adapted to punch a series of holes and to insert eyelets in the same, and then to punch a second series of holes which will be a greater distance apart than the first series, in which no eyelets will be inserted, the latter series of holes being for lacing-studs employed in some classes of boots or shoes in connection with eyelets, the said studs being preferably spaced farther apart than the eyelets.

In the accompanying drawings, Figures 1 and 2 are opposite side elevations of a machine embodying my invention. Fig. 3 is a vertical section of the same in the line 3 3, Fig. 1. Fig. 4 is a plan view, partly in horizontal section on the line 4 4, Fig. 2. Fig. 5 is a detail sectional view on the line 5 5, Fig. 1, showing the sliding fulcrum of the lever for operating the eyelet-feeding mechanism; and Fig. 6 is a detail of part of the mechanism for operating the sliding attachment on the top set and feeding-lever.

In the drawings, A denotes the lever which carries the top set, *a*, having the finger *a'*, said lever being pivoted in the head a^2 of the vertical post a^3, so that it may vibrate vertically, and the said post being adapted to turn in its bearings in the frame of the machine, so as to swing the said lever horizontally to feed the work.

Rigidly attached to the post a^3, so to oscillate horizontally therewith, is the block a^4, to which is attached by a pivot-screw, *b*, the bar *b'*, carrying at its forward end the cutting-bed b^2, and to the rear end of said bar is pivoted the vertically-movable punch-lever B, carrying at its forward end the punch b^3.

The levers A and B are herein shown as being reciprocated vertically and swung horizontally by the mechanism described in the patent above referred to, and which, not being of my invention, need not be herein particularly mentioned. The bar *b*, which carries the punch-lever B, although loosely pivoted to the block a^4, is normally held rigid with said block, so as to swing horizontally in unison with the lever A, said bar being steadied, so as to oscillate with said block, by being held between lugs *c* on a slide, C normally moving with said block, but adapted to be adjusted in a groove therein.

To a depending arm, a^5, of the block a^4 is pivoted an elbow-lever, D, the upper arm of which is loosely connected to the slide C, the lower arm of said lever extending within the post a^3, which is bored out for the reception of a vertical rod, E, to which the lever D is attached.

F is a yoke embracing the driving-shaft, and attached at its upper end to the lower end of the rod E, said yoke being connected at its lower end to a lever, G, pivoted on a post, *g*, secured to the base-piece of the machine. A cord or wire, *g'*, connects one end of the lever G with a suitable treadle, as P, and to the other end of said lever is connected a retracting-spring, g^2, which is in turn connected with the floor or some other stationary support. The

lateral vibrations of the set and feeding-lever A are regulated to vary the distance between the eyelets by the stop-screw *h*, carried by the rigid vertically-reciprocating yoke H, which embraces the rear end of said lever, the latter being moved positively forward by the lever I, operated by the cam J, and the said lever A being retracted and held against its stop *h* by the spring *i*, which latter is attached to the arm *i'* of the lever I, and to the lever A, all as in the patent before referred to. It is obvious that if the screw-stop *h* be adjusted to extend farther within the yoke the backward movement of the lever A will be diminished, and its throw thus lessened; but if the space between said lever (when it is farthest forward) and said stopping-screw be increased the throw of said lever will be correspondingly greater. To effect this latter change suddenly, an abutment or sliding bar, K, is attached to the lever A, said sliding bar being slotted, so that it may move longitudinally on its attaching-screws, which pass into the lever A.

To the sliding bar K is attached a bent rod, *k*, connected to the upper arm of an elbow-lever, *k'*, pivoted to a lug, a^8, on the block a^4, or to the machine-frame, the lower arm of said elbow-lever being in turn connected by a link, k^2, to the lower arm of the elbow-lever D.

When the machine is performing its normal functions of setting eyelets, the sliding bar K is far enough backward so that its rear end is interposed between the lever A and the stopping-screw *h*, and will thus abut against the screw or stop; but when the lever D is operated from the lever G and the treadle P said sliding bar will be drawn quickly forward, so that its rear end will not be interposed between the lever A and stop *h*, thus suddenly increasing the lateral throw and feeding movement of the said lever A.

The standard or carriage M, which supports the eyelet-box *m* and the eyelet chute or roadway *m'*, is attached to a dovetailed slide, m^2, guided horizontally in ways on the machine-frame, said standard and the parts carried thereby being reciprocated forward and back by the lever N, having the post or pin *n*, on which it is pivoted in the machine-frame, said lever engaging above its fulcrum the screw pin or stud n^3, attached to the standard M. Thus, as the lever N is vibrated by its operating-cam R, the standard M and its attached parts will be moved forward and back, an eyelet being presented to the eyelet-setting mechanism at each forward movement of said standard, the latter then retreating to get the forward end of the eyelet-chute out of the way of the eyelet-sets when the latter are to operate on the eyelet, all of this mechanism just above described being common to the class of machines to which I have applied my invention. If, however, it is desired to punch holes without setting eyelets therein, it is necessary to suspend the feeding of the eyelets, and this I accomplish by the mechanism which I will now describe. The post or pin *n* of the lever N projects through the frame X of the machine, and is adapted to slide endwise in its bearing, said pin being provided at its outer end with an annular groove or recess, *n'*, which is engaged by the forked arm *o* of a small rock-shaft, O, journaled in a stud or projection, *x*, attached to the machine-frame X, said shaft having another arm, *o'*, (herein shown as being bent,) which is connected by the link o^2 with the lever G. When the latter lever is operated from the treadle P, the shaft O will be rocked, thus moving the pin *n* and the lever N attached thereto away from the frame X, or to the left in Fig. 3, thereby clearing the pin or roller n^2 on the lower end of the lever N from the groove of the cam P, thus suddenly suspending the operation of the said lever and of the eyelet-feeding mechanism operated thereby.

The operation of my invention is as follows: When it is desired to punch a number of holes into which no eyelets are to be inserted, at a greater distance apart than the eyelet-holes, the operator bears down on the treadle P, to which the rod *g'* is connected, thus depressing said rod and the shorter end of the lever G, to which said rod is attached. This movement of the lever G moves the sliding bar K forward by means of the intermediate mechanism above described, so that its rear end will not impinge against the regulating or stopping screw *h*, (by being between said screw and the rear end of the lever A,) thus increasing the lateral throw or feeding movement of the said lever A in the manner hereinbefore fully stated. Simultaneously with the increase of the feeding movement of the lever A the rock-shaft O is operated from the lever G to throw the lever N away from its operating-cam R, and thus suspend the operation of the eyelet-feeding mechanism, as above described.

As it is necessary for the distance between the punch b^3 and the finger *a'* of the top set (by which the work is fed) to equal the throw of the forward end of the lever A to enable said finger to enter the holes made by the punch, it is obvious that the latter must be suddenly adjusted away from the top set when the lateral throw of the lever A, by which the said top set is carried, is increased, the said lever and the bar *b'*, by which the punch-lever B is carried, being normally vibrated laterally in unison, the block a^4, on which the bar *b'* is mounted, being secured to the horizontally-oscillating shaft or post a^3, which is connected with the lever A, so as to turn therewith when said lever is vibrated laterally. This adjustment of the punch b^3 and the bar *b'* on the independent pivot pin or screw *b* of the latter is effected simultaneously with the other adjustments, above described, by the slide C, which, by its lugs *c*, embraces the said bar, said slide being operated by the elbow-lever D, connected by the rod E and yoke F to the

lever G. Thus it will be apparent that the three different mechanisms for adjusting the punch away from the feeding top set, increasing the lateral throw of the lever by which said top set is carried, and suspending the operation of the eyelet-feeding mechanism, are all simultaneously operated by the movement of the lever G and the treadle with which said lever is connected.

To limit the movements of the bar *b* by the slide C, stops a^6 (see Fig. 4) are secured by screws a^7 to the block a^4 on each side of said bar, said stops being preferably slotted, as shown, so as to be adjustable. These stops will be set so that the movements of the punch away from the top set will correspond with the increased movement of the latter.

To vary the increased throw of the lever A, interchangeable sliding bars K of varying thicknesses may be employed, and the stops a^6 will be adjusted to correspond to the thickness of the bar in use; or, instead of using interchangeable bars of different thicknesses, an adjustable wedge-block or large-headed screw may be attached to the rear end of the bar K, to serve as the abutment against the stop *h*. When the operator releases the treadle, the spring g^2 at once restores the parts to their normal positions, so that the operation of punching the holes and setting the eyelets the usual distances apart will again proceed. It will thus be apparent that the punch and set levers are both supported on the machine-frame by a common pintle or post, a^3, to which they are both rigidly connected, so that they will vibrate horizontally in unison, and that, notwithstanding this rigid connection, the punch-lever may be instantly adjusted toward or from the feeding set-lever A, so that a variation in the spacing of the holes punched may be effected without stopping the machine.

It will be understood that parts of my invention may be used independently of the other parts thereof. Thus the mechanism for increasing the lateral throw of the feeding set-lever and simultaneously adjusting the punch away from the top set may be used with a different mechanism than that herein shown for suspending the feeding of the eyelets, or, in fact, without suspending the feeding of the eyelets at all, if it is desired to vary the spacing of the eyelets without stopping the machine; or the eyelet-feed-suspending mechanism may be used independently of the other features of my invention, if it is desired to punch holes for studs without eyeleting such holes, and without making them farther apart than the eyeleted holes. I do not therefore wish to be understood as limiting my invention to the use of all of the features thereof simultaneously, nor to the details of construction herein shown and described, as my invention may be varied within the province of mechanical skill without departing from the spirit thereof.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In an eyeleting-machine, the combination, with the top set or feeding-lever, of a punch, a lever by which the said punch is carried, a support for the said punch-lever, a sustaining block or standard, and a vertical pivot, as screw *b*, on which the said support for the said punch-lever is loosely pivoted, whereby the punch is adapted to be moved toward or from the top set or feeding device during the operation of the machine to effect an unequal spacing of the holes made by the punch without stopping the machine, substantially as set forth.

2. In an eyeleting-machine, the combination, with the eyelet-setting and work-feeding devices, of a punch-lever which in operation moves laterally in unison with the top set or feeding-lever, a carrying block or standard, as a^4, a support to which said punch-lever is pivoted, and which is in turn loosely pivoted to said carrying-block, a movable device, as slide C, for holding said support rigid with said carrying-block and for shifting the same on its pivot when desired, and mechanism, substantially as described, whereby the operator may shift the said movable device to change the position of the punch relative to the top set, and thus vary the distance between the holes made by the former without stopping the machine, as set forth.

3. In an eyeleting-machine, the combination, with the eyelet-setting and work-feeding devices, comprising a laterally swinging or feeding lever, of a punch-lever which in operation moves laterally with the said feeding-lever, but which is loosely pivoted to its carrying-block, a treadle, a sliding bar, as K, a slide, as C, for varying the position of the punch-lever, a lever, as G, adapted to be operated by a treadle, and connections, substantially as described, between the latter lever and the said slide and sliding bar, as set forth.

4. In an eyeleting-machine, the combination, with the top set and the lever by which said set is carried, of a punch-lever, a pivoted carrying-bar to which said punch-lever is pivoted, a treadle-operated lever, and connections, substantially as described, between the latter and the said carrying-bar, whereby the distance between the top set and punch may be instantly varied by the operator.

5. In an eyeleting-machine, the combination, with the top set or feeding-lever, of a punch-lever loosely pivoted to its carrying-block, a slide by which the said punch-lever may be adjusted laterally without stopping the machine, and stops for limiting the lateral adjustment of the said punch-lever, substantially as set forth.

6. In an eyeleting-machine, the combination, with the punch-lever and its carrying support or bar, of a block or support to which said bar is pivoted, a slide working in said bed and having lugs engaging said bar, an elbow or bell-crank lever connected with said slide, and appliances, substantially as described,

whereby the operator may vibrate said bell-crank lever to adjust the punch-lever.

7. In an eyeleting-machine, the combination, with the laterally-vibrating top set or feeding-lever and the stop by which the return movements of the said lever are limited, of a slide or abutment, as bar K, normally interposed between said stop and lever, but adapted to be suddenly withdrawn to increase the throw of the latter.

8. In an eyeleting-machine, the combination, with the punch-lever B, its supporting-bar b', the horizontally-oscillating support or block a^4, to which said bar is pivoted, the slide C, having lugs c, the lever D, rod E, yoke F, and lever G.

9. In an eyeleting-machine, the combination, with the lever A and its stop-screw h, of the sliding bar or abutment K, the rod k, the lever k', link k^2, elbow or bell-crank lever D, and appliances for vibrating the latter.

10. In an eyeleting-machine, the combination, with the sliding standard carrying the eyelet-box and the eyelet roadway or chute, of the operating-lever for said standard, having a sliding pivot, thereby adapting the said lever to be moved laterally to disengage the pin or roller at the lower end thereof from the cam by which said lever is vibrated, to suspend the feeding of the eyelets.

11. In an eyeleting-machine, the combination, with the sliding standard M and the eyelet-box and eyelet roadway or chute carried thereby, of the lever N, provided with the fulcrum-sliding pin n, having an annular groove or recess, n', the rock-shaft O, having arms o and o', the link o^2, the lever G, and appliance whereby the operator may vibrate the latter to suspend the feeding of the eyelets.

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

LOENDER C. EMERSON.

Witnesses:
HENRY E. HILL,
MARSHALL A. POTTER.