2 Sheets--Sheet 1.

A. DAWES.

Eyeletting-Machines.

No. 139,048. Patented May 20, 1873.

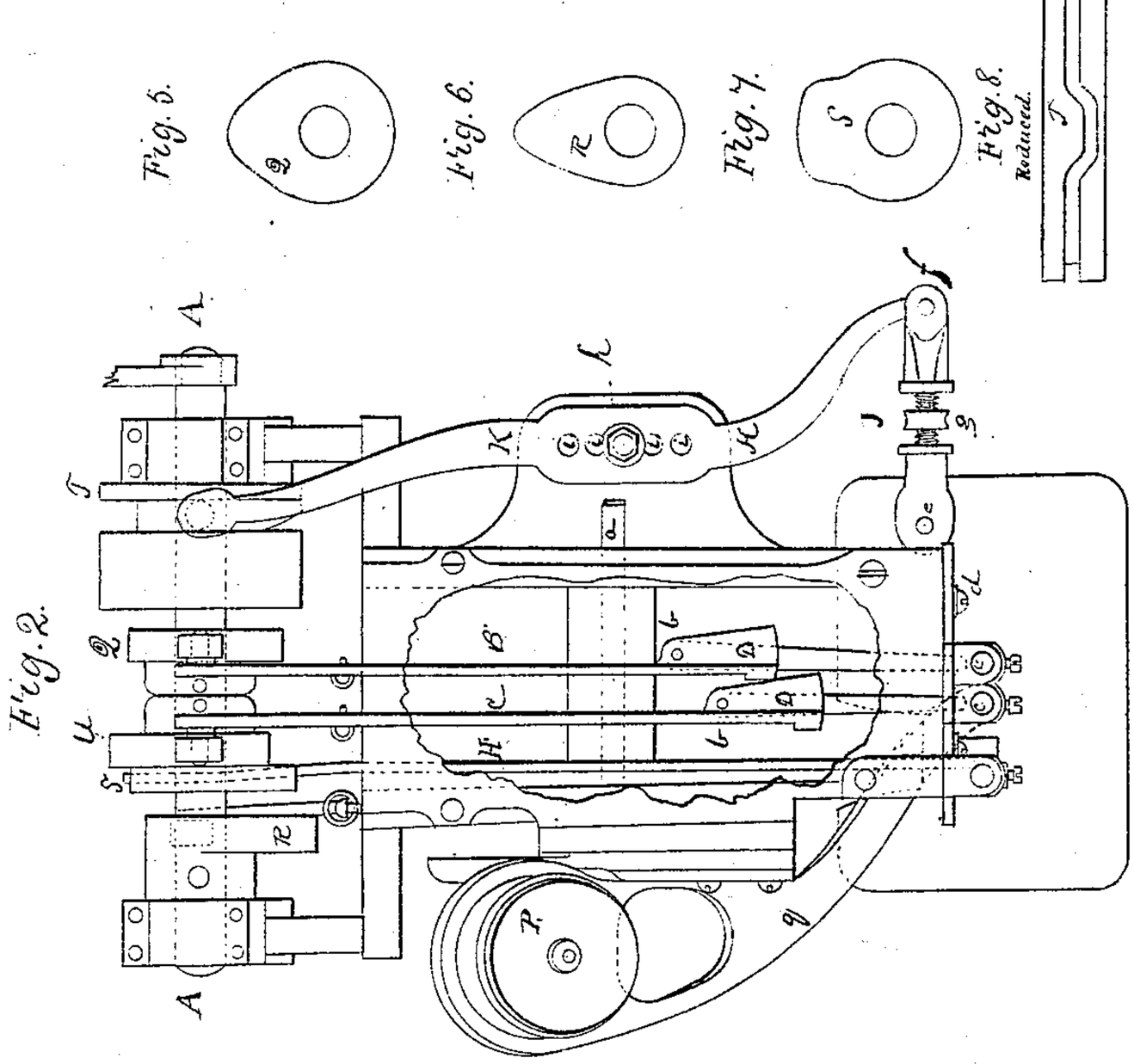


Fig. 1.

Fig. 2.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.
Reduced.

Witnesses.
E. F. Hodges Jr
L. A. Bradley

Inventor.
A. Dawes,

2 Sheets--Sheet 2.

A. DAWES.

Eyeletting-Machines.

No. 139,048. Patented May 20, 1873.

Fig. 4.

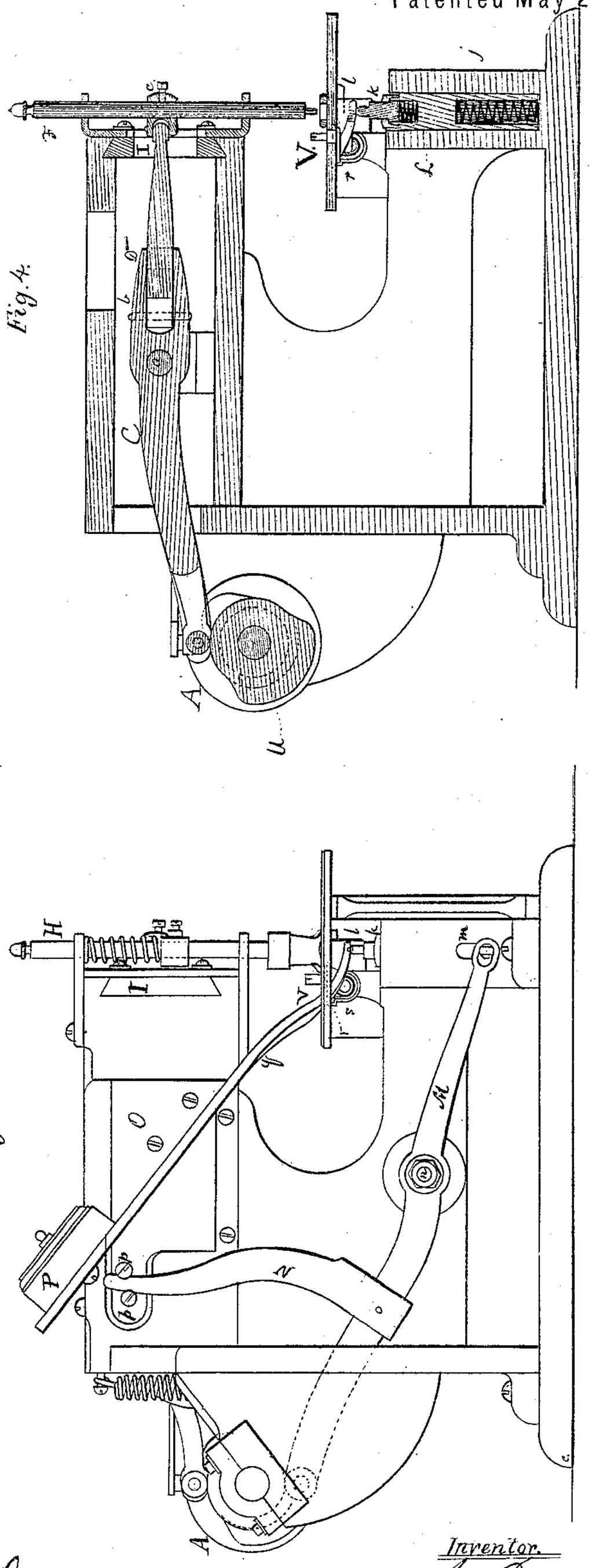
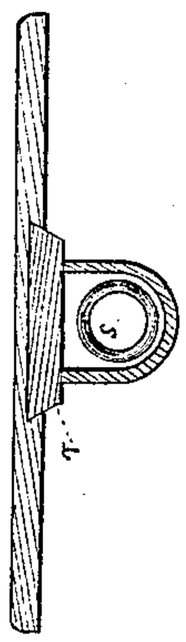


Fig. 3.

Fig. 9.

Enlarged.



Witnesses.

E. F. Hodges Jr.

L. C. Bradford

Inventor.

A. Dawes

UNITED STATES PATENT OFFICE.

ALFRED DAWES, OF HUDSON, ASSIGNOR TO HENRY ELMER TOWNSEND, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN EYELETING-MACHINES.

Specification forming part of Letters Patent No. **139,048**, dated May 20, 1873; application filed January 9, 1873.

To all whom it may concern:

Be it known that I, ALFRED DAWES, of Hudson, in the Commonwealth of Massachusetts, have invented certain Improvements in Eyeleting-Machines, of which the following is a specification:

In my machine I use two plungers—one to punch the hole and the other to feed the material forward and set the eyelet. I use many of the instrmentalities employed in eyeleting-machines now in common use, and do not propose to describe any part of my machine not necessary to a full understanding of the novel features which I have invented. I place my machine at right angles to the cam-shaft for the purpose of obtaining a larger operating-space. I feed the material by means of a reciprocating action given to the plungers. I punch and feed it and set the eyelets substantially as heretofore done in machines in common use; but I have invented certain new devices by means of which I essentially enlarge the capacity of these machines and make them more economical in use—that is to say, I have provided a combination of devices by means of which I can change the feed and adjust the distance between the plungers to that change. I have so provided that inequalities in the thickness of the material shall not impede the progress of the work or derange the machine. I have made the guide-post movable in the direction it is pressed by the material at the turning point, and I have so constructed the levers which operate the plungers that they have a lateral as well as a vertical motion.

The first part of my invention relates to the devices for feeding the material and changing the feed. To do this it is necessary to provide for the means not only to extend and diminish the stride of the feeding-lever, but to adjust the distance between the punch and the eyelet-plungers to any change made in that stride. It is also necessary to provide that the material shall not be carried forward beyond the stationary anvil upon which the eyelets are swaged into form and set upon the material. The plungers are fixed in a block or head in which they move up and down, and with which they are moved to the right and left. This last motion is communicated, by means of an adjustable connecting-rod, from a horizontal feeding-lever pivoted upon a fixed bracket and moved by a cam on the cam-shaft. This lever is provided with several holes, by means of which it may be pivoted at various points, and thus its sweep be lengthened or diminished at will. To the front end of this lever the connecting-rod is joined, by which the plunger head or block is moved to the right or left. It will be seen that any change in the fulcrum of the lever will change the length of the sweep of the connecting-rod both at the right and at the left extremity; and as it is necessary that the plunger-head should at all times move forward to and stop at the same point—viz., so as to bring the setting-plunger directly over the stationary setting-anvil—it is evident that the length of the connecting-rod must be adjustable, so that, while it may draw the plungers in one direction as far as the feeding-stride may demand, it will never carry them forward beyond the point where the setting-plunger will be over the setting-anvil. To insure this I make this rod adjustable as to its length by means of a right-and-left screw, and when the throw of the lever is made longer I so shorten this rod that it will not carry the setting-plunger beyond the said point. The punching-plunger is fixed upon a plate in the head or block, which, by means of set-screws and slots, may be moved to the right or left and fixed in place at any given distance from the setting-plunger. By this means the distance between the plungers may be regulated to accommodate the changes in the throw of the feeding-lever and the stride of the feed.

The second part of my invention relates to the construction of the levers which operate the plungers. The plungers must move up and down in order to punch the material and set the eyelets. They must also at the same time, be subject to a lateral motion in order to take up and feed forward the material to the setting-anvil. In my machine I work the plungers by means of levers, which, at one end, bear upon the cam-shaft, and at the other are so fixed to the plungers as to move them in right, and not in curved, lines. These le-

vers are hung upon a rod or pivots, upon which, as a fulcrum, they move up and down under the control of the cams and cam-shaft. Between the fulcrum and the plungers each of them is jointed by a joint, which permits the lower arms, or arms nearest the plungers, freely to move to the right or left. Thus these levers may move with the plungers horizontally, under the influence of the feeding-lever and connecting-rod, and are at all times in position to bear the plungers up and down as the cams and cam-shafts impel; but it will be seen that the joints above named are points of weakness, inasmuch as they diminish the stiffness of the levers. To obviate this, I fix stiff sleeves firmly and rigidly upon the levers at a point above this joint, and extend them down upon the lower arm toward the plungers. They should be of stiff plates on the upper and under sides and so expand the ends nearest the plungers that the lower arms will be at all times held firmly between them. In this way the levers, notwithstanding the joint, are as rigid in a vertical direction as if of entire pieces and without joints. I thus give to one lever a horizontal motion, while all the time it is capable of operating in a vertical direction.

The third feature of my invention consists in a device by which I avoid the obstacles arising from the varying thickness of the material in which the eyelets are set. The distance between the forming faces of the setting-plunger and the setting-anvil when nearest together—*i. e.*, when the eyelet receives the final pressure—must always be the same in those machines where the setting-anvil rests upon an unyielding foundation. When the material varies in thickness the machine must be unduly strained or broken, or the material must be compressed to the limits fixed by the mechanism. Usually the latter results from such a condition, but the machinery is more or less strained and sometimes broken when the thickness or density of the material forbids the requisite compression. To avoid this, I place the setting-anvil upon a spiral spring, coiled within the anvil block or column, of sufficient strength to overcome the eyelet metal, but yielding to the resistance of the material too thick or dense to be compressed to the dimensions demanded by the machinery. When the material at any point is too thick the spring yields, the setting-anvil sinks down, and the work progresses without impediment and without injury to the machine. The spring upon which the eyelet-pin is usually set I coil within the above-named spring for convenience.

The fourth part of my invention consists in making the ordinary guide-post movable in a line parallel with the feed and in the same direction. This post is usually fixed. When in the progress of the work it becomes necessary to turn the material from a right line, or the line in which it has been fed along, this fixed post proves an obstruction and causes much inconvenience. This post was not designed to resist pressure, save at right angles to the line of feed, and is employed simply to keep the eyelet-line at proper distance from the edge of the work. I therefore have arranged to have the post movable in the line and direction of the feed. I make a slot in the table, extending from a point in the rear of the punch-plunger to the left as far as required. I fix the post upon a slide that works in a dovetail under the table and pass the post through a slot. I keep this post drawn against the wall of the slot on the right by means of a spring upon the slide. When it becomes necessary to turn the work out of its line of feed, and in so doing to bring it in contact with the post, this spring yields and the post and slide are moved out of the way.

Description of the Accompanying Drawing.

Figure 1 is a front elevation. Fig. 2 is a plan with a portion of the top broken away. Fig. 3 is a side elevation. Fig. 4 is a vertical and longitudinal section. Fig. 5 is a punch-bar cam. Fig. 6 is an anvil and hopper cam. Fig. 7 is a pressure-foot cam. Fig. 8 is a sliding-carriage cam, developed on a plane and reduced. Fig. 9 is a slide bearing the movable guide or stop.

General Description.

A is the cam-shaft, from which, and its cams, the various motions of the machine are derived. B is the lever which operates the punch-plunger. C is the lever which operates the setting-plunger. These swing vertically upon a fulcrum-rod, *a*. Between the fulcrum and the plungers at *b b* these levers are severed and jointed so as to admit of their lower portions or arms being swung or moved to the right or left. D D are two sleeves rigidly fixed upon the levers B and C above the points *b b*, and extending down toward the plungers. The plates or pieces composing the upper and lower portions of these sleeves should be of of such weight and stiffness as to make the two parts of the lever, so far as vertical movements are concerned, rigid and like one piece, it being the purpose of these sleeves to secure the same power, or nearly the same, to the vertical motion of the levers B and C that they would have had they been made in one piece. These lower arms are stepped into stirrup-locks *c c* on the plungers, so arranged and constructed that the levers carry the plungers in their vertical movements, and the plungers bear the levers in their horizontal movements; and, the levers not being fixed but loosely held in the stirrup-boxes, all these movements are in right lines, and not in curves. E is the plunger which bears the punch, and F the plunger that bears the setting-face, by which, with aid of the anvil, the eyelet is set. G is a plate fixed upon the head-block by means of the screws *d d*, which pass through the hori-

zontal slots in said plate, thus permitting the said plate to be moved to the right or left and fixed at any point. The plunger E works in guide-straps or brackets fixed upon this plate, and, consequently, as the plate is moved to the right or left upon the block, the plunger goes with it. G′ is a like plate immovably fixed upon the block or head, having like guide-straps, in which the setting-plunger works. H is the pressure-foot bar working in guides fixed on the frame of the machine, and operated by a separate lever, H′, which works through a hole in the plate G′. This bar bears a spiral spring which forces down the foot after it has been released from the lever H′. I is the head or block upon which the plates G and G′ are fastened, and which slides in a dovetailed mortise horizontally under the influence of the feeding-lever. J is a connecting rod, fastened at one end by a hinge-joint, *e*, to the block I, and at the other end by a hinge-joint, *f*, to the feeding lever K. The length of this rod is adjustable by means of a right-and-left screw, *g*. K is a feeding-lever swinging horizontally upon the stationary fulcrum-pin *h*; the sweep of the lever may be changed by passing this pin through any other of the holes *i*, made on either side of the one in which the said pin *h* is shown in the drawing. L is the anvil-block and post within which is coiled a stiff spring, *j*, upon which rests the anvil *k*, and through a hole in the face of which plays vertically the receiving-pin *l*, which rests upon a weaker spring coiled within the spring *j*. This anvil-block or column L is moved up and down to meet the eyelet-plunger and compress the eyelet by means of the lever M, which engages through a slot with the pin *m* fixed upon the bottom of the block L. Lever M is hung upon a fulcrum-pin, *n*. N is a connecting-rod or arm, one end of which is fixed rigidly upon M at *o*, while the other is confined between two pins or cam-balls *p* on the plate or block O. O is a plate which slides in a dovetail mortise upon the frame. P is an eyelet-hopper, fixed upon the sliding-plate O and provided with a spout, *q*, arranged for adjusting and conveying the eyelets to the receiving-pin *l*, as the whole is moved by the lever M. Q, R, S, T, and U are the cams upon the cam-shaft which govern the motions respectively of the lever B M H′ K C. V is a guide-post projecting above the table through a slot, and serving to keep the line of eyeleting; it is fixed upon a slide, *v*, that moves in a dovetail to the right and left in the same line with the feed. In a tube or socket on this slide is coiled a spiral spring, *s*, the end of which nearest the post V bears against a stop fixed upon the under side of the table. A pressure in the same direction with the feed against the post V will overcome the resistance of this spring and cause the post and slide to move in the direction of the feed; the pressure being removed the slide and post will be retracted to their original position by the force of the spring.

Mode of Operation.

The machine is turned until both plungers are raised, and F is directly over the receiving-pin *l*. The material is then placed under the pressure-foot so as to bring the point where the first eyelet is to be set directly under the plunger E. Upon turning the shaft the cam Q bears up one end of lever B and forces the punch on plunger E down through and raises it clear from the material. The cam T then moves lever K horizontally, and carries the block or head I with plungers E and F to the right the distance designed to be between the eyelets. The cam U then moves lever C and presses the setting-plunger down through the hole made by the punch—at the same time the cam S bears upon lever H′ and raises the pressure-foot—when the cam R bears upon the lever M and moves the anvil up so that the anvil-pin takes the eyelet from the end of spout *q* and bears it against the setting-face on plunger F, while it also vibrates the hopper P through the arm N and removes the spout *q* back from the pin *l*, and again restores it to position to deposit an eyelet upon the said pin *l*. While this is in progress the cam S releases the lever H′, and the pressure-foot is brought down upon the material by force of the spiral spring. The machine is now in the position to start the operations for setting a second eyelet. Should the material be too thick in any part for the space between the faces of the anvil and the setting-plunger F when at the nearest point, then the anvil-block will be pressed down against the spring *j*, and the work will proceed without impediment. If it is necessary to turn the material in such a way that the guide-post V would be an obstacle, it, the said post, with the slide *r*, will be forced against the spring *s* to the left and removed from interference with the manipulations of the operator. To change the feed, change the fulcrum of lever K, lengthen or shorten the connecting-rod J by means of the screw *g* so as to insure that bar F will be carried forward exactly to the point over the anvil *k*, and adjust the distance between the plungers E and F to the stride of the new feed by moving the plate G after loosening the screw *d*.

Claims.

I claim—

1. The lever B having the joint *b* and the sleeve D.

2. The lever B jointed below the fulcrum so as to be capable of being moved laterally and vertically.

3. The sliding block I with the plates G and G′, and the plung rs E and F.

4. The sliding block I with the plates G and G′ and the plungers E and F, in combination with the jointed levers B and C.

5. The adjustable connecting-rod J, in combination with the sliding block I.

6. The adjustable connecting-rod J in combination with sliding block I and the lever K.

7. In an eyelet-setting machine, a setting-anvil resting upon a spring.

8. The guide-post V upon the slide *r*, in combination with a retracting spring.

9. The movable guide-post V.

10. In an eyeleting-machine, the jointed levers B and C; the adjusting-plate G; the adjustable-connecting rod J, in combination with the adjustable lever K or other device for actuating the feed.

11. In an eyeleting-machine, a movable guide-post.

A. DAWES.

In presence of—
EDWARD FRANCIS HODGES,
S. A. BRACKETT.