2 Sheets--Sheet 1.

A. B. EDMANDS.

Eyelet-Setting Machines.

No. 151,864. Patented June 9, 1874.

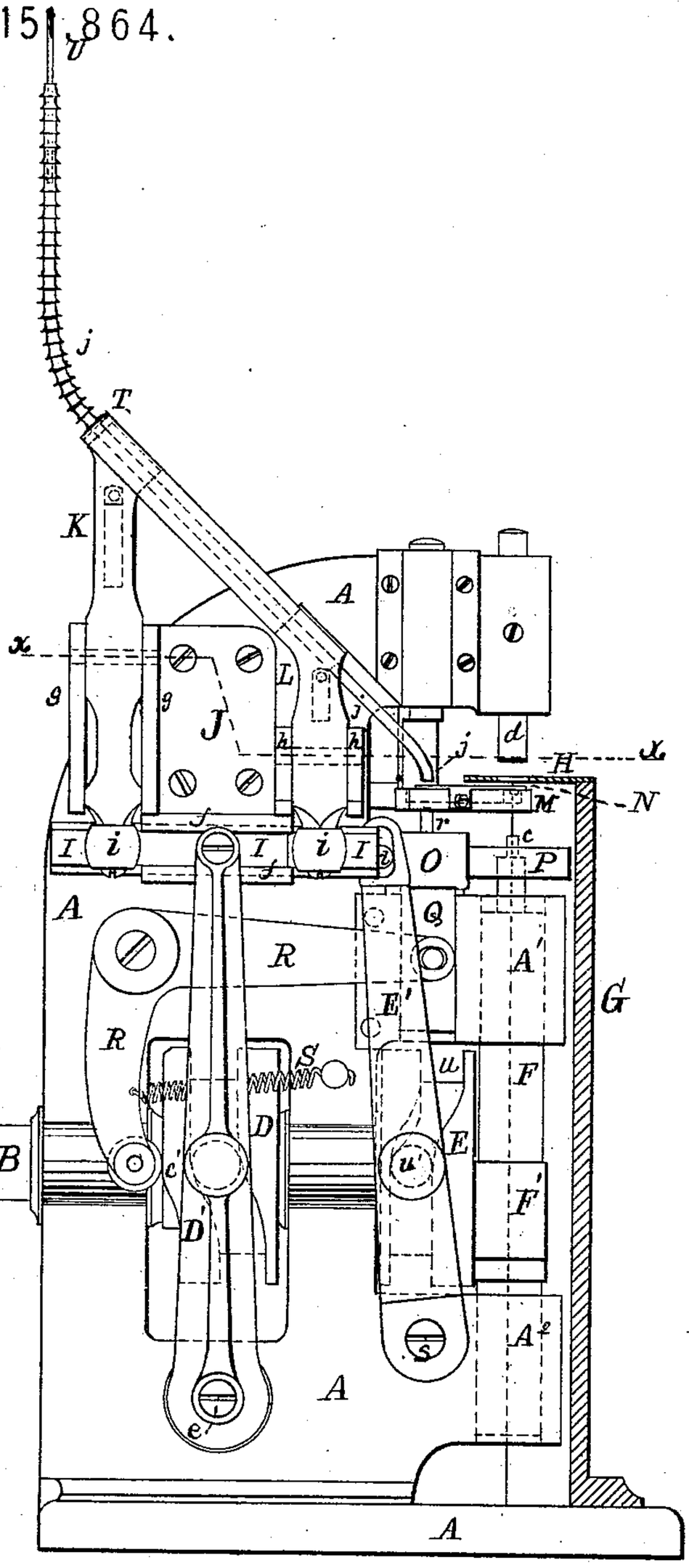

Fig. 1.

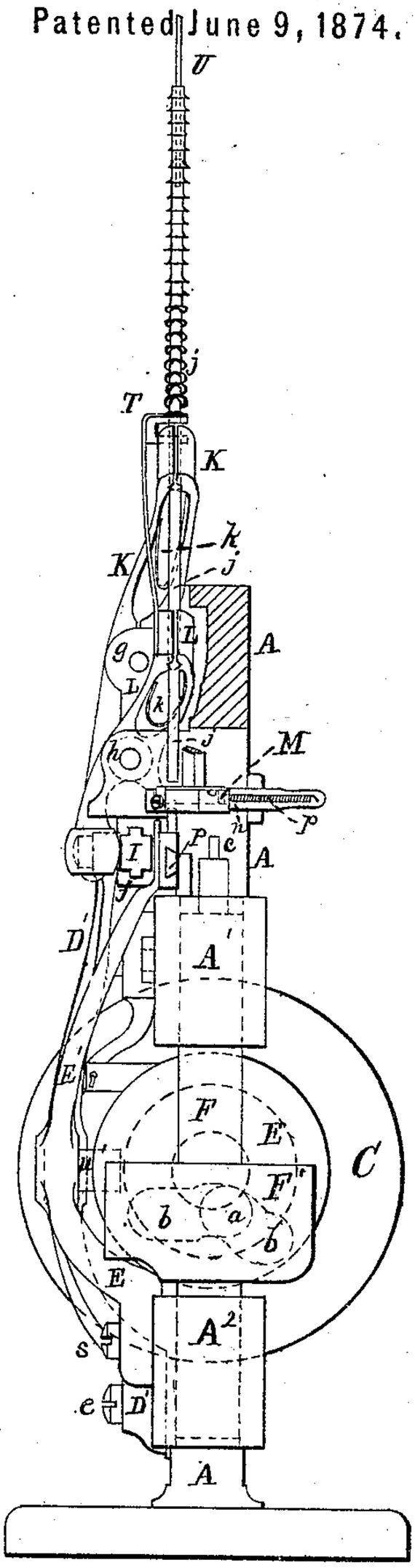

Fig. 2.

Witnesses.
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Artemas B Edmands

2 Sheets--Sheet 2.

A. B. EDMANDS.

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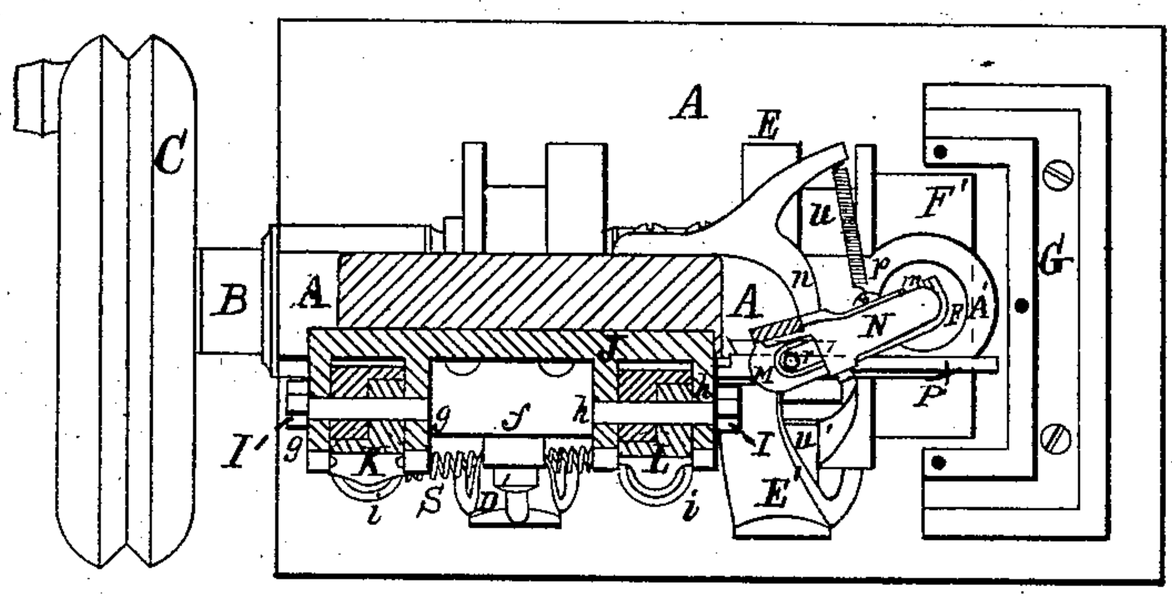

Fig. 4.

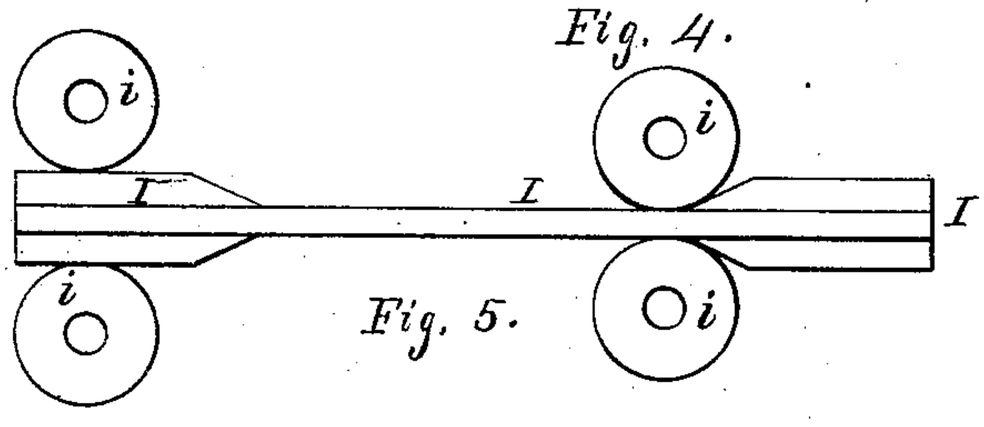

Fig. 5.

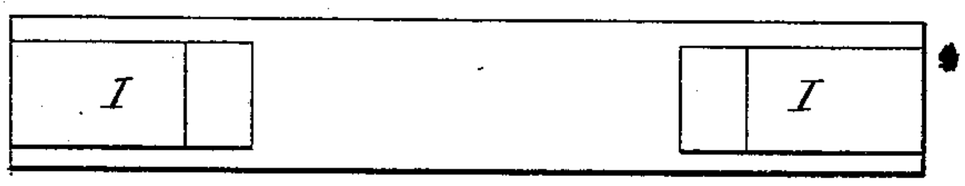

Fig. 6

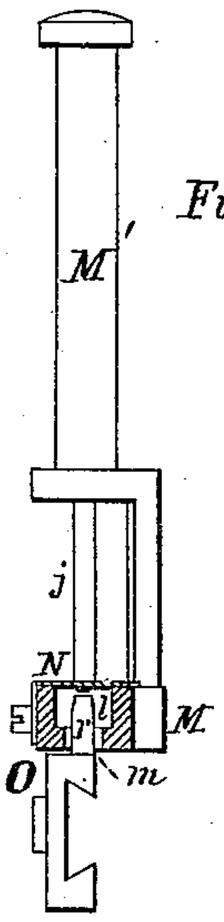

Fig. 9.

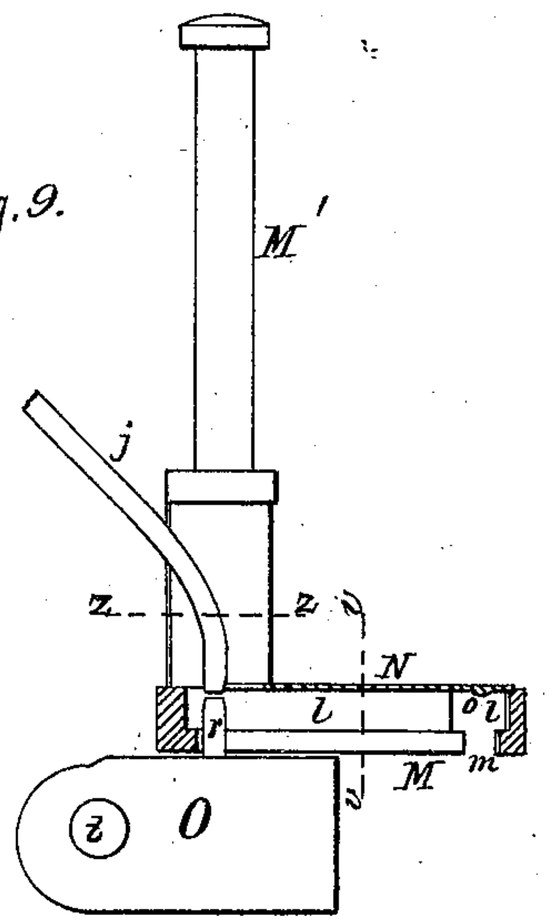

Fig. 8.

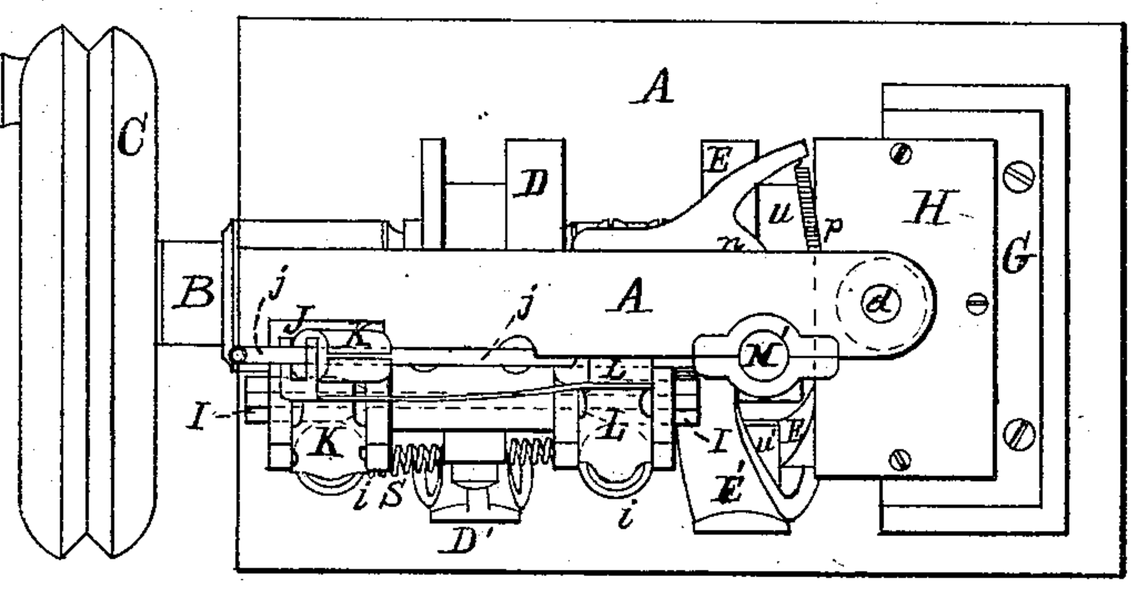

Fig. 3.

Fig. 7.

Witnesses,
Wm. P. Edwards
L. A. Wood.

Inventor.
Artemas B Edmands.

UNITED STATES PATENT OFFICE.

ARTEMAS B. EDMANDS, OF SAUGUS, MASSACHUSETTS.

IMPROVEMENT IN EYELET-SETTING MACHINES.

Specification forming part of Letters Patent No. **151,864**, dated June 9, 1874; application filed March 5, 1874.

To all whom it may concern:

Be it known that I, ARTEMAS B. EDMANDS, of Saugus, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Eyelet-Setting Machines, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to the means employed to feed the eyelets consecutively to the setting-tools; and it consists, first, in the use, in an eyelet-setting machine, of an eyelet guide-rod, onto which the eyelets are fed by their own gravity from a wire or cord upon which they have previously been strung with their flange ends all in one direction, said guide-rod being of a diameter about equal to the diameter of the hole through the eyelet, and held in an inclined or vertical position, according to the circumstances of the case, or the construction of the machine to which the feed is applied, by means of two pairs of clamping jaws or pinchers arranged a short distance apart, and to be alternately closed upon said wire or rod and opened again, the opening and closing of said jaws or pinchers being so timed that there is always at least one pair closed upon the wire, said wire being entirely unsupported, except by said jaws. My invention further consists in the use, in combination with said wire or rod and its supporting-jaws, of a forked finger arranged just above the upper end of the upper jaws, to serve as an intermittent stop to prevent the descent of all the eyelets above it when said upper jaws are open, and to be withdrawn and allow the column of eyelets to descend and rest against the said upper jaws when they are closed, said stop being so formed and located as to straddle the body of the lower eyelet in the column just below the flange of the second eyelet from the bottom of the column, and retain all above it, while the single eyelet below it is allowed to descend through the upper jaws when they are opened, and rest against the lower jaws, where it remains till the upper jaws are closed and the lower jaws are opened, said forked finger and the upper pair of jaws working in conjunction, constituting a complete operative device for separating the lower eyelet from those above it, and allowing it to descend along said guide-rod to be conveyed to the setting-tools. My invention further consists in the use, in combination with said wire or rod and its supporting-jaws, of a slotted vibrating arm, having its axis vertical and in line with the center of the lower end of said wire, the slot in said arm being of two widths, the upper portion of a depth equal to the length of the eyelet, being of a width equal to the diameter of the flange of the eyelet, and the lower portion being of a width equal to the diameter of the hole through the eyelet, said arm being arranged and operated in such a manner that its outer end will swing over the setting-punch when said punch is down, in which position it remains until the setting-punch has entered the eyelet held in the outer end of said arm when said arm is vibrated to one side, leaving the eyelet on the setting-punch, the slot in said arm being cut through one side thereof to allow of said side movement while the setting-punch is in said slot. My invention further consists, in the application to the upper side of said vibrating arm, of a light spring covering a portion of the channel or slot formed therein, through or in which the eyelet is conveyed from the end of the jaw-supported wire to a point directly over the setting-punch, said spring having formed upon the under side of its outer end a small rounded projection to fit into the upper end of the eyelet when it has been moved to the outer end of the slot or channel in said arm, and retain the eyelet in position in said arm until the eyelet is entered by the setting-punch. My invention further consists in the use, in combination with said vibrating arm or carrier, of a pin set in a vertical position arranged to move in a vertical direction, and to receive the eyelet from the lower end of the jaw-supported wire, and to reciprocate in a right line horizontally for the purpose of conveying the eyelet from said wire to the outer end of the slot in the vibrating arm, and at the same time serve the purpose of vibrating said arm away from the setting-punch, the arm being moved in the opposite direction by a spring. My invention further consists in the use of a reciprocating bar having formed thereon two pairs of inclined surfaces, each of said pairs of inclined surfaces forming a wedge for closing one of the

clamping-jaws, said wedges facing in opposite directions, so that a movement of said bar in one direction will close one pair of the jaws, and a continuation of said motion will release the other pair of jaws and allow them to be opened by the action of a spring, and a movement of the bar in the opposite direction will close the jaws that were opened by the previous movement, and then open the jaws that were closed by said previous movement.

In the drawings, Figure 1 is a side elevation of a machine illustrating my invention, with the table on which the work is placed and its supporting-standard shown in section. Fig. 2 is a front elevation of the same with the table and its standard removed and a portion of the upper part of the frame cut away, the cutting-plane being in a line with the center of the jaw-supported wire. Fig. 3 is a plan of the same. Fig. 4 is a horizontal section on line *x x* on Fig. 1, with table removed. Fig. 5 is a plan of the double wedge for operating the clamping-jaws, and showing its relation to the trucks upon the lower ends of the jaw-levers. Fig. 6 is a side elevation of said wedge. Fig. 7 is a sectional plan of the vibrating carrier-arm with its spring removed, the cutting-plane being on line *z z* on Fig. 8. Fig. 8 is a longitudinal section of said arm on line *y y*, showing its supporting-journal, a portion of the jaw-supported wire or eyelet-guide, and the reciprocating carrier-pin in elevation. Fig. 9 is a transverse section on line *v v* on Fig. 8.

A is the frame of the machine, upon which are mounted all the operating parts. B is the driving-shaft, mounted in suitable bearings in the frame A, and provided with the wheel C upon its outer end, by means of which rotary motion may be imparted thereto. The shaft B also carries the cylinder-cams D and E, firmly secured thereto and arranged to impart a vibratory motion, respectively, to the levers D′ and E′. In the front face of the cam E is set a pin, which carries a truck, *a*, arranged to work in a curved slot, *b*, in the back part of the block F′, secured to or forming a part of the plunger F, as seen in dotted lines in Fig. 2, all constructed and operating as set forth and described in the patent No. 141,211, granted to me July 29, 1873. The plunger F is fitted to bearings A^1 and A^2 in the frame A, and carries the clinching and setting punch *c*, arranged to pick up the eyelet, insert it in the material, and, operating in conjunction with the anvil *d*, clinch the eyelet in a well-known manner. G is a standard, which supports the table H. The lever D′ is pivoted to the frame A by means of the pin *e*, and carries a truck which fits into the path in the cam D, by the rotation of which a vibratory motion is imparted to said lever. The upper end of said lever is connected to the bar I, and by its vibration imparts a reciprocating motion to said bar, it being mounted in the bearing *f* in such a manner that it is compelled to move in a right line when it moves at all. The bar I is made thinner in the middle than at its two ends, and the change from the thin to the thick portions of said bar is made by inclined planes, two upon either side thereof, facing in opposite directions, as seen in Fig. 5. J is a stand, secured to the frame A, and provided with the bearing *f* for the wedge-bar I, and the ears *g g* and *h h*, between which are hung the two pairs of clamping-jaws, marked respectively K and L. Each pair of clamping-jaws K and L consists of two levers pivoted at or near the middle of their length by a common fulcrum-pin to the ears *g g* or *h h* of the stand J, in such a manner that when the lower ends of said levers are forced apart the upper ends will approach each other. The lower ends of said levers are each provided with an anti-friction truck, *i*, arranged to rest against the side of the reciprocating wedge-bar I, one of each pair upon either side thereof, as shown in Fig. 5. The upper ends of said jaw-levers have formed upon their inner or contiguous faces V-shaped grooves, arranged to embrace the inclined eyelet guide-rod *j*, and hold it firmly in position, one of said jaws always being closed upon said rod.

It will be seen that the arrangement and construction of the two pairs of jaws, and the wedge-bar for operating the same, are such that a movement of the bar in one direction will cause one of the jaws to be closed, and then allow the other to be opened by the action of a spring, *k*, placed between the upper arms of the jaw-levers, and a motion of said bar in the reverse direction will cause the jaw last opened to be first closed, and then allow the other to be opened, thus alternately griping and releasing the eyelet guide-rod *j* at two different points. The upper pair of jaws, K, in addition to their office of supporting the guide-rod *j*, serve the purpose of an intermittent stop, working alternately in conjunction with another intermittent stop, hereafter described, to separate the lower eyelet from those above it, and allow it to descend along the guide-rod, as will be further explained.

M is an arm, arranged to vibrate within suitable limits about a vertical axis, in line with the center of the lower end of the eyelet guide-rod *j*, and having formed in its upper side a groove or channel, *l*, of a depth equal to the length of the eyelet, and of a length equal to the distance from the center of the lower end of the eyelet guide-rod *j* to the center of the setting-punch *c*, at which point said groove or channel is turned at right angles to its former direction and cut through the side of the arm M, as shown in Fig. 7. The arm M has also formed therein a slot, *m*, of a width about equal to the diameter of the hole in the eyelet, said slot being arranged centrally of the channel *l*, and cutting through to the bottom of said arm, as seen in Figs. 7 and 9. N is a light spring secured to the upper side of the arm M in any suitable manner, and provided upon the under side of its outer end with a rounded projection, *o*, so arranged with relation to the channel *l* that said pro-

jection shall fit into the hole in the eyelet, and the end of the spring shall rest upon the top of the same when the eyelet has been moved to the outer end of said channel, and serve to hold the eyelet in position until the setting-punch enters it. The arm M is attached to, or forms a part of, the vertical shaft or journal M′, by which it is mounted in a suitable bearing in the frame A, about which it may vibrate within certain determined limits, it being held in the position shown in Fig. 4, with its outer end over the setting-punch *c*, and its side resting against the stop *n*, by means of the spring *p*, until it is vibrated to one side by the movement of the vertical carrier-pin *r* toward the outer end of the slot *m*. The pin *r* is set in the upper edge of the block or cross-head O fitted to slide upon the dovetailed bar P, which is secured to, or forms part of, the stand or plate Q fitted to slide vertically in a suitable bearing in the frame A. A reciprocating motion in a horizontal direction is imparted to the cross-head O and its pin *r* by means of the lever E′, which is pivoted to the frame A by the pin *s*, and connected at its upper end to the cross-head O by the pin *t*, a vibratory motion being imparted thereto by the action of path *u* formed in the periphery of the cam E upon the truck *u′* mounted upon a pin set in the lever E in a well-known manner. A reciprocating motion in a vertical direction is imparted to the plate Q, and through to the cross-head O and its pin *r*, by means of the elbow-lever R and an edge cam *c′* formed on the rear end of the cylinder-cam D and the spiral spring S in an obvious manner. T is a forked stop arranged to straddle the body of the lower eyelet of the column when its flange rests against the upper end of the upper clamping-jaws K, in such a position as to prevent all the eyelets above it from descending along the guide-rod *j* when the jaws K are opened. The stop T is connected to, and moves with, the outer portion of the lower jaws L in a direction transversely to the guide-rod *j*, in such a manner that when the jaws L are opened the stop will be removed from the line of movement of the column of eyelets and allow them to descend until the flange of the lower one rests against the jaws K, and be again closed over the body of the lower eyelet when the jaws L are again closed. It is evident that the fork T may be operated by other means independently of the jaws L, if desired.

U is a short piece of cheap wire upon which the eyelets are strung at the manufactory, with their flange ends all in one direction. These wires are of sufficient length to hold, say, one thousand eyelets, and are furnished to the shoe-manufacturers and others using them already strung; and when it is necessary to set a quantity of eyelets, this wire, filled with eyelets, is suspended at length above the machine, with the flange end of the eyelets downward, and the lower end of the wire U is inserted in a hole drilled in the upper end of the guide-rod *j*, as shown in Figs. 1 and 2.

The operation of my machine is as follows, all of the parts being in the position shown in Figs. 1 and 2 of the drawing: When the wire U is connected with the guide-rod *j*, as shown, and the eyelets are allowed to descend, they will slide down the guide-rod *j* until the flange of the lower eyelet rests against the stop T. Now, if the wheel C be rotated in the direction of the arrow, the wedge-bar I will be moved to the extreme of its throw toward the front of the machine, and allowing the jaws L to be opened by the action of the spring *k*, and by said opening withdraw the stop T, and allow the column of eyelets to descend till the lower eyelet rests against the upper end of the jaws K. A continuation of the revolution of the wheel C will cause the wedge-bar I to move in the opposite direction, the first effect of which is to close the jaws L onto the guide-rod *j*, and at the same time move the stop T into its previous position, the fork thereof straddling the body of the lower eyelet just below the flange of the next eyelet above; and the next effect is to open the jaws K, and allow the lower eyelet to descend along the guide-rod *j* until it rests against the upper end of the jaws L. The wedge-bar I, being again moved toward the front of the machine, first closes the jaws K onto the rod *j*, and then opens the jaws L, allowing the eyelet resting against it to slide down the guide-rod *j* and drop over the pin *r*, and rest on its flange end in the channel *l* in the arm M, and at the same time again remove the stop T from the path of descent of the column of eyelets, allowing them to drop down against the jaws K. The revolution of the wheel C being continued, the recession of the wedge-bar, operating as before, allows another eyelet to descend and rest against the jaws L, while at the same time the eyelet that has previously been deposited upon the pin *r* is carried by said pin to the front end of the channel *l*, the pin *r* at the same time vibrating the arm M away from its position over the setting-punch, when the pin *r* is withdrawn from the eyelet by the downward motion of the plate Q and the parts connected therewith, caused by the action of the cam *c′* upon the elbow-lever R, leaving the eyelet in the end of the channel *l*, and held in position by the spring N, the projection *o* upon the under side of which fits into the hole in the eyelet. As the motion is continued, the operations of the wedge-bar and jaws are repeated, as described, while the cross-head O, carrying the pin *r*, returns to its former position, with the pin directly under the lower end of the guide-bar *j*, and in line with the axis about which the arm M vibrates, when the spring *p*, acting upon the arm M, causes it to swing around against the stop *n* in such a position that the center of the eyelet contained in its outer end will be directly over the center of the setting-punch *c*, in which position it remains until the setting-

punch *c*, in its upward movement, has entered the eyelet, the jaws K and L and the stop T having, in the meantime, so operated as to release another eyelet from the bottom of the column, and allow it to descend along the guide-rod *j* and fall upon the pin *r*, when the cross-head O and pin *r* are again moved toward the front of the machine, carrying the eyelet just deposited thereon along the channel *l* in the arm M, and, by the action of said pin upon the side of the slot *m*, causing the arm M to be moved from its position over the setting-punch, the eyelet previously deposited in the end of the channel *l* being retained upon the setting-punch, and carried upward thereby and inserted in the material, and clinched thereto by the continued upward movement of the setting-punch, while the pin *r* deposits the second eyelet in the outer end of the channel *l*, is drawn down out of the eyelet, moves back to a position directly under the lower end of the guide-rod *j*, its upper end remaining in the slot *m*, so as to hold the arm M to one side of the setting-punch until said punch has descended below the under side of said arm, at which time the pin *r* arrives at the limit of its backward movement, when the arm M will be moved by the spring *p* to the oblique position shown in Fig. 4, carrying the second eyelet to a position to be entered by the setting-punch *c* on its next upward movement, as before described.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The eyelet guide-rod *j*, supported in position by a gripe or pressure alternately applied at two different points thereof, and arranged to receive the eyelets at one end and deliver them from the other, and during the process of setting eyelets, substantially as described.

2. In combination with the rod or wire *j*, arranged to guide the eyelets by their interior surfaces, the stop T and jaws K, serving as a secondary stop, all arranged to support the column of eyelets, separate the lower eyelet therefrom, and control the descent along said rod, substantially as described.

3. The combination of the eyelet guide-rod *j*, the two pairs of clamping-jaws K and L, and the double reciprocating wedge I, arranged to operate substantially as described, for the purpose specified.

4. In combination with the eyelet guide-rod *j*, and two pairs of alternately-operating clamping-jaws for supporting the same, the forked intermittent stop T, for controlling the descent of the eyelets, whether said stop is connected to and operated by one of said jaws or independently thereof, substantially as described.

5. In combination with the jaw-supported guide-rod *j*, the vibrating arm M, arranged and operating substantially as described, for the purpose specified.

6. In combination with the slotted and channeled arm M, arranged to vibrate as set forth, the spring N, constructed to operate substantially as described, for the purpose specified.

7. In combination with the arm M, the setting-punch *c*, and the anvil *d*, the pin *r*, arranged to reciprocate in a vertical and horizontal direction, substantially as described, for the purpose specified.

Executed at Boston this 28th day of February, 1874.

ARTEMAS B. EDMANDS.

Witnesses:
WM. P. EDWARDS,
S. A. WOOD.