

(No Model.)

S. N. SMITH.

MACHINE FOR MAKING EYELET STOCK.

No. 259,229.

Patented June 6, 1882.

FIG. 2.

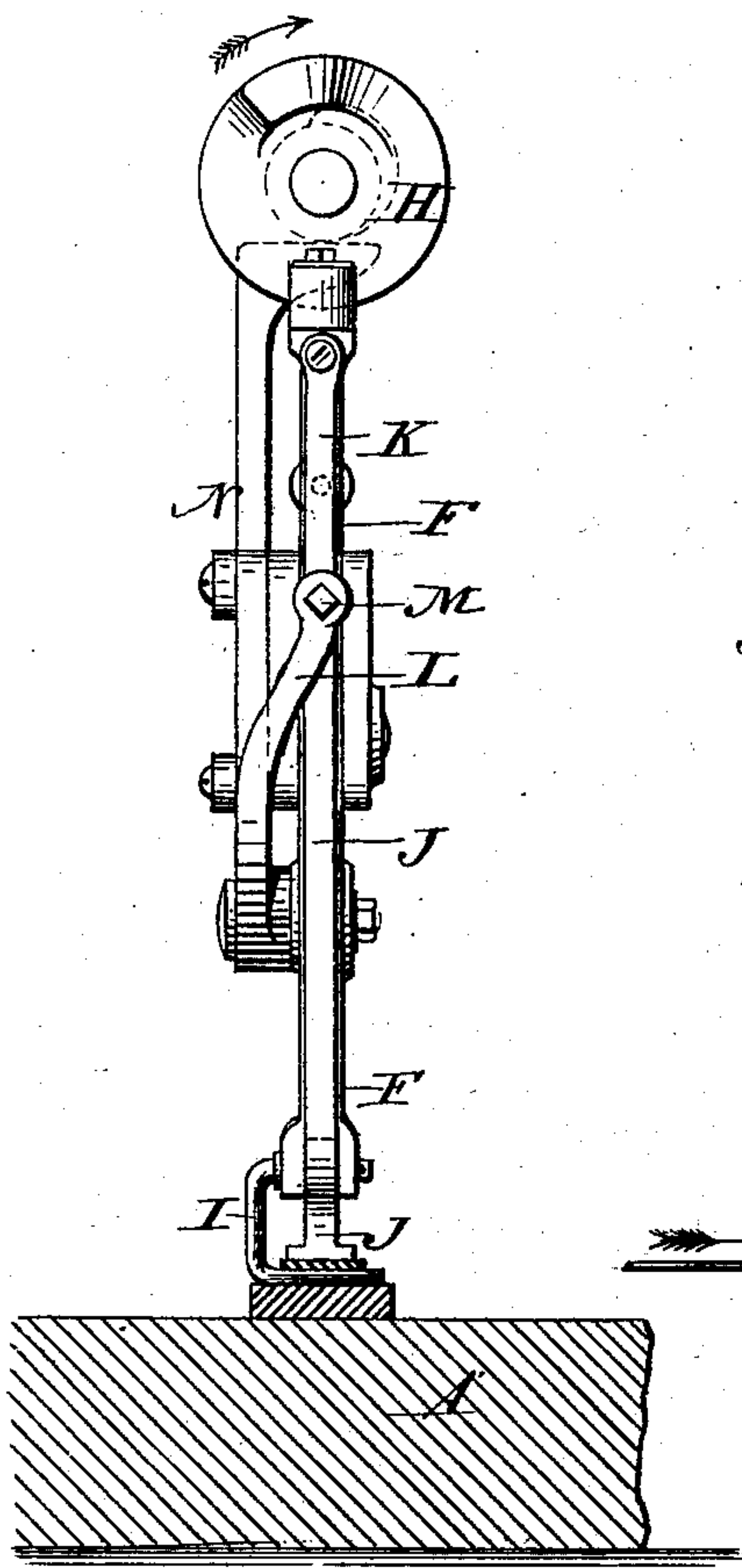


FIG. 1.

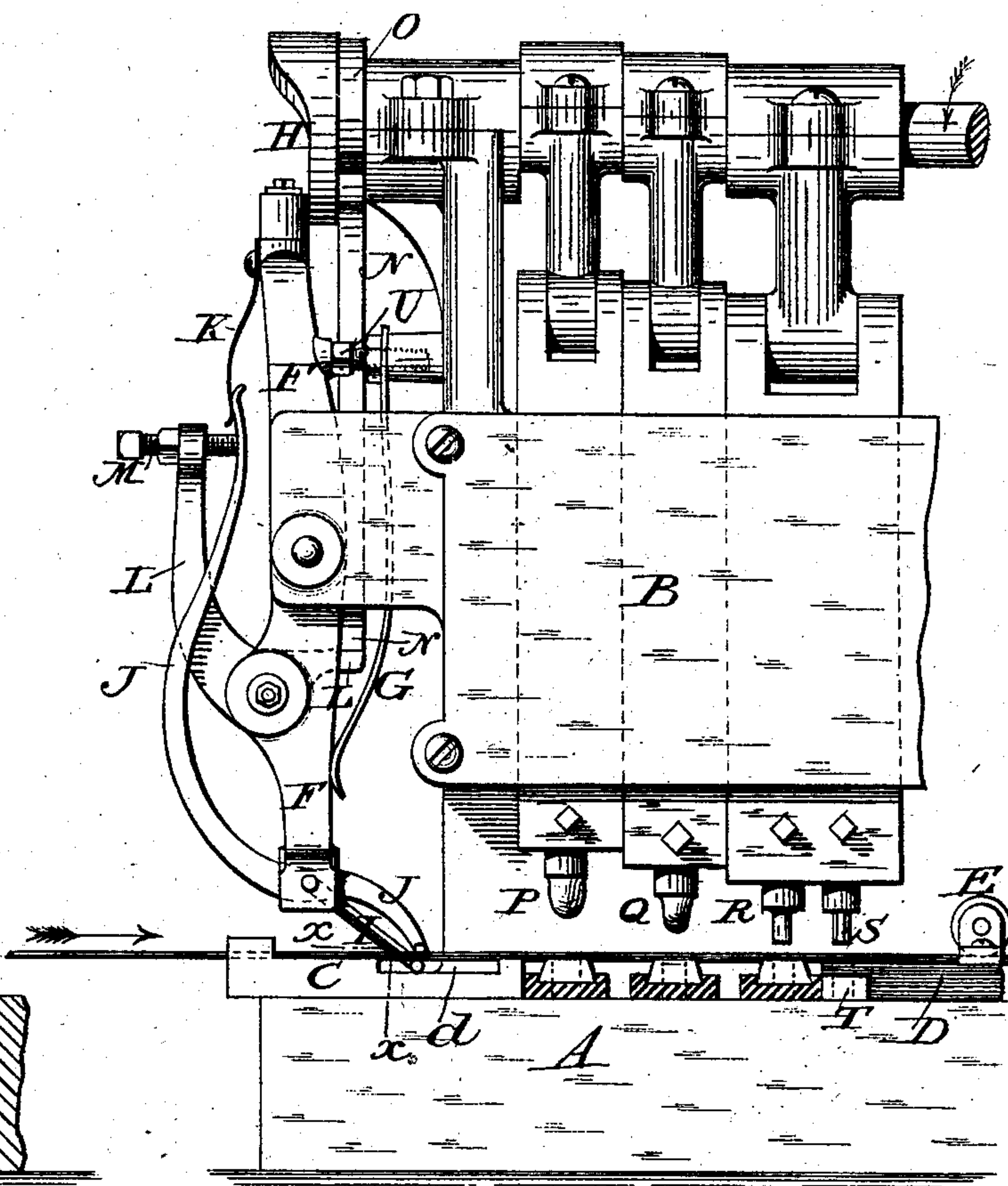
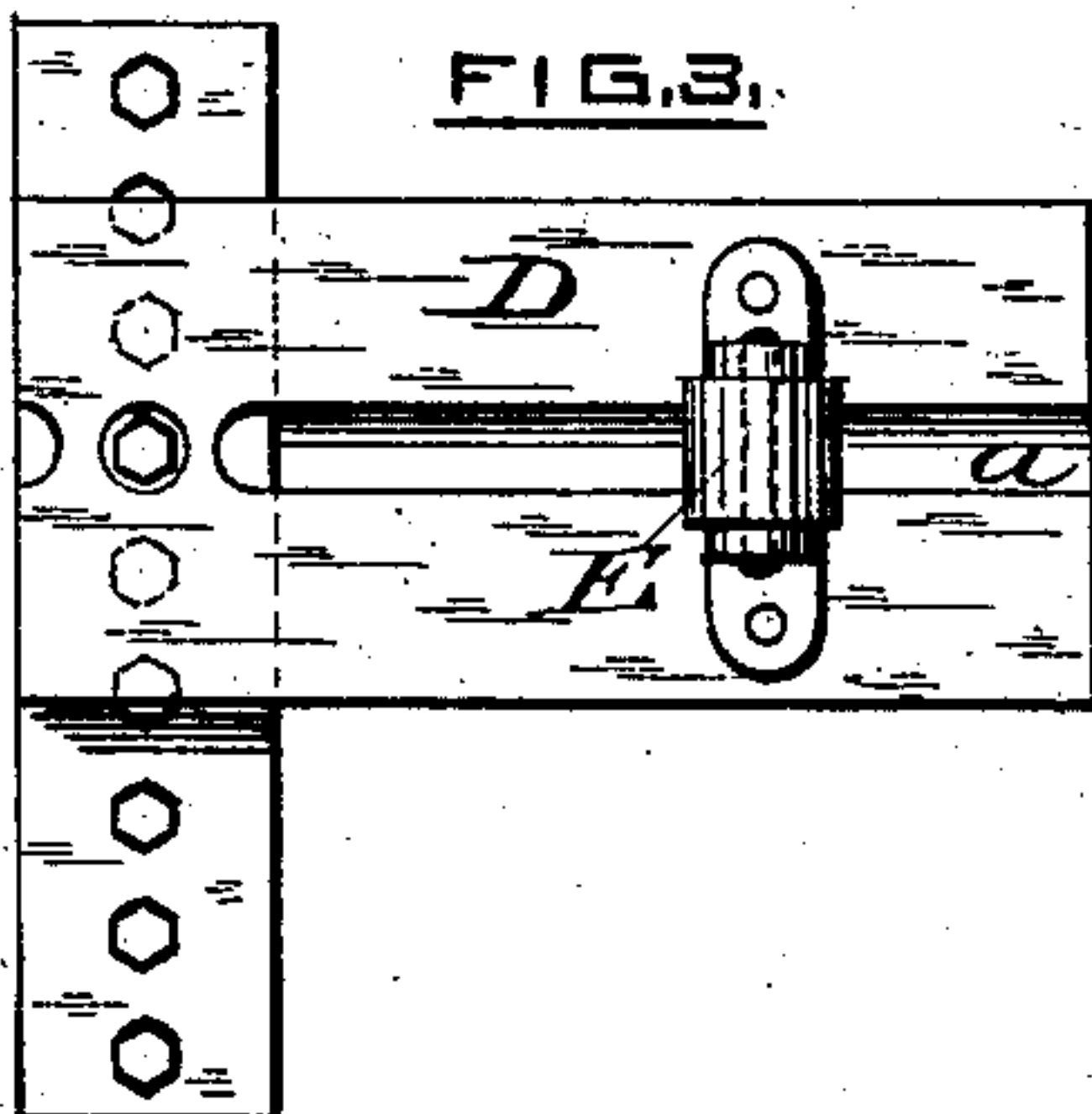


FIG. 3.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

STEPHEN N. SMITH, OF PROVIDENCE, RHODE ISLAND.

## MACHINE FOR MAKING EYELET-STOCK.

SPECIFICATION forming part of Letters Patent No. 259,229, dated June 6, 1882.

Application filed August 18, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN N. SMITH, of Providence, in the county of Providence and State of Rhode Island, have invented certain  
5 Improvements in Machines for Making Eyelet-Stock; &c., of which the following is a specification.

This invention relates to an improved feed mechanism for delivering metal strips to machines for forming stock for lacing-hooks and similar machines, and to the peculiar construction and arrangement of a punch and die for said machines, which serve the twofold purpose of scoring the tubular necks of the stock  
15 and of cutting the bottom or end from said necks.

As regards the feed mechanism, the present invention is designed as an improvement upon that for which Letters Patent were granted to me on the 27th of December, 1870, No. 110,508, the object of the present invention being to simplify the mechanism and to reduce the number of wearing-points, and thus avoid the danger which existed in the old mechanism of  
25 its becoming inaccurate by reason of the wear of the numerous joints.

The improvements consist mainly in mounting the arm by which the downwardly-acting dog is depressed upon the main vibrating lever, instead of upon a fixed support, in dispensing with the spiral spring and bolt employed in the original device, and in arranging the parts formerly connected thereby to operate in direct connection with each other, as  
35 hereinafter explained in detail.

In the manufacture of eyelets, eyelet-stock, lacing-hooks, and stock for lacing-hooks, and similar products which require tubular necks or eyelets to be drawn up in sheet metal, it is  
40 necessary that the feed mechanism shall advance the metal strip or blank by intermittent movements and with great accuracy, and that at the time of the action of the cupping or drawing punch the feed mechanism shall permit the blank to be drawn forward under the action of the punches in order that the necessary metal may be drawn or flowed into the necks. A feed mechanism answering this purpose has hitherto been patented to me.

50 The object of the present invention as regards the feed is to produce a mechanism

which will secure the same results in a much more simple manner.

In the manufacture of lacing-hooks and eyelets it is customary to score or crease longitudinally the interior of the tubular necks, in order that they may be fractured and turned outward uniformly on all sides when applied to use. Hitherto it has been customary in forming the neck to have the bottom or closed  
55 end of the neck or cup punched therefrom by one punch and the scoring effected at a subsequent operation by another punch.

The second feature of the present invention consists in so constructing and arranging a punch and die that they serve both to score the interior of the tubular neck and to remove the end therefrom at one operation, the improvement cheapening the machine, expediting its action, and producing a product of better and  
60 more accurate finish.

Referring to the accompanying drawings, Figure 1 represents a front elevation of a machine for preparing stock for lacing-hooks having my improvements embodied therein. Fig. 75 2 is an end elevation of the same, with the stock-guide shown in section on the line *x x*, Fig. 1. Fig. 3 is a top plan view of the stock-guiding plate of the machine.

With the exception of the features constituting the subject of the present invention, the machine represented in the drawings is of substantially the same construction as those now in general use for the formation of the eyelet-stock, the machine embracing a series of reciprocating punches, by the successive action of which the tubular necks are formed in the stock, and a feed mechanism for advancing the blank step by step beneath the punches.

A represents the bed or base plate of the machine, and B a rigid upright frame rising therefrom to sustain the driving-shaft, the reciprocating punch-carriers, and other movable parts of the machine. Upon the bed-plate, at opposite sides of the machine, in line with each other, are located two guide-plates, C and D, to support and guide the stock in its passage through the machine. The plate C is provided at its receiving end with an opening, through which the stock passes and by which the stock  
95 is prevented from rising out of place. The plate D, at the delivery side of the machine, is  
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provided with a roller, E, to bear upon the top of the stock and keep it down in position, this plate being also provided with a longitudinal groove, *a*, to permit the passage of the tubular necks which are formed in the stock by the action of the machine. The guide-plate C is provided in its upper surface with a depression, *d*, to admit the end of one of the feeding-fingers beneath the strip.

The feeding mechanism is constructed as follows: An upright lever, F, is pivoted to one end of the machine and vibrated by means of a spring, G, which tends to throw it in one direction, and a cam, H, which acts against its upper end to move it in the opposite direction. To the lower end of the lever is attached an arm or finger, I, the lower end of which is bent at right angles and supported in the recess *d* of the feed-plate transversely beneath the stock. A second finger, J, is also pivoted to the lower end of the lever F, to engage with the upper surface of the stock, the two fingers I and J co-operating and grasping the stock between them as they are moved forward by the lever F to advance the stock beneath the punches.

In order to secure the proper action of the machine, it is necessary that the strip shall be permitted to move freely forward independently of the feeding devices during the action of the punches, in order to permit the metal to flow readily and without being ruptured into the necks which are formed by the action of the punches. In order to permit this movement of the stock independent of the feeding devices, and to cause the feeding-fingers to grasp the stock and release the same at the proper times, the end of the finger J is carried upward, as represented in Figs. 1 and 2, and a spring, K, applied to the upper end of lever F for the purpose of acting on the finger J and causing its lower end to press lightly upon the stock.

To the lever F below its fulcrum is pivoted a second lever, L, one end of which is curved upward and provided with an adjustable screw, M, to act upon the upper end of the feeding-finger J, while its opposite end is subjected to the action of a vertically-sliding bar, N, which is depressed at suitable intervals by means of a cam, O, mounted upon the main shaft at the top of the machine, the same shaft carrying both of the feed-operating cams H and O.

The operation of the parts is as follows: During a backward movement of the lever F the two feeding-fingers I and J slide freely backward over the stock or strip, permitting the same to remain at rest or to be drawn forward slightly between the feeding-fingers under the action of the dies. After the feeding-fingers have completed their backward movement the cam H, operating upon lever F, carries its lower end forward, causing it to move forward the two feeding-fingers I and J. At the same time that this action takes place the cam O, depressing the bar N, causes the latter to move the lever L, the upper end of which, through its

screw M, presses forward upon the upper end of the feeding-finger J, causing the lower end of the finger to press downward with great firmness upon the top of the stock, causing the stock to be grasped firmly between the two fingers and carried forward positively thereby. As the fingers complete their forward motion before the lever F begins to carry them backward, the cam O relieves the bar N from pressure, the bar in turn releasing the lever L, which ceases its action upon the finger J. The finger J, pressing now upon the stock lightly under the action of spring K only, will pass backward freely over the same at the same time that the finger I is drawn backward thereunder, leaving the stock in the meanwhile at rest.

While it is preferred to make use of the spring K in order to render the machine noiseless in action, it is not a necessary part of the mechanism.

The form of the parts embraced in the feed mechanism may be modified, if desired, provided their mode of action is not departed from.

The screw M, between the lever L and the feed-finger, admits of the device being adjusted to apply more or less pressure to the strip, and of its being adapted to feed stock of different thicknesses. In order that the movement of the feed-fingers may be varied, a stop-screw, U, is mounted in the side of the frame to limit the backward movement of the lever F. It is obvious that any other adjustable stop may be substituted for this screw.

Passing now to the second feature of the invention, P, Q, and R represent three punches, by the successive action of which the tubular necks are formed in the stock, and S represents a polygonal punch, which descends through the necks for the purpose of scoring the same and cutting the bottom or closed end therefrom. A die, T, is located beneath the punch S, as shown in the drawings, and co-operates therewith for the purpose of supporting or sustaining the necks during the action of the scoring and cutting die, in order to prevent them from being mutilated or changed in form by the action of said punch. By constructing and arranging one punch to serve the twofold purpose of scoring the necks and cutting the end therefrom, I not only increase the capacity of the machine, but produce a stock having the ends of its neck finished in a sharp and regular manner.

Having thus described my invention, what I claim is—

1. In a feed mechanism for eyelet and similar machines, the combination of a vibrating lever provided with a finger engaging beneath the stock, a second lever-finger attached thereto, engaging above the stock, an arm pivoted to the lever to force the upper finger into engagement with the stock, and an operating-cam connected by intermediate devices, substantially such as shown, with said pivoted arm.

2. The combination of the vibratory lever F, feeding-fingers I and J, lever L, bar N, and cams H and O.



3. The combination of the vibratory lever F, the two feed-fingers mounted upon said lever and engaging with opposite faces of the stock, the second lever, L, pivoted upon the first-named lever, and cam O, connected with the lever L, substantially in the manner described and shown.

4. In combination with lever F, fingers I and J, and spring G, the lever L, rod N, and cams H and O.

5. In combination with the vibratory lever F, the fingers I and J, and spring K, a positively-acting device, substantially as shown, operating to force the finger J downward upon the stock during its forward movement.

6. In combination with the vibratory lever provided with the two feed-fingers, the positively-driven lever L, and the adjustable connection between said lever and the feed-finger.

7. In a machine substantially such as described, a punch, S, constructed of angular cross-section, with cutting-edges at its lower end, as described and shown, and arranged for use in scoring the tubular necks and cutting the bottoms therefrom, substantially as described and shown.

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Witnesses:

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THOS. A. MILLETT.