

908,453.

H. H. EATON.
EYELETING MACHINE.
APPLICATION FILED MAR. 7, 1907.

Patented Jan. 5, 1909.

2 SHEETS—SHEET 1.

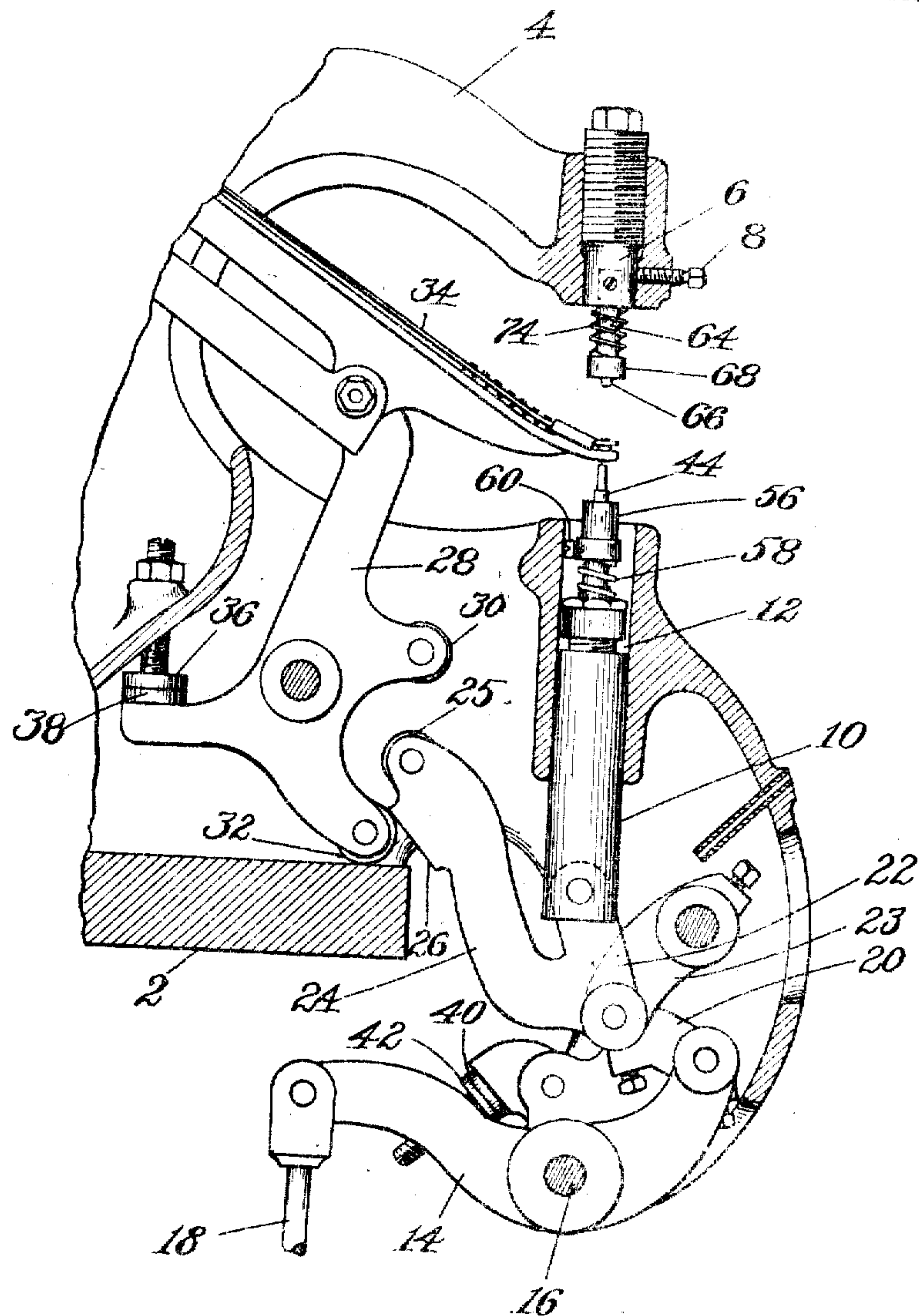


Fig. 1.

WITNESSES.

Burtha H. Hathaway
Edith C. Hollbrook

INVENTOR.

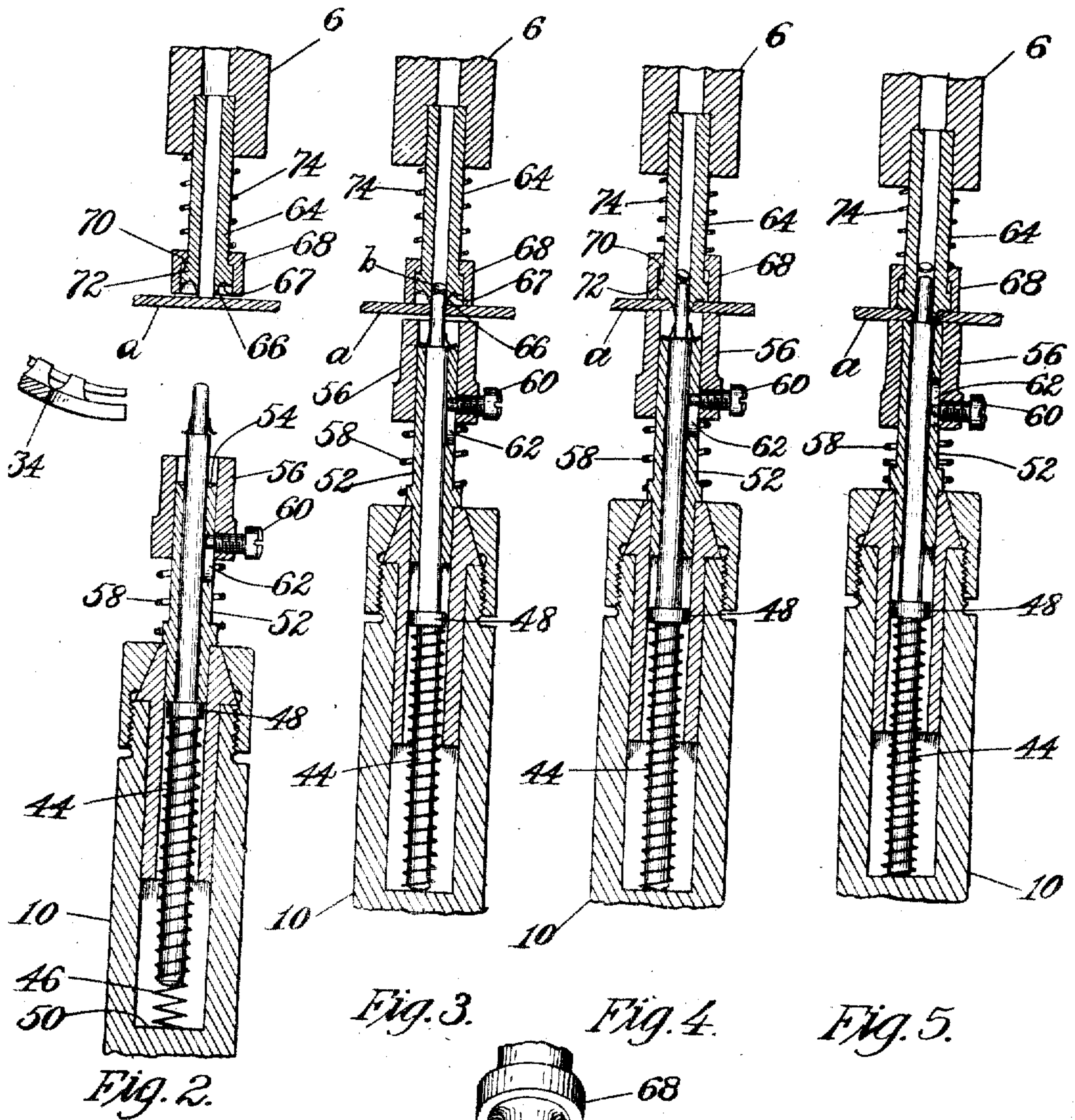
Harrison H. Eaton
By *John A. Starnes*
Nelson K. Howard

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WITNESSES.
Bertie H. Hathaway
Edith C. Holbrook

INVENTOR.
Harison H. Eaton
By his Attorney
Walter H. Howard

UNITED STATES PATENT OFFICE.

HARRISON H. EATON, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

EYELETTING-MACHINE.

No. 908,453.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed March 7, 1907. Serial No. 361,131.

To all whom it may concern:

Be it known that I, HARRISON H. EATON, a citizen of the United States, residing at Beverly, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Eyeletting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for setting eyelets and particularly to machines having a combined punching and setting device.

Prior to this invention the operations incident to the setting of eyelets have usually been performed either by two separate machines, one for punching holes in the stock and the other for setting the eyelets in the punched holes, or by a single machine in which separate mechanisms were provided for the punching and setting operations. Although machines have been devised prior to this invention which it was intended should punch the hole in the stock and set the eyelet at one stroke and without the necessity for moving the stock from the punching device to the setting device, so far as I am aware these have not proved to be entirely satisfactory, especially in setting eyelets in thin stock such as paper.

An object of this invention therefore is to provide a machine in which the punching and setting devices are so combined that a single progressive movement of the operating mechanism both punches a hole in the stock and sets the eyelet therein accurately and expeditiously. I accomplish this object by providing two coöperating eyelet-sets, one of which has a centrally disposed punch and the other of which has means for forcing the stock upon the punch. These elements are preferably so associated that by one progressive movement of the operating mechanism the hole is punched, the stock is forced upon the punch so that the latter projects beyond the stock, the barrel of the eyelet is carried between the punch and the stock surrounding the punched hole, and finally said barrel is clenched by coming into contact with the setting device associated with the punch. It is obvious that the diameter of the punch at its cutting edge must be somewhat less than the diameter of the barrel of

the eyelet in order that said barrel may not come into contact with said cutting edge and thereby injure the same. Therefore to insure the proper setting of the eyelet and to utilize the punch as a guide for the eyelet, it is important to provide means for forcing the stock upon the punch before the eyelet is inserted in the punched hole. If this were not done, the barrel of the eyelet would come into contact with the stock and have a tendency to become displaced before being properly guided by the punch into the hole in the stock. The means for forcing the stock upon the punch preferably consists of a yielding sleeve surrounding the eyelet-set which carries the eyelet. This eyelet-set has associated with it a centrally disposed finger to pick up the eyelet and also to coöperate with the punch. The end of this finger is made of a size to slide snugly inside of the tubular punch and coöperate therewith to produce a shearing action on the stock in cutting the hole. By means of this construction the use of a punch-block is rendered unnecessary and the punch remains sharp much longer than it otherwise would. The finger is arranged to project farther than the sleeve and is preferably mounted so as to yield for a short distance and to stop before it has been retracted as far as the normal position of the sleeve. The finger is thus allowed to yield if it should strike the raceway while at the same time it cannot be retracted far enough for the sleeve to come into contact with the stock before the punching operation takes place.

The punch and associated eyelet-set are preferably surrounded by a yielding member which acts as a stripper and forces the stock off the punch after the eyelet has been clenched by contact with said eyelet-set and the opposed eyelet-set and associated mechanism have been retracted. The stripper and the sleeve which forces the stock upon the punch are so mounted that their ends between which the stock is located approach each other in alinement and clamp the stock between them. The spring which allows the sleeve to yield is stronger than the spring which allows the stripper to yield. Therefore when the sleeve and the stripper come into contact with the stock from opposite sides the sleeve continues its progressive movement and forces the stock upon the punch while the stripper is retracted rela-

tively to the punch. When the retrograde movement of the sleeve occurs it is evident that the stripper will move forward relatively to the punch and strip the eyelet and the stock in which it has been set from the punch.

Referring to the drawings,—Figure 1 is a side elevation, partly in section, of a foot-power eyeleting machine embodying the features of this invention; Fig. 2 is a vertical sectional view showing the parts in the position which they occupy just after an eyelet has been taken from the raceway; Fig. 3 is a vertical sectional view showing the parts as they appear just after the stock has been punched; Fig. 4 is a vertical sectional view showing the stock forced upon the punch; Fig. 5 is a vertical sectional view showing the parts at the time when the eyelet is set, and Fig. 6 is a perspective view of the combined upper set and punch and the finger.

In the drawings 2 designates a table or other support to which a frame 4 for the machine is attached. The upper setting device is carried by a holder 6 secured in an opening in the frame by set screw 8. The lower setting device is carried by a plunger 10 mounted for reciprocation in the guide-way 12. The mechanism for imparting a reciprocatory motion to the plunger comprises a lever 14 pivoted at 16 to the frame, said lever being connected at one end by a rod 18 to a foot-treadle or other actuating means (not shown) and at its other end being connected to the lower end of the plunger 10 by means of links 20 and 22 at whose pivotal point is pivoted a guiding link 23 pivoted at its other end on the frame. The link 22 is pivoted to the lower end of the plunger and has a laterally projecting arm 24 which is provided with a roller 25 and an engaging face 26 to produce a rocking movement of a lever 28 by engagement with the rollers 30 and 32 thereon. A raceway 34 supported on the lever 28 is shifted thereby, the forward movement of said raceway being limited by stops 36 and 38, one of which is adjustable. For limiting the return movement of the lever 14, stops 40 and 42 are provided. It is evident that when the rod 18 is depressed the plunger 10 will be raised, the end eyelet in the raceway will be engaged and then the raceway will be shifted out of the way of the setting devices by the roller 25 engaging the roller 30. The mechanism just described constitutes no part of this invention and no further description of it will be necessary.

Referring now to the lower setting device, it will be seen that this is carried by the plunger 10 and is reciprocated thereby. A finger 44 has its lower end extending within a recess in the plunger and it is allowed to yield relatively to the plunger by means of a spring 46 located between a shoulder 48

on said finger and the bottom wall 50 of the recess. Around the upper portion of the finger is a sleeve 52 which constitutes the lower set and which may be held on the plunger 10 in any suitable manner. The upper end of this sleeve is preferably recessed at 54 to accommodate the eyelet. Surrounding the setting device is a sleeve 56 which is normally forced upwardly by a spring 58 so that its upper end is beyond the end of the setting device. This sleeve is slidably secured to the setting device by a screw 60 which extends into a slot 62 therein. The upper setting device 64 is provided with a hollow centrally depending punch 66, the outer surface of which is inclined and merged into the annular recess 67 within which the end of the eyelet is clenched. The setting device 64 is surrounded by a stripper 68 having an annular shoulder 70 for engagement with an annular shoulder 72 on the setting device. The stripper is held yieldingly by a spring 74 located between the shoulder 70 and the end of the holder 6. The spring 74 is considerably weaker than the spring 58. The upper end of the finger 44 is fitted to slide snugly within the punch 66.

The operation of the machine is as follows:—The operator holds the stock *a* in the desired position for eyeleting and depresses the actuating rod 18 whereby the plunger 10 is raised. The finger 44 is elevated and enters the end eyelet in the raceway 34. Said raceway is then retracted into the position shown in Fig. 2 and the finger continuing to rise comes into contact with the punch 66 to cut a hole in the stock, as shown in Fig. 3, the punching being indicated by the reference character *b*. The plunger 10 continuing to advance, the sleeve 56 comes into contact with the stock and forces it upon the punch as shown in Fig. 4, the stripper 68 at the same time being forced upwardly. Upon the final upward movement of the plunger the eyelet is guided over the punch between the same and the wall surrounding the hole punched in the stock, and the end of the eyelet is clenched by contact with the upper setting device. When the plunger returns to its initial position the sleeve 56 retires from contact with the stock and the stripper 68 forces the stock and the eyelet, which has just been set, off of the punch 66. While this invention has been shown and described as applied to a foot-power machine, it is evident that it may be applied to any suitable eyeleting machine.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a machine of the class described, the combination with an eyelet-set, of a tubular punch centrally disposed with relation thereto, a stripper surrounding said set, a second eyelet-set, a finger at the center of said latter

set which acts in conjunction with said punch to form a hole in the stock, and a yielding sleeve surrounding said latter eyelet-set constructed and arranged to force the stock upon the punch whereby the latter projects beyond the stock.

2. In a machine of the class described, the combination with an eyelet-set, of a tubular punch centrally disposed with relation thereto, a stripper surrounding said set, a spring for holding said stripper in forward position, a second eyelet-set, a finger at the center of said latter set which acts in conjunction with said punch to form a hole in the stock, a sleeve surrounding said latter set constructed and arranged to force the stock upon the punch whereby the latter projects beyond the stock and a spring for holding said sleeve in forward position, said spring being of greater strength than the spring which is associated with the stripper.

3. In a machine of the class described, the combination with an eyelet-set, of a tubular punch centrally disposed with relation thereto, a second eyelet-set, means constructed and arranged to force the stock upon the

punch whereby the latter projects beyond the stock, a finger at the center of said latter eyelet-set, constructed and arranged to slide snugly within said punch, a spring for yieldingly supporting said finger, and means for limiting the yielding movement of said finger.

4. In a machine of the class described, the combination with an eyelet-set, of a tubular punch centrally disposed with relation thereto, a second eyelet-set, means constructed and arranged to force the stock upon the punch, a finger at the center of said latter set, constructed and arranged to slide snugly within said punch, a spring for yieldingly supporting said finger, and means for stopping the yielding movement of said finger before said means for forcing the stock upon the punch comes into contact with the stock.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRISON H. EATON.

Witnesses:

JOHN H. RUCKMAN,
ARTHUR L. RUSSELL.