

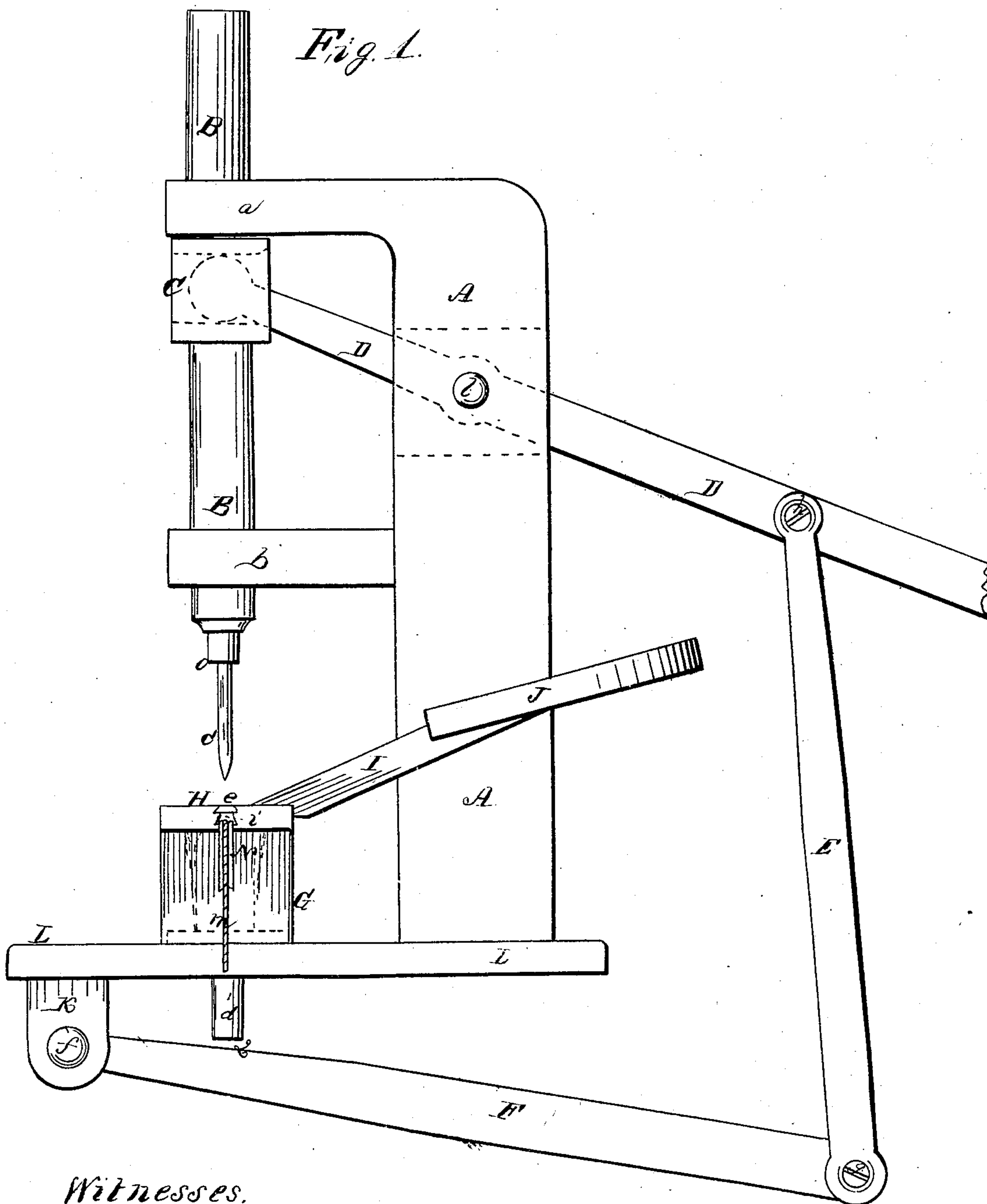
*L. DeForest.*

## *Eyeletting Machine.*

N<sup>o</sup> 37417

*Patented Jan. 13, 1863.*

*Fig. 4.*



Witnesses.

A. de La Cruz,

Michael F. DeLacy.

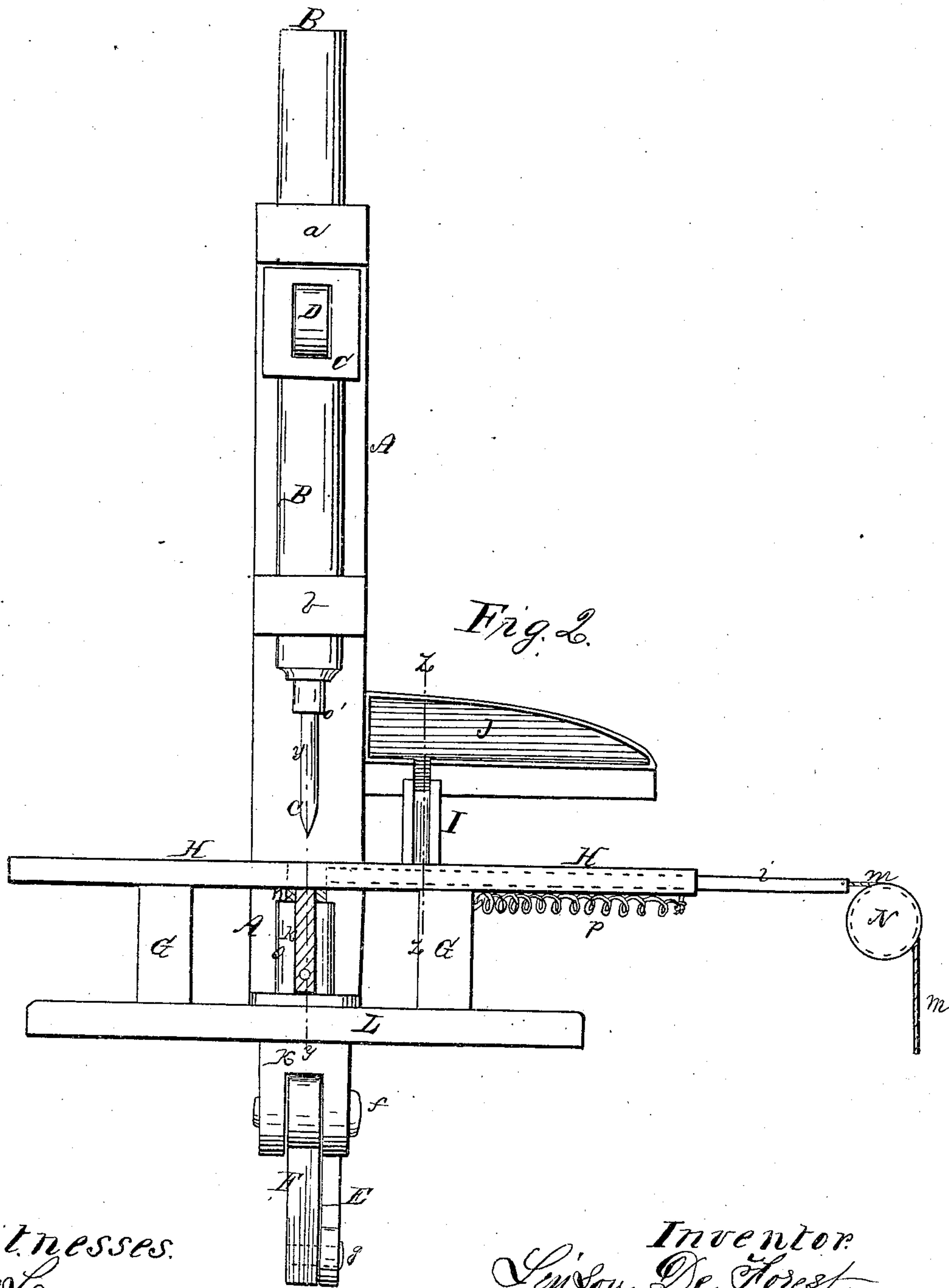
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*Eyeletting Machine.*  
*Nº 37417*      *Patented Jan. 13, 1863.*



*Witnesses.*  
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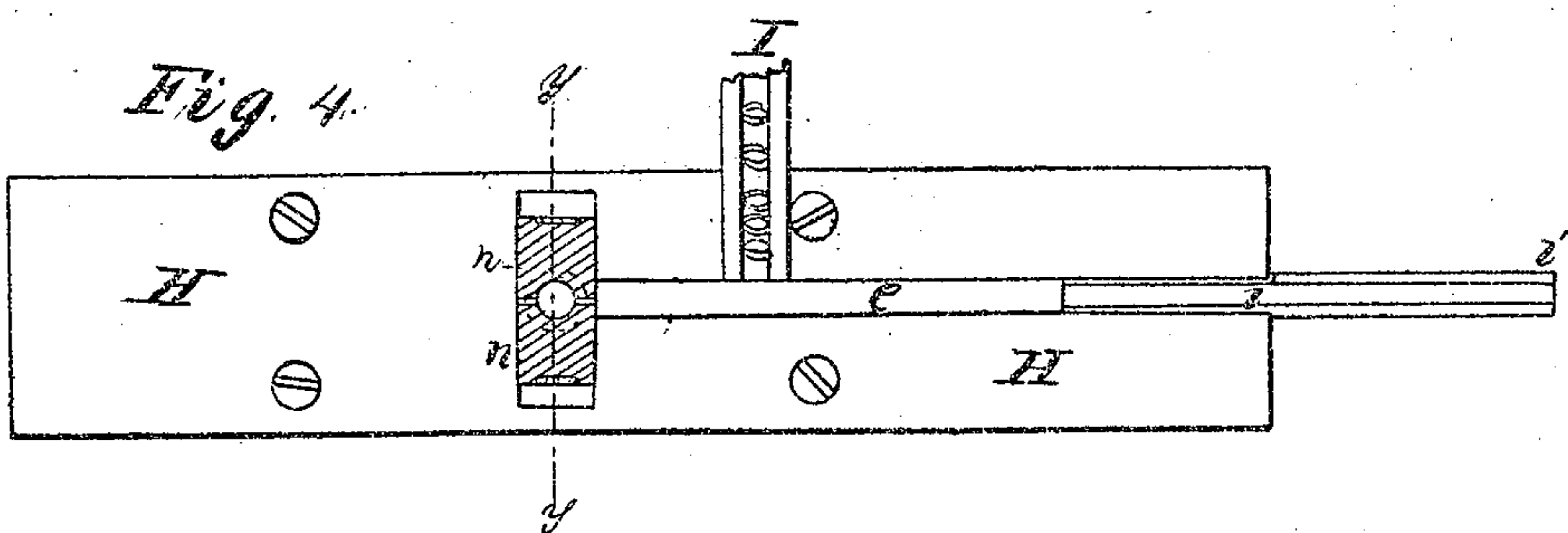
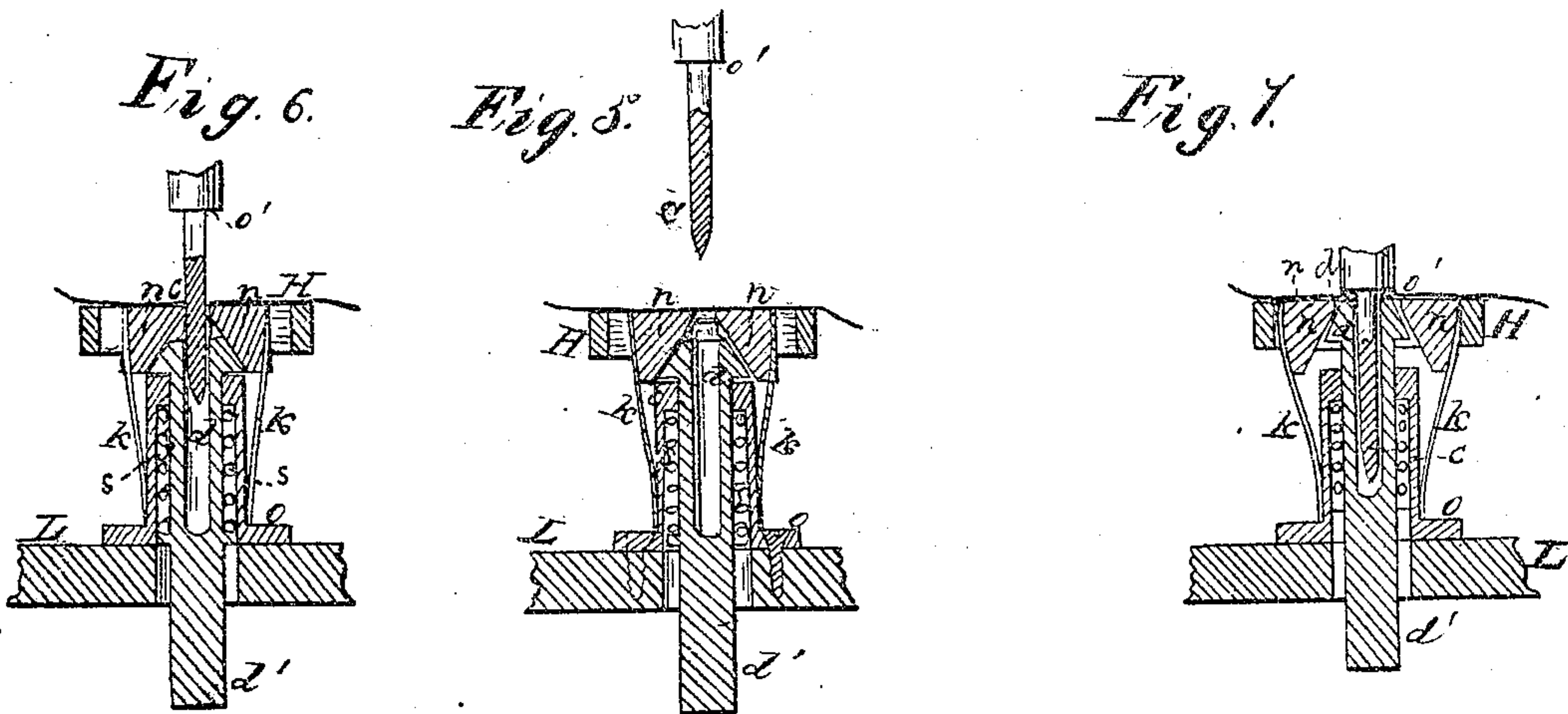
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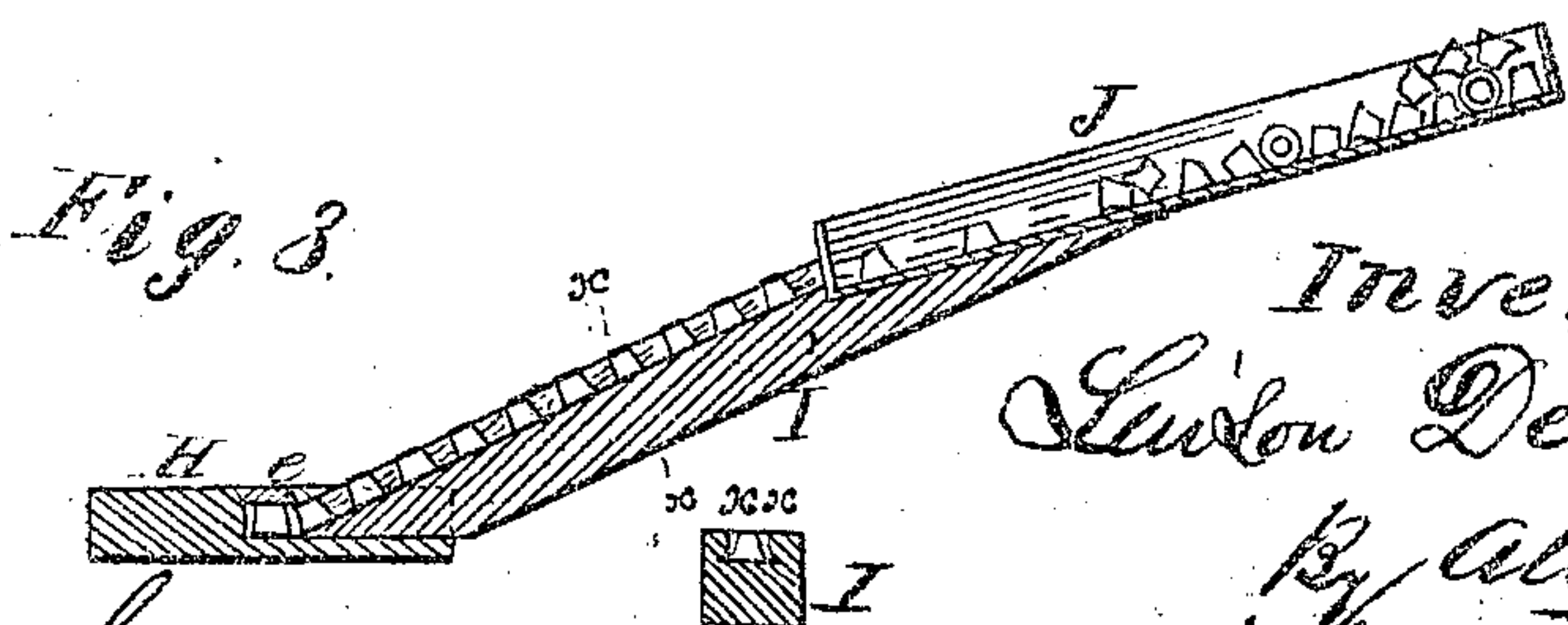
Eyeletting Machine.

N<sup>o</sup> 37417

Patented Jan. 13, 1863



Witnesses.  
A. DeLacy  
Michael H. DeLacy.



Inventor.  
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# UNITED STATES PATENT OFFICE.

LINSON DE FOREST, OF BIRMINGHAM, CONNECTICUT, ASSIGNOR TO HIMSELF AND THOS. B. DE FOREST, OF SAME PLACE.

## IMPROVEMENT IN EYELETING-MACHINES.

Specification forming part of Letters Patent No. 37,417, dated January 13, 1863.

*To all whom it may concern:*

Be it known that I, LINSON DE FOREST, of Birmingham, of New Haven county, in the State of Connecticut, have invented certain new and useful Improvements in Eyeletting-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to an improved automatic machine for performing the operation of inserting eyelets into any and all kinds of material and articles, either previously perforated to receive the eyelets or not.

Previous to my invention different kinds of machines have been constructed and used for eyeletting different kinds of work. In some of these adapted to eyeletting cloth and all articles of light fibrous material the eyelet to be inserted was placed by the hand of the operator onto a die with its flange downward, and the material into which the eyelet was to be inserted was then forced up against a perforating-punch (arranged vertically over the eyelet-holding die.) This punch, with the material surrounding it, was then caused to descend, (a shoulder on it forcing the material to move down with it,) passing down through the bore of the eyelet and through the bore of eyelet-holding die until the material was forced down over and around the eyelet, and the latter then upset or clinched by means of the shoulder on punch coming in contact with the upper rim of the eyelet. In other machines previously used, adapted more particularly to eyeletting shoes and other articles made of more solid and less penetrable stock, the eyelet to be inserted was deposited on a lower die with a tie, a short stud projecting up from its center and through the bore of the eyelet, (to steady the eyelet.) The material, which had been previously punched out was then placed down over and around the eyelet, and a die caused to descend onto the upper rim of the eyelet and upset it and clinch it in the material in a manner well known to those skilled in the art.

My invention has for its object an automatic machine which is so organized as to feed one eyelet at a time to an eyeletting mechanism, by which the eyelet is inserted and fastened into the material or work, properly placed on a ta-

ble or supporting-surface, at the same time performing the operation of perforating the material when requisite, (when not previously punched out;) and to these ends my said invention consists in the employment of a table or work-supporting surface, which sustains the work to be eyeleted independently of the eyeletting mechanism, as will be hereinafter fully explained.

My invention further consists in the employment, in combination with a work-supporting surface or table, of a lower die, onto which the eyelet is fed, and which carries the eyelet up through the perforation in the work, and an upper die, which approaches the lower die, and, together with it, performs the operation of clinching the eyelet in the work, as will be hereinafter fully described.

My invention further consists in the combination of a lower eyelet-holding die with an upper die, a perforating-punch, and a work-supporting surface, whereby the work is perforated and the eyelet inserted therein, all substantially as hereinafter to be explained.

My invention further consists in a passage or conduit, leading from a supply-column of eyelets to the lower eyelet-holding die, in combination with a feeder-bar or other suitable device for causing a single eyelet to be fed at the proper time from the supply-column onto the eyelet-holding die, as will be hereinafter fully described.

My invention further consists in the employment of a conductor or chute, so constructed and so arranged with a supply-hopper and the feeding mechanism as to receive from the hopper in the proper position and supply to the feeding mechanism the eyelets to be inserted, as will be hereinafter more fully explained.

To enable those skilled in the art to make and use my invention, I will proceed to describe the construction and operation of one of my improved eyeletting-machines, referring by letters to the accompanying drawings, forming part of this application, and in which—

Figure 1 is a side elevation of one of my improved eyeletting-machines. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical cross-section of the hopper and supply-chute at the line *z z* of Fig. 2. Fig. 4 is a detail plan view of the work-supporting table;



and Figs. 5, 6, and 7 are three partial vertical sections, each on the line *y y*, showing the several parts in various relative positions and illustrative of the operation of punching the material and inserting and securing therein the eyelet.

In the several figures the same part will be found designated by the same letter of reference.

A is the frame of the machine, which extends vertically up from a suitable bed-plate, L, and which has projecting from one side of it two horizontal arms or stands, *a* and *b*, in which formed suitable bearings for the vertically-reciprocating spindle B, which is operated by means of a lever, D, working on a pivot, *l*, and having one end connected at C to said spindle, and the other end attached to a treadle (not shown in the drawings) worked either by the foot of the operator or by other power. At the lower end of the spindle B is formed or arranged a set or die, *o'*, furnished with a central punch or perforating-rod, *c*, as clearly seen at Figs. 1, 2, 5, &c.

H is a table or work-supporting surface, which is sustained by legs G G from the bed-plate L, and in which the eyelets are fed onto the lower die, and through which the eyelets are passed up into the work, as will presently be explained. This work-supporting table or surface I have shown of the size and proportions of that employed successfully on a working-machine employed for a certain class of work, but it will of course be understood that the size and also the shape of this work-supporting table may be varied greatly to adapt it to different kinds of work for which the machines may be designed.

Between the bed-plate L and the work-table H is arranged a hollow cylindrical stand, *o*, through which works a vertically-reciprocating die, *d*, (see Figs. 5, 6, 7, and 1,) and on the exterior of which are arranged and secured two spring-arms, *k k*, which carry on their upper ends two jaws, *n n*. (See Figs. 2, 4, 5, 6, 7.) The die *d* is kept pressed down in the position seen at Figs. 1, 5, 6 by means of a spring, *s*, arranged within the stand *o*, and is elevated or raised up into the position seen at Fig. 7 by means of the lever F. The portion 2 of which (see Fig. 1) comes in contact with the shank *d'* of said die at the proper time, as and for the purposes to be presently explained. The lever F is hung on a pivot, *f*, in the stand K, and is worked by the main lever D through the medium of the connecting-rod E. A mass of eyelets to supply the machine are thrown promiscuously into a hopper, J, from which they pass (by the jarring of the machine while being worked) down through a chute or conduit, I, to the mechanism, which feeds them, one at a time, onto the die *d*, as shown in red line at Fig. 5. (The eyelets are drawn in red in the several figures.) This chute or conduit I is so formed with a channel, the sides of which are cut under in a dovetailing fashion (see Fig. 3, *x x*)

that only those eyelets which ride down to it on their flanged bases can enter and pass down through said channel, as illustrated at Fig. 3.

*i* is the feeder-bar, which works in a groove or channel in the table H, and which moves a single eyelet at each stroke from the supply-column in the chute I to the die *d*. The bar I is drawn out or back by a cord, *m*, attached to its outer end and passing over a pulley and connected to the working treadle or driving mechanism and is forced in again by the power of a spring, *p*. (See Fig. 2.)

Having alluded more particularly so far to the features of construction of the apparatus, I will now explain briefly the operation of my improved machine.

The hopper J being filled or supplied with a promiscuous mass of eyelets, the jarring of the machine causes them to gradually slide down to the upper end of the chute I, which those eyelets resting on their flanged bases enter, and through which they pass on down, as illustrated at Fig. 3, to another channel formed in the table H and running about right angles to the chute I. The channel in table H, it will be understood, is of a width sufficient to admit only the lower eyelet of the column contained in chute I, one eyelet at a time. Now, suppose the bar *i* to have been just drawn out into the position shown at Fig. 2, by inserting an eyelet, as the mechanism is brought into its normal condition, the bar *i* will be drawn in again by the spring *p*, and will feed the eyelet, which has come into the passage in which said bar *i* works along and push it over or onto the top of the die *d*. Now, if the material into which an eyelet is to be inserted be placed on the table H beneath the punch *c*, and the lever D made to ascend at its rear end, the spindle B will descend and the punch *c* will pass through the material, perforating it with a hole sufficiently large to receive the eyelet resting on the top of die, *d*. By the time, however, that the punch *c* shall have entered to its full diameter the material and passed down sufficiently far to fill the bore of the eyelet, the portion 2 of lever F will come in contact with the shank *d'* of die *d*, and commence to move said die upward, the punch *c* and die *d* will continue moving in opposite directions, (the former sliding in the central bore of the latter,) the die *d* carrying the eyelet, which had been placed on its top by the feeder *i* up around the punch *c* and through the work or material held on the table H until the upper rim of the eyelet comes in contact with the shoulder or set *o'* over punch *c*, and the eyelet is upset and clinched between the set *o'* and die *d*. As the die *d* ascends, its upper inclined edges come in contact with the inclined faces of the jaws *n n*, and force the said jaws apart sufficiently to allow the passage of the die *d* between them, as shown in Fig. 7. When the motions of the parts of the machine are reversed, the die *d* is forced down again by the spring *s*, and the spring-jaws *n*



*n* close together again, and the punch *c* and set *o'* are lifted away from the table *H* and the work on it.

The operation just described of the two sets, the punch and table, together with the work and eyelet, is fully illustrated by the Figs. 5, 6, 7. At Fig. 5 the parts are shown in the position to commence the operation, the eyelet being on the die *d*, (drawn in red,) and the material or work (shown by a blue line) resting on the table *H*. In Fig. 6 the punch *c* has perforated the work and filled the bore of the eyelet. The die *d* now commences to ascend until it meets the set *o'*, clamping the eyelet in the work, as shown at Fig. 7. It will be understood that when work which has been already punched out or perforated is properly placed on the table to be eyeleted the punch *c* is not injurious to the operation of the other parts in the insertion of the eyelet in such previously-punched material, but, on the contrary, is useful as guide, to center or adjust the perforated work and cause the eyelet to be readily forced up through the hole in said work. I have employed the spring-jaws *n n*. So as to have in the work-supporting surface (of which they constitute a part) during the time of perforating or punching the material, a hole in the said supporting-surface only large enough to admit of the passage down through it of the punch *c*; but this is not essential in carrying out my invention, for if the spring-jaws be dispensed with and the surface of the table *H* be made continuous with a hole large enough to admit the passage up through it of the die *d*, the whole operation of punching and inserting the eyelet may be successfully performed. It will be understood that though a large proportion of the mass of eyelets put in the hopper *J* will ride down to the chute *I*, in the proper position to pass through, many will not; but from the peculiar shape of the channel of the chute *I* it is impossible for any but those eyelets which approach it in a proper position to pass down through it, and the operator generally watches the hopper and with a little awl-like instrument pushes back toward the higher portion of the hopper those eyelets which are in a wrong position to go into the chute *I*. It will be observed that the chute *I* has a much greater

degree of inclination than the hopper *J*. The object of this difference is to allow the eyelets to travel slowly over the bottom of the hopper, thus affording them a good opportunity to get turned over into their flanged bases and to cause them to travel rapidly down through the chute to insure their presentation to the feeder.

I wish it to be understood that my improved machine is subject to many modifications of construction without changing the invention embraced.

Having described the construction and operation of my improved automatic eyeleting-machine, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The employment of a table or supporting surface to sustain the work or material being eyeleted, substantially as hereinbefore set forth.
2. The employment, in combination with the work-supporting table, of two sets or dies, *d* and *o'*, the lower one receiving and carrying up the eyelet through the work-table, and the two operating together to clinch the eyelet, substantially as hereinbefore described.
3. The combination of the two dies *d* and *o'* with a perforating-punch, *c*, and work-supporting table or surface, the whole operating substantially as described, for the purpose set forth.
4. Forming a conduit or passage in the table *H*, in combination with a feeder, *i*, or its equivalent, whereby an eyelet deposited in the said conduit is fed onto the die *d*, substantially as described.
5. The employment of a chute, *I*, constructed substantially as described, in connection with a hopper, *J*, whereby the eyelets thrown promiscuously in the said hopper are fed or conducted in a given position to the mechanism for presenting them to and securing them in the work, substantially as hereinbefore described.

In testimony whereof I have hereunto set my hand and affixed my seal this 13th day of December, 1862.

LINSON DE FOREST. [L. S.]

Witnesses:

GEO. W. HUBBELL,  
BENJAMIN H. HOADLEY.