

(No Model.)

2 Sheets—Sheet 1.

M. B. BROWN.  
NAIL MACHINE.

No. 322,413.

Patented July 21, 1885.

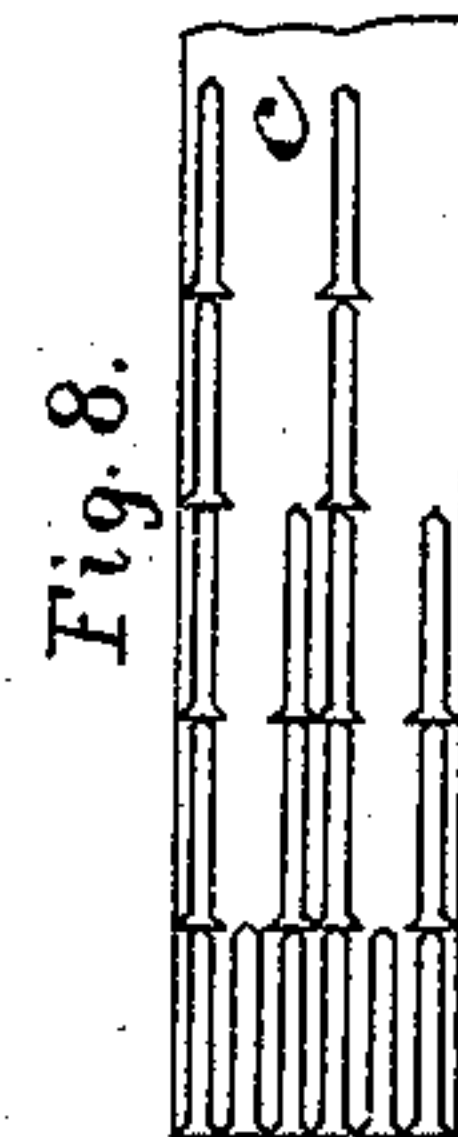
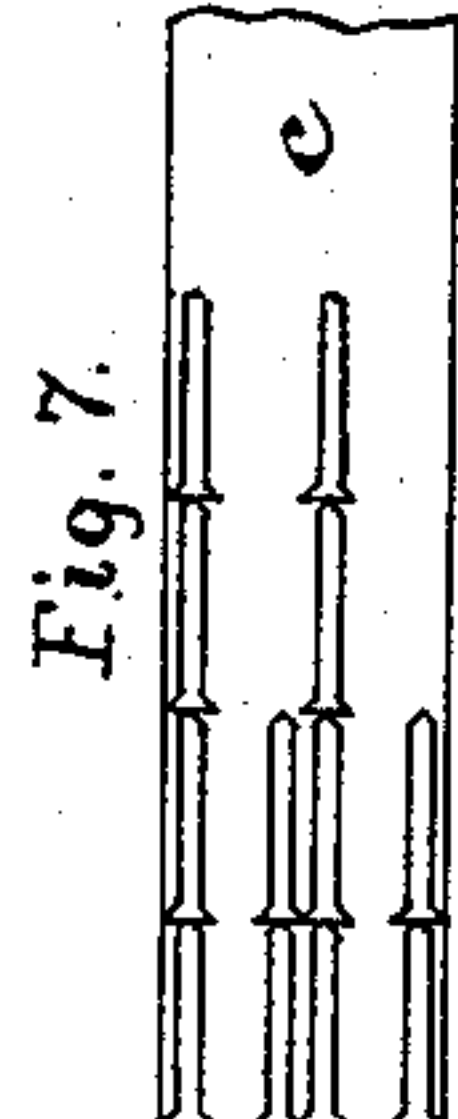
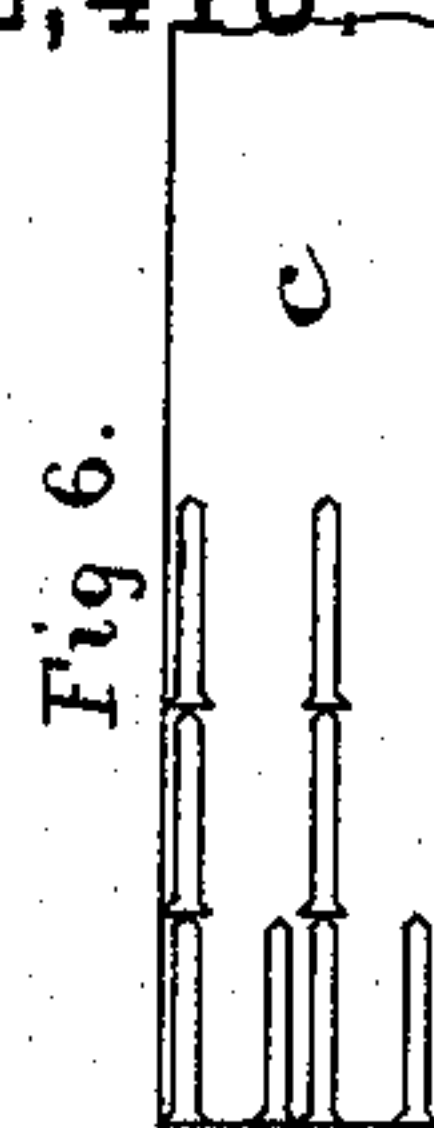
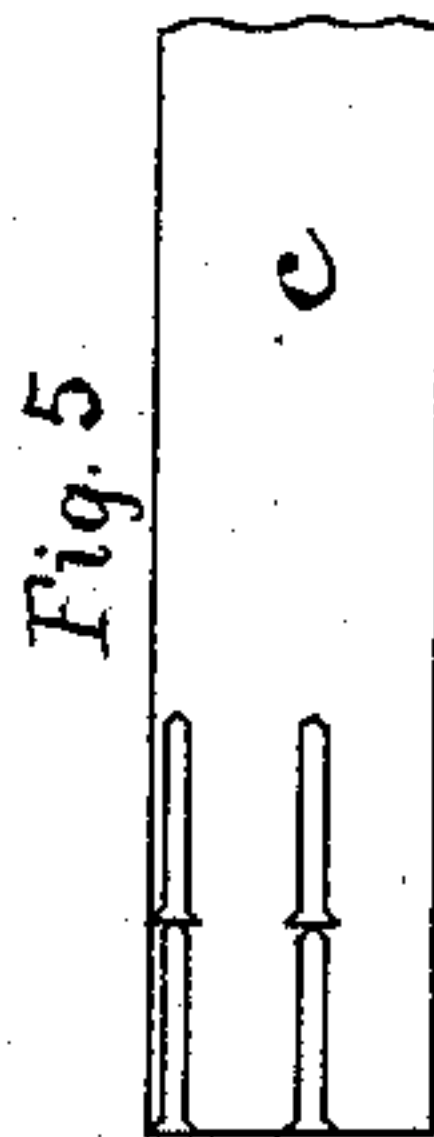
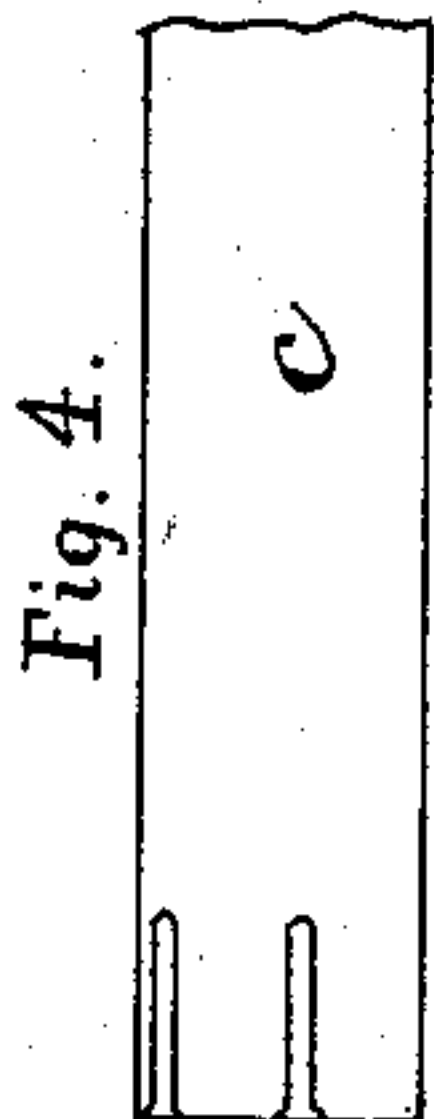
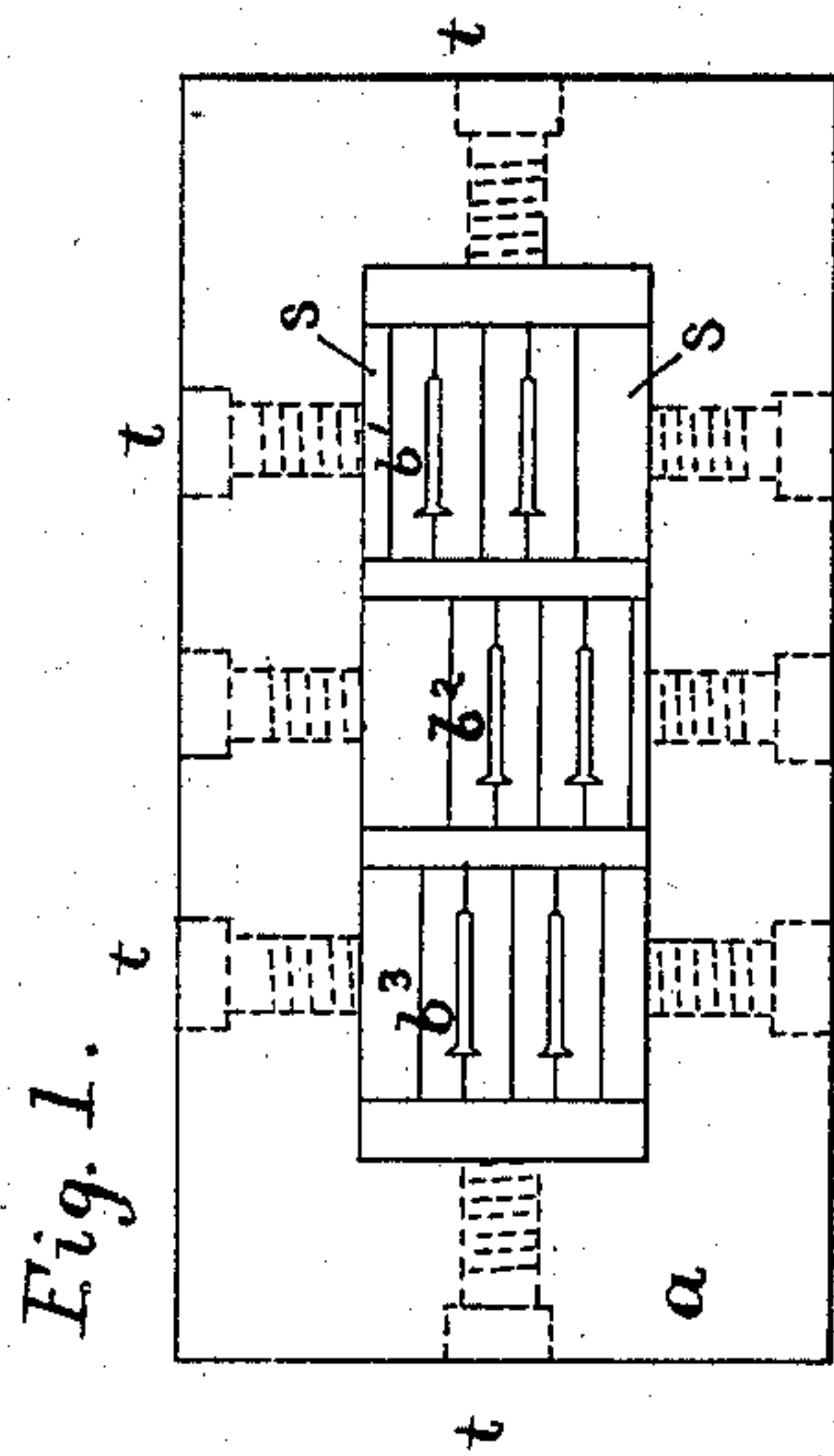


Fig. 2.

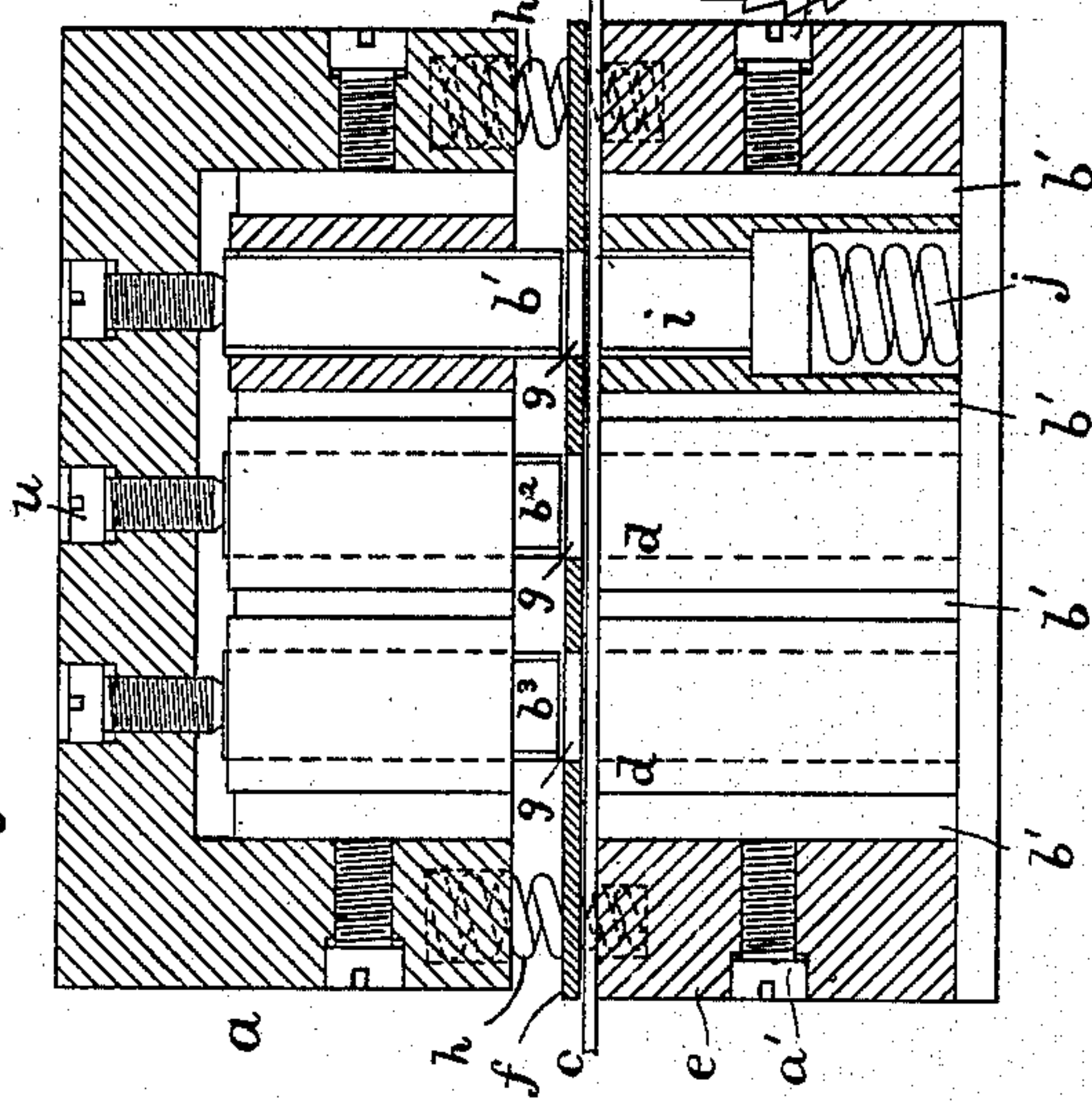
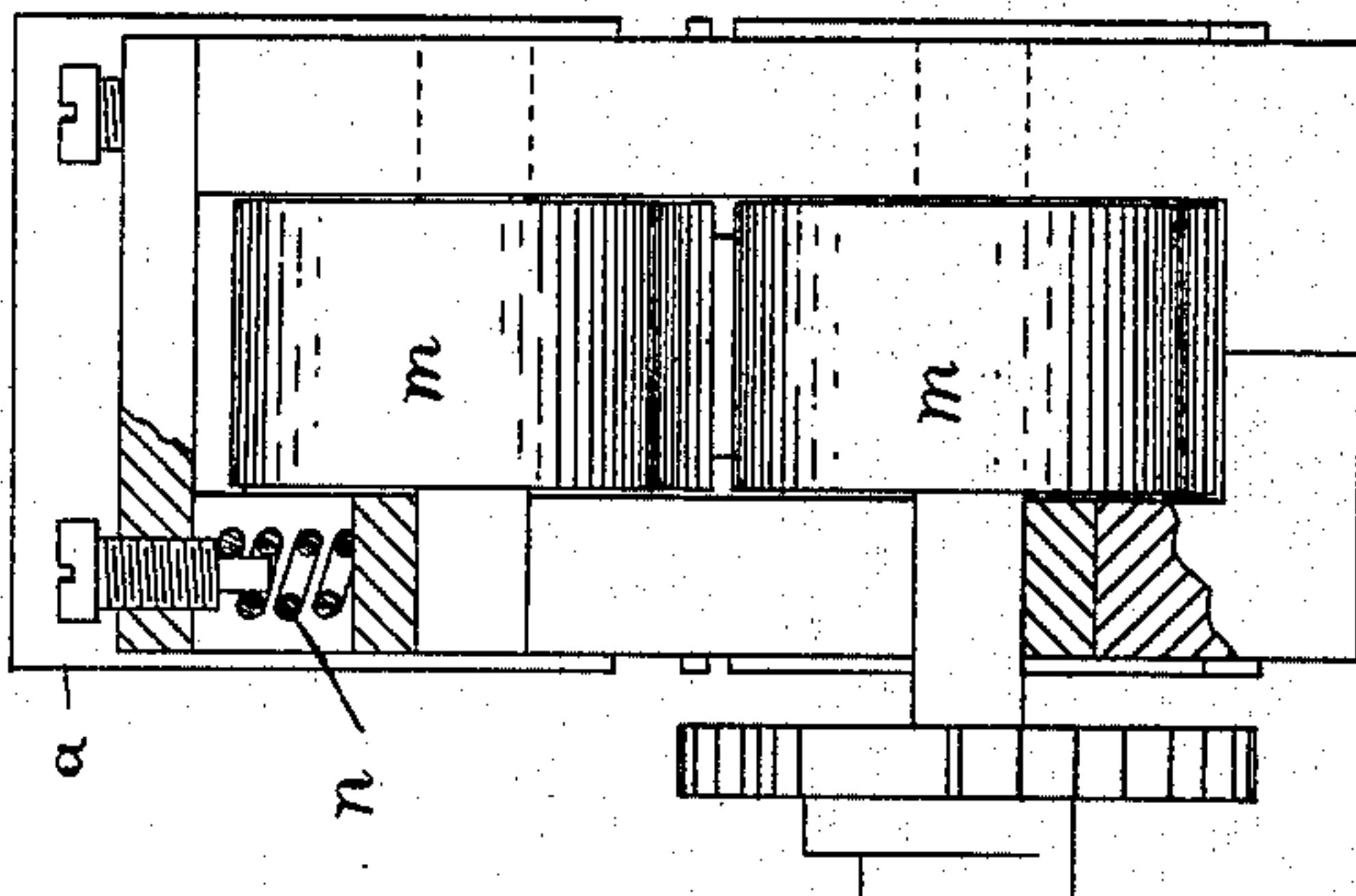


Fig. 3.



Witnesses,

*Henry L. Harrison*  
*A. R. White*

Inventor,

*M. B. Brown*  
*by Wright & Brown*  
*Attys.*

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Fig. 9.

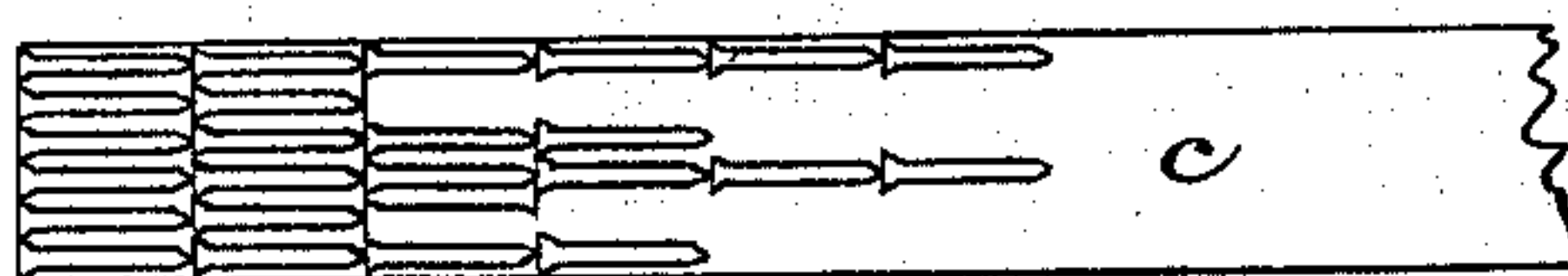
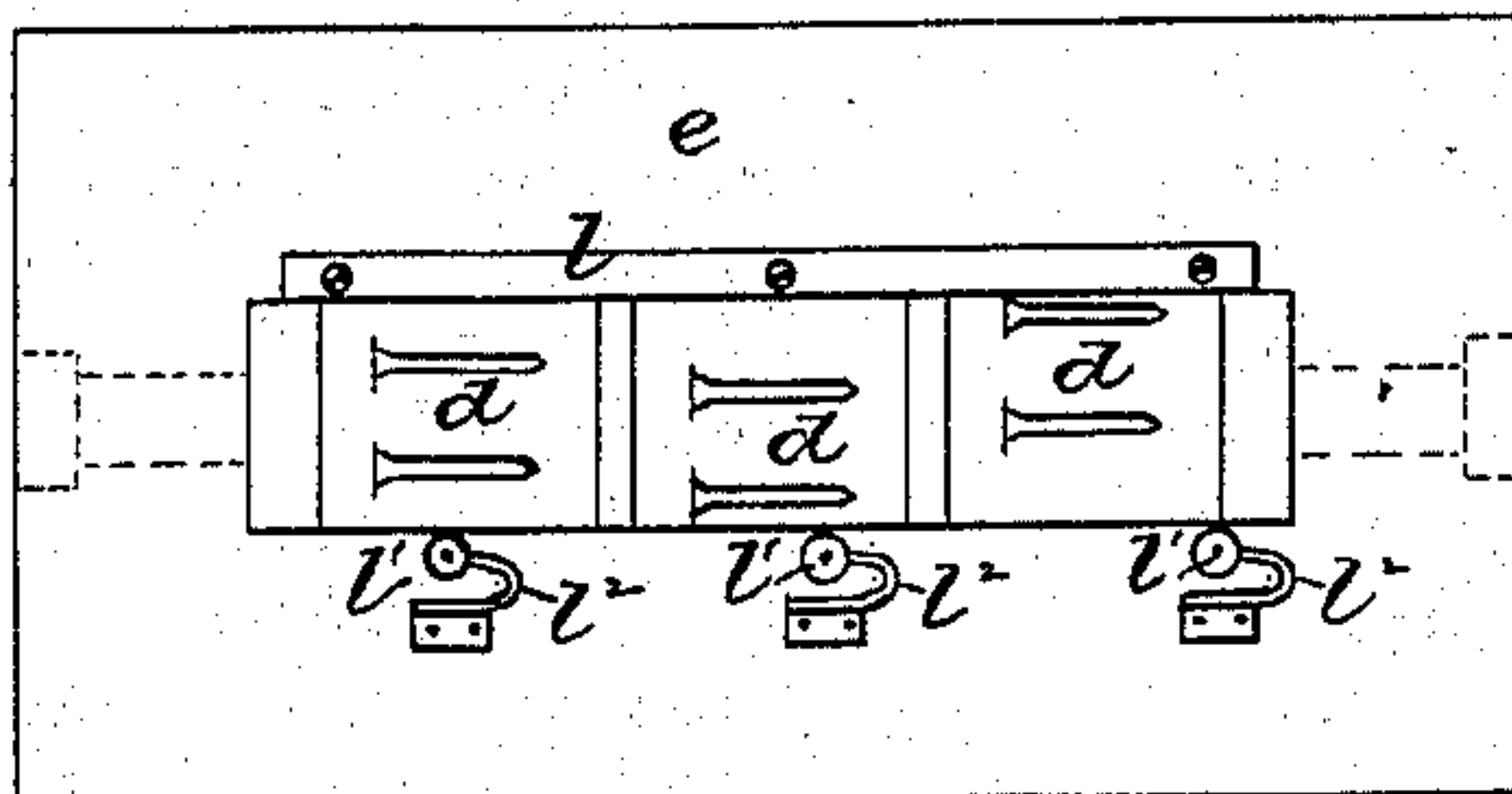


Fig. 10.



Witnesses.

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# UNITED STATES PATENT OFFICE.

MOSES B. BROWN, OF WALTHAM, MASSACHUSETTS.

## NAIL-MACHINE.

SPECIFICATION forming part of Letters Patent No. 322,413, dated July 21, 1885.

Application filed April 17, 1884. (No model.)

*To all whom it may concern:*

Be it known that I MOSES B. BROWN, of Waltham, in the county of Middlesex and State of Massachusetts, have invented certain  
5 Improvements in Nail-Machines, of which the following is a specification.

This invention has for its object to provide improved means for cutting or punching nails from a plate of metal; and it consists in the  
10 improvements which I will now proceed to describe.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a bottom view of a head or holder having a  
15 series of punches forming a part of my invention. Fig. 2 represents a longitudinal vertical section of the head or holder shown in Fig. 1, a corresponding holder having a series of bed-dies corresponding to said punches and  
20 feeding devices. Fig. 3 represents an end elevation of the mechanism shown in Fig. 2. Figs. 4, 5, 6, 7, 8, and 9 represent views of the plate at different stages of the punching operation. Fig. 10 represents a top view of the  
25 fixed holder containing the female dies.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a head or holder provided with punches formed to punch nails  
30 from a plate of metal, *c*. The punches are arranged in groups *b' b'*, *b<sup>2</sup> b<sup>2</sup>*, *b<sup>3</sup> b<sup>3</sup>*, each group occupying a different position lengthwise of the holder *a* from the others. Spaces equal to the length of the punches are formed between  
35 each group and the next, and the punches of each group occupy a different lateral position from the punches of the other groups, so that all parts of the width of a strip of metal presented for the action of said punches and fed  
40 in the direction of the length of the punches will be acted on thereby, the described arrangement enabling all the punches to act on the strip without acting simultaneously on any portion of the strip, as they would if all  
45 were located side by side, only one group of punches acting at the same time on any transverse portion of the strip of the same length as a punch. The shape of the punches is such that the portions of the plate remaining be-  
50 tween the adjacent cut-out nails are reversed fac-similes of the nails, and are also entirely

detached and converted into nails by the successive actions of the punches, as shown in Figs. 8 and 9; hence there is no waste of metal between the nails. A series of female dies, *d*,  
55 coinciding with and corresponding in form to the punches, is arranged in a fixed holder, *e*, the holder containing the punches being reciprocated by any suitable means, so as to cause the punches to alternately enter and re-  
60 ceede from the dies *d* in punching the nails from the plate *c*, which passes between the said punches and dies.

*f* represents a plate, which is provided with orifices *g* coinciding with the punches. Said  
65 plate is pressed by springs *h h*, interposed between it and the holder *a* against the nail-plate *c*, and prevents the nail-plate from adhering to and rising with the punches after they have perforated the plate. Each female  
70 die is provided with a plunger, *i*, fitting closely in said die and pressed upwardly by a spring, *j*. After the nails are punched from the plate *c* and forced into the female dies by the punches, the plungers *i* press the nails out of the female  
75 dies back into the orifices in the plate from which they were punched. The plate is thus prevented from collapsing or yielding inwardly at its edges after it has been partially cut or  
80 punched. The edges of the plate bear against lateral guides *l l*, and if the nails were not thus returned to the orifices from which they were punched, the pressure of the guides against the edges of the plate might cause one edge to  
85 yield, and thus displace the uncut portions with reference to the punches intended to act on them.

The nail-plate is fed intermittently, each feed movement being equal to the length of a nail. I have shown the feed mechanism in the  
90 present instance as consisting of two rolls, *m m*, between which the plate *c* passes, one roll being journaled in fixed bearings and the other in sliding bearings, and pressed by springs *n* against the plate *c*, which is thus grasped by  
95 the two rolls. One of the rolls has a ratchet, *p*, which is engaged by a pawl, *q*, on an oscillating arm, *r*. Said arm is oscillated by any suitable means, and its movements are so timed that it causes the pawl to rotate the ratchet,  
100 and thus feed the plate *c* forward after the punches have been withdrawn from the plate,



and the nails formed by their last action have been forced back into the plate *c*.

The punches and dies may be secured to their respective holders by any suitable means.

5 I have shown the punches clamped between blocks *s*, against which bear set-screws *t t*, inserted in the holder, said screws securing the block to the holder and causing said blocks to clamp or hold the punches. Set-screws *u*, bearing against the ends of the punches, enable the  
10 latter to be adjusted endwise to compensate for wear of their acting ends.

The blocks in which the female dies are formed are secured to the holder by set-screws  
15 *a'* and clamping-blocks *b'*.

Figs. 4, 5, 6, 7, 8, and 9 show the nail-plate, respectively, after the first, second, third, fourth, fifth, and sixth punching-operation, and illustrate the advantages of the above-described arrangement of punches so clearly  
20 that further description is unnecessary.

It is obvious that the number of groups of punches and the number of punches in each group may be varied, and that the form of  
25 the punches may be modified, so that differently-formed nails may be produced.

My improved machine may be used for the manufacture of nails of all sizes and for all purposes. The guides *v* are preferably rollers pressed by springs *z* against the edge of  
30 the nail-plate, and thus adapted to conform to such slight inequalities as may exist in the width of the nail-plate, so that the plate will be at all times closely confined laterally.

35 I claim—

1. In a nail-machine, a series of punches arranged in groups, as described, each group being separated from the next by a distance equal to the length of a punch and occupying  
40 a different position laterally from the other group or groups, combined with a correspondingly-arranged series of dies, as set forth.

2. In a nail-machine, the combination of a series of punches arranged in groups, as specified,  
45 each group being separated from the rest

by a distance equal to the length of a punch and occupying a different lateral position from the other groups, a correspondingly-arranged series of dies, and intermittently-operating feed mechanism, substantially as described, whereby the nail-plate is fed a distance equal to the length of a nail at each movement of the feed mechanism, as set forth. 50

3. In a nail-machine, the combination of a series of punches arranged in groups, as described, a corresponding series of dies, and a spring-backed plate having groups of orifices coinciding with and receiving the punches when they enter the nail-plate and bearing with a yielding pressure on said nail-plate, whereby the latter is prevented from adhering to the punches, as set forth. 55 60

4. In a nail-machine, the combination of a series of punches arranged in groups, as described, a corresponding series of dies, a spring-backed plate having groups of orifices coinciding with said punches and dies and bearing on the nail-plate when the punches are in the same, and a corresponding series of plungers in said dies, whereby the punched-out nails are returned to the plate when the punches recede therefrom, as set forth. 65 70

5. In a nail-machine, the combination of a series of punches arranged in groups, as described, a corresponding series of dies, a fixed guide for one edge of said plate, a spring guide or guides for the other edge, and a series of plungers in said dies, whereby the punched-out nails are returned to the plate when the punches recede therefrom, and the spring-guide is prevented from displacing the plate, as set forth. 75 80

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of April, 1884. 85

MOSES B. BROWN.

Witnesses:

J. H. HIGGINS,  
F. E. KENDALL.