

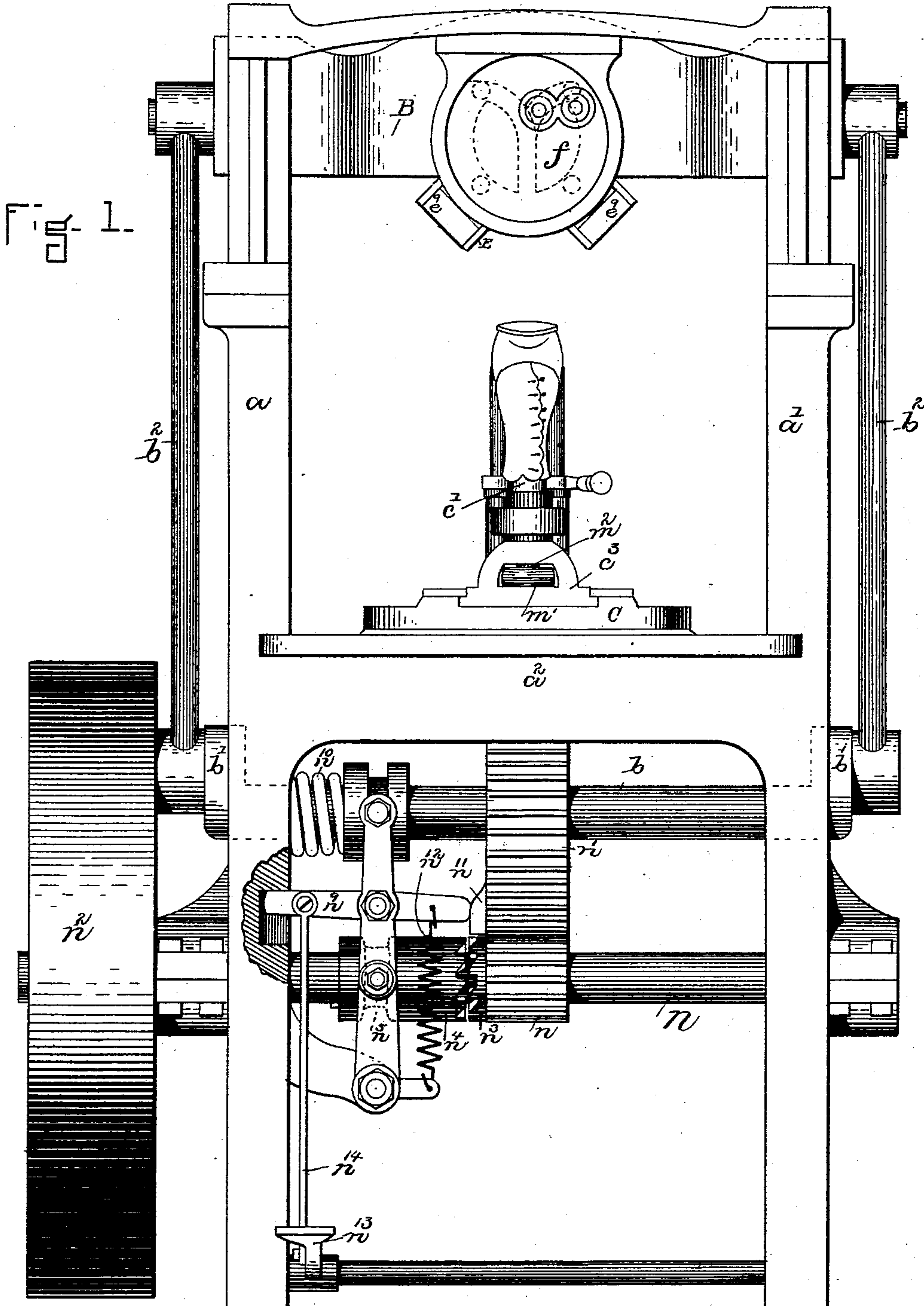
(No Model.)

6 Sheets—Sheet 1.

F. F. RAYMOND, 2d.
HEEL NAILING MACHINE.

No. 570,648.

Patented Nov. 3, 1896.



WITNESSES.

J. W. Dolan
J. T. Ball

INVENTOR.

F. F. Raymond

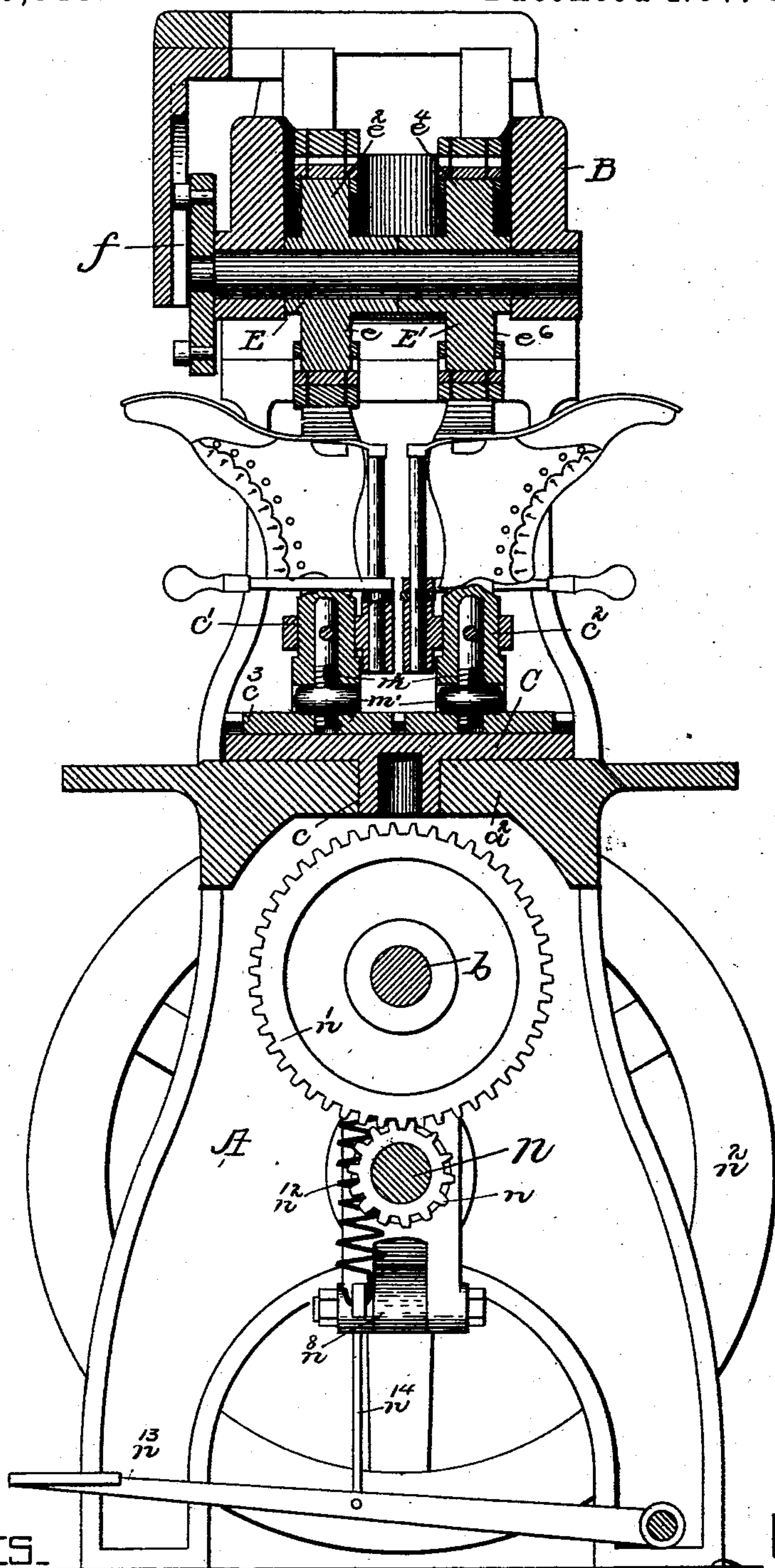
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Fig. 2.

(No Model.)

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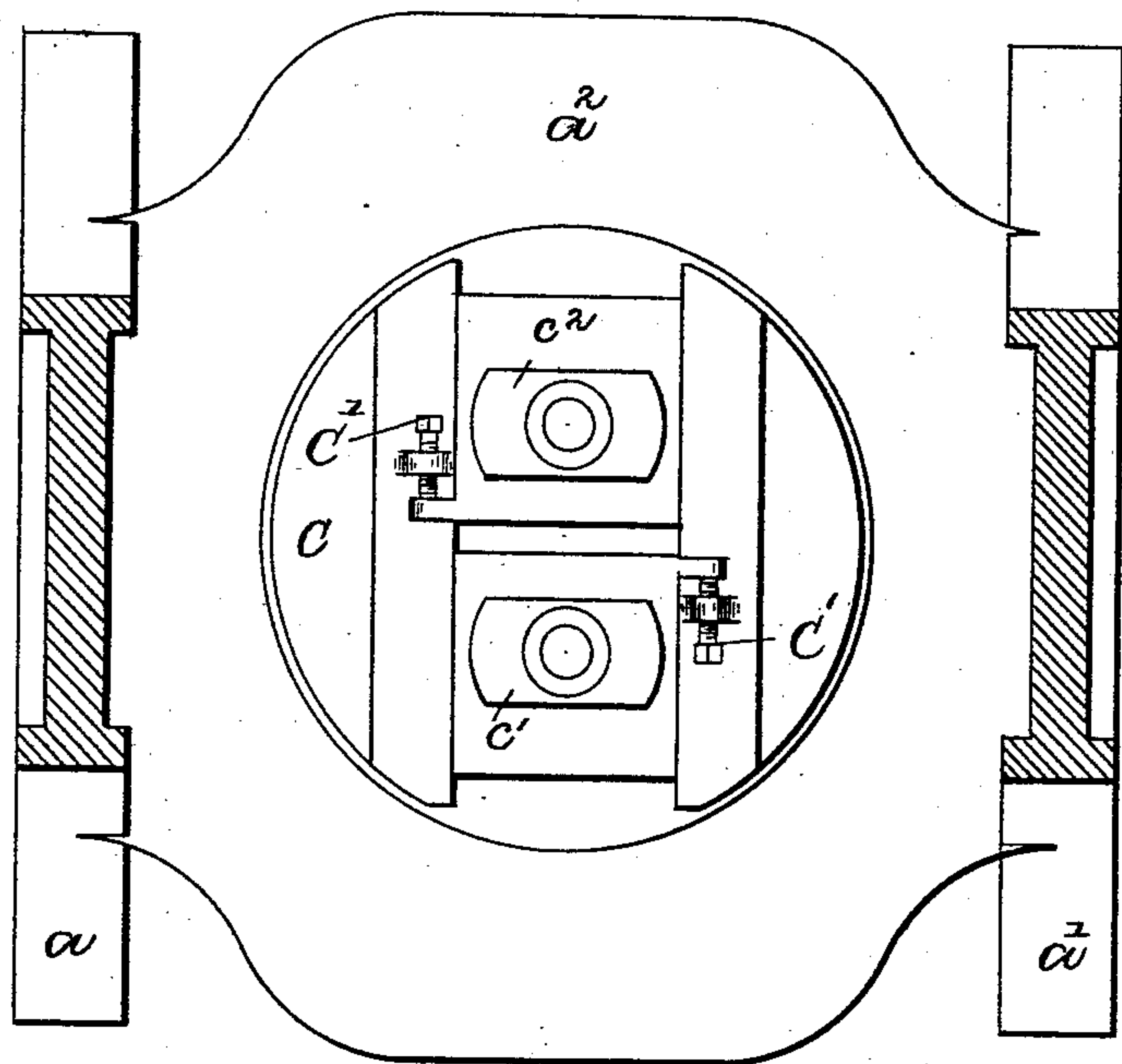
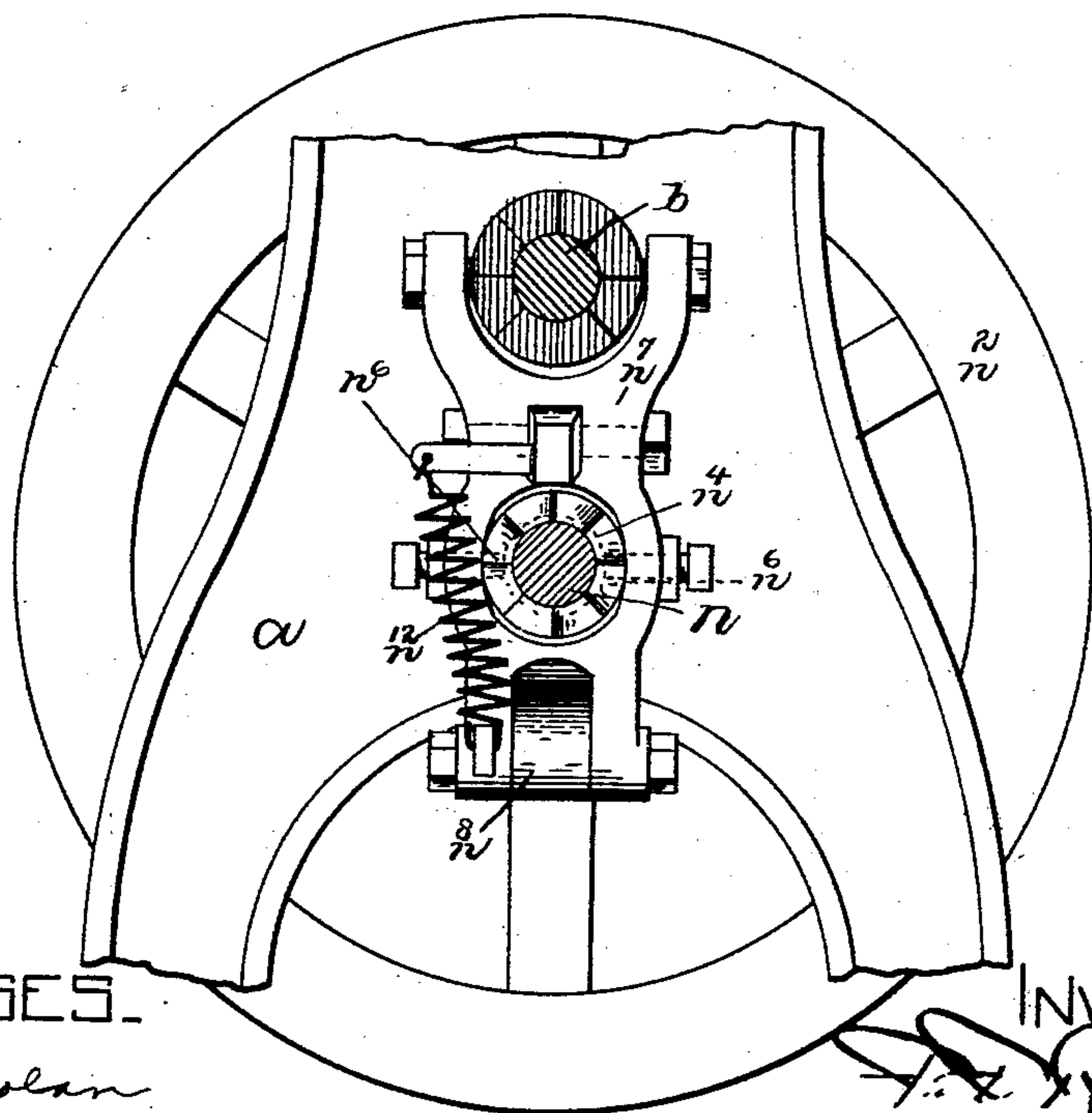


Fig. 3.



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Fig. 4.

(No Model.)

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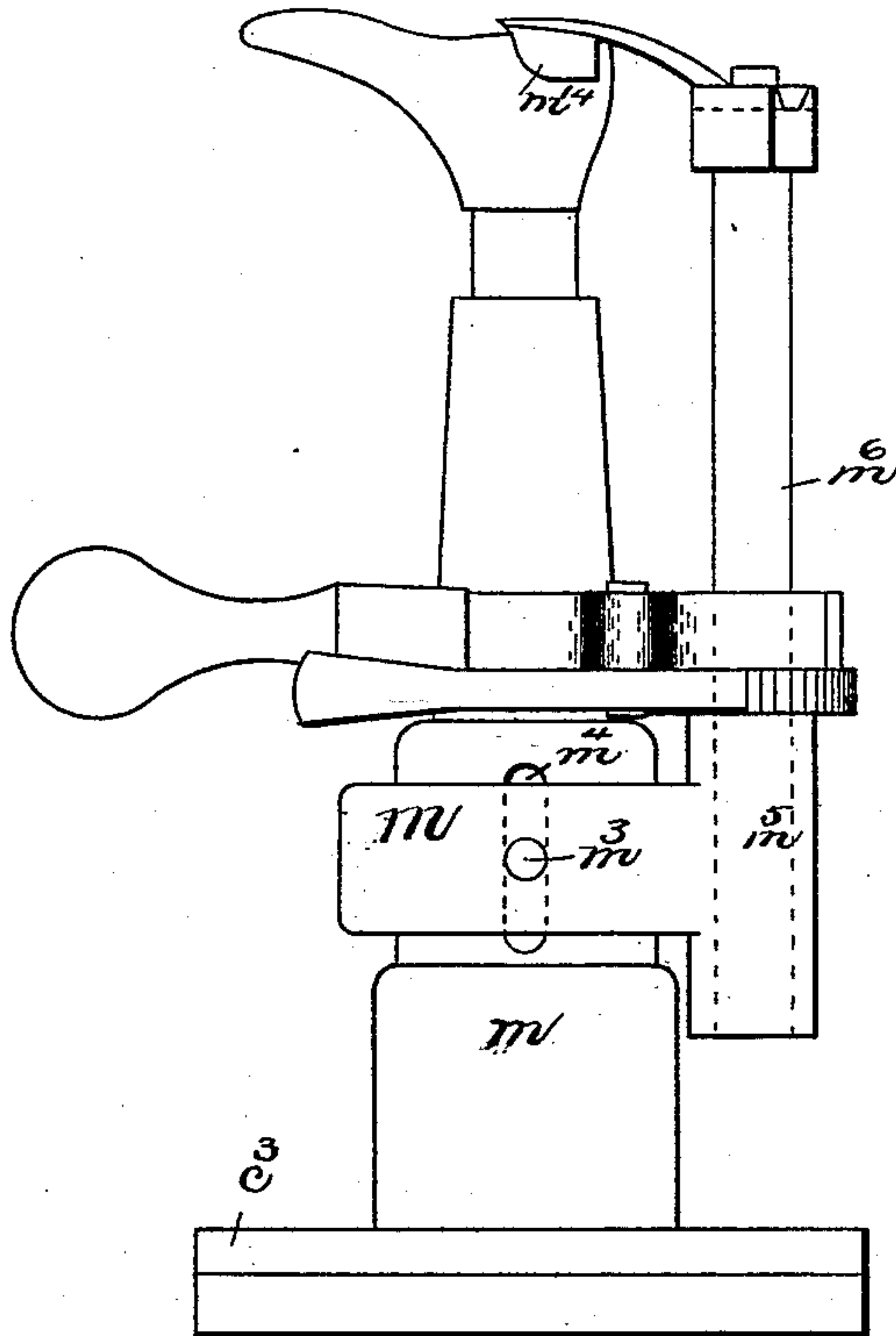


Fig. 5.

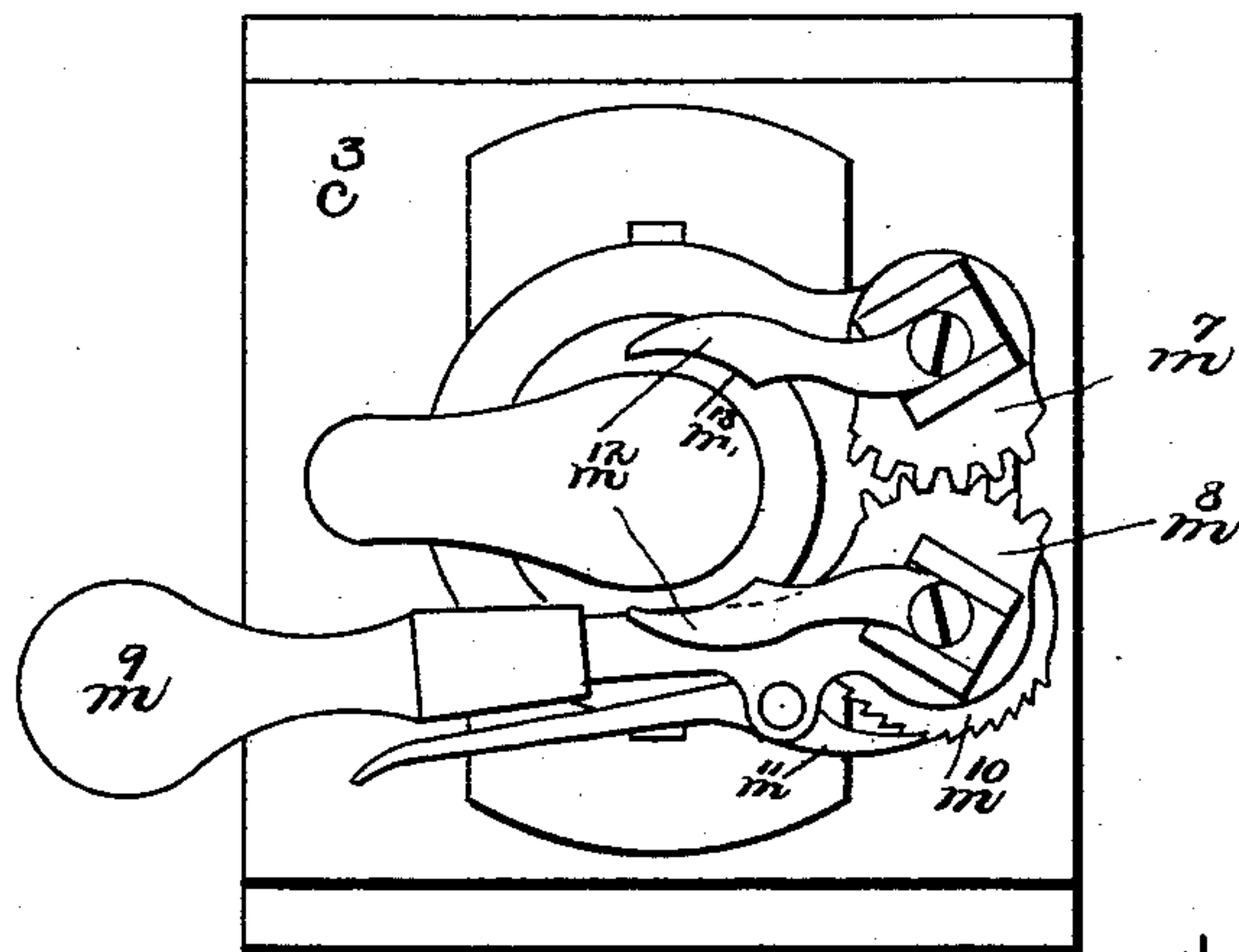


Fig. 6.

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(No Model.)

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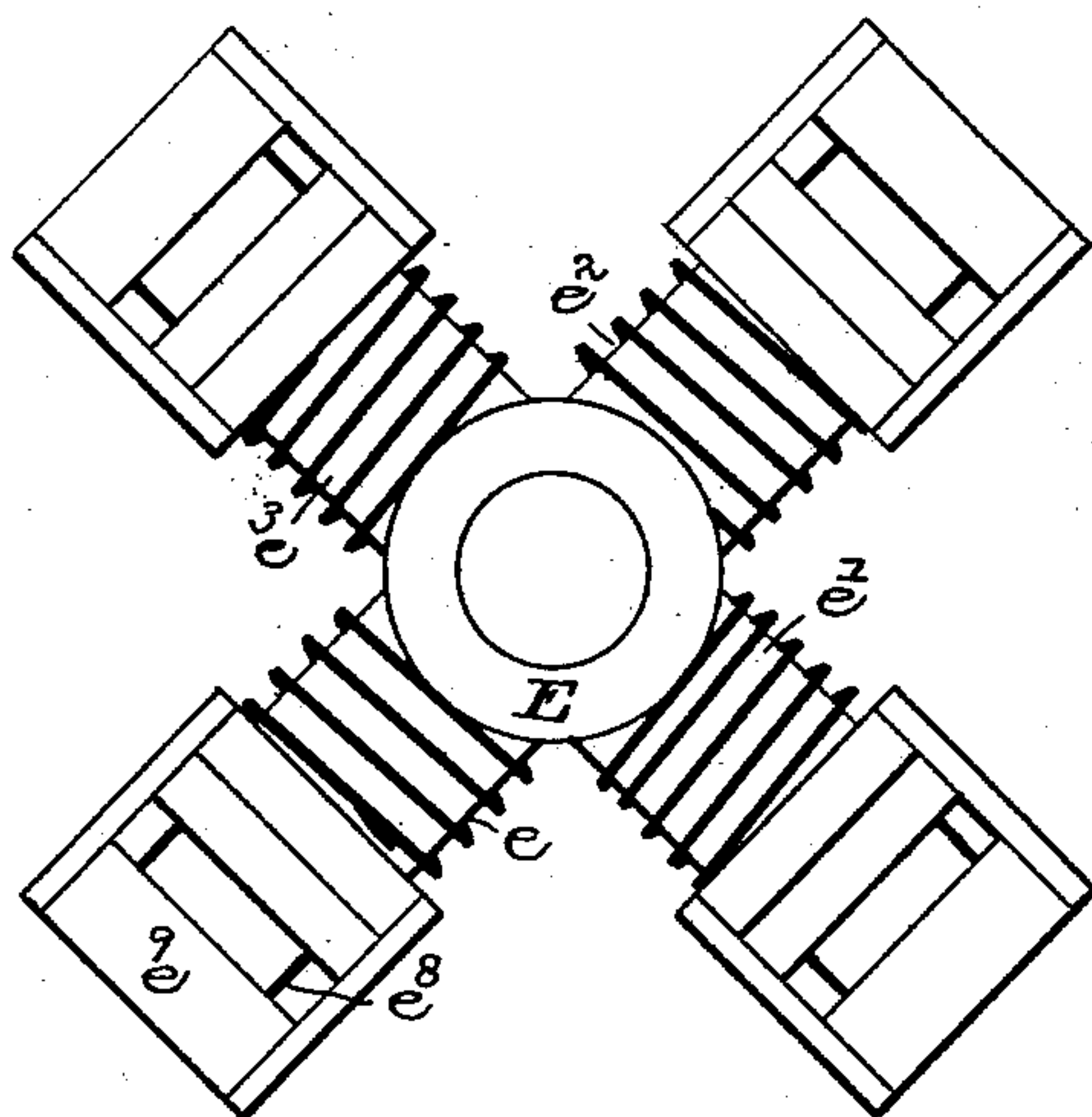


Fig. 7-

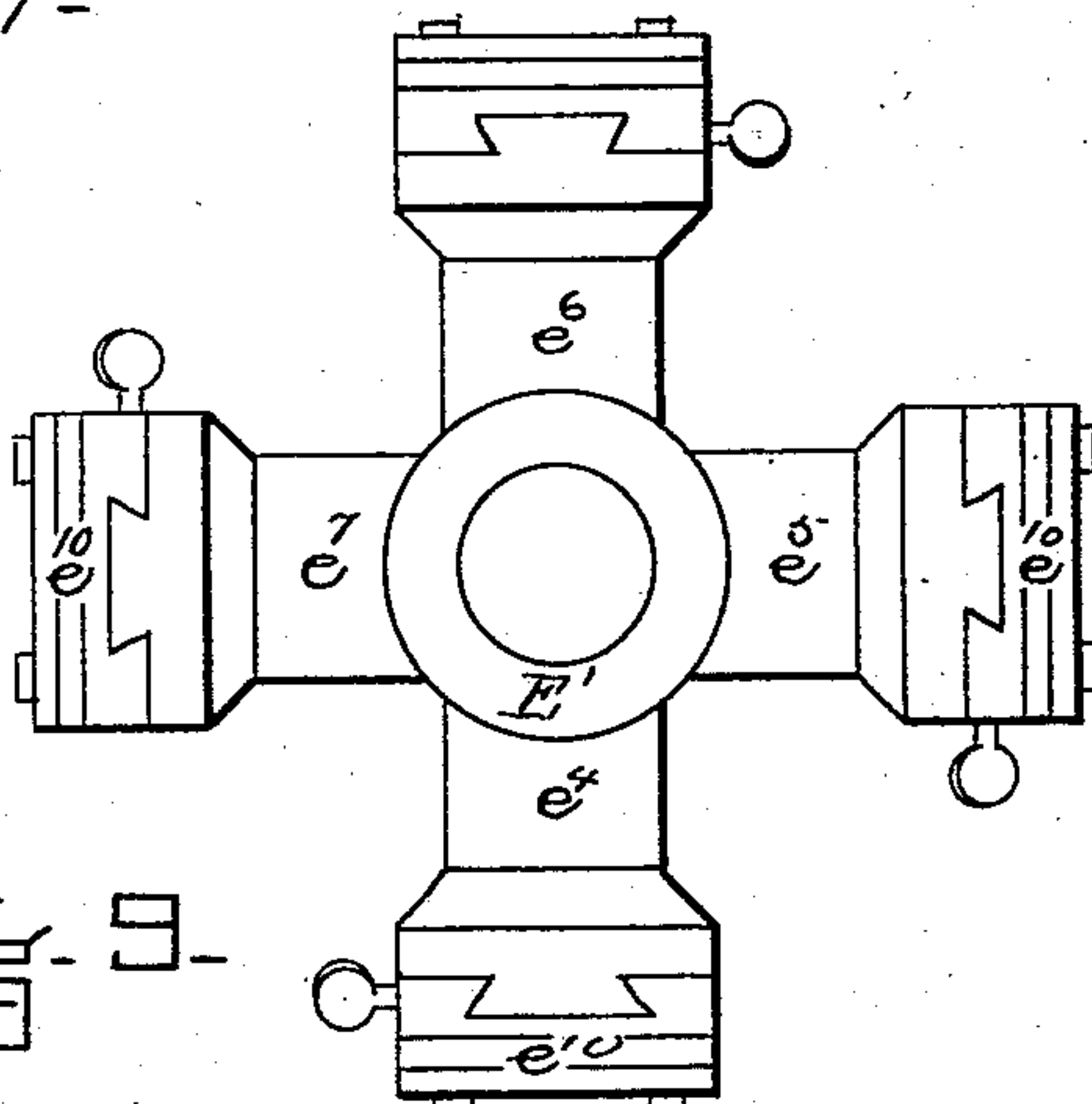
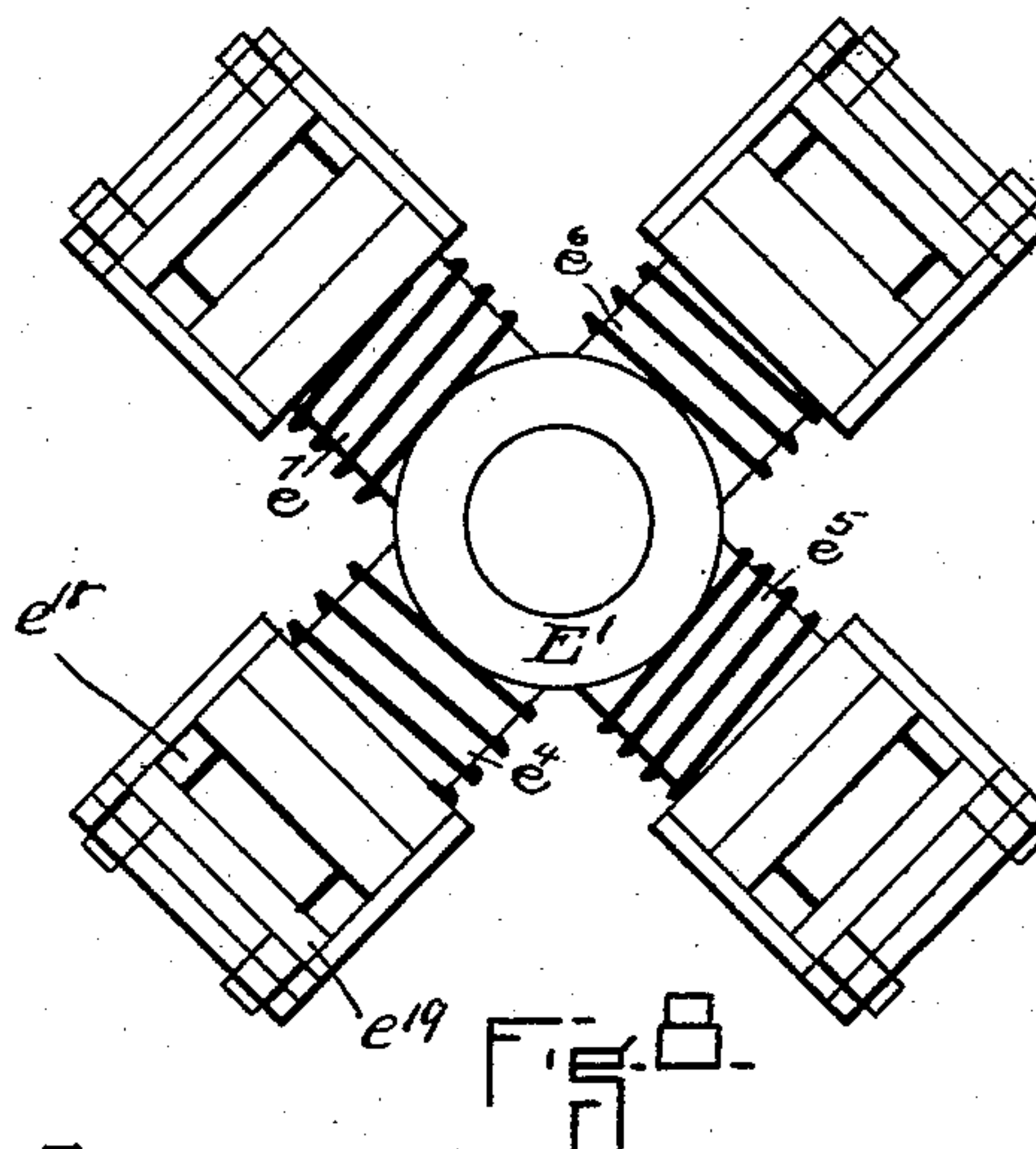


Fig. 9-

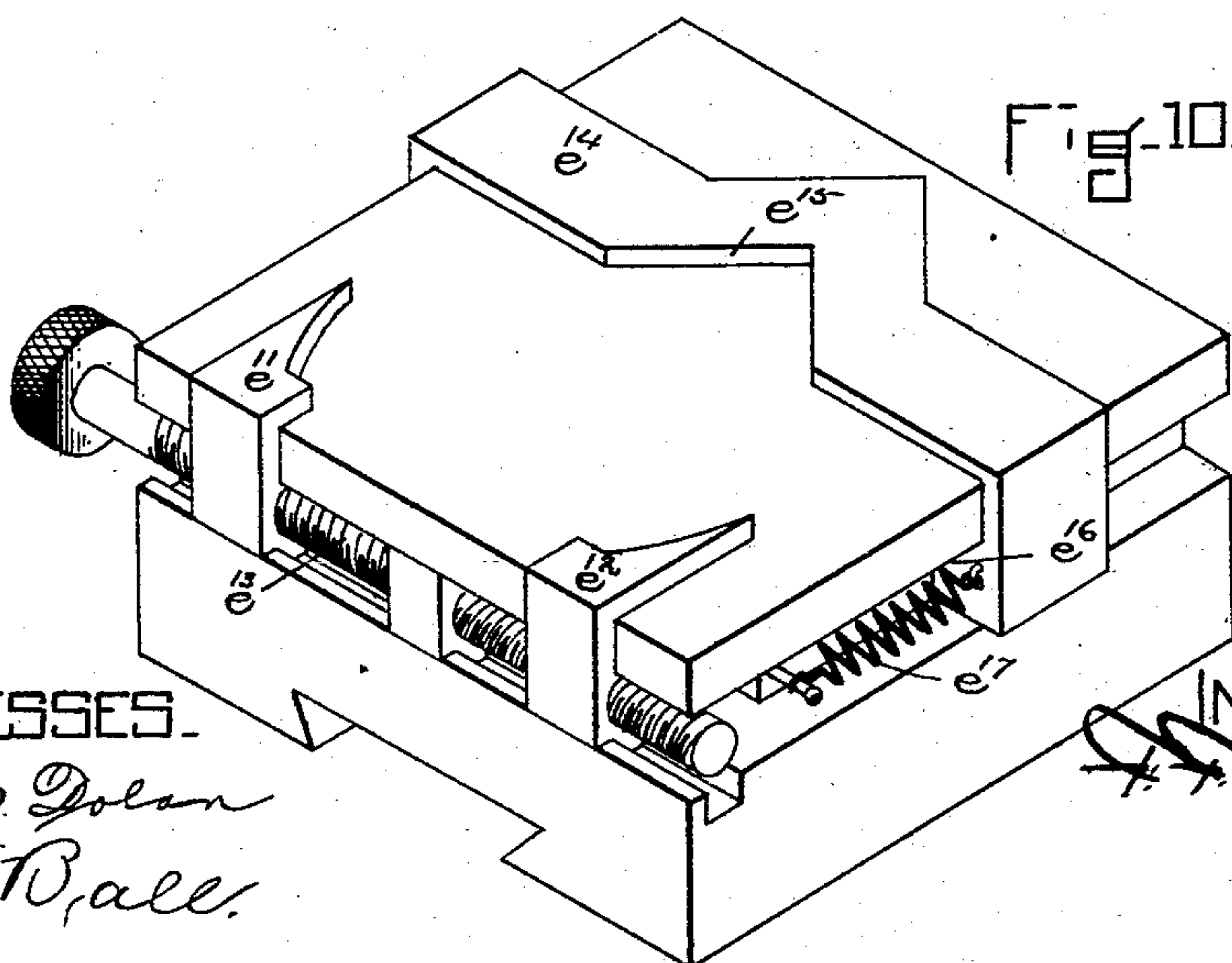


Fig. 10-

WITNESSES.

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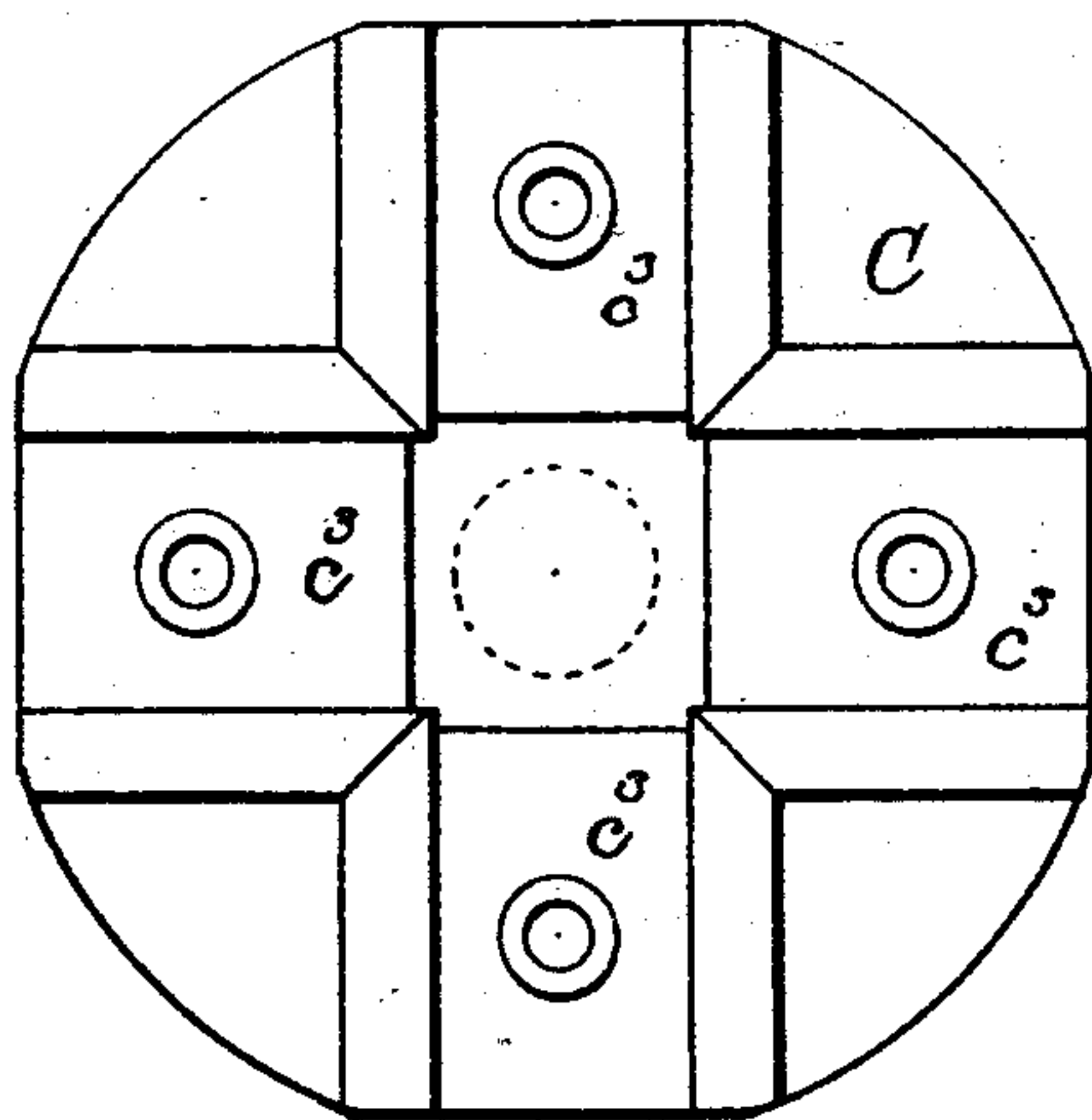


Fig. 11.

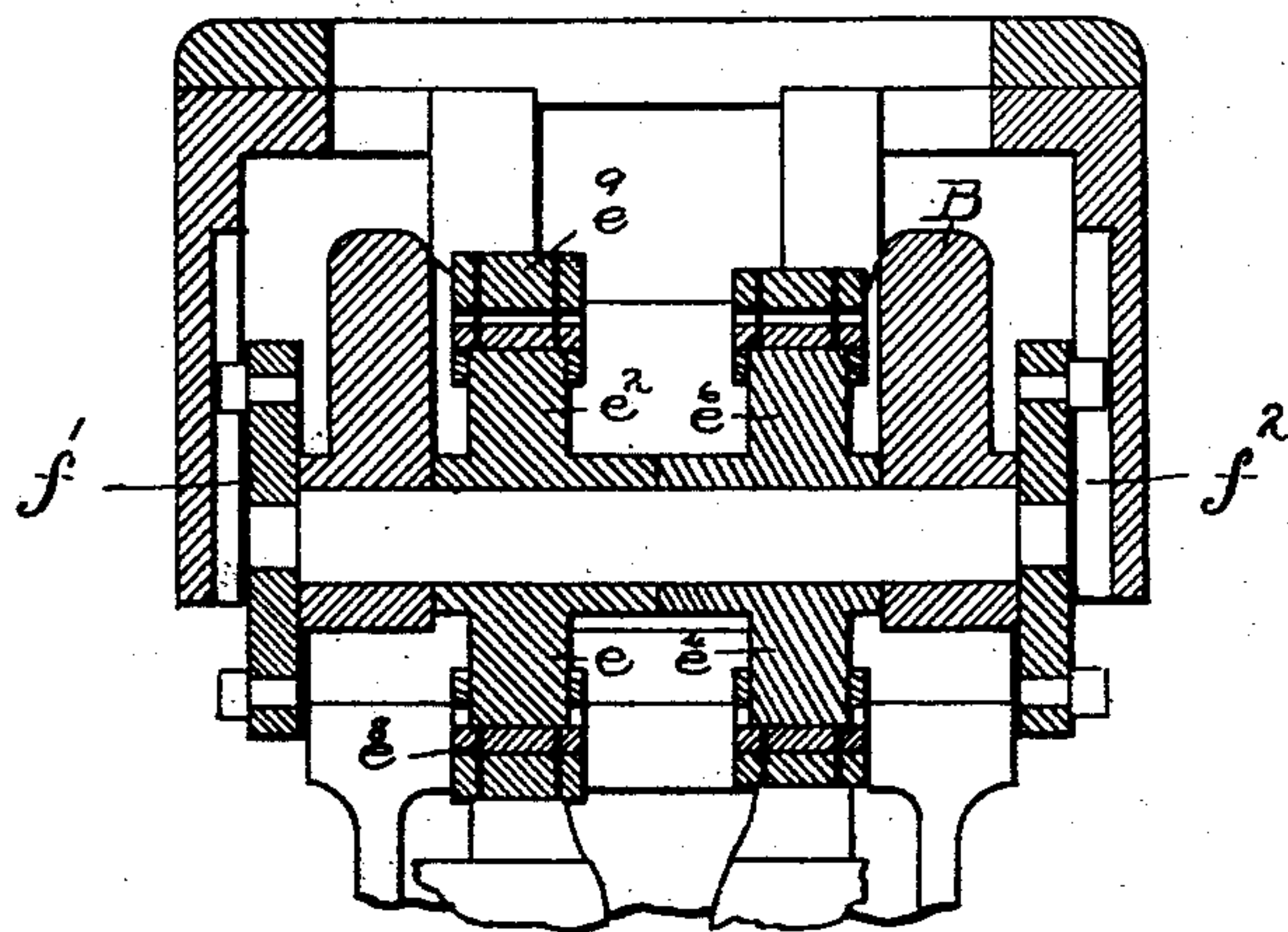


Fig. 12.

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UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2d, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO
JAMES W. BROOKS, OF PETERSHAM, AND JOHN BROOKS, OF CAMBRIDGE,
MASSACHUSETTS, TRUSTEES.

HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,648, dated November 3, 1896.

Application filed December 17, 1889. Serial No. 334,110. (No model.)

To all whom it may concern:

Be it known that I, FREEBORN F. RAYMOND, 2d, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Heel-Nailing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to a heel-nailing machine having a reciprocating head carrying heel-blank-attaching devices at one place and top-lift-applying devices at another and a compound jack mounted below said top-lift and heel-blank applying devices and consisting of a rotary plate upon which is mounted back to back two or more jacks, the plate and jacks being so arranged that there are always two in position beneath the heel-blank-attaching and top-lift-attaching devices, so that upon the reciprocation of the cross-head a heel-blank is attached to one shoe and a top lift to a previously-attached heel-blank, and the next rotation of the jack-plate moves the shoe with the attached heel-blank under the top-lift-applying device while another jack is brought into position under the heel-attaching device to receive the heel-blank, and thus at every reciprocation of the cross-head there is completed a blind-nailed heel, which, however, has been subjected to two operations. First, it has had a heel-blank attached to it by one set of operating devices and then the top lift.

I have represented the heel-blank-attaching and top-lift-applying devices in the form of rotary heads attached to the reciprocating cross-head and automatically revolved, but I would not be understood as limiting myself to this construction, as the cross-head may have one arm only for the heel-attaching devices and one arm for a top-lift-applying device, but I prefer as a rule to use the rotary heads, as this furnishes a number of arms, each of which supports a heel-blank holder and heel-blank and top-lift holder and top lift, and which are moved automatically successively into operative position and which are adapted to be fed with their faces upper-

most by boys or attendants, so that the operation of the machine is very rapid.

Referring to the drawings, Figure 1 is a view in front elevation of a machine having the features of my invention. Fig. 2 is a view in vertical central section thereof taken from one front of the machine to the other. Fig. 3 is a view in horizontal section above the bed and below the cross-head with the work-supports removed from the jacks. Fig. 4 is a detail view of a portion of the start-and-stop-motion mechanism. Fig. 5 is a view in side elevation, enlarged, of one of the jacks. Fig. 6 is a view in plan thereof. Fig. 7 is a view of the rotary head used for attaching loaded heel-blanks. Fig. 8 is a view of the rotary head for attaching top lifts and slugging. Fig. 9 is a view of the rotary head used for attaching top lifts only or without the slugging attachment. Fig. 10 is a view of the top-lift holder attached to the spanker-blocks of the rotary heads shown in Figs. 8 and 9. Fig. 11 is a plan view of a rotary jack-plate and portions of four jacks supported thereby. Fig. 12 is a detail view, in vertical section, to illustrate the rotary heads as turned by two turning devices.

A is the frame of the machine. It has the sides a a' and the cross-bed a^2 , preferably integral with the sides.

B is the cross-head. It is reciprocated by means of the shaft b , cranks b' , and side connecting-rods b^2 . The distance between the uprights a a' of the frame is sufficient to permit the rotation of the jack-plate C and jacks mounted thereon. This jack-plate preferably is circular in shape and is pivoted at c to the bed on a line directly central between the top-lift and heel-blank attaching devices carried by the head B. It is represented as carrying the jacks c' c^2 . These jacks are mounted upon plates c^3 and are movable toward and from the center c of the plate C and are also vertically adjustable. The horizontal movement is given them for the purposes of adjustment. The plate may have more than two jacks, as represented in Fig. 11, if desired.

The head B is represented in Fig. 2 as having the rotary head E, having four arms e e'

$e^2 e^3$, and the rotary head E' , having the arms $e^4 e^5 e^6 e^7$. The head E is the one used for attaching loaded heel-blanks, and each arm supports a heel-blank-applying device preferably consisting of the gang of drivers e^8 and the templet e^9 , similar to that described in my application for patent filed November 11, 1889, and each of the arms of the rotary head E' supports a spanker e^{10} and a top-lift holder preferably comprising the two breast corner-gages $e^{11} e^{12}$, movable from and toward each other by right and left screws e^{13} , and the back-stop e^{14} , comprising a plate having a V-recess e^{15} and attached to two side rods or bars e^{16} , playing in side recesses in the spanker-plate, and springs e^{17} , which draw the V or back-stop toward the breast corner-gages. There may be used also upon the spanking-arms slug-driving mechanism, as represented in Fig. 8, and comprising the gang of slug-drivers e^{18} and a movable spanker-plate e^{19} , having the holes through which the slugs are driven and yielding in relation to the arm which supports it and having a top-lift holder like the one above specified.

I prefer when the rotary heads are used that they be revolved automatically, and they may be fastened upon the same shaft and revolved by one turning mechanism f , as represented in Fig. 2, or there may be two turning mechanisms $f' f^2$, as represented in Fig. 12, or each may be mounted upon the straight shaft and turned by its respective mechanism, as desired.

In use loaded heel-blanks and top lifts are placed upon their respective blocks when they are uppermost by a boy or attendant who stands upon the platform in a position to enable him to so place the top lifts and heel-blanks. The slugging-spanker may be loaded with slugs in any suitable manner.

In operation the operator places a shoe upon the last or work-support, and the heel-blanks and top lifts being fed by an attendant to the arms of the heel-blank and top-lift attaching devices the machine is started and makes one reciprocation, and a heel-blank is attached to the shoe. The jack-plate is then turned, moving the jack having the heeled shoe under the top-lift-applying device. Another shoe is then placed upon the jack brought into position beneath the heel-blank-attaching device by the operator, and the next reciprocation of the machine attaches a heel-blank to that shoe and a top lift upon the previously-attached heel of the other shoe, and the jack is again turned, the first jack brought into position before the operator, the finished shoe removed from it, another unheeled shoe substituted, and the machine set in operation and a heel-blank attached to the shoe and a top lift to the heeled shoe under the top-lift-applying device, and from that time on every reciprocation of the machine completely heels the shoe and also slugs it, that is, at every reciprocation a completed shoe is in condi-

tion to be removed from the machine and another one unheeled to be substituted for it.

As the machine is operated from one front only and the shoe which is receiving the top lift is out of the direct control of the operator, it is necessary, or desirable at least, to employ in connection with the last or work-support shoe holding and centering devices to hold or lock the shoe upon the last or work-support and hold it so locked while the jack is being turned or rotated, and also while the machine is operating, and I have represented each jack as provided with shoe centering and holding devices, comprising in substance a sleeve M , arranged to slide or be vertically moved upon the jack-post by means of an adjusting-nut m' , (see Fig. 1,) which screws on a thread m^2 , formed on the jack-spindle. The sleeve is prevented from turning on the jack-post by a pin m^3 , which enters guiding-slots m^4 in the jack-post, and also serves to connect the sleeve with the jack-spindle, so that the nut m' serves to simultaneously adjust the jack-spindle and last or work-support mounted thereon, and also the sleeve or support for the shoe holding and centering devices. The sleeve carries at its rear end the long supports m^5 for the vertical rods m^6 . The two rods are connected together by segment-gears $m^7 m^8$, whereby the movement of one causes the operation of the other. There is secured to one of the rods m^6 a handle m^9 and a ratchet-wheel m^{10} , and there is mounted upon the handle m^9 a pawl m^{11} to engage the ratchet. At the upper end of each rod m^6 is the shoe centering and holding arm m^{12} , extending forward from the end of the rod, having a thin curved edge m^{13} to enter the rand crease and a shoulder m^{14} to bear against the counter. The shoe is mounted upon the last or work-support when the fingers or shoe-holders are wide open, and they are then closed upon the shoe, the edges m^{13} of the guides entering the rand crease, and the shoulders m^{14} bearing against the counter, and the fingers or holders are held in this position by the pawl and ratchet, and this locks the shoe firmly upon the last or work-support and insures its remaining in the same position during the movement of the jacks and the operation of the machine until the shoe is returned to the operator with the heel-blank and top lift attached.

It will be seen that the curved edges of the holding-arm are shaped so that they not only bear against the side of the shoe at the heel, but also at the back, and therefore press the shoe forward against the back end of the last or work-support as well as clamping its sides.

Power is represented as applied to the machine by means of the main shaft N , the pinion n thereon, the gear-wheel n' on the shaft b . The main shaft N carries the driving-pulley n^2 , which is also a fly-wheel. The pinion n is free to rotate on the shaft N , and has the member n^3 of a clutch secured to it. There

is attached to the shaft N by a feather or spline to slide thereon the other member n^4 of the clutch. It has a groove n^5 , which receives rolls n^6 , carried by the forked lever n^7 .

5 This lever is pivoted at n^8 and supports a latch-lever n^9 . A spring n^{10} operates against the movable member n^4 of the clutch through lever n^7 . The gear n' has a stop-cam projection n^{11} , and the latch-lever n^9 is of a shape
10 and size to be brought into the path of the movement of this cam-stop, and is held in such path by a spring n^{12} . The opposite end of the latch-lever is connected with the treadle n^{13} by a connecting-rod n^{14} .

15 The operation of the device is as follows: The driving-wheel n^2 and the member n^4 of the clutch constantly rotate. The machine makes but one reciprocation, that is, there is one revolution of the shaft b , and to start the machine the treadle is depressed, lifting the end
20 of the lever n^9 from contact with the stop n^{11} on the gear n' . This permits the spring n^{12} to force the member n^4 of the clutch into engagement with the member n^3 on the pinion n , and this engagement is maintained during one revolution of the gear n' and until the cam-stop n^{11} comes into contact with the end
25 of the lever n^9 , which has by the spring n^{12} been brought into position to be operated by the cam-stop, and pushes the lever n^7 sufficiently to cause it to disengage the member n^4 of the clutch from the member n^3 , when the machine comes to rest. It will be observed that this stop-motion mechanism is all contained between the two side frames of the
35 machine.

It will be seen that the plate C furnishes means whereby the jacks are made interchangeable in relation to the duplex nailing
40 devices, and the jacks are attached to the plate preferably by means of cap-plates, so that they may have a sliding movement thereon both for the purposes of adjusting their position horizontally, and also, if desired, for the purpose of drawing them outward from the nailing
45 devices, and in Fig. 3 I have shown the plate C as provided with the adjustable stops C' for limiting or regulating the degree or extent of horizontal movement of the jacks, and
50 also for the purpose of adjusting them upon their carrier-plate in relation to the nail-driving devices.

It will be seen that each spanker-block has a horizontal adjustment upon the end of its
55 holding-arm, whereby the position of the top-lift holder and centerer is adjusted or varied in relation to the heel-blank.

It will be observed that the arms of the head E' may also be used for driving slugs or
60 additional nails into a previously-attached heel-blank.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

65 1. In a heel-nailing machine, the combination with two jacks and a rotary support upon which said jacks are mounted back to back

whereby they may be interchangeable in position of a reciprocating head a heel-blank holding and applying device and a top-lift
70 holding and applying device with or without a slugging attachment the said applying devices being mounted adjacent to each other upon said reciprocating head and adapted for simultaneous use with said jacks, substantially
75 as described.

2. The combination, in a heel-nailing machine, of a single reciprocating cross-head, two rotary heads carried thereby, one of which supports a device for holding and attaching
80 a loaded heel-blank and the other of which rotary heads has a number of arms each of which supports a top-lift spanker and centering device with or without a slugging attachment and one or more jacks movable from
85 operative position with the heel-blank-attaching device to operative position with the top-lift-attaching device, as and for the purposes specified.

3. The top-lift holder comprising the gages
90 e^{11} e^{12} movable toward and from each other and the back-stop plate e^{14} having the V-recess and springs for moving or drawing said plate toward the said gages, substantially as described.
95

4. The combination, in a heel-nailing machine, of a reciprocating head, the heel holding and attaching and top-lift-applying devices arranged thereon and carried thereby
100 as specified, and the jack comprising a movable plate supporting two lasts or work-supports in position for the simultaneous operation of the heel-attaching and top-lift-applying devices, and also arranged to interchange the positions of the said lasts or work-sup-
105 ports, and a shoe-holding device for each jack, as and for the purposes described.

5. The combination, in a heel-attaching machine, of a rotary plate, two jacks supported back to back thereon immediately adjacent
110 to each other, and a shoe holder and centerer for each jack, as and for the purposes described.

6. The combination, in a heel-nailing machine, of a movable plate supporting two
115 jacks back to back immediately adjacent to each other, and the said jacks having a horizontal or sliding movement upon said plate, as and for the purposes described.

7. The combination, in a heel-nailing machine, of a movable plate or jack-support,
120 two jacks carried by said plate back to back immediately adjacent to each other and arranged to be moved horizontally thereon for the purposes of adjustment, and stops for ad-
125 justing the position of said jacks upon said plate, as and for the purposes described.

8. The combination, in a heel-nailing machine, of the last or work-support, the jack-
130 post m , the jack-spindle having a lower threaded end m^2 , the adjusting-nut m' , the shoe centerers or holders connected with the jack-spindle to be moved vertically therewith, substantially as described.

9. The combination, in a heel-nailing machine, of the single cross-head, the heel-attacher and top-lift attacher carried thereon in position for simultaneous operation, interchangeable jacks or work-supports for conjoint operation of the heel-attaching and top-lift-applying devices, and a stop-motion mechanism for stopping the machine at the end of each reciprocation of the cross-head, substantially as described.

10. The combination, in a heel-nailing machine, of a heel-attaching device at one point, a top-lift attaching and nailing device at another point, and two lasts or work-supports one for use in connection with the heel-attaching devices and the other for use in connection with the top-lift attaching and nailing devices and arranged back to back, and immediately adjacent to each other, as and for the purposes described.

11. In a heel-nailing machine, a movable head carrying two or more arms each of which arms supports a top-lift attaching and slugging device comprising the perforated spanker-block movable upon said arm, a top-lift holder carried by said spanking-block, and a gang of drivers, substantially as described.

12. In a heel-nailing machine, a single reciprocating head carrying two movable heads, each of which heads has two or more arms, and every arm of one of which heads supports the templets e^9 movable upon said arms and

the drivers e^8 , and every arm of the other of which heads supports the top-lift spanker and a top-lift holder and centerer secured to said spanker, substantially as described.

13. In a heel-attaching machine, a single movable head having two or more arms, each of which arms carries a top-lift spanking-block and said top lift carrying blocks independently adjustable laterally upon said arms, as and for the purposes described.

14. The combination, in a heel-nailing machine, of a head, two movable heads carried thereby, having two or more arms, the arms of one of which heads supporting only heel-attaching devices, and the arms of the other of which heads supporting top-lift or top-lift-nailing devices, and a common actuator for simultaneously moving the arms of both heads into and out of operative position, as and for the purposes described.

15. The combination, in a heel-nailing machine, of a heel-attacher at one point, a heel-slugging device at another point, and two lasts or work-supports arranged back to back, and adjacent to each other and for simultaneous use with the heel-attacher and heel-slugging device, as and for the purposes described.

FREEBORN F. RAYMOND, 2D.

In presence of—

J. M. DOLAN,

JOS. L. COOMBS.