

(No Model.)

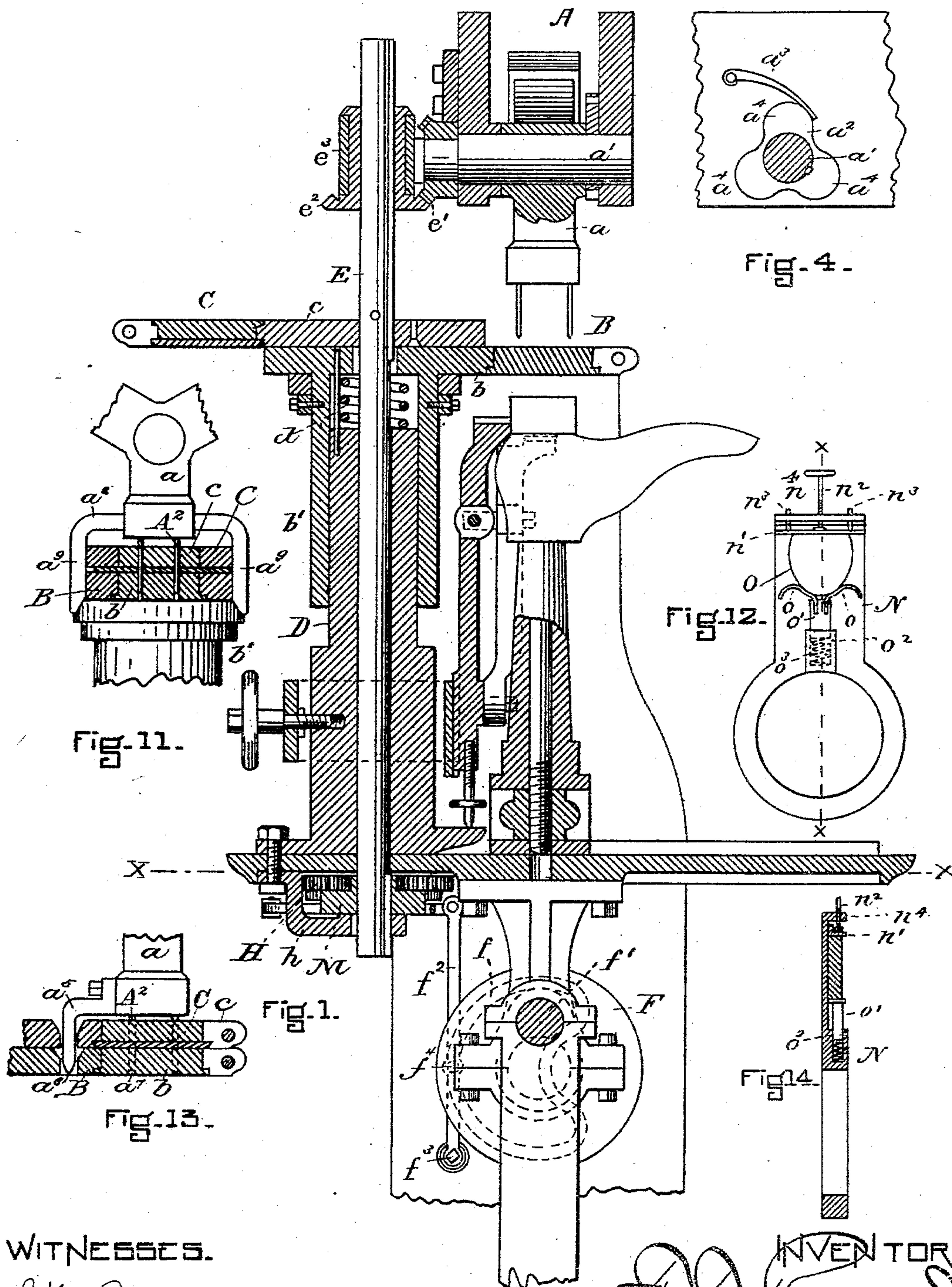
3 Sheets—Sheet 1.

F. F. RAYMOND, 2d.

HEEL NAILING MACHINE.

No. 321,530.

Patented July 7, 1885.



WITNESSES.

L. M. Dolan.

Fred. B. Dolan.

~~INVENTOR~~

(No Model.)

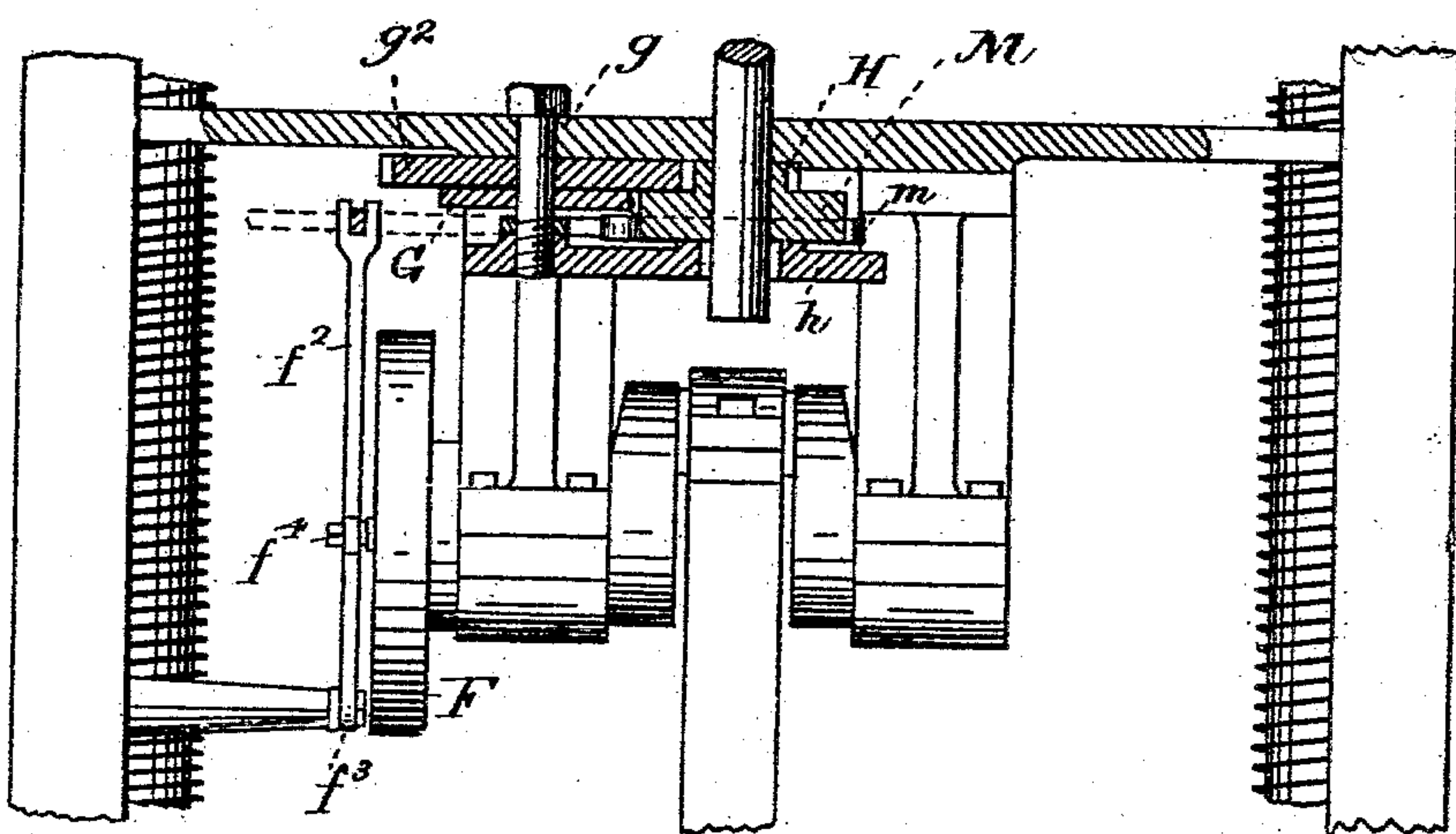
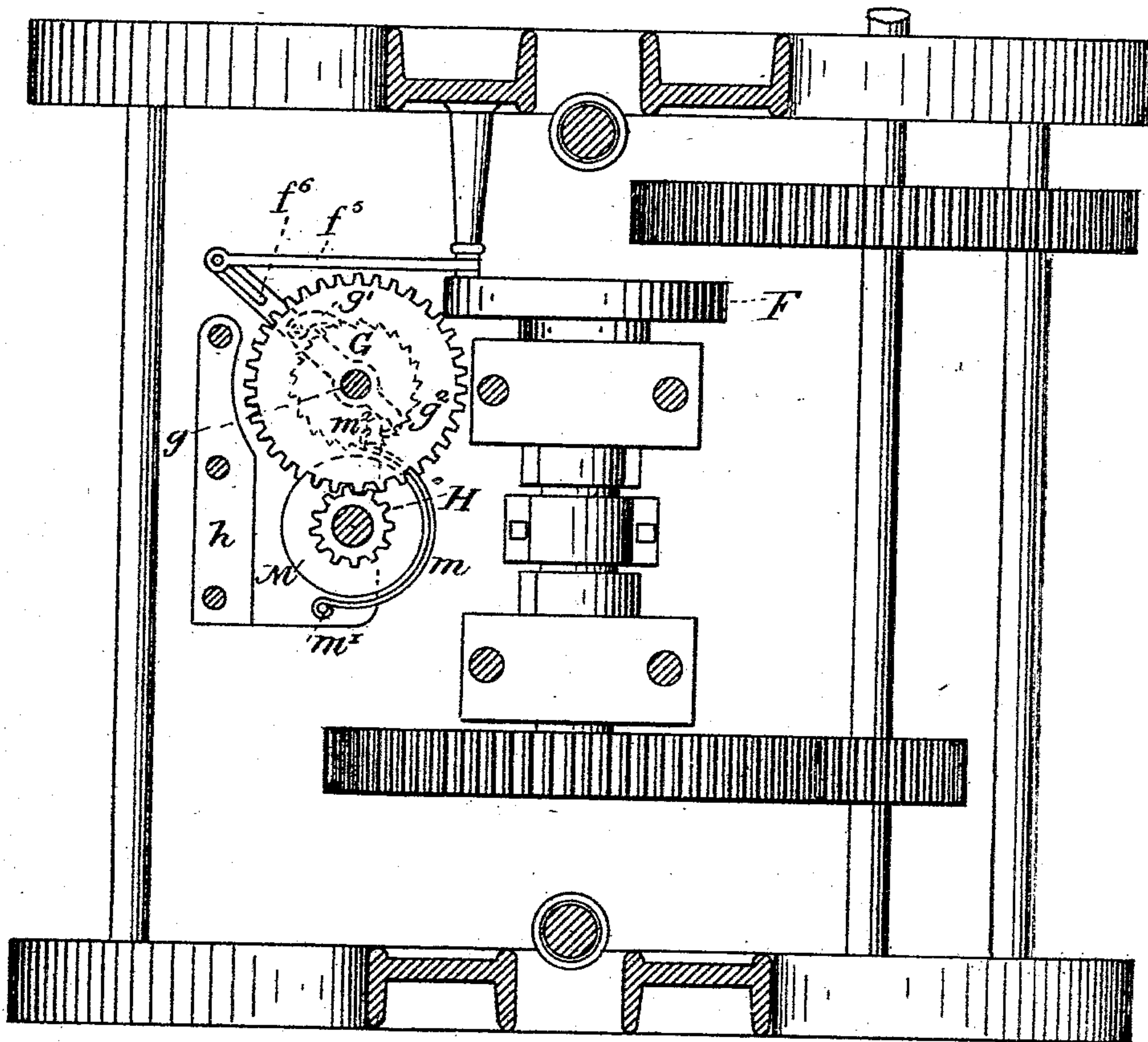
3 Sheets—Sheet 2.

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No. 321,530.

Patented July 7, 1885.



WITNESSES.

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(No Model.)

3 Sheets—Sheet 3.

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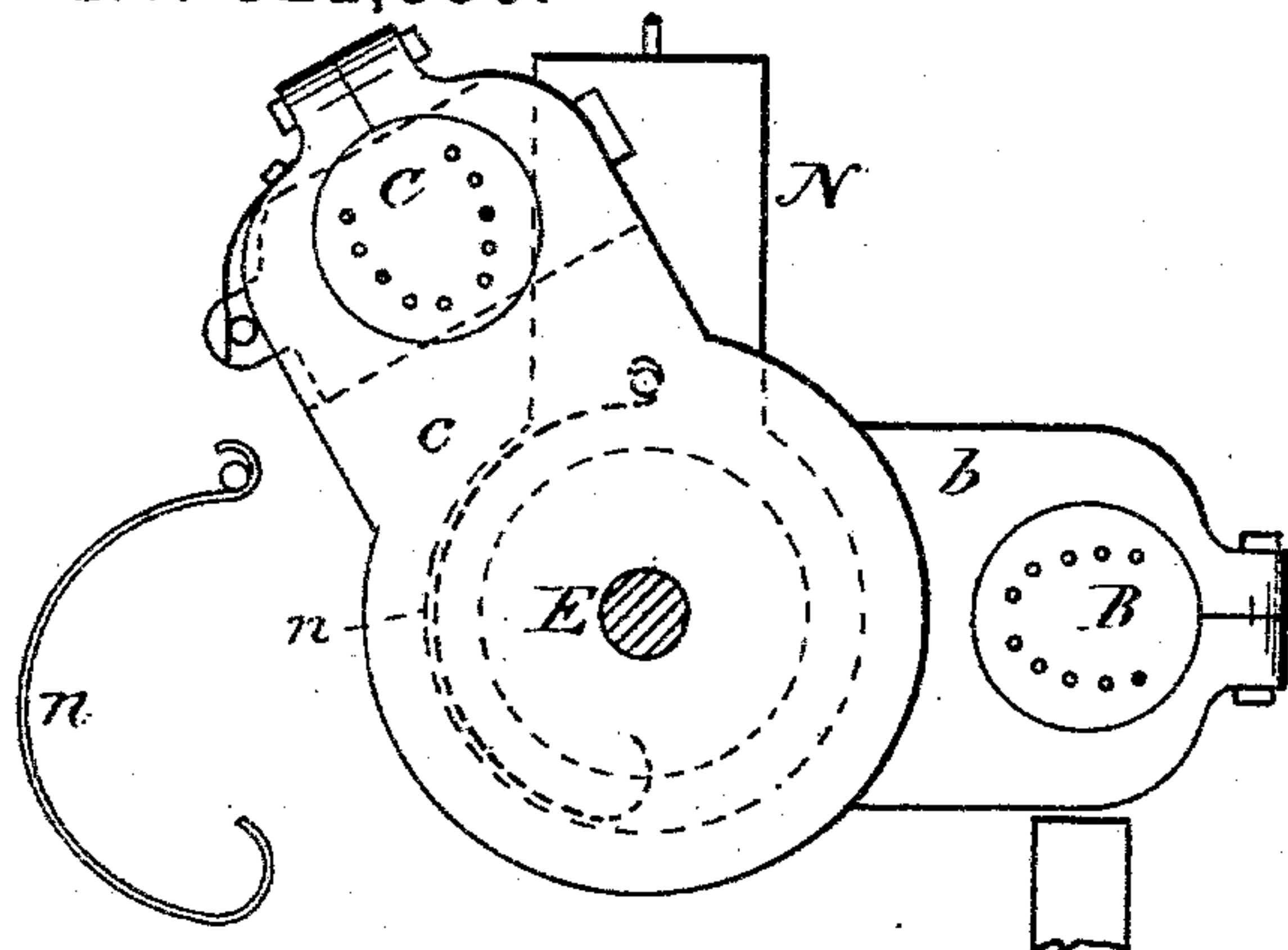


Fig. 5.

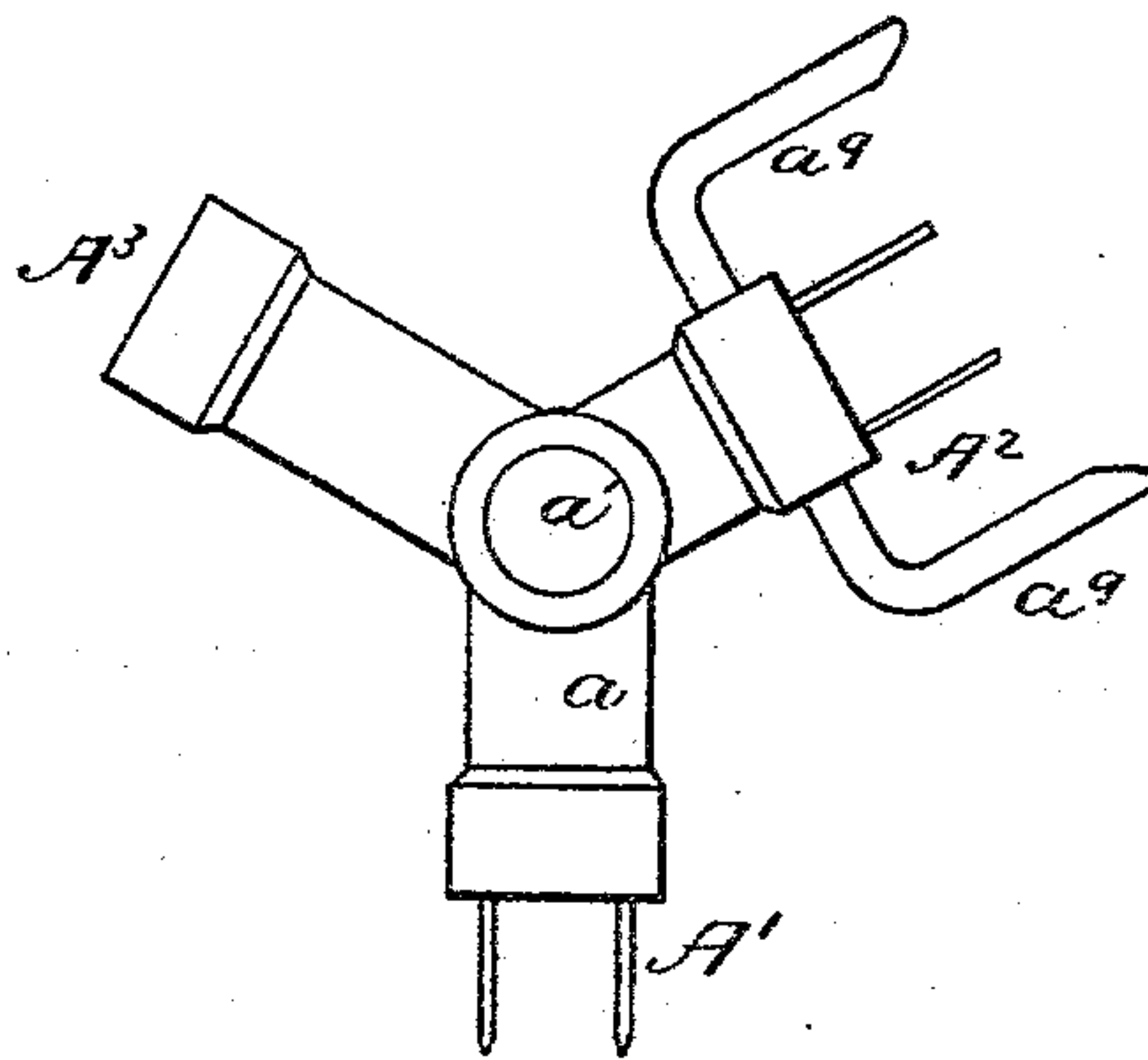


Fig. 6.

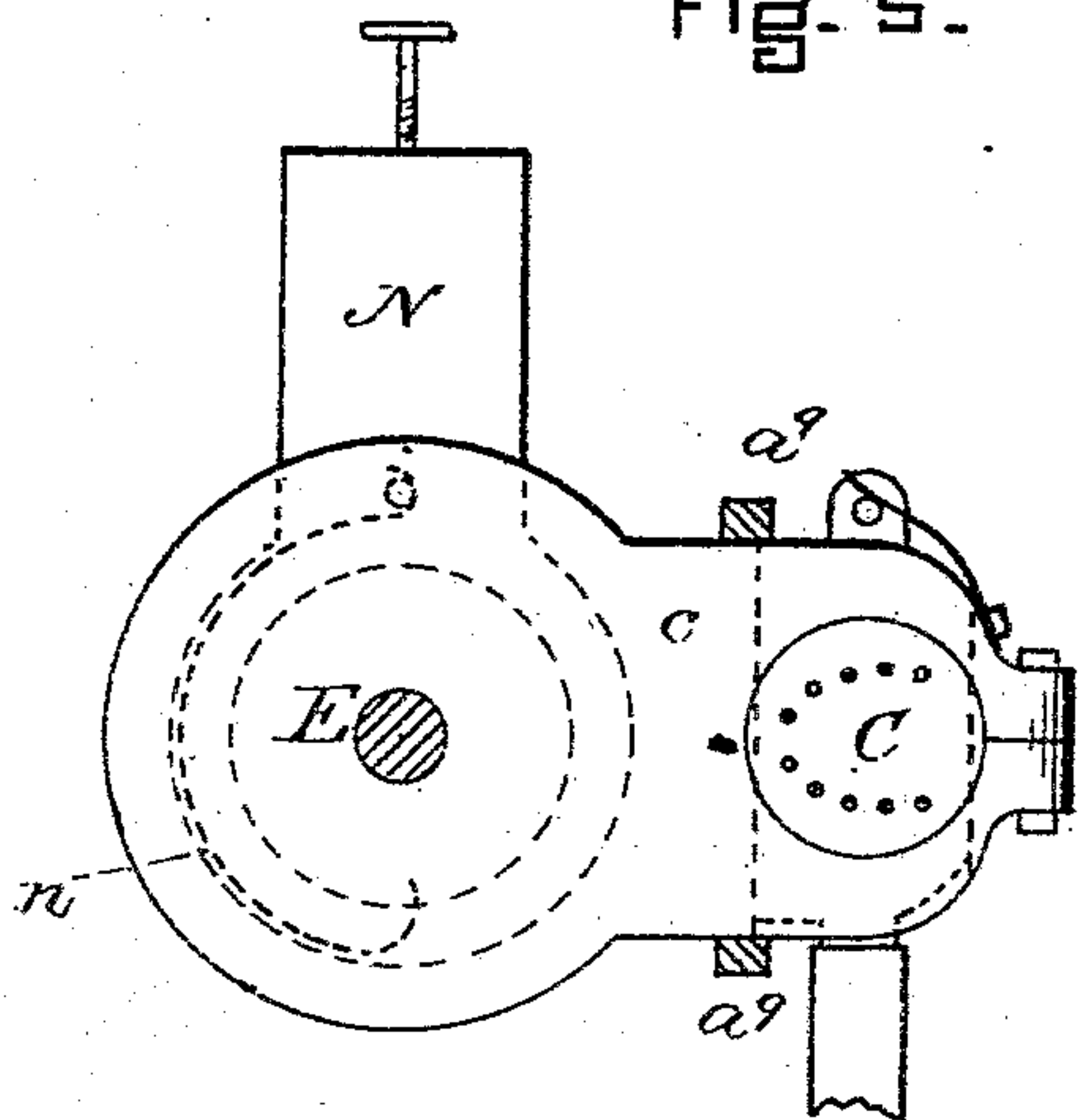


Fig. 7.

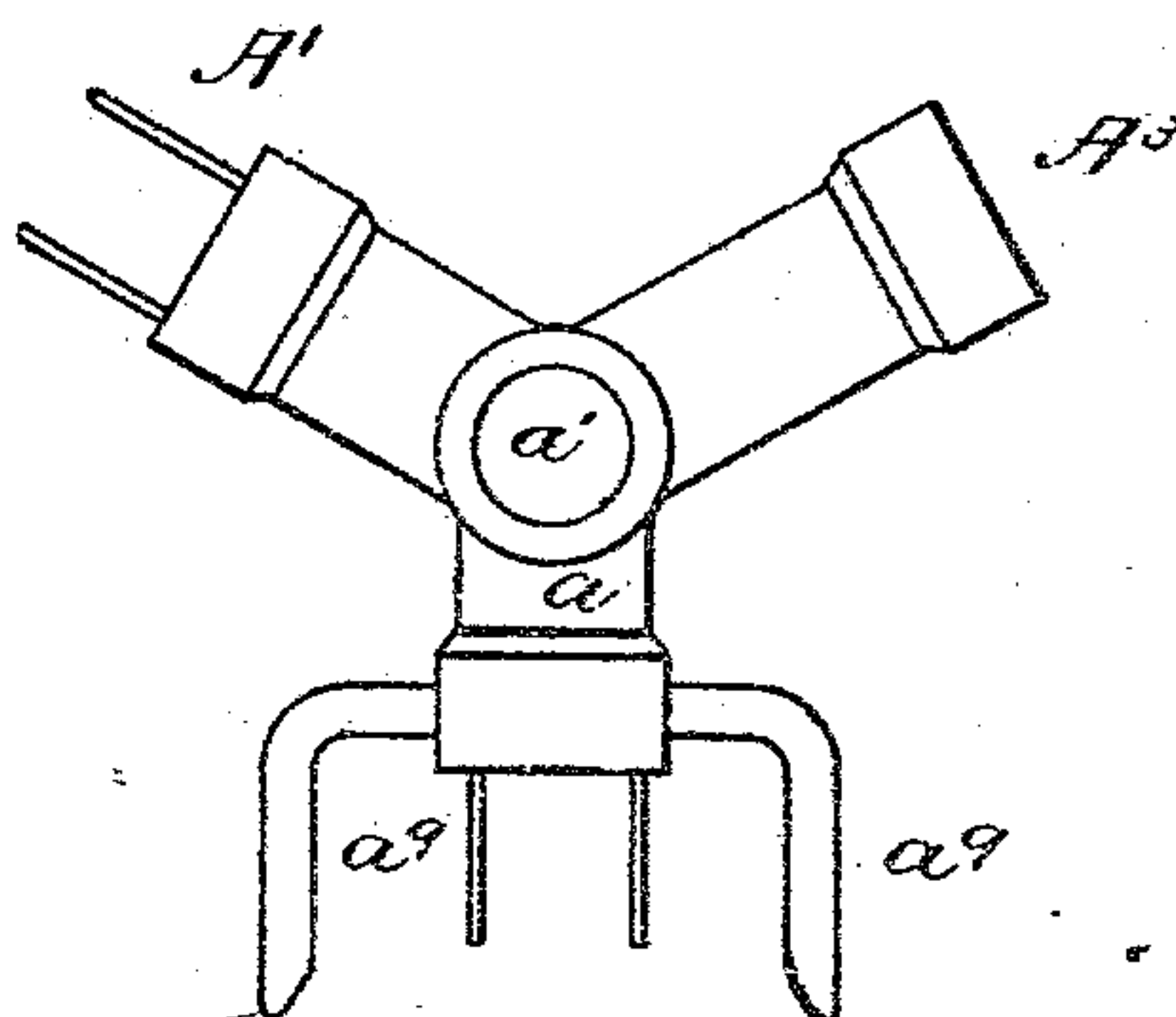


Fig. 8.

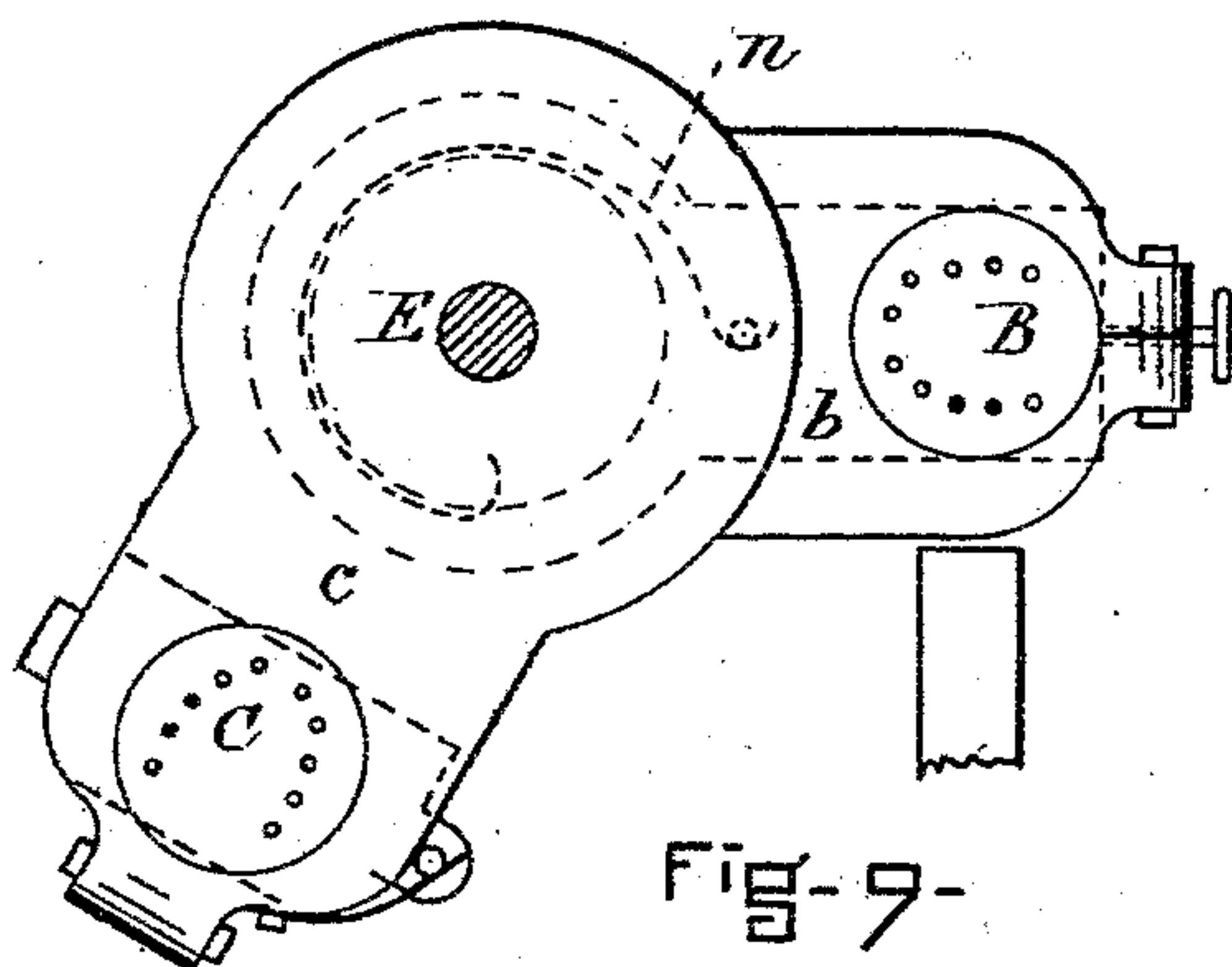


Fig. 9.

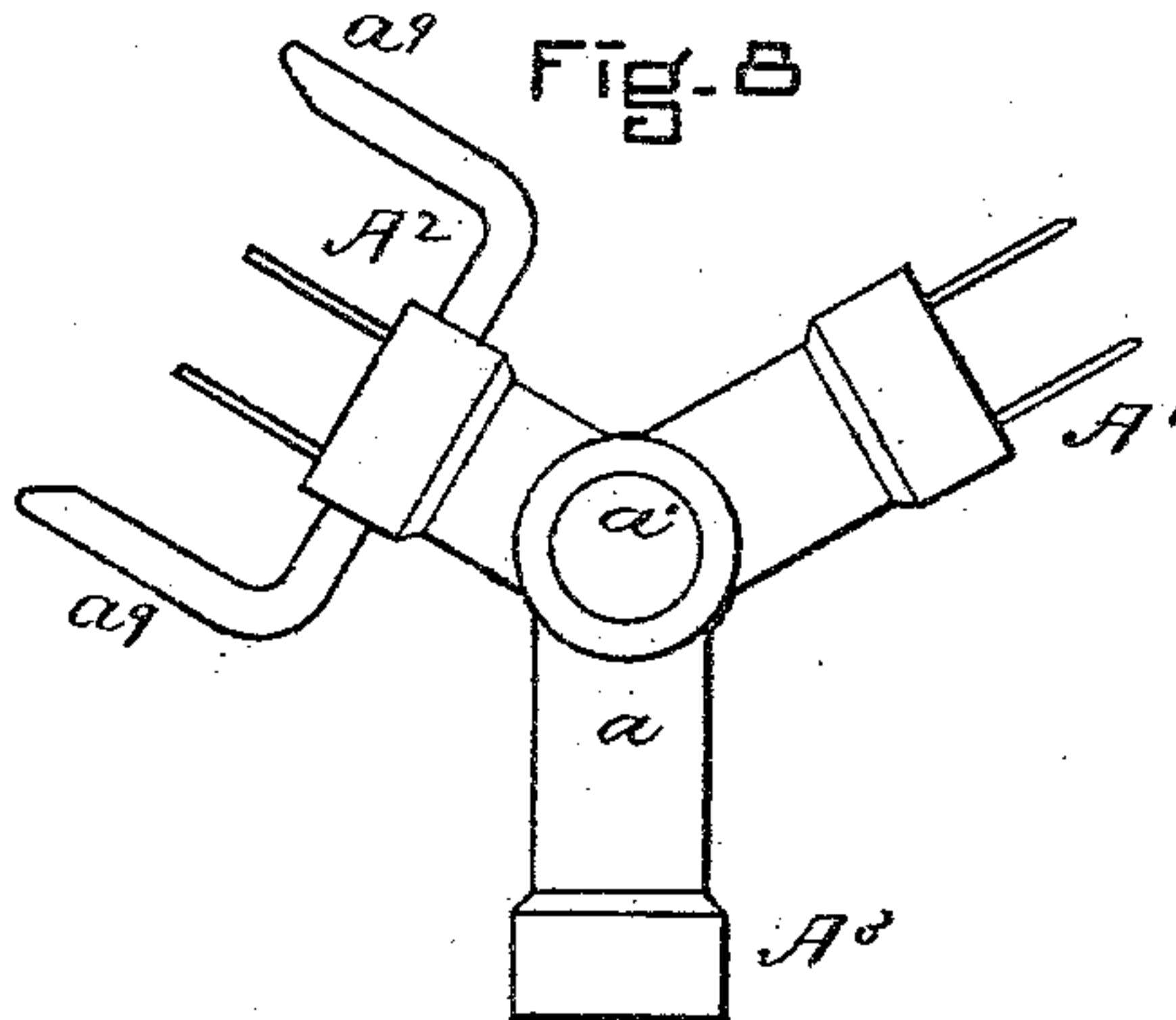


Fig. 10.

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UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2d, OF NEWTON, MASSACHUSETTS.

HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 321,530, dated July 7, 1885.

Application filed April 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, F. F. RAYMOND, 2d, of Newton, in the county of Middlesex and State of Massachusetts, a citizen of the United States, 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, in which—

Figure 1 is a view of a portion of a National machine representing my invention, part in vertical section and part in elevation. Fig. 2 is a section and plan on and below the line xx of Fig. 1. Fig. 3 is a view, part in elevation and part in vertical section. Figs. 4 to 13, inclusive, are detail views, hereinafter referred to. Fig. 14 is a vertical central section of the top-lift-holder plate and the top-lift holder.

This invention is an improvement upon that described in Letters Patent Nos. 252,215, 259,687, and 287,472; and it relates especially to means for providing the parts with automatic movements, and to various details of construction, as will hereinafter more fully appear.

Referring to the drawings, A represents a reciprocating cross-head; a , a revolving head, carrying the awls A' , drivers A^2 , and spanker A^3 , or any two of them. a' is its shaft. B is the templet at the front end of the templet-plate b . C is the nail-holder at the front end of the nail-holder plate c . D is the post upon which the templet and nail-holder plates are vertically movable against the stress of the spring d or some equivalent lifting device. The post D is preferably made round and the templet b with a sleeve, b' , which fits thereon. The post is bolted to the bed-plate of the machine. The shaft E connects the shaft of the revolving head a with the nail-holder plate c by means of the bevel-gear e' , attached to the inner end of the shaft a' , and the bevel-gear e^2 upon the shaft E, movable thereon vertically, and held to the cross-head by the bracket e^3 . This connecting device is like that described in a pending application of J. W. Soule. The shaft, however, is carried down through the post D, and is automatically revolved by means of the cam-groove f in the cam-disk F, attached to the crank-shaft f' , lever f^2 , pivoted at f^3 , hav-

ing the pin f^4 , which enters the cam-groove f , the link f^5 , which connects the lever f^2 with the lever f^6 , which is pivoted to the stud g , which supports the ratchet-wheel G, which lever has the spring-pawl g' , which engages with the ratchet-wheel G. This ratchet-wheel is secured to the cog-wheel g^2 on the stud g , which meshes with the gear-wheel H on the lower end of the shaft E. This gear-wheel is supported by the arm or bracket h , and is splined on the shaft, so that the shaft may have a vertical movement therein.

It will readily be seen that upon the movement of the crank, the ratchet-wheel is revolved by the cam a portion of a revolution, depending upon the throw of the cam and of the leverage employed and the size of the ratchet and gear wheel g^2 in relation to the gear-wheel H. When three reciprocations of the machine are employed for attaching the heels—namely, one to drive the awls, one to drive the drivers, and one to spank—the nail-holder plate is moved a third of a revolution each reciprocation.

In the drawings, I have represented a cam and connecting devices adapted to revolve the nail-holder plate a third of a revolution for each reciprocation, and the various positions of the plates in relation to the awls, drivers, and spanker-block are represented in Figs. 5 to 10, inclusive. Fig. 5 represents the position of the nail-holder plate upon the reciprocation of the awls. Fig. 7 represents the position of the nail-holder plate upon the reciprocation of the drivers; Fig. 9, its position upon the reciprocation of the spanker; and, likewise, Figs. 6, 8, and 10 represent the various positions of the awls, drivers, and spankers at these various intervals in the revolution of the nail-holder plate.

To prevent the momentum of the shaft and its attachments from throwing it farther than is desirable, I have secured to the shaft E, below the gear-wheel H, the brake-wheel M, and have arranged in relation thereto the curved spring-arm m , which is fastened at m' to the bracket h , and which may be lined upon its surface with leather, if desired, and which encircles the brake-wheel, and has at its free or movable end the projection m^2 , which shuts into the path of the end of the lever f^6 , so that when the lever is drawn by the cam to move

the ratchet at or near the end of its movement it comes in contact with the projection m^2 upon the curved arm m and moves it sufficiently to draw it upon the brake-wheel, and thereby
 5 make a braking action or friction of sufficient intensity to immediately overcome any momentum; and in order that this action may take place upon the shaft a' at the same time, I have attached to its front end a disk, a^2 , which
 10 is shaped substantially as shown in Fig. 4; and I have also attached to the head a spring-arm, a^3 , shaped substantially as herein represented, so that at the desired interval of time—that is, at the end of the throw of the ratchet—
 5 a portion, a^4 , of the disk comes in contact with the spring-arm, which acts as a brake or friction.

To accurately center the nail-holder plate, templet-plate, and drivers, I have attached to
 10 the arm carrying the drivers, or to the driver-supporting block, a centering bar or rod, a^5 , which has a tapering or beveled end, a^6 , and have formed in the nail-holder plate and templet-plate a recess or hole, a^7 , adapted to receive said rod or plate. (See Fig. 13.) This
 5 recess, for a portion of its extent in each plate, corresponds to the shape of the rod or plate above the beveled portion; but the upper portion of said holes in both plates flare or taper
 10 outwardly. The rod or plate should project below the under surface of the drivers, so that upon the reciprocation of the cross-head its end shall enter the holes in said plates and accurately center the same in relation to each
 5 other and to the drivers before the drivers enter the holes in the nail-holder plate, and by making the entrance to the said holes beveled I always insure the entrance of the rod or plate, so that if the nail-holder plate or the templet-
 10 plate, or both, should be somewhat out of line they are brought in line with the drivers before the drivers enter the holes in the nail-holder plate. This device not only centers the nail-holder and templet, so that the holes
 5 in the nail-holder must register with the holes in the templet, but it also centers the drivers with the holes in both plates, and the two plates and the drivers are firmly bolted or
 10 locked together during the reciprocation of the machine.

The same device can be applied to the arm supporting the awls or the awl-holding block, and be used in connection with the templet alone for the purpose of securing the perfect
 5 register, if desired.

In lieu of the rod or plate and holes, a yoke, a^8 , having two arms, a^9 , attached to the nail-holder arm and awl-holding arm, or either, of the revolving head, may be used, in which case
 10 the inner or lower ends of the arms are beveled and are made long enough, and are adapted to close on each side of the nail-holder and templet plates, or either, and lock the same in position, and in Fig. 11 I have represented
 5 the nail-holder arm provided with this centering yoke. On some accounts this construc-

tion is preferable to the first named, in that it does not involve the perforation of the plates, and in that it can be used nearer the outer
 70 ends of the plates.

The top-lift holder comprises a plate, N, which has a bearing upon the post D, below the templet-plate, so as to swing thereon, preferably in opposition to the stress of the spring
 75 n , although this spring is not essential, so that the operator or boy can move the plate into position and hold it there during the application of the top lift, when upon its release it will automatically move to its original position.

The top-lift holder herein shown comprises
 80 the angle-plate n' , the front edge of which forms a stop for the breast of the top lift, and which is movable upon the under surface of the plate N by means of the screw n^2 . The pins n^3 , which extend through holes in the downward projec-
 85 tion n^4 of the plate N, hold the gage-plate true, and the curved back or end clamp or jaw, O, which is shaped to fit the end of a top lift and preferably has the outwardly-extending arms o . This jaw I prefer to support by
 90 means of the spindle o' , which extends backwardly into a hole or recess, o^2 , containing a coiled spring, o^3 , which acts to move the spindle outwardly, so that there is always a sufficient pressure upon the front plate, n' , of
 95 the holder to keep the top lift in place, at the same time I get a large range for adjustment to various sizes, as the back jaw will yield to any reasonable extent, and is formed to center the heel-blank very accurately as the
 100 breast comes against the edge of the front plate, n' , and as the curved portions bear upon the curved end of the jaw, which prevents its movement in a lateral direction.

The top-lift holder is perforated when the
 105 heel is flush-nailed, and is not when it is blind-nailed, and is used either with or without a spanker. When the heel is blind-nailed, it will be desirable to use the spanker. When it is flush-nailed, however, it will not be necessary
 110 that the machine be provided with a spanker, and in this event the revolving head will have two arms—one to support the awls and one to support the drivers—and the cam f will be so shaped as to move the nail-holder plate a half-
 115 revolution upon each reciprocation of the machine.

In operation, the boot or shoe is placed upon the jack, moved under the templet-plate, and the cross-head reciprocated, the awls be-
 120 ing in proper position. The next reciprocation of the machine moves, automatically, the drivers into position, and also the nail-holder into position over the templet, if the work is to be flush-nailed. The top-lift holder is brought
 125 into position before the reciprocation of the awls. If it is to be blind-nailed, the top-lift holder is brought into position after the reciprocation of the drivers, and the spanker is then reciprocated, (the nail-holder plate hav-
 130 ing been meanwhile automatically moved out of position,) striking or coming in contact with

the templet and forcing it and the top-lift holder downward.

The stop motion of the machine may be such that the cross-head may be provided with either two or three reciprocations, as desired. When flush-nailing is to be done, two reciprocations will be sufficient. When blind-nailing is to be done, there may be either two or three, as may be required.

I do not confine myself to the specific mechanism herein described for revolving the shaft E; but may use any mechanical equivalent therefor.

It will be observed that by the device herein described I am enabled to automatically move the awls, drivers, and spankers, or any two of them, automatically into and out of operative position, and at the same time revolve the nail-holder plate into and out of operative position.

It is obvious that the centering and locking bolt, rod, plate, or yoke (shown in Figs. 11 and 13) may be attached to and carried by the frame of this cross-head, instead of by the revolving head, and substantially the same result will be obtained.

It is apparent that by the use of a centering device of this nature the fitting of the plate need not be so nice and accurate as it would be if none were used, as it is not essential that the parts be moved by their operative mechanism into perfect register, for the centering device, if they are out of line, brings them in register before the awls or drivers enter their respective holes. Of course the shaft E may be used for revolving the nail-holder or the head *a*, instead of both. It will be noticed that the templet-plate has a vertical movement, but is not moved out of operative position.

The device for locking the templet in its lowest position, the jack, and the boot or shoe and heel-centering mechanism being fully described in said Letters Patent No. 259,687, and in the application of Henderson for patent, filed January 10, 1883, Serial No. 81,453, no reference to them is necessary here.

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

1. In a heel-nailing machine, the combination of a gang of awls, a gang of drivers, and a heel-spanker, or any two of them, the nail-holder plate *c*, and shaft E, connected with the main shaft of the machine, whereby, upon the revolution thereof, the nail-holder plate is automatically moved into and out of operative position, all substantially as and for the purposes described.

2. The nail-holder plate *c*, carrying the nail-holder C, in combination with the shaft E, the main shaft of the machine, and suitable connecting mechanism for automatically revolving the plate.

3. The combination of the nail-holder plate *c*, templet-plate *b*, having vertical movements,

and the automatically-revolved shaft E, all substantially as and for the purposes described.

4. The nail-holder plate *c*, carrying the nail-holder C, in combination with the shaft E, the main shaft of the machine, suitable connecting mechanism for automatically revolving the plate, and devices, substantially as described, for stopping the revolution of the shaft E immediately upon the stopping of the main shaft, all substantially as set forth.

5. The combination of the shaft *a'*, disk *a''*, and friction device *a'''*, for preventing the rotation of the shaft when not directly actuated, all substantially as and for the purposes described.

6. The combination of a gang of awls, a gang of drivers, and a spanker, or any two of them, the shaft E, the bevel-gears *e'* *e''*, the shaft *f'* and connecting mechanism, whereby the awls, drivers, and spanker, or any two of them, are moved automatically into and out of position, all substantially as and for the purposes described.

7. The combination of the cross-head A, the revolving head *a* carried thereby, the shaft *a'*, its bevel-gear *e'*, the bevel-gear *e''*, supported by the cross-head and vertically movable upon the shaft E, the nail-holder plate *c*, and the shaft E, automatically operated by the main shaft of the machine, all substantially as and for the purposes described.

8. The combination, in a heel-nailing machine, of the shaft E, for operating the revolving head and the nail-holder plate, or either, the cam *f* and connecting mechanism, whereby intermittent rotation is given to the shaft, all substantially as and for the purposes described.

9. The combination, in a heel-nailing machine, of the shaft *f'*, the cam *f*, the lever *f''*, the connecting-rod *f'''*, the lever *f''''*, the pawl *g'*, the ratchet-wheel G, the gear-wheel *g''*, the pinion H, the shaft E, the cross-head A, and the revolving head *a*, all substantially as and for the purposes described.

10. The combination of the stationary templet B, mounted on a sleeve, and the top-lift holder also carried by said sleeve and adapted to be rotated beneath the templet, all substantially as described.

11. In a heel-nailing machine, in combination with suitable nailing devices and operative mechanism, the top-lift holder, comprising the plate N, the front gage-plate, *n'*, and the movable jaw or clamp O, all substantially as and for the purposes described.

12. The combination, in a heel-nailing machine, of the templet and nail-holder plates, or either of them, with a reciprocating centering and locking device, substantially as described, for centering the said plates in operative position and holding them locked in said position during the reciprocation of the awls and drivers, or either, all substantially as and for the purposes described.

13. In a heel-nailing machine, in combination with the movable templet and nail-holder plates, or either, a centering device, substantially as described, carried by the cross-head of the machine, and arranged to center the said plate or plates in operative position with their holes in register with the awls and drivers, or either, and before they enter the holes in said plates, in combination with the awls and drivers, or either, all substantially as and for the purposes described.

14. The combination of a gang of reciprocating awls and a gang of reciprocating drivers, or either, a templet and a nail-holder, or either, and a centering device, substantially as described, and adapted to be moved automatically into position to center the templet or nail-holder, or either, and to lock the awl-holder or nail-holder to said plate or plates during their downward vertical movement, all substantially as described.

15. The combination of the templet B, fixed in an operative position, with the automatic nail holder and carrier C, all substantially as and for the purposes described.

16. In a heel-nailing machine, the combination of the stationary templet B and the nail-holder carrier C, moved automatically into and out of position with the templet, and a gang or group of reciprocating drivers, all substantially as and for the purposes described.

17. In a heel-nailing machine, the combination of the stationary templet B, the nail holder and carrier C, moving in relation to the templet, and the plate N, carrying or supporting a top-lift holder and adapted to be moved into and out of operative position below the templet B, all substantially as and for the purposes described.

18. The combination, in a heel-nailing machine, of the vertically-yielding templet B, the plate N, carrying or supporting the top-lift holder and adapted to be moved into and out of operative position below the templet, and vertically movable therewith, and a reciprocating gang of drivers, all substantially as and for the purposes described.

19. The combination, in a heel-nailing machine, of the vertically-movable templet B, the plate N, carrying or supporting a top-lift holder and movable into and out of operative position below the templet B, and a reciprocating spanker, A³, all substantially as and for the purposes described.

20. The combination of the templet, the templet-plate *b*, having the sleeve *b'*, with the post D, all substantially as described.

21. The combination of the post D, the templet-plate *b*, having the sleeve *b'*, and templet B, fixed in operative position, and the nail-holder plate supported upon the templet-plate, vertically movable therewith and carrying the nail-holder C, all substantially as described.

22. The combination of the post D, the templet, the templet-plate *b*, having the sleeve *b'*, and the spring *d*, all substantially as and for the purposes described.

23. The combination of the post D, the templet, the templet-plate *b* carried thereby, and the shaft E, for moving the revolving head and nail-holder, or either, extending vertically through said post, all substantially as and for the purposes described.

24. In a nail-heeling machine, a horizontally-swinging top-lift holder plate for carrying a top-lift to and holding it in position over the heel-blank, combined with an actuating-spring to return the plate to its normal condition, all substantially as and for the purposes described.

25. In a heel-nailing machine, the horizontally-movable top-lift plate, bearing upon its under surface a device for suspending the top lift in an inverted position while the same is being applied to the heel-blank, all substantially as and for the purposes described.

F. F. RAYMOND, 2D.

Witnesses:

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BOWDOIN S. PARKER.