

No. 652,418.

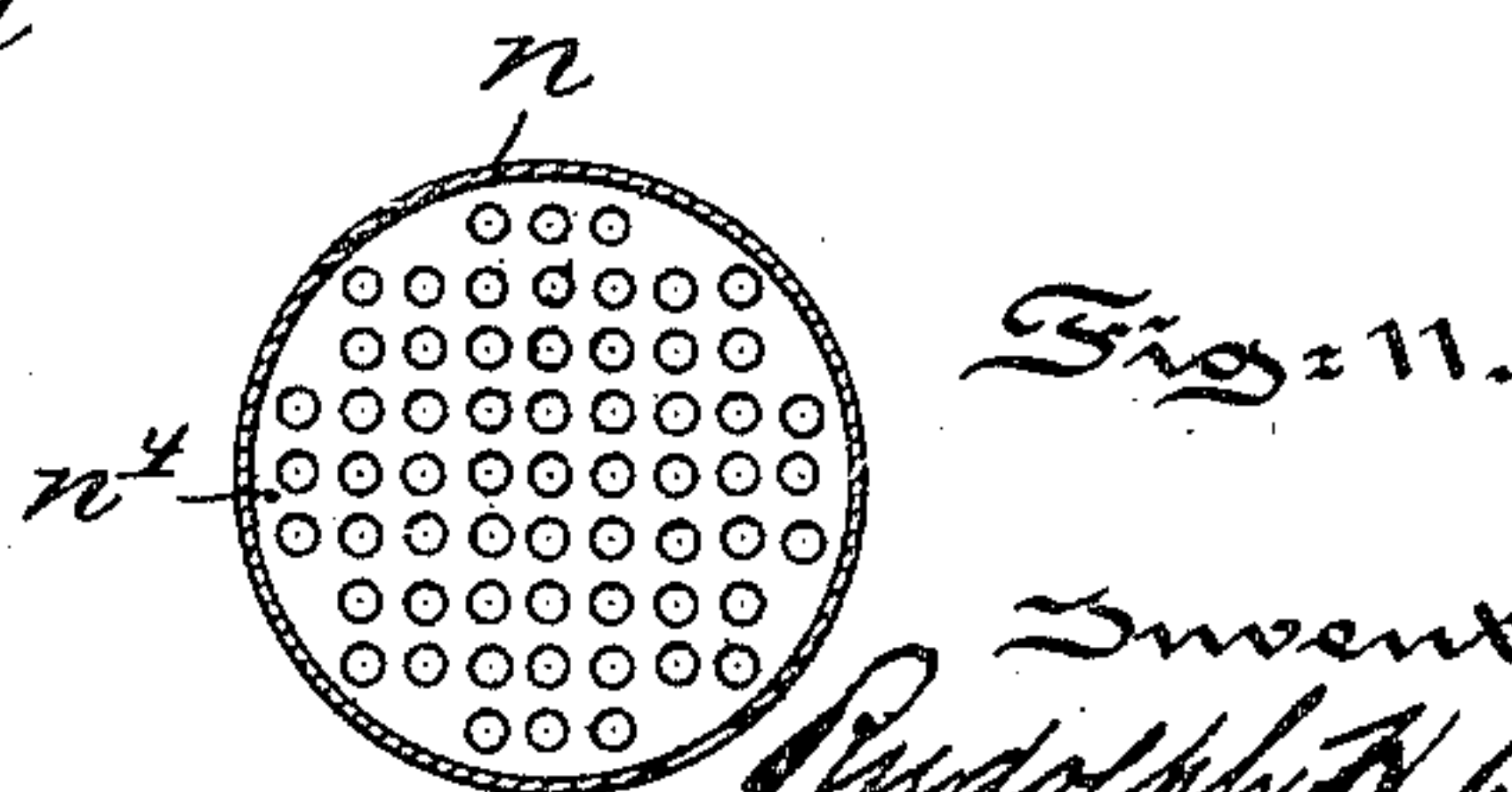
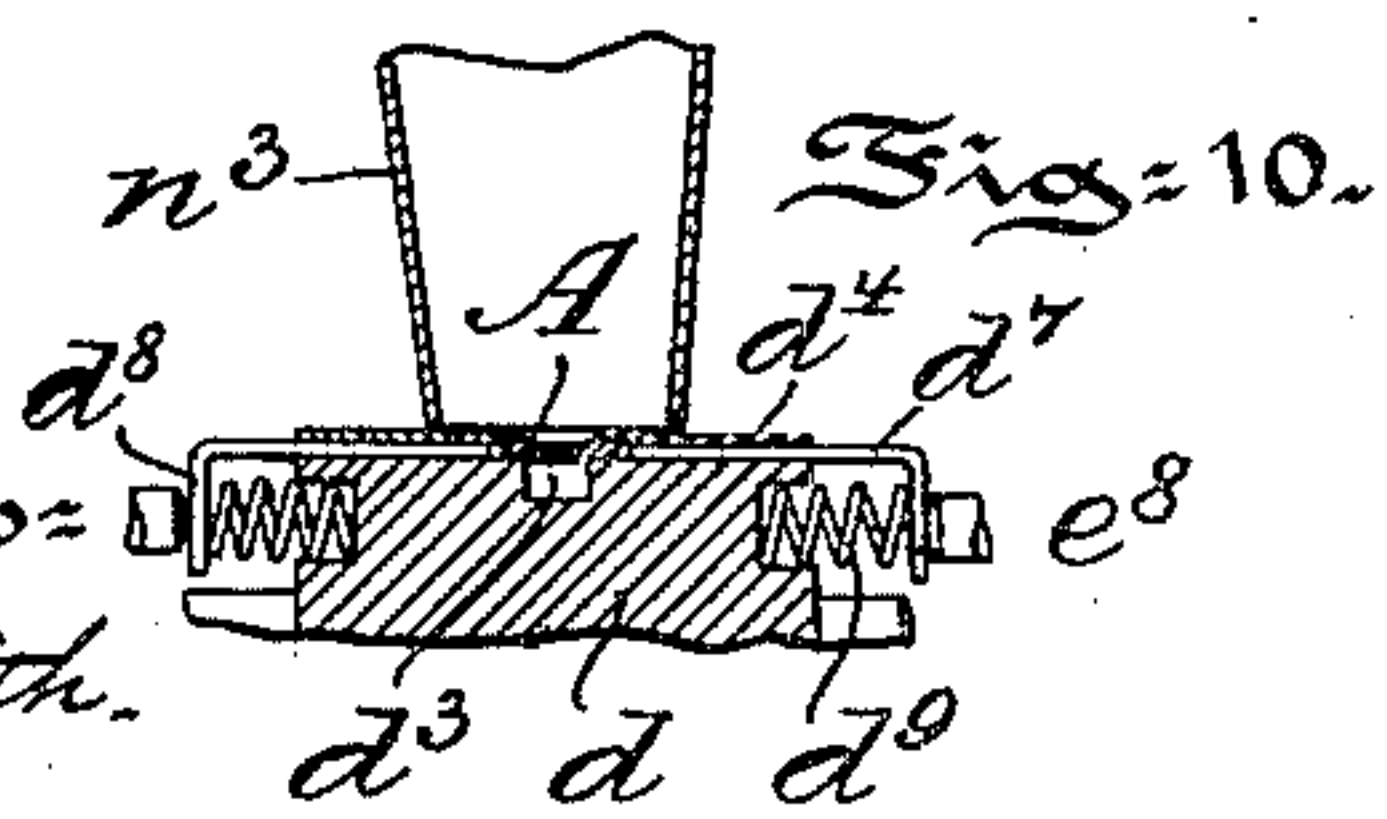
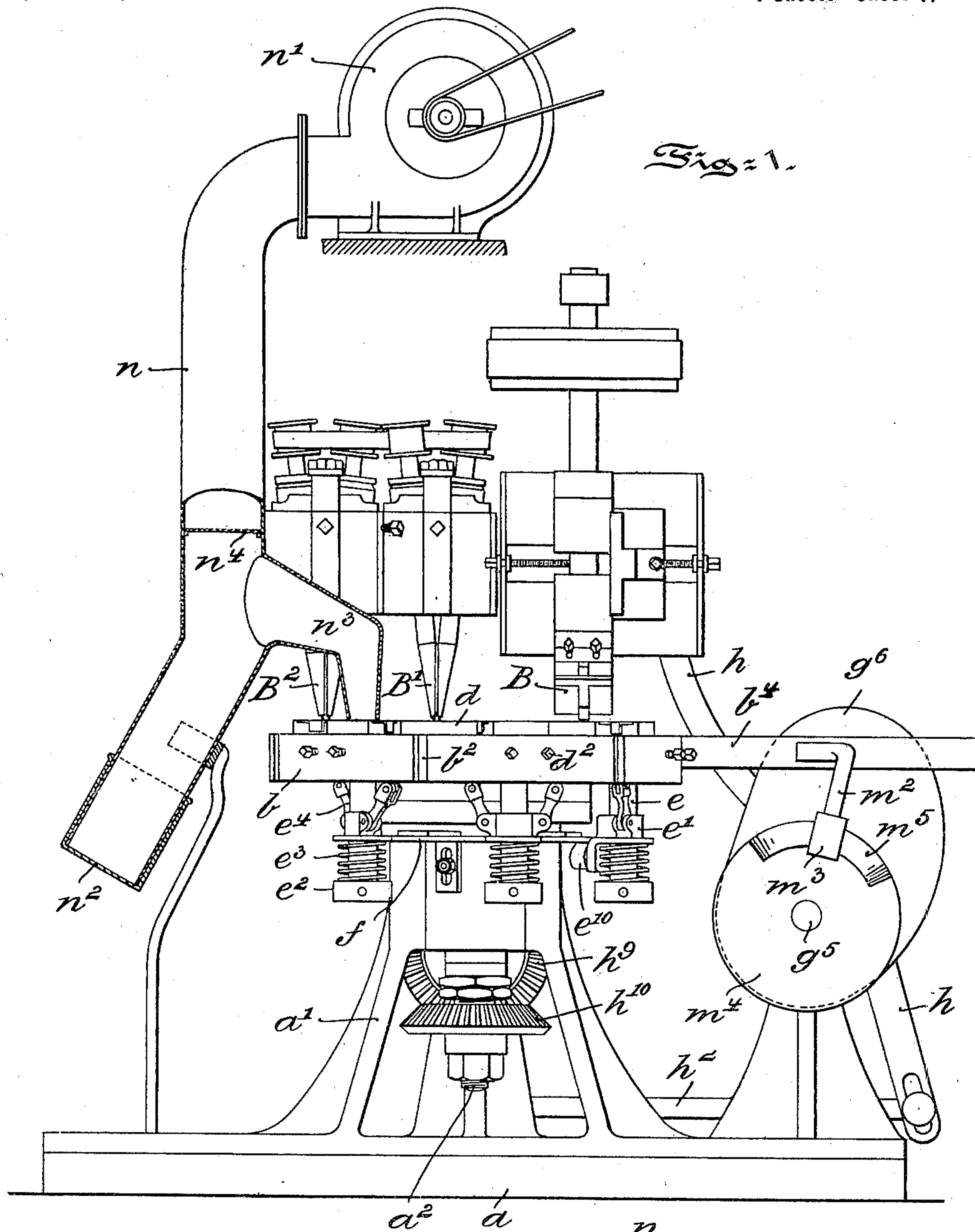
Patented June 26, 1900.

R. H. BECK.
BUTTON MAKING MACHINERY.

(Application filed Mar. 10, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:
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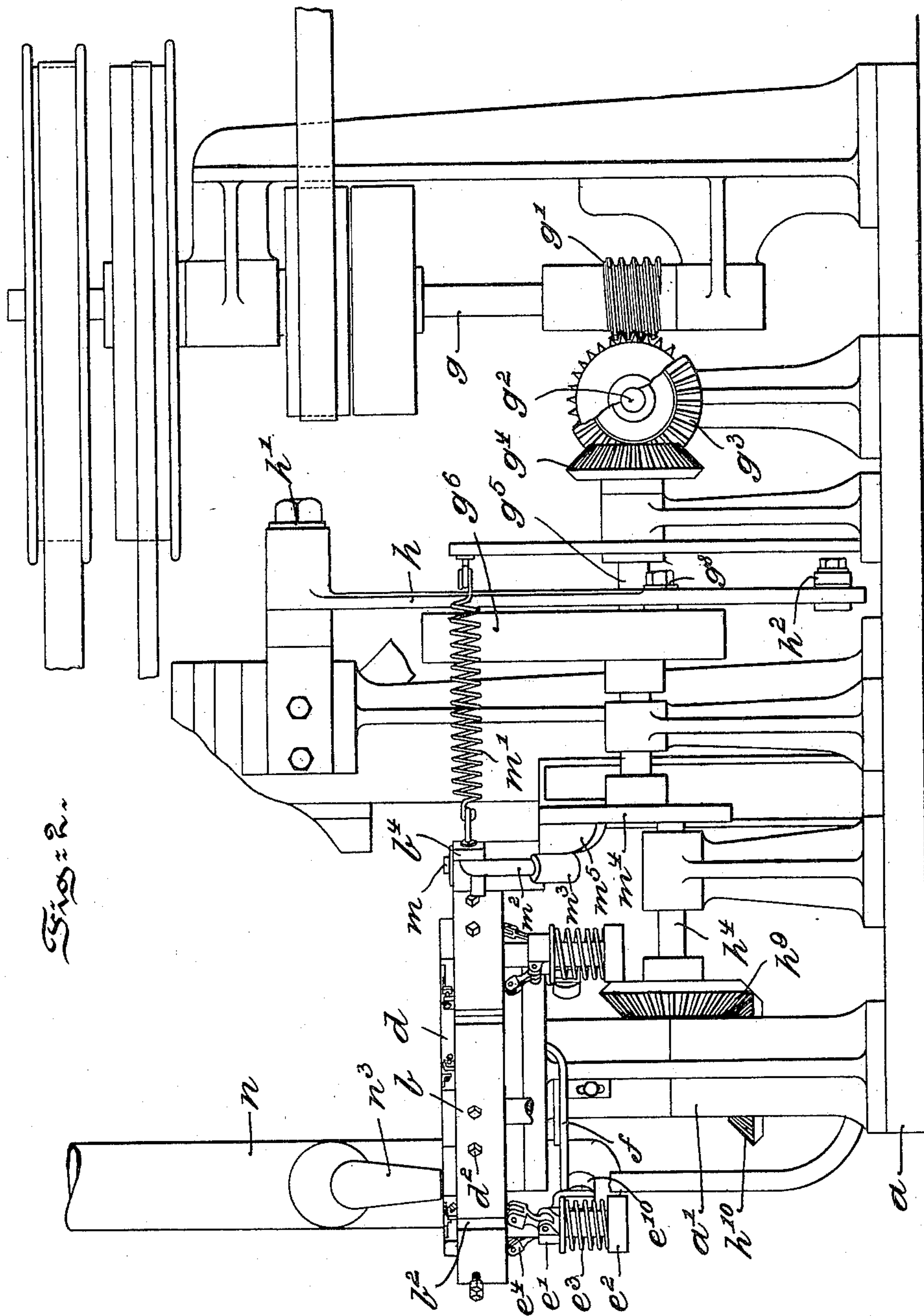
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4 Sheets—Sheet 2.



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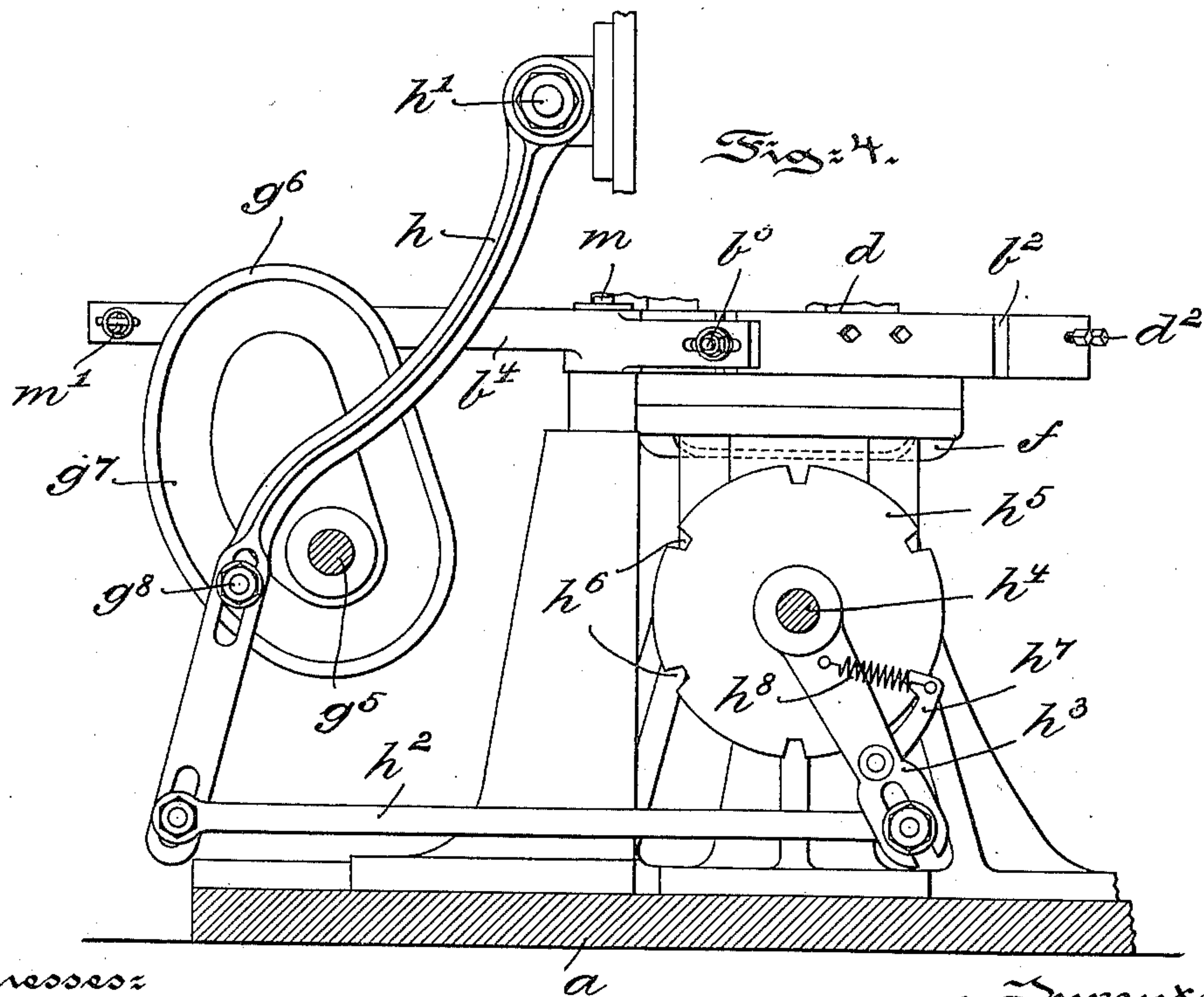
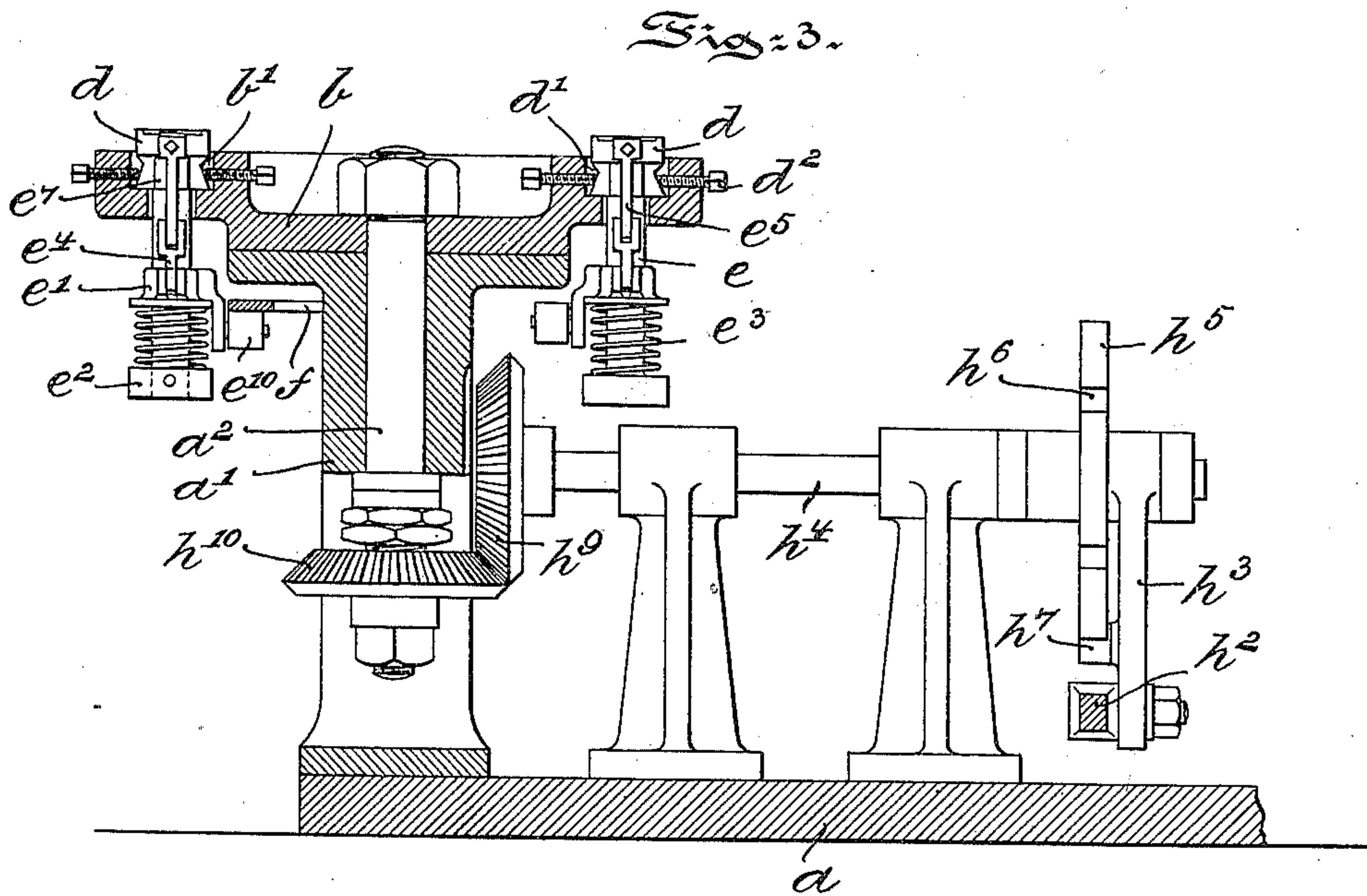
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4 Sheets—Sheet 3.



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(Application filed Mar. 10, 1899.)

(No Model.)

4 Sheets—Sheet 4.

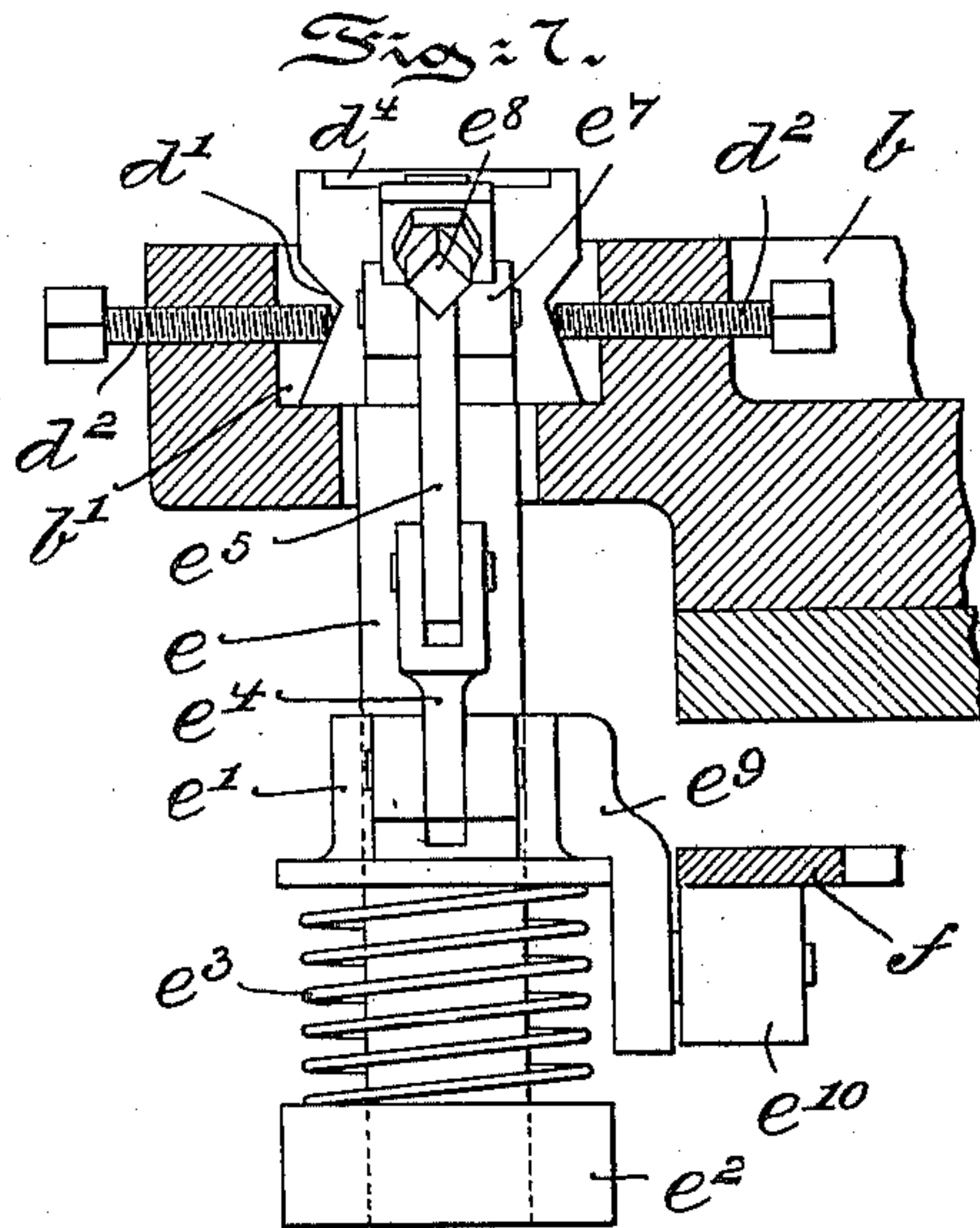
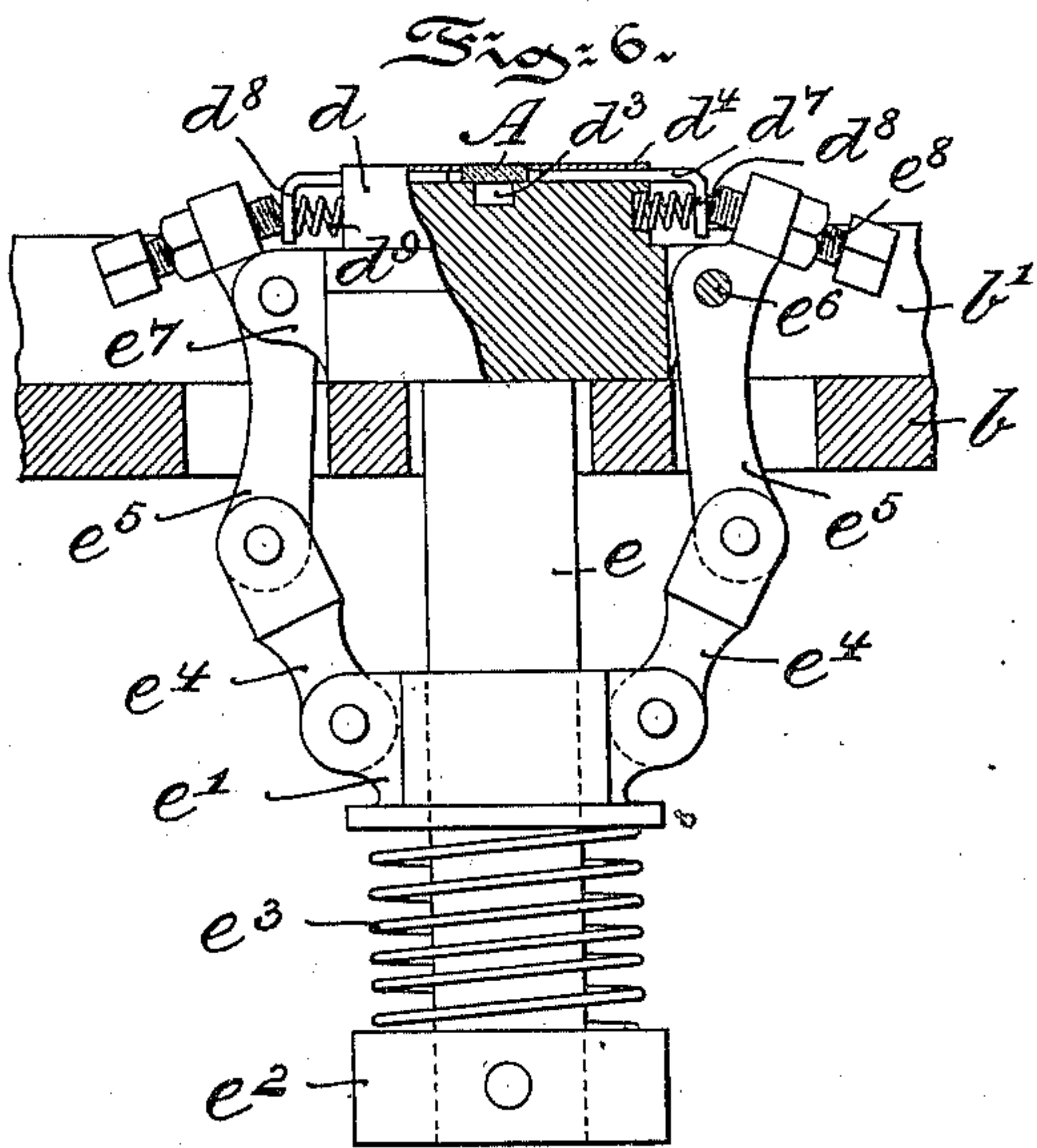
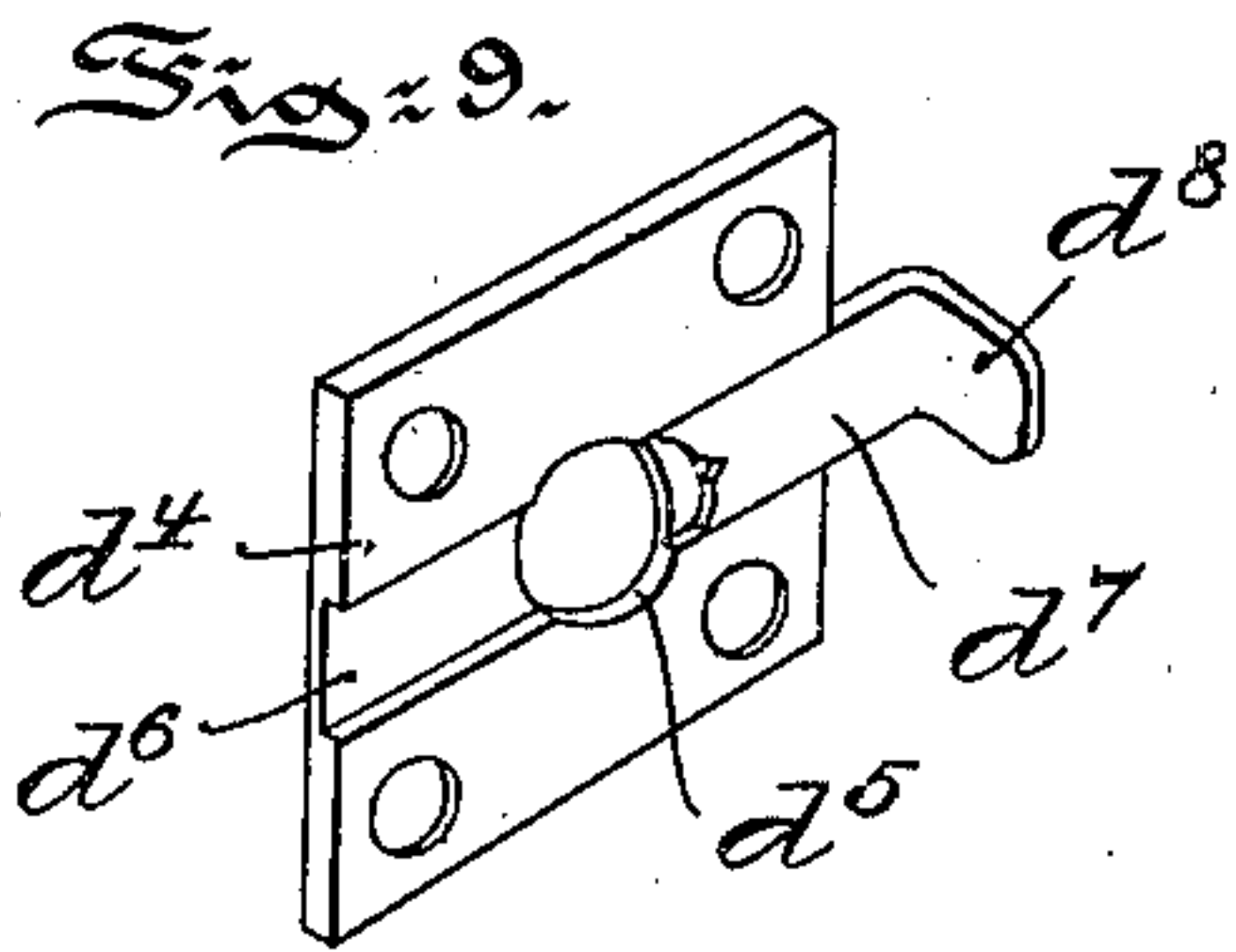
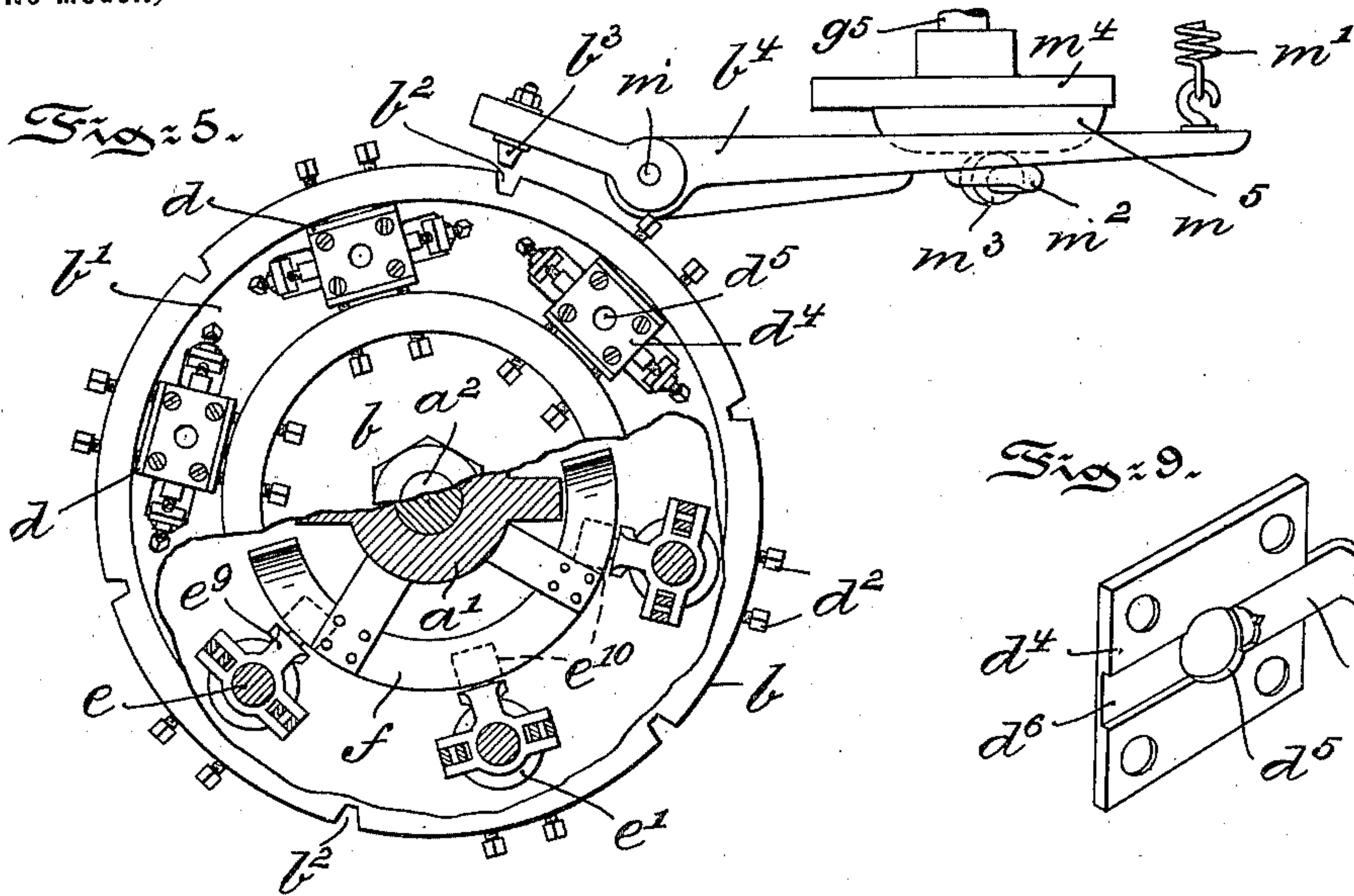
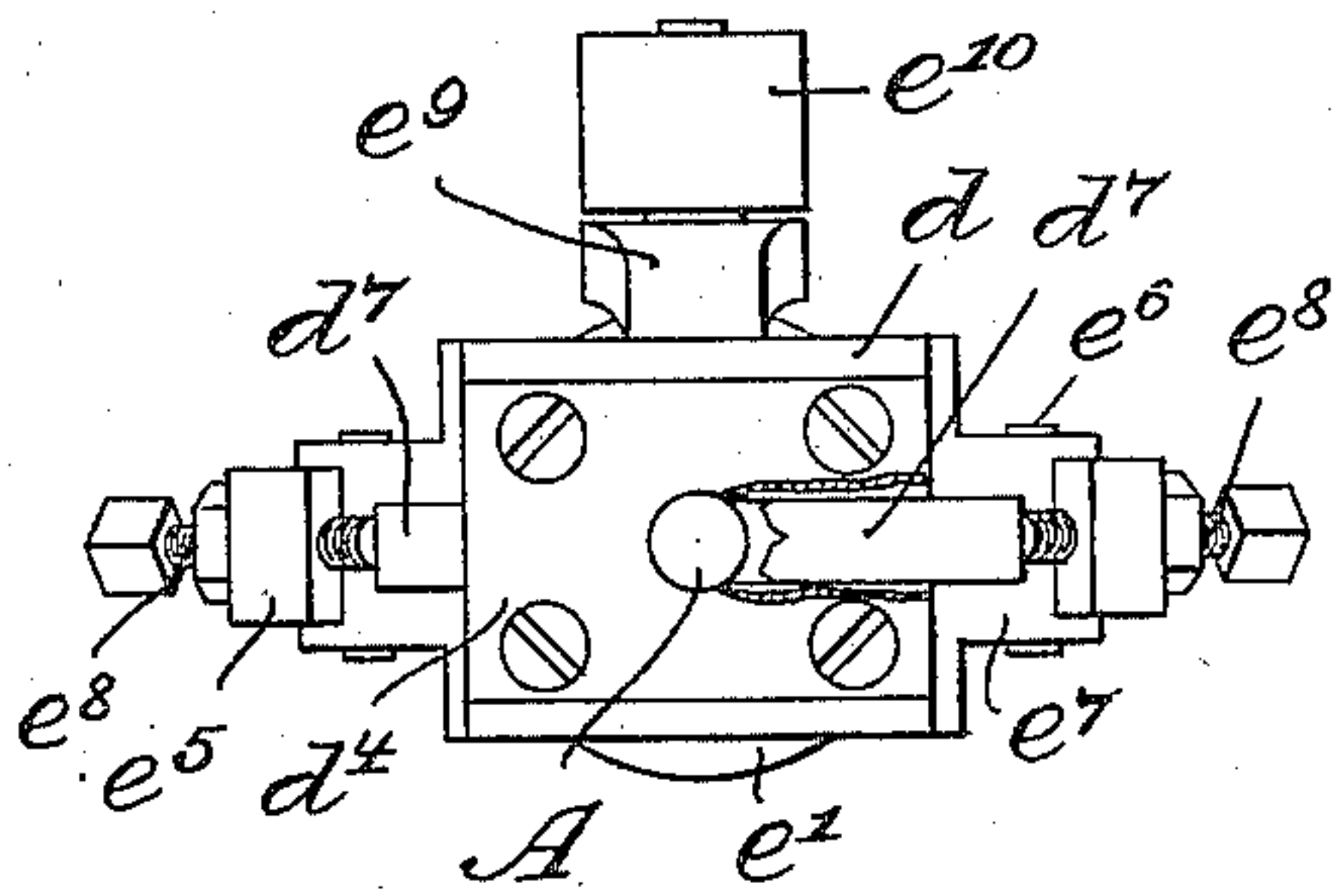


Fig. 8.



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UNITED STATES PATENT OFFICE.

RUDOLPH H. BECK, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
GIRARD BUTTON MANUFACTURING CO., LIMITED, OF SAME PLACE.

BUTTON-MAKING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 652,418, dated June 26, 1900.

Application filed March 10, 1899. Serial No. 708,507. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH H. BECK, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Button-Making Machinery, of which the following is a specification.

My invention has relation to a button-making machine, and in such connection it relates more particularly to the construction and arrangement of that part of the machine known as the "chuck" or that portion wherein the blank is held during the operations of turning or countersinking and drilling.

The principal objects of my invention are, first, to provide, in a button-making machine, a table to which intermittent rotating movement is given, the face of said table supporting a series of chucks for receiving and holding the blanks, the jaws of said chucks being operated at desired intervals of time, so as to permit of the insertion of the blanks, the gripping of the blanks during the turning and drilling operations, and the release of the formed blank to permit of its removal, and, second, to provide, in a button-making machine, in connection with the table and chucks, a pneumatic device for removing the finished blanks and the refuse from the table and chuck and for separating and collecting said finished blanks in an appropriate receptacle.

To these ends my invention consists, first, in providing a table arranged, preferably, in a horizontal plane and below the turning and drilling tools, said table being turned by a step-by-step movement and having in its upper face a series of radially-arranged chucks, the chucks being readily removable from and quickly adjustable in the table; second, in providing, in connection with the table and the chucks, means carried by the table whereby during the rotation of the table the jaws of the chucks may be operated to open or close the chucks; third, to provide, in connection with the table, a chuck of peculiar construction and arrangement, and, fourth, to provide, in connection with the table and its chucks, a pneumatic tube located above the table and beneath which each chuck is successively adapted to register, said tube

adapted to remove from the chuck the finished blank and debris and to separate the blank from said debris.

The nature and scope of my invention will be more fully understood from the following description, when taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a front elevational view of a button-making machine embodying main features of my present invention. Fig. 2 is a side elevational view thereof. Fig. 3 is a detail view illustrating, partly in side elevation and partly in vertical section, the table and its operating mechanism. Fig. 4 is a rear elevational view of the mechanism for operating the table. Fig. 5 is a top or plan view of the table and the mechanism for locking it in its successive positions, the face of the table being partially broken away to more clearly illustrate its construction. Fig. 6 is an enlarged detail view of one of the chucks and the mechanism for holding the jaws of said chuck in open position. Fig. 7 is a view at right angles to Fig. 6 and illustrating the means for opening the jaws of the chuck. Fig. 8 is a top or plan view of one of the chucks. Fig. 9 is a perspective view of the chuck-plate and one of the jaws movable therein. Fig. 10 is an enlarged detail view illustrating in vertical section the lower end of the pneumatic tube located over a chuck to remove the blank therefrom, and Fig. 11 is a face view of the sieve-plate in the pneumatic tube.

Referring to the drawings, a represents the bed-plate, which properly supports a pillar a' of the machine. In this pillar a' is adapted to rotate a vertical shaft a^2 , the shaft being turned by means of miter-gears $h^9 h^{10}$, operated by a longitudinally-arranged shaft h^4 , to which a step-by-step motion is given in a manner hereinafter described. The vertical shaft a^2 is properly secured to a horizontally-arranged table b , in the upper face of which is formed an annular recess b' , which is adapted to receive the chuck-blocks d . On the periphery of the table b are formed suitable notches b^2 , corresponding in number to the number of successive movements given to the table, and in a notch b^2 , as the table ar-

rives at predetermined positions, a pin or projection b^3 of a spring-controlled detent or pawl b^4 is adapted to enter. This pawl or detent is operated, preferably, in a manner hereinafter described. Each of the chucks consists, essentially, of a block d , having two opposite faces indented, as at d' , to receive the ends of set-screws d^2 or similar devices for centering the block d in the recess b' of the table. These set-screws pass, respectively, through the inner and outer rims or flanges of the recess b' in the table b , as clearly illustrated in Figs. 3 and 7. The block d has a central opening or recess d^3 , above which a button-blank A is centered, so as to form below said blank a space which the drills may traverse when the blank is drilled. Upon the upper face of the block d is screwed or otherwise removably fastened a plate d^4 , having a central opening d^5 of a diameter large enough, by preference, to admit a button-blank of the largest size to be used. The under face of plate d^4 is channeled, as at d^6 , (see Fig. 9,) to receive and guide the two jaws d^7 of the chuck. These jaws have circular inner ends to clamp down upon the periphery of the blank A , and the outer ends of the jaws are provided with downwardly-projecting flanges d^8 , extending at right angles to the plate d^4 and parallel to the sides of the block d . Between the sides of the block d and each flange d^8 is inserted a spring d^9 , normally tending to throw the jaws outward, so that their inner curved ends are sufficiently far apart to admit the blank. The tendency of these springs d^9 is normally overcome and the jaws normally closed upon the blank by means of the following preferred mechanism: Referring to Figs. 3 and 7, below the block d extends a post or shaft e , on which is adapted to slide a collar e' . Between the base of this collar e' and a head e^2 of the post e and around the post e is coiled a spring e^3 , normally tending to elevate the collar e' on said post. The collar e' is pivotally connected by the two links e^4 with one end, respectively, of two levers e^5 , pivoted, as at e^6 , in ears or extensions e^7 of the block d and so arranged that their free ends or a set-screw e^8 , passing through the free ends, will press upon the flanges d^8 of the jaws d^7 directly opposite to the pressure of springs d^9 . This pressure of levers e^5 is greater than the pressure of springs d^9 , and hence the jaws will normally be pressed inward to clamp the blank A in the chuck. To permit the jaws to open, it is necessary to depress the collar e' on the post e . To accomplish this, the collar e' is provided with a bracket e^9 , carrying a roller e^{10} , and this roller at certain periods in the rotation of the table b is adapted to ride under a semicircular bridge f , secured in any suitable manner to the pillar a' and located below the lower face of the table b , all as clearly illustrated in Figs. 3, 5, and 7.

In the drawings the table b , as illustrated, is provided with six chucks; but it is to be

understood that a greater or lesser number of chucks may be carried by the table without departing from the spirit of my invention. However, it will be found in practical use that the arrangement illustrated is the most desirable, because it permits of the insertion of the blanks, the turning and drilling of the blank, and its removal without stopping the machine and without danger to the operative—that is to say, by arranging the chucks in sets of six and by having the bridge-piece f under three of these chucks the jaws of three chucks will be opened to permit either the removal of the blanks or their insertion in the chuck, and the jaws of three chucks will be closed to hold the blank for the operation of a countersinking or turning tool B as well as the two sets of drills B' and B^2 . The construction and arrangement of the tool B and of its operating mechanism and the construction and arrangement of the two sets of drills B' and B^2 and of their operating mechanism do not form part of this invention, but are shown, described, and claimed in a companion application filed on the 13th day of March, 1899, under the Serial No. 708,826.

The preferred mechanism for turning the table b with a rotary step-by-step movement, as illustrated in the drawings, consists, essentially, of the following elements: The main or power shaft g of the machine, through a worm g' , drives a shaft g^2 , at one end of which is a miter-gear g^3 , meshing with a second miter-gear g^4 , secured to a second shaft g^5 . The shaft g^5 is provided with a cam g^6 , (shown in detail in Fig. 4,) in the groove g^7 of which is adapted to travel a roller or pin in slotted engagement, as at g^8 , with an arm or lever h . This lever h oscillates upon a fulcrum h' , and at its lower end is pivotally connected to one end of a link h^2 , the other end of which link being pivotally connected to a rock-arm h^3 , which oscillates upon a shaft h^4 . On the shaft h^4 is keyed or otherwise secured a disk h^5 , the periphery of which is provided with a series of notches h^6 , corresponding in number to the number of chucks. In the notches h^6 is adapted to slip the tooth of a ratchet h^7 , which is carried by the rock-arm h^3 and is held against the periphery of disk h^5 by a spring h^8 . From the description of the construction and arrangement of the foregoing parts it will be readily understood that the cam g^6 as it rotates will oscillate the lever h , which in turn, through the link h^2 , rock-arm h^3 , and ratchet h^7 , will operate the disk h^5 step by step and convey to the shaft h^4 a corresponding movement. The shaft h^4 is provided with a miter-gear h^9 , meshing with a miter-gear h^{10} , secured to the shaft a^2 , carrying the table b .

The locking of the table b in its successive positions and its release by means of the pawl b^4 and the notches b^2 are accomplished by the following preferred mechanism: Referring to Figs. 1, 2, and 5, the pawl-arm b^4 is pivoted, as at m , to a fixed part of the machine, and its pin or projection b^3 is normally held in the

notches b^2 of table b by means of the spring m' . On the free end of the pawl-arm b^4 is secured a downwardly-projecting arm or bracket m^2 , having at its lower end a block m^3 , resting under the tension of spring m' upon the face of a disk m^4 , rotating with the shaft g^5 . This disk m^4 has a cam or thrust portion m^5 , which as the disk m^4 rotates will periodically engage the block m^3 and retract the pawl-arm b^4 against the tension of its spring m' , and thus release the pin b^3 from a notch b^2 .

It will of course be understood that the rotation of the cam-disk m^4 is so timed with respect to the step-by-step movement imparted to the table b that its cam-surface will only act upon detent b^4 to release the detent from the table at such periods of time when it is desired to move the table.

In connection with the table and chucks, a pneumatic device for removing the finished blank has been provided. This consists of a tube n , to the upper end of which is connected a blower or air-exhaust apparatus n' . The lower end of the tube n is normally closed by a cap n^2 , forming a receptacle for the blanks, and, above the capped end, the tube n branches out into a funnel-shaped spout or extension n^3 , the lower end of which terminates above the table in close proximity to each chuck which is successively brought under the spout as the table revolves. Above the spout n^3 and in the tube n is placed a screen or separator-plate n^4 , which has perforations of a size sufficiently large to permit dust, refuse, and the like to be drawn upward in the tube n through the plate n^4 , but too small to permit the blanks to pass, which blanks drop from the plate n^4 into the receptacle n^2 . It should be understood that by reason of the arrangement and location of the bridge-piece of the chuck as it arrives beneath the spout n^3 has its jaws separated to permit of the extraction of the blank from the chuck. The use of the tube n , its spout n^3 , cap n^2 , and plate n^4 permits of the removal of the blank and of all dirt or refuse without the intervention of the operator, and hence greatly increases the speed at which the machine may be operated, as well as removes the danger of accident to the operator necessarily present when the blank is to be removed by hand.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a button-making machine, a chuck comprising a base and an upper perforated plate, two jaws adapted to slide in said plate between the plate and base, springs adapted to separate the jaws to permit the insertion of a blank, two lever-arms adapted to bear against the jaws, a spring adapted to normally press said lever-arms against the jaws to close the same against the tension of the separating-springs and means for retracting said closing-spring to release the lever-arms

from the jaws, substantially as and for the purposes described.

2. In a button-making machine, a table having in its upper face an annular recess, a shaft supporting said table, means for intermittently rotating said shaft, and a series of chucks adjustably secured in the annular recess of the table, substantially as and for the purposes described.

3. In a button-making machine, a table having in its upper face an annular recess, a series of chuck-blocks inserted in said recess, the sides of each block adjacent to the walls of the recess being indented, and set-screws adapted to pass through the walls of the recess and to enter the indented sides of the blocks to center said blocks in said recess, substantially as and for the purposes described.

4. In a button-making machine, a table arranged in a horizontal plane, a shaft depending vertically from said table, a hollow pillar supporting said shaft, means for intermittently rotating said table and shaft, a series of chucks carried by said table, means for normally closing the jaws of said chucks, a bridge-piece supported by the pillar below the table and means controlled by said bridge-piece, whereby during a portion of the movement of the table the jaws of a portion of the chucks will be opened, substantially as and for the purposes described.

5. In a button-making machine, an intermittently-rotating table, a series of chucks carried by said table, each chuck consisting of a block, an upper plate secured to said block, and two jaws adapted to slide between the plate and block, springs adapted to separate said jaws, levers adapted to normally close said jaws against the tension of said springs, a post suspended from said block, a spring-controlled collar adapted to normally slide upward upon said post to operate said levers, a bracket and roller carried by said collar, a bridge-piece of substantially-semi-circular shape located below the table and under which the roller of the collar is adapted to travel during one-half the movement of the table, said bridge-piece being adapted to depress the roller, bracket and collar to release the levers from the jaws of the chuck, substantially as and for the purposes described.

6. In a chuck for button-making machines, a block having a central recess in its upper face, a cover-plate adapted to be secured to said block and having a perforation registering with the recess in the block, two chuck-jaws adapted to slide in the under side of the cover-plate, the inner contiguous ends of said jaws being curved to fit down upon the periphery of the blank, a flange projecting downwardly and at right angles at the other end of each jaw and a spring interposed between the block and each flange, substantially as and for the purposes described.

7. In a button-making machine, an inter-

mittently-rotating table, a series of chucks
carried by said table, means for automatic-
ally closing said chucks under spring tension,
and means located outside the table for main-
5 taining each chuck in an open position dur-
ing a portion of the movement of said table,
substantially as and for the purposes de-
scribed.

8. In a button-making machine, an inter-
10 mittently-rotating table, a series of chucks
carried by said table, means for automatic-
ally closing said chucks under spring tension,
means located outside the table for maintain-
ing each chuck in an open position during a

portion of the movement of said table, and 15
pneumatic means for removing, cleaning and
separating the blanks from the table when
said chucks are maintained in open position,
substantially as and for the purposes de-
scribed. 20

In testimony whereof I have hereunto set
my signature in the presence of two subscrib-
ing witnesses.

RUDOLPH H. BECK.

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THOMAS M. SMITH.