

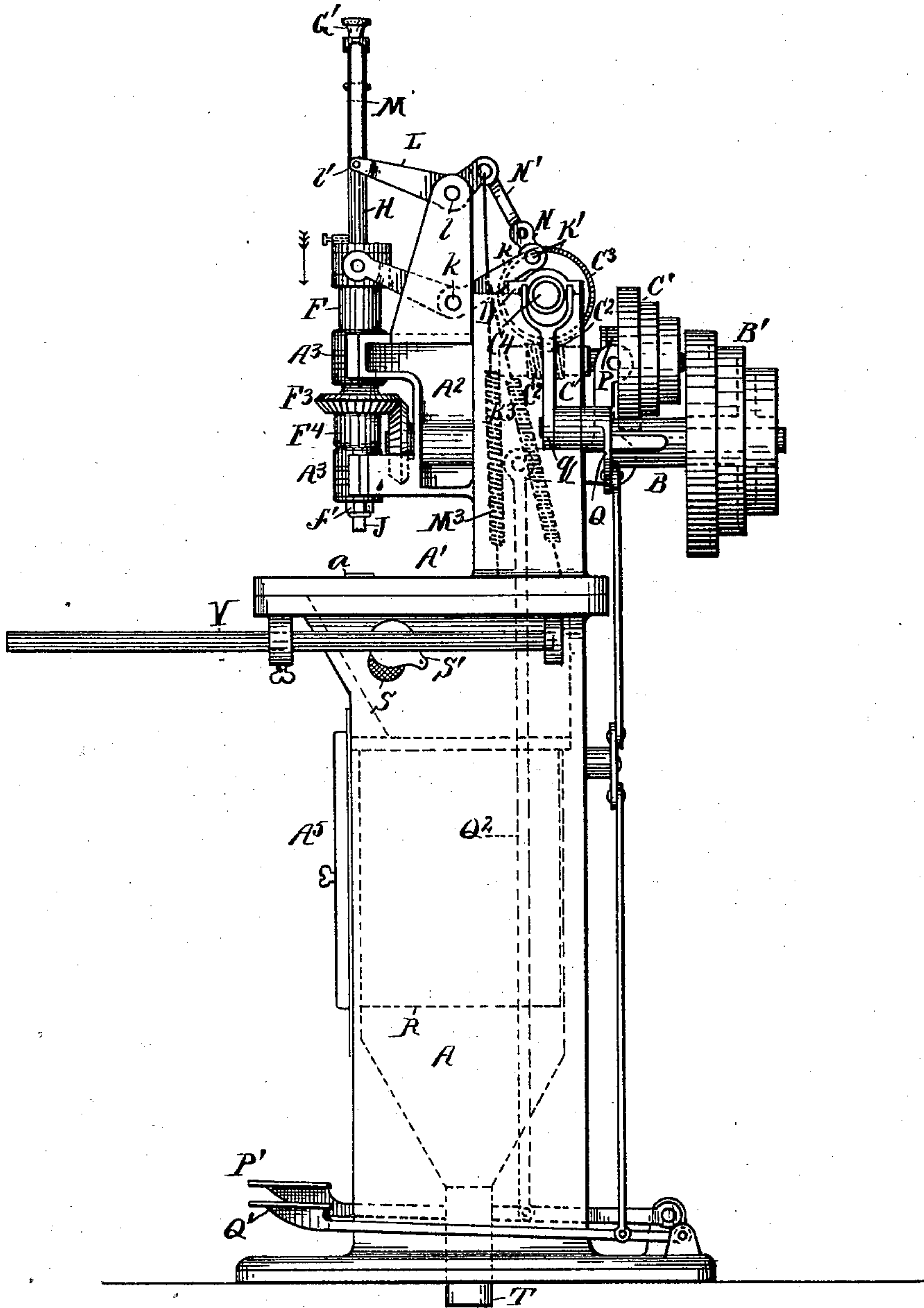
(No Model.)

4 Sheets—Sheet 1.

W. A. PENDRY.
BUTTON BLANK CUTTING MACHINE.

No. 601,675.

Patented Apr. 5, 1898.



WITNESSES

O. B. Parry, Jr.
Mary L. Lacey

INVENTOR

William Allen Pendry
By *his Attorney*
Newell S. Wright

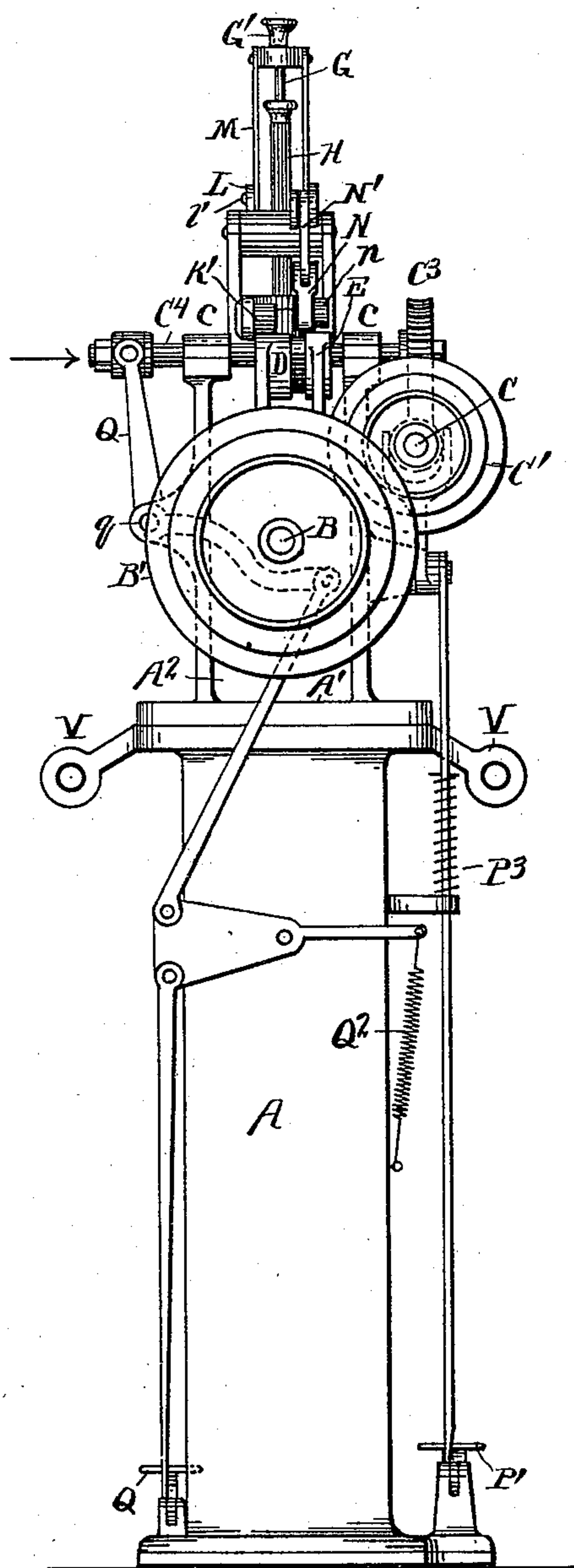
(No Model.)

4 Sheets—Sheet 2.

W. A. PENDRY.
BUTTON BLANK CUTTING MACHINE.

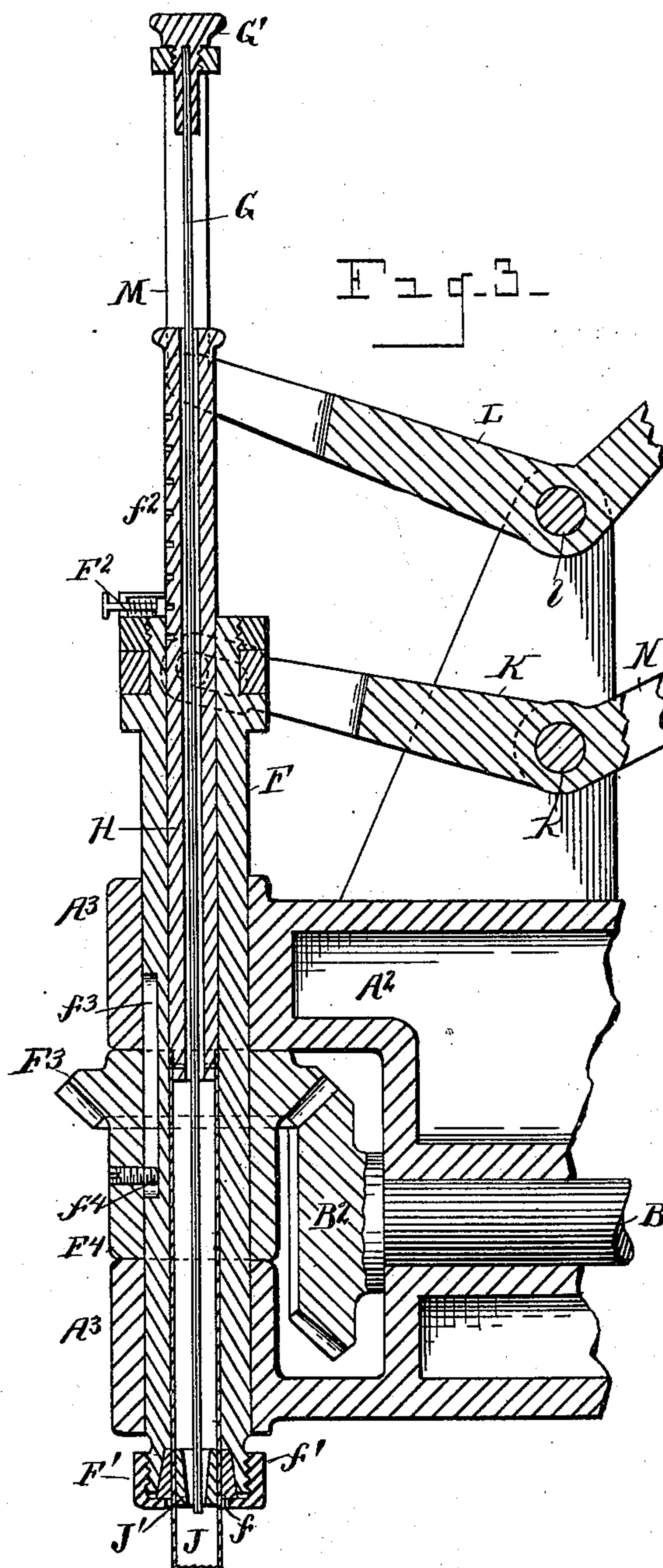
No. 601,675.

Patented Apr. 5, 1898.



WITNESSES

O. B. Baerzger,
Mary Hickey.



INVENTOR

William Allen Pendry

By his Attorney

Newell S. Wright

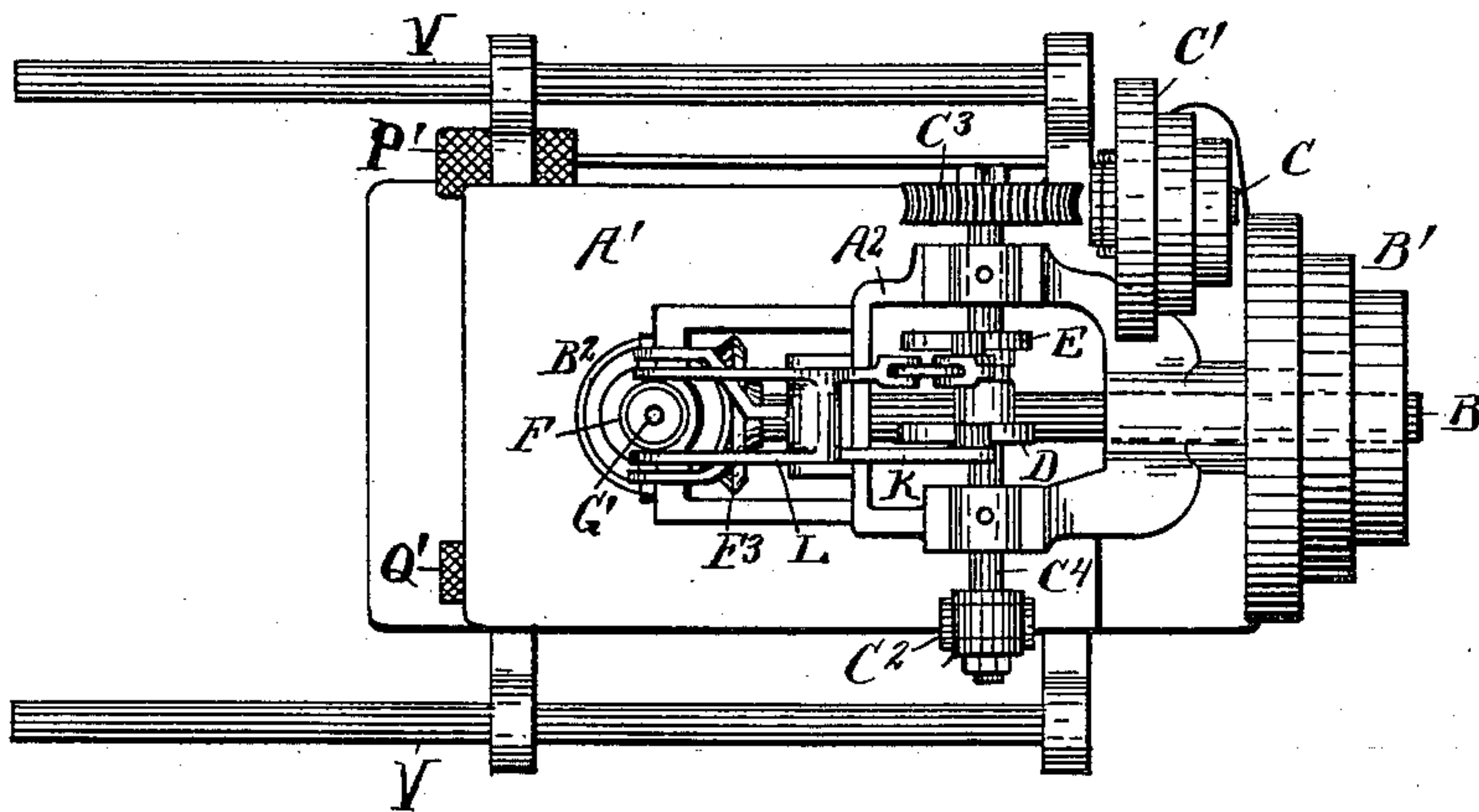
(No Model.)

4 Sheets—Sheet 3.

W. A. PENDRY.
BUTTON BLANK CUTTING MACHINE.

No. 601,675.

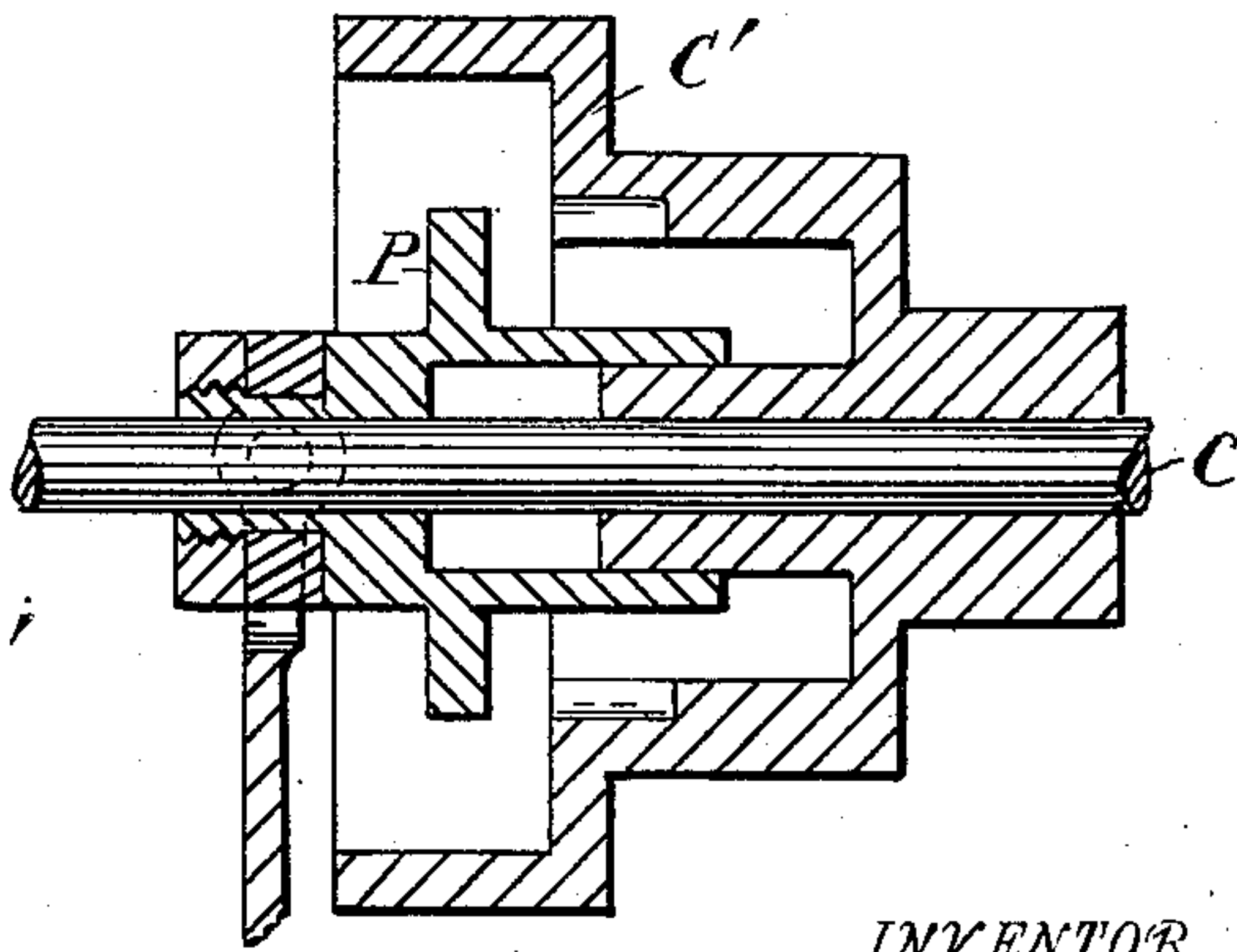
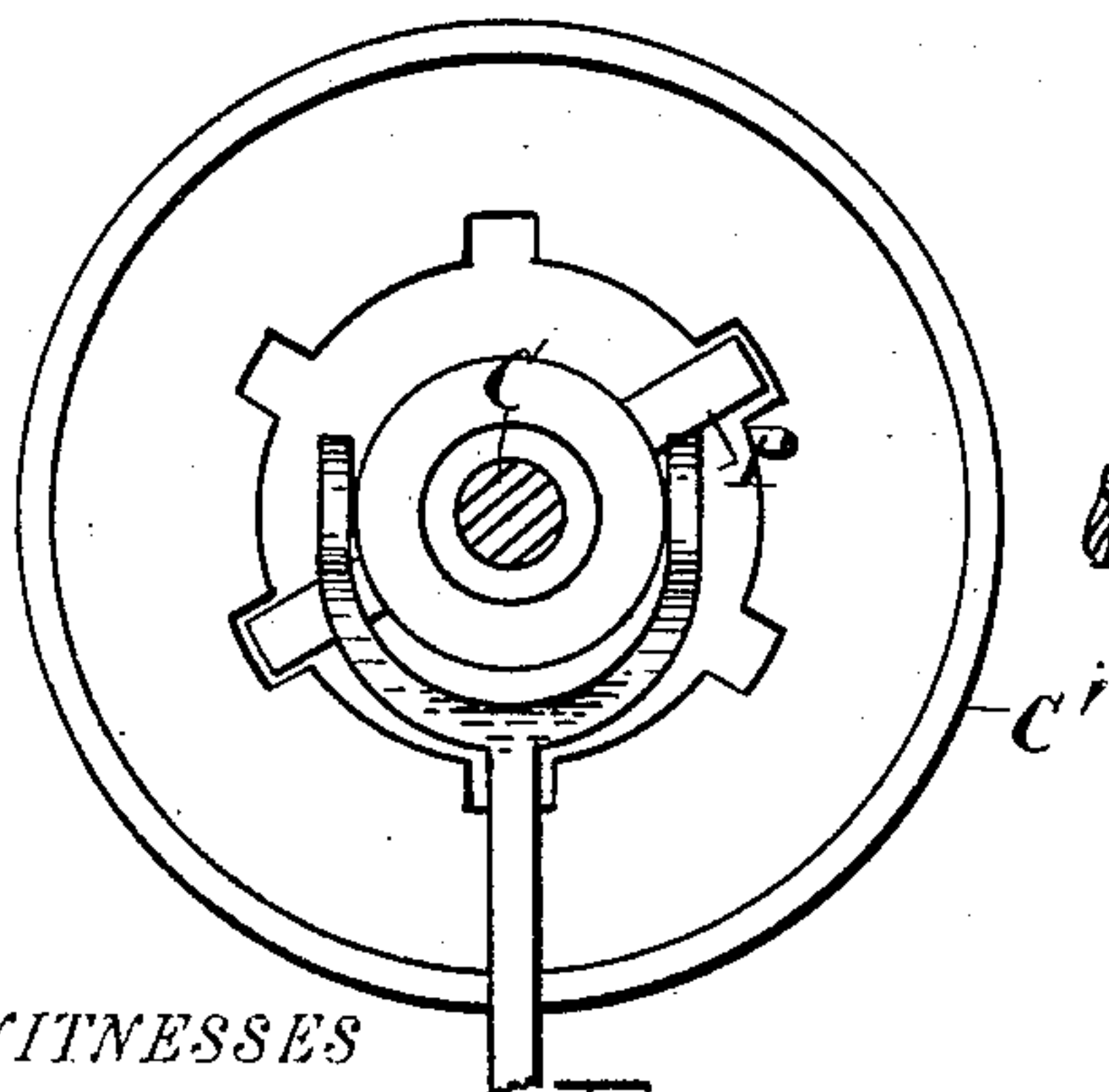
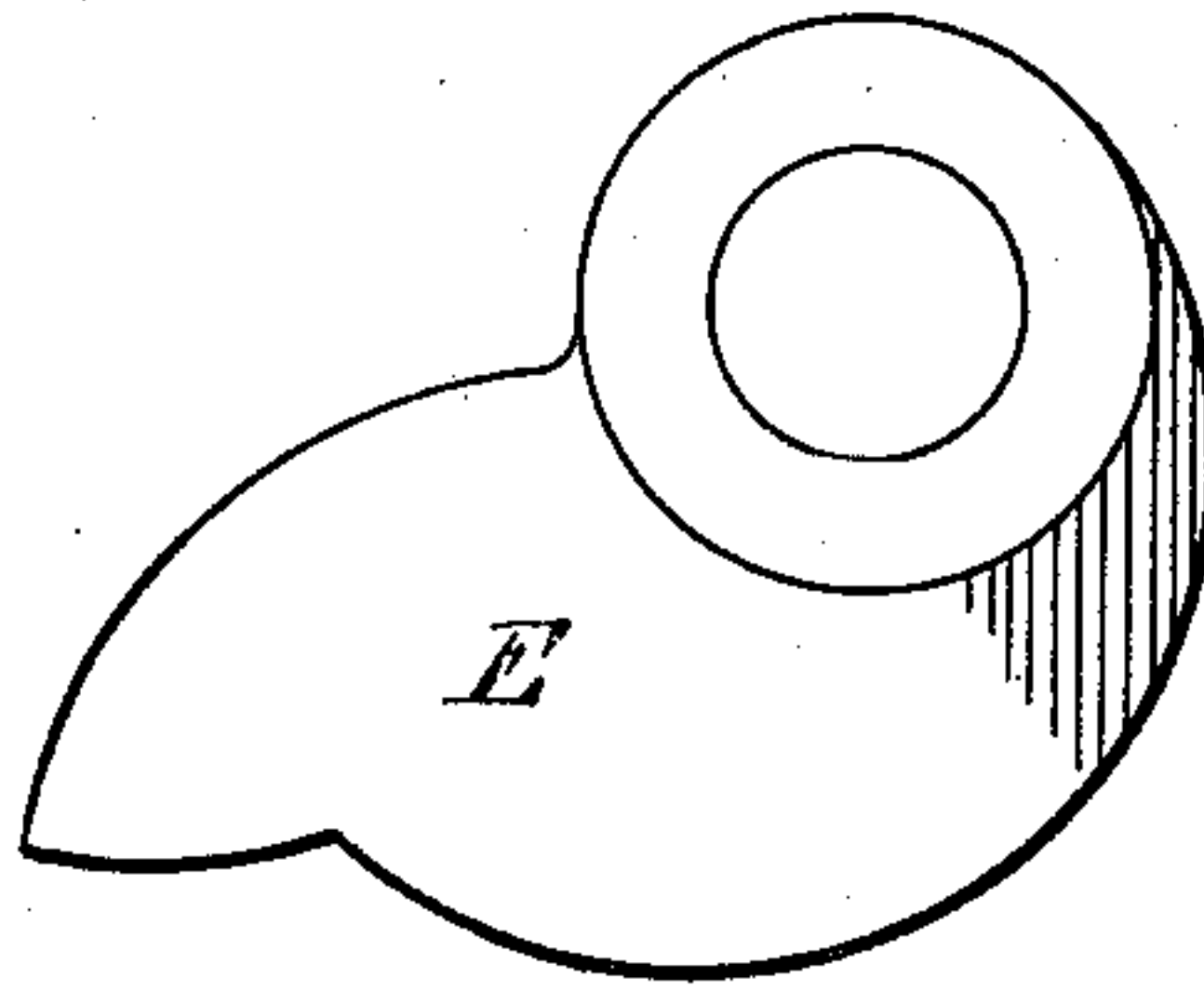
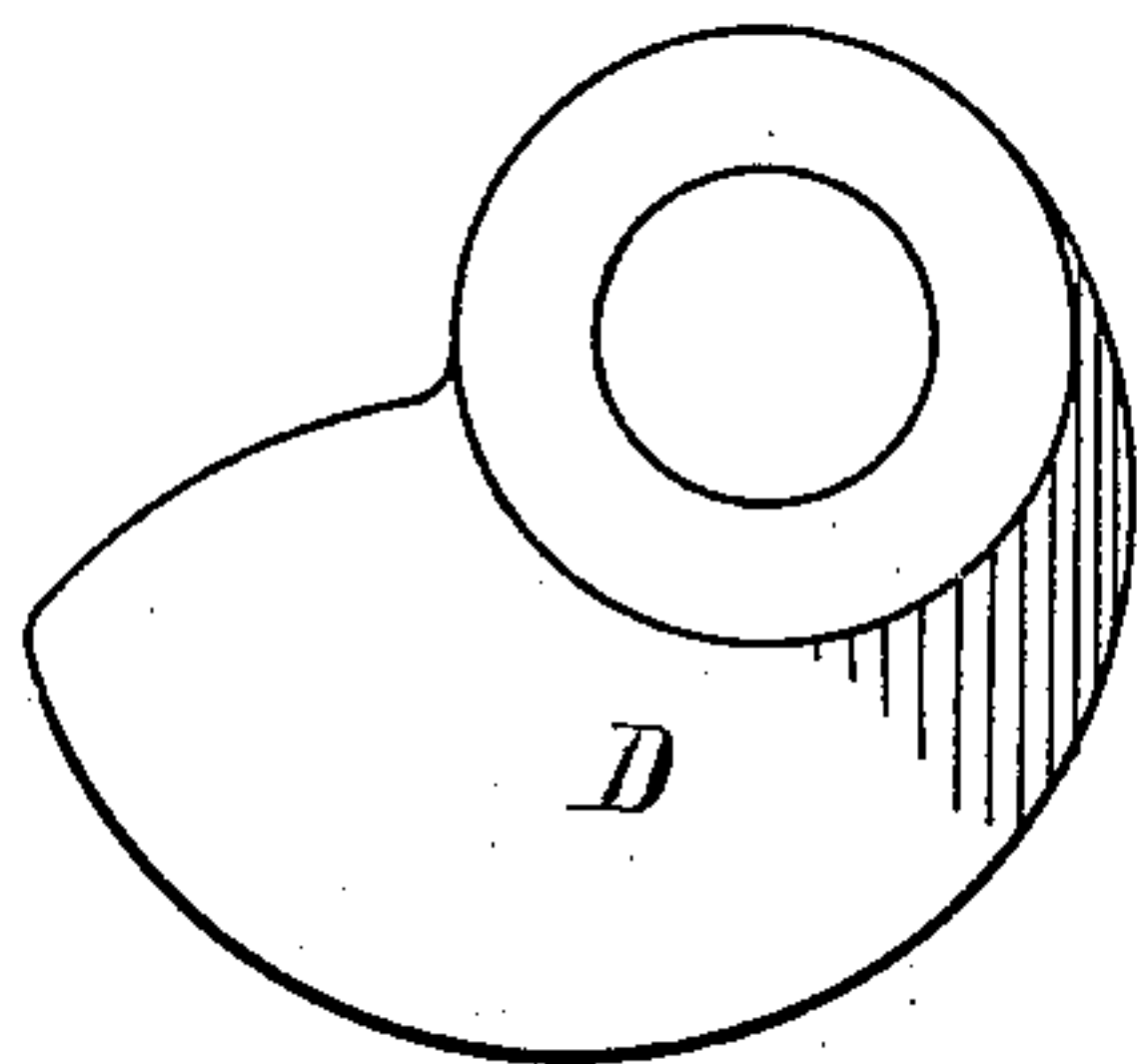
Patented Apr. 5, 1898.



FD-4

14-00000

11-6



WITNESSES

INVENTOR

O. J. Paruziger.
Mary Vicker.

By his Attorney
Newell S. Wright

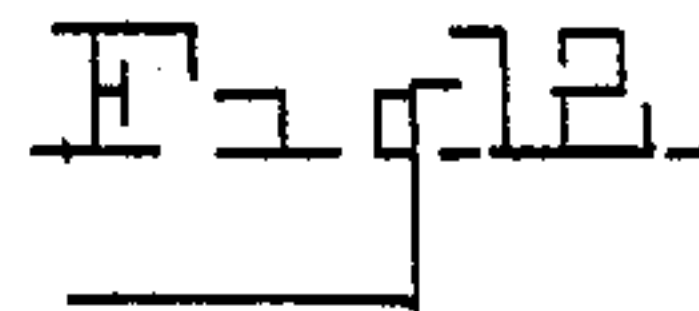
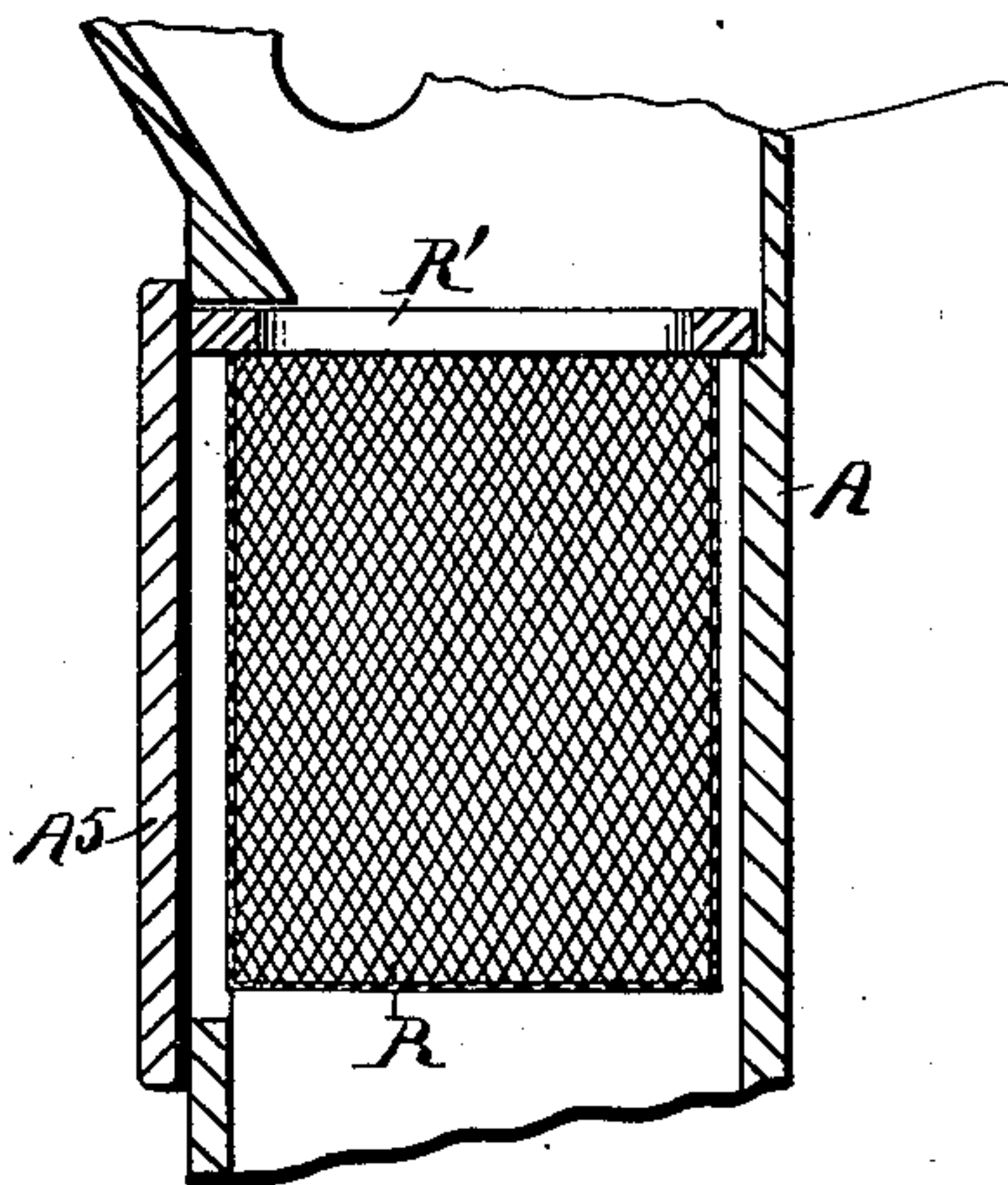
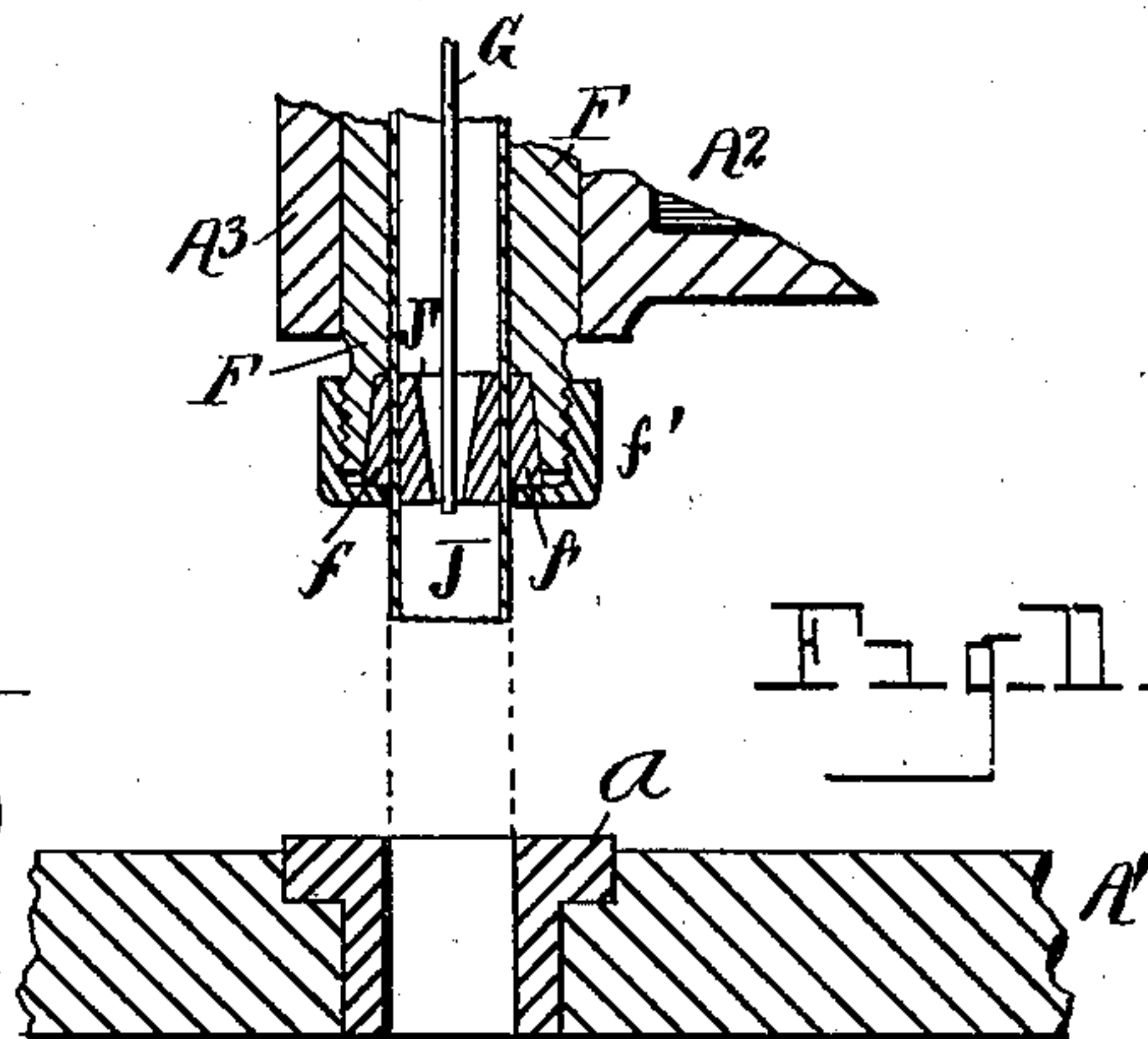
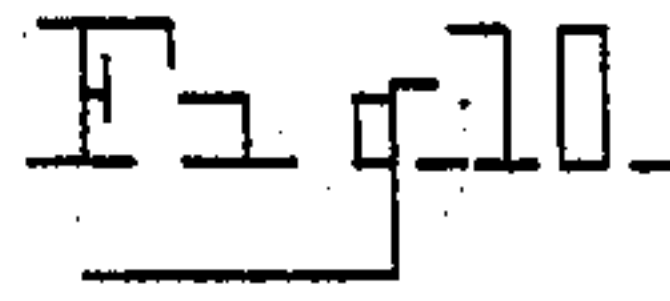
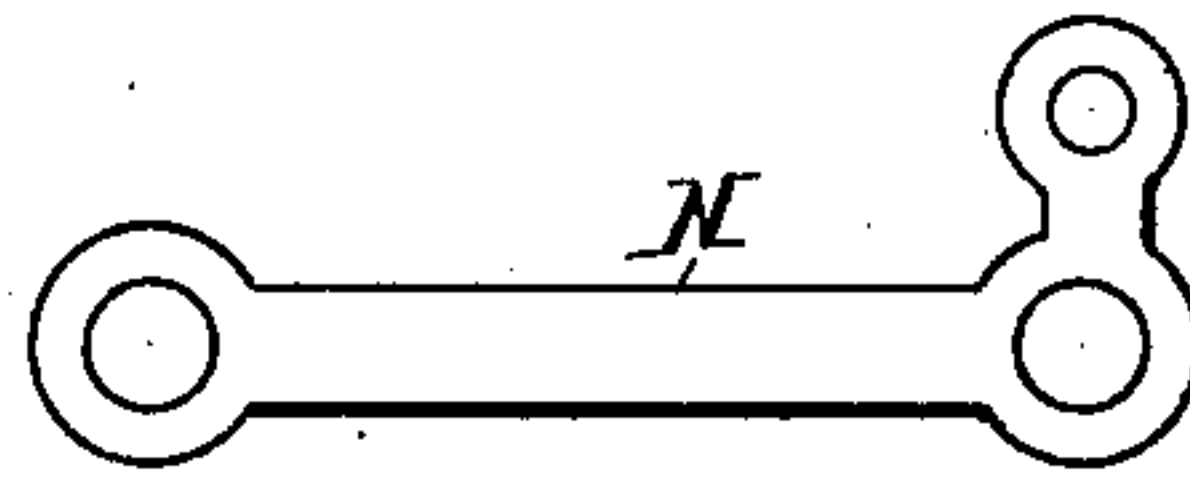
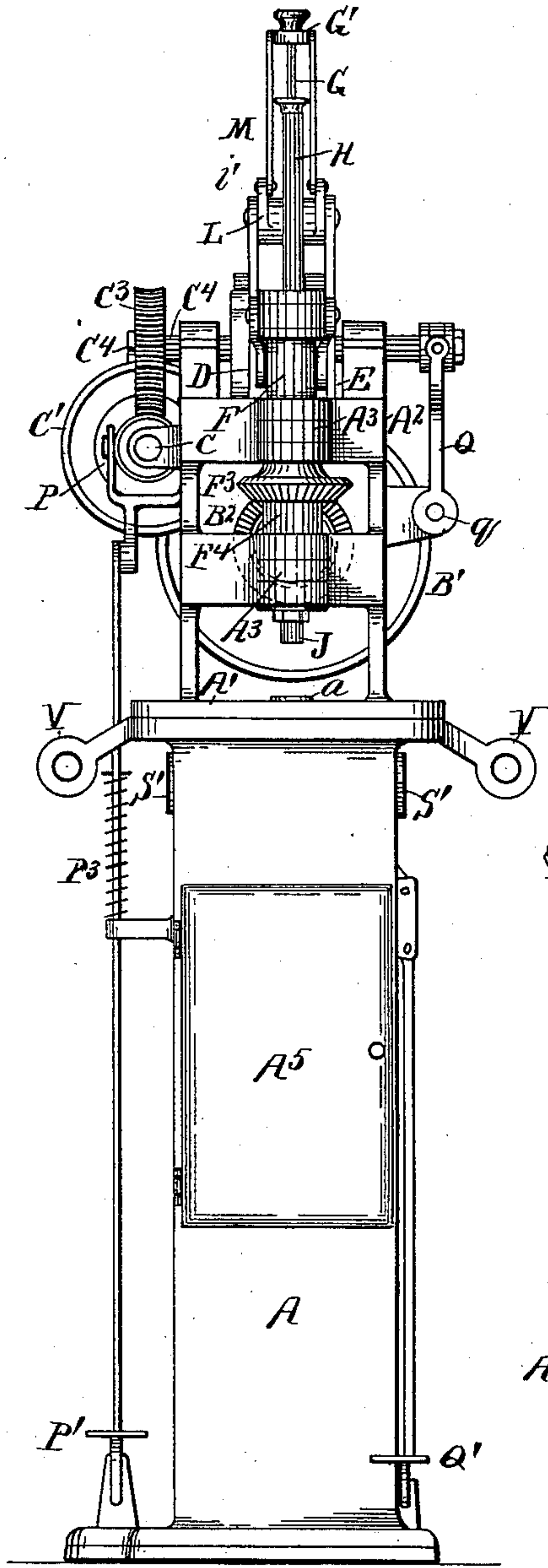
(No Model.)

4 Sheets—Sheet 4.

W. A. PENDRY.
BUTTON BLANK CUTTING MACHINE.

No. 601,675.

Patented Apr. 5, 1898.



WITNESSES

O. B. Barzige,
Mary Hickey.

INVENTOR

William Allen Pendry
By *his* Attorney
Newell S. Wright

UNITED STATES PATENT OFFICE.

WILLIAM ALLEN PENDRY, OF DETROIT, MICHIGAN.

BUTTON-BLANK-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 601,675, dated April 5, 1898.

Application filed April 5, 1897. Serial No. 630,797. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ALLEN PENDRY, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Button-Blank-Cutting Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object to provide a button-blank-cutting machine of novel construction and of superior utility; and it consists of the construction, combination, and arrangement of devices hereinafter described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a rear elevation. Fig. 3 is a vertical section through portions of the device and on a somewhat-enlarged scale. Fig. 4 is a plan view. Figs. 5 and 6 are detail views of the feeding-cams. Fig. 7 is a detail view of the clutch to govern the feed-pulley. Fig. 8 is a sectional view of the clutch mechanism. Fig. 9 is a front elevation. Fig. 10 is a detail view of one of the bell-cranks. Fig. 11 is a vertical section of a portion of the table. Fig. 12 is a detail view of the basket.

My invention has in view more particularly an automatic button-blank-cutting machine of superior efficiency and economy of operation, saving labor and accomplishing the work in a more rapid and satisfactory manner than has hitherto been accomplished by machines of this class.

I carry out my invention as follows:

A represents any suitable support provided with a bed or table A'.

A² denotes portions of the supporting-framework.

B denotes a driving-shaft preferably provided with cone driving-pulleys, as indicated at B'. These pulleys may be belted with cone-pulleys in a well-known manner upon a counter-shaft. (Not shown.)

C denotes a feed-shaft provided with cone-pulleys C', which may be belted to a counter-shaft in a customary manner. The shaft C

is constructed with a worm (indicated in dotted lines in Fig. 1 at C²) meshing with a worm-gear C³ upon a shaft C⁴. The shaft C⁴ is provided with cams D and E, the cam D being designed to actuate a mandrel F and the cam E being designed to actuate a push-bar G. The mandrel F is rotatable and reciprocatory in boxes A³ of the framework A². Within the mandrel is located a plunger H, carrying at its lower end a tubular saw J. At the lower end of the mandrel is a chuck F', provided with jaws f and a cap f'. The jaws f have a wedge-shaped engagement against the adjacent inner face of the mandrel and bear against the saw. It is evident that by screwing the cap upon the mandrel any suitable tension can be given to said jaws of the clutch upon the saw. To prevent injury to the same by too great a tension being applied, I provide a plug J' within the saw, said plug provided with an orifice through which the push-bar G may reciprocate. The location of the plunger may be controlled as to distance in any suitable manner. As shown, the plunger is constructed with a series of recesses or holes F², a bolt or pin F² being provided to engage the plunger in said recesses. As the saw is sharpened or wears it will be obvious that the plunger must be lowered correspondingly in the mandrel.

To rotate the mandrel, it is provided with a gear F³, meshing with a pinion B² of the driving-shaft B. To permit the reciprocation of the mandrel, it is constructed with an elongated orifice or keyway, (indicated at f³), into which projects a screw or pin f⁴, passing through the hub F⁴ of the gear F³.

Upon the framework A² is fulcrumed, as shown at k, a bell-crank K, engaged at one extremity with the mandrel and at the opposite extremity provided with a wiper, as at K', to ride upon the cam D, and by which cam said bell-crank is actuated. It will be obvious that when the wiper is raised by the cam the mandrel will be forced downward. L is a bell-crank, also fulcrumed, as indicated at l, upon the framework A², one end being connected with a yoke M, engaged with the upper end of the push-rod G. N is an additional bell-crank fulcrumed upon the framework, as upon the pin k, and provided with a wiper at n, riding upon the cam E. The bell-crank

N is united to the bell-crank L by a connecting link or bar N'. It will be obvious that as the wiper *n* ascends, the yoke M, carrying the push-rod G, will be forced downward.

5 The yoke M is jointedly connected with the adjacent end of the bell-crank L, as at *l'*. A nut G' is provided at the upper end of the push-rod G to hold the push-rod in engagement with the yoke. By unscrewing said nut
10 from the yoke the push-rod may be withdrawn, when the yoke may be thrown to one side, permitting the removal of the plunger from the mandrel whenever it may be desired to sharpen or to renew the saw.

15 P denotes a clutch upon the feed-shaft to engage the feed-pulleys C', said clutch being actuated by a foot-lever P', suitably connected therewith.

It will be obvious that in feeding the shell
20 from which the blanks are to be cut to the saw the shell may not always be fed in just the desired position, and it will be desirable to prevent the descent of the mandrel and of the push-rod, thereby giving opportunity to
25 change the position of the shell. I provide for this by the construction and operation of the clutch, thereby enabling the operator to stop when the saw is operating upon a thick portion of the shell as it is liable to be choked
30 up by the powder in cutting, rendering it necessary to retract the saw to clear it, and the kerf in the shell, of powder. This may be effected by making the shaft C⁴ reciprocatory in its bearings *c*, so as to carry the cams D
35 and E out from under the corresponding wipers. This may be done in any suitable manner, as by means of a bell-crank Q, fulcrumed as at *q*, said bell-crank being connected in any suitable manner with a foot-
40 lever Q'. The bell-crank Q, and consequently the shaft C⁴, may be automatically retracted in any suitable manner, as by a retracting-spring Q². The mandrel and push-rod may also be retracted automatically in any suitable
45 manner, as by springs K³ and M³. I prefer to make various parts of the device self-retracting in any proper manner. The foot-lever P' may be retracted by a spring P³.

50 The bed of the table is provided with a tubular die *a*, through which the saw may reciprocate and over which the blank is cut, the blank being forced out from the tubular saw by means of a push-rod G.

In the support A, I prefer to locate a wire
55 basket, (indicated at R,) the upper extremity of the basket being provided with a rim R', fitting snugly into the support A, the basket being removable by opening a door A⁵, provided upon the support. I also provide a
60 narrow inlet-opening, as indicated at S, which may be covered with wire-cloth and with a removable slide or cover S' to govern the amount of air admitted therethrough. More or less air will obviously be admitted through
65 the opening in the die, and an additional supply of air may be admitted within the sup-

porting-base A by the adjustment of the slide S'. Beneath the basket R is provided an exhaust-pipe, (indicated at T,) which may be provided with a funnel-shaped top. It is
70 designed to make the basket R of such mesh as to permit the dust and chips dropping therethrough while the button-blanks are retained therein. By this means the blanks
75 may be efficiently separated from the chips and dust without any hand-labor. The rim R' of the basket should fit snugly within the support A, so that the air will be compelled to pass through the basket.

While I have shown automatic devices for
80 forcing the saw and the push-rod to the work, I do not limit myself solely thereto.

My invention contemplates the employment of a long plunger and the use of a long
85 tubular saw engaged therewith made adjustable in the mandrel and removable from its upper end. It will be apparent that by the use of a long tubular saw it may all be fed
90 down to the work as it wears, thereby preventing waste heretofore common in the use of shorter saws, inasmuch as it is impracticable to use a saw after it has been worn
down to within a given distance from its upper extremity.

My invention contemplates the provision
95 of arm-rests V adjacent to the bed of the table or support, on which the arms of the operator may conveniently rest in attending the machine and in feeding the shells to the
100 cutter.

What I claim as my invention is—

1. In a button-blank-cutting machine, the combination of a supporting-frame, a rotatable mandrel sleeved through a portion of
105 said frame, a plunger within the mandrel and carried thereby, means to simultaneously reciprocate the mandrel and plunger, a saw carried by the plunger within said mandrel, a push-bar within the plunger, and means to
110 reciprocate the push-bar, said mandrel projecting downward about the saw toward its lower end and provided at its lower end with a chuck to engage about the saw, the means to reciprocate the mandrel and plunger, and
115 the means to reciprocate the push-bar acting in successive order, for the purpose set forth.

2. In a button-blank-cutting machine, the combination of a rotatable mandrel, a plunger within the mandrel and carried thereby,
120 a saw carried by the plunger within said mandrel, a push-bar within the plunger, a rotatable shaft, a bell-crank actuated from said shaft to simultaneously reciprocate the mandrel and the plunger, and an additional bell-crank actuated by said shaft to reciprocate
125 the push-bar, said mandrel projecting downward about the saw toward its lower end and provided at its lower end with a chuck to engage about the saw, the bell-crank to reciprocate the mandrel and plunger, and the bell-
130 crank to reciprocate the push-bar acting in successive order, for the purpose set forth.

3. In a button-blank-cutting machine, the combination of a rotatable mandrel, a plunger within the mandrel, a push-bar within the plunger, a rotatable shaft, cams mounted upon said shaft, bell-cranks connected the one with the mandrel and the other with the push-bar, said bell-cranks actuated by the corresponding cams upon said shaft, and means to throw said cams out of operation with said bell-cranks, substantially as described.

4. In a button-blank-cutting machine, the combination of a supporting-frame, a plunger, a tubular saw carried by the plunger, a rotatable mandrel sleeved through a portion of said frame carrying said plunger therewithin and projecting downward about the saw at its lower end, a chuck carried by the mandrel located about the lower end of the saw to engage and hold the saw, a plug within the saw to prevent too great tension of the chuck upon the saw, a push-bar reciprocatory through said plug, and means to simultaneously reciprocate the mandrel and plunger, substantially as set forth.

5. In a button-blank-cutting machine, the combination of a supporting-frame, a mandrel sleeved through a portion of said frame, a plunger carried by the mandrel therewithin, a cutter carried by the plunger within the mandrel, a driving-shaft geared with the mandrel to simultaneously rotate the mandrel and plunger, a push-bar within the plunger, means to simultaneously reciprocate the mandrel and plunger, and means to reciprocate the push-bar, said mandrel projecting downward about the saw toward its lower end and provided at its lower end with a chuck to engage about the saw, said mandrel and plunger and said push-bar made reciprocatory in successive order, substantially as set forth.

6. In a button-blank-cutting machine, the combination of a mandrel, a plunger projecting into the upper end of the mandrel and carried by the mandrel therewithin, means to simultaneously rotate the mandrel and plunger, a tubular saw engaged with the lower end of the plunger and projecting through the lower end of the mandrel, a push-bar within the plunger and saw, and automatic mechanism to simultaneously feed and to retract the mandrel and plunger, and automatic mechanism to reciprocate the push-bar, said mandrel and plunger and said push-bar reciprocated in successive order, substantially as described.

7. In a button-blank-cutting machine, the combination of a mandrel, a plunger carried by the mandrel therewithin, a cutter carried by the plunger, means to rotate the mandrel and plunger, a push-bar within the spindle, a feed-shaft provided with a worm, a shaft C⁴ provided with a worm-gear meshing with a worm on the feed-shaft, cams upon the shaft C⁴, a bell-crank actuated by one of said cams to simultaneously reciprocate said mandrel and plunger, an additional bell-crank actu-

ated by the other of said cams to reciprocate the push-bar, and means to throw the cams out of operation, substantially as set forth.

8. In a button-blank-cutting machine, the combination of a mandrel, a plunger carried by the mandrel therewithin, means to rotate the mandrel and plunger, a saw carried by the plunger, a push-bar within the mandrel, a feed-shaft, a shaft C⁴ provided with cams and geared with the feed-shaft, a bell-crank actuated by one of said cams to simultaneously feed the mandrel and plunger, an additional bell-crank actuated by the other of said cams to reciprocate the push-bar, and means to throw said cams out of operation, substantially as described.

9. In a button-blank-cutting machine, the combination of a mandrel, a plunger carried by the mandrel therewithin, a cutter carried by said plunger, means to rotate the mandrel and plunger, a push-bar within the plunger, a feed-shaft provided with a worm, a shaft C⁴ geared with said worm and provided with cams, a bell-crank actuated by one of said cams to simultaneously feed the mandrel and plunger, and a bell-crank actuated by the other of said cams to reciprocate the push-bar, said bell-cranks provided with wipers riding upon said cams, and means to throw said cams out of operation, substantially as described.

10. In a button-blank-cutting machine, the combination of a mandrel, a plunger carried by the mandrel therewithin, a saw carried by the plunger, a push-bar within the plunger, means to rotate the mandrel and plunger, driving devices to successively feed the cutter and the push-bar to the work, and means to longitudinally adjust and hold the plunger within the mandrel to adjust the saw to the work, said mandrel projecting downward about the saw toward its lower end and provided at its lower end with a chuck to engage about the saw, substantially as set forth.

11. In a button-blank-cutting machine, the combination of a rotatable mandrel, a plunger carried by the mandrel therewithin, a tubular saw carried by the plunger, a push-bar within the plunger, a yoke engaging the upper end of the push-bar, a driving device to simultaneously feed the mandrel and plunger, and a device to reciprocate the push-bar, said mandrel projecting downward about the saw toward its lower end and provided at its lower end with a chuck to engage about the saw, substantially as described.

12. In a button-blank-cutting machine, the combination of a rotatable mandrel, a cutter, a push-bar, a rotatable shaft C⁴ provided with cams mounted thereupon, bell-cranks actuated by said cams to feed the cutter and the push-bar to the work, and means to reciprocate said shaft to carry the cams out of operation with said bell-cranks and to retract the same, substantially as described.

13. In a button-blank-cutting machine, the

combination of a mandrel, a cutter, a push-bar, a rotatable shaft provided with cams mounted thereupon, bell-cranks actuated by said cams to feed the cutter and the push-bar to the work, a bell-crank and foot-lever connected with said shaft to force the cams out of operation with the bell-cranks, substantially as described.

14. In a button-blank-cutting machine, the combination of a mandrel, a plunger carried by the mandrel therewithin, a cutter carried by the plunger, a push-bar within the plunger, a feed-shaft, a shaft C⁴ geared with the feed-shaft, cams upon the shaft C⁴, a clutch to throw the feed-shaft into and out of operation, a bell-crank actuated by one of said cams to simultaneously reciprocate the mandrel and plunger, an additional bell-crank actuated by the other of said cams to reciprocate the push-bar, said mandrel and plunger and said push-bar being reciprocated in successive order, substantially as set forth.

15. The combination with a button-blank-cutting machine, of a support, a removable open-work basket having an air-tight engagement within the support, and means to exhaust air through said basket to separate the foreign matter from the blanks, substantially as and for the purpose described.

16. In a button-blank-cutting machine, the combination of a support provided with a hollow die, an open-work basket beneath said die and within the support, an exhaust-pipe beneath the basket, and means to admit an additional supply of air above the basket, said basket having a tight engagement in the support whereby air will be drawn through the die and through the basket into the exhaust-pipe, substantially as and for the purpose described.

17. The combination with a button-blank-cutting machine provided with a hollow support and with a hollow die opening through said support, of an open-work receptacle located within said support beneath said die for receiving the blanks, an exhaust-pipe, and means to exhaust air through said die and receptacle into said exhaust-pipe, whereby the foreign matter will be separated from the blanks, as set forth.

18. In a button-blank-cutting machine, the combination of a rotatable mandrel, means to reciprocate the mandrel, a plunger within the mandrel, and a saw projecting within the

mandrel and carried by the plunger, said plunger with its saw removable from the upper end of the mandrel, substantially as described.

19. In a button-blank-cutting machine, the combination of a rotatable mandrel, means to reciprocate the mandrel, a plunger within the mandrel, a saw projecting within the mandrel attached to the lower end of the plunger, and means to longitudinally adjust and positively hold the plunger with the saw within the mandrel in a desired position of adjustment, substantially as described.

20. In a button-blank-cutting machine, the combination of a rotatable mandrel, means to reciprocate the mandrel, a plunger located within the mandrel, a saw projecting within the mandrel engaged with the plunger, a chuck to engage the saw toward its lower extremity, and additional means to adjust and hold the plunger and saw in desired position of adjustment within the mandrel, substantially as described.

21. In a button-blank-cutting machine, the combination of a rotatable mandrel, means to reciprocate the mandrel, an elongated plunger therewithin, an elongated tubular saw projecting within the mandrel engaged with the plunger, and means to adjust and hold the plunger within the mandrel in a desired position of adjustment, said plunger and saw removable from the upper end of the mandrel, substantially as set forth.

22. In a button-blank-cutting machine, the combination of a rotatable mandrel, a plunger therewithin, a tubular saw carried by the plunger, a chuck provided with jaws having a wedge-shaped engagement against the adjacent inner face of the mandrel, and bearing against the saw, and with a cap having a screw-threaded engagement upon the mandrel to give a desired tension of the chuck upon the saw, a plug within the saw to prevent too great a tension of the chuck upon the saw, a push-bar reciprocatory through said plug, and means to reciprocate the mandrel and the push-bar, substantially as set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

WILLIAM ALLEN PENDRY.

Witnesses:

N. S. WRIGHT,
MARY HICKEY.