

O. RICE.
PNEUMATIC DOOR CHECK AND CLOSER.
APPLICATION FILED APR. 5, 1904.

2 SHEETS—SHEET 1.

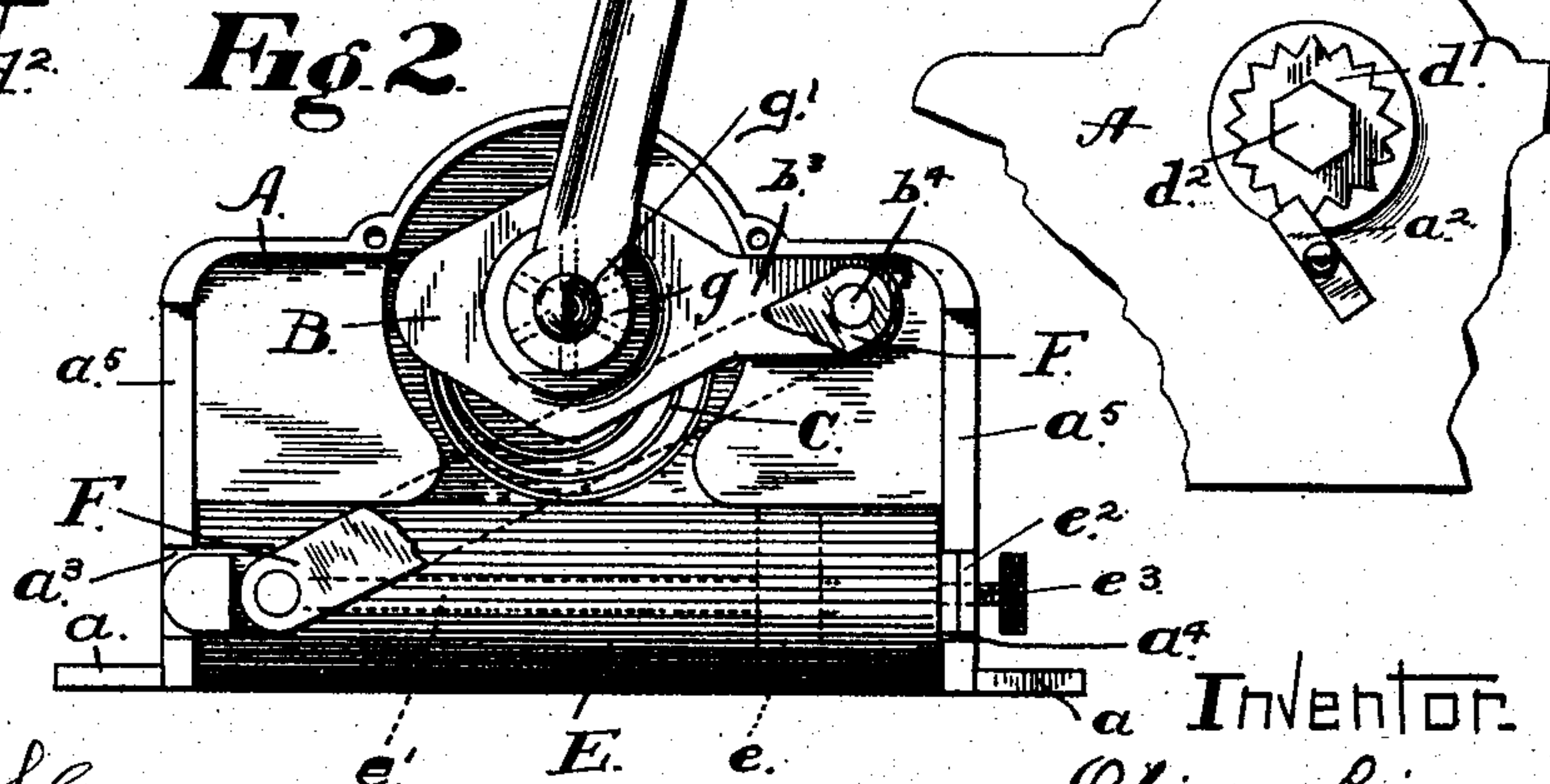
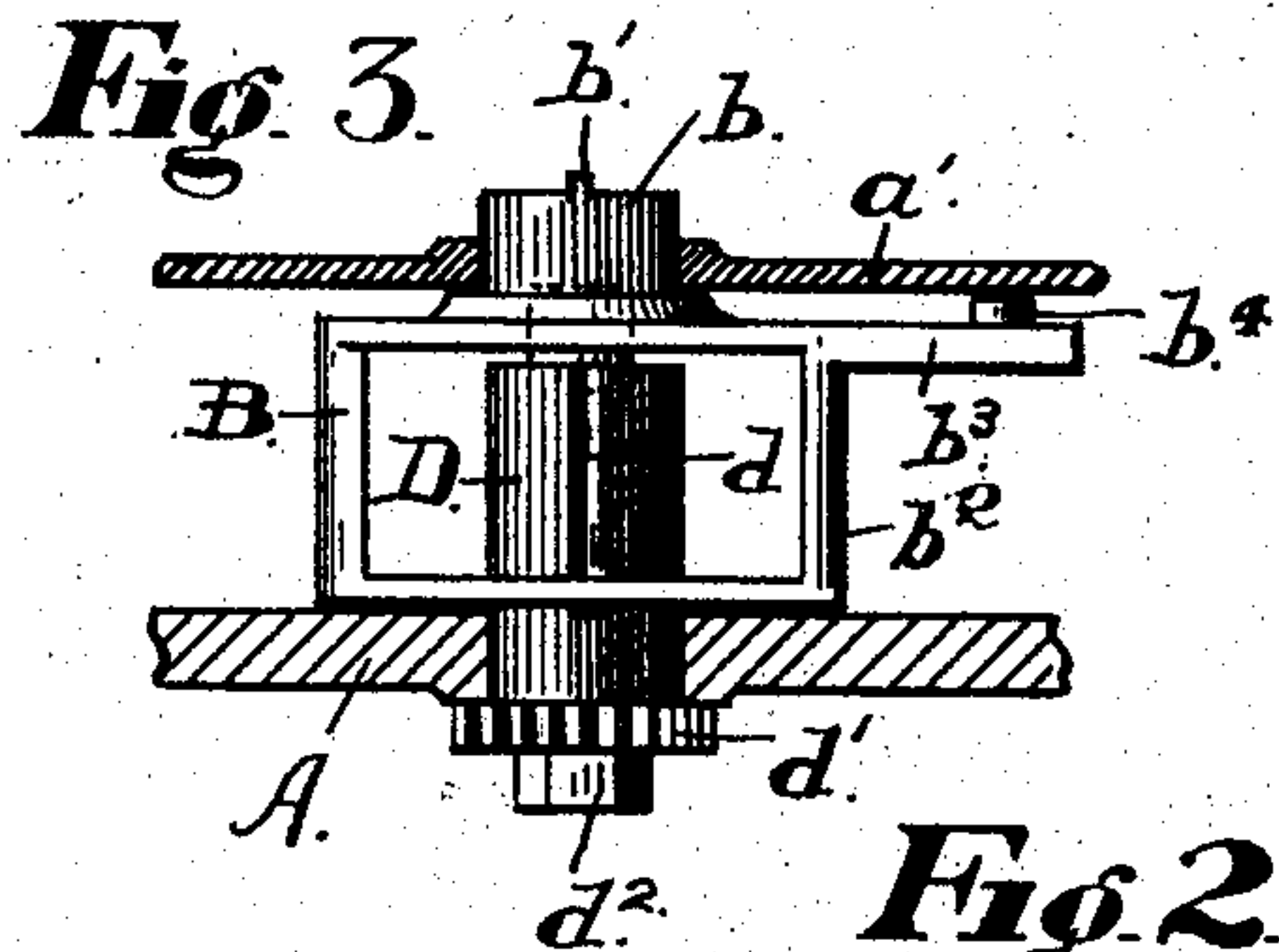
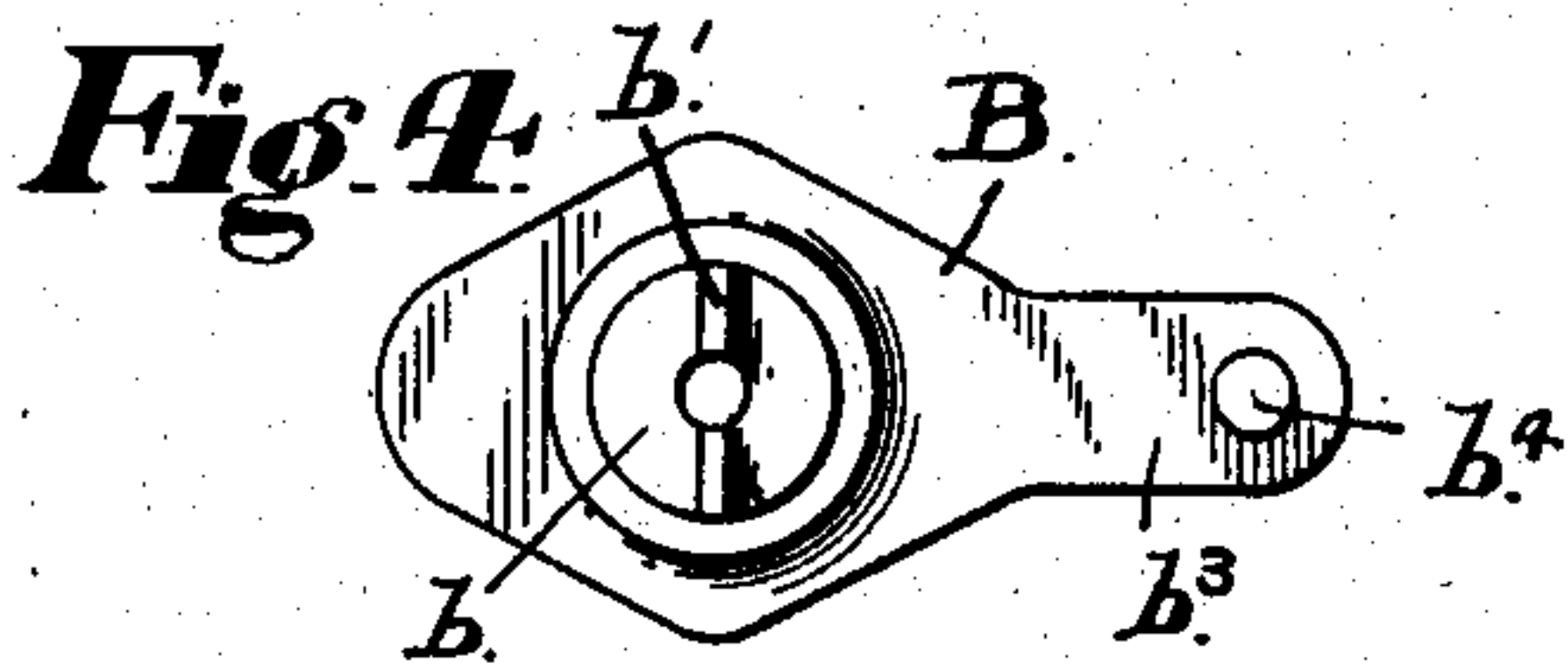
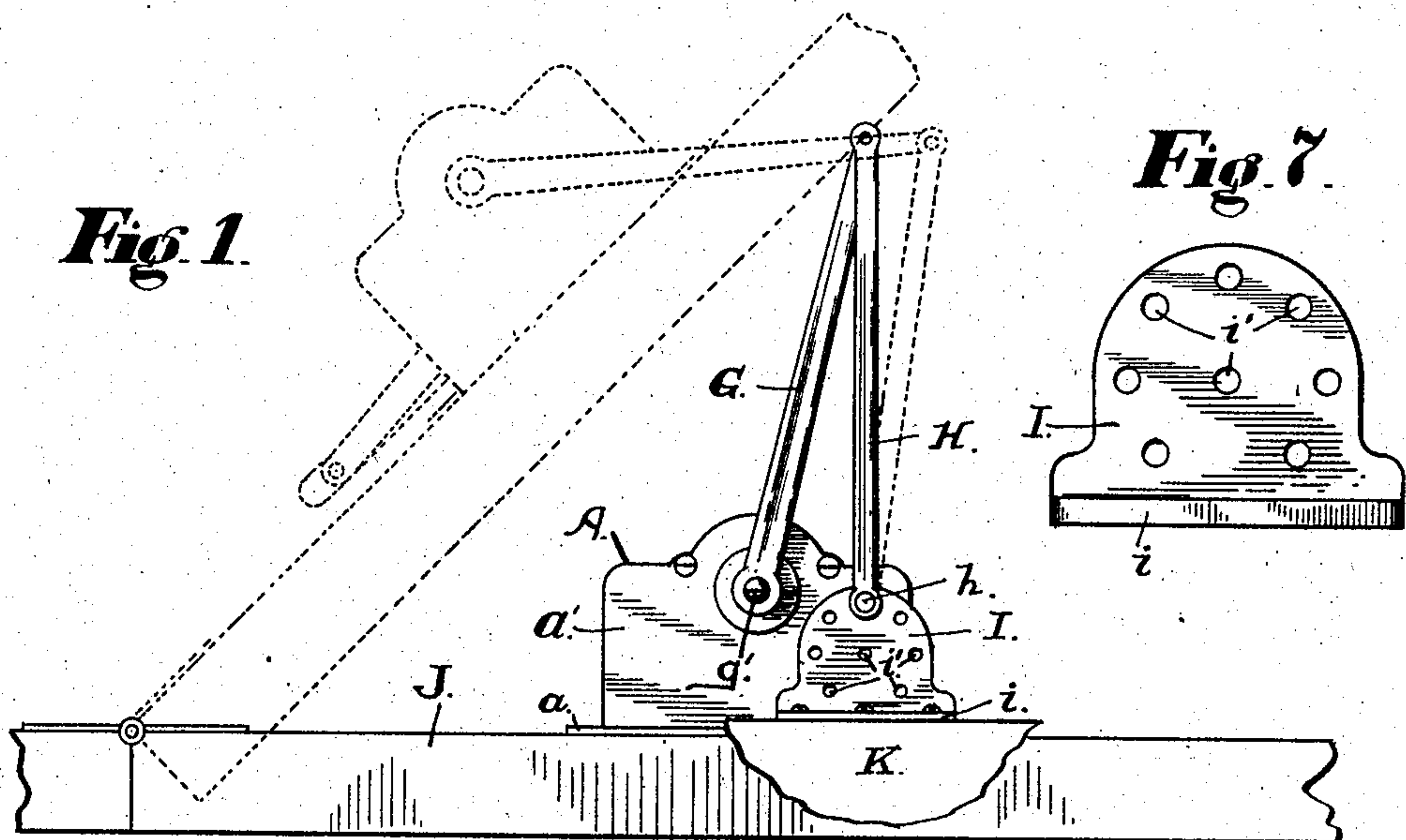


Fig. 6.

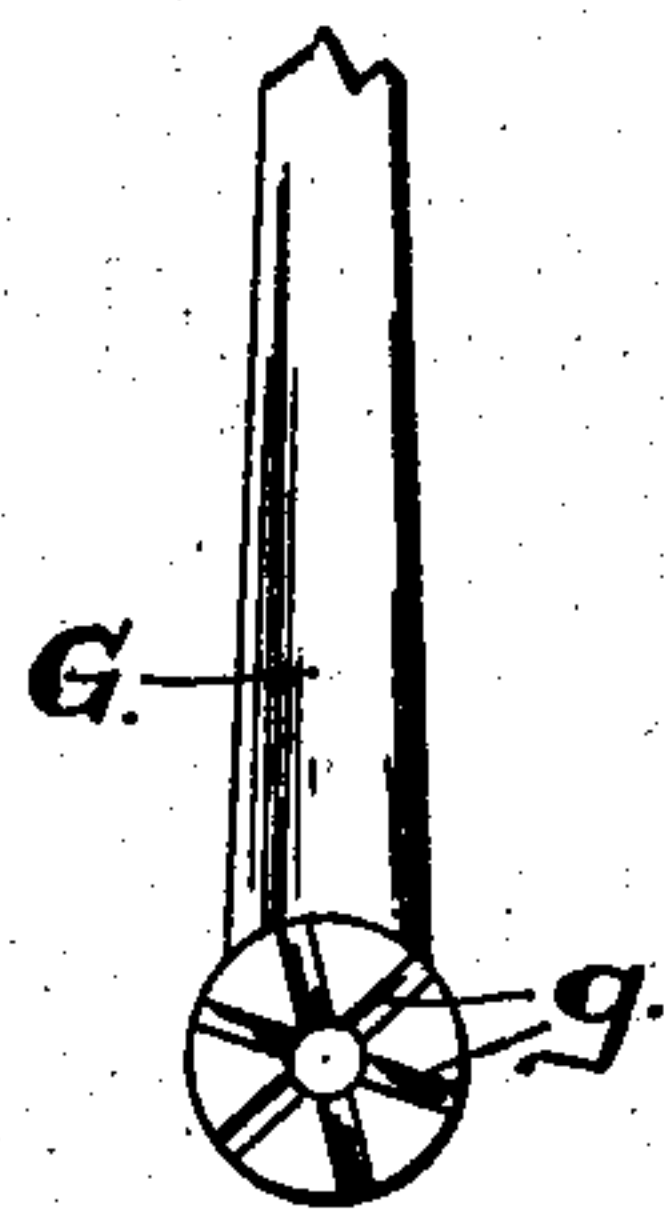
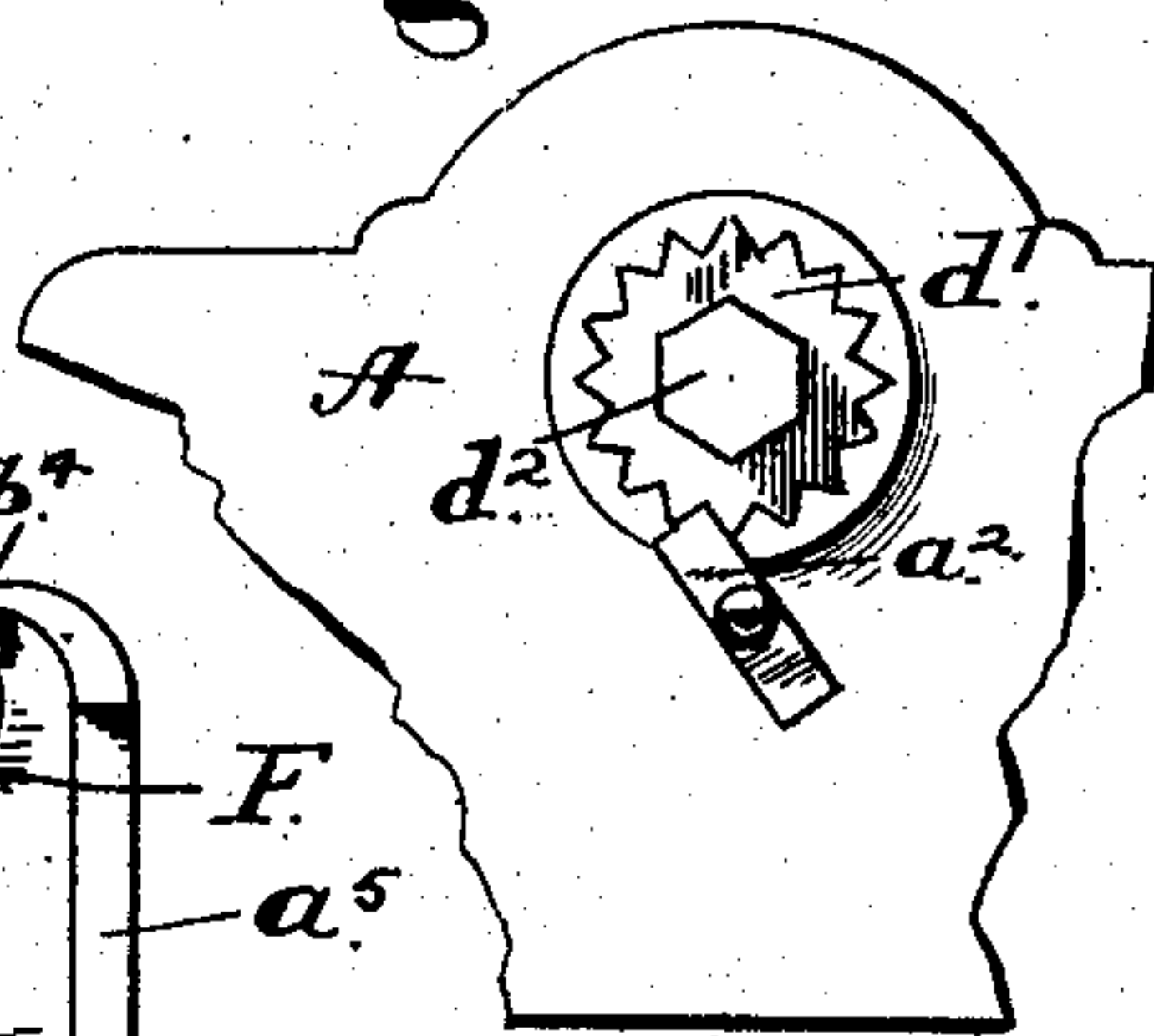


Fig. 5.



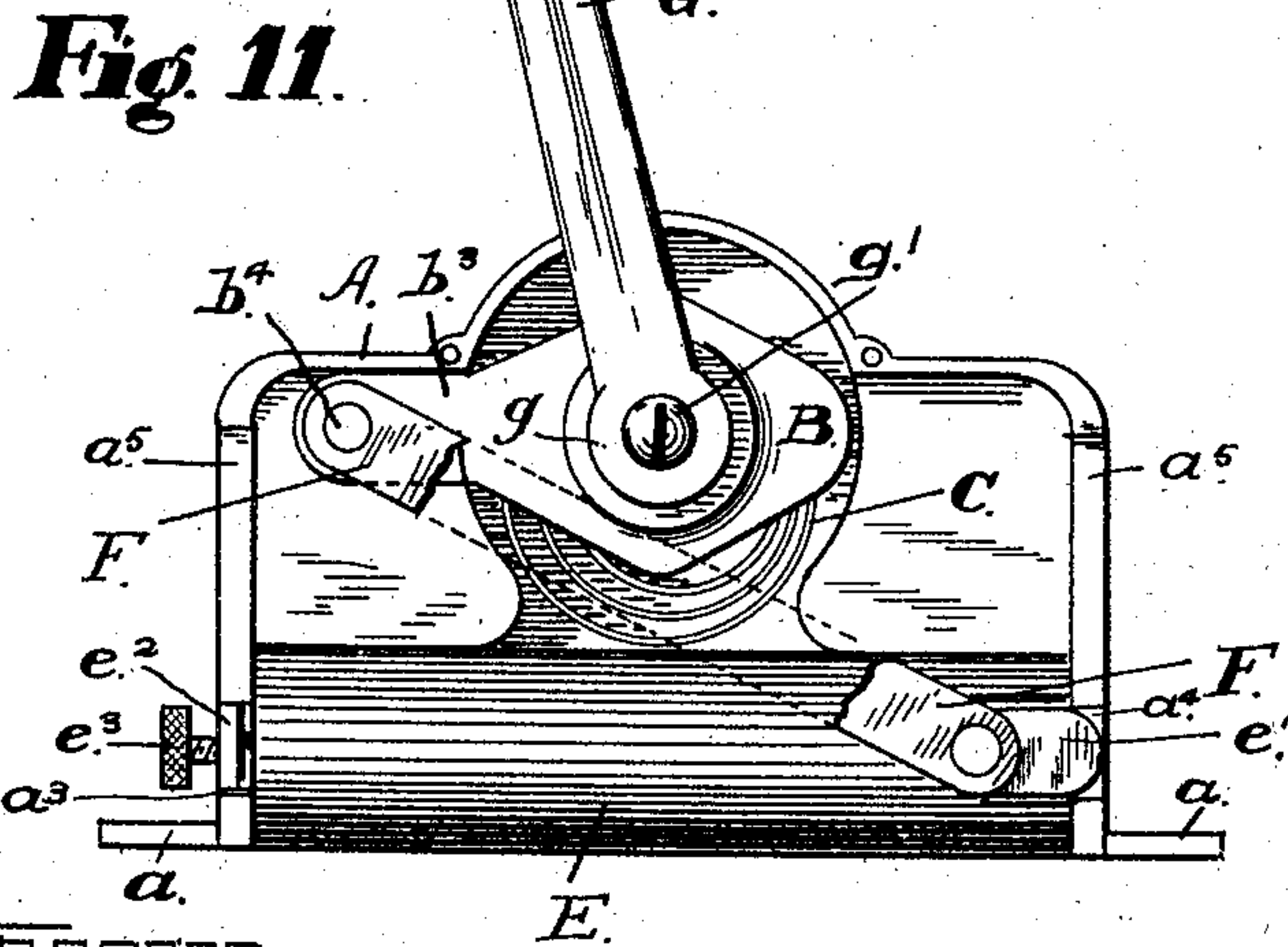
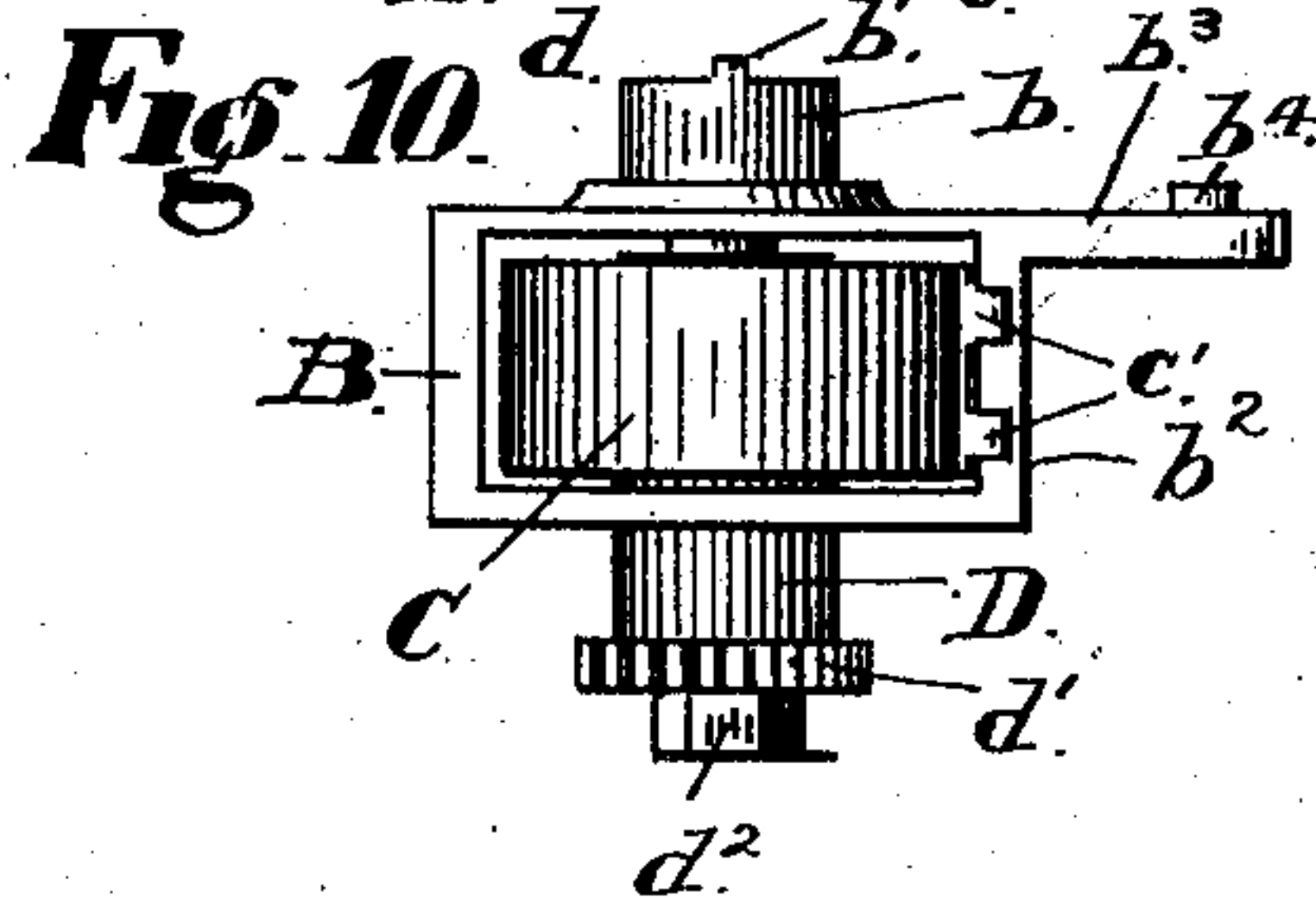
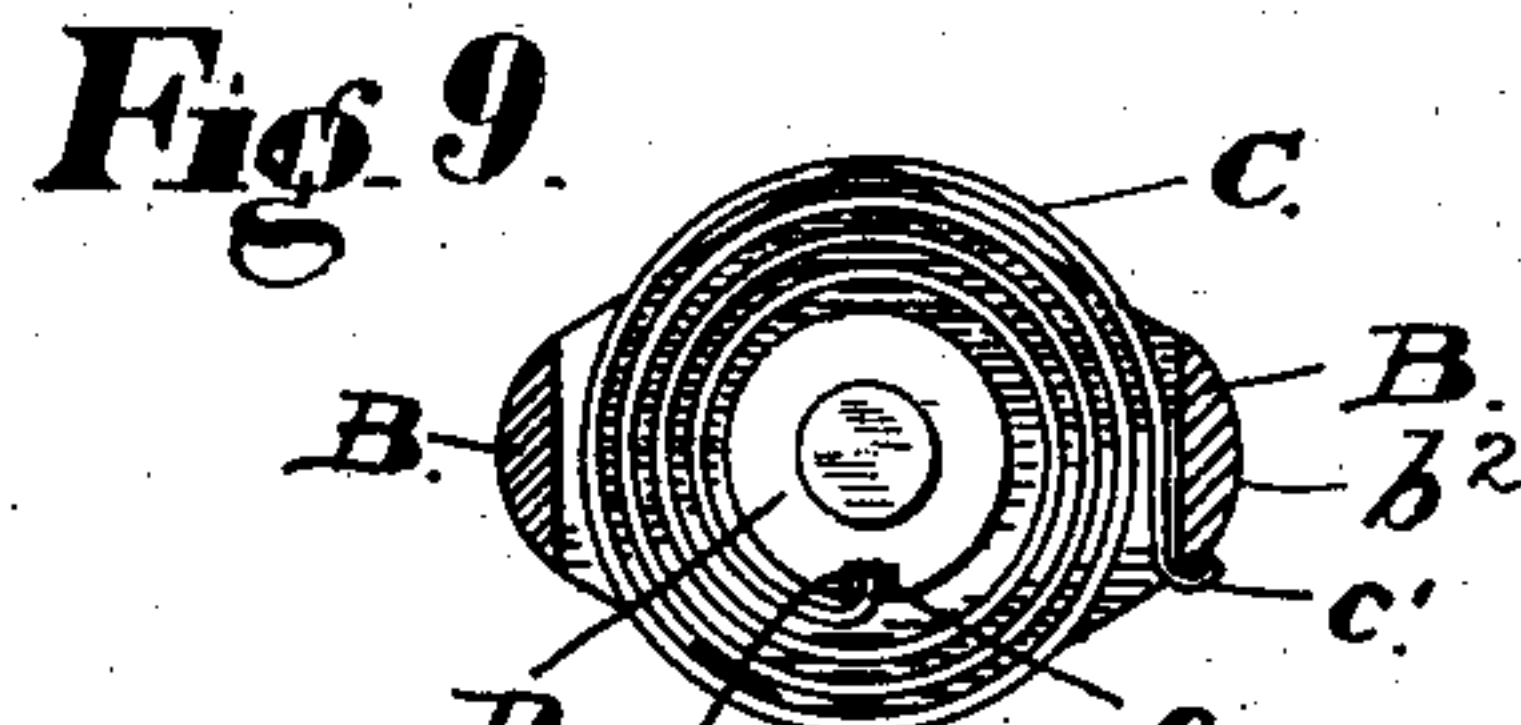
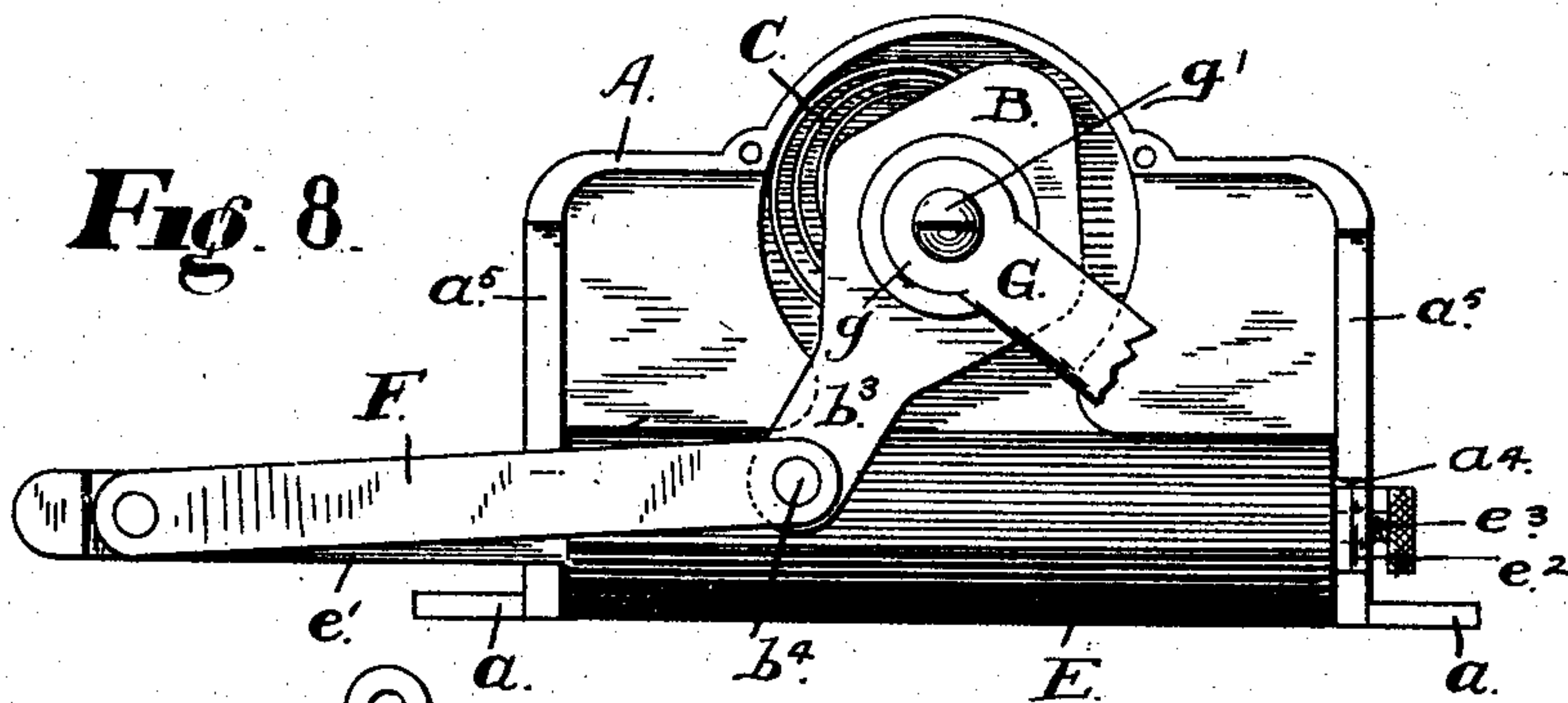
Witnesses.

Arthur F. Slee.
Walter F. Vane.

Inventor.
Oliver Rice
by Wm. F. Booth
his Attorney

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2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

OLIVER RICE, OF OAKLAND, CALIFORNIA, ASSIGNOR TO IDEAL DOOR CHECK SPRING COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

PNEUMATIC DOOR CHECK AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 781,361, dated January 31, 1905.

Application filed April 5, 1904. Serial No. 201,669.

To all whom it may concern:

Be it known that I, OLIVER RICE, a citizen of the United States, residing at Oakland, county of Alameda, State of California, have invented certain new and useful Improvements in Pneumatic Door Checks and Closers; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of door checks and closers in which a casing secured to the door contains a closing-spring and co-operating air-cushion cylinder, said spring being actuated by power-levers connecting it with a fixed bracket on the door frame or casement.

The object of my invention is to provide a simple and effective device of this class capable of adaptation by reason of its construction and the adjustability and reversibility of its parts to all possible situations and to meet all the requirements of speed and gentleness of operation.

To this end my invention consists in the novel construction, arrangement, and combination of parts, which I shall now fully describe by reference to the accompanying drawings, in which—

Figure 1 is a top plan showing the application of my device to a door, the dotted lines showing the position when the door is partly open. Fig. 2 is a top plan of the main casing, the cover-plate being removed to show the position of the interior parts when at rest. Fig. 3 is an elevation of the spring-housing. Fig. 4 is a top view of the spring-housing. Fig. 5 is an end view of the pawl-and-ratchet spring-tensioning device. Fig. 6 is a bottom view of the adjustably-connected head of one of the power-levers. Fig. 7 is an enlarged top view of the fixed bracket. Fig. 8 is a top view of the main casing, the cover-plate being removed to show the position of the interior parts when operated by the opened door. Fig. 9 is a detail top view to show the seating of the spring in the housing. Fig. 10 is a side view of the same. Fig. 11 is a top view of the main casing, the cover-plate being removed and showing the reversed position of

the interior parts to adapt the device to a door swinging the reverse way of that shown in Fig. 1.

A is a casing provided with suitable flanges *a*, by which it is secured to the part to which it is to be attached. Mounted in the forward part of the casing is the rotary housing B, which carries the coil-spring C. The housing or carrier is pivotally mounted by means of a journal *b*, Figs. 3 and 10, rigidly secured to or formed with one side of it, which said journal projects through the cover-plate *a'* of the casing and is formed on its ends with lugs *b'*, Figs. 3 and 4, to receive the power-lever connections presently to be described. The other side of the housing B is pivoted and rotates upon an independent journal D, which serves the further function of a spring-tensioner. This journal passes through the casing into the housing and into the spring center, the inner extremity *c* of said spring, Fig. 9, being engaged by a groove *d*, Fig. 3, in the journal. Upon the outer or lower end of the journal D is formed or secured a ratchet *d'*, which is engaged by a pawl *a''*, pivoted to the casing, Figs. 3, 5, and 10, and said lower end is formed with a wrench-hold *d''* to enable the journal to be turned in order to tension the spring. The outer end of the spring has hooks *e'*, Figs. 9 and 10, which detachably engage a cross-bar *b''* of the housing B. The housing B is formed or provided with a crank *b''*, having a stub *b'''*.

Seated in the inner portion of the casing and horizontally disposed lengthwise thereof is the cylinder E, Figs. 2 and 8, in which is a plunger *e*, the rod *e'* of which projects and plays through the end of the casing in a bearing-groove *a'''* in said casing. The other end of the cylinder has a lug *e''*, which rests in a corresponding groove *a''''* in the other end of the casing. By the rod *e'* and the lug *e''* the cylinder is carried in the bearing-grooves *a'''* and *a''''* of the casing A, being set freely therein in such manner that when the cover-plate *a'* of the casing is unscrewed and removed the cylinder may be easily lifted out and reversed end for end, as shown in Fig. 11, for

a purpose I shall presently explain. The plunger-rod e' is connected with the crank b^3 of the spring-housing by a link F, which fits over the stud b^4 of the crank and can
 5 readily be removed therefrom when necessary. The link F plays through a groove a^5 , Fig. 8, in either end of the casing, according to the position of the cylinder. In the closed end of the cylinder is an air-vent controlled
 10 by a valve e^3 of suitable character, said valve being exposed to and accessible from the outside of the casing.

G is one of the levers of the power connections, the head of which is formed with a
 15 number of radial grooves g , Fig. 6, adapting it to engage at various angles, according to the adjustment desired, the lugs b' of the journal b of the spring-housing. A screw g' secures the lever to the journal. To the outer
 20 end of the lever G is pivoted the second lever H, Figs. 1 and 2, the outer end of which has a socket adapting it to be secured by a removable pin h to the fixed bracket I, Fig. 1. This bracket has a flange i , by which it is secured
 25 to the part to which it is to be attached, and said bracket is provided with a plurality of variously-disposed holes i' , as shown in Figs. 1 and 7, to receive the connecting-pin h of lever H and to regulate the point of attachment
 30 as desired.

In Fig. 1 I show the attachment of my device to a door J, of which K is the frame or casement. In this position the casing A is
 35 secured to the door and the bracket I is secured to the door frame or casement. When the door is opened, the housing B is rotated in a direction to tighten the spring, and at the same time the plunger e is moved toward
 40 one end of the cylinder E, as seen in Fig. 8. When the door is released, the spring closes it, acting against the air-cushion in front of the returning plunger. Now to convert the device for application to a door swinging the
 45 other way the casing A is opened, and after detaching the link F from the housing-crank b^3 the cylinder E is lifted from its seat and reversed end for end, as seen in Fig. 11. Then the spring-housing is removed and the spring
 50 taken out, turned around, and replaced, so that its hooks c' engage the opposite edge of the cross-bar b^2 of the housing. Then the housing is reversed end for end, as seen in Fig. 11, and returned to place and the link F reconnected with its crank. The device can
 55 now be applied to a door which swings in a direction the reverse of that shown in Fig. 1.

By placing the casing A on the casement K and the bracket I on the door the door may be made to normally stay open.

60 The bracket I has a double function. By the disposition of its various holes, some being farther out than others, provision is made for compensating for the various distances which the door frames or casements project over the
 65 plane of the door. Some casements protrude

one inch and some more or less beyond the door. The variously-disposed holes i' in the bracket enable connection with the lever H at such points as will compensate for this difference. Then by having the holes arranged
 70 variously sidewise of the bracket the point of attachment of the lever may be varied to suit its angle as desired, thus governing the speed and gentleness of the door in closing.

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

1. In a pneumatic door check and closer of the class described, the combination of a casing, a rotary spring-housing seated in the casing
 80 and having fixed on one side a journal pivotally mounted in the casing, and having on the other side a journal fixed to the casing and on which journal the housing is pivotally mounted, and a spring seated in the housing,
 85 having one end detachably connected with the housing and the other end detachably connected with the journal which is fixed to the casing.

2. In a pneumatic door check and closer of the class described, the combination of a casing, a rotary spring-housing seated in the casing
 90 and having fixed on one side a journal pivotally mounted in the casing and having on the other side a journal fixed to the casing and on which journal the housing is pivotally
 95 mounted, a spring seated in the housing, having one end detachably connected with the housing and the other end detachably connected with the journal which is fixed to the casing, and a pawl and ratchet for adjustably connecting the last-named journal with the casing
 100 whereby the spring may be tensioned.

3. In a pneumatic door check and closer of the class described, the combination of a casing, a rotary spring-housing, means for mounting the housing in the casing adapting said
 105 housing to be reversed end for end, a spring controlling the movement of the housing, means for mounting the spring in the housing adapting it to be reversed, an air-cushion
 110 cylinder with plunger and rod, means for mounting said cylinder in the casing adapting it to be reversed end for end, and reversible connections between the spring-housing and the plunger-rod of the air-cushion cylinder.
 115

4. In a pneumatic door check and closer of the class described, the combination of a casing, a rotary spring-housing inclosed in said casing, said housing having fixed on one side
 120 a journal pivotally fitted in the casing-wall, a journal fixed to the other wall of the casing and pivotally fitted in the other side of said housing, a spring within the housing having one end connected with the housing and the other end connected with the journal which is
 125 fixed to the casing-wall, a connection with the journal which is fixed to the housing for rotating said housing by the movement of the door, an air-cushion cylinder in the casing with a plunger and rod and a connection between
 130

said housing and the plunger-rod, to operate the latter by the rotation of the housing.

5. In a pneumatic door check and closer of the class described, the combination of a casing, a rotary spring-housing inclosed in said casing said housing having fixed on one side a journal pivotally fitted in the casing-wall, a journal detachably fixed to the other wall of the casing and pivotally fitted in the other side of said housing, a spring within the housing having one end detachably connected with the housing and the other end detachably connected with the journal which is fixed to the casing-wall, a connection with the journal which is fixed to the housing for rotating said housing by the movement of the door, an air-cushion cylinder mounted reversibly in the casing said cylinder having a plunger and rod, and a reversible connection between said housing and the plunger-rod, to operate the latter by the rotation of the housing.

6. In a pneumatic door check and closer of the class described, the combination of a casing, a rotary spring-housing inclosed in said casing, said housing having fixed on one side a journal pivotally fitted in the casing-wall, a journal pivotally fitted in the other side of the housing and rotatably mounted in the other wall of the casing, a ratchet on said journal and a pawl on the casing-wall to control the rotation of said last-named journal, a spring within the housing having one end detachably connected with the housing and the other end detachably connected with said ratchet-controlled journal, a connection with the journal which is fixed to the housing for rotating said housing by the movement of the door, an air-cushion cylinder mounted reversibly in the casing, said cylinder having a plunger and rod, and a reversible connection between said housing and the plunger-rod, to operate the latter by the rotation of the housing.

7. In a pneumatic door check and closer of the class described, the combination of a casing, a rotary spring-housing in said casing, a reversible spring carried by said housing, a

reversible air-cushion cylinder with its plunger and rod, seated in the casing, and detachable connections between the spring-housing and the plunger-rod of the air-cushion cylinder comprising a link secured to the plunger-rod and a crank carried by the housing detachably engaging said link.

8. In a pneumatic door check and closer of the class described, the combination of the rotary spring-housing having a journal by which it is rotated, said journal having the radial lugs on its end and the power-lever having a head with a plurality of radial grooves engaging said lugs whereby the angle of attachment of said lever may be varied.

9. In a pneumatic door check and closer of the class described, the combination of a casing having within it suitable operating parts, a fixed bracket, connecting power-levers between the operating parts of the casing and the fixed bracket and a variable connection between one of the levers and the bracket.

10. In a pneumatic door check and closer of the class described, the fixed bracket to which the connecting power-lever is secured, said bracket having distributed over its surface various points of connection for the power-lever.

11. In a pneumatic door check and closer of the class described, consisting of a casing, a rotary spring-housing in the casing, a fixed bracket, pivoted levers connecting the bracket with one of the journals of the spring-housing whereby the latter is rotated by the movement of the door, a spring carried by the housing and controlling its movement, a controllable air-cylinder, with plunger and rod, in the casing, and a link and crank connecting the spring-housing with the plunger-rod of the air-cylinder.

In witness whereof I have hereunto set my hand.

OLIVER RICE.

Witnesses:

WALTER F. VANE,
D. B. RICHARDS.