

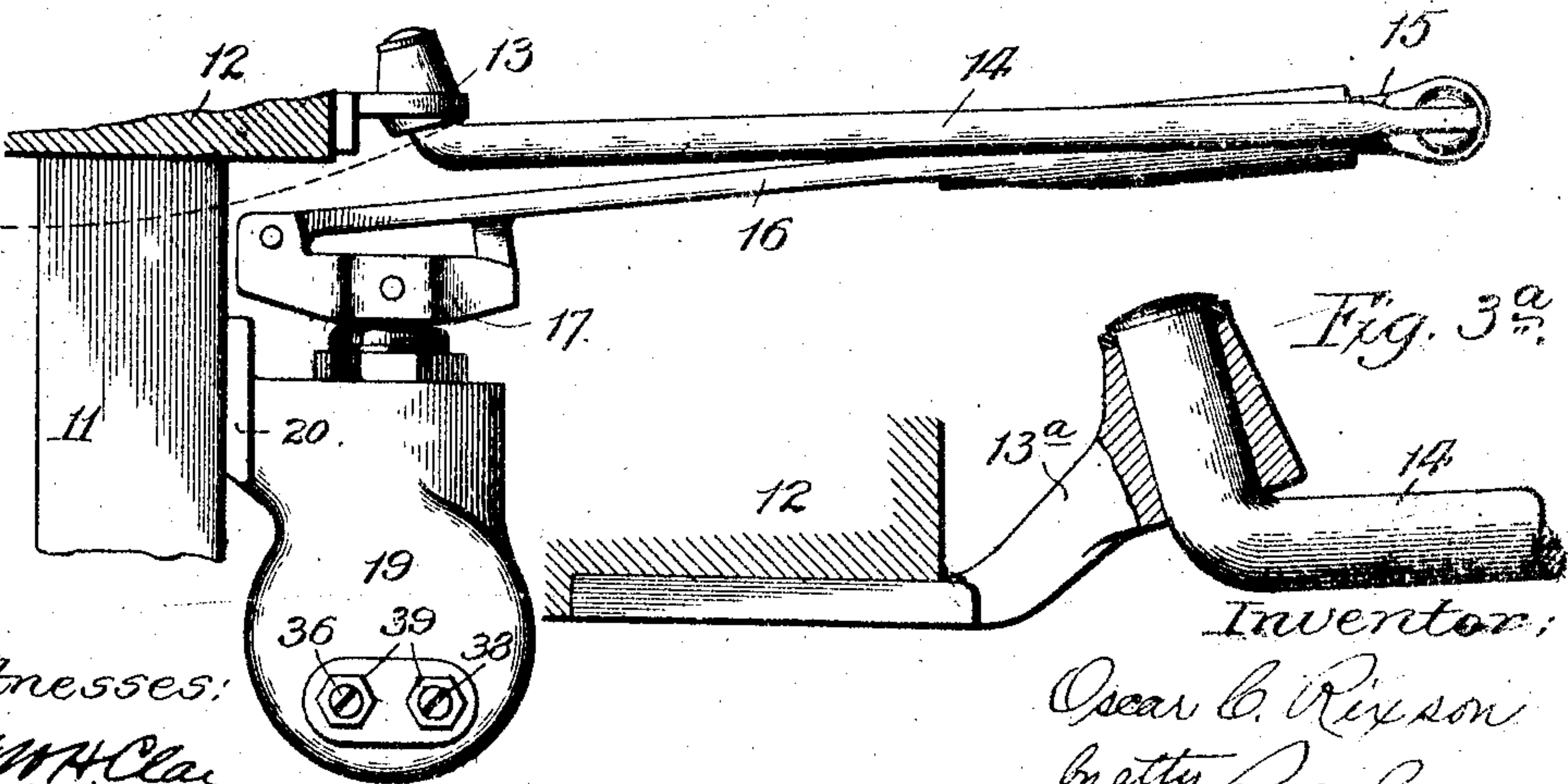
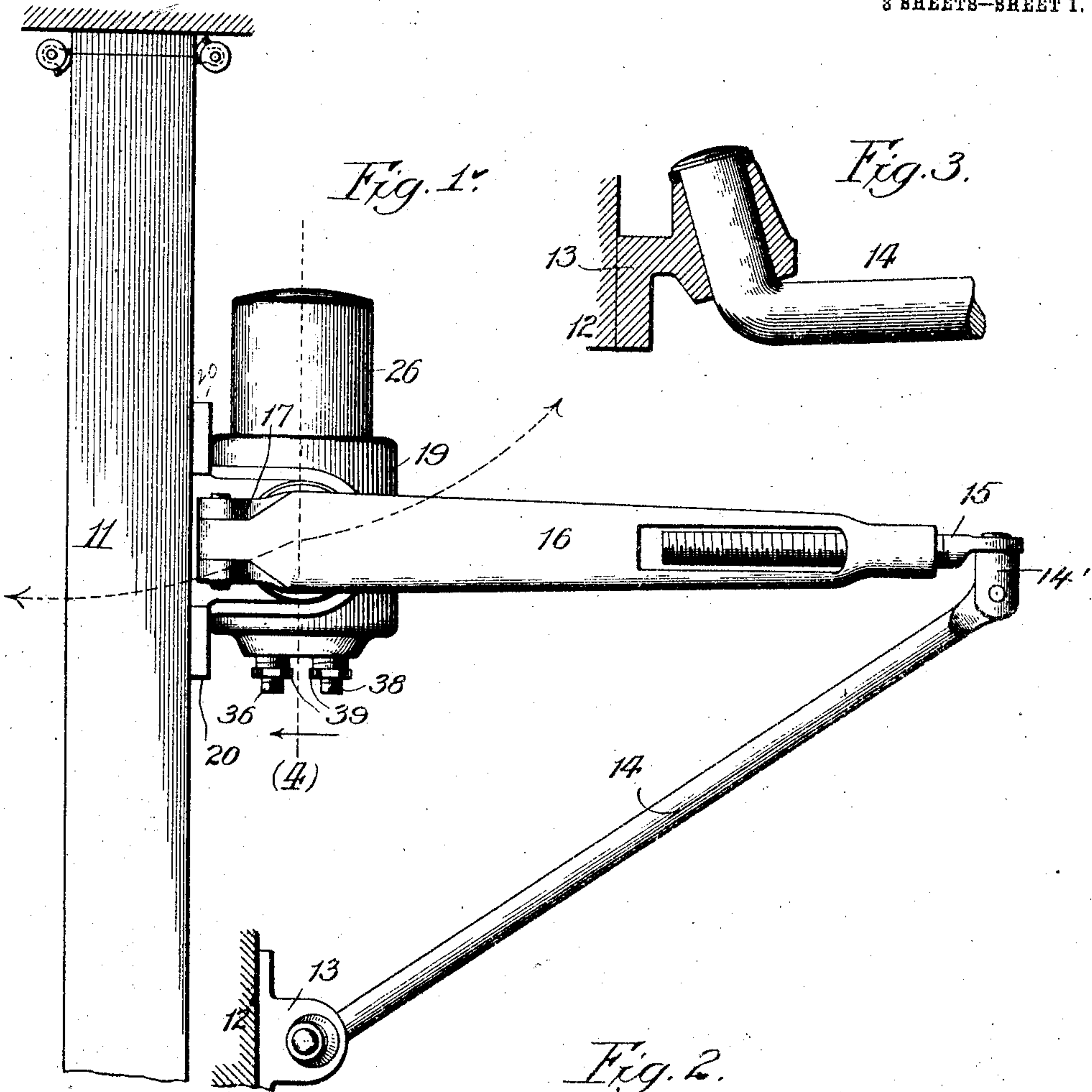
No. 833,940

PATENTED OCT. 23, 1906.

O. C. RIXSON.
DOUBLE ACTING DOOR CHECK.

APPLICATION FILED JUNE 25, 1904.

3 SHEETS—SHEET 1.



Witnesses:
F. W. H. Clay
Saul Carpenter

Inventor:
Oscar C. Rixson
by atty. Thos. H. Synnott

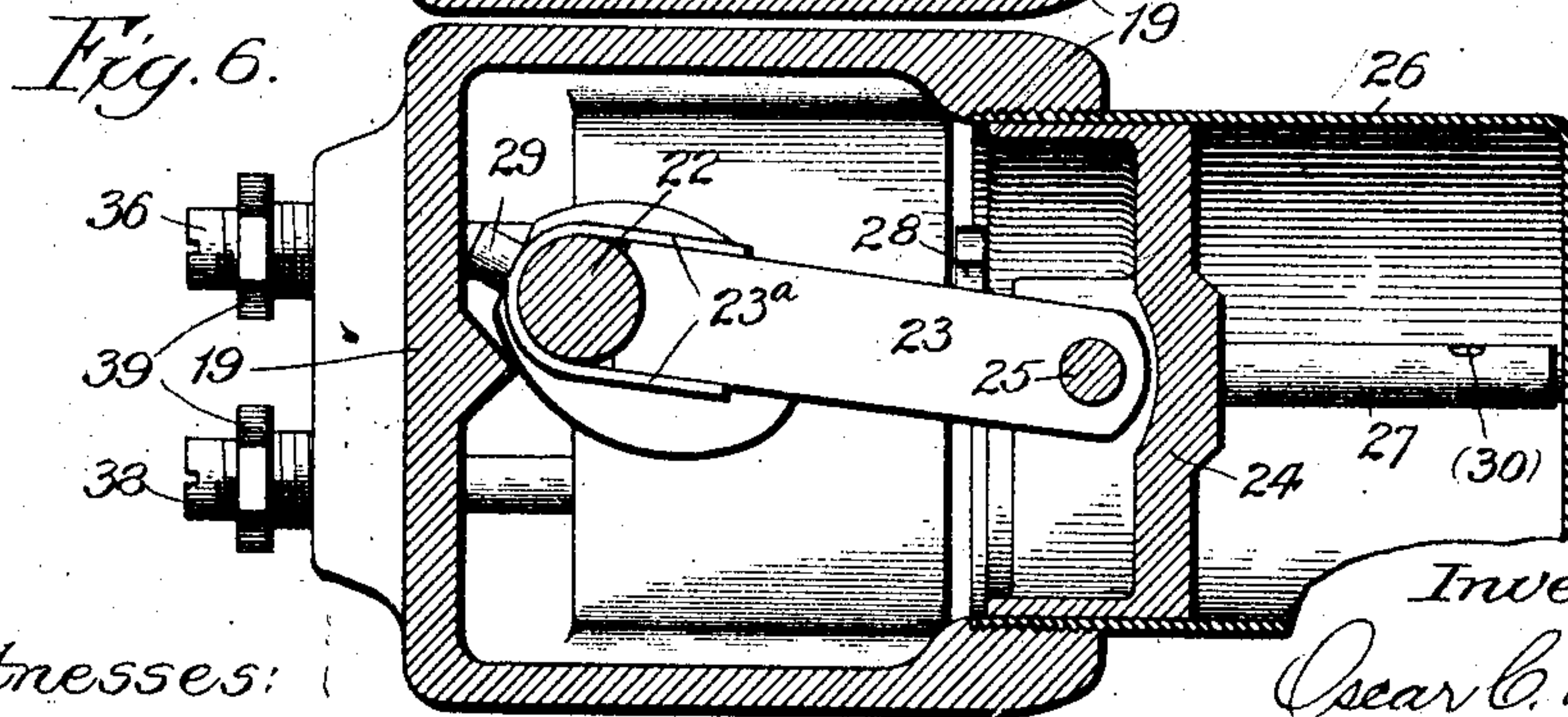
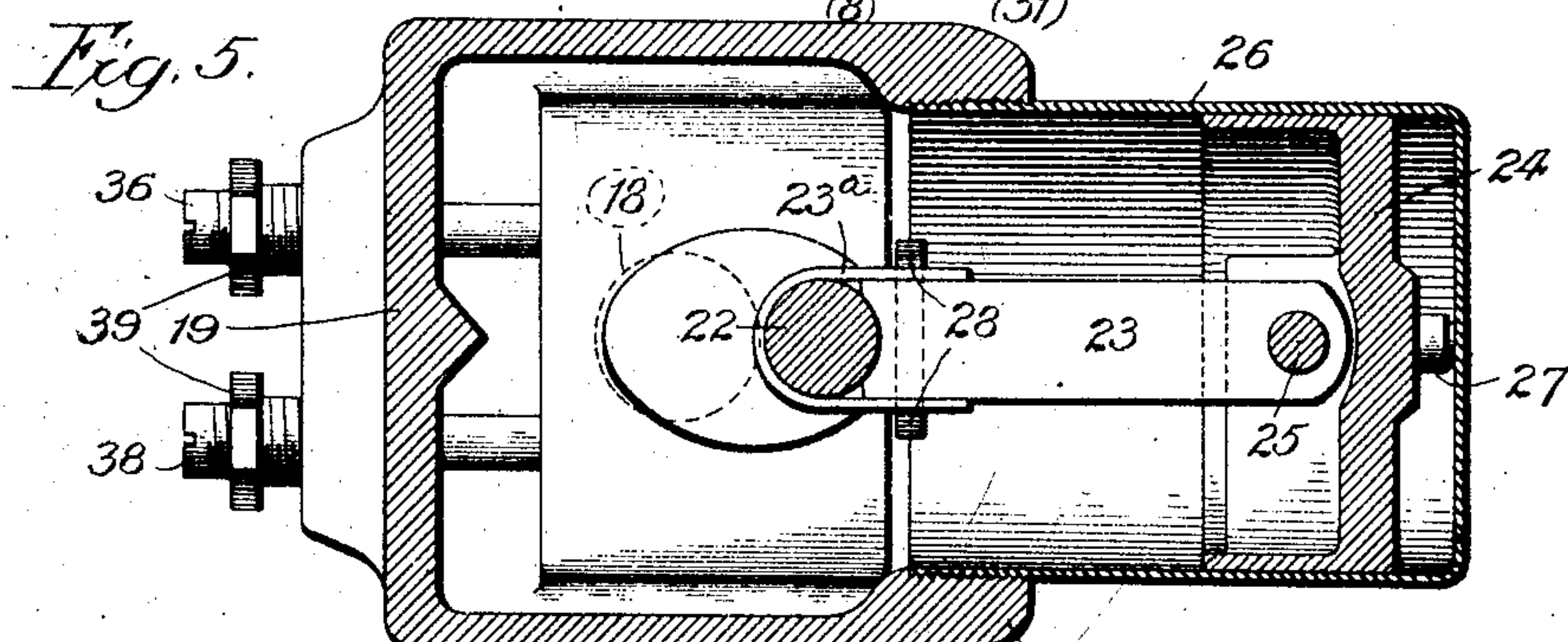
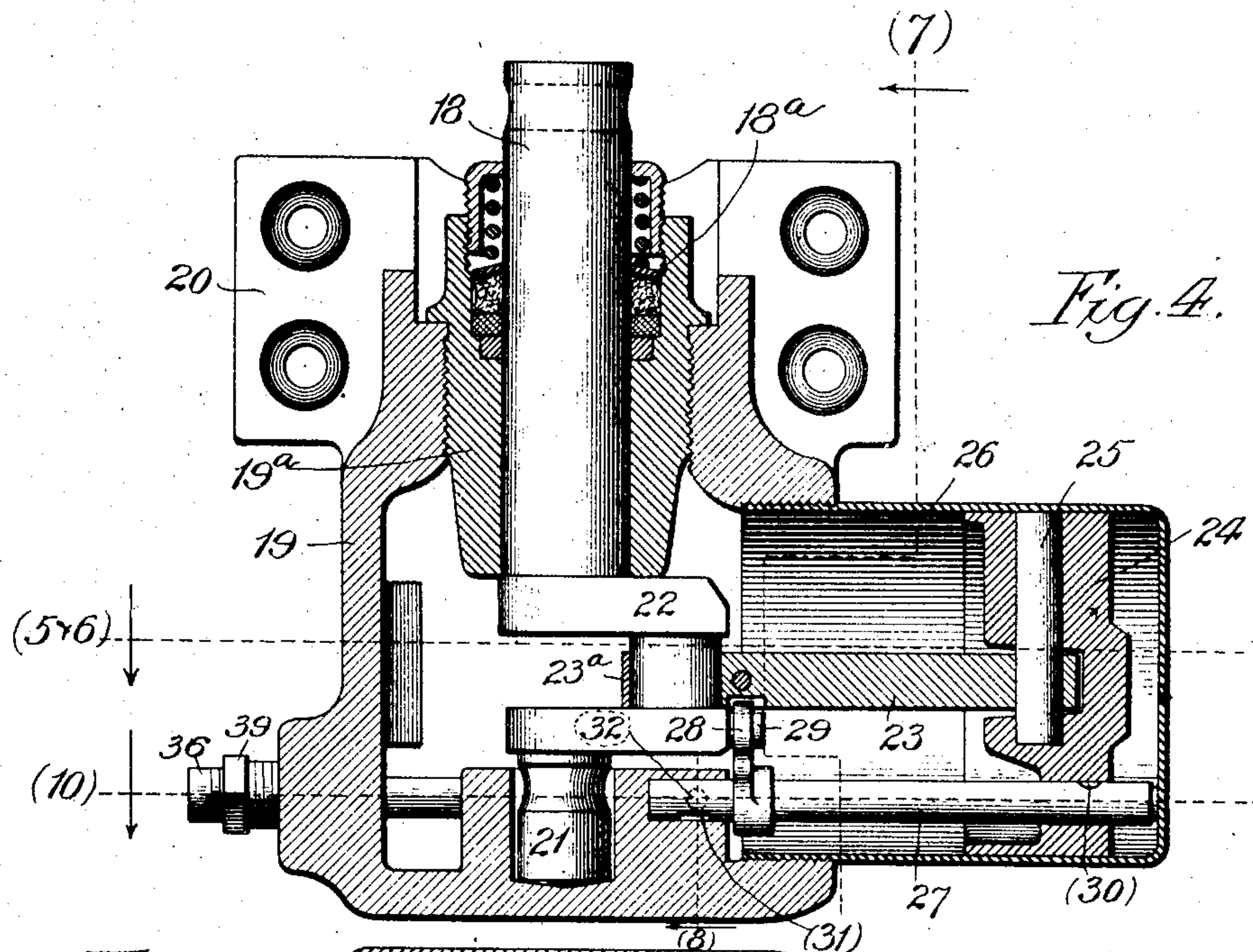
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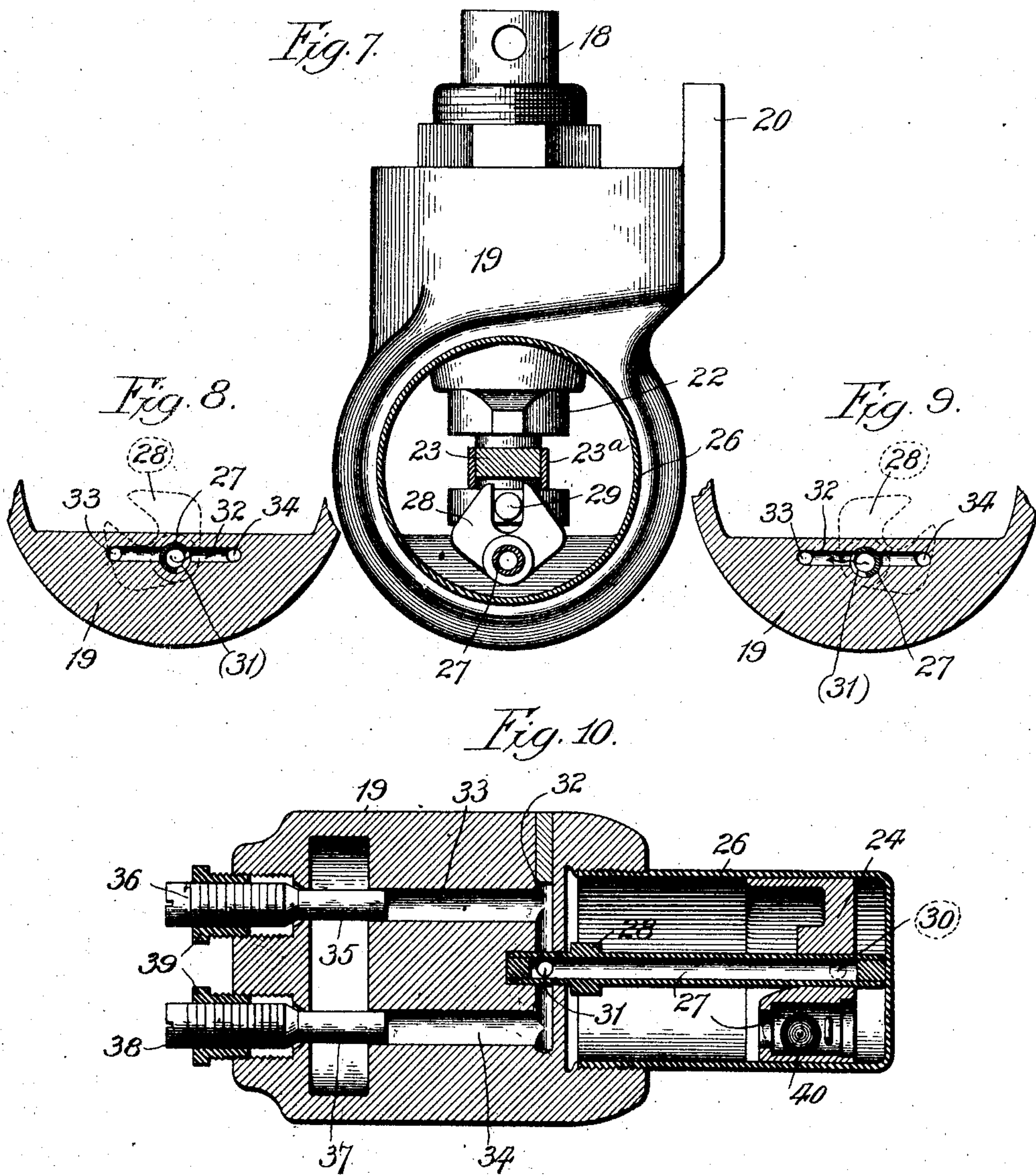
Oscar C. Rixson
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3 SHEETS—SHEET 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

OSCAR C. RIXSON, OF NEW YORK, N. Y.

DOUBLE-ACTING DOOR-CHECK.

No. 833,940.

Specification of Letters Patent.

Patented Oct. 23, 1906.

Application filed June 25, 1904. Serial No. 214,103.

To all whom it may concern:

Be it known that I, OSCAR C. RIXSON, a citizen of the United States, residing at New York, in the State of New York, have invented a certain new and useful Double-Acting Door-Check, of which the following is a specification.

My invention relates to means for checking the closure of doors to prevent slamming, and particularly to door checks designed to allow of opening the door in both directions. The primary objects of the invention are, to provide a double acting check by which the door may be opened in either direction and will be checked by one degree of resistance in closing in one direction, and a different resistance when closing in the opposite direction, when desired, and to vary the resistance as the door closes. Further objects are, to render more simple and effective the checking device and to provide means for regulating the checking force; to provide a fluid escapement check with means to vary the escapement with the approach to closure and also when the spindle operating the check is rotated in different directions; to provide superior devices for regulating the escapement of the fluid, and to generally simplify, cheapen and improve the efficiency of door checks. These objects, and other advantages to hereinafter appear, I attain by means of the structure illustrated in preferred form in the accompanying drawings, wherein—

Figure 1 is a plan view and partial horizontal section showing a door designed to open in both directions and having my improved check applied thereto;

Figure 2 is a side elevation of the same;

Figures 3 and 3^a are partial vertical sections of the joint of the movable arm with its bracket for attaching it to the door casing;

Figure 4 is a vertical section of the checking casing and parts contained therein, taken in a plane parallel with the door, on line (4) in Figure 1, with the actuating arm removed;

Figures 5 and 6 are horizontal sections through the casing, taken on lines (5, 6) in Figure 4, respectively showing the moving parts in two positions;

Figure 7 is a partial side elevation and a broken vertical section, taken along the line (7) in Figure 4;

Figures 8 and 9 are partial sections of part of the casing and illustrating the two alternative positions of the tripping dog revolving the escapement tube, and

Figure 10 is a horizontal section of the casing and cylinder taken through the escapement tube and along the line (10) in Figure 4.

For purposes of illustration I have designed and shown the present door check as applied to a door which swings both inward and outward, and adapted to such positions as outside doors, where when the door opens outward it is aided by the incoming draft in closing, and when it swings inward is opposed by the draft in closing; so that the door in the two opposite closing movements meets with different resistances, to accord with which the checks in the two directions should be properly proportioned.

Referring first to Figures 1 to 3^a, it will be seen that I attach to some stationary part, such as the door jamb, 12, a bracket 13, to which is pivoted an arm 14, with its bearing set at an angle to the plane of movement of the arm so that the arm may swing under the door jamb as the door opens outward. This arm 14 is pivoted at its outer end to the block 14' which is in turn pivoted to a screw-head 15, adjustably engaging the actuating arm 16, which by pivot connection with the head bracket 17, on top of the checking cylinder, engages the checking shaft 18, (shown in Figure 4), and thus as the door swings in or out it swings the arms so as to rotate the shaft 18. It will be noted that when the door opens inward the arm 16 swings forward in one direction with respect to the check, and when the door is opened outward it swings backward in the other direction; and that generally speaking, the shaft 18 has about a quarter rotation when the door is opened in either direction, but that the rotation is in opposite directions in the two cases respectively.

Referring now more particularly to Figures 4 to 10, it will be noted that the checking casing 19 is provided with integral wings 20, which are screwed upon the door as may be desired, as shown in Figure 1, and that this casing 19 is closed by the screw plug 19^a, which furnishes a bearing for one end of the shaft 18, which is tightly sealed by means of any desired form of packing such as that illustrated at 18^a. The other end of the shaft, 21, has a bearing in the casing, and the two ends of the shaft are connected by a double crank 22, which engages the plunger rod 23, by means of the strap 23^a, as shown in Figure 5, and at its outer end the rod carries, on the pivot 25, the checking piston 24,

which fits loosely in the closed cylinder 26, screwed into the casing 19. Thus the entire apparatus is inclosed in the casing and cylinder, and the space is filled with oil or any other fluid desired.

The piston 24 is perforated at one side so as to allow of its movement over the escapement tube 27, and as shown more plainly in Figures 7 to 10, the tube 27 has the rocker arm or tripping dog 28, which engages a pin 29, on the side of the crank 22, so that as the crank swings in the two directions it will engage the dog 28, and rock the tube in two opposite directions, as indicated in Figures 8 and 9. This is for the purpose of causing the outlet 31 at the left of the tube 27, (Figs. 9 and 10), to register alternately with the two sides of the passage 32 in the casing, leading to the two outlets 33 and 34 respectively. By reference to Figures 8 and 9 it will be noted also that as the port 31 approaches its normal position from either side, it gradually restricts its opening to partially cut off the escapement of the liquid. The outer end of the tube has an inlet port 30, which admits of the entrance of the checking fluid into the tube 27, as the piston 24 is carried to the right in the cylinder 26. The tube 27 is closed by plugs at its two ends. It will be understood of course, that some form of check valve, as the ball valve 40, shown in Figure 10, will be used in order to allow the liquid a perfectly free passage through the piston as it moves to the left, but will close as it moves back to the right so as to force the liquid to escape through the port 30 and tube 27.

From Figure 10 especially, it will be seen that the two outlets to the casing from the passage-way 32 are controlled by spindles 35 and 37, which have screw-threaded ends 36 and 38, extending outside the casing 19 and are capable of being adjusted and fixed in place by means of the nuts 39, engaging them and the casing, said spindles fitting loosely enough to allow escape of the fluid, but the speed of escape is varied by the amount of friction which depends upon the length of the escapement passage.

From the above description of the apparatus it will be seen that the action is very simple and is as follows: When the door swings inward, for example, the liquid freely passes through the piston 24 as it moves to the left, and meantime the engagement of the pin 29 with the dog 28 has turned the tube 27 in position to cause the port 31 to register with the passage leading to the left-hand outlet 33, which is controlled by the spindle 35. Upon the return the checking escapement is therefore through outlet 33. If, however, the door opens in the opposite direction, it will be seen that the crank 22, and consequently the pin 29, will swing in the opposite direction and will thereupon

turn the dog 28, as shown in Figure 8, and register the port 31 with the passage 32 on the opposite side, leading to the outlet 34, which is controlled by the other spindle, 37. Since of course the two governing spindles or plugs, 35 and 37, are independently movable and adjustable, these two outlets from the passage-way 32 may be governed at will, so that in its return the piston 24 will meet with any resistances desired, as the spindle 18 revolves in either of the directions. And in either case the escapement varies with the closure, and may be set at any amount by restricting the escape ports 33 and 34. By this device it will appear that the door may swing any distance and swing in either direction, and still the door check may act accordingly as it has been regulated to interpose a certain resistance corresponding to the conditions.

While, as will be observed from Figures 7, 8 and 9, the port 31 is gradually closed to restrict the escapement as the door closes and the pin 29 and crank arm 22 reaches its central position, or "dead center," it is generally necessary on account of the increased leverage the door has in thrusting down the plunger 24 just at this point, to interpose a much augmented resistance. For this purpose it will be noted that I have placed the port 30 at some distance from the end of the tube 27 so that it is closed by the piston 24 before the limit of outward movement is reached. This leaves the only escapement from behind the piston by leakage, and thus additional checking power is applied at the right moment. It will be understood of course, that a tapering file cut may be formed in the tube from the end to the port 30 in order to make the checking effect less sudden, as is customary in such constructions. It is to be noted also that in opening the door the pin 29 will have moved the dog to about the position shown in Figure 8 before the inlet port 30 is uncovered by the piston. For both of the reasons just noted, the checking power is much augmented just as the door closes, whichever direction it may have been opened. Other advantages of the device will readily occur to those familiar with the art.

Having thus described my invention and illustrated its use, what I claim as new, and desire to secure by Letters Patent, is the following:

1. In a door check, the combination with a casing and cylinder, of a piston for the cylinder and devices for moving it by either the inward or outward movement of the door, fluid checking means for the piston, and an escapement from one side of the piston to the other, provided with means for interposing different resistances to the escapement when the door opens inward, and when the door opens outward, substantially as described.

2. In a door check, the combination of ac-

tuating links and a check device attached thereto for opposing the movement of said links, one of the links being attached to the door frame and the other to the door and so
 5 connected as to allow of moving the operating parts of the checking device in either of two directions according as the door opens inward or outward and means in the checking device for interposing different resist-
 10 ances to the checking respectively as the door opens inward or outward.

3. In a door check, the combination of a casing a communicating cylinder and a piston therein, means operated by the opening
 15 of the door to move said piston, an escapement tube passing through the piston and allowing escapement of fluid in front of the same, and means for moving the escape-
 20 ment tube so as to open its escape outlet alternately to two separate and independent ports for escape of the fluid, substantially as described.

4. In a door check, the combination with a closed casing and a piston therein and means operated by the door to move it, of a tube for escapement of fluid in front of said piston, and a pair of regulable outlets with means for alternately making communica-
 30 tion between them and the escapement tube.

5. In a door check, the combination with a casing and a fluid escapement checking device comprising in its construction a piston and a rotatively actuated escapement tube having a port, regulable means in the casing
 35 for varying the amount of escapement from said port by rotation of said tube, and means for operatively connecting said checking devices with a door whereby the closing movement of the same is checked substantially as
 40 described.

6. In a door check, the combination with a cylinder inclosing checking fluid, a piston therein and means to reciprocate it including links connected to the door frame and door
 45 and operated by the movement of the door, and an escapement tube passing through the piston and means to rotate it and means whereby said rotation puts the tube in communication alternately with one or the other
 50 of several outlet ports, as it is rotated in different directions.

7. In a door check, the combination with a closed casing and a checking piston therein and means operatively connecting the same
 55 to the door for moving it, including an actuating spindle and crank arm for operating the piston and means for turning the spindle in opposite directions, an escapement tube for the fluid in front of the piston and means
 60 connecting said tube and crank arm for alternately making communication of said tube with two independent outlet ports.

8. In a door check, the combination with a closed cylinder and a piston therein and means for reciprocating the piston by the

movement of the door, of an escapement tube passing through said piston and opening into the casing alternately by way of two independent ports, and means for independ-
 70 ently regulating the opening of said two escapement ports.

9. In a door check, the combination with a checking cylinder and a piston therein and a rotary escapement tube passing through
 75 the piston of the two independent regulable ports for the escapement of the fluid from said tube, and means for rotating the tube so as to communicate alternately with said ports.

10. In a door check, the combination with
 80 actuating means and a checking cylinder, of a crank operatively connected to its actuating means and a checking piston connected to and moved by the crank in the cylinder, an escapement tube passing through the pis-
 85 ton, devices connecting the tube and crank whereby the movement of the crank rocks the escapement tube, and a series of ports registering alternately with an outlet of the
 90 escapement tube as it is turned by the movement of the crank.

11. The combination of a pivoted link attached to the door frame and an actuating link pivoted thereto, a casing attached to the door and a spindle in the casing engaging the
 95 latter actuating link, a checking piston in the casing, an escapement tube for fluid in front of the piston, a pair of independently regulable outlet ports from the escapement tube, and means operated by the movement
 100 of said rotating spindle to reciprocate said piston and to put the escapement tube into communication alternately with the said outlet ports as the door moves in different di-
 105 rections.

12. In a door check, the combination with a casing on the door and a spindle therein, of a series of links attached to the door frame and to the spindle to revolve it in opposite
 110 directions as the door opens inwardly or outwardly, a piston in the casing moved by said spindle, an escapement tube for fluid in front of the piston, means operated by said spindle to reciprocate said piston and to turn the
 115 tube in two different positions, and adjustable outlet ports adapted to register with the escapement tube in its two different positions respectively.

13. In a door check, the combination with a checking device including a cylinder and a
 120 piston and devices for operating it by the movement of the door, of a rotating escapement tube communicating with the fluid in front of the piston, a connection from the devices for operating the piston and the tube
 125 whereby the tube may be revolved, and means to vary the outlet port of the tube by its rotation and thereby vary the escape-
 130 ment of the fluid behind the piston.

14. In a door check, the combination with

- a checking device including a cylinder and a piston therein, and a device attached to the door to move the piston, of an escapement tube for fluid in front of the piston moved by the piston-moving devices, and means for varying the escapement outlet from said tube by such revolution, and separate means to vary the resistance of escaping fluid after passage out of the tube.
15. In a double acting door check, the combination with a checking device on the door, a lever arm operatively connected thereto, and an actuating link connecting such lever arm to the door frame, of a supporting bracket on the frame for such link having a pivot for the link set at an angle to the axis of the door hinge whereby the link may swing under the door frame while the checking device moves in a horizontal plane.
16. In a double acting door check, the combination with a checking device on the door provided with a rotary checking shaft, of an actuating link therefor pivoted on the side of the door frame so as to swing in a plane at an angle to the horizontal, and another link universally pivoted at one end to the first link and at the other end pivoted to the checking shaft for movement in a verti-

cal direction, whereby the checking device may move in a horizontal plane, and the links move angularly under the door frame.

17. In a double acting door check the combination with a checking device, of actuating links for the checking device attached outside the door frame, one of which is pivoted to the door frame so as to swing under the same when the door opens away from the point of attachment of the same to the frame.

18. In a double acting door check the combination with a checking device of an actuating mechanism, one member of which is attached to the checking device and the other member to the door frame, said members angularly pivoted for swinging under the door frame when the door opens away from the point of attachment of the mechanism to the frame and swings over the top of the door when the door opens in the other direction.

In testimony whereof I have hereunder signed my name in the presence of the two subscribed witnesses.

OSCAR C. RIXSON.

Witnesses:

E. T. ANDERSON,
PAUL CARPENTER.