

No. 736,850.

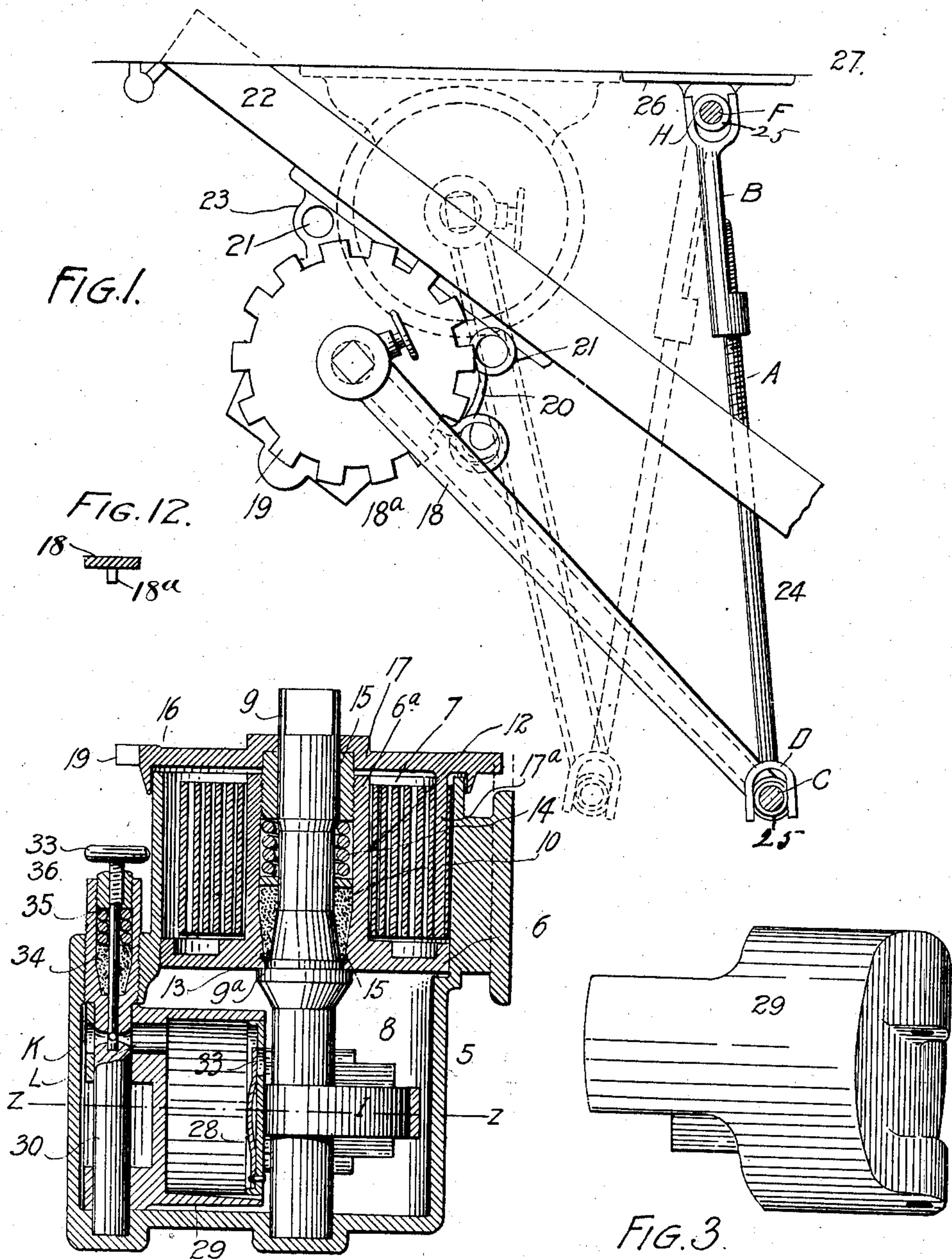
PATENTED AUG. 18, 1903.

R. C. HILLS & H. A. GROSS.
COMBINED DOOR CHECK AND CLOSER.

APPLICATION FILED NOV. 26, 1901. RENEWED JUNE 20, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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Dana Nelson.

INVENTORS

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BY

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No. 736,850.

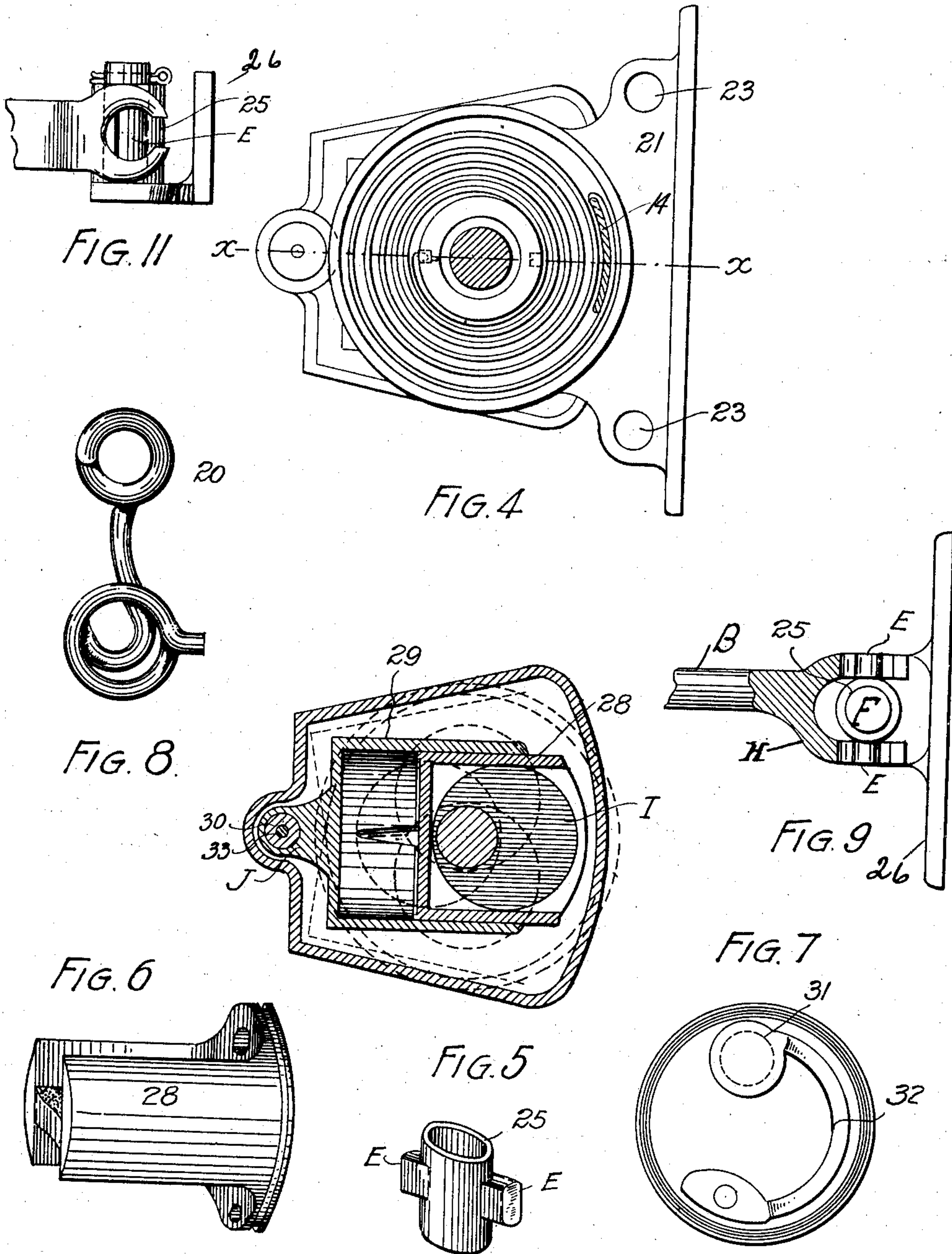
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WITNESSES:
[Signature]
Dena Nelson.

FIG. 10.

INVENTORS
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UNITED STATES PATENT OFFICE.

RICHARD C. HILLS, OF DENVER, AND HARRY A. GROSS, OF WALSENBURG,
COLORADO.

COMBINED DOOR CHECK AND CLOSER.

SPECIFICATION forming part of Letters Patent No. 736,850, dated August 18, 1903.

Application filed November 26, 1901. Renewed June 20, 1903. Serial No. 162,451. (No model.)

To all whom it may concern:

Be it known that we, RICHARD C. HILLS, a subject of the King of Great Britain, residing at Denver, in the county of Arapahoe, and HARRY A. GROSS, a citizen of the United States of America, residing at Walsenburg, in the county of Huerfano, State of Colorado, have invented certain new and useful Improvements in a Combined Door Check and Closer; and we do 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, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in a combined door check and closer of the class set forth in the Letters Patent No. 678,339 and dated July 9, 1901.

Our invention may be considered an improvement over the construction shown in said patent, and consists of certain novel features of construction and arrangement of parts, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment of the invention.

In the drawings, Figure 1 is a top or plan view of our improved device shown in use and in two positions, one in full lines and one in dotted lines. The full lines show the position of the parts when the door is partly open and the dotted lines the position of the parts when the door is closed. Fig. 2 is a central vertical section taken on the line xx , Fig. 4. Fig. 3 is a perspective view of the oscillating cylinder shown on a larger scale. Fig. 4 is a top view of the same with the cap removed, parts being shown in section. Fig. 5 is a horizontal section taken on the line zz , Fig. 2. Fig. 6 is a perspective view of the cylinder plunger or piston. Fig. 7 is an interior view of the same. Fig. 8 is a detail view of a spring dog or stop shown on a larger scale than in Fig. 1. Fig. 9 is a fragmentary top view, partly in section, of the rod which connects the door frame or casing with the lever-arm of the device. Fig. 10 is a perspective view of a bearing-sleeve forming a

part of a novel construction of joint. Fig. 11 is a side view of the construction shown in Fig. 9. Fig. 12 is a cross-section taken through the lever-arm to show the lug which engages a notch of the cap.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the casing, which is separated by a horizontal partition 6 into upper and lower compartments 7 and 8, which will be termed in this specification the "spring" and "liquid" chambers, respectively. The partition 6 is provided with a central upwardly-projecting sleeve 6^a, through which passes the main vertical spindle 9, provided with a shoulder 9^a, which engages the lower surface of the horizontal partition, around the opening therein. The sleeve 6^a forms a packing-chamber surrounding the spindle, its lower extremity being cone-shaped and containing a packing-sleeve 10, surrounding the spindle, which is provided with a conical portion coöperating with the inner receptacle for the packing-sleeve. This sleeve is composed of suitable packing material and provided with metal washers or rings 12 and 13, located, respectively, above and below the same. Located in the packing-chamber and engaging the ring 12 from above is a coil-spring 14, which is compressed by a packing-nut 15, screwed into the top of the packing-chamber. This packing construction forms a liquid-tight joint around the spindle between the liquid and spring chambers.

The power-spring 16 is made fast at one extremity to the sleeve 6^a, which is stationary on the casing, the partition 6 being screwed thereinto. The outer extremity of the power-spring is made fast to a depending projection 17^a, attached to the cap 17, which turns freely on the top of the casing. This cap is provided with a central opening through which the spindle 9 passes and above which the upper extremity of the spindle projects far enough to be connected with the lever-arm 18, to which it is made fast. The outer edge or periphery of the cap is notched, as shown at 19, to receive one extremity of a dog 20, which is mounted on the bracket 21, secured to the door 22. This dog is formed from an integral piece of spring-wire. One extremity

is coiled to form a socket adapted to slip over a stud 23, formed integral with or made fast to the bracket 21 in any suitable manner. There are two studs on the bracket and the dog is reversible, being adapted to engage either stud, whereby it is arranged to accommodate itself to a door opening in either direction. In changing from one stud to another it is only necessary to turn it over. This spring-dog is also coiled at the extremity which engages the notches of the cap, whereby it possesses a certain degree of yielding capacity. This dog, as will readily be understood, forms a stop to hold the door open. It allows the door to move or yield without injury to the mechanism in case force is applied through mishap or accident.

The inner extremity of the lever-arm 18 is made fast to the upper extremity of the spindle 9, while its outer extremity is connected with a rod 24, which is composed of two parts A and B, one threaded in the other, whereby the rod is made extensible. The outer extremity of the lever-arm 18 is provided with a stud C, which engages a sleeve 25, located in the fork-arms of the extremity D of the rod 24. This sleeve is provided with two lugs E, which are elongated in the direction of the axis of the sleeve. The fork-arms of the extremity D of the rod 24 are slotted to receive the lugs E lengthwise or the narrow way, and after the sleeve has been inserted it is turned to a position at right angles to the position of insertion. The fork-arms are provided with a socket to receive these lugs, and when in the last-named or operative position the lugs cannot slip out of the slots in the arms until the sleeve is turned to the position aforesaid by detaching it from the stud of the lever-arm.

The opposite extremity of the extensible rod is connected with a bracket 26, attached to the door-casing 27 in the same manner. This bracket is provided with a stud F, which enters the sleeve 25, mounted in the forked extremity H of the rod. The lever-arm 18 is provided with a depending lug 18^a, which engages a notch 19 in the periphery of the cap 17.

The lower extremity of the spindle 9 is journaled in a socket formed in the bottom of the casing. The portion of this spindle which passes through the liquid-chamber is provided with an eccentric disk I, which fits a ring or strap formed in a plunger 28, arranged to reciprocate in a cylinder 29, which is mounted to oscillate in the liquid-chamber on a pintle 30, screwed into the casing from above and to one side of the liquid-chamber. The cylinder is provided with a lug J, having two separated apertured parts through which the pintle passes. This pintle 30 is provided with a small opening K in line with an opening L formed in the base of the cylinder. The interior surface of the base of the plunger is provided with a valve 31, having a spring-arm 32 secured to the plunger at its extremity re-

mote from the valve, which normally closes an opening 33 in the plunger-base.

When the device is in use, the chamber 8 is filled with liquid, preferably oil. When the door is closed, the plunger is at its inward limit of movement, its base being adjacent the base of the cylinder. As the door is opened the casing is turned on the spindle and the spring 16 placed under tension by virtue of the construction and arrangement of parts heretofore described. This opening movement of the door withdraws the plunger from the base of the cylinder and the valve 31 opens, allowing the liquid to pass freely into the space between the heads or bases of the cylinder and the plunger. During the operation of opening the door the stop-dog 20 is disengaged from the notches of the cap, but when the door is opened the dog is thrown to engagement with a notch of the cap if it is desired to hold the door in the opened position.

As soon as the door is released from the holding-dog or the opening force applied, as the case may be, the recoil of the spring acts to close the door and return the operating parts to their normal position or that corresponding with the position of the door when closed. During this closing movement the spindle 9 is turned to force the plunger into the cylinder by virtue of the action of the eccentric disk in the ring of the plunger. This inward movement of the piston is resisted by the liquid in the cylinder, and the closing movement of the door is regulated by the passage of the liquid through the opening K in the pintle 30, and the passage of the liquid through said opening is controlled by a screw-valve 33, inserted in the upper part of the pintle 30, which is provided with a conical cavity for the reception of packing 34. Above this packing is located a coil-spring 35, which is held under tension by a bushing-nut 36, screwed into the top of the opening of the pintle. The upper part of the screw-valve is threaded in the bushing-nut. This packing construction forms a liquid-tight joint to prevent the escape of the liquid around the screw-valve.

Having thus described our invention, what we claim is—

1. A dog formed from an integral piece of spring-wire, coiled at its holding end to give it yielding capacity, and at its opposite end to form an opening for the support upon which it may be mounted.

2. In a door check and closer, the combination of a lever-arm, and a rod connecting the lever-arm with a relatively stationary support, the arm being provided with a stud, and the adjacent extremity of the rod forked, the arms of the fork being slotted, and a sleeve adapted to receive the stud of the lever-arm, said sleeve having elongated lugs on opposite sides adapted to enter the slots of the forked arms which are provided with bearings for the lugs, the arrangement being such that

when the sleeve is turned at right angles to the position of insertion, it is prevented from slipping out of the forked arms.

3. The combination of two parts, one having a stud and the other being forked and having its forked arms slotted, a sleeve adapted to pass between the forked arms and to receive the stud, the said sleeve having lugs on opposite sides elongated in the direction of the axis of the sleeve, and adapted to enter the slots of the forked arms, the narrow way of the lugs, the said arms being fashioned to form a bearing for the lugs, the arrangement being such that the sleeve is held in position, when turned to a position at right angles to the position of insertion.

4. In a door check and closer, the combination with a casing and a spring-restored spindle located therein, of a cap movable on the

casing and provided with notches in its periphery, said cap being connected to turn with the spindle, a lever-arm connected to turn with the spindle and cap, and a spring-dog mounted on the casing and arranged to engage a notch of the cap to hold the door open, the said dog being formed from an integral piece of spring-wire coiled at its holding end to give it yielding capacity, and at its opposite end to form an opening for the support upon which it may be mounted.

In testimony whereof we affix our signatures in presence of two witnesses.

RICHARD C. HILLS.
HARRY A. GROSS.

Witnesses:

DENA NELSON,
A. J. O'BRIEN.