

W. K. HENRY.
DOOR CLOSER.

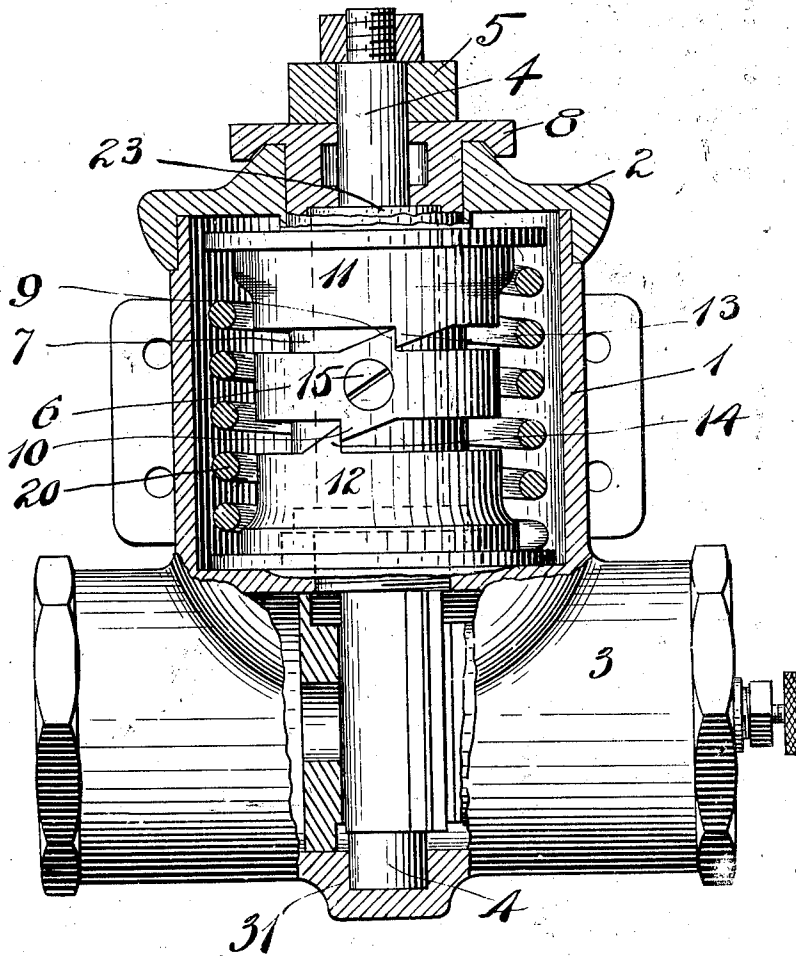
APPLICATION FILED MAR. 21, 1910.

967,769.

Patented Aug. 16, 1910.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Charles R. ...
Fred W. Dammeyer

Inventor:

W. K. HENRY

Charles R. ...
Frederick W. Dammeyer

W. K. HENRY.

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4 SHEETS—SHEET 2.

Fig. 2.

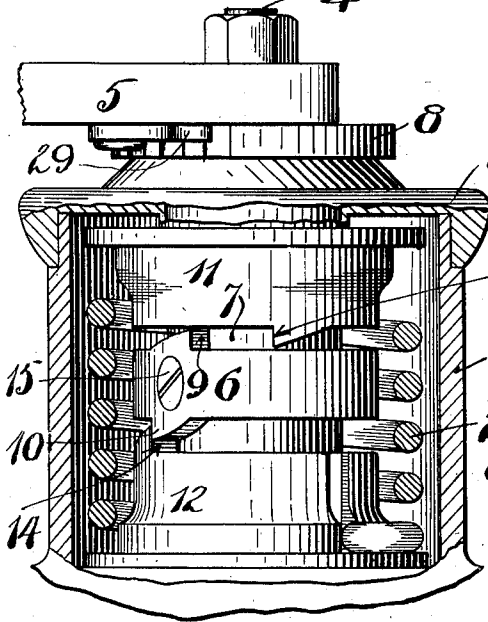


Fig. 3.

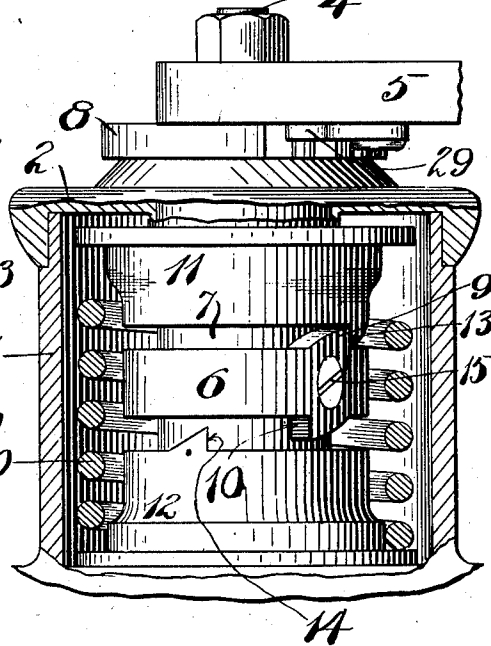
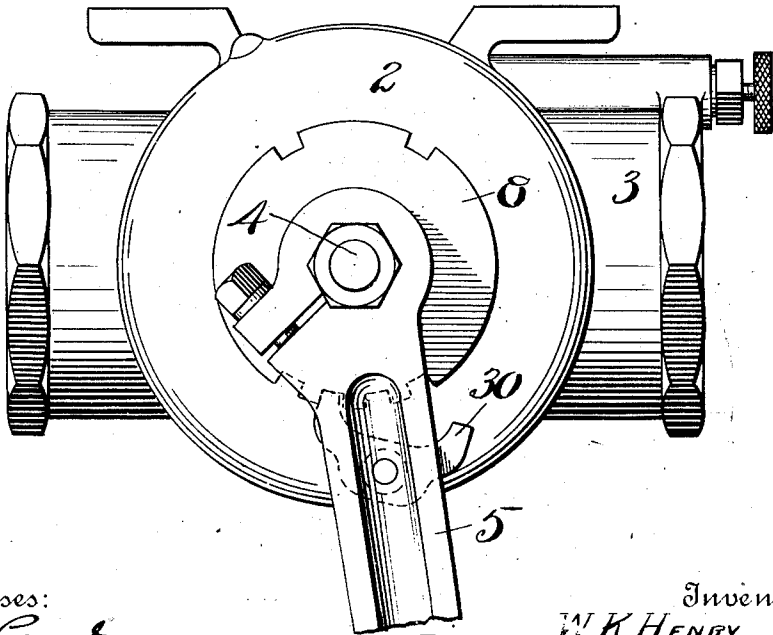


Fig. 4.



Witnesses:

Chas. A. Raudy
Fred M. Danvers

Inventor

W. K. HENRY.

Antony Bonner & Tuckwell

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4 SHEETS—SHEET 3.

Fig. 5.

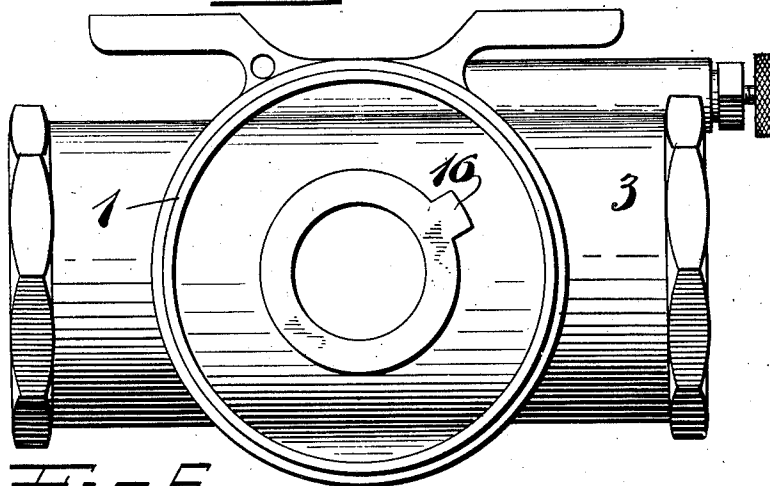


Fig. 6.

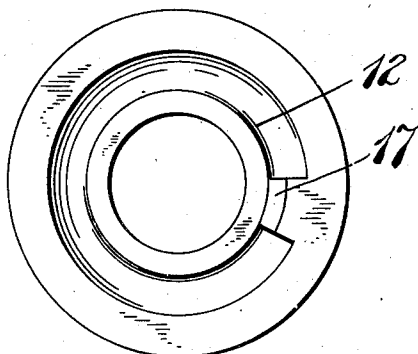


Fig. 7.

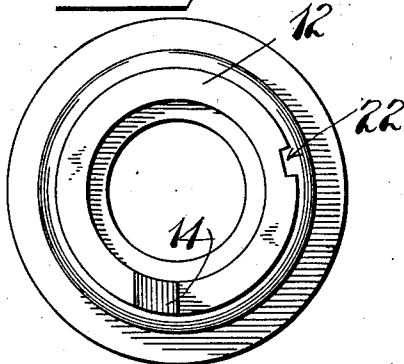
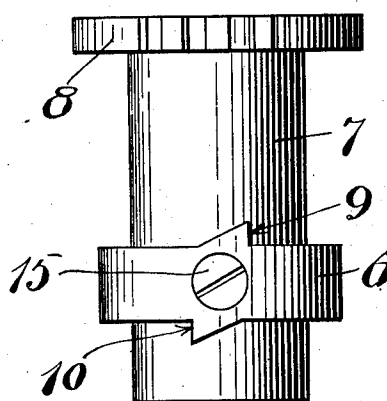


Fig. 8.



Witnesses:

Charles E. Case
Fred W. Warrumbler

Inventor

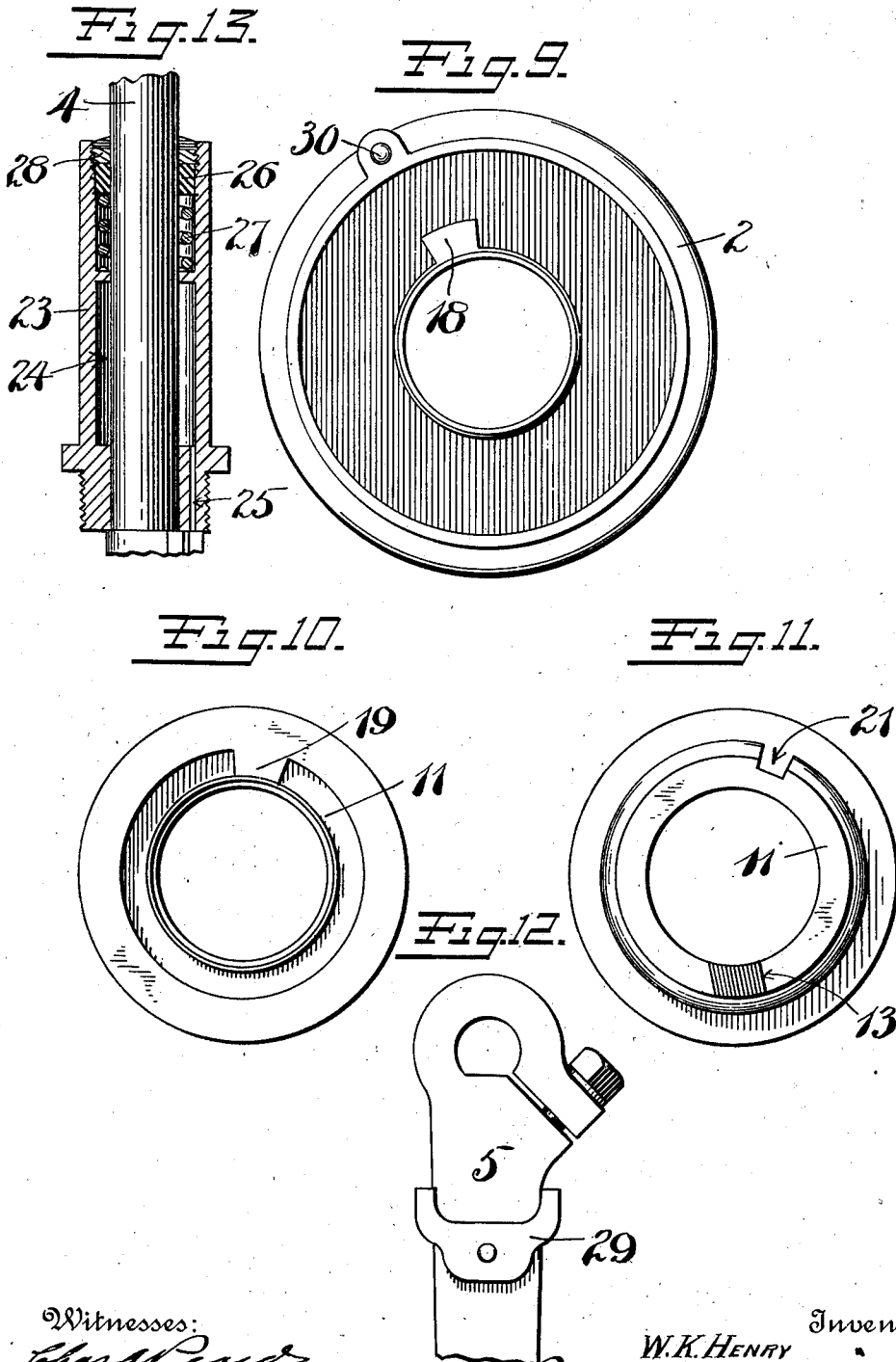
W. K. Henry
By *James C. Mott*, Attorney

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4 SHEETS—SHEET 4.



Witnesses:
Charles Reed
Fred W. Dammunfeller

Inventor
W. K. HENRY
By *his Attorneys*
Paul & Company

UNITED STATES PATENT OFFICE.

WILLIAM K. HENRY, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO P. & F. CORBIN,
OF NEW BRITAIN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

DOOR-CLOSER.

967,769.

Specification of Letters Patent. Patented Aug. 16, 1910.

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To all whom it may concern:

Be it known that I, WILLIAM K. HENRY, a citizen of the United States, residing at New Britain, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Door-Closers, of which the following is a full, clear, and exact description.

My invention relates to improvements in door closers.

In the preferred form of my invention the closer is associated with door checking mechanism of any suitable construction.

The object of the invention is to improve the closer mechanism in a variety of ways as will later be explained.

In the drawings—Figure 1 is a side elevation of a combined door closer and check, certain parts being shown in section to reveal the interior arrangement; Fig. 2 is a similar view minus the check and showing the parts in different position; Fig. 3 is a view similar to Fig. 2 but showing the parts in still another position; Fig. 4 is a plan view of the assembled mechanism; Fig. 5 is a plan view, the cap and interior movable parts of the closer being removed; Fig. 6 is a view of the under side of what I will term the lower dog; Fig. 7 is a view of the upper side of said dog; Fig. 8 is a side elevation of the clutch; Fig. 9 is a view of the under side of the cap for the closer case; Fig. 10 is a view of the top side of what I will term the upper dog; Fig. 11 is a view of the under side of the upper dog; Fig. 12 is a view of the under side of the lever arm; Fig. 13 is a vertical sectional view of what I will term the combined center support and bushing.

1 is the closer case or housing preferably of cylindrical outline and provided with a removable cap 2.

3 is the case or housing of a door check mechanism, the same being preferably integrally formed with the case 1 and containing any suitable checking mechanism, preferably of the so-called "liquid" type.

4 is a spindle passing centrally down through the case 1 and through the partition wall at the base of the same between said case and the cylinder 3, the lower part of the spindle being suitably connected with the checking mechanism.

5 is a lever arm, such as customarily connected to the upper end of the spindle 4,

and by which the closer and check is connected to a door casing, the check itself being usually connected to the door proper.

It should be understood that the apparatus is adapted to either a right or left hand door, and that when properly applied to a door, the opening and closing movement of the door imparts a swinging movement to the lever arm 5.

6 is a clutch rigidly mounted upon the sleeve 7, the upper end of the latter projecting through the cap 2 and is provided with a toothed or notched flange 8 at a point outside of the cap 2. The clutch 6 is provided with oppositely facing clutch teeth or shoulders 9—10. Rotatably mounted upon the sleeve 7 above and below the clutch 6 are dogs 11—12 respectively. The upper dog 11 has an abutment tooth or shoulder 13, which is arranged to be engaged by the clutch teeth 9. The lower dog has an abutment tooth or shoulder 14 arranged to be engaged by the clutch tooth 10. The clutch 6 may be formed upon the sleeve 7 in any suitable way or may be separately formed and secured thereto as by a screw 15.

The bottom of the case is provided with a back stop 16 arranged eccentrically while the under side of the lower dog 12 has a stop shoulder 17 which is so arranged as to engage the aforesaid back stop 16, which latter acts as a back stop to limit the rearward turning movement of the dog 12. The cap 2 is provided on its under side with a back stop 18 while the upper side of the upper dog 11 is provided with a stop shoulder 19 arranged to co-act with the back stop 18, the latter serving to limit the rearward turning movement of the upper dog.

20 is a coil spring, one end of which is anchored in a notch 21 in the upper dog 11, the other end being anchored in a notch 22 in the lower dog 12. The action of the spring 20 is to pull the two dogs toward the two back stops 16—18 respectively.

23 is a combined center support and bushing which is mounted in the center of the bottom of the case 1, and through which passes the spindle 4. This center bearing extends upwardly to approximately the level of the top of the case 1 and is provided with an inner air chamber 24 with a return flow duct 25. It may also contain a packing 26, held by a spiral spring 27 against the inner

end of an adjustable gland 28. The length of this bushing not only permits the same to be employed as a center support for the various rotatable inner parts, namely, the clutch and dogs, but also by reason of its length absolutely prevents the possibility of any liquid from the check chamber working up into the spring chamber.

29 is a dog or pawl pivotally mounted on the under side of the lever arm 5 and arranged to engage in any one of the notches in the flange 8. By preference, the pawl 29 is double-ended whereby it may be easily adapted to right or left hand adjustment. The cap 2 is held against turning on the case 1 in any suitable way, for example, by a pin 30, carried by the under side of the cap and arranged to take into a corresponding opening in the upper end of the case 1.

It will be observed that the rear sides of the teeth or abutment shoulders 9—13 and 10—14 are correspondingly beveled, which is a preferred construction, since it permits the dog 11 to make practically a complete forward revolution. The same is also true of the dog 12. When it is desired to adjust the spring finally to determine its force on the lever arm 5, a spanner or suitable wrench may be applied to the flange 8, and the clutch turned in the desired direction, according to the swing of the door to which the check is applied. This turning movement turns the clutch 6 and one of the dogs 11 or 12 (as the case may be) in a direction to wind up the spring to the desired extent. Finally the pawl or dog 29 is then moved into one of the notches in the flange 8, whereupon the tension of the spring will be applied directly to the lever arm through the medium of the flange 8 and pawl 29. To adapt the apparatus to a door swinging in an opposite direction, the pawl 26 is released and the parts are shifted to the opposite position and the pawl again moved into its flange engaging position.

It will be observed that all the parts are so proportioned and arranged that the greatest strength and durability is secured. The parts are also so designed that they may be manufactured at comparatively small cost. As shown, the spindle 4 not only takes a bearing within the bushing 23 at a point intermediate the length of the former but it also is preferably stepped at its lower end in a bearing 31 in the lower end of the check case 3 so that side strain on the spindle is resisted most effectively.

When assembled, it will be seen that all of the rotatable parts find a common support upon the bushing 23 and are thereby guaranteed at once effective and accurate alinement. Further than this, it permits the clutch and dogs to be made of maximum proportions and to be engaged for driving purposes near their periphery where the

greatest leverage is afforded, all of which features contribute to the strength and durability of the entire apparatus.

What I claim is:

1. In a door closer, a housing, a rotatable spindle, a hollow center support therefor, a lever arm connected to the spindle, a double-acting closer spring, a rotatable clutch, means for adjustably connecting said clutch with said arm, including a sleeve carrying the clutch, and means standing on said sleeve and at opposite ends of the clutch for alternate engagement thereby, the ends of said spring being respectively connected with said clutch through the medium of said means, said sleeve surrounding and being supported by said center support.

2. In a door closer, a housing, a rotatable spindle, a lever arm connected thereto, a double-acting closer spring, a rotatable clutch, means for adjustably connecting said clutch with said arm, including a sleeve carrying the clutch, and means standing at opposite ends of the clutch and independently rotatable on said sleeve for alternate engagement by the clutch, the ends of said spring being respectively connected with said clutch through the medium of said means, and a single support in common to said sleeve and said spindle and between the same.

3. In a door closer and check, a housing, a rotatable spindle, a lever arm connected thereto, a double-acting closer spring, a rotatable clutch, means for adjustably connecting said clutch with said arm, dogs at opposite ends of said clutch for alternate engagement thereby, said springs being operatively connected with said dogs, the ends of said spring being respectively connected to said clutch by said dogs, a back stop device for each of said dogs to limit the backward turning movement of the same, and a central tubular support for said clutch and dogs, said spindle passing through said support and having a bearing within the same, and a checking device connected with said spindle.

4. In a door closer and check, a housing, a rotatable spindle, a lever arm connected thereto, a double-acting closer spring, a rotatable clutch, means for adjustably connecting said clutch with said arm, dogs at opposite ends of said clutch for alternate engagement thereby, said spring being operatively connected with said dogs, the ends of said spring being respectively connected to said clutch by said dogs, a back stop device for each of said dogs to limit the backward turning movement of the same, a central tubular support for said clutch and dogs, said spindle passing through said support and having a bearing within the same, said center support having an elongated annular air space and a packing at one end of said air space, and a liquid door checking de-

vice connected to the lower end of said spindle.

5. In a reversible door closer, a spindle, a lever arm rigidly secured thereto, a double-acting spring indirectly connected at both ends with said spindle, said indirect connection including two rotatable dogs, a clutch cooperating therewith, reversible and adjustable means of connection between said clutch and said lever arm, said clutch and dog mechanism having a central fixed bearing support independent of said spindle.

6. In a reversible door closer, a spindle, a lever arm rigidly secured thereto, a double-acting spring indirectly connected at both ends with said spindle, said indirect connection including two rotatable dogs, a clutch cooperating therewith, reversible and adjustable means of connection between said clutch and said lever arm, said clutch and dog mechanism having a central fixed bearing support independent of said spindle.

7. In a door closer, a housing, a central tubular bearing support extending from the lower end of said housing to a point near the upper end of said housing, a sleeve rotatable thereon, a clutch mounted upon said sleeve, two dogs rotatable on said sleeve and arranged one above and one below said clutch and arranged to be alternately engaged by said clutch, a back stop for each of said dogs to limit the rearward turning movement of the same, a coil spring surrounding said parts and engaged at opposite ends with said dogs and operating to

turn them in a rearward direction toward said back stops, a spindle passing through said central tubular bearing, a lever arm fixed on the outer end of the spindle, and means for reversibly and adjustably connecting said lever arm to the clutch sleeve externally of the casing.

8. In a closer mechanism, a casing, a central rotatable spindle, a stationary tubular center bearing surrounding said spindle, a lower dog mounted to rotate relatively to said spindle, a clutch arranged above said dog and to engage said dog when turned in one direction for the purpose of rotating the latter, a sleeve-like extension from said clutch surrounding and supported by said center bearing, an upper dog rotatably mounted upon said sleeve-like extension and arranged to be engaged by said clutch, a back stop for each of said dogs, a removable cap for said casing, said cap carrying one of said back stops, a coiled spring surrounding said parts and connected with said dogs and arranged to move them toward said back stops, a lever arm fixed on the spindle, and means for adjustably connecting said lever arm with the sleeve extending from said clutch, said lever connecting means being shiftable for either right or left hand rotation of the spindle.

WILLIAM K. HENRY.

Witnesses:

IDA M. HUNZIKER,
CHAS. A. PEARD.