R. R. RUNDELL.

COMBINED CHECK AND CLOSER.

APPLICATION FILED OCT. 18, 1921.

1,425,900. Patented Aug. 15, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

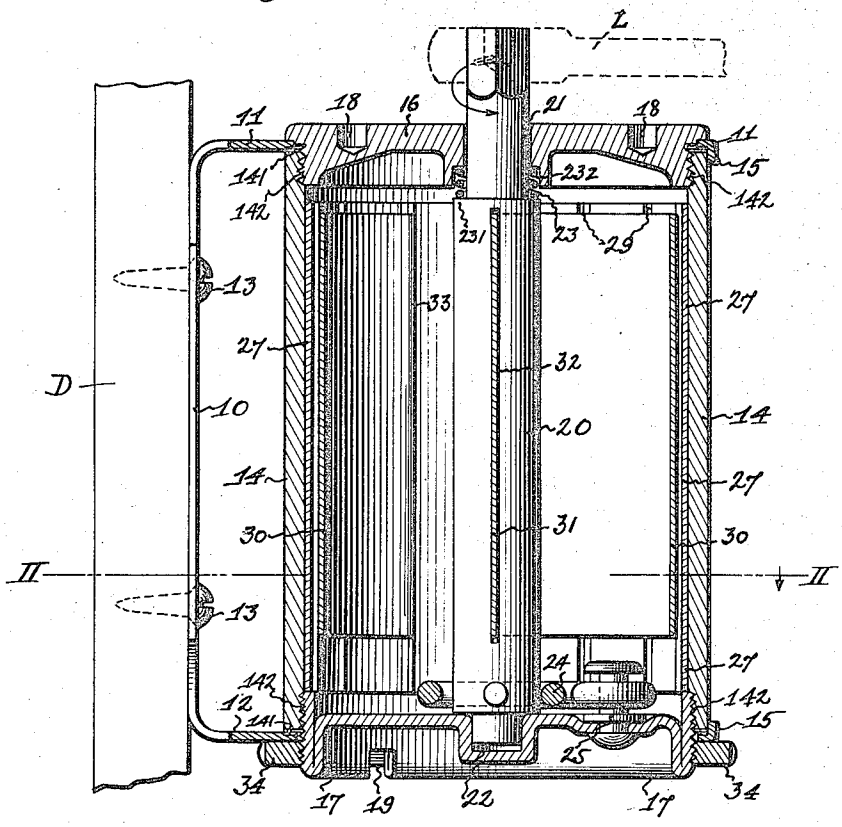
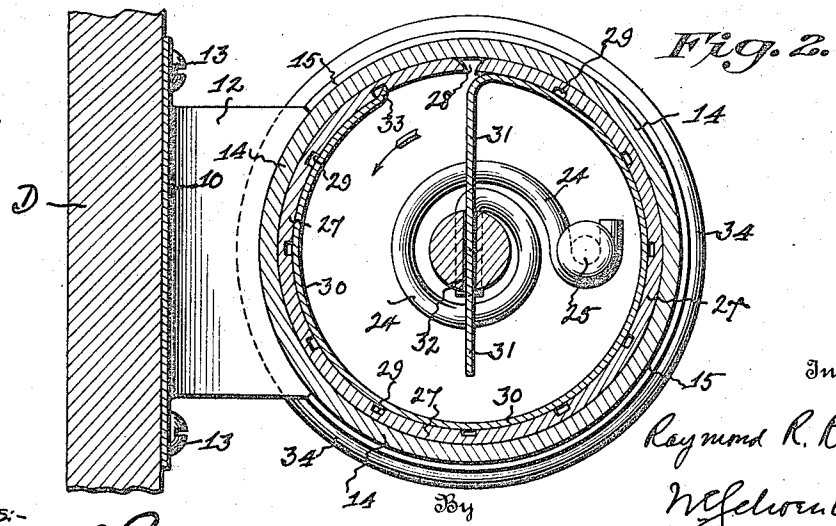


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

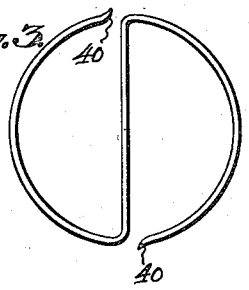


Fig. 5.

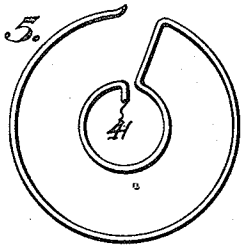


Fig. 4.

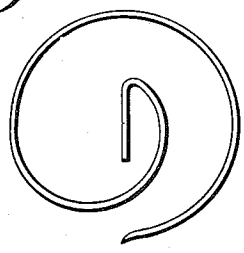


Fig. 6.

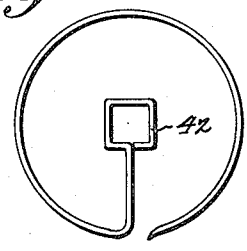


Fig. 7.

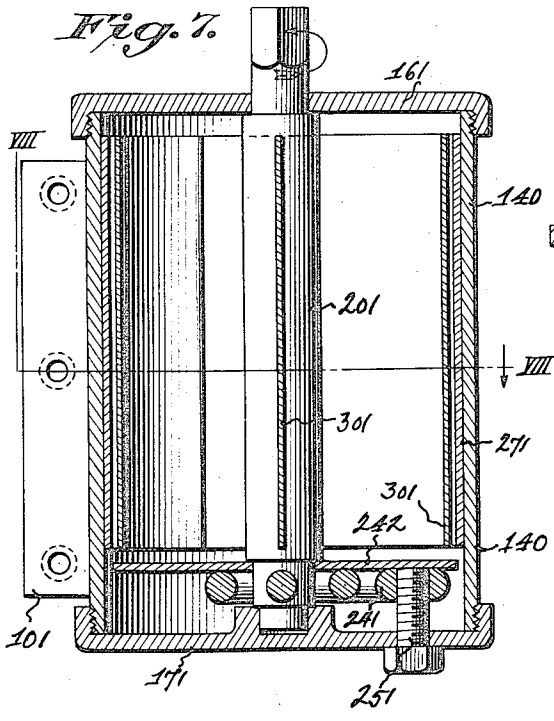
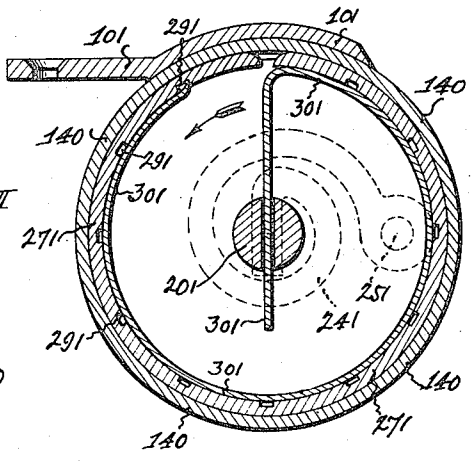


Fig. 8.



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UNITED STATES PATENT OFFICE.

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COMBINED CHECK AND CLOSER.

1,425,900. Specification of Letters Patent. Patented Aug. 15, 1922.

Application filed October 18, 1921. Serial No. 508,489.

To all whom it may concern:

Be it known that I, RAYMOND R. RUNDELL, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Combined Checks and Closers, of which the following is a specification.

The invention relates to automatic checks and closers which are employed for the purpose of preventing any body which is so arranged and constructed to have a to-and-fro motion with respect to a fixed support to automatically return to said fixed support when displaced therefrom without being violently slammed against said fixed support, and is more particularly adapted for use as a door check and closer.

The objects of the invention are:

First, to construct a check and closer of the nature above indicated consisting of a minimum number of parts which may be easily and cheaply manufactured and assembled, installed, adjusted or taken apart with ease and without the use of skilled labor.

Second, to provide a check and closer which embodies mechanism adapted to automatically adjust itself to wear and at the same time provide a uniform tension or friction of the cooperating parts controlling the closing and checking functions of the device.

Third, other objects and advantages of the invention will appear from the detailed description of the construction, mode of assembling and operation of the same to be presently disclosed.

The invention consists of structural characteristics and relative arrangements of elements which will be hereinafter more fully described and particularly pointed out in the appended claims.

In the drawings, in which similar reference characters indicate the same parts in the several figures,

Figure 1 is a longitudinal section of the improved check and closer.

Figure 2 is a transverse section taken on line II—II of Figure 1.

Figures 3, 4, 5 and 6 are plan views of modified forms of the ratchet spring.

Figure 7 is a longitudinal section of a modification of the invention.

Figure 8 is a section taken on line VIII—VIII of Fig. 7.

Referring to Figures 1 and 2 of the drawings, 10 is a bracket or support having upper and lower annular extensions or ends 11 and 12 and is adapted to be secured to a door D, or other movable element by means of screws 13, 13, as shown. Interposed between and engaging the inner sides of the annular extensions or ends 11 and 12 is a hollow cylindrical casing 14 having its ends knurled or roughened at 141 to engage similar roughened or corrugated inner sides of the extensions or ends 11 and 12 to prevent said casing 14 from turning while seated in the bracket 10 and engaged by the flanges 15 on said ends 11 and 12 of the bracket.

Said casing 14 is provided at its ends with internal screw threads 142 adapted to be engaged by top cap 16 and bottom cap 17, and when said caps 16 and 17 are firmly screwed down or seated against the outer sides of the annular extensions 11 and 12, said casing 14 is firmly and immovably held within the bracket 10, as will be readily understood. Said top cap 16 is also provided with sockets 18, 18, while the bottom cap 17 has diametrically opposed slots 19 to be engaged by a spanner wrench or other proper tool for the purpose of tightening up or adjusting this class of constructions.

20 is a rotatable shaft or post arranged at the center or axis of the casing 14 and is so arranged that its upper end passes loosely through an opening 21 in the top cap 16, while its lower end is rotatably seated in a central socket 22 formed on the inside of the bottom cap 17, said shaft or post 20 being retained in said socket 22 by means of a coil spring 23 interposed between a shoulder 231 formed on said shaft or post and a circular recess 232 on the inside of top cap 16, as shown.

24 is a coil spring within and at the lower end of the casing 14, one end of which spring is passed through or rigidly secured to the lower end of the shaft or post 20 while the other end of said spring 24 is anchored to a pin 25 attached to and projecting through the bottom cap 17.

Within the casing 14 and frictionally in contact with the inner surface thereof is a retarder sleeve 27 which may be and is pref-

erably split to form a slit at 28, as shown, and provided on its inner surface with a series of separated grooves or recesses 29, 29, for purposes to be presently explained.

30 is a ratchet spring which consists preferably of a coiled broad strip or band of thin sheet metal and arranged within the retarder sleeve 27 having one edge or straight section 31 passing through a slot 32 in the rotatable shaft or post 20, while its outer or free edge 33 is turned outwardly and adapted to pass into any one of the series of grooves or recesses 29, 29, formed in the retarder sleeve 27 in a manner to be hereinafter disclosed.

34 is an adjustable locking ring at the bottom of the casing 14 and is provided with a knurled outer edge, and internal threads adapted to engage the threads on the outer cylindrical surface of the bottom cap 17 and capable of locking the position or extent into which said cap 17 is secured into the casing 14.

The construction of the modification shown in Figs. 7 and 8 is substantially the same as illustrated in Figs. 1 and 2, except that the casing 140 is made integral with the supporting bracket or lug 101 by brazing or otherwise, and the rotatable post or shaft 201, spring 241, retarder sleeve 271 with its grooves 291 and ratchet spring 301, caps 161 and 171 are substantially in the same relation as shown in Figs. 1 and 2, except a disk or plate 242 is interposed between the spring 241 and the adjacent or lower end of the ratchet spring 301. The spring 241 is anchored to a bolt 251 passing through a threaded opening in bottom cap 171. This form of the invention is intended for use in connection with elements of lighter weight than that shown in Figs. 1 and 2.

The construction of the ratchet springs 30 and 301 shown in Figs. 1 and 2, and 7 and 8, may be varied in many ways and if desired may assume the form shown in Figure 3 when it is desired that said spring have two engaging ends 40 and 40. Figure 4 shows a form of spring which would tend to store up potential energy and thereby easily overcome any possible tendency of the retarder sleeve 27 from sticking. Figure 5 illustrates a type which would be adapted to engage a key-way in the shaft and post by means of the bent-in end 41, while Figure 6 illustrates a construction capable of being secured to a shaft or post square in cross section by means of the inner rectangular end 42.

The parts being arranged as shown in Figures 1 and 2 and the upper or outer end of the shaft 20 having been pivotally connected to a fixed point by means of a link L, shown in dotted lines, and oil having been placed within the casing 14 to act as a lubricant, the operation of the invention is as follows:

As the movable or hinged element or door D is swung around on its pivot it carries with it the bracket 10 and connected casing 14, during which movement the shaft or post 20 is made to rotate in the direction, as indicated by the arrow, in Figure 1. This rotation of the shaft or post 20 is resisted by and stores up energy in the spring 24 and at same time causes the ratchet spring 30 to rotate in the direction shown by the arrow in Fig. 2, which movement has a tendency to wind up and decrease the diameter of said spring 30 and hence reduce the frictional effect of the spring against the inner wall of the retarder sleeve 27 and thereby permit the bent end or edge 32 of said spring to easily slide over said inner wall without disturbing or tending to move or rotate the retarder sleeve 27. After the door D, or other moving element has reached the end of this motion, by the action of the stored energy in spring 24, the shaft or post 20 has a tendency to rotate in a direction opposite from that indicated by the arrows in Figures 1 and 2, and hence said door D is forced to return to its initial position. As the shaft 20 rotates in the opposite direction, it carries with it the ratchet spring 30 which permits said ratchet spring to expand to its former diameter and at the same time allows its edge or end 32 to engage or spring into one of the grooves 29, 29, in the retarder sleeve 27, and during the further movement of the ratchet spring 30, said retarder sleeve being in frictional engagement with the casing 14, is dragged with said ratchet spring 30 and acts as a resistance to the movement or rotation of the shaft 20 by the spring 24 and therefore checks up or retards the movement of the door D or other element.

It will also be seen that owing to the retarder sleeve 27 being split at 28 and assembled under initial tension, the frictional resistance between the casing 14 and said sleeve 27 is automatically kept constant, although said parts may wear from repeated and continuous operation of the combined closer and check for the reason the expansion of the ratchet spring 30 has a tendency also to further expand the retarder sleeve 27.

Should it be found that the turning effect or adjustment of the spring 24 is not proper for the conditions under which the device is to be operated, the torsional strength of said spring 24 may be modified by turning the bottom cap 17 either to the right or left and locking it in its adjusted position after proper regulation by means of the locking ring 34, as will be readily understood and needs no further disclosure.

It will be seen from the hereindescribed constructions, mode of assembling and cooperation of the parts, that all the objects and advantages recited in the statement of invention have been fully and efficiently car-

ried out, and although two forms are disclosed, many changes and other modifications will readily suggest themselves without departing from the essential features and scope of the present invention, as for example, the retarder sleeve 27 or the slit 28 and grooves 29 in the retarder sleeve 27, and turned up edge or end 30 of the ratchet spring 29 may be dispensed with as they are not absolutely necessary for the operation of the device.

What I claim is:

1. A combined closer and check device comprising a fixed cylindrical casing, a rotatable shaft disposed at the axis of the cylindrical casing, a retractile ratchet spring within the cylindrical casing having an end connected to the rotatable shaft and its disconnected section adapted to engage and disengage the inner surface of said casing, and a spring having one end connected to said fixed casing and its other end secured to the rotatable shaft.

2. A combined closer and check device comprising a fixed cylindrical casing, a retarder sleeve fitted within and adapted to frictionally engage the inner surface of said casing, a rotatable shaft disposed within the cylindrical casing, a ratchet spring within the retarder sleeve having one end connected to the rotatable shaft and its other end adapted to engage and disengage the inner surface of said retarder sleeve, and a spring having one end fixed and its other end secured to the rotatable shaft.

3. A combined closer and check device comprising a fixed cylindrical casing, a retarder sleeve fitted within and adapted to frictionally engage the inner surface of said casing, a rotatable shaft disposed within the cylindrical casing, a band coil spring within the retarder sleeve having one end connected to the rotatable shaft and its outer curved surface adapted to frictionally engage and disengage the inner surface of said retarder sleeve, and a spring having one end fixed and its other end secured to the rotatable shaft.

4. A combined closer and check device comprising a fixed cylindrical casing, a retarder sleeve having a series of separated recesses on its inner surface and fitted within and adapted to frictionally engage the inner surface of said casing, a rotatable shaft disposed within and at the axis of the cylindrical casing, a ratchet spring within the retarder sleeve having one end connected to the rotatable shaft and its other end turned outwardly and adapted to engage and disengage the recesses in the inner surface of said retarder sleeve, and a spring having one end connected to said fixed casing and its other end secured to the rotatable shaft.

5. A combined closer and check device comprising a hollow fixed cylindrical casing, a split retarder sleeve fitted within and adapted to frictionally engage the inner surface of said casing, a rotatable shaft disposed within and at the axis of the cylindrical casing, a ratchet spring within the retarder sleeve having one end connected to the rotatable shaft and its other end adapted to engage and disengage the inner surface of said retarder sleeve, and a spring having one end connected to said fixed casing and its other end secured to the rotatable shaft.

6. A combined closer and check device comprising a fixed cylindrical casing, a split retarder sleeve having a series of separated grooves on its inner surface and fitted within and adapted to frictionally engage the inner surface of said casing, a rotatable shaft disposed within and at the axis of the cylindrical casing, a ratchet spring within the retarder sleeve having one end connected to the rotatable shaft and its other end turned outwardly and adapted to engage and disengage the grooves in the inner surface of said retarder sleeve, and a spring having one end connected to said fixed casing and its other end secured to the rotatable shaft.

7. A combined closer and check device comprising a fixed cylindrical casing, a retarder sleeve fitted within and adapted to frictionally engage the inner surface of said casing, a rotatable shaft disposed within and at the axis of the cylindrical casing, a ratchet spring within the retarder sleeve having one end connected to the rotatable shaft and its other end adapted to engage and disengage the inner surface of said retarder sleeve, a torsional spring having one end connected to said fixed casing and its other end secured to the rotatable shaft, and means for adjusting said torsional spring.

In testimony whereof I affix my signature.

RAYMOND R. RUNDELL.