W. K. HENRY.

DOUBLE ACTING DOOR CLOSER HINGE.

APPLICATION FILED NOV. 19, 1912.

1,086,325. Patented Feb. 3, 1914.

Fig. 1.

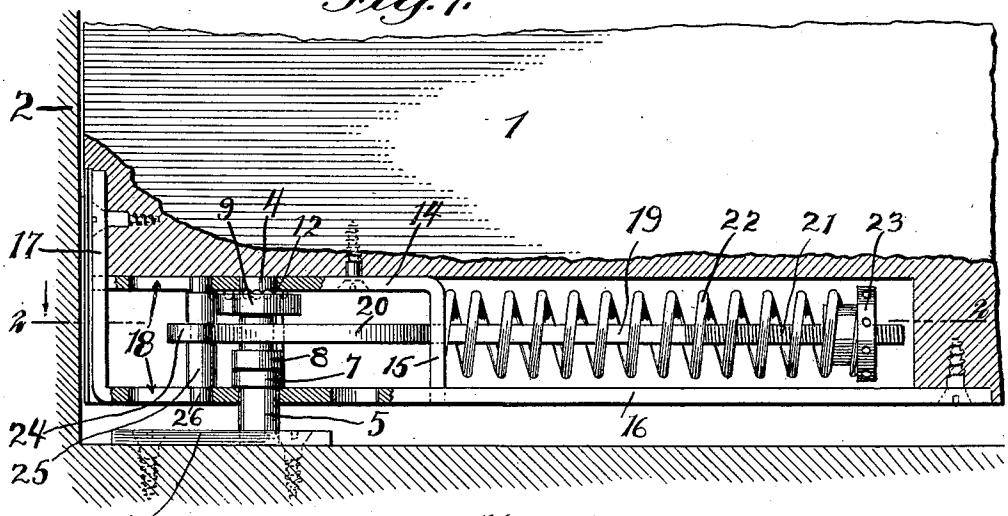


Fig. 3.

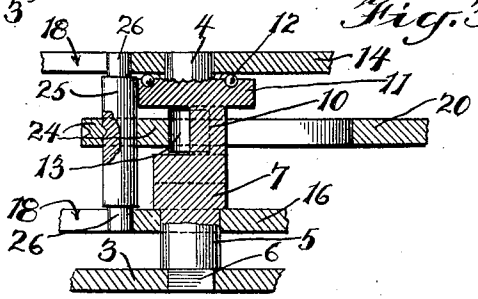
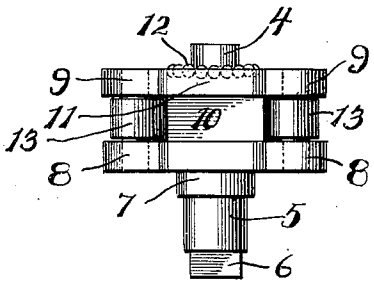


Fig. 4



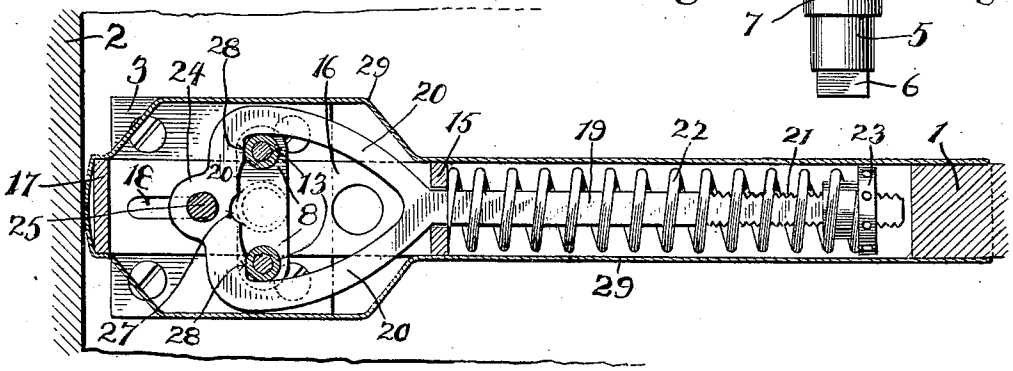


Fig. 2.

Witnesses:
Chas. A. Pearce
Ida McHunziker

Inventor
W. K. HENRY
By his Attorneys
Bartlett, Brownell & Mitchell

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM K. HENRY, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE AMERICAN HARDWARE CORPORATION, OF NEW BRITAIN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

DOUBLE-ACTING DOOR-CLOSER HINGE.

1,086,325. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed November 19, 1912. Serial No. 732,232.

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 Double-Acting Door-Closer Hinges, of which the following is a full, clear, and exact description.

This invention relates to closer hinges for doors and the like of the double acting type and is designed to provide a very inexpensive structure of this character for application to doors swinging in both directions. The closer hinge of the present invention is designed to automatically return the door to closed position when opened in either direction and is also provided with means for locking the door opened in either direction. These and other advantages are fully described in the following specification taken in connection with the accompanying drawings forming part thereof and illustrating preferable embodiment of the invention.

In these drawings: Figure 1 is a fragmentary view of the lower portion of a door having my improved closer hinge applied thereto, parts being shown in section. Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1. Fig. 3 is a fragmentary vertical section through the parts shown in Fig. 1, and Fig. 4 is a view in elevation of the pivot member and its cam arms.

Referring to the drawings by numerals, 1 indicates a door and 2 its casing.

3 represents a plate designed to be secured to the floor or threshold of the door beneath the lower edge of the same. This plate 3 is designed to carry a pivot member having its extreme upper end 4 rounded and also having its lower end 5 rounded but reduced at its extremity 6 to form a square plug which fits within a squared aperture formed in the plate 3, and may be, and preferably is, upset thereagainst. At the upper extremity of the portion 5, the pivot member is shouldered outwardly to form an enlargement 7. Between this enlargement 7 and the upper end 4 of the pivot member, the pivot member is reduced to form an intermediate flat body portion 10 from the upper and lower sides of which extend transverse webs 8 and 9. The central portion of the web 9 is enlarged to form a bearing head 11 which has a groove formed in its upper face in which are seated a plurality of balls 12, the upper grooved face of this web 9 constituting therefore a ball race. Between the alined outer ends of the webs 8 and 9, anti-friction rollers 13 are journaled, these rollers serving as cams as will be more clearly seen later.

The lower inner edge of the door is recessed to receive the parts coöperating with the pivot member and its cams. A bar 14 is secured to the inner under face of the recessed portion of the door and is provided at one end with a transverse extension or cross-bar 15. A bottom bar 16 is secured to the lower edge of the door and to the end of cross-bar 15, and has its inner end formed with a transversely extending portion 17 secured to the inner face of the door and to the inner end of the bar 14, these parts forming a frame. The inner ends of the bars 14 and 16 are provided with alined elongated slots 18. A plunger 19 is located within the recessed portion of the door between the door and the bottom plate 16, this plunger 19 extending longitudinally of the lower edge of the door and through an aperture formed in the cross-bar 15. The rear end of this plunger 19 is enlarged and of skeleton form to provide a yoke member 20 which incloses and is in alinement with anti-friction rollers 13 carried by the transverse webs 8 and 9 of the pivot member. The rear end of the yoke 20 constitutes a cross-head which normally bears against the two anti-friction rollers 13—13 when the door is closed, said antifriction rollers operating as cams to force the yoke rearwardly when the door to which the apparatus is applied is opened in either direction. The outer end of the plunger 19, which may be in the form of a flat bar, has its edges threaded as at 21, and a coiled spring 22 is mounted thereover, one end of said spring engaging the cross-bar 15 and the other end abutting against the flange of a tensioning nut 23 which has a threaded engagement with the threaded end of plunger 19. The tension of the coiled spring 22 acts through the abutment afforded by its tensioning nut to move the yoke 20 against the cam rollers of the pivot member.

The inner end or cross-head portion of yoke 20 is provided with an extension 24 which carries rigidly a stud 25 having reduced ends 26 fitting within the alined slots 18 of the frame carried by the door. The yoke 20 is normally pressed by its spring

to bring its inner face against the cam rollers of the webs 8 and 9 of the pivot member. The bar 14 of the door frame is apertured to fit over the upper end 4 of the pivot member and journal the door thereon, the under face of said bar adjacent its pivot resting on the ball race 12 and the upper face of the bottom bar 16 resting against the shoulder formed by the lower edge of the enlargement 7 of the pivot member.

The contacting edge of the yoke is formed with a central locking recess 27 of a curvature corresponding substantially to that of the cam rollers 18, and is curved outwardly from either side of said recess and is formed at its extremities with flat portions 28 against which the cam rollers are held by the spring 22 when the door is closed.

It will be obvious that the door 1 is journaled on the upper end of the stationary pivot member and that as said door swings, the frame carried thereby together with the plunger 19 and its yoke, will move relative to the stationary pivot member. When the door is in central or closed position, the parts will be in the position shown in Figs. 1 and 2 of the drawing. In this position the anti-friction cam rollers 13 will rest against the flattened ends 28 of the contact edge of the yoke, the pressure of the spring tending to hold these edges firmly against the cam rollers and, therefore, tending to center the door in closed position. When, however, the door is swung open in either direction, one of the cam rollers 13, being stationary, will engage the contact edge of the yoke as the latter moves relative thereto with the swinging of the door, and, as the door continues to swing, will ride over the contact edge of the yoke 20, the plunger 19 being moved inwardly to compress the spring 22 which forms the closer spring. If the door is not entirely opened the compressed spring will act to return the parts to normal door closed position. If, however, the door is fully opened, the locking recess 27 of the yoke 20 will snap over one of the cam rollers 13 when the door reaches fully opened position, locking the door in fully opened position by reason of the setting of a cam roller in this recess and the pressure of the compressed spring against this cam roller. The door may be closed by moving the same inwardly until the locking recess 27 of the yoke is moved from engagement with its coöperating cam roller whereupon the force of the compressed closer spring 22 will return the parts to normal door closed position, the door being centered in this position by the engagement of the two cam rollers with the contact edges 28 of the yoke hereinbefore referred to. During the opening of the door and the consequent swinging of the yoke, the side bars of the yoke remain out of contact with the free cam roller or that cam roller which is not in engagement with the contact edge of the yoke.

The parts described may be readily and comparatively cheaply manufactured and require but a minimum amount of machine work. The frame carried by the door and composed of the bars 14, 15, 16 and 17 may be and preferably are of wrought iron. The plunger 19 and its yoke 20 may be readily cast as well as the floor plate and the body of the pivot member, so that it is apparent that substantial economies in manufacture are effected by the construction set forth. It is of course understood, that, as is usual in devices of this character, the upper inner edge of the door is provided with a pin which is adapted to be seated in a socket formed in the upper casing of the door. The parts of the closer hinge are preferably first assembled and then secured to the inner edge of the door, and the door then moved to bring its upper pivot pin in its socket and the floor plate 3 of the closer hinge to that point on the floor or threshold which will bring the pivot member 3 thereof in alinement with the upper pivot pin, whereupon said pivot plate may be secured to the floor.

While I have described and shown herein a specific embodiment of the invention, various structural modifications are still possible within the spirit of the invention and the scope of the appended claim.

What I claim therefore, and desire to secure by Letters Patent is:

In a double-acting door hinge and closer, a stationary pivot stud, a pair of oppositely arranged eccentric cams carried thereby, a frame extending forwardly of and to the rear of said pivot stud and arranged to swing concentrically thereto, a reciprocating plunger carried by the frame and including a yoke surrounding the said stud and the eccentric cams thereon, that part of the yoke to the rear of said eccentric cams comprising a cross-head for coaction with said eccentric cams, a guide connection between said cross-head and said frame, a guide connection between the plunger and said frame, and a spring coacting with said plunger to force said cross-head in a direction toward said stud and eccentric cams to normally cause said cross-head to engage both of said cams when the parts are in the door closed position.

WILLIAM K. HENRY.

Witnesses:
WM. V. COLLINS,
NEWTON G. CURTIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."