

W. K. HENRY.
DOOR CLOSER HINGE.
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Fig. 1.

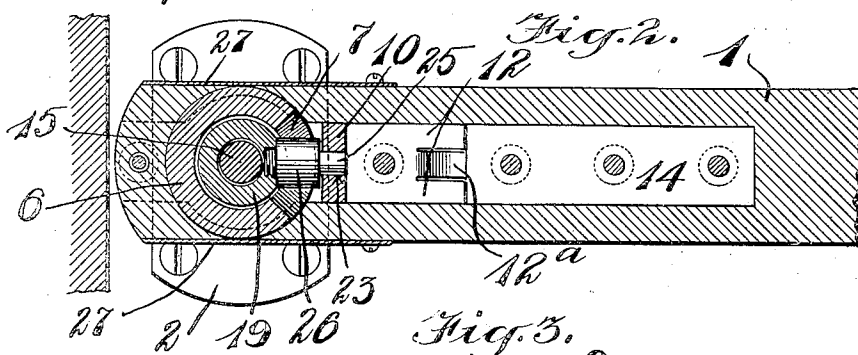
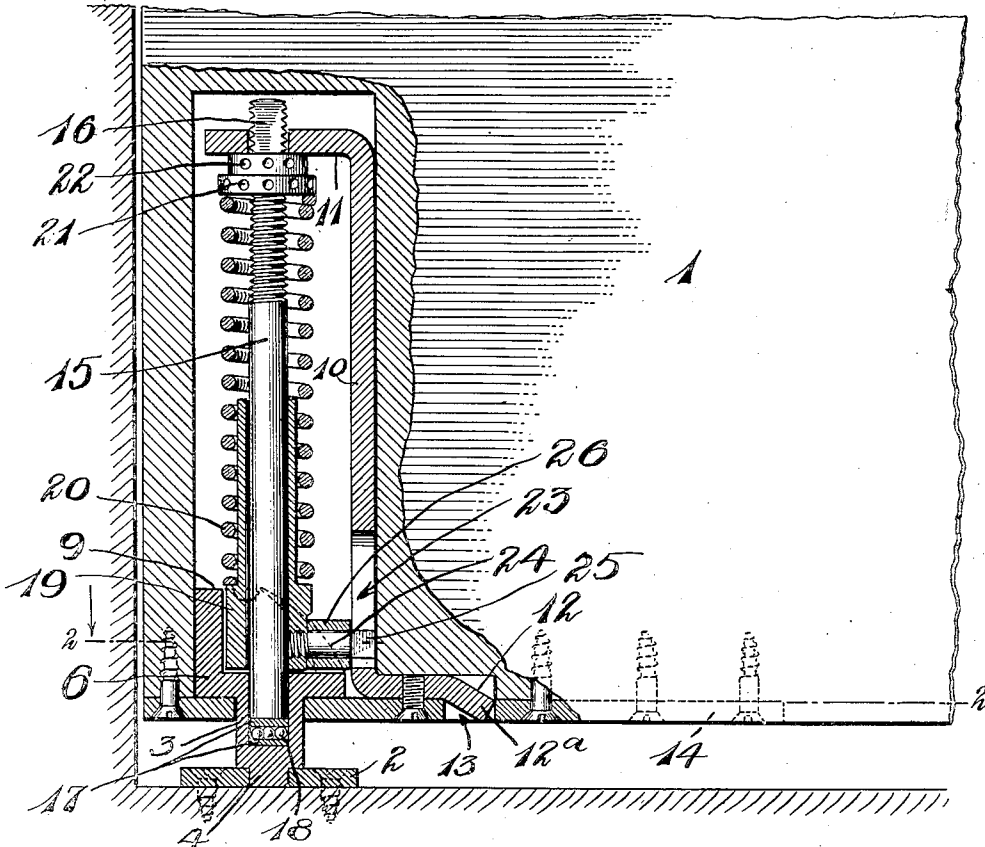
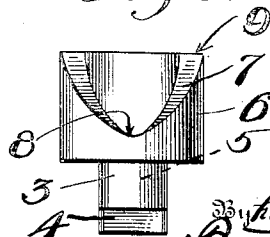


Fig. 3.



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UNITED STATES PATENT OFFICE.

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DOOR-CLOSER HINGE.

1,056,171.

Specification of Letters Patent.

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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, Hartford county, State of Connecticut, have invented certain new and useful Improvements in 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, and is designed to provide a hinge of this type of simple construction and efficient in operation, which hinge may be applied to doors swinging in both directions and is adapted to automatically return the door to closed position when opened in either direction, and is further adapted to hold the door in fully opened position. A specific embodiment of my invention illustrating this and other advantages is described in detail in the following specification and is illustrated in the accompanying drawings forming part thereof and illustrating a preferable embodiment of the invention.

In these drawings, Figure 1 is a fragmentary view in elevation, partly in section, of the lower inner end of a swinging door showing my closer hinge applied thereto as a floor hinge. Fig. 2 is a horizontal sectional view taken on the line 2-2 of Fig. 1. Fig. 3 is a view in elevation of the stationary pivot member detached.

Referring to the drawings by numerals, 1 indicates a door of the double swinging type. At a point below the door and adjacent its inner edge, a floor plate 2 is fastened to the floor or threshold of a door casing in which is rigidly mounted a pivot member 3 whose squared lower end 4 is seated in a similar recess formed in the floor plate and is preferably upset thereagainst. This pivot member is provided with a socket 5 therein and with an annular head 6 concentric thereto and extending upwardly therefrom, the edge of this annular head being cut away at one side to form complementary arcuate cam surfaces 7 extending upwardly and in opposite directions from an intermediate and common low point 8. The high points of these cam surfaces terminate in the flat surfaces 9 of the head.

Extending up within a recess formed in the bottom of the door 1 is a bracket plate or bar 10 having its upper end terminating in an arm 11 and having also a lower arm 12 seated against a cut-out portion at the under edge of the door, and being split at its end to form a bent tongue 12^a seating within a slot 13 formed in a bottom bar 14, which is secured to the bottom recessed edge of the door and to the lower arm 12 of the bracket 10, the forward or inner end of this bar seating under and against the head 6 of the pivot member.

A spindle 15 having its upper portion threaded and its upper extremity flattened as at 16, is seated at said upper end in an aperture formed in the upper arm 11 and corresponding in shape to the shape of the flattened end of the spindle so that said spindle is held by said bracket arm against rotary movement. The flattening of the upper end of the spindle forms shoulders which rest against the under face of the arm 11 of the bracket. The lower end of the spindle seats in the socket 5 of the pivot member 3, its end resting upon and being supported by a ball race formed of two bearing washers 17 inclosing a plurality of steel balls 18.

Slidably mounted on the lower portion of the spindle 15 is a bearing sleeve 19 against which bears the lower end of a coiled spring 20 encircling the spindle and engaged at its upper end by an adjusting and tensioning nut 21 threaded on the upper end of said spindle. A lock nut 22 is also preferably provided to cooperate with the adjusting nut 21.

The bracket bar 10 adjacent its lower end is provided with an elongated slot 23 within which slides the flattened end 25 of a stud 24 whose other end is threaded into the lower portion of the bearing sleeve 19, and on which stud is journaled an anti-friction roller 26.

It will be evident from the foregoing that the door is journaled on the pivot member 3 by reason of the spindle 15 carried by the door through the bracket resting upon the ball race within the socket 5 of the pivot member. The spindle 15, of course, extends

in the line of axis of the pivot stud, and the bearing part 19 carried thereby likewise lies in said line of axis. As this bearing portion is connected to the bracket 10 through the connection of the stud 24 therewith, it will be obvious that as the door is swung, the bearing sleeve 19 and its anti-friction roller contact 26 will swing with the door. This roller contact is so positioned that when the door is closed, it will rest upon the intermediate low part 8 between the complementary cam surfaces 7 of the pivot head. These cam surfaces each extend in an arc, with the pivot member 3 as the center, the combined arcs of the complementary cam surfaces being preferably slightly less than a semi-circle. When the door is swung in either direction from closed position, it will, therefore, be evident that the anti-friction roller 26 will ride up on one of these cam surfaces 7, moving its bearing sleeve 19 upwardly to compress its spring. If the door is moved through an angle of more than ninety degrees in one direction, the anti-friction roller 26 will ride over the top or high point of the cam surface and will rest on the flat portion 9 of the annular head 6 so that under such circumstances the pressure of the spring 20 will hold said roller against such flat portion and frictionally retain the door in fully opened position. If the door is not swung entirely open, or in an arc of less than ninety degrees, the anti-friction roller will not pass over the high point of the cam surface, and, releasing said door, will, through the power of the compressed spring 20, move said roller downwardly against the inclined cam surface and return the door to closed position. I find that in practice the pressure of the compressed coiled spring 20 serves to frictionally hold the anti-friction roller 26 against the top flat surface of the annular head so that the door is held in opened position when swung in either direction, but it is obvious that this flat edge at points at substantially ninety degrees to the intermediate low portion 8 of the cams, may be provided with a slight concavity into which the anti-friction roller will be pressed by the spring to lock the door against closing movement.

A door to which my closer hinge is applied is, of course, provided with a stud at its opposite end seated within a socket formed in the door casing. It is obvious that in mounting such a door provided with my closer hinge, the entire hinge including the floor plate may be first secured to the door and then the door moved to bring its upper stud within the socket in the casing of the door. The lower end of the door can then be positioned to bring its floor plate in the line of axis of the upper stud, and said floor plate then be secured to the floor by

screws or other analogous means, making the mounting of the door a comparatively easy matter. Finish plates 27 may be secured to the sides of the door, as illustrated.

While I have herein described and illustrated a specific embodiment of my invention, it is, of course, understood that various structural changes are possible within the spirit of the invention and the scope of the appended claims.

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

1. In a device of the character described, a stationary pivot member having a socket formed therein and having a concentric annular head extending outwardly from said socket and provided with complementary cam surfaces thereon extending in opposite directions from an intermediate low point, a door, a spindle connected to said door extending in the line of axis of said pivot member and having its end journaled in the socket thereof, anti-friction thrust bearings within said socket for said spindle end, a bearing member guided on and movable longitudinally of said spindle and having a contact member positioned to engage said annular head and to seat in the intermediate low point of said cam surfaces when the door is in closed position, and spring means cooperating with said bearing member to hold it in engagement with said cam surfaces.

2. In a device of the character described, a stationary pivot member having a socket formed therein and having a concentric annular head provided with complementary cam surfaces thereon extending in opposite directions from an intermediate low point, a door, a spindle connected to said door extending in the line of axis of said pivot member and journaled in the socket thereof, anti-friction thrust bearings within said socket for said spindle end, a bearing member movable longitudinally of said spindle and having an anti-friction contact member positioned to engage said annular head and to seat in the intermediate low point of said cam surfaces thereof when the door is in closed position, and spring means for moving said bearing part to force its contact member into engagement with said cam surfaces.

3. In a device of the character described, a stationary pivot member having a socket formed therein and having a concentric annular head extending outwardly therefrom and provided with complementary cam surfaces extending in opposite directions from an intermediate low point and terminating in flat surfaces at their high points, a door, a spindle connected to said door extending in the line of axis of said pivot member and having its end journaled in the socket thereof, anti-friction thrust bearings within

said socket for said spindle end, a bearing member guided on and movable longitudinally of said spindle and having a part positioned to engage said annular head and to
5 seat in the intermediate low point of said cam surfaces when the door is in closed position, and a closer spring cooperating with

said bearing member to move it to engage with said cam surfaces.

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