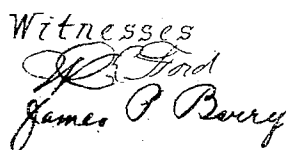


DOOR HINGE.

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DOOR-HINGE.

932,129.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE M. HUGHES, a citizen of the United States of America, residing at Albion, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Door-Hinges, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to door hinges of that type in which the pivot is arranged beneath the door and engages a hinge member arranged in the floor.

It is the object of the invention to obtain a construction which permits of readily attaching and detaching the same from the door, which is inexpensive to manufacture, and which is provided with a spring for closing the door, which may be varied in tension, and it is further provided with means of attachment for shifting the neutral point at which the door is held by the tension of the spring.

With these and other objects in view, the invention consists in the construction as hereinafter set forth.

In the drawings—Figure 1 is a vertical longitudinal section through the hinge as applied to a door; Fig. 2 is a horizontal section on line $x-x$, Fig. 1; and Fig. 3 is a rear elevation of the spring adjusting means.

My invention is particularly adapted for use in connection with doors which swing both ways and are returned to their neutral position by the tension of the spring. For such use it is desirable to have a spring of sufficient strength to properly control the door and at the same time this spring must necessarily be arranged in the floor fitting. I have therefore devised a construction in which greater space is provided for this spring by placing it beside an upturned extension or angle flange of the floor fitting and in a recess in the casing close by said flange. I have also provided adjustments both for the tension of the spring and for shifting the neutral position of the door, said adjustments being operable without detachment of the hinge or any portion thereof.

As shown, A is the door member which comprises in its construction a strip B secured to the lower edge of the door and extending longitudinally thereof. This strip may be secured by a plurality of screws C

and may be attached before the hanging or placing of the door in position.

D is the pivot carrying member which is detachably secured to the strip B and preferably by providing the latter with an upwardly offset portion B' against which the member D is placed so that the lower face of said member D is flush with the lower face of the main portion of the strip B. The member B has secured thereto the downwardly projecting pivot E which engages the floor member F of the hinge. This floor member is preferably in the form of a casing located in a recess in the floor and having its upper face flush with the top of the floor, said member being also provided with an upwardly extending angle flange G, which is set in flush with the face of the door casing. The pivot E is formed with a journal portion E' and, as shown, this is provided with a ball race coöperating with a ball race F' on the member F with the balls E' therebetween. Below the journal portion of the pin E is formed a crank portion E² which engages a horizontal link H connected to the spring I. The latter, as above stated, is located adjacent to the upward extension G of the floor fitting and in the recess in the door casing. At its upper end, the spring I is anchored to this fitting, while its lower end is free to flex and exerts the required tension on the link H.

In detail construction the crank E² of the pin E is preferably formed by two offset bearings E⁴ and E⁵ upon opposite sides of the axis of the pin and which are engaged by the hooks H' on the link H. This link, as shown, is formed of a bent metallic bar having a central loop H² for engagement with the end of the spring I and having the hooks H' formed at its ends. The arrangement is such that the tension of the spring I will normally hold the crank in its neutral position—that is, where the hooks H' are in engagement with their respective bearings E⁴ and E⁵ and exert an equal pressure thereon. When, however, the door is swung and the pivot E is thereby rotated the crank E² will be turned which moves the bearings E⁴ and E⁵ oppositely, one of them drawing the link H, while the other is free to turn in the space between the opposite sides of the link. It is evident that as soon as the door is released the tension of the spring, operating through the link

H upon the one bearing of the crank, will also draw the latter back to its normal position where the other hook H' will engage with the other bearing.

5 As the turning of the door by the tension of the spring is effected through the rotation of the crank E³ and pivot E it is necessary that the latter should be firmly secured to the member B. At the same time, as above
10 stated, the connection must be a detachable one and also one where the members D and B are engaged by a relative lateral movement, which may be effected when the door is in position. The attachment between
15 these members I preferably form by providing an upward extension E⁶ on the pin E, which is square or polygonal in section, and which engages a correspondingly shaped aperture in the offset portion B' of the strip
20 B. In addition to this attachment, a securing bolt J is arranged in a recess in one side of the door and clamps the two plates D and B together. Thus in placing the door after the pin E is in position the door may be
25 lifted sufficiently to clear the end of the upward extension E⁶ and move laterally until said extension engages with the aperture in the plate B, after which the plates are clamped together about the bolt J.

30 The spring I can consist either of a straight bar or preferably, as shown, a return bent bar with the return bent portion at the upper end. The spring is anchored by means of an adjustable bearing K which is arranged to
35 embrace the spring at the bend, and is adjusted inward and outward by a screw L operable from the front side of the plate G. Below this fitting K is a guide M, which is bifurcated to embrace the spring and which is
40 swiveled to a rotary adjustable member N. The member N is journaled in an aperture in the plate G and is provided with a slotted head for engagement of a screw driver by which it may be turned into different positions
45 of adjustment. The swiveled pin O is eccentric to the axis of the head N and consequently the turning of said head will adjust the guide M laterally either to one side or the other of its normal position. This ad-
50 justment will change the angularity of said spring I and throw its lower end from one side to the other, while this in turn will change the direction of pull on the link H so as to alter its central or neutral position. Thus by ad-
55 justing the head O the neutral position of the door may be thrown either one way or the other.

To hold the head O in different positions, of adjustment, I preferably provide a clamp
60 P, which frictionally engages the head and may be tightened by a screw Q operable from the outside of the plate G.

What I claim as my invention is:

1. In a door hinge, the combination of a
65 pivot member adapted to be secured to a

door, said pivot member having a crank, a link engaging said crank and extending in a plane transverse to the axis of said pivot, and a spring engaging the outer end of said link and exerting an outward tension thereon. 70

2. In a door hinge, the combination of a pivot member adapted to be secured to a door, said pivot member having a crank therein, a link extending in a plane transverse to said pivot and engaging said crank, 75 and a laterally flexing spring arranged in the plane substantially parallel to the axis of the pivot and engaging the outer end of said link.

3. In a door hinge, the combination of a pivot adapted to be secured to a door, a casing engaging a recess in the floor in which said pivot is journaled, said pivot being provided with a crank within said casing, a link in said casing engaging said crank and extending toward the casement of the door, 85 and a spring located in a recess in said door casement and engaging said link to exert a tension thereon.

4. A door hinge comprising a member adapted to be fitted in the floor and provided 90 with an angular portion adapted to fit against the door casement, a pivot pin adapted for securement to a door journaled in the floor portion of said member, said pivot pin being provided with a crank, a spring se- 95 cured to the angle member, and a link connecting the spring to the crank.

5. In a door hinge, the combination of a member having a floor portion and an up- 100 turned angular portion for fitting against the door casement, a pivot adapted to be secured to a door, said pivot being journaled in the floor portion and provided with a crank, a spring adjacent to said upturned angle portion within the recess within the casement, a 105 link connecting said spring and crank, and adjusting means for said spring operable from outside of said flange.

6. In a door hinge, the combination of a pivot member adapted to be secured to a 110 door, said pivot member having a crank therein, a link standing in a plane transverse to said pivot and engaging said crank, a laterally-flexing spring arranged in a plane parallel to the axis of the pivot and engaging the 115 outer end of said link to place the same under tension, and means for adjusting said spring transversely of said link to change the neutral position of said crank.

7. In a door hinge, the combination of a 120 pivot member journaled in a fixed support, said pivot member being adapted to be secured to a door and having a crank therein, a link extending transverse to said pivot and engaging said crank, a laterally-flexing 125 spring arranged in a plane substantially parallel to the axis of the pivot and engaging the outer end of said link to place the same under tension, means for adjusting the tension of said spring, and means for adjusting said 130

spring in a direction transverse to the link to change the neutral position of said crank.

8. In a door hinge, the combination of a member having a floor portion and an upturned angle portion for fitting against the door casement, a pivot journaled in the floor portion and provided with a crank, said pivot being adapted to be secured to a door, a spring adjacent to said upturned angle portion within a recess in the casement, a link connecting said spring and crank, adjusting means for altering the tension of said spring, and means for adjusting said spring laterally operable from outside said upturned angle portion.

9. In a door hinge, the combination of a member having a floor portion and an upturned angle portion for fitting against the door casement, a pivot journaled in the floor portion and provided with a crank, said pivot being adapted to be secured to a door located within a recess in the floor, a

spring adjacent to said upturned angle portion within a recess in the casement, a link connecting said spring and crank, and a revoluble member journaled in said upturned angle portion for adjusting said spring.

10. In a door hinge, the combination with a casement member, of a spring arranged adjacent to said casement member, a pair of revoluble heads journaled in said casement member, an anchor for said spring having a threaded engagement with one of said revoluble heads, whereby it may be adjusted, and a bearing for said spring eccentrically engaging the other of said revoluble heads whereby said spring may be laterally adjusted.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE M. HUGHES.

Witnesses:

NELLIE KINSELLA,
JAMES P. BARRY.