

H. J. WRIGHT.
HINGE FOR DOUBLE SWING DOORS.

APPLICATION FILED SEPT. 15, 1903.

NO MODEL.

Fig. 12.

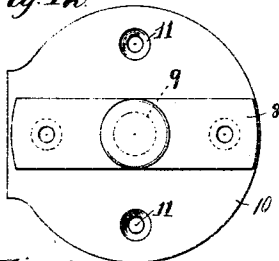


Fig. 13.

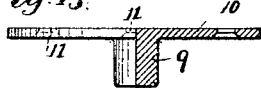


Fig. 14.

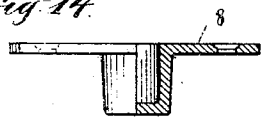


Fig. 1.

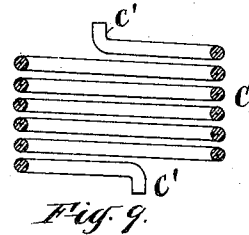
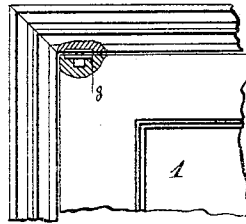


Fig. 9.

Fig. 8.

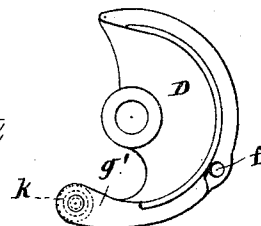


Fig. 3.

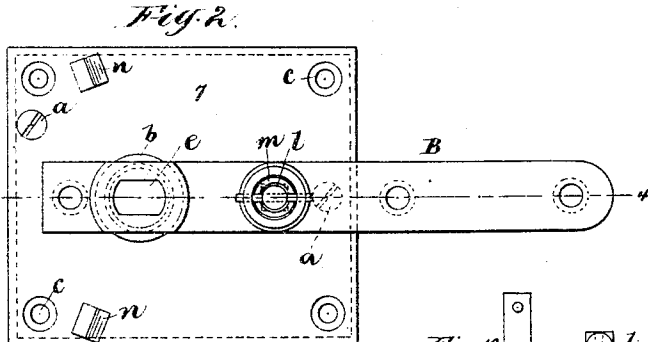
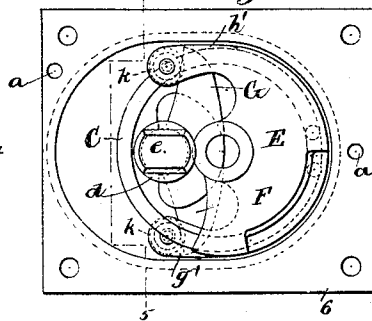


Fig. 10.

Fig. 11.

Fig. 4.

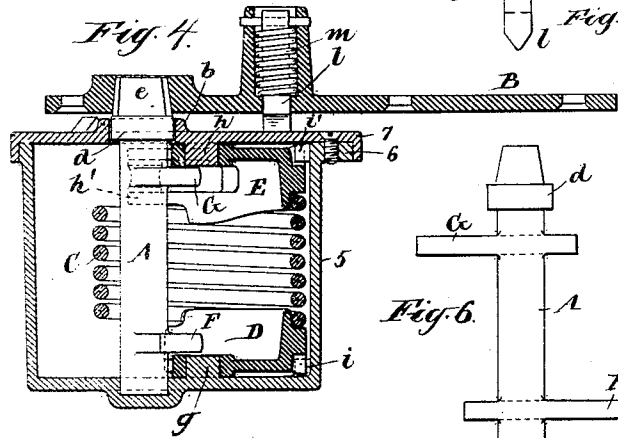


Fig. 6.

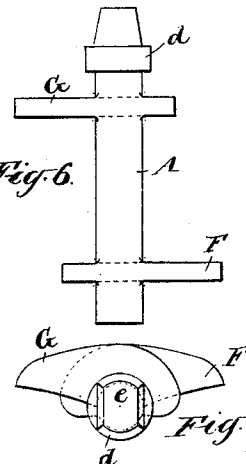
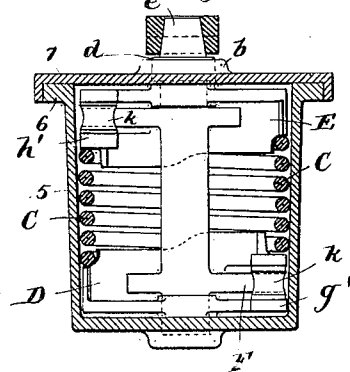


Fig. 5.



Witnesses:
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W. C. Brown

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by his attorney,
Charles R. Searle.

UNITED STATES PATENT OFFICE.

HARRY J. WRIGHT, OF NEW YORK, N. Y.

HINGE FOR DOUBLE SWING-DOORS.

SPECIFICATION forming part of Letters Patent No. 764,026, dated July 5, 1904.

Application filed September 15, 1903. Serial No. 173,231. (No model.)

To all whom it may concern:

Be it known that I, HARRY J. WRIGHT, a citizen of the United States, and a resident of the borough of Bronx, city of New York, county of Westchester, and State of New York, have invented certain new and useful Improvements in Hinges for Double Swing-Doors, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, and to the letters and figures marked thereon.

My invention has relation to door-closers or spring-hinges adapted to hold doors normally closed, but permitting them to be opened in either direction by a slight push, and particularly does it relate to that variety of door-closers commonly known as "floor-hinges," in which the lower or spring-actuated hinge is secured in the floor beneath the door and the complementary hinge fastened in the lintel or door-frame above the door, although the position of these two parts may be reversed.

The object of my present invention is to provide or produce a complete hinge or door-closer which may be easily and cheaply made, easily and quickly mounted in place and connected with the door for use, which shall afford efficient and reliable means for automatically closing the door after the latter has been swung in either direction as may be usual during its use, and for holding the door in its opened position when so desired, and which will afford a gradually-decreasing spring-pressure as the door is being opened. To accomplish these objects and to secure other and further advantages in the matters of construction, operation, and use, my improvements involve certain novel and useful arrangements or combinations of parts, principles of operation, and details of construction, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is an elevation, partly in vertical section, showing a door-frame and door equipped with my improved floor-hinge and top pivot. The succeeding figures are on a larger scale. Fig. 2 is a plan view of the floor-hinge and its lever. Fig. 3 is a similar view with the lever and cover re-

moved to show the interior portions. Fig. 4 is a longitudinal vertical section taken on the line 4 4 in Fig. 2. Fig. 5 is a transverse vertical section through the floor-hinge casing on the line 5 5 in Fig. 3, certain portions being shown in elevation and others in section. Fig. 6 is an elevation of the floor-hinge pintle alone, and Fig. 7 is a corresponding plan or top view. Fig. 8 is a plan view of one face of one of the collars. Fig. 9 is a vertical section showing the spring. Fig. 10 is a side elevation of the bolt. Fig. 11 is an end view thereof. Figs. 12, 13, and 14 show the top pivot and its socket. Fig. 12 is a plan view of the pivot and socket together. Fig. 13 is a partial elevation and vertical section of the pivot alone, and Fig. 14 is a similar view of the socket.

In all the figures like letters and figures of reference wherever they occur indicate corresponding parts.

1 represents a double swing-door, 2 the floor, 3 one of the door-jamb, and 4 the lintel, all of any ordinary or approved form.

5 is the casing of the floor-hinge or closer, the same being, preferably, of cast metal and made oval in horizontal section, or longer in one direction than in the other, for purposes which will hereinafter appear. This casing is closed at the bottom and has a shallow socket therein at one side of the center to receive the lower end of the pintle, and is provided at top with a rectangular flange 6.

7 is a cover for the casing, the same being constructed to fit over and to embrace the rectangular flange and being held in place on the casing by suitable screws, as at the points *a a*. The cover is provided with a central boss *b*, surrounding the opening through which the pintle projects and located directly over the point at which the pintle is stepped in the bottom of the casing, and it is also provided with perforations, as at *c c*, to receive suitable screws by which the device may be anchored in the floor. The casing and cover are mortised in the floor near the rear edge of the door, the upper face of the cover being flush with the surface of the floor.

A is the vertical pintle, the same being stepped in the bottom of the casing projecting

through the cover and supplied with a cylindrical part, as at *d*, which is fitted to turn in the circular opening in the boss *b*, and above this with a short projecting head, as *e*, having
 5 flat plain sides or otherwise fitted to receive the operating-lever and to make a positive engagement therewith, so that both must turn simultaneously.

B is the lever or arm, intended to be mortised into the bottom of the door and to connect the door with the pintle.

C is the operating-spring, made in the form of a coil and arranged to operate on the pintle to return the latter to its normal position
 15 whichever way it may be turned by the swinging of the door. The connection between the spring and the pintle is of peculiar formation. Two similar arcs or collars *D* and *E* are mounted with their axes in line vertically on studs
 20 *g* and *h*, formed on the bottom of the casing and under face of the cover, respectively, and in line with the pintle, but at a little distance therefrom. The collars are alike, but are mounted reversely and carry open or slotted
 25 arms *g'* *h'*, extending toward the pintle on opposite sides of the casing provided with anti-friction-rollers *k*. The outer portions of the collars are formed with grooves to accommodate stationary stops, as at *i* and *i'*, on the
 30 bottom of the casing and under face of the cover, which limit the movements of the collars each in one direction, the end of the groove bringing up against its stationary stop. The collars receive each a bent end of the
 35 spring, as at *C'*, in openings provided for the purpose, as at *f*, and thus hold the spring between them, preferably under a slight tension.

The pintle carries two oppositely-extending lugs *F* and *G*, one at the upper part and the other at the lower, the ends of which are received each in one of the open arms *g'* *h'* on the collars and lie against the rollers *k*.

As the door is swung in either direction one
 45 of the pintle-lugs forces one of the collars to partake in the motion, the other collar being held against movement in that direction by its stationary stop and the lug therefor swinging idly in the opening in its collar-arm, the
 50 effect being to tighten the spring, and as the pintle and collars are mounted eccentrically the roller *k* approaches nearer and nearer to the axis of the pintle as the movement progresses, thus increasing the leverage of the
 55 pintle-lug in its action on the collar and the spring. This increase in leverage is more rapid than the increase of tension of the spring, and the result is that the spring will offer less resistance as the pintle is rotated
 60 farther, and the door correspondingly offers its greatest resistance at the beginning of the opening movement, gradually reducing its opposition as the door is opened wider, the maximum effect of the spring being greatest
 65 when the door is in the closed position. Thus

the closed door will not yield to slight forces, as gusts of wind, but may be easily opened by persons desiring to pass through.

That the door may be held in wide-open position whenever desired and without the necessity of supplying an independent mechanism for that purpose I supply the lever *B* with a bolt, as *l*, the same being mounted in a socket on the top of the lever provided with a spring, as *m*, by which the bolt is held down
 75 normally, the lower end of the bolt being inclined, so as to ride easily over the stops provided for it. Two inclined stops, as at *n* *n*, are mounted on the cover 7 and in the path of the lower end of the bolt *l* as it turns about
 80 the axis of the pintle. When the door is swung open far enough in either direction, the bolt *l* strikes one of these stops *n*, rises and rides over it and drops down behind it, thus locking the door in its extreme open position. To release the door and to allow it to
 85 swing to its closed position, it is only necessary to pull upon it with sufficient force to make the bolt rise and pass over the stop, and then the door will automatically assume its
 90 closed position.

Instead of locating the casing in the floor it might of course be set in the lintel, if desired, where its operation upon the door would be the same as if it were placed in the floor.

The door-hinge is not complete without some suitable hinge-pin at the part opposite the spring-actuated pintle. Heretofore in these hinges for double swing-doors it has been difficult to locate the second hinge-pin. To obviate the difficulties in this regard I make the second hinge of two parts, as shown in Figs. 12, 13, and 14, of which 8 is a plate having a socket, the same being intended to be let in flush with the end of the door and secured in place. The socket is intended to receive and hold the hinge-pin 9, which is applied to the under surface of an enlarged plate 10, the latter being intended to be conveniently secured to the door-frame, for which purpose it is supplied with perforations, as at 11 11, to receive holding-screws.

To hinge the door, the casing is first located and fixed, the lever applied to the door, and the piece 8 also applied and fastened in proper place. Then the piece 10, with the hinge-pin, is placed on the piece 8 and the door brought into position, so that the lever will fit upon the end of the pintle, the other end of the door being easily moved into place and allowed to assume the normal closed position. Then two screws are entered through the uncovered perforations 11 11. After this the door is swung upon its hinges, thus uncovering the remaining openings 11 11, through which holding-screws may be easily and conveniently inserted.

Obviously the forms and proportions of the parts may be modified to adapt the invention to various conditions of service.

Having now fully described my invention, I

what I claim as new herein, and desire to secure by Letters Patent, is—

1. In a spring-hinge of the character herein set forth, the casing for containing the pintle and spring, said casing being of oval form in horizontal section and of greater horizontal diameter in one direction than in the other, a pintle located therein to one side of the longitudinal center, a spring and means within said casing eccentric to the pintle for automatically varying the spring-power as the door is moved on its hinges.

2. In a spring-hinge of the character described, the combination with the pintle having oppositely-extended arms, of arcs or collars against which the arms impinge, a spring connected with said arcs or collars and connections whereby the leverage of said extended arms is automatically increased as the door is opened.

3. The combination with the lever applied on the end of the pintle, of a locking-bolt mounted on said lever and two stops located on the path of the bolt, for the purpose of holding the door in open position, substantially as and for the purposes set forth.

4. In combination with the lever adapted to receive the end of the pintle, a hub, a locking-bolt mounted therein and a spring for holding said bolt down, the end of the bolt projecting through the lever and being arranged to ride over stops provided for the purpose, substantially as set forth.

5. In a spring-hinge of the character set forth, a pintle having oppositely-extended lugs and arranged to be partially rotated by the swinging of a door in either direction, a pair of collars mounted eccentrically to said pintle and having arms engaged by said lugs, a spring attached to and located between said collars and encircling said pintle, and a stationary stop for each collar limiting its movement in one direction, a lever on the end of the pintle and locking means on said lever.

6. In a spring-hinge of the character set forth, a casing having a cover, a pintle having oppositely-extending lugs, one near the upper and the other near the lower end thereof, said pintle being stepped in said casing and extending through said cover, means for connecting said pintle to a door to partially rotate as the latter is swung, two collars mounted eccentrically to said pintle, one on the under face of said cover and the other on the bottom of said casing, a stationary stop for each collar,

limiting its motion in one direction, each collar having an open arm receiving one of said lugs, an antifriction-roller in each arm against which its lug impinges, and a helical spring attached at its opposite ends to said collars and encircling said pintle, the whole arranged to offer the greatest resistance of said spring when said door is closed and to gradually lessen its resistance as the door is swung toward the open position.

7. A casing oval in horizontal section, a pintle eccentrically mounted vertically therein and having lugs extending transversely of said casing in opposite directions, one at the upper and the other at the lower portion of said pintle, a pair of collars having their axes in the same line one above the other and adjacent to said pintle, each collar having an arm receiving one of said lugs and permitting it to swing idly in one direction, and being engaged by the movement of the lug in the other direction, a stationary stop for each collar limiting its motion in one direction, and a spring eccentric with relation to said pintle between said collars tending to return said collars to said stops when moved therefrom by the partial rotation of said pintle in either direction.

8. A casing, oval in horizontal section and having eccentric sockets, a pintle in said socket, arms mounted in said casing with their axes in vertical line and to one side of the pintle, antifriction-rollers on said arms, oppositely-extending lugs on said pintle engaging said rollers and working in the open arms, and a spring having its ends secured to said arms.

9. A casing oval in horizontal section and having eccentric sockets, a pintle in said socket, collars mounted in said casing with their axes in vertical line and to one side of said pintle, antifriction-rollers on said collars, oppositely-extending lugs on the pintle engaging said rollers, and received in open arms of said collars, a spring having its ends secured to said collars, said collars being grooved at their outer portions, and stationary stops at the top and bottom of the casing coincident with said grooves.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

HARRY J. WRIGHT.

Witnesses:

CHARLES R. SEARLE,
M. E. GRACE.