A. J. GEORGE.

SPRING HINGE.

APPLICATION FILED NOV. 23, 1910.

1,000,254. **Patented Aug. 8, 1911.**

2 SHEETS—SHEET 1.

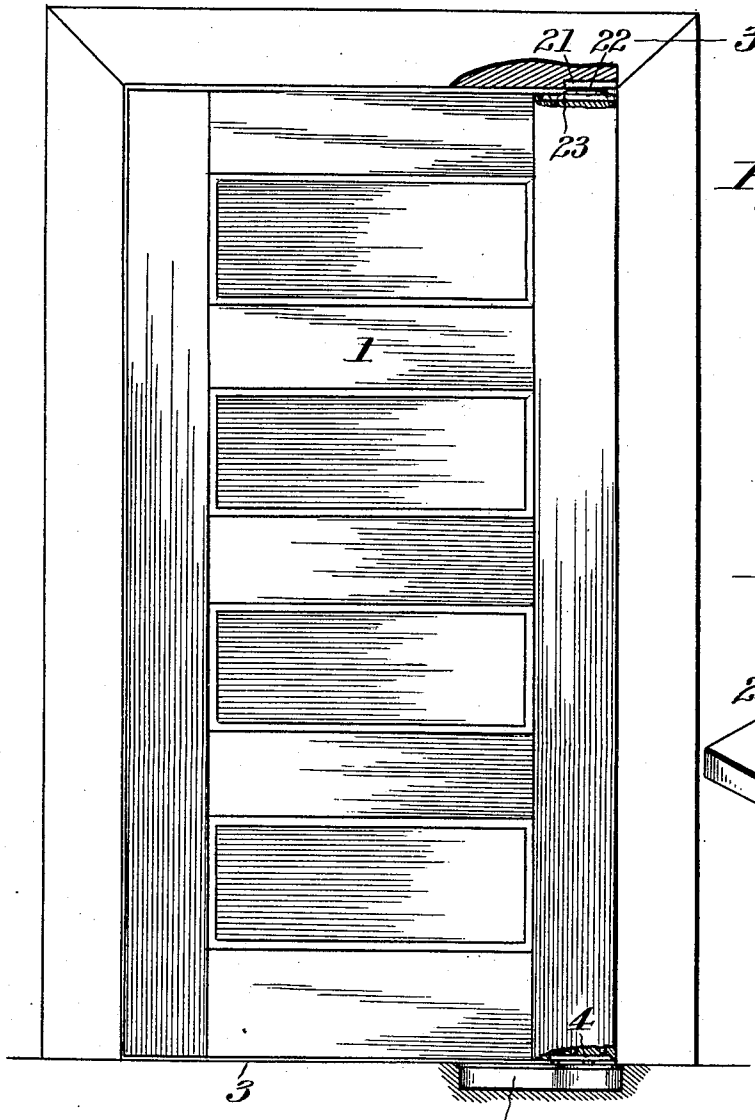


Fig. 1.

Fig. 8.

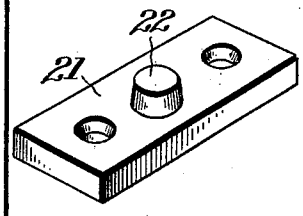
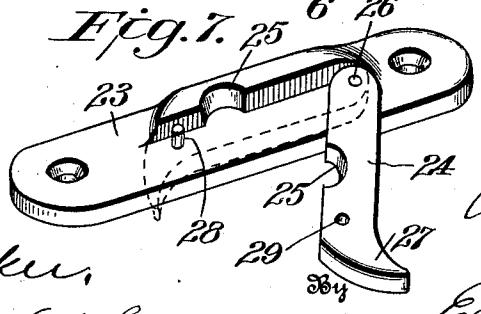


Fig. 7.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

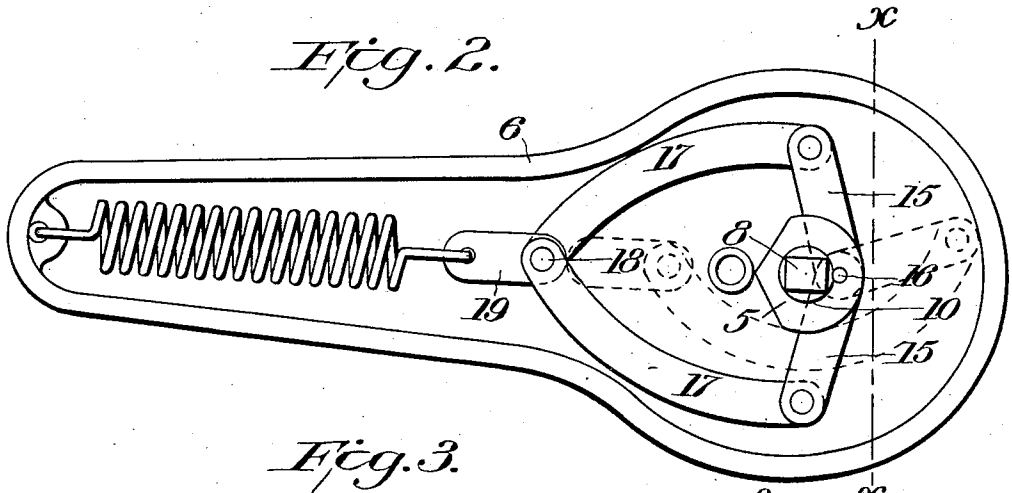


Fig. 3.

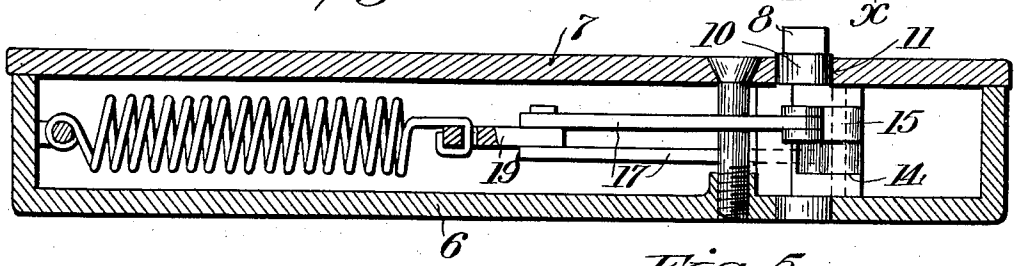


Fig. 4.

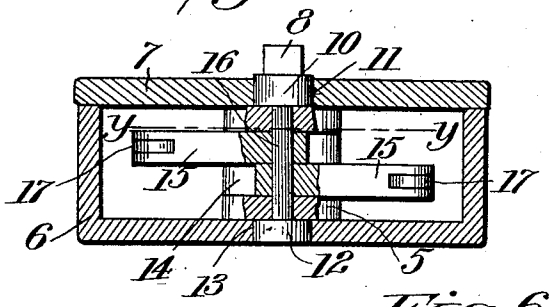


Fig. 5.

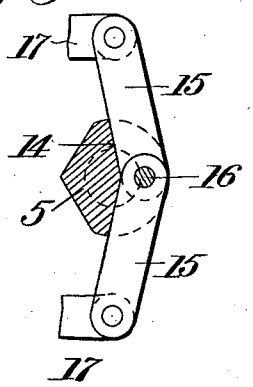
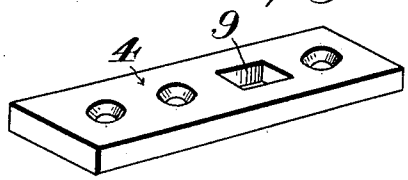


Fig. 6.



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UNITED STATES PATENT OFFICE.

ANDREW J. GEORGE, OF PULASKI, IOWA.

SPRING-HINGE.

1,000,254. Specification of Letters Patent. Patented Aug. 8, 1911.

Application filed November 23, 1910. Serial No. 593,901.

To all whom it may concern:

Be it known that I, ANDREW J. GEORGE, a citizen of the United States, residing at Pulaski, in the county of Davis and State of Iowa, have invented certain new and useful Improvements in Spring-Hinges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to spring hinges for doors of that class which permit the door to be swung in either direction.

The principal object of my invention is to provide a hinge of this kind which is reliable in operation, durable, simple in construction and, therefore, cheap to manufacture, and which is so arranged that the door may be quickly hung or removed without the necessity of first taking out screws, or the like, or removing parts of the hinge from the door or casing.

Other objects will become apparent from the following description.

The invention consists in the features of construction, combinations and arrangements of parts, hereinafter set forth, illustrated in the accompanying drawing, and more particularly pointed out in the appended claims.

In the accompanying drawing: Figure 1 is a broken elevation, partly in section, of a door and casing therefor, showing my hinge applied. Fig. 2 is a plan view of the casing which is embedded in the floor, the cover of said casing being removed to disclose the spring and other operating mechanism mounted in said casing, and the position of the mechanism when the door is opened beyond an angle of ninety degrees being shown in dotted lines. Fig. 3 is a longitudinal vertical sectional view of said casing. Fig. 4 is a cross section on the line *x*—*x* of Fig. 2, showing more particularly the connection of the spring-pressed levers to the rotatable hub. Fig. 5 is a horizontal section taken on the line *y*—*y* of Fig. 4 to disclose more clearly the construction of the recess in the hub. Fig. 6 is a perspective view of the socket plate which is mounted on the bottom of the door. Fig. 7 is a perspective view of the latch-plate mounted on the top of the door, the latch being shown in its open position in solid lines and in its closed position in dotted lines, and Fig. 8 is a perspective view of the lug-carrying plate which is fastened to the top of the door frame or casing.

Referring more particularly to the drawings, 1 designates the door, 2 the floor, and 3 the door frame. The lower hinge comprises a socket plate 4 secured to the bottom of the door, and a spring-actuated shaft having a hub 5 mounted vertically in a casing 6 embedded in the floor. Said shaft projects at its upper end through the top 7 of said casing and has its projecting end squared, as at 8, to fit the correspondingly shaped socket 9 in the plate 4. Said shaft is pivoted in the casing, so as to be capable of rotation, by means of the cylindrical portion 10 of the upward projection fitting in a round opening 11 in the top of the casing, and by means of a downwardly extending cylindrical lug 12 fitting a correspondingly shaped opening 13 in the bottom of the casing. A recess 14 is formed in one side of the shaft, and extends substantially half way through the same. In this recess, there are pivoted two oppositely extending arms or levers 15, preferably by means of a vertical pivot pin 16. The outer ends of said arms or levers are pivotally connected respectively with arcuate links 17 having their other ends connected by a common pivot pin 18 to a shorter straight link 19. A coiled spring is connected to the opposite end of said straight link and to the end wall of the casing, and tends to hold both of the arms or levers 15 against the vertical wall of the recess 14 so that the shaft is normally retained by spring tension against rotation in either direction.

When the shaft is in its normal position, as illustrated in solid lines in Fig. 2, the door is closed. The swinging of the door open to an angle of more than ninety degrees will rotate the shaft to the position, indicated in dotted lines in Fig. 2, bringing the lower one of the arcuate links there shown into position with its end, which is connected to the arm 15, at a point beyond the imaginary line connecting the axis of the shaft and the other end of said arcuate link. In this position the spring acts to hold said link and arm off the dead center and holds the door open. It will be understood that when the door is opened, in either direction, to an angle of less than ninety degrees, it will be automatically closed, as soon as released, by the spring operating through one

of said arcuate links and arms. The independent pivoting of the two arms 15 allows one of them to swing backward to accommodate its arcuate link each time the other arm, with its arcuate link, acts positively upon the opening of the door.

The upper hinge or pivot of the door comprises a plate 21 secured to the top of the door frame and provided with a downwardly extending pivot lug 22, and a socket plate 23, of peculiar construction, secured to the top of the door. Said socket plate is provided with a pivoted latch 24 in which half of the socket 25 is formed. The latch is pivoted at one end, as at 26, and is capable of swinging outwardly edgewise of the plate. The free end of the latch is preferably provided with a projecting handle 27 and means for holding it in its closed position, said means comprising an upward projection or pin 28 on the plate, and a socket or opening 29 in the free end of the latch. When the latch is closed, its free end must be raised somewhat to snap it over the projection or pin 28. The free end of the latch must also be raised in order to disengage its socket from the locking pin in opening said latch. Both of these operations may be conveniently accomplished by grasping the projecting handle 27 of the latch. It will be understood that the latch is opened, as shown in solid lines in Fig. 7, when the door is to be hung.

To swing or hang the door, the slotted plate on the bottom of the door is first seated upon the projecting end of the hub, and the top of the door then brought into position with the half socket in the plate 23 engaging the lug 22 at the top of the door frame. The latch is thereupon closed and locked, as illustrated in dotted lines in Fig. 7, thus securely fastening the door in place. In order to remove the door from the hinges, the operations just described are reversed. It will be noted that the pivot lug 22 is made sufficiently long or, in other words, the socket 25 in the plate 23 is made sufficiently shallow to leave the requisite space between the top of said plate 23 and the plate 21 to permit the free end of the latch to be raised over its locking pin 28 on opening or closing said latch. The weight of the latch is sufficient to normally hold it in its locked position engaging said lug.

I claim:

1. A hinge, of the character described, comprising means to pivot the lower end of a door consisting of a vertical rotatable shaft having a hub mounted in a fixture below the door and having an angular projection on its upper end, oppositely extending arms independently pivoted on said hub, a spring, a link connecting said spring and arms whereby the turning of said shaft in either direction will exert a tension on said spring tending to automatically return said shaft to normal position when released, and a plate secured to the bottom of the door and having an angular socket fitting the projection on said hub.

2. A hinge, of the character described, comprising means to pivot the lower end of said door consisting of a vertically rotatable shaft having a hub mounted in a fixture below the door and having an angular projection on its upper end, oppositely extending arms independently pivoted on said hub and adapted to move with respect thereto in a limited arc, a spring connected at its outer end to said fixture, means of connection between said spring and said arms, including facing arcuate links, each having one of its ends pivotally connected to a different one of said arms, and a link connected thereto and to the spring, whereby the arms are normally retained at the opposite extremities of their arc of movement and the turning of said shaft in either direction will cause a tension to be exerted on said spring tending to automatically return said shaft to normal position when released, and a plate mounted on the bottom of the door and provided with an angular socket fitting the projection on said hub.

3. A hinge, of the character described, comprising means to pivot the lower end of a door consisting of a vertical rotatable shaft having a hub mounted in a fixture below the door and having an angular projection on its upper end, oppositely extending arms independently pivoted on said hub and adapted to move with respect thereto in a limited arc, facing arcuate links pivotally connected respectively to the extremities of said arms, a straight link pivotally connected to the other ends of said arcuate links, a spring connected to said straight link and to said fixture, said spring normally holding said arms at the opposite extremities of their arc of movement, and a plate secured to the bottom of the door and provided with an angular socket fitting the projection on said shaft.

4. A hinge, of the character described, comprising means to pivot the lower end of a door consisting of a vertical rotatable shaft having a hub mounted in a fixture below the door, said shaft having an angular upward projection, oppositely extending arms independently pivoted on said hub and capable of movement in a limited arc, means including a spring to yieldingly hold said arms at the opposite extremities of their arc of movement, and a plate secured to the bottom of the door and provided with an angular socket fitting the projection on said shaft.

5. A hinge, of the character described, comprising means to hinge the bottom of a door consisting of a vertical rotatable shaft

having a hub mounted in a fixture seated in the floor and having an angular upward projection, said hub also having a segmental recess in one side thereof, oppositely extending arms independently pivoted in said recess, means including a spring to yieldingly hold said arms at the opposite extremities of said recess, and a plate secured to the bottom of the door and provided with an angular recess fitting the projection on said shaft.

6. A hinge, of the character described, comprising means to pivot the bottom of a door consisting of a vertical rotatable shaft having a hub mounted in a fixture below the door and having an angular upward projection, said hub also having a segmental recess in one side thereof, oppositely extending arms independently pivoted in said recess, facing arcuate links connected respectively to said arms, a spring connected to the other ends of said arcuate links, and yieldingly holding said arms in the opposite extremities of the recess in the hub, and a plate secured to the bottom of the door and provided with an angular socket fitting the projection on said shaft.

7. A hinge, of the character described, comprising means to pivot the bottom of a door consisting of a vertical rotatable shaft having a hub mounted in a fixture below the door and provided with an angular upward projection, oppositely extending arms pivoted on said hub and capable of movement with respect thereto in a limited arc, means including a spring for yieldingly holding said arms at the opposite extremities of their arc of movement, and thereby hold said shaft against being returned to normal position when it is rotated beyond a predetermined angle, and a plate secured to the bottom of the door and provided with an angular socket fitting the projection on said shaft.

8. A hinge, of the character described, comprising means to pivot the top of said door consisting of a plate secured to the top of the door frame and having a downwardly projecting pivot lug, a plate secured to the top of the door and provided with a socket fitting said lug, a latch pivoted on said socket plate and adapted to swing laterally thereon for retaining the lug in the socket or releasing it therefrom, and means to lock said latch in its closed position.

9. A hinge, of the character described, comprising means to pivot the top of said door consisting of a plate secured to the top of the door frame and having a downwardly projecting lug, a plate secured to the top of the door and provided with a socket fitting said lug, a latch pivoted on said socket plate and adapted to swing laterally thereon for retaining the lug in the socket or releasing it therefrom, and an upwardly extending locking pin fixed on the latch plate and over which the latch is adapted to be dropped for locking the latter in closed position.

10. A hinge, of the character described, comprising means to pivot the lower end of a door consisting of a vertical rotatable shaft having a hub mounted in a fixture below the door and having an angular projection on its upper end, oppositely extending arms independently pivoted on said hub, a spring, links connecting said spring and arms, the movable parts being so arranged with relation to said spring that the latter will operate to hold the door open at ninety degrees and will tend to close or fully open the door from said predetermined point.

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

ANDREW J. GEORGE.

Witnesses:
C. E. WAGLER,
R. W. HUNT.