No. 619,689. Patented Feb. 14, 1899.

O. C. MOORE.

DOUBLE ACTING SPRING HINGE.

(Application filed Dec. 16, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

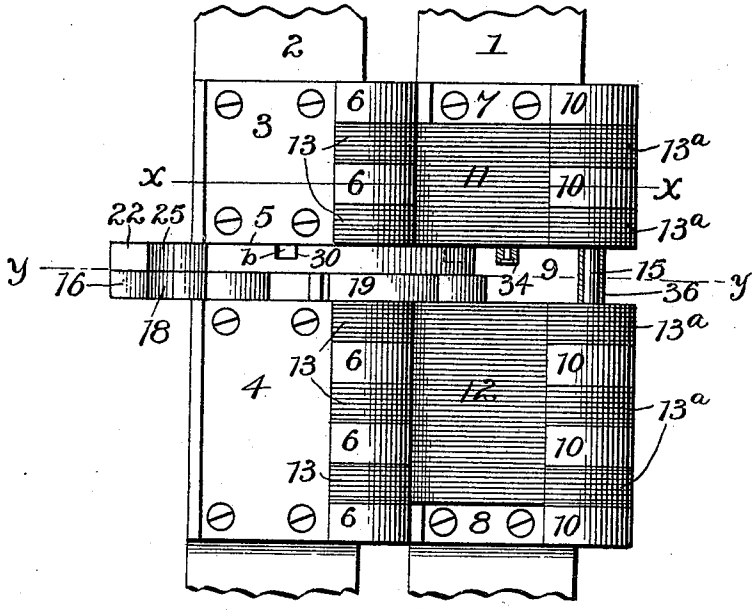


Fig. 2.

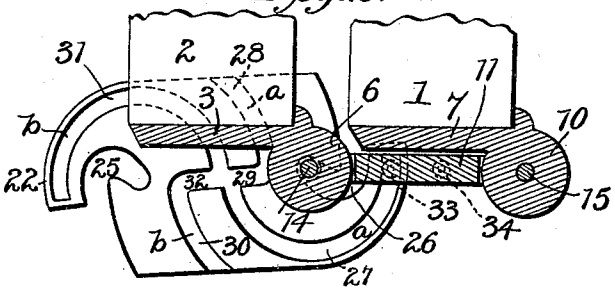
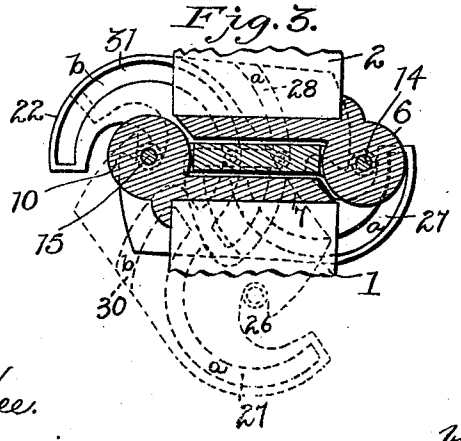


Fig. 3.



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Fig. 4.

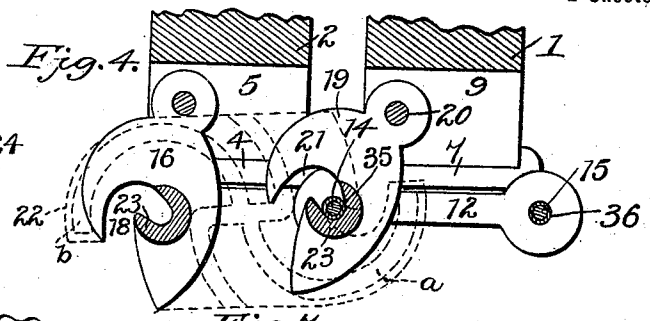


Fig. 5.

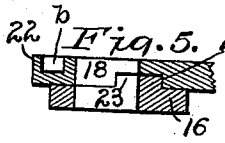


Fig. 6.

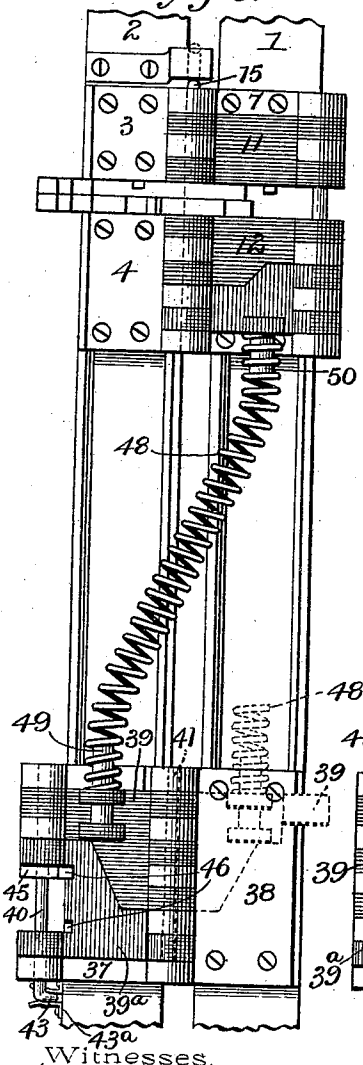


Fig. 7.

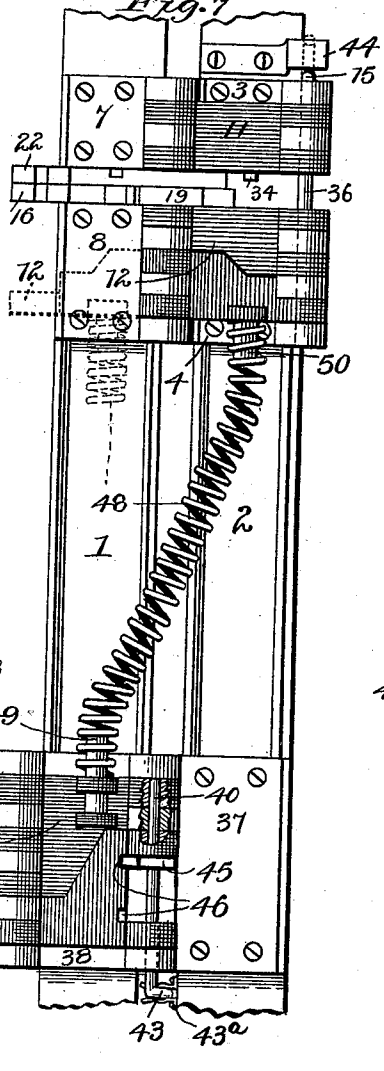


Fig. 8.

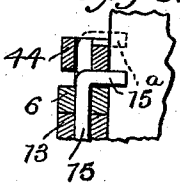


Fig. 9.

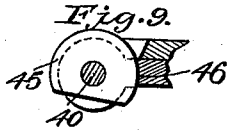
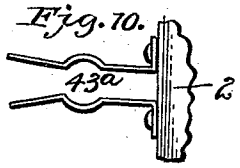


Fig. 10.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OTHO C. MOORE, OF NORFOLK, VIRGINIA, ASSIGNOR OF ONE-HALF TO JEREMIAH C. MEEKINS, JR., OF SAME PLACE.

DOUBLE-ACTING SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 619,689, dated February 14, 1899.

Application filed December 16, 1897. Serial No. 662,187. (No model.)

To all whom it may concern:

Be it known that I, OTHO C. MOORE, a citizen of the United States, and a resident of Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Double-Acting Spring-Hinges; and I do 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, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention is designed to provide a double-acting spring-hinge of such character that the spring may be thrown entirely out of operation when desired or which can be thrown out of operation so as to close the door from one direction, but not from the opposite direction.

The invention is also designed to provide a hinge having means whereby the door is prevented from dropping or sagging away from the jamb in either closed position thereof or at any point in its movement; also, to provide a hinge of strong and durable character which can be readily manufactured and applied and which is thoroughly practical and efficient in its operation.

With these objects in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

Referring to the accompanying drawings, Figure 1 is a face view showing the main double-acting hinge connection and clutches as applied with the door in full-opened position. Fig. 2 is a transverse section of the same on the line x x of Fig. 1. Fig. 3 is a detail sectional view with the door in closed position and illustrating the operation of the clutch devices. Fig. 4 is a transverse section of the parts as shown in Fig. 1, taken in a plane which passes between the clutches and their connecting-bar, the position of the latter being indicated in dotted lines. Fig. 5 is a detail sectional view showing the connection between the clutches and the connecting-bar. Fig. 6 is a face view of the complete hinge as applied with the door opened to the right. Fig. 7 is a similar view with the door opened to the left. Figs. 8, 9, and 10 are detail views showing means for securing the movable pintles.

In the drawings the numeral 1 designates a door, and 2 the jamb or post.

3 and 4 designate fixed hinge-plates, which are secured to the face of the jamb, their adjacent edges being separated from each other by a slot or recess 5, which extends back into the jamb. Said plates are each formed at one edge with projecting vertical pintle-eyes 6. Secured to the face of the rear edge of the door and respectively in alinement with the plates 3 and 4 are two similar plates 7 and 8, which are separated from each other by a slot or recess 9 and are provided with pintle-eyes 10.

11 and 12 designate two loose hinge plates or straps, each of which has pintle-eyes 13 or 13^a at both of its lateral edges, said eyes being in alinement, respectively, with the eyes 6 and 10 of the fixed plates, with which they interfit and alternate, as shown.

14 and 15 designate two pintles, one of which extends through the entire series of eyes 6 and 17 and the other of which extends through the eyes 10 and 13^a. As shown in Figs. 6 and 7, the lower loose hinge-plate 12 is formed in two parts, and the pintle 15 is made capable of vertical movement, whereby it may be withdrawn from the lower part of said plate, as hereinafter more fully described.

16 designates a laterally-vibrating clutch device, which is pivoted in the slot or recess 5 of the jamb and which has opening into one edge thereof a cam-slot 18. 19 is a second and similar but reversed clutch device, which is pivoted at 20 in the slot or recess 9 of the door and which has a cam-slot 21. These clutches are best shown in Fig. 4.

22 is an arm or bar which connects the two clutch devices 16 and 19 and which is loosely connected to the same by centers or bushings 23 on the clutch devices, which pivotally engage slots 24 in the connecting bar or arm (see Figs. 4 and 5) at the inner end portions of the cam-slots 25 and 26 of the latter, which slots substantially coincide, respectively, with

the slots 18 and 21 of the clutches. Formed in the upper face of this connecting bar or arm are two similar cam grooves or channels *a* and *b*. The groove *a* has a portion 27, which is concentric with the pintle 14 when the door is swinging upon that pintle as a center. Said groove also has a short laterally-offset connecting portion 29. The portion 28 of said groove opens out to the edge of the bar, while the portion 27 is closed at its outer end. (See Fig. 2.) The groove *b* has similar main portions 30 and 31 and short offset connecting portions 32, which cut or intersect the central portion of the groove *a*. The portion 30 of the groove *b* is concentric with the pintle 14, while the portion 31 is concentric with the pintle 15. On the lower edge of the loose hinge-plate 11 are two projecting studs, each of which is provided with an antifriction-roller 33 or 34, said rollers being arranged to engage and travel, respectively, one in each of the grooves *a* and *b* above described. That portion of the pintle 14 which extends across the slot or recess 5 carries an antifriction sleeve or roller 35, which is designed to engage the cam-slots 21 and 26 of the clutch 19 and the connecting-bar 22, and the pintle 15 has a similar roller or sleeve 36, which is designed to engage the cam-slot 18 of the clutch 16 and the slot 25 of the said connecting-bar. Below this hinge connection as thus described is a second or supplemental hinge connection which consists of a fixed hinge-plate 37, which is secured to the door-jamb, a second and similar fixed plate 38, which is secured to the door, and a loose connecting plate or strap formed in two parts 39 and 39ª, which are connected to the fixed plate 37 by a pintle 40 and to the plate 38 by a pintle 41. The said pintle 40 is made to have a vertical sliding movement, whereby it may be withdrawn from engagement with the eye or eyes of the section 39 of the said loose plate, and for this purpose its lower end is bent outwardly, as indicated at 43, Figs. 6 and 7, to form a finger-catch. 43ª is a keeper therefor.

48 is a helical spring, one end portion of which is connected to a stud 49 of the hinge-plate section 39, while its opposite end is connected to a stud 50 of the lower part of the loose hinge-plate 12. As thus connected it will be readily seen that if the door is opened or swung in either direction the spring will be put under tension and will operate to swing the door in the reverse direction. It is desirable, however, at times that the door shall not be closed by the spring, but that it shall remain open, and this can be accomplished by moving the pintles 15 and 40 to withdraw them from engagement with the eyes of the loose plate-sections to which the ends of the spring are connected. In this manner these sections become entirely disconnected from the hinge, and the spring consequently remains inactive. It is also desirable at times that the spring shall operate to close the door from one direction, but not from the other. This is also possible in the present hinge and is accomplished by withdrawing only one of said pintles—that is to say, if the lower pintle 40 be withdrawn from engagement with the plate-section 39 without disturbing the pintle 15 the spring will be active when the door is opened to the right, but it will be inactive when it is opened to the left. This is by reason of the fact that in the former case the hinge-plate section 12 is carried over with the door and puts the spring under tension, while in the latter case both the section 12 and the section 39 remain on the jamb. If the pintle 15 be the one withdrawn, the spring will be active when the door is opened to the left, but will be inactive when it is opened to the right. The upper end of the pintle 15 is bent as shown at 15ª, and a slotted keeper 44 is provided therefor for the purpose of securing said pintle in either one of its two positions. The pintle 40 has a collar 45 secured thereto, said collar being flattened off upon one side, and which is designed to engage either one of two notches or recesses 46 in the adjacent edge of the plate-section 39ª to thereby hold this pintle in either one of its two positions. To disengage the said collar from the notch or recess with which it is engaged at any time, the pintle must be turned until its flat side comes opposite to the said notch or recess. The pintle can then be moved vertically.

The operation of the hinge is as follows: When the door is opened to the right, (referring to the drawings,) the pintle-eyes 13 of the loose plates 11 and 12 and the clutch 19 turn upon the pintle 14, the pintle 15, with its roller or sleeve, riding out of the cam-slots 18 and 25, and the stud-rollers 33 and 34 travel in the portions 27 and 30 of the grooves *a* and *b*. The stud-roller 34 rides out of the open end of the groove *b* when the door has opened a short distance, while the stud-roller 33 remains in the groove *a* during the entire movement of the door in this direction. Inasmuch, therefore, as one or both of these rollers is always in engagement with the cam-grooves, it is impossible for the door to sag or drop bodily away from the jamb, as would otherwise occur at certain points of its movement. The clutch 19 also operates to the same effect. As the door swings back on closing the operation is the reverse of that just described. When the door opens to the left, the pintle-eyes 13ª of the loose plates 11 and 12 and the clutch 16 turn upon the pintle 15, and the stud-rollers 33 and 34 pass the middle or connecting portions of the grooves *a* and *b* and ride, respectively, into the portions 28 and 31 thereof. During these movements the loose hinge-plate 39 39ª of the lower or secondary hinge connection turns in the one direction upon the pintle 40 and in the other direction upon the pintle 41, and the operation of the spring, if in operation, is as above described.

The connecting-bar 22, in addition to the operation as above described, also serves to hold the clutches 16 and 19 in proper positions to

receive in their cam-slots the respective rollers or sleeves 35 and 36 of the pintles 14 and 15 as the door closes.

In spring-hinges as ordinarily constructed if the door is held open the spring is kept under tension during the whole time the door remains open, and in consequence of this it soon loses its life and requires to be rewound. This rewinding is a more or less difficult matter for the ordinary person, and the services of a mechanic are usually required. By the present arrangement, however, whereby the spring may be thrown out of operation when the door is to be held open, the life of the spring is greatly extended and frequent rewinding is unnecessary.

For light doors or where a spring is not required so much of the above-described hinge as is shown in Figs. 6 and 7 above that part of the plate 12 to which the hinge is connected may be used of itself, omitting the other parts. In this case the hinge will preferably appear as shown in Fig. 1, that part of the plate 12 which is employed being made broader to give it additional strength.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a double-acting hinge, the combination of fixed hinge-plates secured to the respective members connected by the hinge, a loose hinge-plate, two pintles, one of which connects one edge portion of the loose plate to the fixed plate of one member, and the other of which connects its opposite edge portion to the fixed plate of the other member, and slotted vibrating clutches pivotally secured one to each of the said members, together with a connecting device for the said clutches, substantially as specified.

2. In a double-acting hinge, the combination of the fixed hinge-plates secured to the respective members connected by the hinge, a loose hinge-plate, two pintles, one of which connects one edge portion of the loose plate to the fixed plate of one member, and the other of which connects its opposite edge portion to the fixed plate of the other member, the slotted vibratory clutches pivotally secured one to each of the said members, a bar connecting the said clutches and loosely connected thereto, said bar having cam-grooves in its upper face, and antifriction-rollers carried by the said loose plate and arranged to engage the said grooves, substantially as specified.

3. In a double-acting hinge, the combination of the fixed hinge-plate secured to the door, the similar plate secured to the jamb or post, a loose hinge plate or strap, the two pintles which connect opposite edge portions of the said loose plate to the respective fixed plates, the two slotted clutches, one of which is pivotally secured in the jamb and the other in the door, said clutches being designed to engage and clutch the respective pintles in the manner described, an arm or bar which connects the two clutches and is loosely connected thereto, said arm or bar having cam-slots at its end portions which are adapted to register with the slots of the cams, and also having, in its upper face, two cam-grooves, each of which has one portion concentric with one of the said pintles, and a second portion concentric with the other pintle, and antifriction-rollers carried by the said loose hinge-plate and adapted to engage the said cam-grooves, substantially as specified.

4. In a double-acting hinge, the fixed hinge-plates 3 and 4 secured to the jamb and separated from each other by a slot or recess which extends back into the jamb, the similar plates 7 and 8 which are secured to the door and are separated from each other by a slot or recess extending back into the door, the loose hinge-plates 11 and 12, the pintles 14 and 15 which connect the loose plates to the said fixed plates, the slotted vibratory clutches 16 and 19, the end slotted connecting-bar 22 having the cam-grooves in its upper face, and the antifriction rollers or guides carried by the loose hinge-plate 11 and running in the said grooves, substantially as specified.

5. In a double-acting hinge, the combination with a main hinge, consisting of fixed hinge-plates connected respectively to the door and to the jamb, a loose hinge-plate and pintles which connect the loose plate to the fixed plate, said loose plate being formed in two parts, of a supplemental hinge adjacent to the main hinge, and having a loose plate also formed in two parts, a helical spring attached at one end to one part of the loose plate of the main hinge and at the opposite end to one part of the loose plate of the supplemental hinge, and means whereby either one or both of the parts of said loose plate to which the springs are connected may be disengaged from the adjacent part or parts, substantially as specified.

6. In a double-acting spring-hinge, the combination with sectional loose hinge-plates, and with vertically-movable pintles which connect the said plates to the fixed portions of the hinge, of a helical spring connecting two of the sections of said plates, and means for moving the said pintles to withdraw them from engagement with the sections to which the spring is connected, substantially as specified.

7. In a double-acting spring door-hinge, the combination with a main hinge consisting of fixed plates secured to the door and to the jamb, two loose hinge-plates, two pintles which connect the loose plates to the fixed plate, one of said loose plates being formed in two sections, and one of said pintles being capable of being withdrawn from one of the said sections, of a supplemental hinge consisting of two fixed plates, one of which is secured to the door and the other to the jamb, a loose hinge-plate which is formed in two sections, two pintles which connect said loose plate with the fixed plates, one of said pintles being capable of being withdrawn from engage-

ment with one section of said loose plate, and a helical spring whose ends are respectively connected to those sections of the sectional loose plates from which the pintles may be withdrawn, substantially as specified.

8. In a double-acting spring door-hinge, the combination with fixed plates secured respectively to the door and to the jamb, loose hinge-plates formed in two sections, and pintles which connect the said loose plates to the fixed plates, two of said pintles being vertically movable, of a helical spring connected at its ends to sections of different loose plates, means whereby the pintles may be withdrawn from those sections to which the spring is connected, and clutch devices for holding the door to the jamb, substantially as specified.

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

OTHO C. MOORE.

Witnesses:
ROBERT W. TOMLIN,
LEO JUDSON.