C. DIENER.

SPRING HINGE.

APPLICATION FILED FEB. 16, 1916.

1,186,294. Patented June 6, 1916.

Fig. 1.

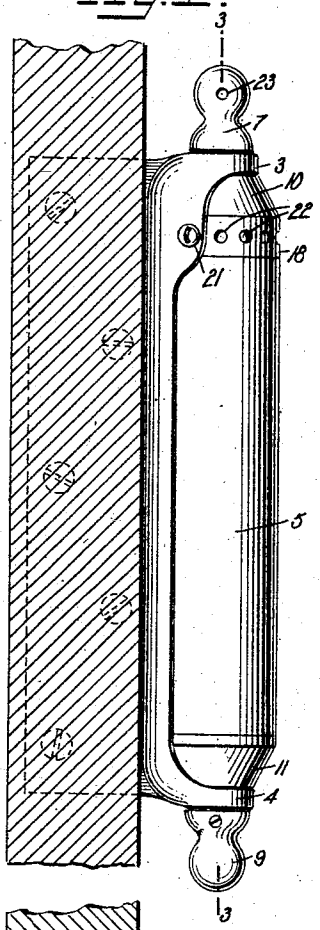


Fig. 3.

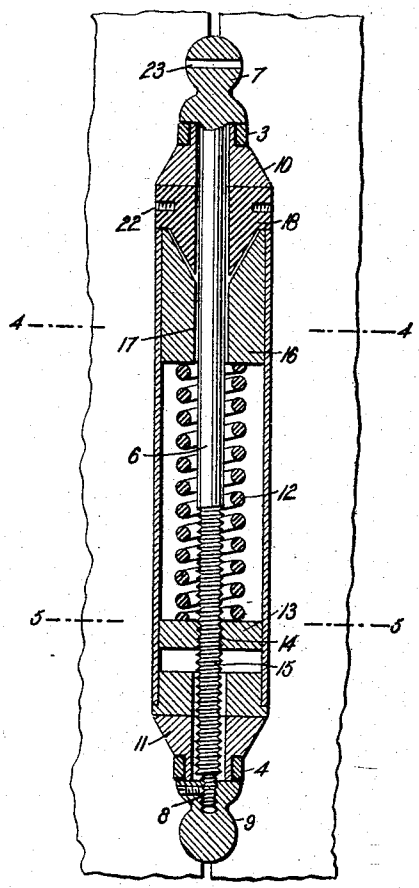


Fig. 2.

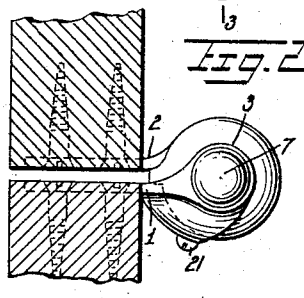


Fig. 4.

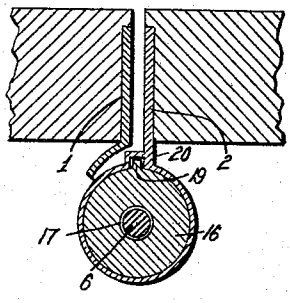


Fig. 6.

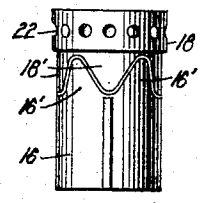
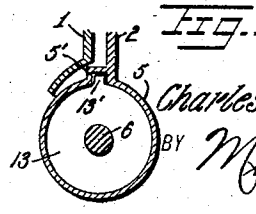


Fig. 5.



WITNESSES

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SPRING-HINGE.

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To all whom it may concern:

Be it known that I, CHARLES DIENER, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Spring-Hinge, of which the following is a full, clear, and exact description.

This invention relates to door hinges of the self-closing type and has for its general objects to improve and simplify the construction and operation of hinges of this character so as to be reliable and efficient in use, comparatively simple and inexpensive to manufacture, and so designed that the door can be automatically locked open in any desired position.

A more specific object of the invention is the provision of a hinge of the barrel type that incloses a spring, and coacting cam elements urged together by the spring for the purpose of yieldingly holding the door open in any desired position and for insuring the self-closing of the door after the same has been started on its closing movement, the design being such that the parts can be easily and quickly adjusted to lock the door in any desired open position and to regulate the force with which the door swings closed automatically.

With such objects in view, and others which will appear as the description proceeds, the invention comprises various novel features of construction and arrangement of parts which will be set forth with particularity in the following description and claims appended hereto.

In the accompanying drawing, which illustrates one embodiment of the invention and wherein similar characters of reference indicate corresponding parts in all the views, Figure 1 is a side view of the hinge; Fig. 2 is a plan view thereof; Fig. 3 is a vertical section on the line 3—3, Fig. 1; Figs. 4 and 5 are horizontal sections respectively on the lines 4—4 and 5—5, Fig. 3; and Fig. 6 is a side view of the coacting cam elements.

Referring to the drawing, 1 and 2 designate the two leaves of the hinge, the first having upper and lower ears 3 and 4, and the second a barrel 5 set in between the ears and operatively connected with the latter by a pintle 6 which passes through the ears and barrel. One end of the pintle has a fixed head 7 and the other end has a threaded portion 8 on which is screwed a nut 9. Conical or other washers 10 and 11 surround the pintle and interlock with the ears 3 and 4. In the barrel and surrounding the pintle is a helical compression spring 12 which bears at one end on a nut 13 that has a central threaded opening 14 engaging the screw threads 15 of the pintle 6, and the other end of the spring bears against a sleeve 16 which has a bore 17 large enough to permit the pintle to be freely turned. The nut 13 is prevented from turning by having a lug 13′ engageable in a groove 5′ in the barrel. The sleeve 16 is one part of a lock or clutch device with which coöperates another part or annular member 18 that also encircles the pintle 6. The elements 16 and 18 have coacting cam surfaces formed by tapering teeth 18′ and 16′. These teeth slip one past the other by relative rotary motion of the parts 16 and 18, and in so doing the part 16 slides axially in the barrel 5. The part 16 is prevented from turning by reason of a longitudinal rib 19 or its equivalent engaging in a groove 20 in the barrel, and the part 18 is fastened to the hinge leaf 1 by means of a screw 21 or equivalent device engaging in any one of a series of apertures 22 in the periphery of the said part 18. By removing the screw 21 and turning the cam element 18 and then reinserting the screw, the position at which the door will be held open or closed can be changed, but this adjustment is possible preferably when the tension is removed from the spring 12, this being done by turning the pintle 6, so that the nut 13 will move downwardly. The turning of the pintle is facilitated by inserting an implement in an aperture 23 in the head 7. By increasing the tension on the spring 12 the clutch element 16 grips its companion element 18 with a greater pressure, so that a greater force will be required to move the door, and when the door is released after having been partially moved, it will continue its movement by reason of one clutch tooth passing beyond the tip of the next tooth 16′ or 18′. In the construction shown in Fig. 6, the door will have a swing of ninety degrees from open to closed position, or vice versa, but if the door is to swing through one hundred and eighty degrees a less number of cam teeth will be employed.

From the foregoing description taken in connection with the accompanying drawing, the advantages of the construction and

method of operation will be readily understood by those skilled in the art to which the invention appertains, and while I have described the principle of operation, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made when desired as fall within the scope of the appended claims.

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

1. A hinge comprising a pair of leaves for pintle-receiving members, a pintle extending through and rotatable in the members, a cam element disposed between adjacent members of the leaves and confined against longitudinal movement but free to be rotatably adjusted around the pintle, a portion of the cam element being exposed between the members, means for fastening the cam element adjustably to one of the leaves, a sliding cam sleeve on the pintle and connected with the other leaf, whereby there is relative rotation of the sleeve and cam element as the leaves move on the pintle, a spring forcing the sleeve constantly in engagement with the cam element, and a nut on the pintle and held against rotation and having a threaded engagement with the pintle, whereby the rotation of the pintle moves the nut longitudinally to vary the tension of the spring.

2. A hinge comprising a pair of leaves, a rotatable pintle connecting the leaves together, a cam element adjustably mounted on the pintle and normally held against longitudinal movement, means for adjustably fastening the cam element to one of the leaves, a cam element surrounding the pintle and movable toward and from the first, an adjustable non-torsional compression spring urging the movable cam element toward the first, and means actuated by the rotation of the pintle for varying the tension of the spring.

3. A hinge comprising a leaf having ears, a leaf having a barrel, a rotatable pintle passing through the ears and barrel and having a threaded portion, a nut on the threaded portion and disposed in the barrel and prevented from rotating, whereby the turning of the pintle shifts the nut, a non-torsional compression spring bearing on the nut, a sleeve slidable in the barrel and against which the spring bears, interlocking parts between the sleeve and barrel for preventing relative rotation, a clutch member fastened to the ear-bearing leaf, and cam teeth on the opposed faces of the sleeve and member maintained in engagement by the spring.

4. A hinge comprising a leaf provided with ears, a leaf provided with a barrel disposed between the ears, filling washers between the ends of the barrel and the ears, a pintle passing through the ears and barrel and through the washers, a nut in the barrel and having a threaded engagement with the pintle, interlocking means between the nut and barrel for preventing rotation, a sleeve in the barrel and surrounding the pintle, means for preventing rotation of the sleeve, a helical compression spring disposed between the nut and sleeve, an annular member disposed between the barrel and one of the washers, said member having apertures in its periphery, a fastening engaging one of the apertures and holding the annular member fixed with respect to the ear-bearing leaf, interengaging cam teeth on the annular member and sleeve for holding the hinge leaves in predetermined positions, and a nut on the pintle for preventing the pintle from shifting longitudinally when being turned.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES DIENER.

Witnesses:
C. BRADWAY,
PHILIP D. ROLLHAUS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."