No. 701,554. Patented June 3, 1902.

W. L. EVANS, JR.

DOOR HINGE.

(Application filed Oct. 31, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

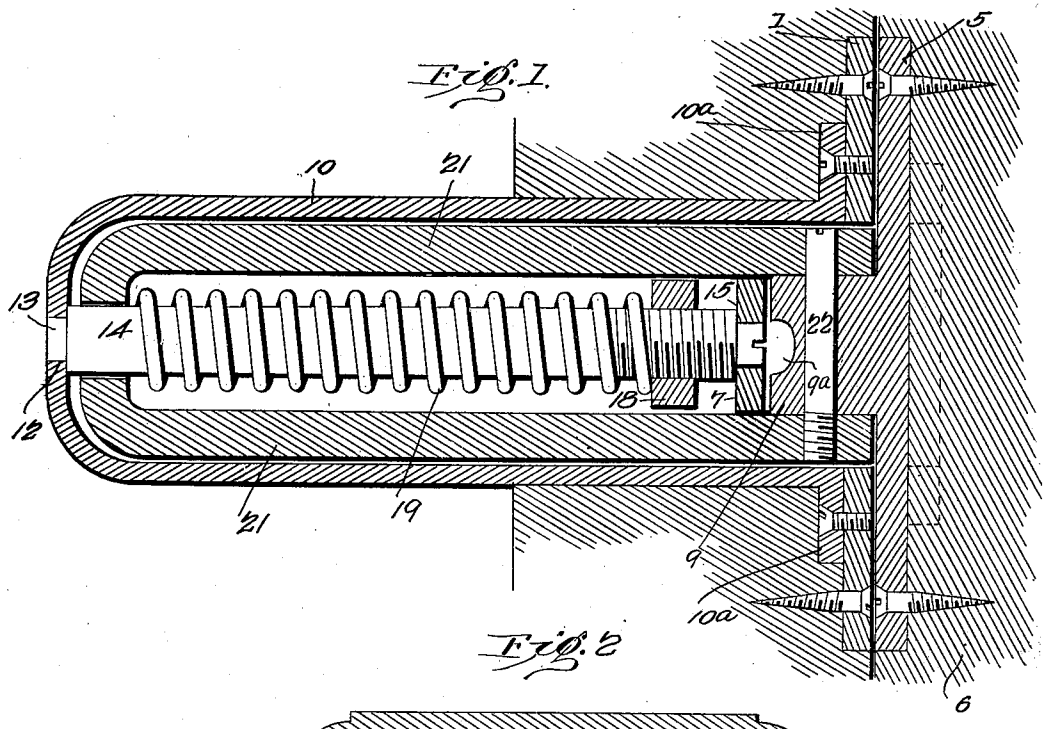
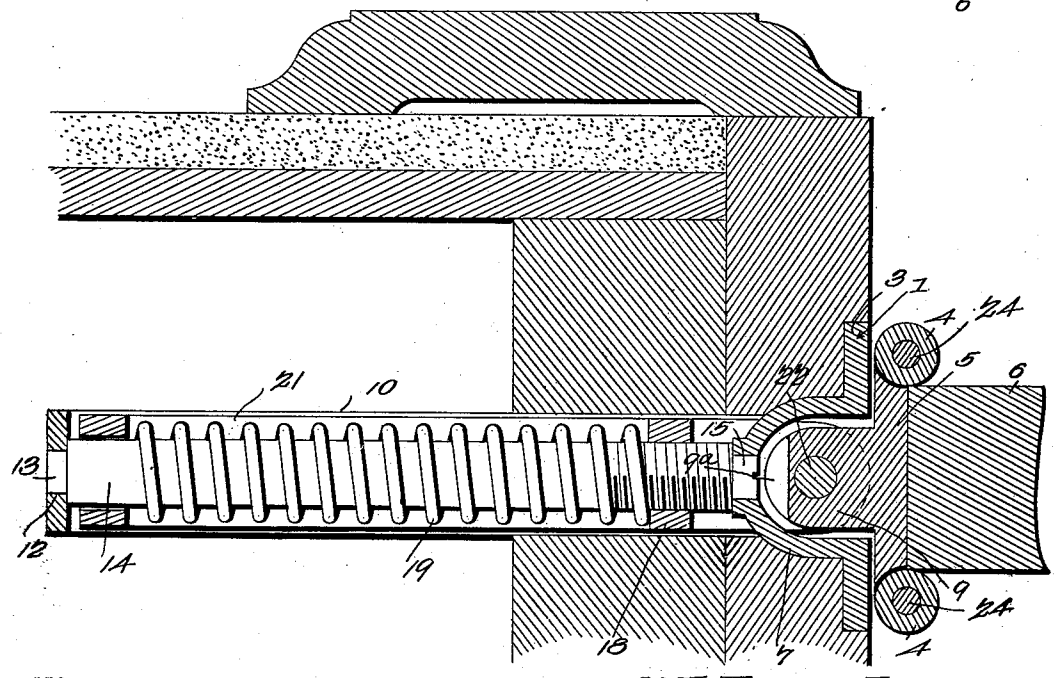


Fig. 2.



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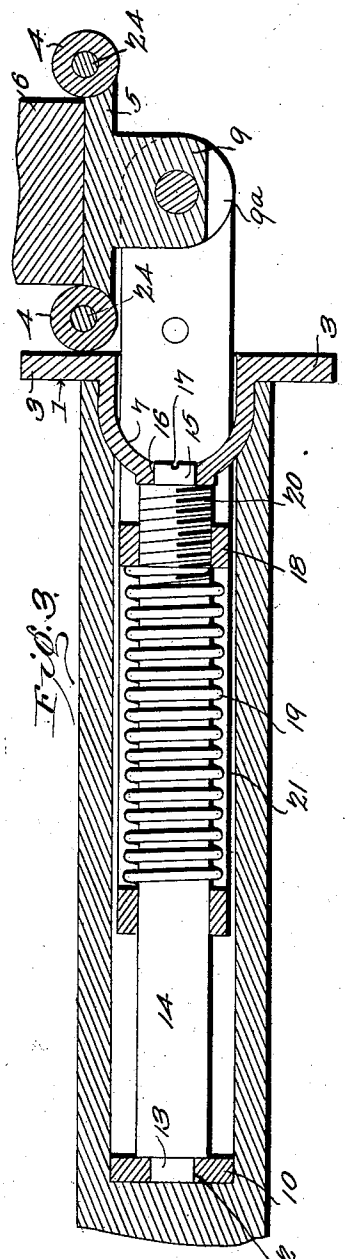


Fig. 3.

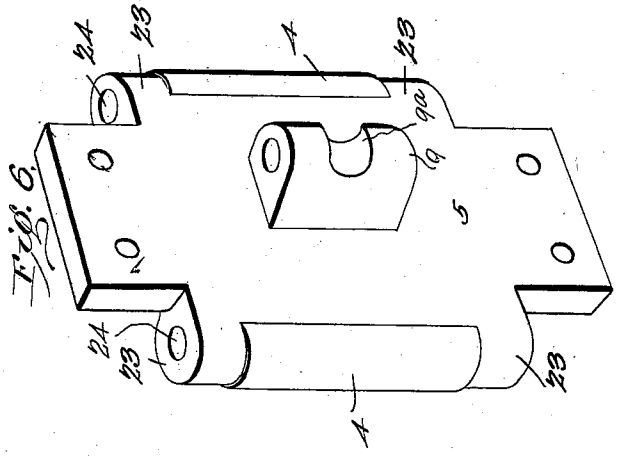


Fig. 6.

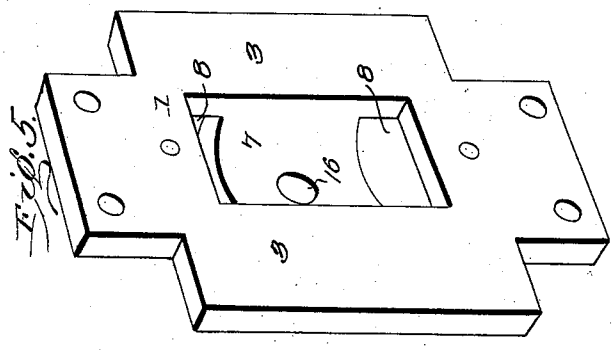


Fig. 5.

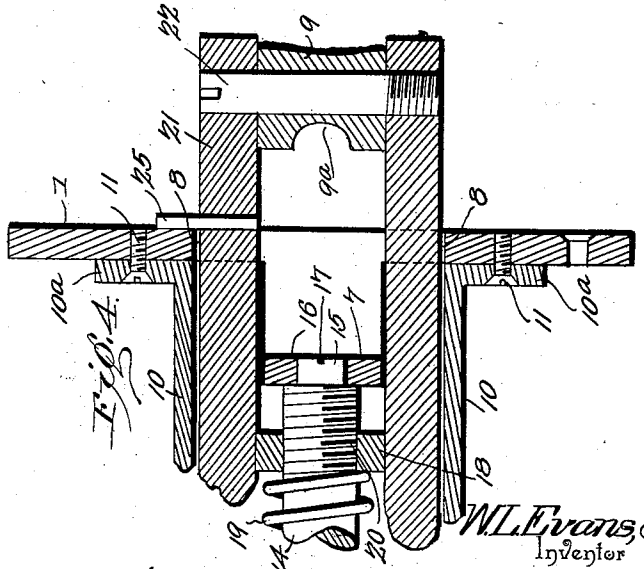


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM L. EVANS, JR., OF WASHINGTON, INDIANA.

DOOR-HINGE.

SPECIFICATION forming part of Letters Patent No. 701,554, dated June 3, 1902.

Application filed October 31, 1901. Serial No. 80,677. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. EVANS, Jr., a citizen of the United States, residing at Washington, in the county of Daviess and State of Indiana, have invented a new and useful Door-Hinge, of which the following is a specification.

The invention relates to improvements in door-hinges.

The object of the present invention is to improve the construction of door-hinges and to provide a simple and comparatively inexpensive one adapted to be readily applied to a door and a door-frame and capable of permitting a door to swing in either direction and of automatically closing the door after it has been opened.

A further object of the invention is to provide a spring-hinge of this character in which the parts may be readily adjusted from the exterior to permit the spring to be tightened should it become loose through long use.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a vertical sectional view of a door-hinge constructed in accordance with this invention and shown applied to a door and a door-frame. Fig. 2 is a horizontal sectional view of the same. Fig. 3 is a similar view illustrating the arrangement of the parts when the door is open. Fig. 4 is a detail sectional view illustrating the manner of locking the yoke in an extended position to facilitate assembling the parts when applying the hinge to a door and a door-frame. Fig. 5 is a detail view of the leaf or plate which is secured to the door-frame. Fig. 6 is a similar view of the leaf or plate which is secured to the door.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a plate or leaf designed to be secured to a door-frame with its outer face flush with the adjacent face of the same and provided with lateral wings or extensions 3 to form bearing-faces for rollers 4 of a leaf or plate 5, which is secured to a door 6. The plate 1 is provided with a central inwardly-extending approximately semicircular transverse portion 7, and it has apertures 8, located above and below the transversely-disposed portion 7. The inwardly-disposed transverse portion 7 forms an exterior recess for the reception of a lug or eye 9 of the leaf or plate 5 of the door. The plate 1 is secured to the door-frame 2 by screws or other suitable fastening devices, and it has fastened to its upper and lower portions an inwardly-extending approximately U-shaped supporting-frame 10, provided at its front end with flanges or arms 10^a, which are perforated for the reception of screws 11 or other suitable fastening devices for securing the supporting-frame to the plate 1.

The approximately U-shaped supporting-plate, which has upper and lower sides, is provided at its inner or rear end with a bearing-opening 12 for the reception of the inner or rear end 13 of a guide-bar 14, which is provided at its outer or front end 15 with a reduced portion. The outer or front end 15 is arranged in a bearing-opening 16 of the inwardly-extending transverse portion 7 of the plate 1 and is provided with a groove 17 for the reception of the blade of a screw-driver for enabling the guide-bar 14 to be rotated. The reduced ends of the guide-bar, which is round, form journals to permit the said guide-bar to be rotated for moving a nut 18 inward and outward to vary the tension of a coiled spring 19. The nut 18 is arranged on a threaded portion 20 of the guide-bar and receives the outer or front end of the coiled spring 19, which has its other end engaging a yoke 21. The yoke 21, which is approximately U-shaped, conforms to the general configuration of the U-shaped supporting-frame, which has upper and lower sides extending through the apertures 8 of the plate 1 and connected by a vertical pin or pintle 22 to the lug 9 of the leaf or plate 5. The pin or pintle is provided at its upper end with a groove for the reception of a screw-driver, and its lower end is threaded and engages a threaded opening of the lower side of the yoke, the upper side of the yoke being provided with a smooth opening, as indicated. The lug 9 is centrally arranged and is provided with a vertical opening to receive the pin or pintle. The

plate 5 is provided at opposite sides with lateral extensions having upper and lower eyes or bearings 23 for the reception of vertical pins or spindles 24, upon which the vertical rollers 4 are mounted. The rollers 4, which extend laterally beyond the door 6, as clearly shown in Figs. 2 and 3 of the drawings, are adapted when the door is opened in either direction to form a movable fulcrum and to roll on the lateral extensions or wings 3 of the plate 1, whereby the coiled spring will be compressed by the yoke, which is drawn outward by this movement of the door. The opening of the door carries the lug or eye 9 outward from the recess or cavity of the center of the plate 1 to the position shown in Fig. 3, and when the door is released the spring will expand and return the door to its closed position. The pins or spindles are designed to be removable to enable the rollers to be detached, and when the rollers are removed the frictional engagement of the eyes and the plate 1 will be sufficient to hold the door in its open position, and, if desired, the hinge may be constructed without rollers.

When it is desired to apply the hinge to a door, the yoke is drawn outward to the position illustrated in Fig. 4 of the drawings and is held there by means of a removable pin or plug 25. The pin or plug 22 may then be removed to separate the leaf or plate 5 from the yoke. The plate 1 and the parts carried thereby are mortised in the door-frame, and the other plate 5 is similarly mounted on the door, after which it is connected with the yoke. The pin or plug 25 may be readily removed by drawing the yoke outward slightly to free the plug or pin from the plate 1, and the hinge is then ready for use.

After the door has been hung the spring can be given the desired tension by opening the door the full width and inserting a screw-driver in the groove of the outer end of the rotary guide-bar, and should the spring become loose or weakened at any point it may be readily tightened in this manner. Should occasion require, the door may be removed by arranging the parts as shown in Fig. 4 and detaching the plate 5, and the groove in the outer end of the rotary guide-bar will then be readily accessible.

In order to facilitate the adjustment of the rotary guide-bar, the lug or eye 9 of the leaf-plate 5 is provided with a notch or recess 9^a, adapted to receive the stem or shank of a screw-driver to permit the blade of the same to be readily engaged with the groove of the rotary guide-bar.

It will be seen that the hinge is exceedingly simple and inexpensive in construction, that it possesses great strength and durability, and that it will permit a door to swing in either direction and will automatically close the door. It will also be apparent that the slidable member or yoke receives the nut and prevents the same from rotating on the screw portion of the guide-bar when the latter is rotated for adjusting the spring.

What I claim is—

1. A hinge comprising a leaf or plate designed to be secured to a door-frame, a rotary bar rotatively mounted at its forward end on the leaf or plate and provided at its front portion with screw-threads, the rear portion of the bar forming a guide, means for supporting and holding the rotary bar against longitudinal movement, a nut arranged on the front threaded portion of the rotary bar, a coiled spring disposed on the bar and having its front end engaged by the nut, a leaf or plate designed to be secured to a door, and means slidable on the rear portion of the rotary bar for connecting the leaf or plate of the door with the rear end of the spring, substantially as described.

2. A hinge comprising a leaf or plate designed to be secured to a door-frame, a spring, a sliding member connected with the leaf or plate and engaged by the spring, and a leaf or plate designed to be secured to a door and connected with the sliding member and provided with rollers arranged to engage the leaf or plate of the door-frame and located at opposite sides of the pintle of the hinge, substantially as described.

3. A hinge comprising a leaf or plate 1, an approximately U-shaped supporting-frame fixed to the leaf or plate 1, the rotary bar journaled on the frame and on the leaf or plate 1 and held against longitudinal movement and provided with a threaded front portion and with a smooth rear portion forming a guide, a slidable member guided on the smooth rear portion of the rotary bar, a leaf or plate connected with the slidable member and designed to be secured to a door, a spring engaging the slidable member, and a nut arranged on the front threaded portion of the rotary bar and engaging the spring, substantially as described.

4. A hinge comprising a leaf or plate designed to be mounted on a door-frame, a supporting frame or barrel open at its front or mouth and closed at its rear end and extending rearward from the leaf or plate, a bar rotatively mounted at its forward end in the leaf or plate at the mouth of the frame or barrel and at its rear end in the closed end of the said frame or barrel and held against longitudinal movement by the latter and having its forward end exposed at the leaf or plate for rotation, said bar being also provided with a threaded portion and a smooth guiding portion, a spring disposed on the bar, a nut arranged on the threaded portion of the bar and engaging the spring, a leaf or plate designed to be secured to a door, and means for connecting the leaf or plate of the door with the spring, substantially as described.

5. A hinge comprising leaves or plates 1 and 5 designed to be mounted respectively on a door-frame and on a door, a supporting frame

or barrel open at its front or mouth and closed at its rear end and extending rearward from the leaf or plate 1, a bar rotatively mounted at its forward end on the leaf or plate 1, at the open end or mouth of the frame or barrel and journaled at its rear end in the closed end of the said frame or barrel, said bar being held against longitudinal movement by the latter and provided with a threaded front portion and having a smooth inner or rear portion forming a guide, a nut arranged on the threaded portion of the bar and held against rotation, a slidable member connected with the leaf or plate 5 and guided on the smooth rear portion of the bar, and a spring interposed between the nut and the slidable member, substantially as described.

6. A hinge comprising a leaf or plate 1 provided with apertures, a rotary guide-bar having screw-threads and held against longitudinal movement, a yoke arranged to slide on the guide-bar and extending through the apertures of the plate 1, a nut arranged on the threaded portion of the guide-bar between the sides of the yoke and held against rotation by the same, and a spring interposed between the nut and the yoke, substantially as described.

7. A hinge comprising a leaf or plate 1 provided with apertures, an approximately U-shaped yoke having parallel sides and extending through the apertures, a guide-bar connected with the leaf or plate 1 and held against longitudinal movement and extending through the inner end of the yoke and receiving the latter, a spring engaging the yoke, and a leaf or plate pivotally connected with the yoke and designed to be mounted on a door, substantially as described.

8. A hinge comprising a leaf or plate 1 having apertures, an approximately U-shaped frame fixed to the leaf or plate, a guide-bar mounted on the frame and on the plate and held against longitudinal movement, an approximately U-shaped yoke having parallel sides and arranged to slide on the guide-bar and extending through the apertures of the leaf or plate 1, a leaf or plate connected with the yoke and designed to be mounted on a door, and a spring arranged on the guide-bar and engaging the yoke, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM L. EVANS, JR.

Witnesses:
J. K. HALL,
W. J. REYNOLDS.