A. S. NERO.

SPRING HINGE.

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977,468. Patented Dec. 6, 1910.

Fig. 3.

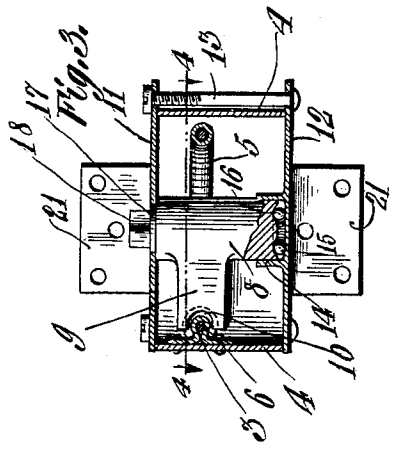


Fig. 4.

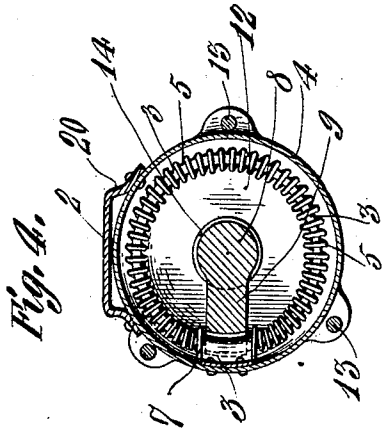


Fig. 1.

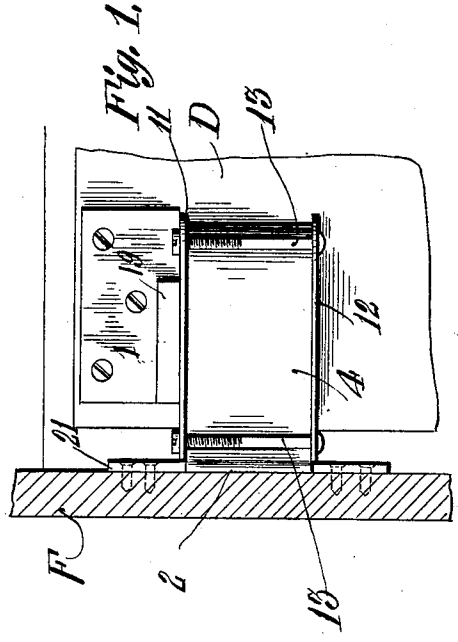
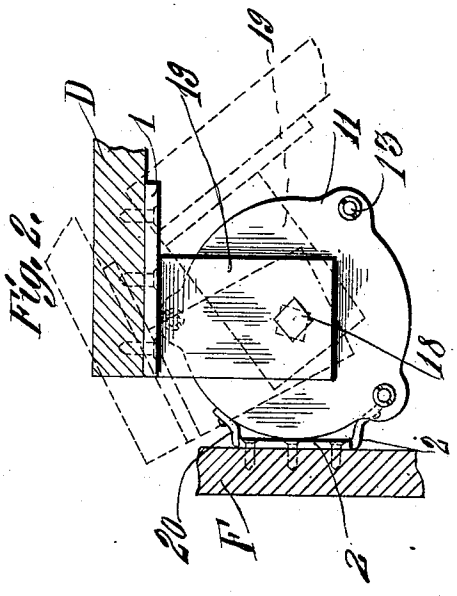


Fig. 2.



Witnesses

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SPRING-HINGE.

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To all whom it may concern:

Be it known that I, ALLEN S. NERO, a citizen of the United States, residing at Bottineau, in the county of Bottineau and State of North Dakota, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in spring hinges for doors or the like of any description, but particularly adapted for screen doors, storm doors and the like which swing both inwardly and outwardly in the door frame or other structure in which they are arranged.

The object of the invention is to provide an improved spring hinge of this character which will be simple, strong and durable and comparatively inexpensive.

With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a detail section through a portion of a door frame showing one of the improved spring hinges for supporting a door therein; Fig. 2 is a horizontal section through the door and its frame showing the hinge in top plan; Fig. 3 is a vertical section through the hinge; and Fig. 4 is a horizontal section through the same.

The invention comprises two members 1, 2, one for attachment to a door or the like D and the other for attachment to a door frame F or other supporting structure. The member 2 has secured to it a casing 4 within which is arranged a circular or arc-shaped guide 3 carrying a coil spring 5. The guide 3 is preferably in the form of a circular rod or ring supported at one point in a bracket 6 shown in Fig. 3 as formed from a single metal plate by bending it upon itself to form an eye in which the ring 3 is secured and having its extremities bent in opposite directions to form attaching feet which are riveted or otherwise secured to the casing 4. The spring 5 surrounds the guide ring 3 and its ends engage and actuate washers 7 which are slidable on said ring, toward opposite sides of the supporting bracket 6. The member 1 of the hinge is fixed to a pivot 8 rotatably mounted in the casing 4 concentric with the guide ring 3 and which is provided with a radially projecting arm 9 having an open portion to enter between the washers 7 and receive the ring 3 and its bracket 6. The open portion of the arm 9 is preferably formed by making a semi-circular recess 10 in its outer end, the recess being of less size than the washers so that when the arm is swung in either direction it will pick up one of the washers and compress the spring 5. The casing 4 may be of any suitable form and construction but, as illustrated, it comprises a circular body provided with open upper and lower ends closed by circular heads or plates 11, 12 which are secured by means of vertical bolts or the like 13 arranged upon the exterior of the body portion of the casing and passing through apertured ears or lugs on the edges of the plates 11, 12. The lower bearing for the pivot 8 is preferably formed by providing upon the bottom plate or head 12 an annular flange 14 which is concentrically disposed and forms a seat for the lower end of the pivot which is cylindrical and also for an annular row of bearing balls 15 arranged in an annular recess or raceway 16 formed in the lower end of the pivot, as clearly shown in Fig. 3. The upper bearing for the pivot 8 is formed by reducing its upper end, as shown at 17, to rotate in a concentric opening in the top plate or head 11. The projecting extremity of the pivot is reduced and squared or provided with flat faces, as shown at 18, so as to enter a similar-shaped opening in an arm 19 of an angular bracket which forms the attaching member 1. The latter has its other arm in the form of an apertured plate adapted to be engaged with and secured to a door or the like by screws or similar fastenings. The member 2 has a body portion with laterally extending flanges 20 riveted or similarly secured to the circular body of the casing 4 and at its top and bottom are provided apertured flanges or plates 21 adapted to be secured to the frame F by screws or the like.

The operation of the hinge is as follows: When the door is in its closed position, the arm 9 will be disposed opposite the bracket 6 and between the washers 7 so that the spring 5 will not be under tension, but when the door is swung in either direction, as indicated by the dotted lines in Fig. 2, the arm 9 of the pivot will swing in either one direction or the other to compress either end of the spring. The instant the door is released

the spring will return the arm 9 and hence the door, to a normal position.

From the foregoing it will be seen that the invention provides an exceedingly simple device of this character which may be produced at a small cost and which will be strong and durable in use. It will be further noted that the hinge may be effectively used upon doors of all kinds.

The accompanying drawing illustrates the hinge as applied to the side of the frame or casing of a door but it will be understood that it may be arranged in the floor or in the top of the door frame if desired.

While I have shown and described in detail the preferred embodiment of the invention, it will be understood that various changes in the form, proportion, arrangement and details of construction may be resorted to without departing from the spirit or scope of the invention.

Having thus described the invention what is claimed is:

1. A spring hinge comprising a casing having an upright cylindrical wall and top and bottom plates, a concentric pivot rotatably arranged between the top and bottom plates and formed with a single integral radially projecting arm having in its outer end a semi-circular notch, a continuous ring, a bracket for supporting the ring formed from a metal strap having its central portion bent around the ring and secured thereto and its end portions bent in opposite directions and secured to the wall of the casing, said semi-circular notch in the arm of the pivot being adapted to swing over the central portion of said bracket, a coil spring surrounding said ring, washers slidably arranged on the ring at the ends of said spring and adapted to engage the opposite sides of the bracket and to be actuated by the arm on the pivot, and attaching brackets connected to the pivot and to the casing.

2. A spring hinge comprising a cylindrical casing having a circular side wall and top and bottom plates, a rotatably mounted spring actuated pivot arranged in the casing and having its upper end projecting through the top plate of the casing, a right angular attaching bracket fixed to said projecting end of the pivot and to the door and an attaching bracket for the casing formed from a single piece of sheet metal and having a flat body portion to engage a flat surface and formed at its top and bottom with apertured attaching flanges, the opposite sides of said flat body being formed with outwardly bent flanges shaped to engage the circular side wall of the casing and secured thereto.

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

ALLEN S. NERO.

Witnesses:

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D. RODNEY.