Dec. 18, 1928. 1,695,454

E. J. COYNE

DOOR SPRING

Filed May 23, 1927

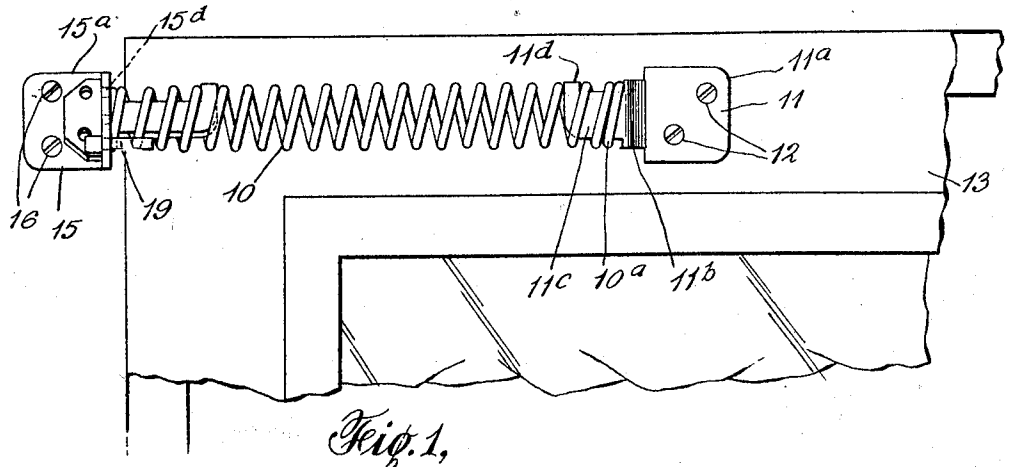


Fig. 1.

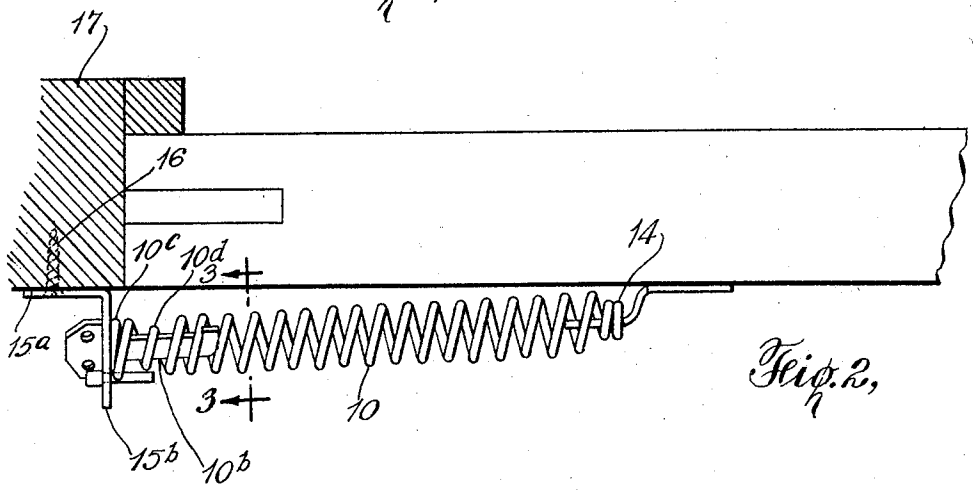


Fig. 2.

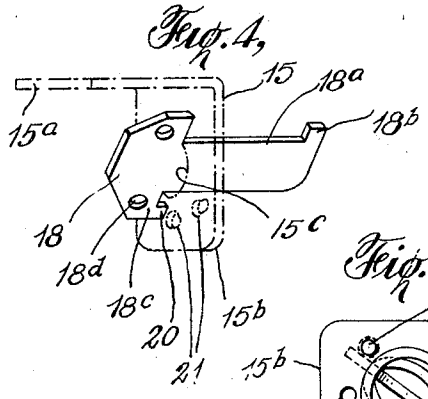


Fig. 4.

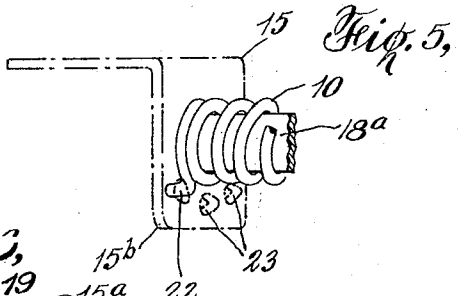


Fig. 5.

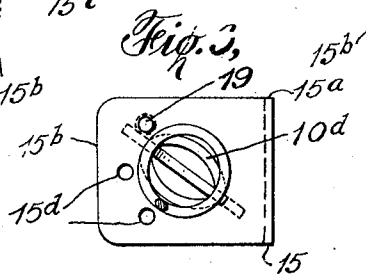


Fig. 3.

INVENTOR
EDWARD J. COYNE
BY
Howard B. Thompson
ATTORNEY

Patented Dec. 18, 1928. 1,695,454

UNITED STATES PATENT OFFICE.

EDWARD J. COYNE, OF BROOKLYN, NEW YORK.

DOOR SPRING.

Application filed May 23, 1927. Serial No. 193,426.

This invention relates to door springs or devices of this class for use in moving a swinging member into a predetermined position; and the object of the invention is to provide a device of the class specified with improved and simplified means at the end portions of the spring member thereof for mounting said member in connection with a stationary support and swinging member; a further object being to provide a mounting means for springs of the class specified fashioned from sheet metal bent to form attaching bracket portions and spring engaging portions, one of said bracket members having a sheet metal part movably mounted in connection therewith for rotating the spring to increase or decrease the tension thereof, and means for securing said part and spring in predetermined position of adjustment; and with these and other objects in view, the invention consists in a device of the class and for the purpose specified, which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Fig. 1 is a face view of a part of a door and door frame; showing one of my improved springs mounted in connection therewith.

Fig. 2 is a sectional, plan view of the structure shown in Fig. 1.

Fig. 3 is a sectional, detail view on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of a modified form of construction; and,

Fig. 5 is a perspective view showing another modification.

In practice, I provide a spring body 10 in the form of a coil spring of the desired tension to suit the requirements, it being understood that a light spring is employed for actuating a door of light weight and a heavier spring for a door of heavier weight, and coupled with one end of the spring is an attaching bracket member 11 fashioned from sheet metal, one part 11^a being apertured to receive the attaching screws 12 for securing said member to a support, for example, the door 13 in the construction shown. Extending at an angle to the part 11^a is a reduced shoulder portion 11^b upon which the end 10^a of the spring rests. Extending from the shoulder portion 11^b is a reduced part 11^c which is arranged in substantially parallel relation to the part 11^a and passes through the coils of the spring 10, and is provided at its outer end with an offset finger 11^d which extends between the coils of the spring, and functions as a key to lock the bracket member 11 in connection with the spring. In attaching the member 11 to the end 10^a of the spring, the part 11^c with the projecting finger 11^d is threaded through the coils of the spring in the manner of a screw, until the end 10^a bears against the shoulder portion 11^b after which the end windings of the spring are compressed as seen at 14, Fig. 2 of the drawing, to retain the member 11 against rotation and displacement from the spring 10.

Another bracket member 15 is fashioned from sheet metal and is L-shaped in form, one part 15^a being provided with apertures for attaching screws 16 passed into the door frame 17 for the door 13, and the other part 15^b which extends at right angles to the part 15^a is provided centrally with an aperture 15^c, and at the outer end portion thereof with a plurality of similar apertures 15^d spaced circumferentially with reference to the axis of the aperture 15^c. Rotatably mounted in connection with the bracket member 15 is a tension adjustment key 18, the shank 18^a of which passes through the aperture 15^c and is provided at its free end with a laterally extending finger 18^b which is adapted to be threaded through the windings of the spring 10 at the end portion 10^b thereof, until said end of the spring which is preferably flattened as seen at 10^c is in engagement with the lower face of the part 15^b of the member 15, and is under slight tension, and the key 18 is then secured in fixed relation to the spring by compressing one or more windings thereof, as seen at 10^d, in Fig. 2 of the drawing.

The other end of the key 10 is provided with an enlarged head 18^c, the width of which is sufficient to extend beyond the apertures 15^d in the part 15^b so as to engage a pin 19 mounted in one of the apertures 15^d to retain the key 18 as well as the spring 10 in a given position of adjustment, and with said spring under the desired tension. The key 18 may be rotated to adjust the tension of the spring by the application of a wrench to the wide,

flat head 18c or a rod may be placed in either of two apertures 18d provided in said head for rotating the same, and a large nail will, in most instances, be sufficient to give the required leverage.

In the construction shown in Figs. 1, 2 and 3, the pin 19 is detachable with respect to the several apertures 15d employed, it being understood that either extending side portion of the head 18c may engage the pin in the adjustment of the spring. In Fig. 4 of the drawing, I have shown a slight modification wherein the pin 19 is eliminated, and the head 18c is provided at one side with a downwardly directed finger or pin 20 adapted to be placed in either of the apertures 21, said apertures being preferably provided with beveled walls, extending in the direction of rotation of the key 18 to facilitate the rotation of said key, as will be apparent. The same result may also be accomplished by providing one end of the spring 10 with an outwardly directed finger pin 22 as seen in Fig. 5 of the drawing, which will engage one of a number of apertures 23 in the bracket member 15. In this instance, the walls of the aperture 23 are also beveled on the lower face of the part 15b of the bracket to facilitate the displacement of the pin 22 in the adjustment of the spring.

It will be noted that the bracket member 15 is held under tension by that part of the spring extending between said member and the finger 18b on the key 18. While the member 15 may be moved longitudinally of the key or the shank 18a thereof by compressing the spring, said key is not movable relatively to the spring in the rotation of the key for applying tension to the spring.

It will be understood that by providing the sheet metal bracket members and the tension adjustment key 18 also composed of sheet metal, I provide an entire device which has the greatest possible strength and yet a device which may be manufactured and sold at a very reasonable price; and the possibility of breakage, as is commonly experienced with other devices of this class employing bracket ends constructed from cast metal is obviated; and while I have shown certain details of construction for carrying my invention into effect, it will be understood that I am not necessarily limited to these details and various changes therein and modifications thereof may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

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

1. A spring of the class described, one end portion of which is provided with a sheet metal bracket member having an attaching plate part and an integral part to which one end of the spring is directly secured, a sheet metal bracket mounted in connection with the other end of the spring, and a member secured directly to said spring and mounted directly in connection with said last named bracket, and adjustable relatively thereto, for coupling the bracket and spring together and for retaining the spring in predetermined position with reference to said bracket.

2. A spring of the class described, one end portion of which is provided with a sheet metal bracket member having an attaching plate part and an integral part to which one end of the spring is directly secured, a sheet metal bracket mounted in connection with the other end of the spring, a member secured directly to said spring and mounted directly in connection with said last named bracket and adjustable relatively thereto, for coupling the bracket and spring together and for retaining the spring in predetermined position with reference to said bracket, and said member being rotatable with reference to the second named bracket and adapted to adjust the tension of said spring.

3. A spring of the class described, one end portion of which is provided with a sheet metal bracket member having an attaching plate part, and an integral part to which one end of the spring is secured, a sheet metal bracket mounted in connection with the other end of the spring, a member secured to said spring and adjustable relatively to and cooperating with said last named bracket for coupling the bracket and spring together and for retaining the spring in predetermined position with reference to said bracket, said member being rotatable with reference to the second named bracket and adapted to adjust the tension of said spring, and means for retaining said member in predetermined positions of adjustment with reference to said bracket.

4. The combination with a spring of the class described of brackets fashioned from flat strips of sheet metal for supporting the end portions of said spring in connection with predetermined supports, and a member movably supported with reference to one of said brackets and having a part extending into and secured to one end of said spring for coupling the said bracket to said spring.

5. The combination with a spring of the class described of brackets fashioned from sheet metal for supporting the end portions of said spring in connection with predetermined supports, a member movably supported with reference to one of said brackets and having a part extending into and secured to one end of said spring for coupling the said bracket to said spring, said bracket being supported in connection with said member under tension, and means for retaining said member in predetermined positions of adjustment with reference to said bracket.

6. The combination with a coil spring of the class described, of two sheet metal members extending into and in threaded engagement with the coils at the end portions of said spring and retained against displacement from said spring by the compression of one or more coils of the spring where said members are mounted therein.

7. The combination with a spring of the class described, of two sheet metal members in threaded engagement with the end portions of said spring and retained against displacement from said spring by the compression of one or more coils of the spring where said members are mounted therein, said members extending beyond the ends of said spring, and a bracket part supported in connection with one end of the spring and held in engagement therewith by the member coupled with said end of the spring.

8. The combination with a spring of the class described, of two sheet metal members in threaded engagement with the end portions of said spring and retained against displacement from said spring by the compression of one or more coils of the spring where said members are mounted therein, said members extending beyond the ends of said spring, a bracket part supported in connection with one end of the spring and held in engagement therewith by the member coupled with said end of the spring, and means whereby said member and spring may be moved relatively to said bracket part.

9. The combination with a spring of the class described, of two sheet metal members in threaded engagement with the end portions of said spring and retained against displacement from said spring by the compression of one or more coils of the spring where said members are mounted therein, said members extending beyond the ends of said spring, a bracket part supported in connection with one end of the spring and held in engagement therewith by the member coupled with said end of the spring, means whereby said member and spring may be moved relatively to said bracket part, and means for retaining said member in predetermined positions of adjustment with reference to the bracket part.

10. The combination with a spring of the class described, of two sheet metal members in threaded engagement with the end portions of said spring and retained against displacement from said spring by the compression of one or more coils of the spring where said members are mounted therein, said members extending beyond the ends of said spring, a bracket part supported in connection with one end of the spring and held in engagement therewith by the member coupled with said end of the spring, means whereby said member and spring may be moved relatively to said bracket part, means for retaining said member in predetermined positions of adjustment with reference to the bracket part, and the other of said members having an attaching plate portion.

11. The combination with a coil spring of the class described of two members having hook ends extending into and in threaded engagement with the coils at the end portions of the spring, the hook portion of said members being positioned between the windings of the spring, and said members being retained against displacement from the spring by the compression of one or more coils of the spring onto said members.

12. The combination with a spring of the class described of two members having hook ends in threaded engagement with the end portions of the spring, the hook portion of said members being positioned between the windings of the spring, said members being retained against displacement from the spring by the compression of one or more coils of the spring onto said members, and one of said members having an enlarged head, and a bracket part positioned between the head of said member and one end of the spring and said member and spring being adjustable with reference to said bracket part.

In testimony that I claim the foregoing as my invention I have signed my name this 20th day of May 1927.

EDWARD J. COYNE.