Feb. 28, 1939. A. H. FLORETH 2,149,047

DOOR CLOSER

Filed Feb. 5, 1938

Fig. 1.

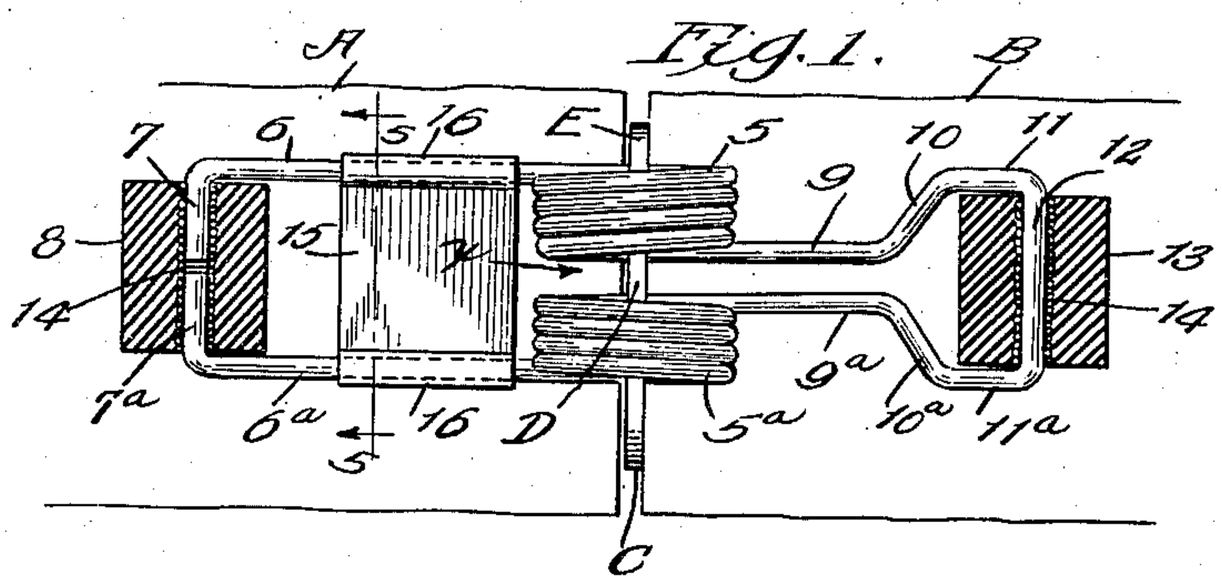


Fig. 2.

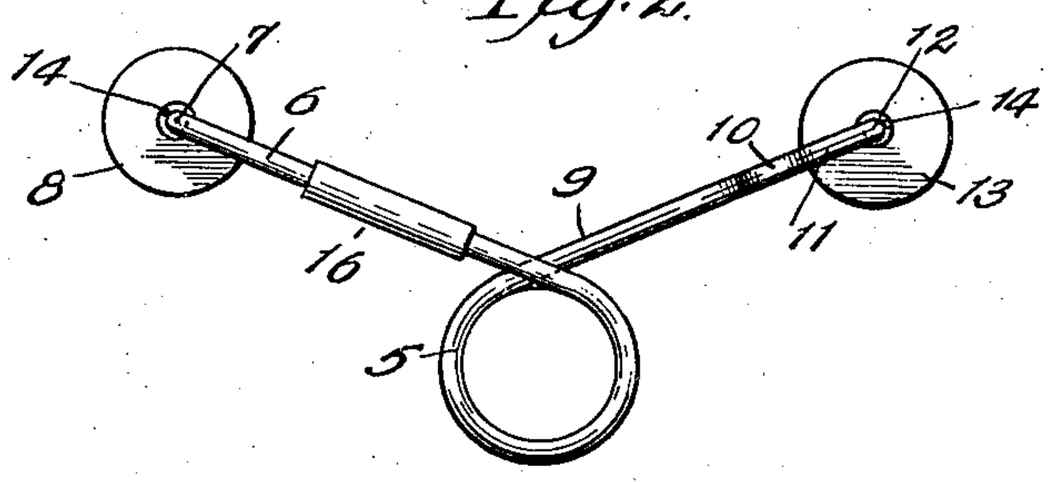


Fig. 3.

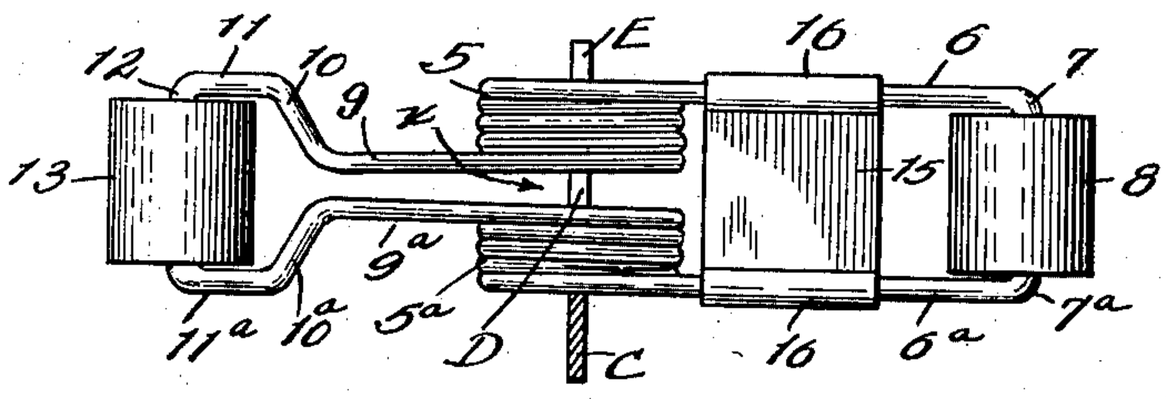


Fig. 4.

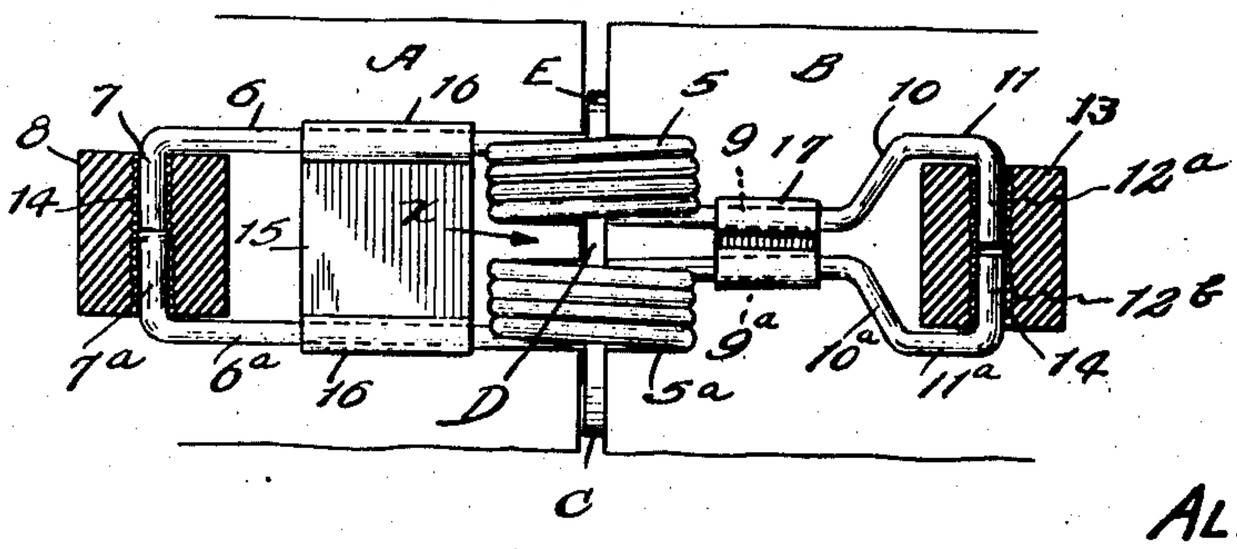
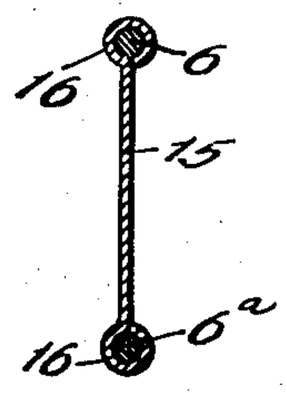


Fig. 5.



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By. C. R. Lundy Atty.

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2,149,047

UNITED STATES PATENT OFFICE

2,149,047

DOOR CLOSER

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Application February 5, 1938, Serial No. 188,938

2 Claims. (Cl. 16—76)

My invention relates to door closers and especially to spring devices adapted for closing screen doors and the like.

The present device consists of horizontally disposed arm members that extend in opposite directions from a central or intermediate spring body member, these parts being arranged with respect to each other so that the body member may be readily mounted upon a support that projects from between the door and frame, and the arm members of the closer respectively engage the adjacent outer surfaces of the door and the door frame. The said body member is preferably in the form of a plurality of coiled springs, preferably two, that are right-hand and left-hand coils, and said springs are arranged in superposed relation and in axial alinement with each other. The arm members are preferably oppositely disposed pairs, with one pair on each side of the intermediate body. Each arm is formed with and projects from a convolution of a coiled body, and the arms of each pair are connected together in a manner to provide a wide pressure member of stiff construction. Cushion rollers may be provided on the operating or free ends of the arms or pressure members to engage the surfaces of the door and frame, and suitable bushings may be interposed between the journals and the bores of said rollers to permit easy rotation of the rollers and to prevent wear and distortion of the rollers.

The arrangement of the parts herein disclosed results in an equalizing action of the spring coils upon each pair of arms, thus adapting the rollers for flat and even contact with the surfaces engaged by them because there is the same, (or substantially the same), pressure exerted at both ends of a roller thus avoiding a tilting of an end thereof due to uneven pressure or where pressure is exerted solely at one end. The spring door closer which I have invented is extremely easy to install as it requires a minimum of effort to spread the arms when mounting the central coiled body member upon its supporting bracket or post.

The primary object of my invention is to produce a spring closer for screen doors and the like that is of novel construction. Further advantages of my improvements reside in the fact that this device is capable of performing its functions in a dependable manner; it is easy to manipulate when being installed; it is made of simple and sturdy parts that will withstand hard usage and will not readily get out of order; and it is economical to fabricate so that it may be sold for a small retail price. Other advantages of this device will be obvious to persons familiar with the art after the construction of my door closer is understood from the disclosure hereinafter made in this specification.

I prefer to practice my invention and to accomplish the numerous objects thereof in substantially the manner herein described and claimed, and I refer to the accompanying drawing, forming a part hereof, for a better understanding of my improvements. The drawing is more or less schematic, and discloses a typical or preferred form in which the present device may be conveniently made.

In the drawing:—

Figure 1 is a front view, in elevation, of my spring door closer in operative position and partly in section.

Figure 2 is a top plan of my device showing the same detached from its mounting bracket.

Figure 3 is a rear view, in elevation, with the arms extended as in Figure 1.

Figure 4 is a view similar to Figure 1 of a modified two-part construction.

Figure 5 is an enlarged transverse section on line 5—5, Figure 1.

Like reference characters are used to identify the same parts in the different views, and in Figure 1 the door is designated as A and the adjacent frame is designated as B. The mounting bracket is a flat plate C secured by screws or other means preferably to the surface of the frame that opposes the edge of the door, and it has an L-shaped extension that projects out beyond the meeting edges of the door and the frame to provide an upright post D to receive the coiled body of the closer, and the lateral upper end E of the post affords an overhanging retainer or abutment that projects over the top convolution of the coiled body of the closer for maintaining the device in proper position with relation to the door and frame.

My improved device embodies a structure made from either one or two pieces of wire bent substantially into shapes which simulate the structure shown, the central body portion being formed with right and left hand coils. The wire is of suitable gage and has an intermediate portion shaped into a spirally coiled cylindrical body 5, and there is a horizontal arm 6 extending tangent from the upper convolution of this coiled body. At the free portion of the arm 6 the end of the wire is bent laterally a distance about equal to the height of the coil 5 to provide a portion of a journal or axle 7 upon which the

roller 8 is rotatably mounted. At the bottom of the coil 5 there is a horizontal arm 9 extending tangent from the lowermost convolution, and about midway the length of this arm the wire is given an upward bend to provide an oblique portion 10 that extends to about the horizontal plane of the first arm 6, and at this location the wire is given a second bend to dispose the free outer portion 11 of the arm in a horizontal plane parallel with the inner portion 9 of said arm and off-set with respect thereto. A journal or axle member 12 for a second roller 13 is provided at the end of the arm just described by bending the adjacent portion of the wire in a downward direction in a manner similar to the axle member 7 but approximately twice the length of journal 7.

The portion of the article just described embodies the upper portion of the door closer that is formed from half of the length of wire, and for purpose of convenience may be designated as the upper member. The lower member or bottom half of the structure embodies a continuation of the piece of wire of which the first-described portion is fabricated.

The intermediate portion of this remaining piece of wire is coiled into a cylindrical body 5*a* with its convolutions disposed in a manner opposite to the convolutions of the coiled body 5. A horizontal arm 6*a* extends tangent from the bottom convolution of coiled body 5*a* and parallel with arm 6, and there is a laterally disposed journal or axle 7*a* at its end that axially alines with and projects towards the corresponding journal 7. Another arm 9*a* projects horizontally and tangentially from the top convolution of coiled body 5*a*, and said arm has an oblique portion 10*a* and an off-set portion 11*a* similar to the corresponding members of the first described section. The outer end of the off-set portion is bent from and is a continuation of the lateral journal or axle 12 that connects the free ends of the arms 11 and 11*a* permit them to move simultaneously as well as maintain the roller 13 in position.

It will be seen the right and left hand coils are axially alined and provide a cylindrical body, and the arms 9 and 9*a* are disposed near to and parallel with each other and the arms 6 and 6*a*, while they are parallel with each other, they are spaced apart a distance equal to the combined axial length of the cylindrical body. Also it will be noted that the off-set portions 11 and 11*a* are spaced apart a distance corresponding with the spacing of arms 6 and 6*a*. There is preferably a gap *x* between the coils that permits entrance therein of the arms 9, 9*a* whenever the door is swung open to its fullest extent, thus preventing distortion of the closer device.

In the fabrication of this structure roller 13 is threaded onto the center of the wire. The central portion of the wire is first formed into a complete journal or axle 12 with the irregular arms extending from the ends thereof, after which the right and left hand coils are shaped, and lastly the second or straight pair of arms 6, 6*a* are formed with separate journal or axle members 7, 7*a* at their ends which project towards each other at the ends of the wire. The structure is then spread about and the journals inserted into opposite ends of roller 8 after which a reinforcing connector 15 which is clamped or seamed by beads 16 upon the pair of arms 6, 6*a* in the manner shown in Figure 5. Small metal bushings 14, preferably coiled wire cylinders, are interposed between the journals and the bores of the rollers to reduce friction and wear and to increase the ease of rotation of the rollers.

In Figure 4 I have disclosed a slightly modified construction wherein the closer device is made from two separate pieces of wire. This form is substantially the same as that hereinbefore described with the exception that the journal or axle at the ends of the off-set portions 11, 11*a* of arms 9, 9*a* embodies two laterally bent extensions 12*a* and 12*b* that axially aline with and project towards each other. Also the intermediate portions of the contiguous arms 9, 9*a* are connected by a metal clip 17 that is beaded upon the wire in the same manner as the connector 15 is secured to arms 6, 6*a*.

The connecting means for the arms, in either of the types of structure herein described, act as reinforcement and adapts the arms of each pair for movement simultaneously with respect to each other. The construction and arrangement of the parts of the article permits the door closer being mounted on its support in a manner that disposes either pair of arms in engagement with the door, i. e.,—the article is reversible at any time. Also the coiled spring body affords the sole means for mounting the door closer upon the post D of the supporting bracket.

In use, the tension of the coiled springs, through the arms, is exerted uniformly upon the journals or axles so that the rollers receive equalized or even pressure throughout their lengths with the result that there is no tendency of a roller to tilt at one end or unevenly engage the surface with which it is contacted. The rollers are preferably made of rubber or other suitable cushion material that will not mar or damage the wood-work against which they operate.

For the purpose of providing a unitary one-piece structure, the adjacent ends of the journal members 7 and 7*a* and the journal members 12*a* and 12*b* may be butt-welded or brazed together so that the wire structure is endless and continuous. In such event the reinforcing connector members 15 and 17 may be omitted as may also the rollers and the latter may be substituted by other suitable cushion means.

What I claim is:

1. A door-closing device embodying a suitable bracket and a spring mounted thereon; said spring comprising two wire coils disposed in axial alinement to provide a central body; a pair of arms extending from certain end convolutions of said coils; means other than and separate from said bracket connecting said arms for simultaneous operation and to constitute a presser-arm that is movable independently of the bracket; a second pair of arms extending from certain other end convolutions of said coils; and means other than and separate from said bracket connecting said second arms for simultaneous operation and to constitute a second presser-arm that is movable independently of the bracket; said pressure-arms extending in opposite directions from the bracket, and one of said presser-arms operatively engaged with the surface of a door-member and the other presser-arm operatively engaged with the surface of a stationary frame-member alongside the door, whereby movement of the door-member will cause said presser-arms to move upon and relative to the respective members engaged by them.

2. A door-closing device embodying a suitable bracket and a spring mounted thereon; said spring comprising two spaced wire coils disposed in axial alinement to provide a central body engaged by

said bracket; a pair of arms extending from the outer end convolutions of said body; means other than and separate from said bracket connecting said arms for simultaneous operation and to constitute a presser-arm that is movable independently of the bracket; a second pair of arms extending from the inner end convolutions of said body; and means other than and separate from said bracket connecting said second arms for simultaneous operation and to constitute a second presser-arm that is movable independently of the bracket; said presser-arms extending in opposite directions to the bracket; the first pressure-arm urged toward and operatively engaged with the surface of a door and the second presser-arm urged toward and operatively engaged with the surface of a stationary door-frame alongside the door, whereby movement of the door with respect to the frame will cause the first presser-arm to move upon and with respect to the door and the second presser-arm to move upon and with respect to the door-frame.

ALVIN H. FLORETH.