Dec. 17, 1935. E. L. FREDRICKS ET AL 2,024,919

DOOR CLOSING DEVICE

Filed April 13, 1935

Fig. 1.

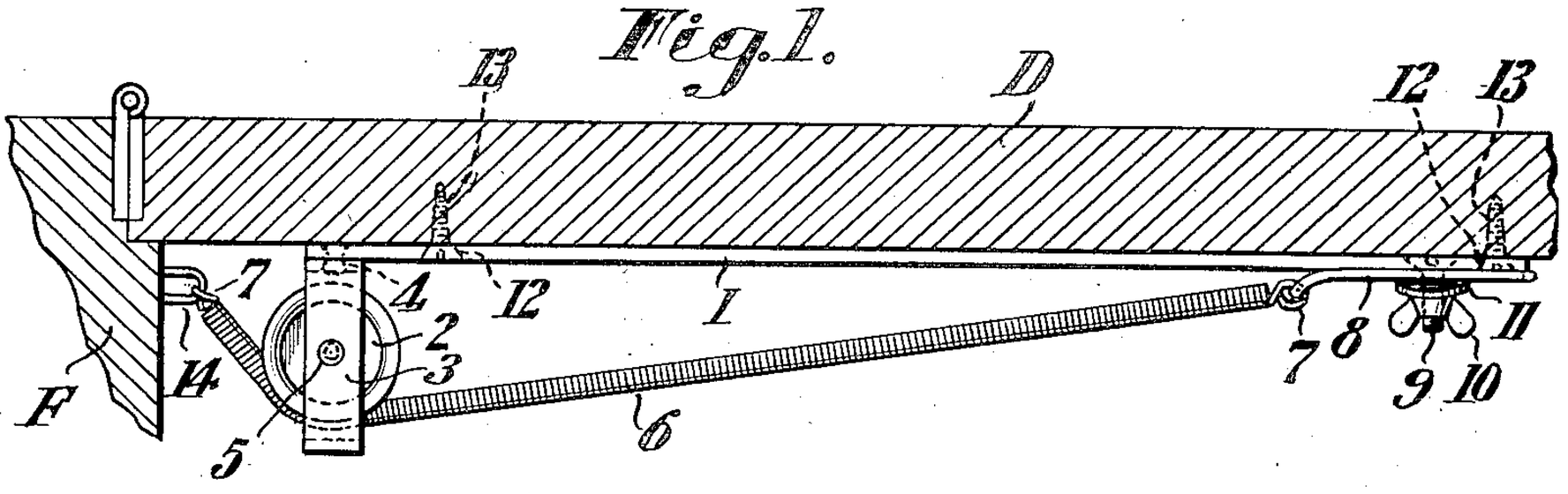


Fig. 2.

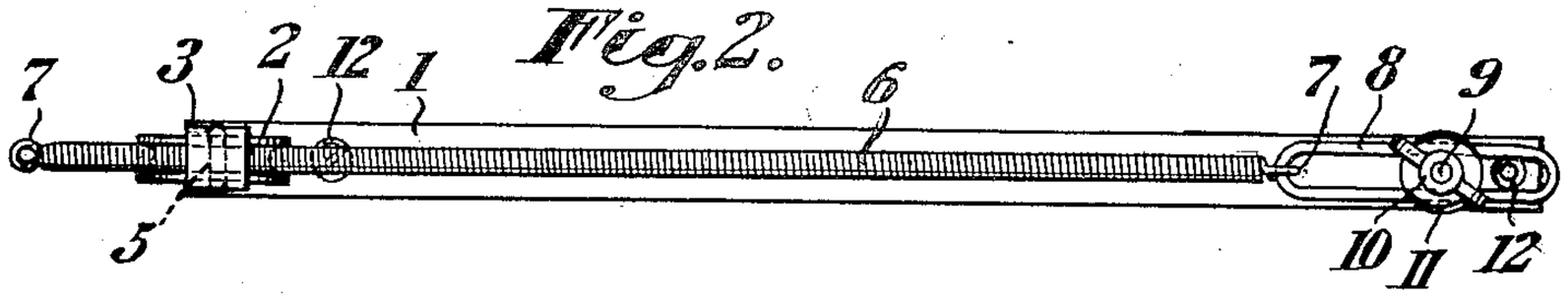


Fig. 3.

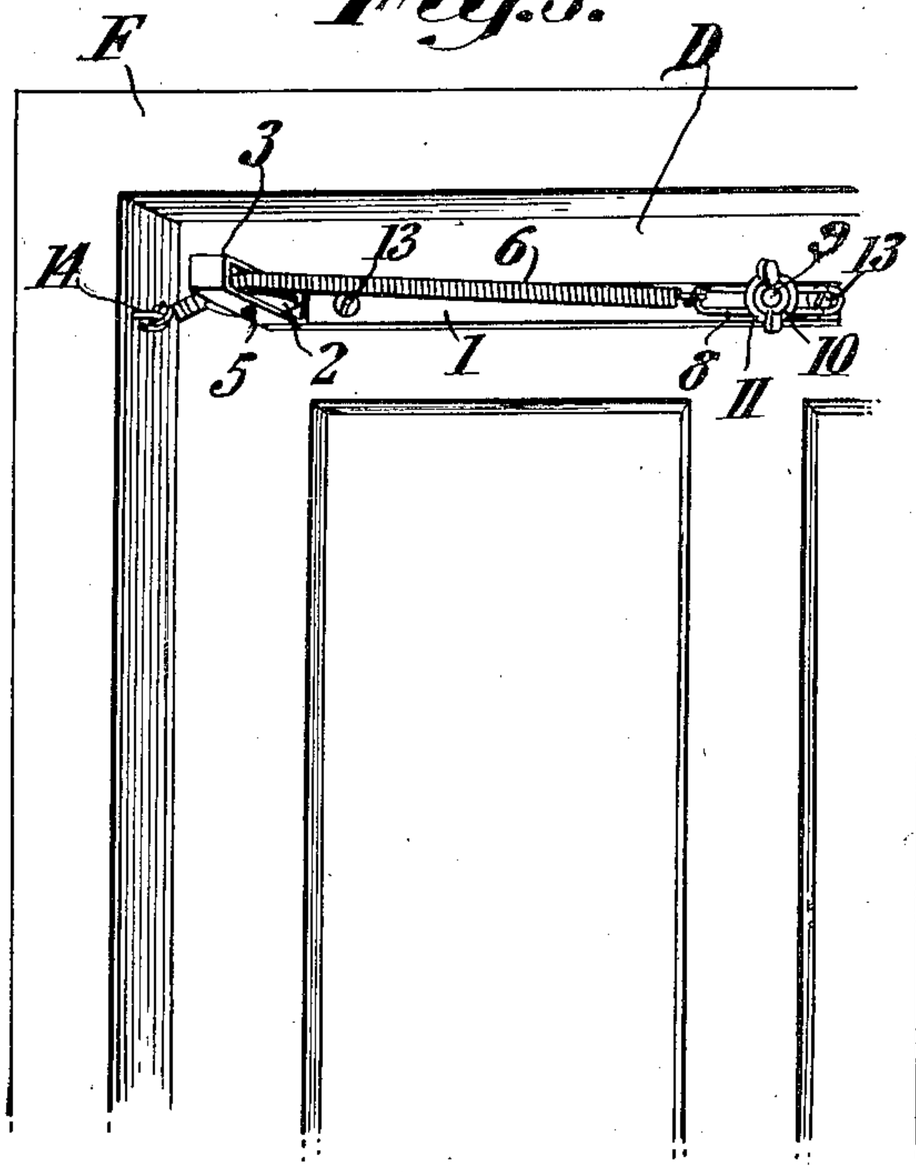
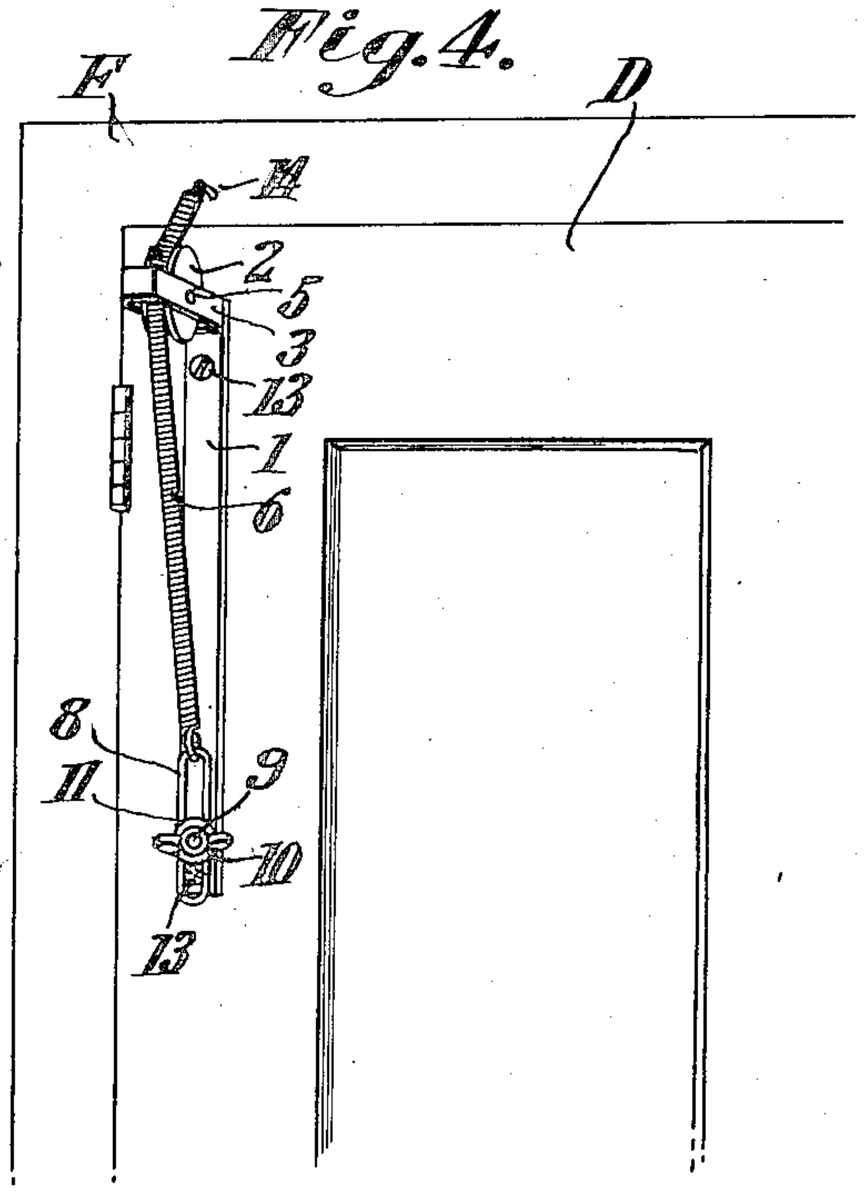


Fig. 4.



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DOOR CLOSING DEVICE

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Application April 13, 1935, Serial No. 16,124

2 Claims. (Cl. 16—72)

Important objects of the present invention are to provide an improved, efficient door closing device of simple, inexpensive construction; to provide such a device designed for easy installation; and to provide such a device designed for installation upon either an outwardly opening door or an inwardly opening door and adapted to function satisfactorily in either installation.

Other objects of the invention will appear hereinafter.

In the drawing, Fig. 1 is a horizontal partial section of a door and the frame of the doorway with the door closing device installed;

Fig. 2 a plan view of the device;

Fig. 3 a perspective view showing the device installed for closing an outwardly opening door, that is a door opening away from the observer, and

Fig. 4 a perspective view showing the device installed for closing a door opening inward, toward the observer.

The device is a unitary structure and it includes a straight, flat, elongated base 1 which may be made inexpensively from a length of strap iron. At or near one end of the base there is a mounting for a grooved pulley 2. Said pulley mounting includes a rigid rectangular frame 3. The frame also may be made from a length of strap iron, bent into shape. Of course the base 1 and the frame 3 may be made of other materials and in other shapes if desired. By means of a rivet 4 or other fastening means the frame is rigidly secured at one end to the base 1 and projects forward at a right angle to the plane of the base. The pulley 2 is disposed within the frame on a shaft 5 whose ends are fixed in apertures in opposite sides of the frame so that the pulley is supported to rotate on an axis transverse to the length of the base and spaced outward from the outer face of the base.

A stretchable and resilient tension strand in the form of a long helical spring 6 is trained through the frame 3 and over the pulley. At its opposite ends said spring has anchoring loops 7. One end of the spring is anchored to the base 1 at a point near the opposite end of the base from that which bears the pulley. Preferably the anchorage of the spring at that point is adjustable in order that the tension of the spring may be adjusted when the device is installed. For that purpose the spring is anchored through one end of an elongated loop 8. The latter may be made inexpensively by bending a length of strong wire into shape. It is releasably held to the outer face of the base 1 for adjustment therealong by a clamp including a bolt 9 passed through an aperture in the base and through the loop, a winged nut 10 on the bolt, and a washer 11 between the nut and the loop. The end of the loop to which the spring is anchored is bent upward slightly to afford clearance for attachment of the spring. The spring is of such length that when anchored to the base in any adjustment it extends beyond the pulley. Its reach beyond the pulley, however, is small in comparison with the reach from the pulley to its anchorage with the base.

For securing the device to a door the base has apertures 12 through which screws 13 are passed and screwed into the door. Figs. 1 and 3 show the device installed for closing a door which opens outward or away from the observer, with respect to Fig. 3. In that installation the base is secured along the upper margin of the adjacent face of the door D and in such a position that the pulley 2 is disposed rather close to the hinged edge of the door. The end of the spring 6 which extends beyond the pulley is anchored to the frame F of the doorway at such a point as to bend the spring rather sharply around the pulley. A staple 14 may be employed for said anchorage. When the door is swung open the spring is stretched between its anchorages to the door and to the frame F. Owing to the fact that the pulley 2 is carried by the door it retains the long reach of the spring in a constant angular relation to the door and keeps the direction of pull of the spring well off of dead center even when the door is opened wide and thereby renders the spring effective for positive closing of the door. The location of the pulley 2 close to the hinged edge of the door also contributes to the effectiveness of the spring by affording the latter good leverage or mechanical advantage.

Fig. 4 shows the device installed for closing a door which opens inward or toward the observer, with respect to Fig. 4. The base 1 of the device is here secured upon the adjacent face of the door in a position to extend along and rather close to the hinged edge of the door and to dispose the pulley 2 rather close to the upper edge of the door. The end of the spring 6, beyond the pulley is anchored to the frame of the doorway at a point above the pulley and located so that the spring will be bent or bowed rather sharply around the pulley. When the door is swung open the spring will be stretched, the pull thereof will be kept well off dead center with good mechanical advantage for the tension of the spring to close the door. The pulley by

reason of its location near the upper edge of the door will guide the spring out of contact with said edge. In both installations of the device the pulley trains the spring in a manner to prevent it from colliding with the door or with the frame of the doorway in any open or closed position of the door.

What we claim is:

1. A door closing device comprising an elongated flat base for attachment to the face of a door; a grooved pulley; a mounting for said pulley borne by said base and supporting the pulley for rotation on an axis transverse to the length of the base and spaced outward from the outer face of the base; a tension spring trained over the pulley to provide a long reach thereof extending along the base in one direction from the pulley and a short reach extending in the opposite direction from the pulley; and a tension-adjusting anchorage between the outer end of said long reach of the spring and the base and including a slotted member to which the spring is anchored, and releasable clamping means securing said slotted member to the base through the slot and rendering said member adjustable along the base to adjust the tension of the spring, the outer end of the shorter reach of the spring being anchorable to the frame of the doorway, and the pulley training the spring outward at an angle to the base between the pulley and said adjustable anchorage to the base, for the purpose set forth.

2. A door closing device comprising a base for attachment to a face of a door; a pulley; a mounting for said pulley borne by the base and supporting the pulley for rotation on an axis spaced outward from the base; a tension spring trained over the outer side of the periphery of the pulley to provide reaches extending in opposite directions from the pulley; an anchorage between the outer end of one of said reaches and the base, the outer end of the other reach being anchorable to the frame of the doorway; and means borne by the base to retain the spring over the periphery of the pulley, all of said elements of the device being held assembled in a unit for attachment of the device bodily to a face of a door.

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