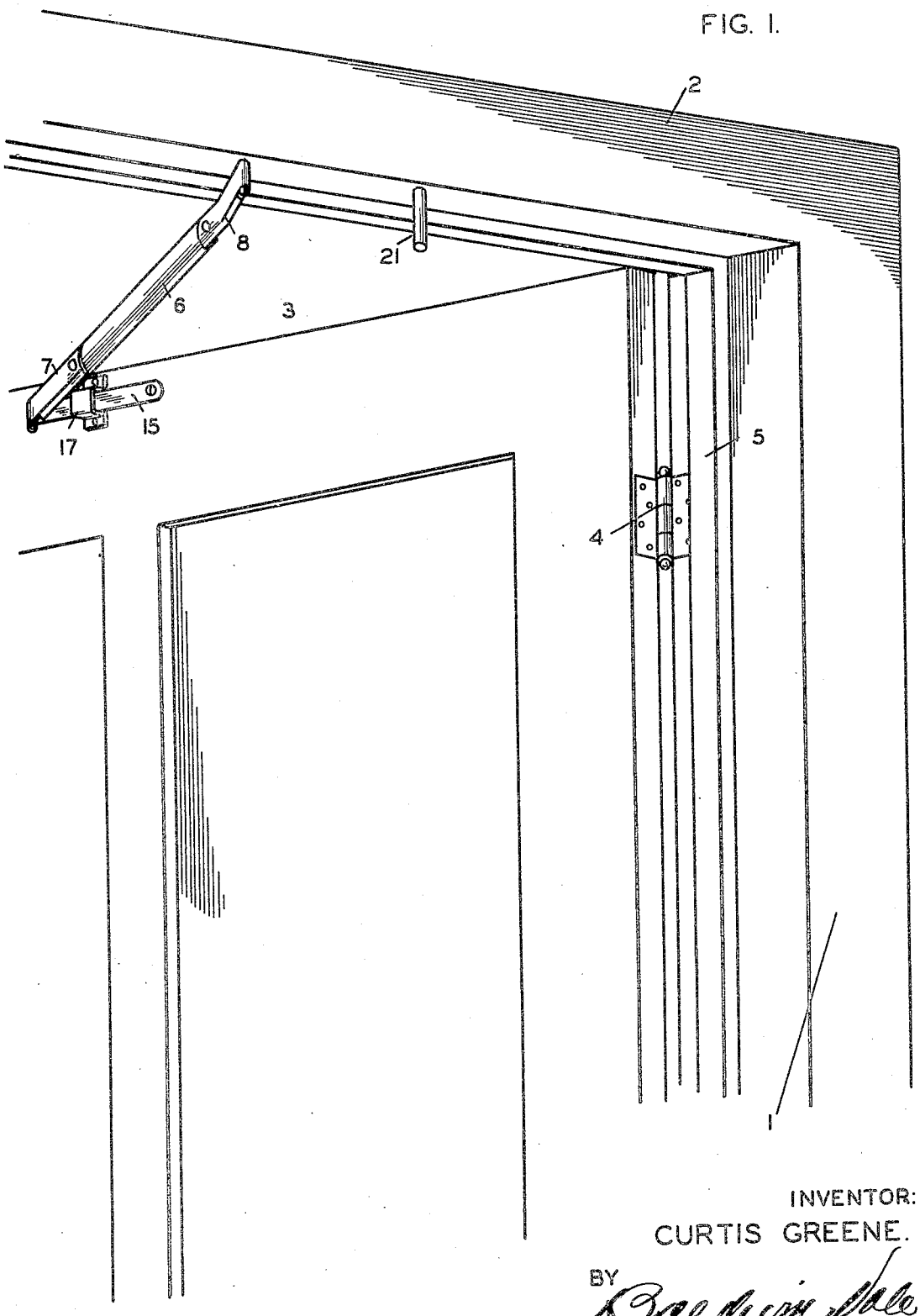
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COLLAPSIBLE STRUT

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FIG. 1.



INVENTOR:
CURTIS GREENE.

BY Gardner Dale
ATTORNEY.

July 4, 1933. C. GREENE 1,916,882

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FIG. 2.

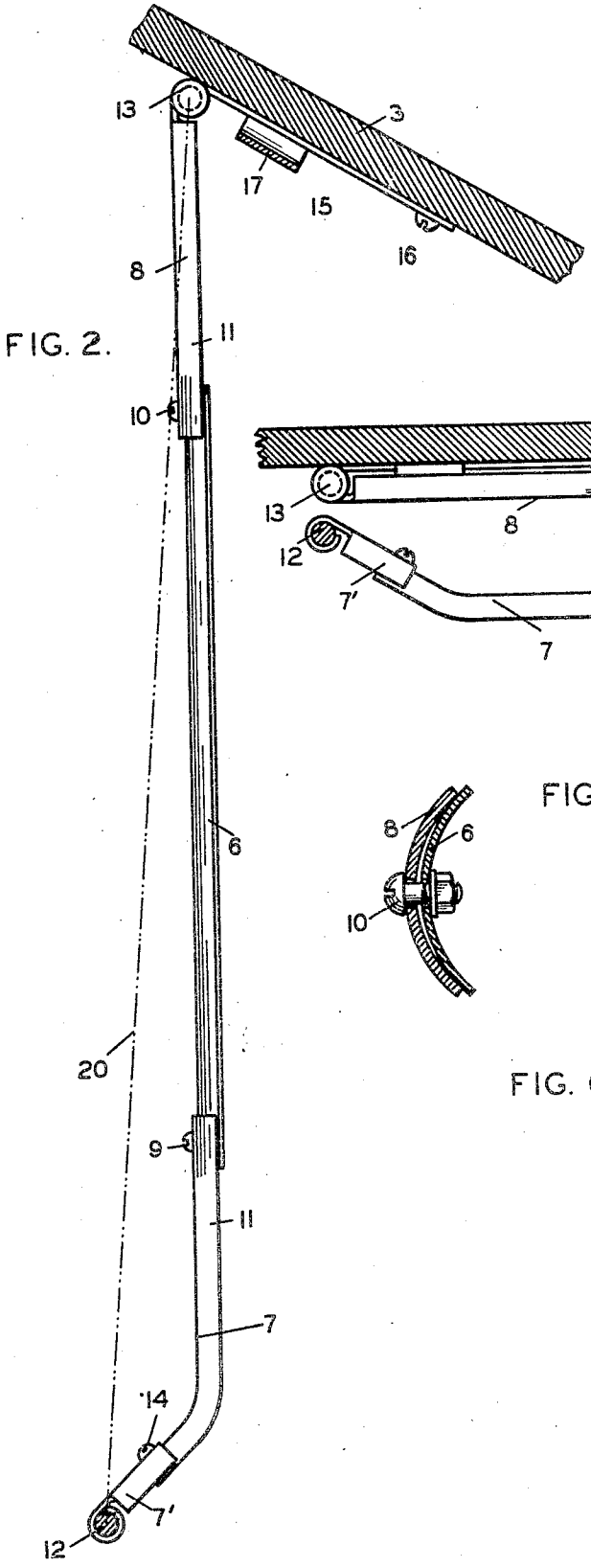


FIG. 4.

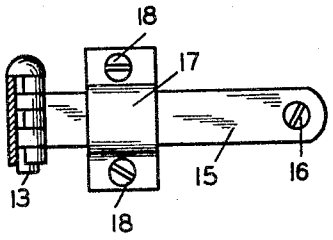


FIG. 3.

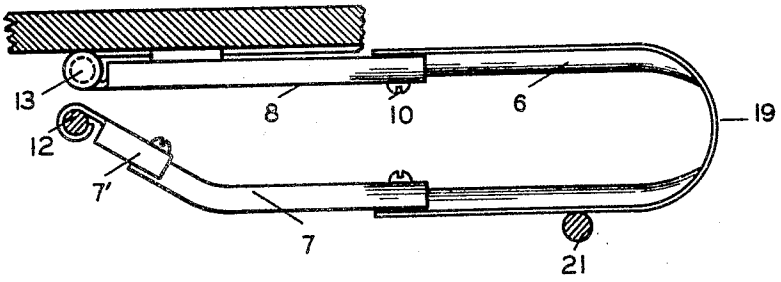
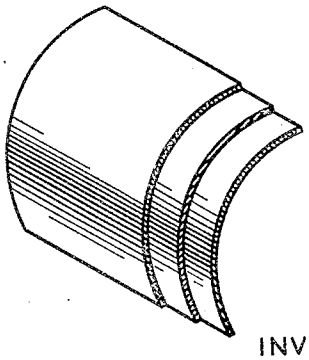


FIG. 5.

FIG. 6



INVENTOR:
CURTIS GREENE
BY Baldwin Vale
ATTORNEY.

Patented July 4, 1933 1,916,382

UNITED STATES PATENT OFFICE

CURTIS GREENE, OF SAN FRANCISCO, CALIFORNIA

COLLAPSIBLE STRUT

Application filed March 24, 1931. Serial No. 524,785.

This invention relates to improvements in collapsible struts.

Among the objects of the invention is to provide means for opening and holding open hinged and sliding doors, windows, lids and similar movable objects.

Another object is to counter-balance the weight of slidable and pivotal objects.

Another object is to resiliently arrest the outward swing of doors and the like to protect the strut and the hinges from undue strain.

Another object is to provide a strut that will collapse into a small space.

Another object is to provide simple means for adjusting the collapsible resistance of the strut.

A further object is to so construct and arrange the strut that it may be collapsed automatically, at the will of the operator, without manipulating the strut.

Other objects and advantages will appear as the description progresses.

In this specification and the accompanying drawings the invention is disclosed in its preferred form. It is to be understood, however, that it is not limited to this form because it may be embodied in other forms without departing from the spirit of the invention as defined in the claims following the description.

In the two sheets of drawings:

Fig. 1 is a perspective view of a fragmentary open door equipped with a collapsible strut in accordance with this invention.

Fig. 2 is a plan view of the strut, in the extended position.

Fig. 3 is a similar view of the same in the collapsed position.

Fig. 4 is a front elevation detail of the resilient stop.

Fig. 5 is a cross section of the strut taken on the line V of Fig. 2.

Fig. 6 is a perspective fragmentary detail in cross section of a laminated spring for the strut.

In detail the construction illustrated in Fig. 1 comprises the conventional door frame having the side stile 1, and the lintel 2. The door 3 is hinged to the side stile at 4, in the usual manner. The door swings against the usual stop 5.

The active element in the present combination consists of the length of spring material 6 with an arcuate cross section. The opposite ends of the strip are fixed to the rigid extensions 7—8 in any suitable manner, such as the bolts 9—10 passing therethrough and provided with nuts to draw the parts snugly together. For greater rigidity the extensions may also be arcuate in cross section where they engage the strips 7—8 and throughout their lengths or they may be flanged as at 11—11 between their ends.

The outer ends of the extensions are curled to form eyelets to engage their respective transverse pivots 12—13. The anchor pivot 12 may be a lag screw screwed into the lintel 2 as in Fig. 1, or it may be fixed in a suitable base to be attached to the lintel or other stationary part in the most suitable manner.

The extension 7 is preferably divided into two parts 7—7′ having overlapping slotted ends, bent at an angle to the longitudinal axis of the strip 6 and joined by the adjusting bolt 14, for reasons which will hereinafter be more fully explained.

The resilient flat bracket 15 has one end curled to encircle the pivot 13. The opposite end is secured to the door 3 by the screw 16. The yoke detent 17 straddles the bracket 15 and is fixed thereto by the screws 18—18.

This invention operates substantially as follows: When an overload closing pressure is applied to the door 3 the central portion of the strip collapses and assumes a flat plane and flexes back upon itself as at 19 in Fig. 3, when the door is closed.

This flexing is facilitated by setting the longitudinal plane of the strip at an angle to the chord line 20 between the centers of the pivots 12—13. It is obvious that the maximum resistance would be on the chord line 20. By adjusting the overlapped plates at the point 14 the degree of resistance can be varied by varying the angle of divergence between the chord line and the strip 6. This angle also insures that the strut will always buckle or flex in the desired direction. The collapsed strut is held in compact formation

between the stud 21 and the door 3. The strut can be manually collapsed by a quick jerk on the door and the door easily closed against the flexed tension of the spring strip 6.

When the door is released from the closed position the bent strip 6 tends to straighten out and will automatically swing the door to the full open position. The opening swing of the door is arrested by the flexing of the spring bracket 15 which has a cushioning effect and permits the spring strip 6 to completely straighten and prevent the rebound of the door. The spring bracket also absorbs undue shocks against the hinges 4, as the outward movement of the door is arrested.

The collapsible resistance of the strut can be multiplied by laminations as shown in Fig. 6. The thickness of the strip 6 should be reduced to the point where it will bend laterally without fatigue and crystallization, but there is no reasonable limit to the multiplication of the strips in a single strut.

Having thus described this invention what I claim and desire to secure by Letters Patent is:

1. In combination with a stationary member having a swing member hinged thereto, an elongated strip of spring material curved transversely to the longitudinal axis pivoted to said stationary member; a resilient bracket fixed to said swing member and pivotally engaging said strip and a detent on said swing member engaging said bracket.

2. In combination with two objects having relative movement, an elongated strip of spring material curved transversely to the longitudinal axis and having its ends pivoted to said objects.

3. A collapsible strut including an elongated strip of spring material curved transversely to the longitudinal axis, rigid extensions fixed to the ends of said spring strip and pivoted to two objects having relative movement.

4. In combination with two objects having relative movement, an elongated strip of spring material curved transversely to the longitudinal axis and having its ends pivoted to said objects, said pivots being substantially parallel to said transverse curve.

5. In combination with a stationary member having a swing member hinged thereto, an elongated strip of spring material curved transversely to the vertical axis, rigid extensions fixed to the ends of said spring strip and pivoted to said members, said spring strip being adapted to collapse when said pivots are brought into juxtaposition.

In testimony whereof I have hereunto set my hand this 18th day of March, 1931.

CURTIS GREENE.