

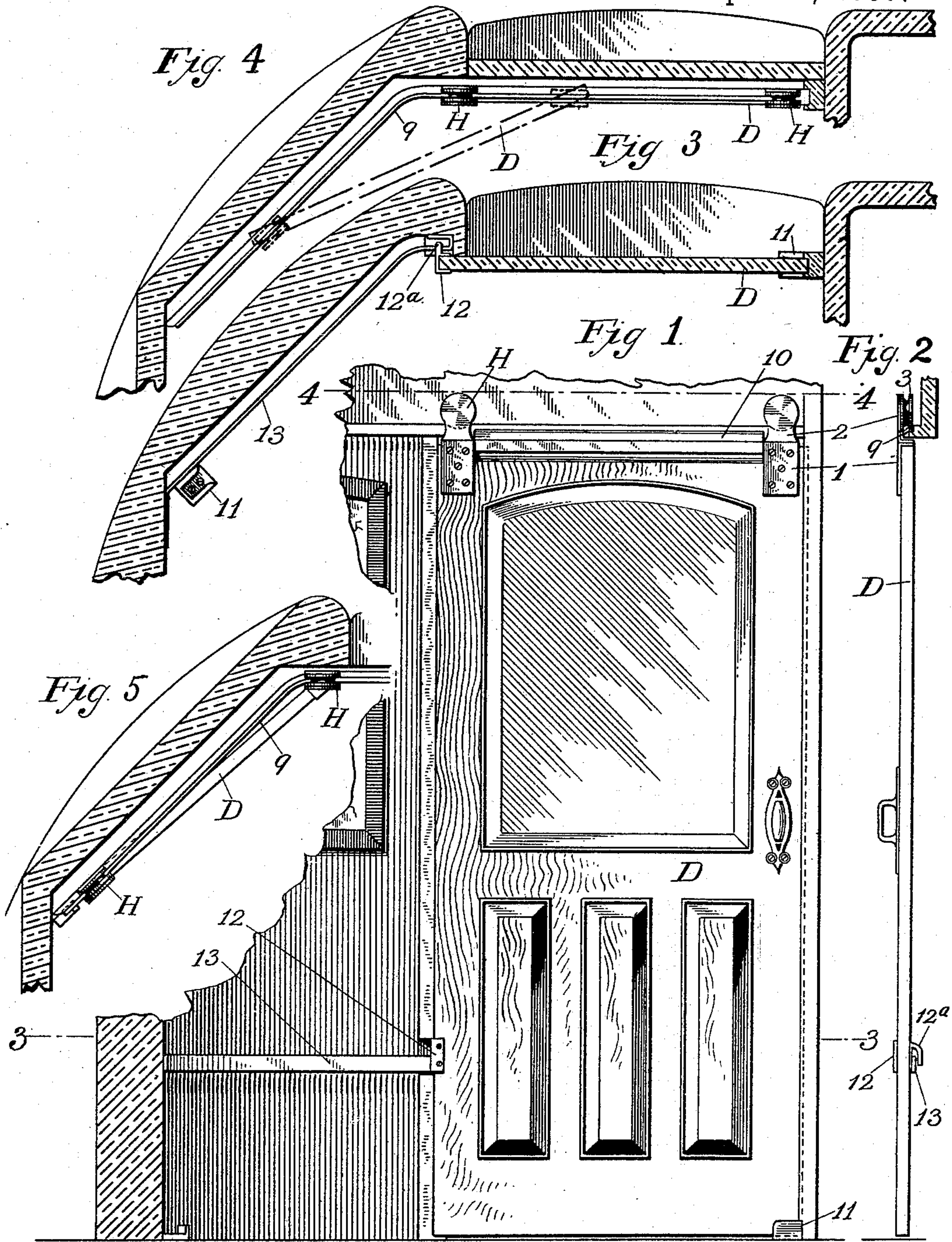
(No Model.)

2 Sheets—Sheet 1.

C. F. AGARD.  
SWIVELING DOOR HANGER.

No. 580,590.

Patented Apr. 13, 1897.



Witnesses  
L. S. Storer.  
Jennie Nellis

*Inventor*  
*Charles F. Agard*  
*By his Attorney*  
*W. H. Honiss.*



(No Model.)

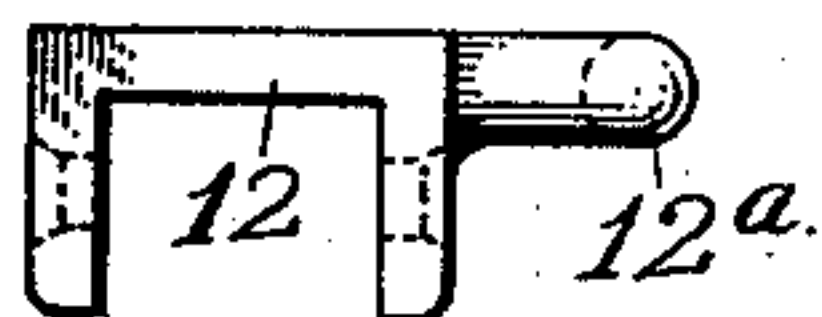
2 Sheets—Sheet 2.

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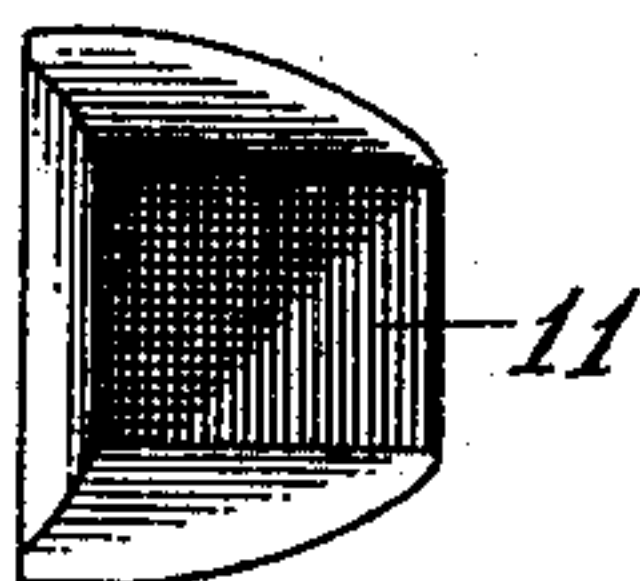
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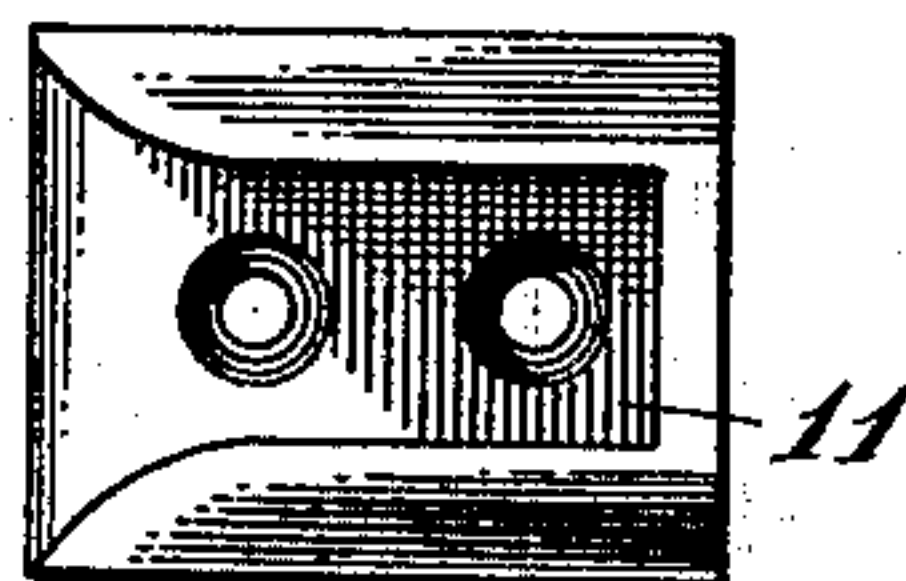
*Fig 6*



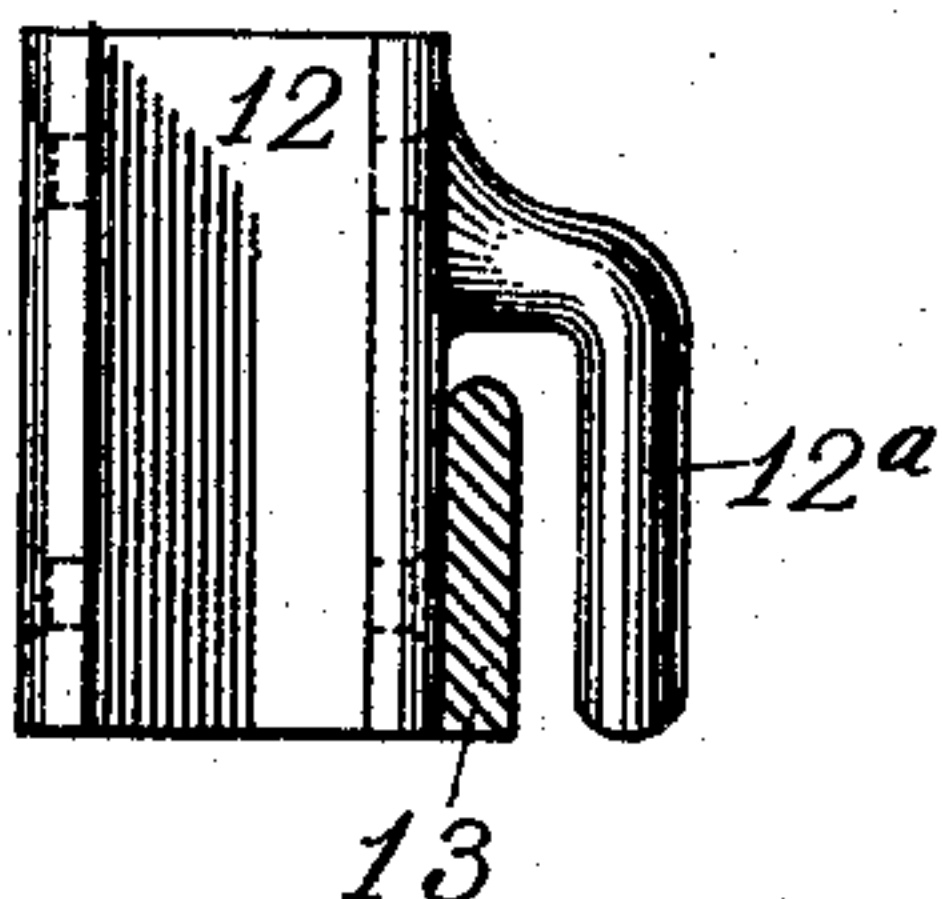
*Fig 8*



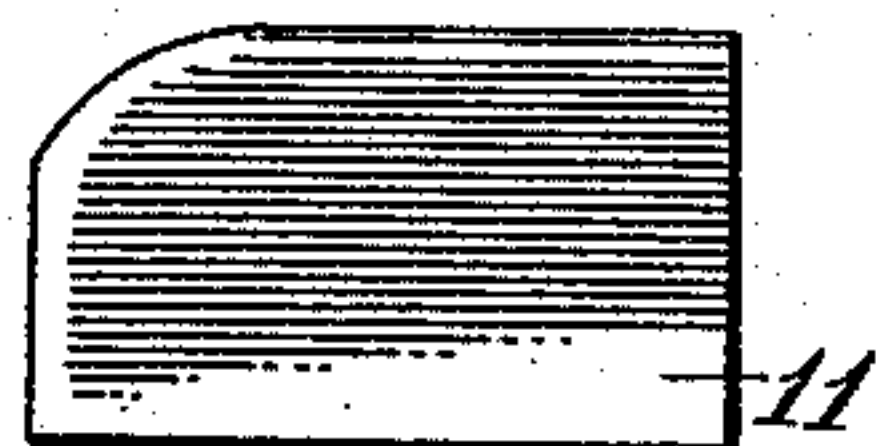
*Fig 9*



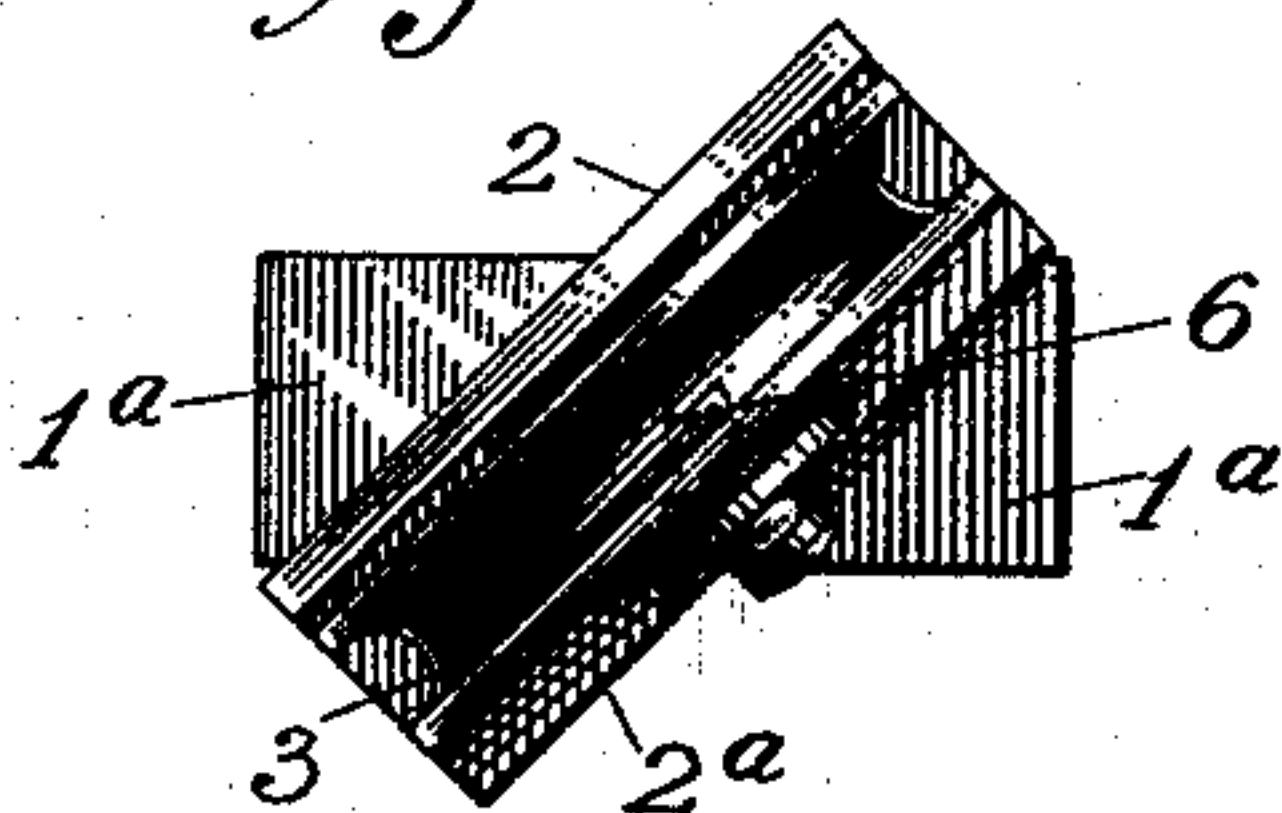
*Fig 7*



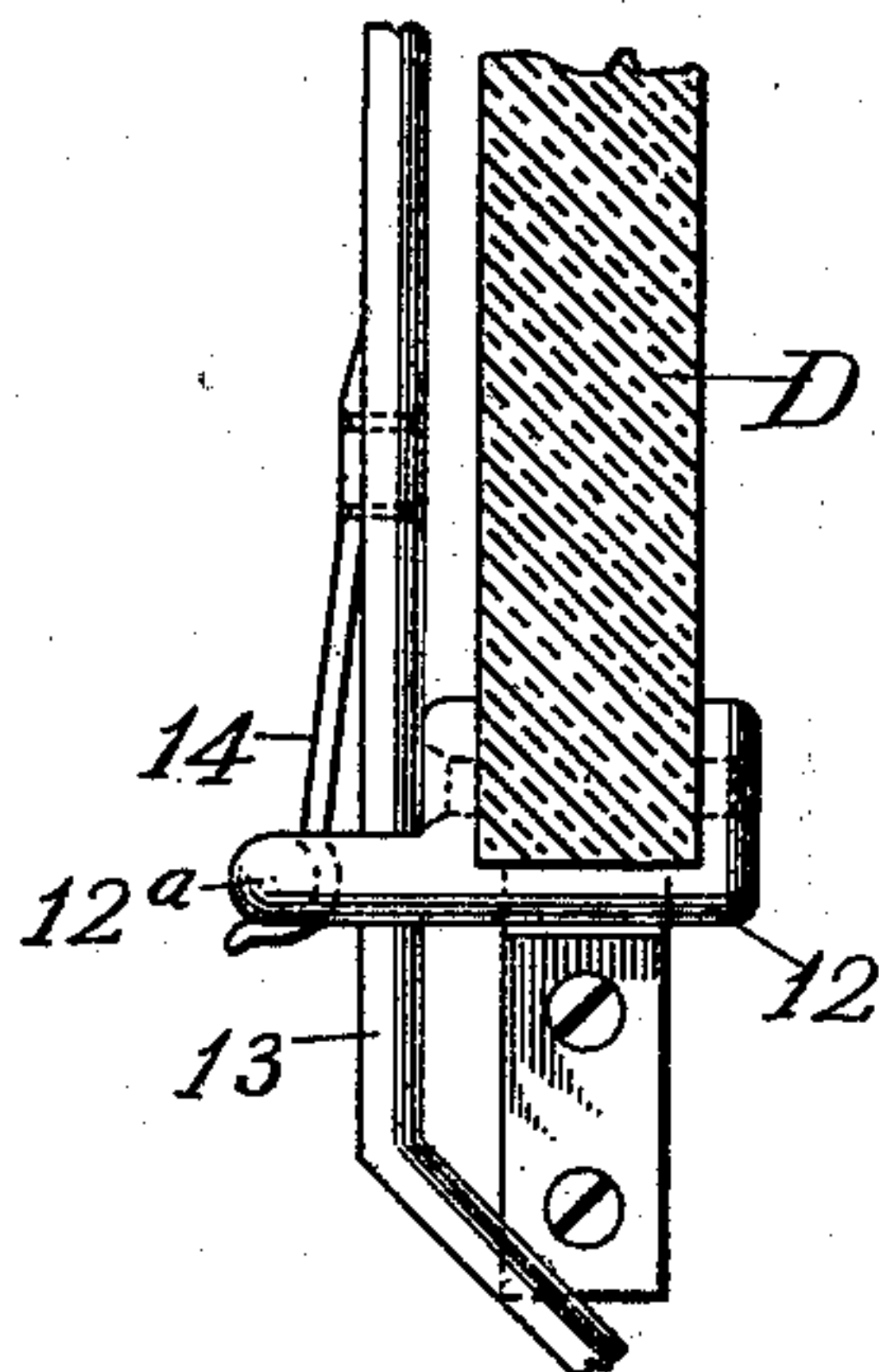
*Fig 10*



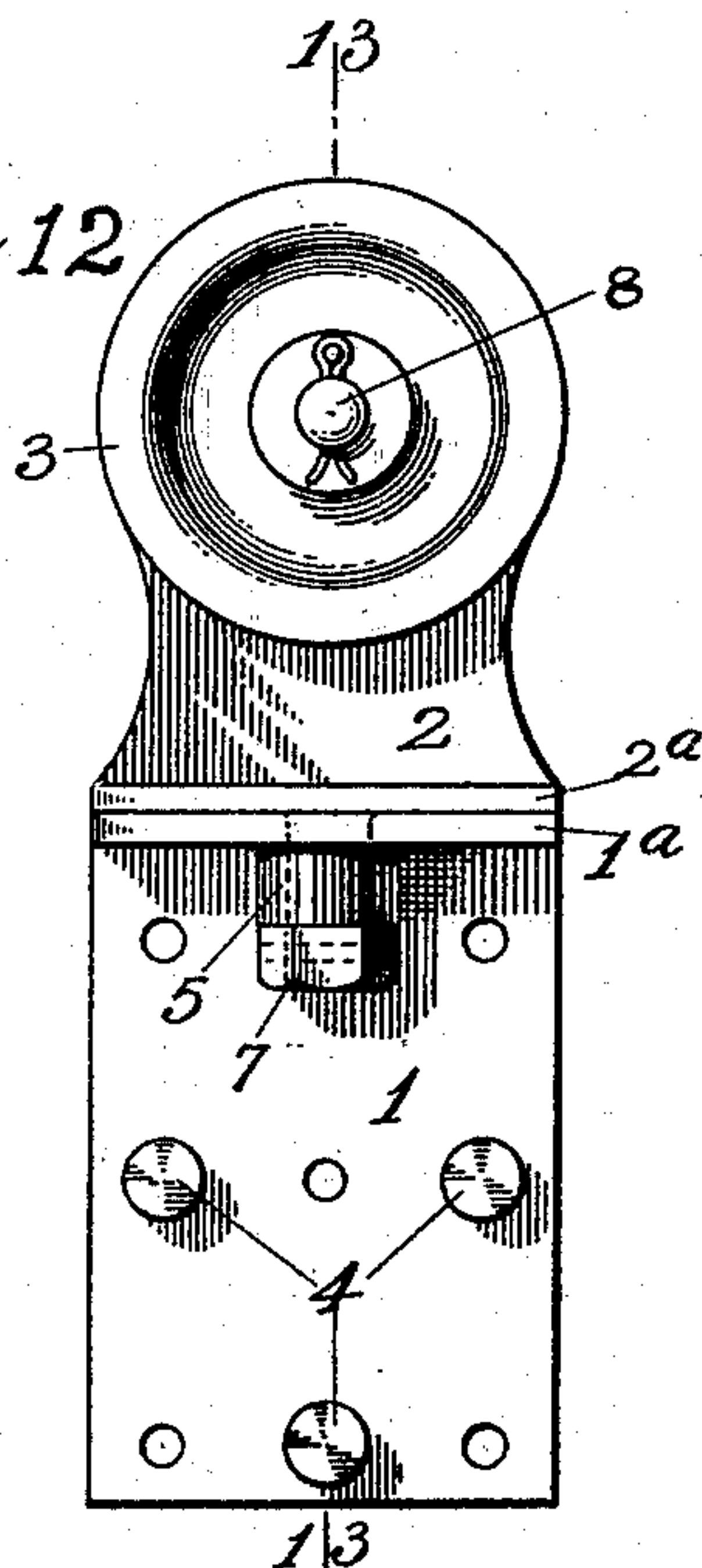
*Fig 11*



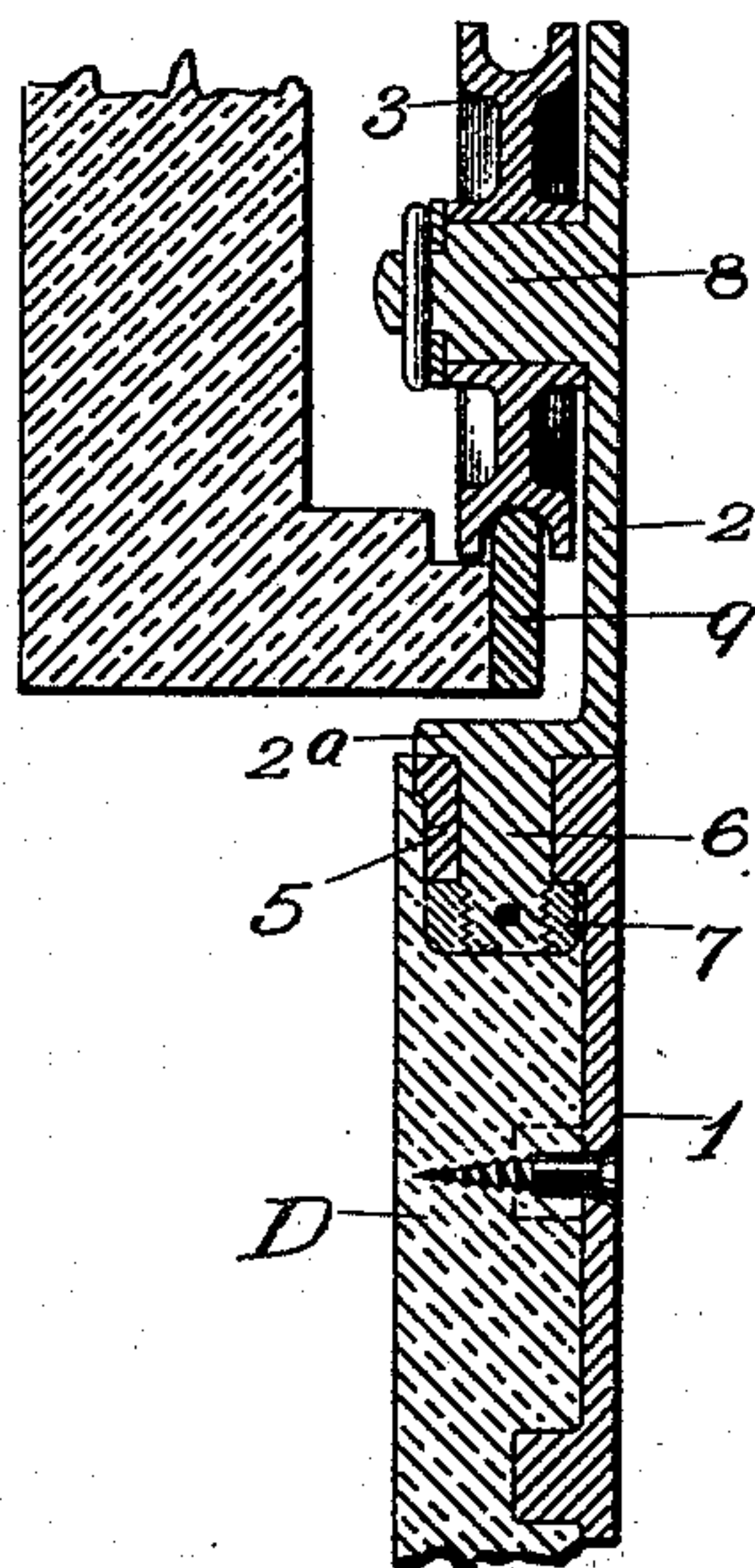
*Fig 15*



*Fig 12*

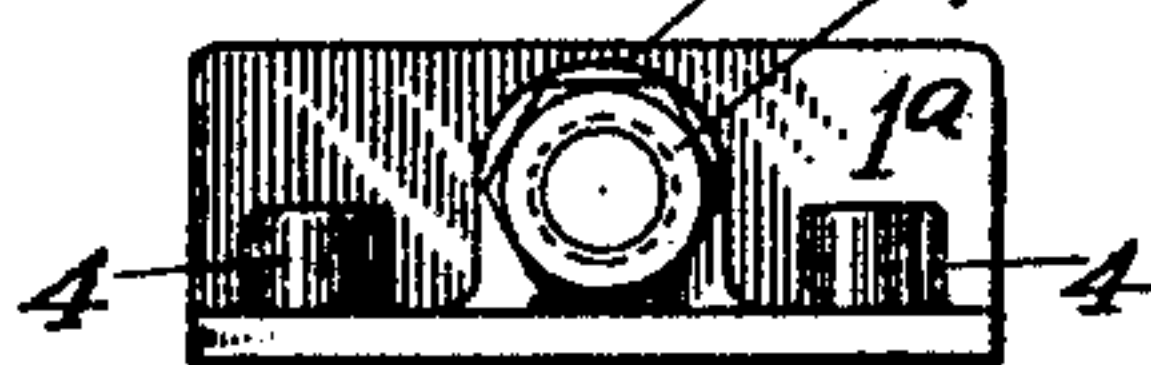


*Fig 13*



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*Fig 14*



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# UNITED STATES PATENT OFFICE.

CHARLES F. AGARD, OF HARTFORD, CONNECTICUT.

## SWIVELING DOOR-HANGER.

SPECIFICATION forming part of Letters Patent No. 580,590, dated April 13, 1897.

Application filed May 26, 1896. Serial No. 593,192. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES F. AGARD, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Swiveling Door-Hangers, of which the following is a full, clear, and exact specification.

This invention relates to improved means for supporting and guiding sliding or rolling doors, windows, or shutters which are adjacent to the angles of buildings, railway-cars, and other structures, the principal object of the invention being to provide means whereby the door or window may be opened by moving it edgewise toward and against the adjacent angle of the wall without swinging it inwardly, thereby enabling it to be opened without encroaching upon the room or space adjacent to or inclosed by the walls.

This invention is herein shown as applied to one of the side doors of a street-car vestibule, the end wall of which is usually of a semicircular or semipolygonal form. In this case the door is shown to be so fitted and supported as to be moved from its opening edgewise closely along the adjacent angle of the end wall of the vestibule. By this arrangement the door may easily be opened even when the vestibule is filled with passengers without crowding them aside against the controller or against each other.

Figure 1 of the drawings is a side view, looking from the inside of the vestibule of the car, of a door fitted and mounted in accordance with my present invention, showing it in its closed position. Fig. 2 is an edge view of the door of Fig. 1. Fig. 3 is a plan view in section taken on the line 3 3 of Fig. 1, showing the guiding means for the lower lower portion of the door. Fig. 4 is a plan view in section, taken on the line 4 4 of Fig. 1, showing the door and its swiveling hangers and the supporting track-rail, on which the rolls of those hangers rest. Fig. 5 is a fragmentary plan view corresponding with a portion of Fig. 4, showing the door in its open position. Fig. 6 is a plan view, and Fig. 7 a side view, of my preferred means for guiding and steadying the lower portion of the door. Fig. 8 is an edge view, Fig. 9 a plan view, and Fig. 10 a front view, of my preferred means for central-

izing and steadying the bottom end of the door at its closing edge. Fig. 11 is a plan view, and Fig. 12 is a side view, of my improved swiveling door-hanger, while Fig. 13 is an edge view in vertical longitudinal section, taken through the center line of the hanger of Fig. 12, showing that hanger, its roller, and the track upon which the roller is supported. Fig. 14 is an end view looking from the adjacent lower end of the hanger of Fig. 12. Fig. 15 is a plan view showing a portion of the door in its open position with its guiding-bracket and showing also my improved means whereby the door is retained in its open position, and whereby it is prevented from rattling.

The door D is provided with the hangers, (designated in a general way by H,) the details of which are best shown in Figs. 11 to 14, inclusive, consisting of the door-plate 1, the swivel 2, and the sheave 3. The door-plate 1 is provided with suitable lugs 4, which enter the wood of the door and serve to prevent sidewise displacement of the plate with relation to the door, the plate being secured to the door by means of screws. The upper end of the plate is provided with a lug 5, which is bored to receive the round stem 6 of the swivel 2, which, after passing through its bearing in the door-plate 1, is provided with a nut or collar 7, so fitted thereon as to allow of the rotary movement of the swivel with relation to the door-plate.

The sheave 3 is fitted to rotate upon a stud 8 of the swivel 2, being retained laterally thereon by means of a washer and split pin, as shown in Figs. 12 and 13. The sheave is deeply grooved, as shown in the latter figure, so as to enable it to set well down over the track-rail 9, in order that the sides of the grooves of the sheave, by engaging with the corresponding sides of the track-rail, may cause the swivel to turn in its seat in the door-plate 1, so as to enable the sheave to aline itself with and follow the windings of the track-rail. That rail is preferably arranged immediately over and substantially in line with the axis of the swivel, as shown in Fig. 13, the upper surface of the flange 2<sup>a</sup> of the swivel extending immediately beneath the track-rail, so as to prevent the door from being lifted far enough to allow the sheave



to be disengaged from the rail, it being therefore necessary to slide the sheave and its swivel endwise upon the track-rail in assembling them to place.

5 The track-rail is preferably attached to a projecting molding or bead along the top of the doorway and along the adjacent side of the vestibule, that track running therefore substantially parallel with the doorway and  
10 curving with the adjacent angle thereof, as shown in Fig. 4. The hangers are attached at the top of the door, preferably at the opposite edges thereof, as shown in Fig. 1, so that as the door is pushed toward the left  
15 from the closed position shown in Fig. 1 the left-hand hanger will in following along its track-rail follow the curve of that rail at the corner angle of the vestibule, running then parallel with the side of that angle, as shown  
20 in Fig. 4, until it reaches the position shown in Fig. 5. As the leading opening end of the door thus follows its hanger along the track-rail, the right-hand hanger, upon the closing or following edge of the door, will be gradu-  
25 ally turned upon its swivel, the sheave aligning itself to its adjacent portion of the track-rail. The result is that the two edges of the door are each carried as closely as possible to their adjacent angles of the vestibule, thus  
30 encroaching as little as possible upon the space within the vestibule and at no time encroaching upon that space to a greater extent than is shown by the dot-and-dash position of the door in Fig. 4.

35 The door should be so fitted that when in its closed position it lies close against the door-opening, being thereby practically tight, its forward edge fitting into a rabbet in the doorway, as shown in Figs. 1 and 4. As a  
40 means of closing the joint at the top of the door the latter may be provided with a molding 10, extending from one hanger to the other and projecting above the top of the door, so as to cover the joint between the top  
45 of the door and the track-rail.

As a means for centralizing and steadying the leading bottom corner of the door in its closed position, as shown in Fig. 1, I employ a socket or shoe 11, screwed to the threshold.  
50 This shoe is best shown in Figs. 8, 9, and 10 and is of a box-like form, open at the top and at one end, the sides of the box adjacent to the open end being beveled or rounded, as shown in Fig. 9, to allow of the easy entrance  
55 of the door, even when the latter may be swung somewhat out of the perpendicular. The shoe extends beyond the rabbet, so as to centralize the door with that rabbet and guide it to its seat therein.

60 As a means for guiding the lower portion of the door so as to retain it in an approximately perpendicular position during its opening and closing movements and preventing it from swinging away from the side of the vestibule I have provided a guiding-rail  
65 13 and a guiding-bracket 12, the latter being attached at the rearward edge of the door, well

down toward the bottom thereof, as shown in Fig. 1. The construction and arrangement of this guiding-bracket is best shown in Figs. 70 6 and 7, it being preferably provided with flanges arranged to pass on opposite sides of the door, the bracket being secured to the door by means of screws. The bracket is also provided with an outwardly and down- 75 wardly extending arm 12<sup>a</sup>, leaving a sufficient space between the arm and the door to allow room for the guiding-rail 13, as shown in Fig. 7.

The rail 13 is attached at its ends to the 80 wall of the vestibule, as shown in Figs. 1 and 3, below the track-rail 9, being located at a suitable distance from the floor to enable it to be engaged by the guiding-bracket 12. In cases where the guiding-bracket 12 is located 85 at a point substantially directly below one of the swiveling hangers of the door the curvature or course of the lower guiding-rail 13 should be substantially the same as that of the upper track-rail 9 in order to retain the 90 door in a vertical position at all times during its opening and closing movement, but where that guiding-bracket is located elsewhere than directly beneath one of these swiveling hangers the contour of the guiding-rail must 95 be correspondingly modified.

As a means for retaining the door in its open position securely and preventing the rattling noise due to the vibrations of the car I have provided an elastic catch 14, best shown 100 in Fig. 15. That catch consists of a spring having one end riveted or otherwise rigidly attached to the guiding-rail, the opposite end being bent inwardly to a suitable distance from the rail and having a curve or 105 hook formed in the end, as shown in Fig. 15, over which the arm 12<sup>a</sup> is carried as the door is pushed to its fully-opened position, (shown in the latter figure,) the catch 14 engaging the inner side of the arm and press- 110 ing the inner flange of the bracket firmly against the track-rail 13, as shown in Fig. 7. In closing the door from this position it is released from the catch by giving the door a sharp pull, causing the arm 12<sup>a</sup> to ride out of 115 the depression of the catch, which springs toward the guiding-rail to a sufficient extent to allow the arm to pass. The arm 12<sup>a</sup> and the adjacent flange of the bracket 12 may be provided with rollers for engaging with the track- 120 rail 13, if deemed desirable, but if the door is properly balanced, as herein shown, I do not consider such rollers to be necessary or desirable.

Any suitable means may be employed for 125 locking or otherwise fastening the door in the position shown in Fig. 1, such locking or fastening means forming no part of my present invention.

The axis of the stud 8, on which the sheave 130 is mounted, is preferably located in the plane of the axis of the stem 6 of the swivel 2, and that stem should be fitted so as to turn easily in its bearing in the door-plate 1 in order



that the swivel may turn readily under the control of the track-rail engaging with the deep groove in the sheave 2. With the bearings thus adapted for easy movement the door  
5 may be as smoothly and easily pushed along its curving track-rail as though that rail were straight.

The meeting flanges 1<sup>a</sup> and 2<sup>a</sup> of the door-plate and of the swivel, respectively, are preferably made of the full length and width of their respective members in order to present broad bearing-surfaces for the base of the swivel, thus preventing all liability to  
10 cramp as the swivel is turned to its various positions, as suggested in Fig. 11, and permitting of the use of a relatively short bearing for the swivel.

The track-rail 9 may be bent to any desired curvature in either direction, as the swiveling  
20 hangers will aline themselves with and follow the track-rail through the most devious windings that are likely to occur in practice.

The socket or shoe 11 may be utilized as a stop for the open position of the door, as  
25 shown in Fig. 3, serving to hold it against sidewise displacement and to prevent rattling.

I claim as my invention—

1. The combination with a swiveling door-  
30 hanger, and a door suspended therefrom, of a car-vestibule having a curved or angular wall

adjacent to the doorway thereof, a support-  
ing-trackway for said hanger and door located  
above the doorway, and extended to conform  
to the angular or curved wall of the vestibule, 35  
whereby the door may be opened and passed  
along said wall, means for guiding the lower  
portion of the door, consisting of a guiding-  
rail attached to the wall above and away from  
the floor of the vestibule, arranged substan- 40  
tially parallel and coextensive with the de-  
sired path of the door, and a guiding-bracket  
attached at or near the rearward edge of the  
door and engaging with the guiding-rail  
throughout the entire movement of the door, 45  
whereby the suspended door may be main-  
tained in position without encroaching upon  
the floor or upon the doorway, substantially  
as described.

2. In combination with a sliding door of the 50  
class specified, a centralizing shoe or socket  
11 therefor, secured upon the threshold of the  
doorway, provided with upwardly-extending  
flanges engaging the front edge and the sides  
of the door when in its closed position, the 55  
side flanges being beveled to allow of central-  
izing the door when being pushed to its closed  
position, substantially as described.

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Witnesses:

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