

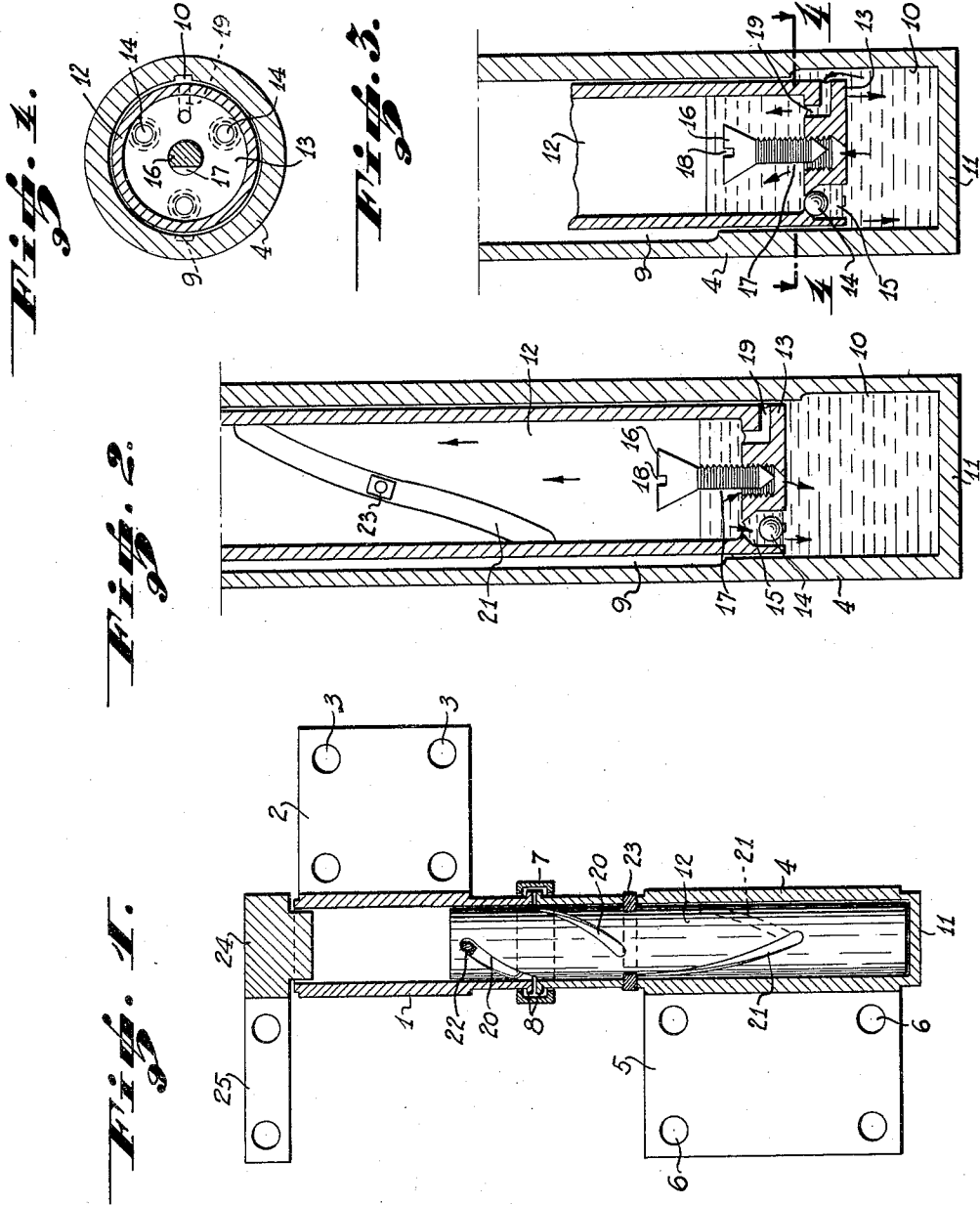
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HINGE

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HINGE

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My invention relates to a new type of hinge for cushioning the closing of doors, French windows and the like, and consists in a simple adjustable device which, while acting as a hinge, at the same time prevents any violent door closing, besides offering other advantages as will later appear.

In order that the present invention may be more fully understood and readily put into practice, I have shown, by way of illustration, a preferred embodiment of the invention on the hereto attached drawing, wherein

Fig. 1 is a sectional view of the complete hinge,

Fig. 2 an enlarged vertical section of a portion of the hinge showing the displacement of the inner piston during the opening of the door,

Fig. 3 a similar view as Fig. 2, showing the operation of the piston during the closing of the door, and

Fig. 4 a transverse section along line A—A in Fig. 3.

As shown on the drawing, the hinge comprises an upper tube 1 wherefrom projects a plate 2 provided with holes 3 for fastening means, e. g. screws, to pass through to secure the plate to the door, windows, or the like.

In line with tube 1 below the same is provided a similar tube 4 closed at its lower end and having projecting therefrom a plate 5 provided with holes 6 for fastening means, e. g. screws, to pass through for securing the plate to the door jamb, or frame.

At their abutting ends, the two tubes 1 and 4 are provided each with a flange 8, these flanges being engaged by a flanged collar 7 so that the tubes may freely rotate relative to each other.

Along its inner wall, the lower tube 4 is provided with a narrow duct 9 which, starting from the open end of the tube extends to within a certain distance from the closed bottom of the tube as clearly shown in Figs. 2 and 3. Another duct 10, shorter than duct 9, extends to the closed bottom 11 of tube 4.

As shown in Fig. 1, inside tubes 1 and 4 is provided a tightly fitting tubular piston 12, shown also in Figs. 2 and 3. The closed bottom 13 of piston 12 is provided with check

valves 14 contained in chambers 15 formed in said bottom.

In the central portion of bottom 13 is a threaded orifice engaged by a screw 16 whose conical end fits a corresponding seat in said orifice. Along the entire length of screw 16, on one side thereof, a duct 17 (Fig. 4) is formed, the screw 16 thus functioning as a valve which may be adjusted at will by means of a screw-driver, or the like, fitting the groove 18 formed in the head of screw 16.

In the bottom 13 of tubular piston 12 is provided an elbow-shaped bore 19 terminating at one end in the duct 10 of tube 4 and at the other end inside the tubular piston 12.

In the upper portion of piston 12, there are formed on the outside two helicoidal grooves 20 (Fig. 1), disposed diametrically opposite to each other, while in the lower portion of piston 12, extending toward its bottom, there are formed two diametrically disposed grooves 21, extending through the wall of the piston.

In the wall of the upper tube 1, two diametrically opposite orifices are formed through each of which passes a pin 22 into the helicoidal grooves 20 of piston 12. Likewise, in the lower tube 4, a pin 23 is secured extending into the grooves 21 of piston 12.

According to Fig. 1, the upper end of tube 1 is arranged to pivot about a part 24 secured to the door, or window jamb by means of a bracket 25. This part 24, while at all times ensuring a perfectly perpendicular position of the hinge, allows oil to be introduced into the tube, which oil partially fills the lower tube 4, as shown in Figs. 2 and 3.

The operation of the device is very simple and efficient and is as follows:

As the door, window or the like is closed, the upper tube is rotated, causing pin 22 to slide within the cam grooves of piston 12 which thereby is moved downwards in the lower tube 4. This downward movement is retarded by the pin 23 secured in the lower tube 4 and extending into the cam groove 21 in the piston. Vice versa, as the door or window is opened, the piston 12 will rise within tubes 1 and 4, also under the control of the cam grooves.

Since the lower tube 4 is partially or wholly filled with oil preferably of a non-freezable nature, each time piston 12 descends upon the closing of the door, or window, the check valves 14 will close, as may be seen from Fig. 3, forcing the oil to flow in a very slow manner through the upper duct 9 in tube 4 and through the duct 17 in the central screw 16. Because of this slow passage of the oil, the piston will slowly descend and, consequently, the closing of the door or window is gradual, a violent closing of the door or window being thus effectively prevented, even if pushed either by manual force or by the wind.

As the descent of the piston 12 continues, there will arrive a moment, when the oil cannot pass through the duct 9 but as it continues passing through the duct 17 of screw 16, the piston will continue to slowly descend up to the moment when upon the bore 19 registering with the lower duct 10 in tube 4, that is, when the door or window is nearly fully closed, the oil will swiftly escape into the hollow piston 12, whereby the closing of the door or window will be completed.

When the door or window is opened, the piston 12 will freely ascend without any obstruction, for, during this movement, the check valves 14 will open, as is shown in Fig. 2, permitting the free flow of the oil.

By a suitable adjustment of the central screw 16, the closing speed can be nicely regulated.

As will be perfectly understood, the new hinge can be readily applied to any type of door, window, or the like, in the same manner as an ordinary hinge, involving the following additional advantages.

The hinge being secured in position in the usual manner, therefore, does not present any obstruction.

The hinges can also be applied to doors equipped with automatic door-closing devices.

The hinge can be cheaply manufactured and readily mounted. When the screw 16 is omitted, the device acts as an ordinary hinge.

Obviously, various changes in construction and design may be introduced without a departure from the scope of this invention.

I claim:

1. In a cushioning hinge for doors, and the like, the combination of two superposed tubular members, to be respectively attached to the door and the door jamb, means uniting said members permitting their relative rotation, a hollow piston disposed within said tubular members, and provided with cam grooves arranged to be engaged by pins provided on said tubular members, the closed bottom of said piston containing a bore opening into said piston and adapted to communicate with a duct provided in the lower portion of the lower tubular member having a

second duct in its upper portion, and a grooved screw and check valves disposed in the closed bottom of said hollow piston for controlling the flow of a liquid contained in said lower tubular member.

2. The combination as specified in claim 1, including a means for insuring the perpendicular position of said tubular members.

In testimony whereof I affix my signature.

RAMON DONADEU.