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A. CLAUD-MANTLE
DOOR HOLDER OR LIKE ARTICLE

2,289,873

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Fig. 1.

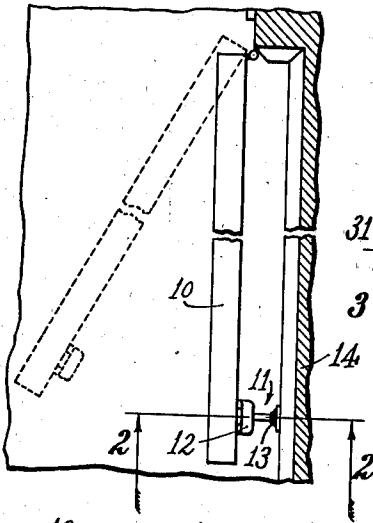


Fig. 2.

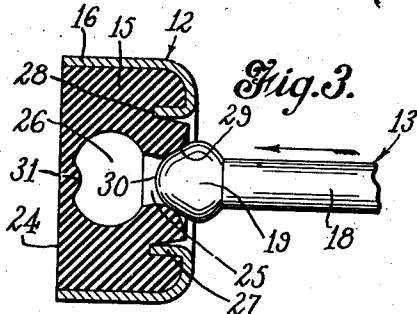
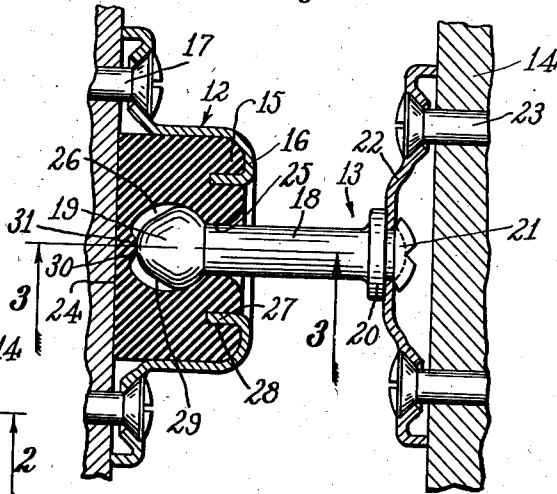


Fig. 3.

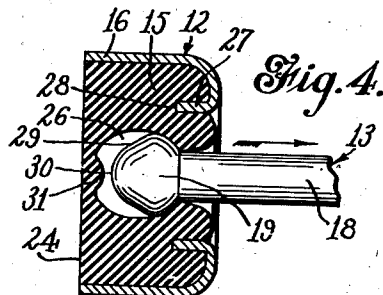


Fig. 4.

Fig. 5.

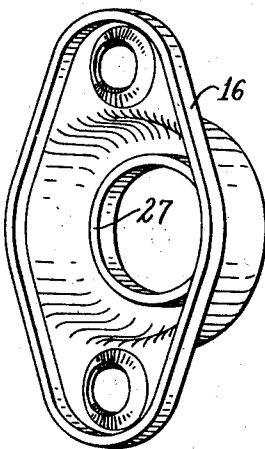


Fig. 6.

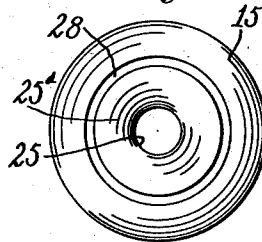
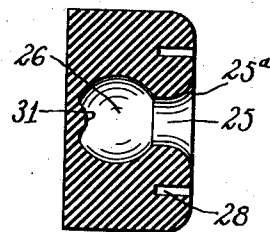


Fig. 7.



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DOOR HOLDER OR LIKE ARTICLE

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Application August 1, 1940, Serial No. 349,182

9 Claims. (Cl. 292—70)

This invention relates to door holders and like articles where a door or similar member is adapted to be caught and held in a predetermined position in an effective manner, although it is releasable when for purposes of release an extra degree of force is exerted.

Door holders of this general nature have been used in which a projecting element on one of the members engages between spring leaves or the like on the other member.

The present invention contemplates an improvement in which the member forming the socket is constructed of elastic material such as rubber, and in which the operation is less noisy than heretofore and the socketed part better enclosed and protected.

Another object is to provide a device whose operation in catching, holding and releasing the movable element, for example the door, is more effective and satisfactory.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawing:

Fig. 1 is a somewhat diagrammatic plan view partly in section showing a door holder embodying my improvements, the door being shown in full lines as held in the open position;

Fig. 2 is an enlarged section on line 2—2 of Fig. 1;

Fig. 3 is a sectional view of the socket member showing the plunger in engagement with the mouth of the socket preliminary to entry, illustrating the preliminary deformation of the rubber;

Fig. 4 is a similar view illustrating the deformation of the rubber in the initial stage of the withdrawal movement of the plunger;

Fig. 5 is a detail perspective view, looking from the rear, of the metal escutcheon or casing in which the rubber block is mounted; and

Figs. 6 and 7 are details of the rubber block, the first being a front face view and the second an axial section.

Prior to my invention door holders have been used in which a plunger-like member mounted on the face of the door near the free edge was adapted to be caught and held between spring leaves mounted on and projecting from an adjacent wall. According to my invention a plunger may be used on the door, but the cooperating member presents a round socket for the plunger head, preferably open at the front only, and the socket proper is formed of elastic material such as rubber, although the rubber block or element

in which the socket is formed is preferably reinforced and supported exteriorly by metallic means, as hereinafter described. The rubber block has a socket which is preferably of rounded formation and is adapted to conform to a degree to a rounded head on the plunger element. The socket proper communicates with the front face of the rubber element by way of a restricted opening normally of less diameter than the plunger head and adapted to control its insertion and withdrawal movements relatively to the socket.

In the drawing, the door is shown at 10, the door holder generally at 11, said door holder in this instance comprising a composite socket element or member 12 of rubber and metal carried by the door, and a plunger element or member 13 attached to a fixed wall 14. The element 12 comprises a rubber block 15 held in place relatively to the door by a metal escutcheon or casing member 16 secured to the door by means such as screws 17. The plunger element 13, on the other hand, comprises a plunger shank 18 having a rounded head 19. The base portion of the plunger shank is attached by means such as a collar portion 20 and a riveted or upset portion 21 to an escutcheon 22, which in turn is attached to wall 14 by means such as screws 23.

The escutcheon or casing 16 presents at its under or rear portion a round chamber for enclosing and protecting the rubber block 15, which is preferably round, said escutcheon being effective with screws 17 to hold the rear face 24 of the rubber block tightly against the adjacent face of the door. While the escutcheon or case 16 covers the peripheral portion of the rubber block, it leaves clear a restricted or entrance portion 25 of the block through which the head 19 of the plunger enters the retaining socket or chamber 26 of the block. The escutcheon 16 is provided with means for controlling the deformation of the mouth or entrance portion of the socket, and in this particular case this means comprises an annular flange 27 extending inwardly or substantially axially from the front wall of the escutcheon or casing and lying within a relatively deep annular groove 28 formed in the rubber block at the front face thereof and encircling the entrance portion 25 at some distance therefrom.

It will be noted that in the preferred form the plunger shank 18 is cylindrical, and that the head 19 on said shank, of round cross section, has a conical portion 29 leading to a rounded end portion 30. The socket portion 26 of the block is preferably to a large degree normally of spherical contour, but at the inner part of the block

the socket 26 is formed with a rounded projection or bump 31 which, when the door holder is in the fully engaged or normal position shown in Fig. 2, abuts the rounded surface 30. When this condition occurs the rear convexly curved portion of the plunger head conforms to the adjacent surface of the rubber socket so that the plunger is effectively held against endwise movement in either direction. In this position of the elements a part of entrance portion 25 of the rubber block accommodates a portion of shank 18 because of the fact that a part of entrance portion 25 is of about the same diameter as the shank, but the entrance portion 25 is outwardly flared at 25^a adjacent the front face of the block to facilitate entrance of the head.

The operation of engaging the plunger with the socket member is shown in Fig. 3, and it will be observed that as the conical portion 29 of the head engages the entrance portion 25, the entrance portion is deformed by being displaced axially to a degree (toward the left of Fig. 3), while at the same time there is some inward radial displacement relatively to flange 27. This permits the entrance portion to be distended for the insertion of the head in a relatively easy manner, that is to say, without using very much force. When the head enters the socket or chamber 26 it is held in the manner previously stated. It is desirable that the insertion of the plunger be easier to accomplish than the withdrawal, because the setting of the door in the open position should be as easy and convenient as possible for the operator, but on the other hand the release of the door should only occur when there is a desire to release it evidenced by a definite and strong pull on the part of the operator, so that the door will not be released at an inconvenient time as a result of jarring, vibration or the like, or movement of a vehicle or marine or other craft on which the door may be used. In my improved device this condition is brought about because in the withdrawal movement of the plunger, as shown in Fig. 4, there is deformation of the rubber which is resisted by the metal flange 27. In the operation of withdrawing the plunger the socket or chamber 26 is elongated, and the rounded rear portion of the plunger head, acting in an outward or radial direction, has to thin the rubber surrounding entrance portion 25 before the head is freed. In this operation the metal flange 27 or its equivalent acts as an abutment for the entrance portion of the socket, supporting it from one side, in other words, exteriorly of the entrance portion, while the head acts on it interiorly to distend the entrance by thinning the surrounding rubber. This provides a greater localization of the distention than when the plunger is inserted.

My improved device is quite noiseless in operation and acts effectively in catching the door when fully opened, holding it, and permitting its release. In the held position the door is yieldingly retained in the desired position by engagement of the rubber socket with the plunger head such that the plunger cannot move endwise to any appreciable degree under normal conditions. The device, moreover, is simple, attractive in appearance, and can be produced inexpensively. Moreover, a rubber socket will give long wear, but, should the rubber block become worn or be injured, a new block can be readily placed in the socket case.

While I have shown but a single form which the invention may take, it is to be understood

that it is susceptible of many different embodiments, and that various changes may be made in the organization of parts and in the details without departing from the principles of the invention or the scope of the claims. Where I speak of the elastic block as being formed of rubber I do not intend to limit myself to the use of natural as distinguished from synthetic rubber, and, in fact, the term is used in a broad sense so as to include any rubberlike material.

What I claim is:

1. A door holder or like article comprising a block of rubber having an interior socket of rounded conformation with a flared entrance portion leading thereto from one face of the block, said block adapted to cooperate with a plunger having a rounded head adapted to move into and out of the socket by way of said entrance portion with incidental displacement of the rubber around said entrance portion, and reinforcing means extending around the entrance portion and so located as to require the exertion of greater force in deforming the rubber in withdrawing the plunger than in inserting it into the socket.

2. A door holder or like article comprising a block of rubber having an interior socket of rounded conformation with a flared entrance portion leading thereto from one face of the block, said block adapted to cooperate with a plunger having a rounded head adapted to move into and out of the socket by way of said entrance portion with incidental displacement of the rubber around said entrance portion, and reinforcing means extending around the entrance portion and so located as to require thinning of the wall of the entrance portion in withdrawing the plunger, said last means comprising a metal flange located in a face groove of the block.

3. In a door holder or like article, a block of elastic material having a socket therein with an entrance portion leading to the front face thereof and constituting the sole means of communication to the exterior, said block having a flat closed rear face, and a chambered escutcheon plate adapted to receive said block and to clamp its rear face against the face of a support to which said escutcheon plate is attached, with the entrance to the socket exposed.

4. In a door holder or like article, a block of rubber having a relatively small interior socket to receive a rounded head, said socket having a restricted entrance portion displaceable axially and distensible on insertion of said head, and means disposed about the entrance portion which requires thinning of the wall of the entrance portion on the withdrawal of the head.

5. In a door holder or like article of the type in which a plunger having a rounded head is adapted to be received in an elastic-walled socket, a block of elastic material having a relatively small interior head-receiving socket of rounded conformation in axial section with a flared restricted entrance portion leading thereto from the front face of the block, said socket in the holding position closely confining said head and engaging the same from the rear to resist withdrawal and from the front to limit forward movement.

6. In a door holder or like article of the type employing a plunger with a rounded head, a rubber member having a head-receiving socket provided with an entrance normally of somewhat less diameter than the head, and means positioned to confine the material around said en-

trance so as to require thinning of the wall thereof upon the withdrawal of the head from the socket.

7. In a door holder or like article of the head and socket type in which the head has a convex rear portion presenting a shoulder, the head in front of the shoulder being of conical shape, a block of rubber having a relatively small interior head-receiving socket of rounded conformation in axial section with a flared entrance portion leading thereto from the front face of the block, said socket in the holding position conforming to the convex rear portion of the head but being slightly spaced from the conical portion of the head, the inner part of the socket having a bump which contacts the forward extremity of the head so that in the holding position the head is yieldingly held from movement.

8. In a door holder or like article of the type employing a plunger with a rounded head, a rub-

ber block having an interior socket adapted to receive the head and having a deformable entrance portion distendable by the head on entrance, and means for resisting the distention of the entrance portion on withdrawal of the head, said means being disposed forwardly of the main portion of the socket and having localized action.

9. A door holder of the type employing a plunger with a rounded head, comprising as a holding element a rubber member in the form of a block having a relatively small interior socket in which said head is received and confined from the front and rear, said socket having a restricted entrance leading to the front face of the block but otherwise being closed on all sides, and means for holding said block in place with its rear portion against a supporting surface.

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