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A. RONNING

2,203,580

DOOR CATCH

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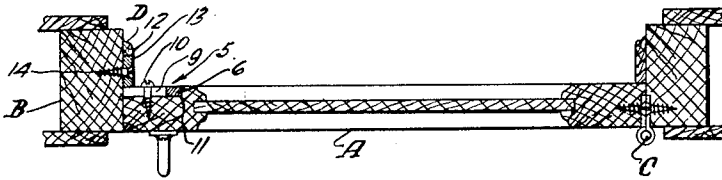


FIG-1-

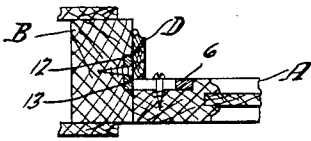


FIG-2-

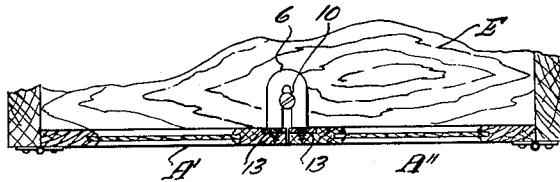


FIG-6-

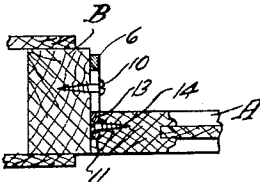


FIG-3-

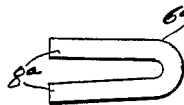


FIG-7-

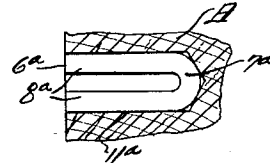


FIG-8-

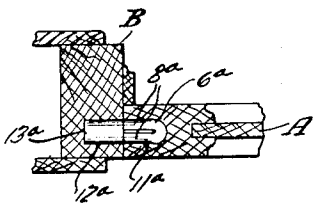


FIG-4-

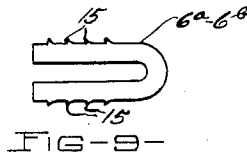


FIG-9-

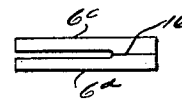


FIG-10-

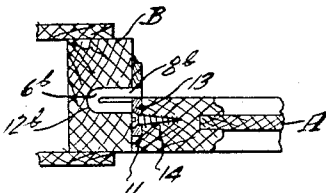


FIG-5-

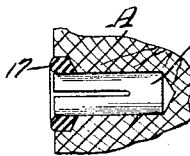


FIG-12-

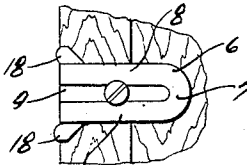


FIG-11-

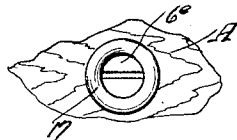


FIG-13-

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## UNITED STATES PATENT OFFICE

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## DOOR CATCH

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Application June 9, 1938, Serial No. 212,733

2 Claims. (Cl. 292—70)

This invention relates to improvements in door catches, and means for retaining movable closures of all kinds in closed or adjusted positions.

The primary object of the invention is to provide a door catch utilizing the power of attraction of a permanent magnet as the means for retaining the door in a closed or other adjusted position. For this purpose the invention contemplates the use of a permanent magnet upon either the door or its frame, and the use of a complementary pole piece or keeper upon whichever of these elements is suitable so that as the door reaches a closed position, the magnet and pole piece will move together and the magnetic attraction of the magnet for the pole piece will retain the door in position against normal forces tending to move it away from that position. It will, of course, be readily possible to open the door by overcoming the pull of the magnet, and without performing any unlatching or unlocking operations whatever.

Another object is to provide a magnetic catch or retention means of this kind which is readily adaptable for use upon all kinds of swinging or sliding closures such as doors, and windows, as well as table drawers and the like.

Another object is to provide a magnetic door catch assembly which may be fitted to the door and frame (or other parts) with a minimum amount of work and alteration thereof and without in any way injuring the construction and appearance thereof.

Another object is to provide a device of this kind which is extremely inexpensive in initial cost, has no moving parts to wear or break, and is durable and trouble free in operation.

A further object is to provide a door catch which may be readily arranged to exert a lateral or edgewise pull on the door, as well as the straightaway pull necessary to close the door, and which therefore will absolutely prevent rattling or vibration of the door.

Still a further object is to provide a door catch of the foregoing desirable characteristics and which may be readily provided with resilient bumper or buffer means to make the closing of the door entirely noiseless.

The foregoing and other objects of my invention will be made apparent in the course of the following detailed specification, in which reference is had to the accompanying drawing.

In the drawing:

Fig. 1 is a horizontal sectional view through a door and its frame, and showing my invention

applied thereto with the magnet carried by the door and the pole piece secured to the frame.

Fig. 2 is a fragmental sectional view showing the pole piece recessed into the door frame.

Fig. 3 is a similar view, but showing the magnet secured to the frame and the pole piece carried by the door.

Fig. 4 is a similar view but showing a modified assembly wherein both the magnet and pole piece are recessed into the edges of the door and frame.

Fig. 5 is another similar view, showing the magnet secured to the frame and arranged to apply a pulling force in two directions to the pole piece on the door to hold the door tightly closed and also to prevent lateral movement of the door in its frame.

Fig. 6 is a horizontal section through a cupboard assembly including double swinging doors and showing a single permanent magnet arranged to hold both doors closed.

Fig. 7 is an enlarged side elevation of a bifurcated or horseshoe shaped permanent magnet suitable for my use and showing the legs thereof as slightly spread apart toward their free ends or poles.

Fig. 8 is a fragmentary sectional view through a door showing the magnet of Fig. 7 inserted into a hole drilled therein and with the legs pressed together to retain the magnet in place.

Fig. 9 is a view similar to Fig. 7, but showing the magnet formed with barbs or burrs to aid in holding it in place in a door.

Fig. 10 is a side elevation of a magnet formed up from lengths of round stock milled out to provide legs.

Fig. 11 is an elevation of a flat, horseshoe-shaped magnet as applied to a flat surface by a single mounting screw.

Fig. 12 is a sectional view through a fragment of a door edge, showing the magnet of Fig. 10 applied thereto and provided with a resilient bumper ring.

Fig. 13 is an end or edge view of the assembly shown in Fig. 11.

The invention will be described initially as applied solely to swinging doors, but it is to be understood that it may be used in connection with swinging or sliding closures, drawers, and other moving devices as will be pointed out hereinafter.

Referring now more particularly and by reference characters to the drawing, A will designate the door throughout all views, while B will designate the frame, jamb or fixed member against which the door closes. In Fig. 1 the door A is hinged at C and its free edge is adapt-

ed to swing closed against a stop strip D affixed to the frame B. The magnetic catch is designated generally at 5, and comprises a flat, U-shaped or horseshoe-shaped permanent magnet 6 (better shown in Fig. 11) having the bight 7 and spaced parallel legs 8. These legs thus define a slot 9, and the magnet is secured to the door A by a screw 10 run through the slot and driven into the door so that its head bears against the contiguous margins of the legs. As shown in Fig. 1, the door is recessed at 11 in its inner face, or the face adjacent the stop strip D, and the magnet 6 is mounted in this recess flush with the surface of the door. The ends, or poles, of the legs 8 of the magnet thus extend outward (with respect to hinge C) and contact the strip D when the door closes.

The stop strip D is also recessed at 12, and a pole piece keeper or block 13 of iron or similar magnetic substance is mounted in this recess by a screw or screws 14. This pole piece, as it will be hereinafter termed, is adapted to span the ends of the legs 8 of the magnet 6 and to contact, or almost contact, these legs when the door A closes against the strip D.

In operation, the magnetic attraction of the magnet 6 for the pole piece 13 will serve to hold the door closed and to draw its free edge tightly against the stop strip D. However, by simply pulling or pushing on the door it may be readily opened by overcoming the magnetic pull. By employing one of the newer types of metal for the magnet and pole piece the attraction may be made very strong and sufficient to draw the door tightly closed as soon as its free edge, carrying the magnet, approaches the closed position, as will be understood.

In Fig. 2, the magnet 6 is mounted in the edge of the door A in exactly the same manner but the pole piece 13 is located in a recess 12 formed in the frame B instead of in the stop D. The action is the same, but here the pole piece is partially concealed by the strip D and engages the ends of the magnet's legs instead of the sides, as in Fig. 1.

The position of the magnet and pole piece may, of course, be reversed and in Fig. 3 the magnet 6 is shown as secured by screw 10 to the frame B, while the pole piece 13 is secured by screw 14 in a recess 11 in the free edge of the door. Here the pole piece moves against the ends of the legs of the magnet 6 as the door closes, and the magnet tends to draw the door closed by its attraction of the pole piece.

Fig. 4 illustrates the use of a slightly different type of magnet and pole piece. The magnet 6a, also shown in Figs. 7 and 8, is formed from bar stock (such as half-round) bent to provide the bight 7a and spaced legs 8a which normally diverge slightly toward their free ends or poles, as shown best in Fig. 7. For mounting this magnet a recess or hole 11a is bored in the free edge of the door A, and the magnet is inserted bight end first into this hole. The dimensions of the hole are such that the legs 8a will be pressed together by this insertion and their outward pressure on the walls of the hole will serve to frictionally retain the magnet in place. The ends or poles of the legs 8a will then lie flush with the edge or face of the door, as clearly shown.

The pole piece 13a may be either a flat block as hereinbefore described, or it may take the form of a short round plug or billet which is inserted endwise into a recess or hole 12a bored in

the frame B. The pole piece 13a, however formed, is of course so located that the exposed ends or poles of the magnet 6a will contact or nearly engage the piece as the door closes.

It will be noted that in the assemblies shown in Figs. 2 and 4, there will be an endwise pull exerted on the doors in addition to the pull necessary to hold the doors closed. This action holds the door rigidly against any lateral movement such as would cause rattling, as will be understood. The effect may be enhanced by the structure shown in Fig. 5, wherein the magnet 6b is similar in construction to the magnet 6a heretofore described, and is mounted in a hole 12b bored in the frame. The pole piece assembly is identical to that shown in Fig. 3, and the piece 13 is secured by screw 14 in the recess 11 formed in the free edge of the door. However, one leg 8b of the magnet 6b is extended considerably beyond the other and beyond the end of the hole 12b so that it will engage the inner edge of the pole piece 13 while the shorter leg engages the exposed face of the pole piece at the free edge of the door. The longer leg of the magnet thus exerts a closing pull on the door A while the shorter leg exerts a lateral pull to prevent vibration or rattling of the door, as will be readily apparent.

The magnets 6a or 6b may be provided with barbs or burrs along the outer edges of their legs, as shown at 15 in Fig. 9, to aid in holding the magnets in place in the door or frame. The magnets furthermore may be made up from two pieces of half-round stock, as shown at 6c and 6d, or from a single length of round stock as shown at 6e, and the legs and spaced poles provided by milling or slotting out between these parts as indicated at 16. The two part construction, shown in Fig. 10, may be welded together along the meeting line 16 or simply rested together and held in face of face engagement, and this magnet, as well as the one piece construction shown in Figs. 12 and 13, may of course be provided with retaining barbs if so desired.

In some cases it may be desirable to provide buffers or bumpers to prevent the magnets and their pole pieces from sharply contacting and causing noise as the doors close. Figs. 12 and 13 show a rubber, or other resilient bumper ring 17 which is vulcanized or otherwise secured to the pole end of the magnet to project slightly past that end and so prevent abrupt contact between the magnet and the pole piece. Or the magnet 6 may be provided with separate rubber bumpers 18 vulcanized to each leg, as shown in Fig. 11, for the same purpose.

The slotted, flat magnet 6 also lends itself particularly well to cupboard and cabinet installations, as shown in Fig. 6, and the magnet may be mounted by a screw 10 to a shelf or other part E of the cupboard so that its poles will attract separate pole pieces 13 secured to each of the swinging doors A' and A''. A single magnet may thus be used for catching or retaining each pair of doors of the cabinet, and where single doors are used any of the previously described assemblies of magnets and pole pieces may be employed, as will be understood. The slot in the magnets, where used with a screw fastening, permits adjustment of the magnets relative to the door or the pole pieces.

From the foregoing it will be apparent that I have provided an extremely simple and trouble free means for retaining a door in a closed or

adjusted position, and for preventing rattling of the door. The device thus lends itself well to any type of installation where a quiet and inexpensive catch is needed, and due to this quietness in operation and to the fact that in no way can the door become locked, the device is particularly suited for use upon hospital room doors and the like. The same type of catch may be used to retain a window in an adjusted position by locating several of the pole pieces at the desired heights and may actually be used for retaining any movable member in a selected position relative to a fixed member, as will be understood.

It is understood that suitable modifications may be made in the structures as described, provided that such modifications fall within the scope of the appended claims. Having thus fully described my invention, what I claim is new and desire to secure by Letters Patent is:

1. A permanent magnet lock device comprising a mounting member having a cylindrical bore opening to one face thereof, a generally U-shaped magnet mounted in said bore with its closed end

inward and its leg end extending outwardly, the outer surface of the legs being transversely curved to conform with the curvature of the bore surface, said legs being of such spread formation prior to insertion in the bore that they will be compressed when forcibly inserted and by reason of said compression will create retaining friction between the contacting surfaces of the legs and bore.

2. A permanent magnet lock device comprising a mounting member having a cylindrical bore opening to one face thereof, a generally U-shaped magnet mounted in said bore with its closed end inward and its leg end extending outwardly, the outer surface of the legs being transversely curved and being provided with barbs for retention engagement with the surface of the bore, the ends of the legs being preformed with a spread greater than the diameter of the bore, whereby the legs must be compressed to permit insertion in the bore and the resulting tension will force the barbed surfaces into retention engagement with opposite wall surfaces of the bore.

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