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3,425,729

MAGNETIC LATCH FASTENER

Filed Nov. 17, 1967

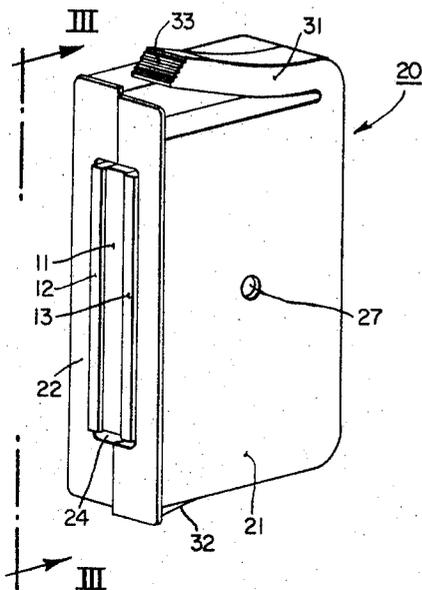


Fig. 1

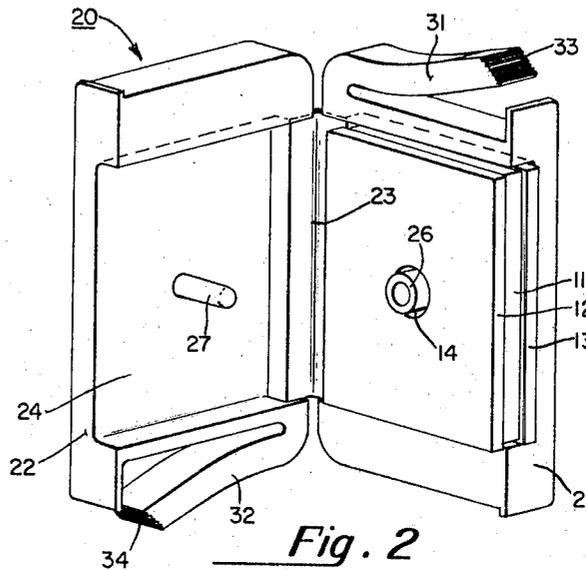


Fig. 2

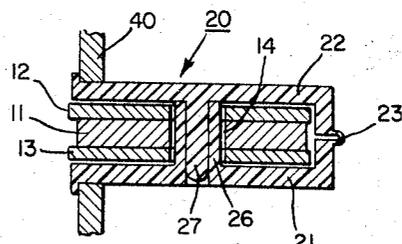


Fig. 4

Fig. 5

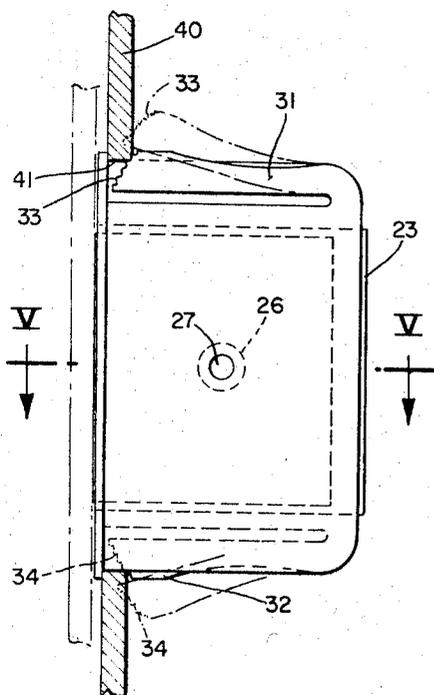
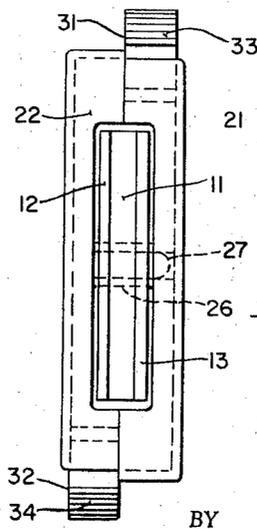


Fig. 3



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**MAGNETIC LATCH FASTENER**

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U.S. Cl. 292-251.5

4 Claims

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**ABSTRACT OF THE DISCLOSURE**

A magnetic latch fastener is disclosed having its magnet and pole piece assembly enclosed within the pocket of a foldable book-like molded housing of resilient plastic material. Described in folded closed condition, the housing has a flanged forward surface for abutting against the door frame or panel, a hinged-like rear wall, side walls, and at each end wall a resiliently compressible finger which, when in non-compressed condition, projects forwardly from the rear wall along an outwardly inclined path in the principal plane of the housing. The free forward ends of the projecting fingers are stepped (inclined and ribbed) for engaging the edge of the door-frame aperture into which the magnetic latch fastener is inserted.

*Cross reference to related application*

The magnetic latch fastener of the present application represents a modification of the magnetic latch assembly shown in the copending patent application of John K. Barry, Ser. No. 632,302, filed Apr. 20, 1967, and assigned to the assignee of the present application.

*Field of the invention*

This invention relates to magnetic door holders or catches.

*Description of the prior art*

The prior art patents most nearly related to the magnetic latch assembly of the present application are Martin, Jr. 2,896,991; Loeb 2,935,353; Ahlgreen 3,057,650 and Heppner 3,276,804.

*Summary of the invention*

The magnetic latch fastener of the present application is designed for holding a door which overlaps a door frame. The magnet and pole pieces are contained in a foldable book-like molded casing or housing of resilient plastic material, held closed by a boss and stud which project from the side walls of the casing and pass through a central aperture in the magnet assembly. Opposite end walls of each housing half are provided with resilient fingers which project slantingly outwardly. The free forward face of the projecting fingers are inclined and ribbed, or stepped. When the fastener is pressed through the aperture in the door frame cut to receive the same, the projecting fingers are cammed inwardly and then push outwardly as the fingers begin to clear the door frame. The stepped forward faces of the fingers thereupon catch the edges of the opening in the door frame and in this manner the fastener is maintained in position.

*Brief description of the drawing*

FIG. 1 is a perspective illustration of the magnetic latch fastener;

FIG. 2 is a perspective view of the magnetic latch fastener opened to show its foldable book-like construction;

FIG. 3 is an elevational front view of the magnetic latch fastener of FIG. 1 looking along the line and in the direction of the arrows III—III;

FIG. 4 is a side elevational view illustrating the mag-

net latch assembly inserted through an aperture in the door frame;

FIG. 5 is a view, in section, looking down along the line V—V of FIG. 4;

*Description of the preferred embodiments*

Referring now to the drawings, the magnetic latch fastener of the present invention includes a molded foldable book-like plastic casing or housing 20 formed of two housing halves 21 and 22 integrally joined at the fold line 23. Each housing half has a generally rectangular interior recess forming, when the two housing halves are closed together, a pocket 24 containing a flat rectangular magnet 11 sandwiched between two flat rectangular pole plates 12 and 13. The housing is preferably polypropylene; the magnet preferably barium ferrite in a plastic binder, and the pole plates preferably steel.

The magnet sandwich is provided with a centrally located hole 14 for receiving the boss 26 which projects inwardly from the sidewall of one housing half 21. Projecting inwardly from the other housing half 22 is a stud 27 which, when the two halves of the housing are closed, enters into the hole in boss 26 and functions to maintain the housing closed. Preferably, the stud 27 has a spherical tip and a diameter slightly larger than that of the hole in boss 26, so that a tight interference fit is obtained. The manner in which the magnet assembly is held within the housing, and the manner in which the housing halves are held closed, is clearly seen in the cross-section view of FIG. 5. It will be understood that the boss 26 and stud 27 are integral parts of the molded housing. The two halves 21 and 22 of the housing 20 are molded as a single integral piece, integrally joined at the center fold line 23.

Opposite end walls of each housing half are provided with outwardly projecting resilient fingers 31 and 32 connected integrally to the housing at the rear, but free at their forward ends. The forward ends of the fingers are inclined and ribbed, or stepped, forming gripping surfaces 33 and 34, respectively. The outer surfaces of the fingers 31, 32, rearwardly of the stepped gripping surfaces 33, 34, are preferably slightly concave. The angle at which the fingers 31, 32, diverge from the main portion of the housing may, in a typical case, be 15°. The forward surfaces of the housing halves are flanged to provide for abutment against the door frame.

The manner in which the magnetic latch fastener is installed and the advantages to be derived therefrom will now be described.

In FIG. 4, a door frame 40 is illustrated having therein a rectangular opening 41 corresponding in size and shape to that of the closing housing 20 at its rear end portion. When the fastener is inserted into the opening 41 and pressed therethrough, the fingers 31, 32 are compressed inwardly, the upper finger 31 being compressed downwardly and the lower finger 32 being compressed upwardly. This compression continues until the peak points of the fingers, located at the rearward end of the stepped gripping surfaces 33 and 34, pass the inside edge of the door-frame opening. The fingers 31 and 32 then start to return outwardly, due to their inherent resilient outward thrust, and when the insertion is completed and the flanged front surface of the housing abuts against the door frame 40, the inside upper and lower edges of the door frame opening are in engagement with some part of the stepped gripping portions 33, 34 of fingers 31, 32. The extent to which the fingers 31, 32 move outwardly depends upon the thickness of the door frame 40.

To accommodate different thicknesses of door frames, it is contemplated that the magnetic latch housing will be molded in at least several sizes having in most respects identical dimensions but having different dimensions with

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regard to the resilient fingers 31, 32. In particular, the dimensions between the foremost tip of the stepped gripping surfaces 33, 34 and the inner surface of the forward wall flange will be greater for thicker door frames and the divergent angle of the fingers 31, 32 will be less.

While the preferred embodiment of this invention has been described in some detail, it will be obvious to one skilled in the art that various modifications may be made without departing from the invention as hereinafter claimed.

What is claimed is:

1. A magnetic latch fastener for insertion in a frame opening, said fastener comprising:

- (a) a magnet assembly comprising a permanent magnet and a pair of pole plates;
- (b) a housing of resilient material;
- (c) said housing comprising two halves each having a sidewall, a rear wall, and a pair of opposing end walls;
- (d) the rear walls of said housing halves being pivotally connected together;
- (e) the interior surface of each sidewall being recessed to form with said rear walls a pocket open at the forward end, said pocket receiving the magnet assembly;
- (f) opposite end walls of each housing half having exterior fingers projecting outwardly and forwardly from the rearward portion and unconnected at the forward end;
- (g) said fingers being adapted for inward movement in response to external compressive forces and outward return movement in response to the inherent thrust of the resilient material.

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2. A magnetic latch fastener according to claim 1 characterized in that the sidewall of one housing half is provided with an inwardly projecting boss having a bore therethrough, in that the sidewall of the other housing half is provided with an inwardly projecting stud adapted to be received in an interference fit in the bore of the boss, and in that said magnet assembly has a hole therethrough for receiving said boss and stud, whereby said housing halves are maintained in closed relation.

3. A magnet latch fastener according to claim 1 characterized in that said fingers have a stepped forward face for gripping the edge of the frame opening into which the latch assembly is inserted.

4. A magnetic latch fastener according to claim 2 characterized in that said fingers have a stepped forward face for gripping the edge of the frame opening into which the latch assembly is inserted.

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