Sept. 3, 1963 D. HEYER 3,102,748

MAGNETIC CATCH ASSEMBLY

Filed Nov. 21, 1960

FIG. 1.

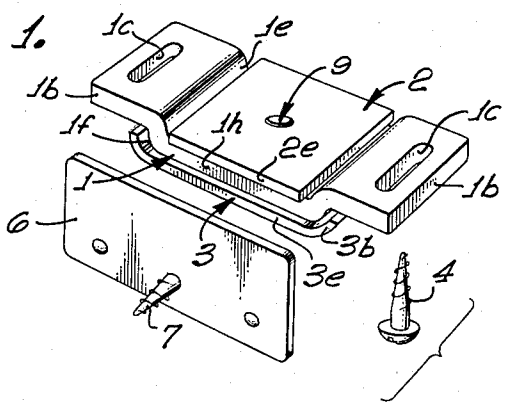


FIG. 3.

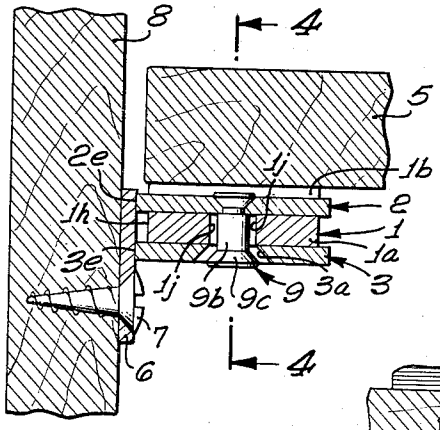


FIG. 4.

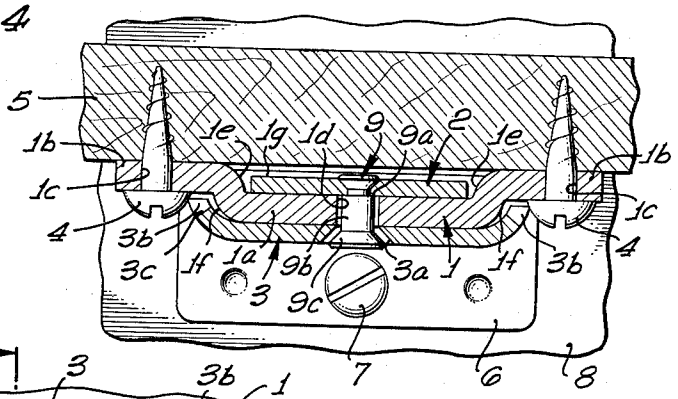
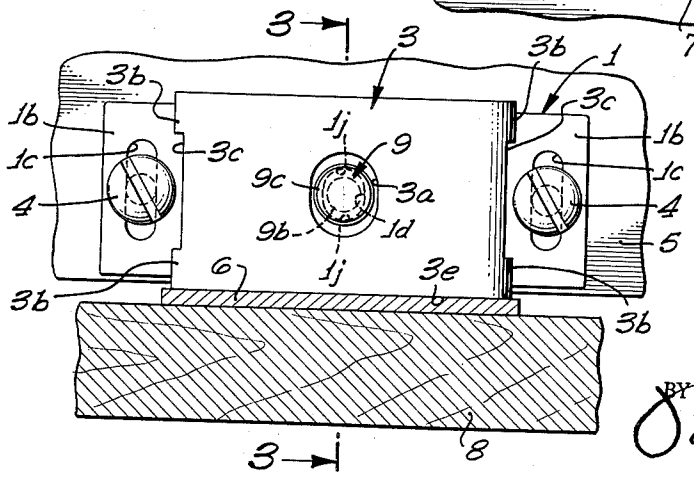


FIG. 2.



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MAGNETIC CATCH ASSEMBLY

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This invention relates to a magnetic catch for use in connection with cabinet doors or other closures to releasably hold them in a predetermined position.

It has been the practice in the production of magnetic door catch assemblies to provide a complex form of housing or mounting structure in which are supported magnet elements for engaging a strike plate of magnetic material mounted on a door or similar closure which is to be held closed by the magnet elements. This housing or mounting structure is an element apart from the magnet elements and entails considerable expense as to tooling and production, since such a housing or mounting structure usually includes numerous angularly related portions, apertured mounting ears and a formation which will prevent the magnet elements from being pulled out of place when the door is opened.

It is an object of this invention to provide a magnetic catch assembly which constitutes an improvement in this art in point of eliminating the use of a housing or special mounting means such as heretofore required, simplicity of construction, compactness, inexpensiveness, and ease of assembly and installation.

It is another object of this invention to provide a magnetic catch assembly such as described wherein the magnet serves as a means for supporting a pair of pole pieces as well as provides simple and reliable mounting means which may be readily adjusted best to position the assembly for efficient use.

Further, it is an object hereof to provide the objectives hereinbefore noted by employing a simple form of magnet having apertured terminal portions for reception of fastenings, whereby the magnet, with separate pole pieces mounted thereon, may be directly secured to a stationary part of a cabinet or to the cabinet door, as the case may be, for cooperation with a strike plate of magnetic material to hold the door closed.

A further object of this invention is the provision of a novel magnetic catch assembly which comprises but four separate elements, namely, a magnet having apertured ends forming mounting ears, a pair of pole pieces and a simple fastening element securing these elements together in such a manner that the pole pieces are supported on the magnet for limited movement relative thereto to assure proper contact thereof with a strike plate for magnetically holding a door or other closure in closed position.

A further object of this invention is to provide a magnetic catch assembly in which the magnet is provided with simple yet novel formations engageable by the pole pieces to restrict movement of the pole pieces relative to the magnet in a manner rendering the assembly reliably self-adjusting for compensating for misalignments in cabinet doors and similar closures.

Another object of this invention is to provide a magnetic catch assembly such as described wherein the pole pieces have limited relative movement independently of one another and relative to the magnet on which they are mounted, thereby assuring that both pole pieces will make proper contact with the strike plate regardless of misalignment of the door or closure to be held by the catch.

Another object is the provision of a magnetic catch assembly wherein advantages hereinbefore noted are achieved in a particularly simple and effective manner by employing a shouldered rivet which is fixed to one

pole piece, passes loosely through an opening in the magnet for free movement therein, and is riveted to the other pole piece so that the latter is movable relative thereto. With this arrangement the rivet is freely movable both axially thereof and angularly about its axis in the opening of the magnet to permit the one pole piece to which the rivet is fixed to have free movement corresponding to that of the rivet relative to the magnet, the other pole piece being movable axially and angularly relative to the rivet as well as relative to the magnet by reason of the rivet receiving opening thereof being of much larger diameter than the part of the rivet disposed therein. Thus, the pole pieces are independently movable relative to one another as well as to the magnet to assure proper contact thereof with the strike plate.

Further, it is an object of this invention to provide a magnetic catch assembly such as described which may be economically constructed of small and compact form and easily installed so as to take up but little space, by reason of the use of a plate-like magnet having offset apertured ends for mounting the assembly, a pair of plate-like pole pieces mounted on opposite faces of the magnet in closely assembled relation thereto between the offset ends, and the special manner of riveting the magnet and pole pieces together to permit limited movement of the pole pieces relative to one another and the magnet.

Other objects and advantages of the invention will be hereinafter described or will become apparent to those skilled in the art, and the novel features of the invention will be defined in the appended claims.

Referring to the drawing:

FIG. 1 is an exploded perspective view of a magnetic catch assembly and strike plate;

FIG. 2 is a bottom plan view of the magnetic catch assembly applied to a support, and showing a strike plate in section applied to a closure and magnetically held in contact with the catch assembly;

FIG. 3 is a sectional view as taken on the line 3—3 of FIG. 2; and

FIG. 4 is a sectional view as taken on the line 4—4 of FIG. 3.

As shown in the accompanying drawings, a magnetic catch assembly embodying the present invention includes a permanent magnet 1 which serves as the body of the assembly, a support for a pair of pole pieces 2 and 3, and as means for mounting the assembly in place with the aid of fastenings 4. As here shown, the assembly is mounted on a cabinet shelf 5, with the pole pieces positioned to engage a strike plate 6 of magnetic material secured by a fastening 7 on the cabinet door 8.

The magnet 1 as here shown, is formed as a plate-like strip having its ends correspondingly offset to form a flat body 1*a* and a pair of integral mounting ears 1*b* offset from one side of the body. These ears have apertures in the form of slots 1*c* extending transversely thereof for reception of the fastenings 4 by which the magnet is mounted on the cabinet shelf with the body 1*a* spaced from the shelf. The slots 1*c* provide for adjusting the magnet to occupy the position best suited for efficient use, after which the fastenings are tightened to fix the magnet in place.

The body 1*a* of the magnet has flat faces on opposite sides thereof constituting opposite poles of the magnet. Accordingly, the pole pieces 2 and 3 which are plate-like, are positioned flatwise on the opposite faces of the magnet body and are fastened thereto so as to have limited movement relative to one another as well as relative to the magnet, whereby the pole pieces will be self-adjusting so that the edges thereof are assured face-to-face contact with the strike plate 6.

As a means for fastening the pole pieces 2 and 3 to the magnet body 1*a*, a shouldered rivet 9 of non-magnetic

material is immovably riveted at one end to the pole piece 2 with the shoulder 9*a* abutting the face of this pole piece adjacent the magnet body. The shank 9*b* of the rivet passes loosely through an opening 1*d* in the magnet body, this opening being elongate transversely of the magnet body and of such size with relation to the rivet shank 9*b* as to permit of free movement of the rivet and the pole piece 2 as a unit relative to the magnet.

The rivet 9 is also fastened to the pole piece 3 but in such a manner as to permit limited movement of this pole piece relative to the rivet and the magnet body. For this purpose the shank 9*b* of the rivet is extended loosely through a beveled opening 3*a* in the pole piece 3, this opening being elongate transversely of the pole piece 3 and of greater diameter than the rivet shank to permit limited movement of the pole piece 3 relative to the rivet as well as relative to the pole piece 2 and magnet 1. A beveled head 9*c* on the rivet is of such size as to retain the pole piece 3 loosely mounted on the magnet 1. With this arrangement the pole piece 3 has limited movement axially of the rivet and the magnet as well as angular movement about the axis of the rivet while the rivet is also capable of limited axial movement together with the pole piece 2 relative to the magnet and pole piece 3. Moreover, the pole pieces are independently movable angularly about the axis of the rivet.

Means are provided to limit angular movement of the pole pieces 2 and 3 about the axis of the rivet. Accordingly, the offsetting of the end portions forming the ears 1*b* of the magnet provide on one side of the latter the shoulders 1*e* and on the other side the shoulders 1*f*. The offsetting of the ends of the magnet defines between the shoulders 1*e* a recess 1*g* in which the pole piece 2 is loosely mounted with its end edges spaced sufficiently from the shoulders 1*e* to permit of limited angular movement of this pole piece about the axis of the rivet.

Angular movement of the pole piece 3 about the axis of the rivet 9 is limited by means of the shoulder 1*f* being engageable by inwardly curved end portions 3*b* of the pole piece 3, these inwardly curved end portions being normally spaced from the shoulders 1*e* as shown in FIG. 4. Notches 3*c* are formed between the inwardly curved end portions 3*b* to accommodate the fastenings 4 and to permit the pole piece 3 to move relative to these fastenings.

It is desired that the outer longitudinal edges 2*e* and 3*e* of the pole pieces 2 and 3, as shown in FIG. 3, be disposed at all times in somewhat outwardly spaced relation to the adjacent edge 1*h* of the magnet 1, in order that the pole pieces will always be in a position to engage the strike plate 6 ahead of the edge 1*h* of the magnet. For this purpose the opening 1*d* in the magnet has opposed side walls 1*j* so spaced from the rivet 9 as to limit the movement of the rivet in a direction normal to the edge 1*h* an extent which will prevent the edges 2*e* and 3*e* of the pole pieces from being disposed inwardly of the outer edge 1*h* of the magnet. However, there is sufficient clearance between the rivet 9 and the side walls 1*j*, also between the end walls in the slot 1*a* to assure sufficient movement of the pole pieces to provide for alignment of the edges 2*e* and 3*e* with the strike plate 6. Should the face of the strike plate 6 not be presented squarely to the edges 2*e* and 3*e*, the pole pieces 2 and 3 upon contact with the strike plate will adjust themselves for proper contact therewith. This proper contact of the pole pieces is further assured by having the pole pieces subject to independent movement relative to one another and the magnet. Such flexibility of the magnetic catch assembly significantly simplifies assembly and installation since precision of manufacture and assembly are not important.

It should be noted with reference to FIGS. 3 and 4 that in having the magnet provided with the offset mounting ears 1*b*, the assembly can be very compactly made for convenient positioning underneath a cabinet shelf so as to occupy but little cabinet space. This offsetting of the mounting ears at ends of the magnet also provides ample room between the bottom of the cabinet shelf and the pole piece 2 to assure the desired self-aligning movement of the pole piece 2 and the rivet.

While specific structural details have been shown and described, it should be understood that changes and alterations may be resorted to without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A magnetic catch assembly comprising: a magnet having at least one of its extremities adapted to be fixed directly upon a structure on which the assembly is to be supported; a pair of pole pieces; and means mounting said pole pieces on said magnet providing for limited movement of said pole pieces relative to said magnet.

2. A magnetic catch assembly comprising: a magnet, opposite portions of which are adapted to be fixed directly upon a structure on which the assembly is to be supported; a pair of pole pieces; and means mounting said pole pieces on said magnet providing for limited movement of said pole pieces relative to one another as well as relative to said magnet.

3. A magnetic catch assembly comprising: a magnet; means carried by said magnet adapted to be mounted on a structure on which the assembly is to be supported; a pair of pole pieces; and means mounting said pole pieces on said magnet for movement relative thereto including a fastening extending through said magnet and joined to said pole pieces, said fastening being bodily movable relative to said magnet.

4. A magnetic catch assembly comprising: a magnet; means carried by said magnet adapted to be fixed to a support for the assembly; a pair of pole pieces; and means mounting said pole pieces on said magnet for bodily movement relative to one another as well as relative to said magnet including a fastening extending through said magnet and immovably fixed to one of said pole pieces and axially movable relative to said magnet.

5. A magnetic catch assembly comprising: a magnet; a pair of pole pieces; and means mounting said pole pieces on said magnet for movement relative thereto including a fastening joined to said pole pieces and extending through said magnet so as to be bodily movable relative thereto said magnet having at least one extremity extending outwardly from edges of said pole pieces and disposed to be fastened to a support for the assembly.

6. A magnetic catch assembly comprising: a magnet; means carried by said magnet adapted to be fixed to a support for the assembly; a pair of pole pieces; and means mounting said pole pieces on said magnet for movement relative to said magnet including a fastening immovably fixed to one of said pole pieces extending through said magnet and connected to the other pole piece; said fastening being movable axially relative to said magnet and said other pole piece.

7. A magnetic catch assembly comprising: a magnet; means carried by said magnet adapted to be fixed to a support for the assembly; a pair of pole pieces; and means mounting said pole pieces on said magnet for movement relative to said magnet including a fastening connected with said pole pieces and said magnet; said fastening being fixed to one of said pole pieces for movement therewith and being movable axially and angularly relative to the other pole piece and said magnet.

8. A magnetic catch assembly comprising: a magnet having apertured margins for reception of fastenings for mounting said magnet on a structure on which the assembly is to be supported; a pair of pole pieces; and means mounting said pole pieces for bodily sliding movement on said magnet including a fastening extending through said magnet and connected with said pole pieces.

9. A magnetic catch assembly comprising: a plate-like magnet having opposite apertured margins disposed to be secured by fastenings on a support for the assembly; a pair of pole pieces; and means mounting said pole pieces

on opposite sides of said magnet for movement relative to said magnet.

10. A magnetic catch assembly comprising: a magnet having apertured end portions adapted to be secured by fastenings on a support for the assembly; a pair of pole pieces; and means mounting said pole pieces on opposite sides of said magnet between said end portions for movement relative to said magnet with said pole pieces movable relative to one another as well as relative to said magnet.

11. A magnetic catch assembly comprising: a magnet having ends adapted to be fastened on a support for the assembly; a pair of pole pieces; and means mounting said pole pieces on opposite sides of said magnet for movement relative to said magnet between said ends; said ends being offset from the remainder of said magnet.

12. A magnetic catch assembly comprising: a magnet having ends adapted to be fastened on a support for the assembly; a pair of pole pieces; and means mounting said pole pieces on opposite sides of said magnet for movement relative to said magnet; said ends being offset from said magnet and providing shoulders on opposite sides of said magnet for cooperation with said pole pieces to limit said movement of said pole pieces.

13. A magnetic catch assembly comprising: a magnet having opposite faces constituting the opposite poles of the magnet; apertured ears fixed to opposite ends of the magnet and affording the mounting of the magnet on a surface of a structure for supporting the assembly with one of said faces in opposed spaced relation to said surface of said structure; pole pieces mounted on said faces with portions thereof disposed in outwardly spaced relation to said magnet; and a fastening extending through said magnet and connected with said pole pieces so as to permit movement of said pole pieces relative to one another as well as relative to said magnet.

14. A magnetic catch assembly comprising: an elongate magnet having end portions correspondingly offset to define between said end portions a magnet body portion having opposite faces constituting the opposite poles of the magnet; said end portions being disposed to be mounted against a surface of a support for the assembly so that

one of said faces of said magnet body portion is positioned in opposed and spaced relation to said surface of said support; a pole piece positioned on said face of said body portion between said offset end portions so that it will be spaced from said surface of said support; another pole piece mounted on the other face of said magnet body portion; and a fastening extending through said magnet and connected with said pole pieces in a manner permitting movement of said pole pieces relative to said magnet.

15. A magnetic catch assembly comprising: a magnet body; pole pieces on opposite sides of said body for engagement by a strike plate; connecting means securing said magnet and pole pieces in assembled relation as a unit with said magnet and pole pieces subject to relative movement; and mounting means free from connection with said connecting means and supported in said assembly solely by connection thereof with margins only of said magnet body and having portions offset from the plane of said magnet body for connection with a support for the magnet catch assembly.

16. A magnetic catch assembly comprising: an elongate magnet body; a pair of pole pieces on opposite sides of said body and projecting laterally of said magnet body for engagement by a strike plate; and means at the ends of said magnet body connectable to a support; said magnet body being offset from said means at the ends of said magnet body and forming therewith shoulders on one face and a recess in the other face; one of said pole pieces being mounted in said recess; the other of said pole pieces having end portions projecting into opposed relation to the shoulders on said magnet body.

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