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2,840,408

MAGNETIC LATCH

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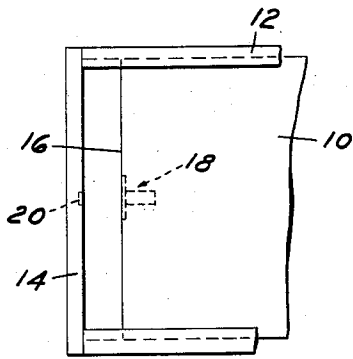


FIG. 1

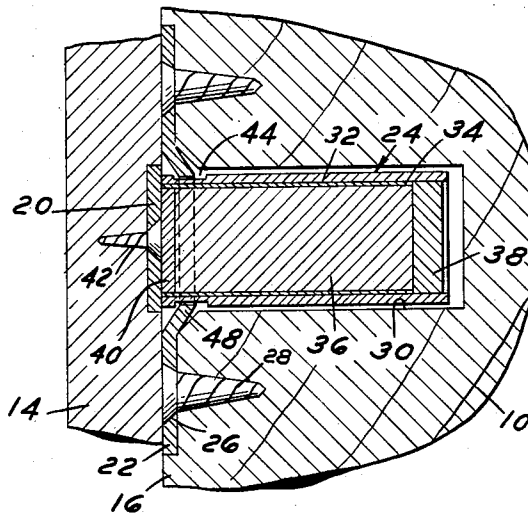


FIG. 2

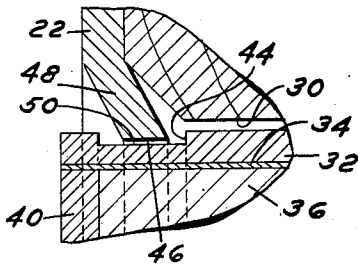


FIG. 4

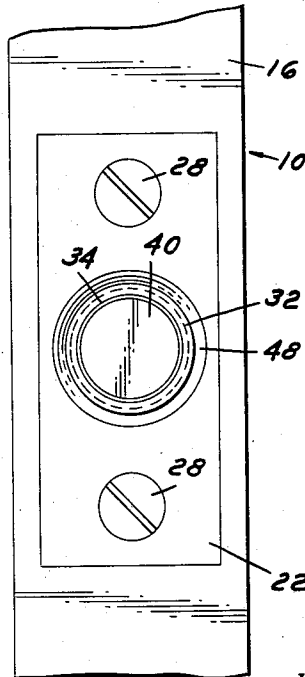


FIG. 3 BY

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MAGNETIC LATCH

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11 Claims. (Cl. 292—251.5)

This invention relates to a magnetic latch and more particularly to a bore-in type of latch for holding sliding doors in closed position.

It is an object of this invention to provide a latch of the type described wherein the magnet assembly is floatingly mounted on a face plate so that full contact with the strike is assured.

A further object of the invention resides in the provision of a magnetic bore-in latch wherein a floating connection between the magnet assembly and the face plate of the latch is designed for economical manufacture.

In the drawings:

Fig. 1 is a fragmentary side elevational view of a sliding door panel provided with the magnetic latch of the present invention.

Fig. 2 is a fragmentary vertical sectional view of the latch with the door in the fully closed position.

Fig. 3 is a fragmentary end view of the door panel showing the latch mounted thereon.

Fig. 4 is a fragmentary sectional view of an enlarged scale showing the floating connection between the magnet assembly and the face plate.

Referring more particularly to the drawings, there is shown in Fig. 1 a door panel 10 mounted for sliding movement in a frame member 12 provided with a jamb 14. The end face 16 of the door has the magnetic latch 18 mounted therein; and on the jamb 14, there is arranged a strike plate 20 adapted to be engaged by latch 18. The particular construction of the latch of the present invention is illustrated in Fig. 2. The latch includes a rectangular face plate 22 formed of brass or other non-magnetic material and a magnet assembly 24 mounted on face plate 22 in a manner described hereinafter. Door panel 10 is provided with a mortised recess 26 in which face plate 22 is adapted to be secured by means of mounting screws 28. The magnet assembly 24 is received within a cylindrical socket 30 bored in the end face 16 of the door.

Magnet assembly 24 comprises an outer cylindrical sleeve 32 preferably fashioned from steel tubing. Within sleeve 32, there is arranged a non-magnetic liner 34 which is advantageously formed from a piece of brass tubing. Within liner 34, there is arranged a cylindrical bar magnet 36. At the inner end of magnet assembly 24, an end plug 38 formed of steel or other magnetic material is pressed fitted into the end of steel sleeve 32. The inner end of magnet 36 abuts against the inner face of end plug 38 so that the end plug 38 forms a flux path between magnet 36 and sleeve 32. At the outer end of magnet assembly 24, an end plug 40 is press fitted into the end of brass liner 34 in abutting relation with the outer end of magnet 36. The press fits of end plugs 38 and 40 insure an integral connection between the various elements of the magnet assembly 24. In this arrangement, it will be observed that sleeve 32 and end plug 40 form the pole pieces of the assembly and these pole pieces are

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insulated magnetically from one another by the brass liner 34.

In magnets of this type for sliding doors, the door is effectively held in the closed position only when the pole pieces of the magnet are in complete face-to-face contact with the strike plate 20. Strike plate 20 may be in the form of a circular disc mounted on the jamb 14 as by a mounting screw 42. When a magnet assembly such as shown at 24 is rigidly mounted on a face plate such as that shown at 22, misalignment of either the door or the latch itself results in only partial contact of the magnet assembly with strike plate 20. Thus, as a practical matter, it is desirable to mount the magnet assembly 24 in a floating condition on face plate 22.

In the latch of the present invention, this floating connection is effected very economically in a manner illustrated in Figs. 2 and 4. Outer sleeve 32 has an annular groove 44 formed around the outer surface thereof adjacent its outer end. The width of groove 44 is substantially greater than the thickness of the material from which face plate 22 is fashioned. Face plate 22 is formed with a central opening 46, and the portion 48 of face plate 22 surrounding opening 46 is originally formed in a flared condition so that the magnet assembly 24 can be inserted through the opening 46. Thereafter, the portion 48 of face plate 22 is crimped to bring the edge 50 surrounding opening 46 into the undercut annular groove 44 in outer sleeve 32.

In the assembled condition of the latch, the diameter of central opening 46 is slightly greater than the diameter of the undercut groove 44. As pointed out previously, groove 44 is also wider than the thickness of the portion 48 of face plate 22. Thus, the magnet assembly 24 is free to shift slightly axially with respect to face plate 22 and at the same time is permitted a slight amount of universal pivoting movement on face plate 22. It follows, therefore, that if there should be some slight misalignment between the plane of face plate 22 and the plane of strike plate 20, the floating connection between magnet assembly 24 and face plate 22 will compensate for this misalignment; and when the door is closed, the pole piece 40 will automatically engage strike plate 20 in full face-to-face contact, thus utilizing the maximum magnetic attracting power of magnet 36 to effectively hold the sliding door 10 in closed position. It will be obvious that the floating connection described herein lends itself admirably to economical production manufacture.

We claim:

1. A magnetic bore-in latch for sliding doors including a face plate adapted to be mounted on the edge of the sliding door and a magnet assembly supported on said face plate and projecting therethrough, said magnet assembly including an outer cylindrical sleeve having an annular groove around the outer face thereof closely adjacent but spaced from the end of said magnet assembly projecting through said face plate, said face plate having an opening therein through which said magnet assembly projects, the portion of said face plate surrounding said opening being disposed within said annular groove to floatingly mount said magnet assembly on said face plate.

2. A magnetic bore-in latch for sliding doors including a face plate having a central opening therein with the portion thereof surrounding said opening being flared inwardly of the outer face of said face plate, a magnet assembly projecting through said central opening, said magnet assembly being generally cylindrically shaped at the portion thereof projecting through said face plate and having an annular groove around the outer surface thereof spaced from the adjacent end of the magnet, said inwardly flared portion of said face plate being disposed

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within said annular groove to floatingly mount the magnet assembly on said face plate.

3. A magnetic bore-in latch as called for in claim 2 wherein the width of said groove is substantially greater than the thickness of said face plate at said inwardly flared portion thereof.

4. A magnetic bore-in latch as called for in claim 3 wherein the diameter of said central aperture in the face plate is greater than the outer diameter of the base of said annular groove.

5. A magnetic bore-in latch as called for in claim 4 wherein said magnet assembly projects through said inwardly flared portion of said face plate to at least the plane of said face plate.

6. A magnetic bore-in latch for sliding doors comprising a face plate having a central aperture, the portion of said face plate surrounding said central aperture being flared inwardly from the outer face of the face plate, a magnet assembly projecting through said central aperture, said magnet assembly including a cylindrical tube formed of magnetic material and a magnet insulatively supported within and extending axially of said tube, means forming a flux path between said tube and one end of the magnet, said tube having a circumferential groove around the outer surface thereof at the portion projecting through said inwardly flared portion of the face plate, said groove being spaced slightly from the adjacent end of the tube, said inwardly flared portion of said face plate being loosely retained in said groove.

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7. A magnetic bore-in latch as called for in claim 6 wherein said means comprises a plug formed of magnetic material press fitted into the inner end of said tube and abutting the inner end of said magnet.

8. A magnetic bore-in latch as called for in claim 7 including a liner formed of non-magnetic material disposed between said magnet and the inner face of said tube.

9. A magnetic bore-in latch as called for in claim 8 including a plug formed of magnetic material press fitted into the outer end of said liner and abutting against the outer end of said magnet, said last-mentioned plug and said tube forming concentrically disposed pole pieces.

10. A magnetic bore-in latch as called for in claim 9 wherein the diameter of said groove at the base thereof is slightly less than the diameter of said central aperture.

11. A magnetic bore-in latch as called for in claim 10 wherein the width of said groove is substantially greater than the thickness of said face plate at said inwardly flared portion thereof.

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