United States Patent [19]

Berducone

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[54] **MAGNETIC LATCH**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **292/251.5,** 70/276

[51] **Int. Cl.** **E05c 19/16**

[58] **Field of Search** 292/251.5, 144, 201

[56] **References Cited**

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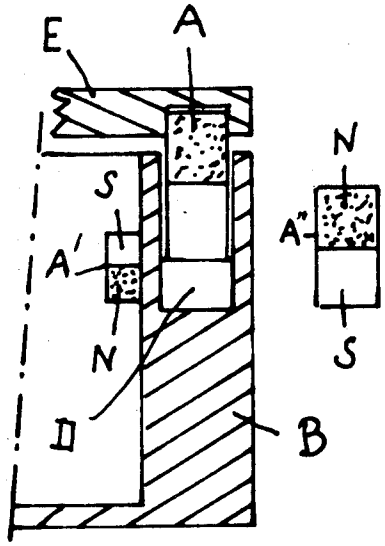
[57] **ABSTRACT**

A magnetic latch comprises a pair of magnets in mutually repelling position so that one of them is urged into a latching position, and a third magnet which when brought close to the latching magnet overcomes the repulsion and withdraws the latching magnet, and when remote from the latching magnet permits the latching magnet to resume latching position.

1 Claim, 6 Drawing Figures



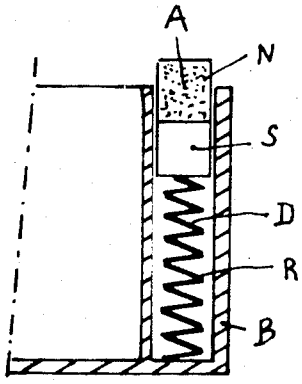


Fig_1

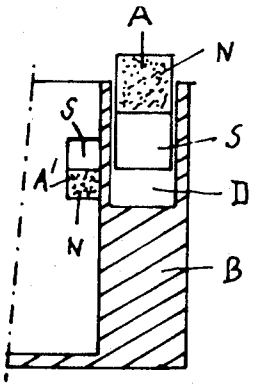


Fig_2

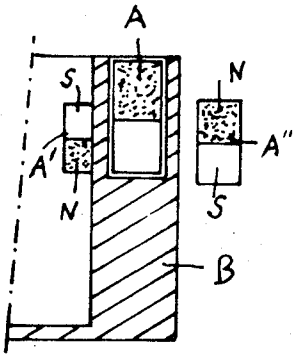


Fig_3

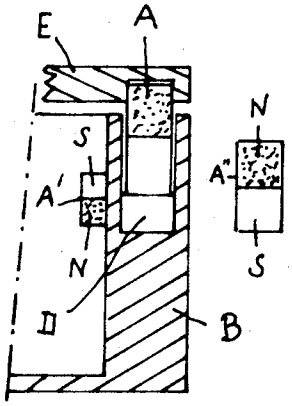


Fig_4

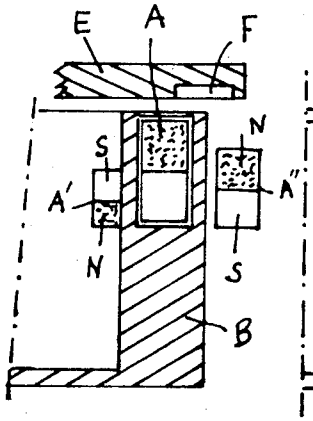


Fig_5

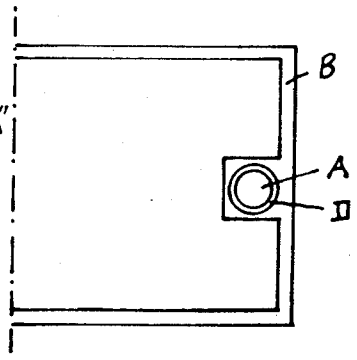


Fig_6

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MAGNETIC LATCH

The present invention relates to magnetic latches.

It is an object of the present invention to provide a magnetic latch which utilizes only magnetic attraction and repulsion and hence is free from the difficulties which ordinarily attend the use of magnetic latches.

Another object of the present invention is the provision of a magnetic latch which will be relatively simple and inexpensive to manufacture, easy to operate, and rugged and durable in use.

Other objects, features and advantages of the present invention will become apparent from a consideration of the following description, taken in connection with the accompanying drawing, in which:

FIG. 1 is a view in cross section of a magnetic latch not according to the present invention but showing certain structure known in the prior art;

FIG. 2 is a fragmentary cross sectional view showing a magnetic latch actuated by the repulsion of a pair of magnets;

FIG. 3 is a view similar to FIG. 2 but showing a magnetic latch according to the present invention in the withdrawn position;

FIG. 4 is a view similar to FIG. 3 but showing the latch in extended position, to retain the cover of a container;

FIG. 5 is a view similar to FIG. 4 but showing the parts in the FIG. 3 position to permit removal of the cover; and

FIG. 6 is a fragmentary top plan view of a portion of a latch structure according to the invention.

Referring now to the drawing in greater detail, and first to FIG. 1 thereof, there is shown a container B with a recess D in the side thereof in which is disposed a coil compression spring R that bears against the underside of a magnet A having a north pole N and a south pole S to urge the magnet into latching position.

FIG. 2 also shows a fragmentary view of a box B in cross section, having a cavity D therein in which is disposed a permanent magnet A having a north pole N and a south pole S, and also a further magnet A' smaller and weaker than the magnet A and disposed on the inside of the container B. The poles of the magnets A and A' are so related that the fixed magnet A' urges the movable magnet A into the latching position shown in FIG. 2.

FIG. 3 is a view similar to FIG. 2, but showing a third magnet A'', larger and stronger than magnet A', whose poles are arranged in attractive relationship to magnet A so that in the FIG. 3 position, when magnet A'' is relatively close to the magnet A, then the magnet A is drawn down into retracted position against the repulsive force of magnet A'.

FIG. 4 shows the same structure as in FIG. 3, but with the permanent magnet A'' relatively remote from the magnet A, so that the magnet A' is sufficiently strong to repel the magnet A into the latching position shown in FIG. 4 in which magnet A enters a recess in the underside of a cover E to latch the cover in place.

FIG. 5 shows the same structure as in FIG. 4, but with magnet A'' in the FIG. 3 position and the magnet A retracted to unlatched position so that the magnet A is withdrawn from the recess F in the underside of cover E and cover E can be retracted.

FIG. 6 shows in plan the structure of FIG. 2.

Of course, appropriate housings and mountings will be provided, for mounting the parts relative to each other, and particularly for mounting magnet A'' for ready manipulation toward and away from the container so as respectively to retract and to extend the latch of the present invention which is the permanent magnet A. Such housings and connections are not shown in the drawing, it being understood that they can take any conventional form.

In view of the foregoing disclosure, therefore, it will be evident that the initially recited objects of the present invention have been achieved.

Although the present invention has been described and illustrated in connection with a preferred embodiment, it is to be understood that modifications and variations may be resorted to without departing from the spirit of the invention, as those skilled in this art will readily understand. Such modifications and variations are considered to be within the purview and scope of the present invention as defined by the appended claims.

Having thus described my invention, I claim:

1. A container having a magnetic latch comprising a pair of permanent magnets arranged to repel each other, one of said magnets being mounted for movement on and relative to the container between extended and retracted positions, and a third permanent magnet movable toward and away from said one magnet selectively to overcome the repulsion of said pair of magnets thereby to draw said one magnet to said retracted position, to other of said pair of magnets being fixedly mounted on the inside of said container, said one magnet being mounted for movement parallel to the poles of said fixed magnet, said third magnet being movable in a direction transverse to the path of movement of said one magnet.

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