Nov. 29, 1966 J. B. TAVANO 3,288,511

TWO-PART MAGNETIC CATCH FOR DOORS OR THE LIKE

Filed July 20, 1965

FIG. 1

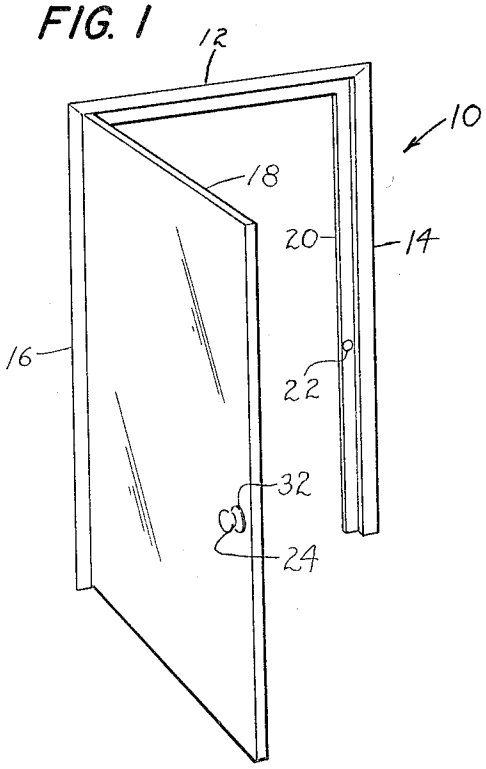


FIG. 2

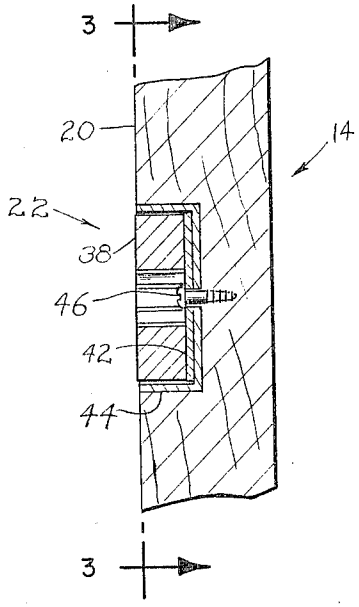
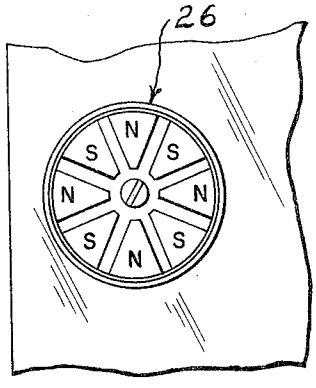
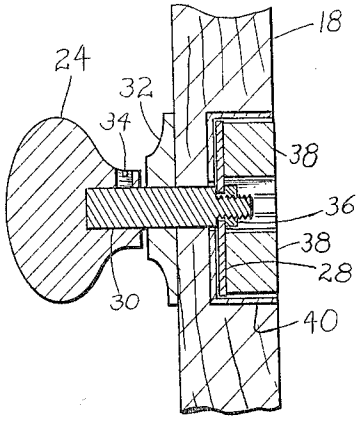


FIG. 4

FIG. 3





INVENTOR.
JOHN B. TAVANO

BY
McCormick, Paulding & Huber
ATTORNEYS

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TWO-PART MAGNETIC CATCH FOR DOORS OR THE LIKE

John B. Tavano, 28 Edgewood Ave., Torrington, Conn.

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This invention relates to magnetic catches for doors or the like and deals more particularly with a magnetic catch having two separable magnetic parts, one of which is adapted to be mounted in a door which is to be releasably held closed, and the other of which is adapted to be mounted in a door frame.

A general object of the present invention is to provide a two-part magnetic catch of the foregoing character wherein the magnetic holding force generated therebetween can be preset to any convenient value by relative rotational movement of at least one of said two parts with respect to the other such part.

Another general object of the present invention is to provide a two-part magnetic catch of the foregoing character wherein a conventional door opening means, such as a door knob, is connected to one of said parts and adapted to vary the magnetic holding force generated between said magnetic catch parts in response to conventional movement of said means, as for example rotation of the door knob.

The drawing shows a preferred embodiment of the invention and such embodiment will be described, but it will be understood that various changes may be made from the construction disclosed, and that the drawing and description are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawing:

FIG. 1 is a perspective view of a door and door frame in which a two-part magnetic catch of the present invention has been installed.

FIG. 2 is a vertical section through that part of the magnetic catch installed in the door frame of FIG. 1.

FIG. 3 is an elevational view of the magnetic catch part shown in FIG. 2 and is taken along the line 3—3 of that figure.

FIG. 4 is a vertical section through that part of the magnetic catch installed in the door of FIG. 1.

Turning now to the drawing in greater detail, FIG. 1 shows a door frame **10** including a door frame header **12** and two upright door jambs **14** and **16**. A flush door **18** is hingedly connected to the left-hand door jamb **16** and is adapted to close the doorway opening defined by said door frame **10**. Preferably and as shown the right-hand door jamb **14** of the door frame **10** defines a door engageable stop portion indicated generally at **20** in which is mounted a magnetic catch part **22** best shown in FIG. 2. A door knob **24** is rotatably received in the door as shown and carries the second magnetic catch part **26** of the two-part catch as best shown in FIG. 4. It is a feature of the present invention that the two-parts **22** and **26** are of generally annular configuration, as shown in FIG. 3, and are adapted to register axially with one another when the door **18** is in a closed position.

Turning now to a detailed description of the means for mounting said last-mentioned magnetic catch part **26** in the door **18**, an annular disc member **28** will be seen from FIG. 4 to be connected to the door knob **24** by a shaft **30** which is rotatably received in the door **18**, and in an escutcheon plate **32**. The door knob **24** is attached to one end of said shaft **30** by a setscrew **34** and said shaft is connected at its other end to the disc member **28** by a nut **36** threadably received on a threaded end portion of said shaft as shown. As so constructed, rotational movement of the knob **24** is accompanied by relative rotational movement of the magnetic catch part **26** to be described.

In accordance with the present invention, each of the two magnetic catch parts **22** and **26** are generally similar in construction and each comprises an annular disc member for retaining a plurality of permanent magnets in equally spaced circumaxial relation as best shown in FIG. 3. The disc member **28** shown in FIG. 4 carries a first plurality of permanent magnets each of which has a rearwardly facing exposed pole face of particular polarity in the general pattern shown in FIG. 3. As shown, eight such pole faces are provided and each of these has a polarity opposite that of the two immediately adjacent pole faces in this circumaxial pattern. Preferably, and as shown in FIG. 4, the magnet retaining member **28** and its associated permanent magnets, indicated generally at **38, 38**, are recessed in the rear side of the door **18** in a cavity defined therein for this purpose and a nonmagnetic cup-shaped member is set in this cavity as shown. The cup-shaped member **40** has an opening to receive the shaft **30** and will be seen to provide a convenient receptacle for the door mounted magnetic catch part **26**.

In further accord with the present invention, the magnetic catch part **22** which is mounted in the door jamb **14** includes a second disc retaining member **42** for carrying a second plurality of permanent magnets having exposed pole faces circumaxially arranged therearound in equally spaced relationship as shown in FIG. 3. These magnets are identical to those described hereinabove with reference to the door mounted catch part **26**. The magnetic catch part **22** is adjustably mounted in a cavity defined in the door stop portion **20** of the door jamb **14** and a second nonmagnetic cup-shaped member **44** is provided in said cavity to receive the disc member **42** and its associated magnets **38, 38**. A wood screw **46** is received in an opening in the member **42** and extends through a coaxially arranged opening in the cup-shaped housing member **44**. The inner end of said screw **46** is threadably received in the door jamb **14** so as to lock the magnetic catch part **22** in any desired angular relation with respect to the first mentioned magnetic catch part **26** described hereinabove.

While the door knob **24**, and its associated magnetic catch part **26** are shown as rotatably supported in the door **18**, it will be apparent that many of the advantages to the present invention can be realized by nonrotatably mounting the part **26** in the door. For example, the other magnetic catch part **22** might be adjustably pre-positioned to bear an angular relation with the fixed door mounted part **26** which would exert only enough closing force therebetween to hold the door shut against forces below a certain threshold value, as for example the force due to a wind of particular intensity.

In the preferred embodiment shown however, the door mounted catch part **26** is rotatably supported for movement in response to a movable door opening means such as the knobs **24**, and part **22** may also be rotatably adjusted to the desired operative position. As so constructed and arranged the magnetic catch part **26** can be selectively positioned in either a door closed position wherein the pole faces of the catch parts **22** and **26** are attached to one another, or a door open position wherein these pole faces are repelled from one another.

The invention claimed is:

1. A magnetic catch for a door which is adapted for movement into and out of a door frame for closing the doorway defined therein, said catch comprising a first magnet retaining member, means for mounting said first member on said door, a first plurality of permanent magnets carried by said first member and having a series of exposed pole faces circumaxially arranged around said first

member, each such pole face having a polarity opposite that of the two pole faces adjacent thereto in said first member, a second magnet retaining member generally similar to said first member, means for mounting said second member in said door frame so that the respective axes of said annular members are in registered relation when said door is closed in said doorway, a second plurality of permanent magnets carried by said second member and having a series of exposed pole faces circumaxially arranged around said second member, each of said last-mentioned pole faces having a polarity opposite that of the two pole faces adjacent thereto in said second member, and said means for mounting at least one of said magnet retaining members including suitable adjustment means for prepositioning that member in any desired angular relation with respect to the other of said members whereby the magnetic closing force exerted on said closed door can be preset to any desired value.

2. A magnetic catch for a door as set forth in claim 1 and further characterized by door opening means accessible from at least one side of said door and connected to said first magnet retaining member for relative rotational movement of the latter with respect to the door whereby the magnetic door closing force can be replaced by an oppositely directed force tending to open said door.

3. A magnetic catch for a door which is adapted for movement into and out of a door frame for closing the doorway opening defined therein, said catch comprising a first magnet retaining disc, means for rotatably mounting said first disc on said door, a first pluraility of permanent magnets carried by said first disc and having a series of exposed pole faces circumaxially arranged around said first disc in equally spaced relationship, each such pole face having a polarity opposite that of the two pole faces immediately adjacent thereto, a second magnet retaining disc generally similar to said first disc, means for mounting said second disc in said door frame so that the respective axes of said discs are in registered relation when said door is closed in said doorway, a second plurality of permanent magnets carried by said second disc and having a series of exposed pole faces circumaxially arranged around said second disc and corresponding in number and spacing to the pole faces in said first annular member, each of said second series of pole faces having a polarity opposite that of both pole faces adjacent thereto on said second disc, and door opening means accessible from at least one side of said door and connected to said first magnet retaining disc for rotating the same and selectively positioning the pole faces of said second series in position for attracting those of said first series whereby the door can be magnetically held in its closed position and for repelling said last-mentioned series whereby the door is urged out of said closed position upon manual movement of said door opening means, said pluralities of magnets being rotatably, adjustably mounted relative to one another to provide a desired holding force therebetween.

4. A magnetic catch for a door which is adapted for movement into and out of a door frame for closing the doorway defined therein, said catch comprising a first annular magnet retaining disc member adapted to be received in a cavity defined in the door adjacent to marginal edge portion thereof, a first plurality of permanent magents carried by said disc member in said cavity and having a series of rearwardly exposed pie-shaped pole faces circumaxially arranged around said disc member in equally spaced relationship, each such pole face having a polarity opposite that of the two pole faces immediately adjacent thereto on said disc member, a door opening means accessible from a front side of said door and including a stub shaft rotatably supported in said door with a rear end extending into said door defined cavity, said first disc member being affixed to said rear shaft end for rotational movement in response to rotational movement of said shaft, a second annuar magnet retaining disc member adapted to be received in a second cavity defined in said door frame, a second plurality of permanent magnets carried by said disc member and having a series of forwardly exposed pie-shaped pole faces circumaxially arranged around said said second disc member in equally spaced relationship, each of said last-mentioned pole faces having a polarity opposite that of the two pole faces adjacent thereto on said second disc member, and mounting means for securing said second series of forwardly facing pole faces in said door frame defined cavity in a particular angular relation with respect to said first series of rearwardly facing pole faces whereby the said faces can be selectively registered with one another to hold said door in a closed position in said door frame.

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EDWARD C. ALLEN, *Primary Examiner.*

R. E. MOORE, *Assistant Examiner.*