MAGNETIC DOOR HOLDER

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My invention relates to a magnetic door holder.

There are many advantages to magnetic means for holding a door in position, for example, closed or open. A magnetic door holder may be arranged to hold the door in some position with any desired degree of force, but of course the effort required for opening the door depends upon the degree of force exerted by the magnetic means and where the magnetic means exerts a strong holding force, the effort required to open the door becomes excessive. When a magnetic means for holding the door, say in closed position, is employed in conjunction with a door closer, the action of the latter is greatly assisted by the magnetic means during the final small closing movement of the door, but when the door is closed, the effort of the door closer and the magnetic means are combined and the physical effort required to open the door may be excessive.

It is the general object of my invention, therefore, to provide a magnetic door holder which will possess all of the advantages inherent in such a door holder and yet will not require great physical effort to move the door from held position.

It is a further and more specific object to provide means for readily moving a door from the extreme position in which it is held by magnetic means.

Still more specifically, it is an object of the invention to provide improved mechanical means for readily breaking the holding force exerted by a magnet in holding a door or the like in position.

Other objects and various features of novelty and invention will be hereinafter pointed out or will become apparent to those skilled in the art.

In the drawings which show, for illustrative purposes only, preferred forms of the invention—

Fig. 1 is a fragmentary sectional view on a horizontal plane through a door and door casing and illustrating one form of the invention;

Fig. 2 is a generally sectional view taken substantially in the plane of the line 2—2 of Fig. 1, a part of the handle mechanism back of the section plane being shown in the plane 2a—2b merely for the sake of clarity of illustration;

Fig. 3 is a sectional view, taken substantially in the plane of the line 3—3 of Fig. 1;

Fig. 4 is a view in elevation of a form of magnet illustrated in Fig. 1 and viewed in the direction of the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary plan view of a door in open position, illustrating a magnetic door holder of slightly modified form and arranged for holding a door in open position;

Fig. 6 is a sectional view on the line 6—6 of Fig. 5.

Briefly stated, in a preferred form of the invention I employ magnetic means including a magnet and a keeper for holding a door in desired position. A part of the magnetic means is carried by the door, while a cooperating part of the magnetic means is carried by a door casing or other part arranged relatively to the door so as to hold the door in desired position. I employ mechanical means for readily breaking the magnet and its keeper away from each other so as to facilitate door movement. Such means for breaking the magnet and keeper away from each other may be arranged to be operated independently of movement of the door, though in its broader aspect the invention contemplates merely mechanical means for readily breaking the magnet and its keeper away from each other regardless of whether the door moves or does not move during such operation, but so arranged as to require the exercise of a manual force smaller than the force of the magnet holding the keeper. As has been indicated, my improved magnetic holder may be employed for holding the door in any desired position, but is particularly advantageous for holding a door in closed position or in some predetermined open position.

In that form of the invention shown in Figs. 1 to 4, there is illustrated a metal door casing 5 of more or less conventional form, and a fragment of a metal door 6 in closed position on the casing. Magnetic means, including a permanent magnet and a keeper, are carried by the door and casing so that when the door approaches closed position, the magnetic means will draw the door and hold the same in final or closed position. The permanent magnet and its keeper are arranged for relative movement so that one of the elements may be moved away from the other to break the magnetic force holding the keeper to the magnet. In the form illustrated by way of example, the magnet is held in fixed position and the keeper is arranged for movement away from the magnet.

In the form illustrated, the magnet, designated generally 7, is attached to the door casing 5, and the keeper, designated generally 8, is carried by the door and is arranged for relative movement away from the magnet, and the parts are so constructed that the breaking away of the keeper from the magnet requires the exertion of less manual force than the maximum holding force between the magnet and the keeper. In the form shown, the permanent magnet includes a case 9 of non-magnetic material such as brass, and a
block 10 of magnetized material is carried in the case. The block 10 of magnetized material may be clamped between pole plates 11—12 as by means of screws 13—15. A block 14 of material such as brass may be secured to the pole plates 11—12 and may be secured to the housing or casing 8 by means of screws 18—19, as will be understood, and whereby the magnet as a whole is held in the casing. The pole plates 11—12 may be flanked inwardly as indicated particularly in Fig. 3, and the ends 16—17, constituting the pole pieces of the mold, may extend through the housing 8 and be located in position to cooperate with a keeper. The magnet case may be provided with ears secured to the face of the frame as by means of screws 18 to hold the entire magnet to the door casing. In the preferred form the magnet housing or casing 8 is so arranged as to be flush with or form a continuation of the door casing, but the pole pieces 16—17, if desired, may project slightly from the casing.

The keeper in the present instance is carried by the door, and the parts are arranged so that the keeper and magnet may be readily separated from each other. In the form illustrated, the keeper 8 comprises a heavy iron or steel plate 19, which may project or be accessible through an opening in the door 6 in position to cooperate with the pole pieces 16—17 of the magnet. The keeper plate 19, in the form shown, is mounted upon a lever 20, pivoted at 21 to a strut or other member in the door 6. The lever is provided with an anular arm 22, and the arm and keeper plate 19 have coating self-aligning seats as indicated at 23. A rivet or other holding member 24 serves to hold the keeper plate 19 on the lever and preferably the central or inner seat 25 in the keeper plate is somewhat larger than the rivet so that there may be the desired degree of self-alignment of the plate 19 on the lever 20 so that the keeper plate may always cooperate flatwise with the pole pieces of the magnet. The head 26 of the rivet may be of spherical form and fit a spherical seat in the face of the keeper plate 19 to facilitate the self-alignment mentioned.

The lever 20 in the preferred form has a part thereof, such as a tail piece 27, which may engage an abutment 28 carried by the door. Means, such as a compression spring 29, serves to urge the lever forwardly until it is stopped by the abutment 28, in which position the keeper plate 19 is in position to cooperate with the pole pieces 16—17 when the door is closed.

The lever 20 is provided with means for manual engagement, preferably from both sides of the door. As illustrated, the lever 20 has a handle 30 on one side of the door, which may be pulled away from the side of the door, and the lever may also be provided with a push handle 31 at the opposite side of the door so that pushing of the push handle 31 toward the door or pulling of the handle 30 away from its side of the door will rock the lever about its pivot 21 and against the spring 29. It is to be understood that the foot pedal 46 may be employed for urging the keeper plate 19 upwardly to the position shown in Fig. 6, where it will be held, for example, by the engagement between the foot pedal 46 and the upper end of the slot 44.
With the parts in the position shown in Figs. 5 and 6, the magnet 40 and keeper 41 will be in engagement with each other, and the door will be then magnetically held. When it is desired to break the holding force between the magnet and its keeper without exerting a physical force equal to the holding power of the magnet, it is only necessary to depress the pedal member 45 so as to move the keeper 41 downwardly until it disengages the magnet 40. After such disengagement, the door may be readily moved. As soon as the foot pedal is released, the spring 50 will return the keeper 41 to its operative position shown in Fig. 6, so that it will be ready to be again attracted and held by the magnet when the door approaches the open position.

While the invention has been described in considerable detail and preferred forms illustrated, it is to be understood that many changes may be made within the scope of the invention as defined in the appended claims.

I claim:

1. In a magnetic door holder for association with a door and door casing, a unitary door handle to be pivotally mounted on a door and including a part to be manually grasped, a magnet member and a keeper member, one of said members being mounted on said handle so as to be movable therewith and in the direction of door opening when the handle is moved pivotally, said one magnet member being relatively close to the pivot and said manual grasping part being relatively remote from the pivot, the other of said members to be mounted on a casing in position to cooperate with the member on said handle, whereby when said handle is moved in the direction to open the door the handle will first pivot on the door and with increased mechanical ad-

vantge the member carried by the handle will be drawn away from the member on the casing and in the direction of door opening for the purpose set forth.

2. In a magnetic door holder for association with a door and door casing, a door handle to be pivotally mounted on a door, a magnet member and a keeper member, one of said members being mounted on said handle so as to be movable there-

with and in the direction of door opening when the handle is moved pivotally, the other of said members to be mounted on a casing in position to cooperate with the member on said handle, whereby when said handle is moved in the direc-
tion to open the door the handle will first pivot on the door and the member carried by the handle will be drawn away from the member on the casing and in the direction of door opening, the member carried by said handle being loosely mounted thereon for slight universal movement so that when the door is closed both members may coat fully with each other.

Benjamin S. Bernhard.

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