

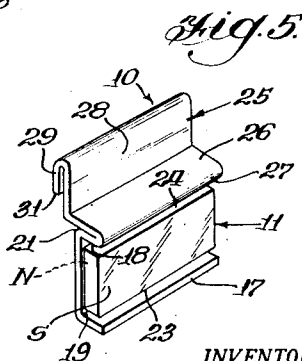
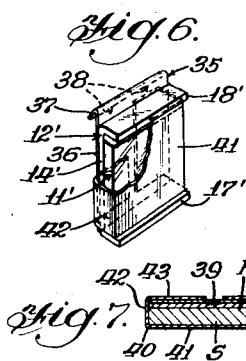
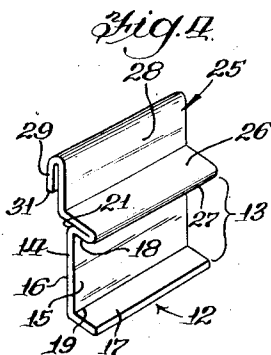
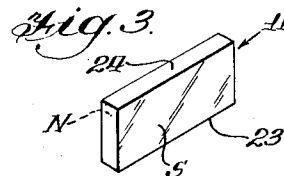
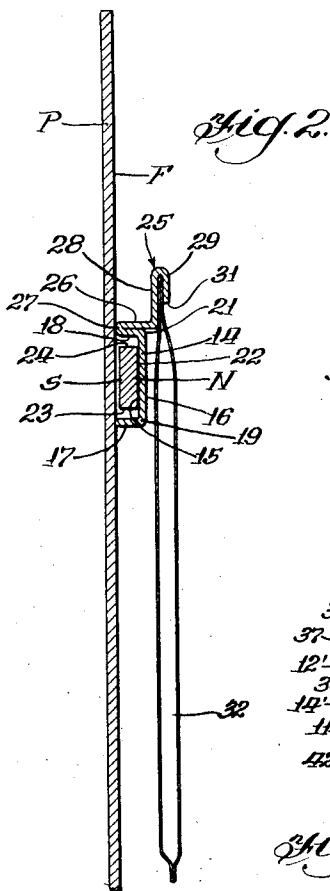
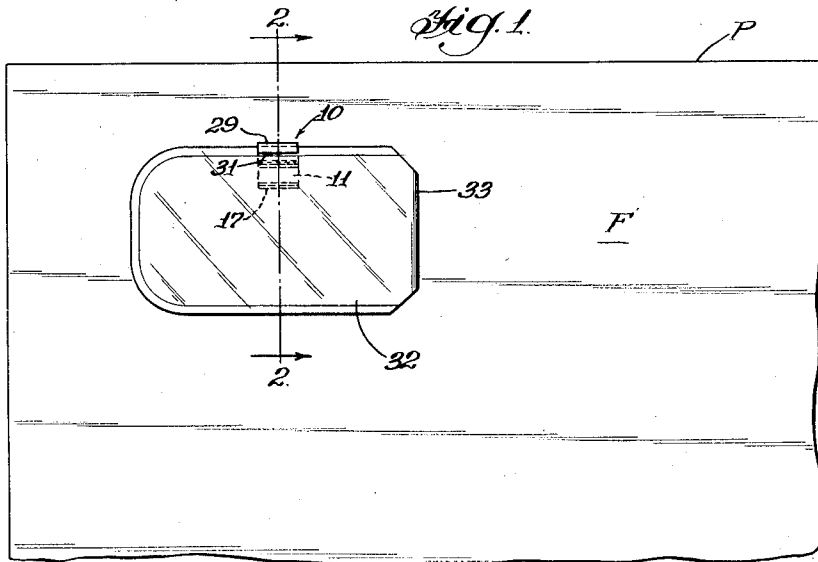
June 28, 1960

H. C. RIORDAN

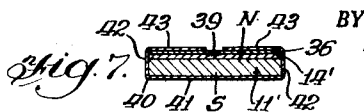
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MAGNETIC DETACHABLE HOLDING DEVICE

Filed Feb. 28, 1956



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MAGNETIC DETACHABLE HOLDING DEVICE

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Filed Feb. 28, 1956, Ser. No. 568,366

1 Claim. (Cl. 317—159)

This invention relates to magnetic holding devices magnetically attachable to a mounting surface of magnetizable material, and more particularly concerns such a device comprising a permanently magnetized piece assembled within a paramagnetic frame having flange portions for conducting the magnetic flux from one pole of such piece into a position of contiguity with the opposite pole of such piece.

An important object of this invention is the provision of a magnetic holding device of compact structure employing a wafer-like permanently magnetized piece of which the opposite magnetic poles are respectively at the opposite broad faces of such piece, and wherein there is a frame of paramagnetic material having a web in contiguity with one of the magnetized piece faces and flanges projecting from the web out of contact with the magnetized piece into a position of contiguity with the opposite face thereof to form a path of low magnetic reluctance for the magnetic flux lines extending between the two faces. Thus the invention provides a magnetic holding device of substantially flat structure capable of concentrating the flux lines extending externally from a thin magnetized piece having pole faces of large area spaced only a short distance apart and thereby amplify the magnetic potential within a gap adjacent one pole face to increase the magnetic attraction between the magnetized piece and a surface of magnetizable material.

A further object is the provision of a detachable magnetic holding device of the aforesaid character of which the paramagnetic frame incorporates means for fastening onto an article which the device is adapted to detachably mount upon a surface of magnetizable material.

The above and other desirable objects inherent in and encompassed by the invention are illustrated in the ensuing specification, the appended claim and the annexed drawings, wherein:

Fig. 1 is a fragmentary elevational view of a magnetizable mounting panel upon which one of the devices constituting a preferred embodiment of this invention is shown mounted for holding an article in display relation upon the panel.

Fig. 2 is a vertical sectional view taken at the line 2—2 of Fig. 1, through a portion of the panel and sectionally through the magnetic holding device as well as through the article to which the device is attached.

Fig. 3 is a perspective view of a thin permanently magnetized piece comprising a part of the device.

Fig. 4 is a perspective view of a frame of paramagnetic material with which the permanently magnetized piece of Fig. 3 is adapted to be assembled for making up the device.

Fig. 5 is a perspective view with the elements illustrated in Figs. 3 and 4 in assembled relation.

Fig. 6 is a perspective view of a second species of magnetic holding device embodying the principles of this invention, there being a fragment of a wrap around holding and guard element thereof broken away to expose other elements of such device.

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Fig. 7 is a horizontal transverse sectional view of the device shown in Fig. 6, looking downwardly.

The magnetic holding device 10 as shown in Figs. 1 and 5 is made up of a permanently magnetized piece 11 of Fig. 3 and the paramagnetic frame 12 shown in Fig. 4. The magnetized piece 11 is wafer-like in the sense that it is thin or has a short dimension between pole end faces N and S of opposite magnetic polarity. In the particular species of device illustrated the pole faces N and S of the magnetic piece are rectangular. The south pole face S may be considered the obverse face of the magnetized piece and face N may be considered the reverse face thereof.

The paramagnetic frame 12 may be made of soft iron sheet material and comprises a channel section 13 having a web 14 with an obverse face 15 and a reverse face 16. Flanges 17 and 18 extend forwardly from opposite parallel edges 19 and 21 of the web 14.

In assembling the device 10 the magnetized piece 11 is disposed within the channel 13 with the reverse face N in contiguity with the obverse face 15 of the web 14. This contiguity is preferably to the degree of the pole face N being an actual contact with the web face 15. Adhesive material 22, Fig. 2, may be placed about the perimeter of the reverse face N of the magnetized piece 11 and in contact with such magnetized piece and the channel 13 for securing the piece and the frame 12 in fixed assembly. In Fig. 2 it can be seen that while the parts are in this assembly the channel flanges 17 and 18 are in opposed spaced relation though contiguous with opposite edges 23 and 24 of the magnetized piece. This adhesive material serves as means for preventing the magnetized piece sliding on the web and preserving the spacing between the flanges 17, 18 and the edges 23, 24 of the magnetized piece. Also in Fig. 2 it can be seen that the flanges 17 and 18 project forwardly, leftwardly as viewed in Fig. 2, from the obverse face 15 of the web 14 a distance substantially equal to the thickness of the magnetized piece 11 between the pole faces N and S, that is, between the reverse and obverse faces of the magnetized piece. This places the forward edges of the flanges 17 and 18 substantially within a common plane with the forward polarized face S of the magnetized piece so they are adapted to concurrently contact a face F of a panel P of paramagnetic material.

An article-attaching tab 25, formed from a portion of the paramagnetic sheet material from which the channel 13 is formed, projects sidewise from the channel, upwardly as viewed in Figs. 2, 4 and 5. This tab 25 is formed by a first section 26 of the sheet folded backwardly from the forward edge 27 of the channel flange 18, a second section 28 of the sheet projecting substantially perpendicularly away from the first sheet section 26, and a U-shaped hook section 29 on the second section 29 and having a tip 31 bent backwardly and arranged in spaced parallelism with the second section 28. The hook 29 of the tab is more or less permanently attached to any desired article by being squeezed closed onto a portion thereof, and in the drawings such article is illustrated as an eye glasses case 32 of the envelope type having an open end 33 for the insertion and withdrawal of eye glasses frames.

Articles equipped with magnetic holding devices of the described character can be arranged in any desired order for display and classification upon a magnetizable panel P, from which they are easily detachable for inspection or the like and then easily and quickly reattachable by merely placing the article in the desired position relatively to the panel while causing the device to engage the panel as shown in Fig. 2. The frame 12 in addition to holding the article 32 associated with the mag-

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netized piece 11, because of the disposition of the low magnetic reluctance flanges 17 and 18, enables the magnetic potential of the piece 11 to create more magnetic flux lines exteriorly thereof between the poles N and S and through the panel P, and therefore to magnetically attach to the panel with greater force than if the frame were not associated with said piece.

The species of the device shown in Figs. 6 and 7 has many elements corresponding to those in the device shown in Fig. 5, and to expedite this description such corresponding elements are designated by the same respective reference characters plus a prime. The magnetic piece 11' has a north pole designated N and the south pole designated S and disposed with respect to the channel shaped frame 14' in the manner illustrated in Figs. 6 and 7. A bracket 35 has a wide rectangular portion 36 disposed flatly against the reverse side of the frame web 14' to which it is secured by spot welding shown at 39 in Fig. 7. A hook portion 37 at the upper end of the bracket has a pair of tangs 38 projecting from its free edge and adapted to penetrate into the upper edge of an article as 32 when the hook portion 37 is clamped thereonto in the manner illustrated with respect to the hook portion 29 in Fig. 2.

A wrap-around holding element 41 of non-magnetic substantially non-resilient material such as sheet aluminum is placed against the obverse face of the magnetic piece 11' as illustrated in Fig. 7 and this sheet material is bent backwardly to form sides 42 thereof and then folded again to form wings 43 disposed against the back side of the bracket portion 36 as an expedient for holding the pole piece 11' in the frame 12'.

Having described a limited number of embodiments of the invention with the view of clearly and concisely illustrating the same, I claim:

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In a detachable magnetic holding device, a frame comprising a channel of paramagnetic sheet material having a web with an obverse face and a reverse face, flanges projecting forwardly from the web along opposite respective edges of the obverse face and an article-attaching tab portion projecting from said channel, and a wafer-like permanent magnetic piece having obverse and reverse faces of opposite polarity and disposed within the channel between said flanges with the reverse face of such piece in contiguity with the obverse face of the web and opposite edges respectively in contiguity with but spaced from said flanges, the obverse face of said piece being exposed and the thickness of said piece between its faces being substantially equal to the distance the flanges project forwardly from the obverse face of the web, said tab being formed by a portion of the paramagnetic sheet having a first section folded backwardly from the forward edge of one of the flanges, a second section projecting substantially perpendicularly away from the first section, and a U-shaped hook section on the second section and having a tip bent backwardly and arranged in spaced parallelism with the second section.

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