

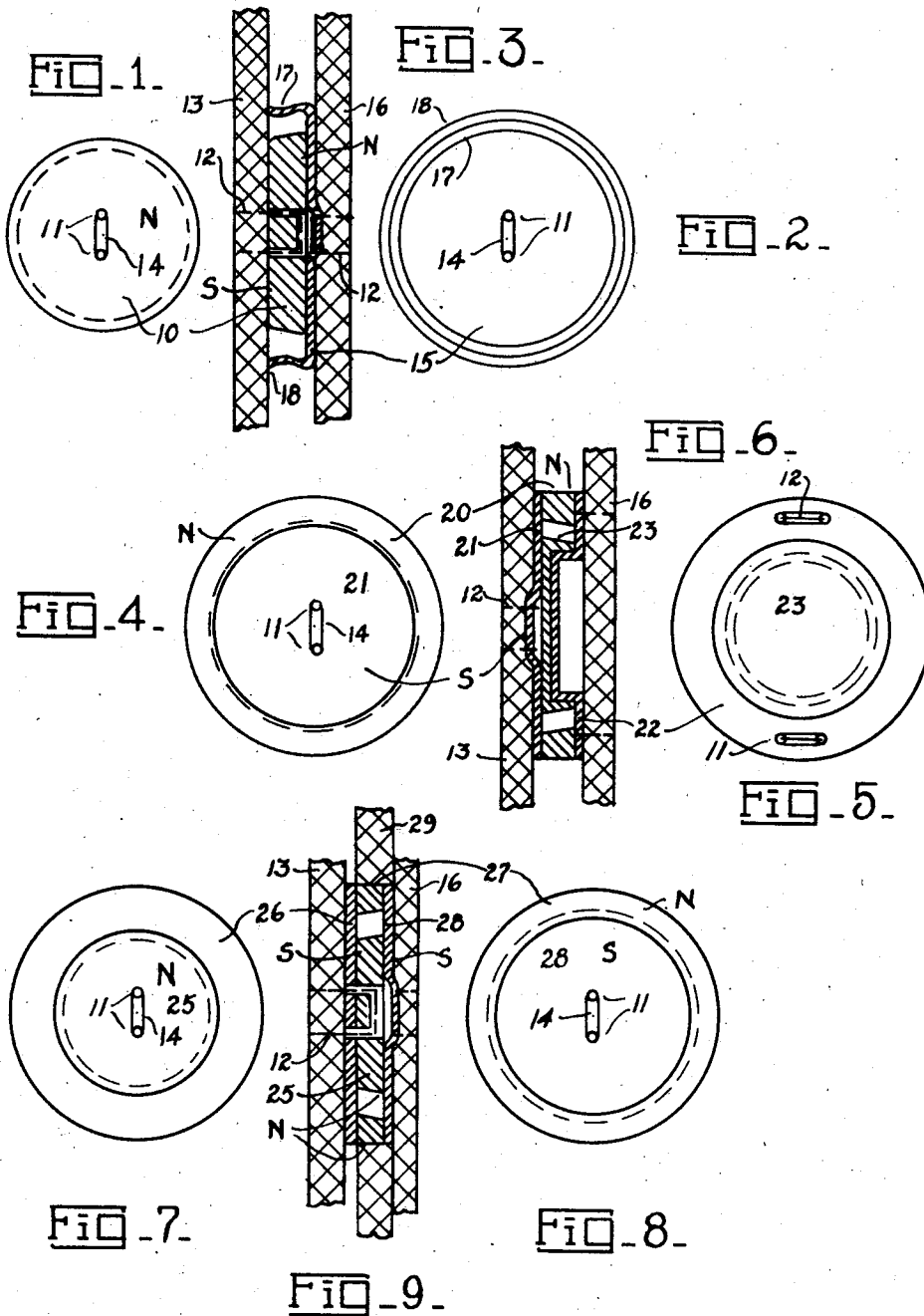
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MAGNETIC BUTTON

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MAGNETIC BUTTON

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3 Claims. (Cl. 24—201)

This invention relates to magnetic buttons and is a divisional application of my application on Apparel fasteners, Serial #480,749, filed March 27, 1943.

The object of this particular invention is the provision of a magnetic button which can be manipulated to either open or closed position with greater convenience and speed than other apparel fasteners such as now generally used on garments, shoes, garters, belts, brief cases, etc., and yet to very securely hold the article in closed position during the wearing or ordinary use thereof but to open with only a slight effort by proper manipulation of either the article of apparel or the magnetic button.

A further object of my invention is the provision of a magnetic button which has the general appearance of an ordinary button but is made in two associated parts which are held together, when the garment is closed, by inherent magnetic attraction but so designed that ordinary stresses applied thereto through the wearing of the article, will be subjected to mechanical resistance.

Other and further objects will appear in the specifications and be specifically pointed out in the appended claims, reference being had to the accompanying drawing exemplifying the invention, and in which:

Fig. 1 is a face view of the permanently magnetized part of the button.

Fig. 2 is a face view of the armature part of the button.

Fig. 3 is a cross-sectional view showing the associated parts illustrated by Figs. 1 and 2 in attracted or closed position.

Fig. 4 is a face view of a modification of Fig. 1.

Fig. 5 is a face view of a modification of Fig. 2.

Fig. 6 is a cross-sectional view showing the associated parts illustrated by Figs. 4 and 5 in attracted or closed position.

Fig. 7 is a face view of one of the permanently magnetized parts of the button.

Fig. 8 is a face view of the other permanently magnetized part of the button.

Fig. 9 is a cross-sectional view showing the associated parts of Figs. 7 and 8 in attracted or closed position.

Referring to the drawing in which similar characters and numerals of reference refer to similar parts throughout the several views, and describing more particularly Figs. 1, 2, and 3, the numeral 10 denotes a permanently magnetized disc, magnetized in a longitudinal direction, so that one face will be a north magnetic pole

while the opposite face will thus become a south magnetic pole, the letters N and S on the drawing denoting north and south magnetic poles respectively. This disc 10 is provided with two holes 11 by means of which it may be sewed with thread 12 onto a flexible closure flap 13 which may be the cloth of a garment, leather of a shoe, end of an elastic garter, flap of a pocket book or brief case, etc. The two holes 11 are connected on the outer face of the button with a trough or depression 14 so that the thread used for sewing the button part to the flap 13 will lay therein and permit the face of the permanent magnet disc 10 to be flush with its armature 15 which in this case is merely a shallow cup preferably stamped from thin soft sheet iron and sewed in a similar manner onto the opposite closure flap 16 of the garment or other article of wearing apparel. The depth of the cup 15 is preferably the same as the thickness of the magnetic disc 10 and the diameter of the latter is sufficiently smaller than the diameter of the cup so that the magnetic disc is easily inserted into the armature cup and, being of the same depth, the permanently magnetized north face of the disc will just touch or contact the bottom face of the soft iron cup and the two parts of the button will thus be held together by magnetic attraction and hold the apparel flaps in closed position. It will be evident that a slight outward pull, that is, a pull perpendicular to the faces of the magnet 10 and armature 15, will easily and quickly separate them but during the wearing of the article of apparel, the natural stress is a circumferential tension around the body, limb, etc., of the wearer, which pull is parallel to the faces of the magnet and its armature and would also even more easily pull them apart against their mutual magnetic attraction were it not for the shoulder 17 on the cup-shaped armature 15 which prevents any but a slight initial movement due to looseness as will be readily understood. The annular sides of both the magnet part 10 and the shoulder 17 of the armature part 15 are preferably slightly inclined as illustrated so that the stronger the circumferential tension applied to the apparel flaps 13 and 16, the tighter the two associated button parts will hold together as will also be readily understood. The extreme outer edge of the cup-shaped armature 15 may be flanged outwardly at 18 very slightly so as to enable the magnetic disc 10 to be more easily inserted therein. It will thus be evident that I have evolved an extremely simple, inexpensive and strong magnetic button which is quickly and

conveniently manipulated and which has both magnetic and mechanical holding means, the magnetic means acting as a keeper for the mechanical lock, which latter will resist every possible wearing strain, yet can easily be opened by merely a slight pull outwards on the magnetic locking means.

In Figs. 4, 5 and 6 is illustrated a modification of the design previously described in that, although only one of the associated parts of the button is permanently magnetized as in the previous case, yet I manage to provide a closed magnetic circuit so that both faces of the permanent magnet are utilized in holding the two parts together with consequent greater magnetic force, a highly desirable feature as the attractive power of a magnet of the desired size of a button is naturally too small to effectively hold the parts together without the medium of a closed magnetic circuit. Also in this design, although not necessarily so, I show the permanent magnet part of the button in the shape of a ring 20 to one face of which is welded, glued or otherwise attached the soft iron disc 21 which may be provided with holes 11 as in the previous case, this magnetic element being also sewed onto a closure flap 13. The associated armature is denoted by the soft sheet iron flanged shallow cup 22, in this case the outer part or bottom of the cup being inserted into the magnetized ring 20, which is also preferably magnetized in a longitudinal direction, the face of the magnet 20 contacting the flanged perimeter of the armature 22, the magnetic circuit being practically closed by the close proximity of the bottom of the cup to the soft iron disc 21, this construction naturally having greater magnetic traction as both north and south poles of the permanent magnet ring 20 are utilized, the south pole in this case being the center of the soft iron disc 21 as will be readily understood by experienced persons. To prevent a "short circuit" of the magnetic lines of force which would likely occur during shifting of the armature 22 within the magnetized ring 21, owing to the sides touching, I provide a non-magnetic filler ring 23 attached around the sides of the cup, this ring being preferably composed of plastic, and which may also extend over the bottom face of the cup for neater appearance, as illustrated. The inner circumference of the magnetic ring 20 and the outer circumference of the filler ring 23 are also preferably inclined in such a manner as to automatically tighten their mechanical holding power when circumferential tension is applied to the apparel flaps 13 and 16 as in the previous case.

Figs. 7, 8 and 9 illustrate a magnetic button, both associated parts thereof being permanently magnetized and the construction is such that they also form a closed magnetic circuit when contacted, thus still greater increasing the magnetic attractive force capable in this necessarily small button. In this case one permanent magnet is in the shape of a disc 25, the south pole of which is attached to the center of a larger soft sheet iron disc 26, and being sewn or secured onto the closure flap 13. The associated part of the magnetic button which is secured to the opposite closure flap 16 is composed of a permanently mag-

netized ring 27 to the south pole of which is also attached a soft sheet iron disc 28, of the same diameter as the ring 27. As the north pole of each permanent magnet contacts the south pole of the associated magnet of the button, a maximum magnetic traction results through the closed circuit formed by these double acting magnetic elements. The thickness of disc 25 is the same as the thickness of ring 27 and the co-acting sides thereof may also be inclined so that the stronger the circumferential tension exerted on the parts, the stronger they will hold together. Of course, as in the previous cases, the male magnetic element will easily fit into the female magnetic element and is therefor free to slide sideways to a limited extent therein and a short circuit, (magnetic), may also be prevented by employing a non-magnetic filler ring as shown in Figs. 4, 5 and 6. In order to bring the apparel flaps close together if desired, one of the parts composing the button may be recessed into a closure flap or hem 29 of the flap 16. It will be evident that a large number of different shapes and designs may be used and I do not wish to limit myself in this respect to those illustrated.

From the foregoing description it will be evident that I have evolved a magnetic button which may be used with greater convenience than the usual type button which must be forced through a button hole in order to close the flaps of an article of apparel and then reversing the procedure in order to open the flaps. With my magnetic button, all that is necessary is to simply insert the smaller part into the larger part which can be done by merely grasping the flap near the button while to open the flaps, the flaps are merely pulled outward and the button parts will disengage.

Various changes may be made in the embodiment of the invention hereinabove specifically described without departing from or sacrificing the advantages of the invention as defined in the appended claims.

I claim:

1. As a new article of manufacture, a magnetic button comprising two mutually magnetically attractive elements, means for attaching each respective element to an opposite flap of a flexible closure means, one of said elements fitting loosely in a lateral direction over the other element, the abutting sides of said magnetic elements being interlockingly inclined.

2. As a new article of manufacture, a magnetic button as in claim 1, both of said magnetic attractive elements being permanently magnetized and the abutting faces of which are of opposite magnetic polarity.

3. As a new article of manufacture, a magnetic button comprising two magnetically attractive elements, means for attaching each respective element to an opposite flap of a flexible closure means, one of said elements fitting loosely in a lateral direction over the other element, the abutting sides of said magnetic elements being interlockingly inclined, the degree of inclination of said sides being substantially the same on each respective magnetic element.

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