

CLOSURE DEVICE

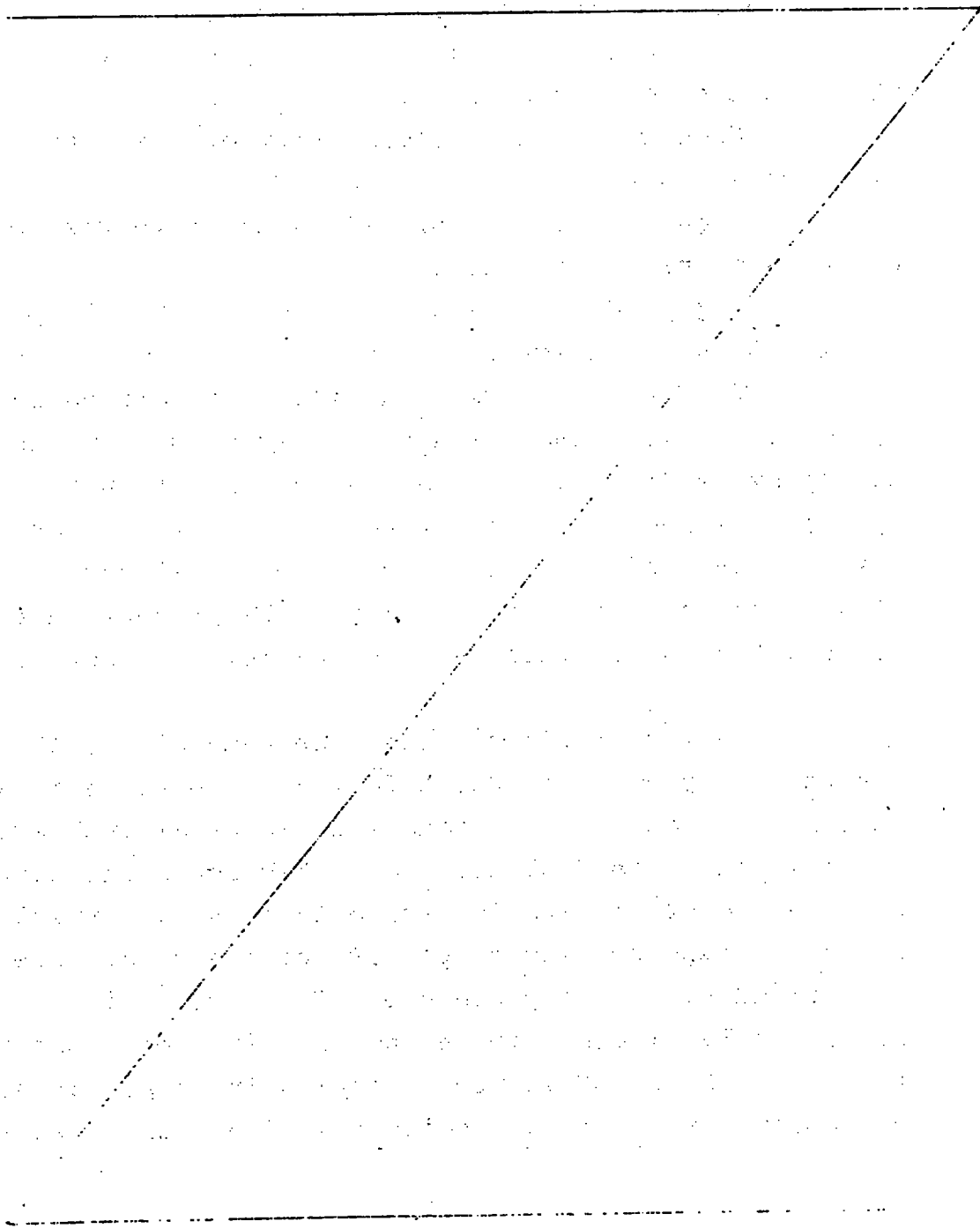
This invention relates to closure devices. Particularly, though by no means exclusively, the invention relates to clasps suitable for example for a handbag.

5 Numerous forms of prior art handbag clasps are known as well as closure devices of multi-various kinds.

As will be clear from the detailed description which follows, we have sought to provide a new and useful means of a magnetic kind capable of being used as
10 a handbag clasp.

In accordance with the present invention there is provided a closure device comprising first and second means adapted to be respectively mounted on two members arranged to be brought together to form a closure there-
15 between (such as the opposite sides of a handbag opening); the first means comprising a permanent magnet and a first ferromagnetic plate attached to one pole of the magnet; and the second means comprising a second ferromagnetic plate; at least one said plate carrying a solid integral
20 projection and the first and second means being so configured that, on bringing the first and second means together, the second plate is attracted to and magnetised by the other pole of the permanent magnet, and the projection and the other plate or the two projections are
25 brought into engagement thereby to complete a magnetic circuit; and wherein said first and second means are adapted to be respectively mounted on said two members by U-shaped locking members, each locking member comprising a base plate, fixed at a single point of attach-
30 ment centrally disposed on those faces of the first and second ferromagnetic plates which will form the outside faces of the assembled device, and a pair of legs extending from either side of the outside face of said base plate.

- The permanent magnet may be provided with a covering over its top surface (i.e. the said other pole) and around its peripheral surfaces, since these surfaces are in practice exposed when the closure device is open.
- 5 The covering may consist of a coating treatment, or, as in the specifically described arrangement, a cover as such formed, for example of brass or synthetic resin, and which may be given a pleasing external appearance.



In order to enable the invention to be more readily understood, reference will now be made to the accompanying drawings, which illustrate diagrammatically and by way of example embodiments thereof, and in which:

Figure 1 is an exploded perspective view of a clasp which is one embodiment in accordance with the present invention;

Figure 2 is a sectional view of the clasp illustrated in Fig. 1 in its assembled state;

Figure 3 is an exploded perspective view of a clasp which is a second embodiment;

Figure 4 is a sectional view of the clasp illustrated in Fig. 3 in its assembled state;

Figure 5 is an exploded perspective view of a clasp which is a third embodiment;

Figure 6 is a sectional view of the clasp illustrated in Fig. 5 in its assembled state.

The present invention will be described in detail by way of typical embodiments of clasps as shown in the accompanying drawings. Although the invention is described by way of example with reference to specific clasps, for example for handbags, it is not to be considered so restricted. Closure devices in accordance with the present invention may be adapted for other utilities, for example as door catches.

In the drawings, reference numerals 1, 11 and 21 designate a permanent magnet formed of metal ferromagnetic material or compound ferromagnetic material such as, typically, ferrite, pirotite FeS1.15, etc. This permanent magnet may be of a square or rectangular shape in plan, a partially concaved circular shape or ring shape, or any other suitable shape determined by the proposed use. The magnets 1, 11 and 21 are respectively placed with one pole surface on ferromagnetic plates 2, 12 and 22 formed of typically, e.g., iron, nickel or cobalt, or alloys and compounds of any of these three

elements or alloys and compounds of manganese and chrome, and are fastened to said plates respectively in a suitable manner. As shown in the figures, non-magnetic cover members 3, 13 and 23, surround the peripheral surfaces and the other pole surfaces of the magnets 1, 11 and 21. Further, lugs 3A, 13A and 23A which project from the lower edges of the cover members 3, 13 and 23 are bent towards the lower surfaces of the plates 2, 12 and 22 so as to act as engagement members for holding said plates in position adjacent said magnets. This arrangement constitutes said first means. While the non-magnetic cover members 3, 13 and 23 are generally formed of brass or synthetic resin material, in view of the aesthetics of the external appearance of the finished clasp and of the protection of the magnets 1, 11 and 21 from damage, the material is not particularly limited thereto, but any other suitable non-magnetic material may also be used. It is clear that in order for the force acting between the magnetic poles to be at a maximum, the cover members 3, 13 and 23 must be made as thin as possible and fitted so as to come into close contact with the magnets 1, 11 and 21.

Respective mounting means 5, 15 and 25 are provided on respective plates 2, 12 and 22 and plates 4, 14 and 24 in the three embodiments such that said first means comprising, respectively, a magnet 1, 11 or 21, a plate 2, 12 or 22, and a cover member 3, 13 or 23, may be mounted on one side of e.g. a handbag opening, and such that said second means comprising, respectively, a ferromagnetic plate 4, 14 or 24 may be mounted on the other side of said handbag opening. Pairs of plates 2 and 4, 12 and 14, and 22 and 24 are configured in a manner described below, so that bringing the first and the second means together brings the plate 4, 14 or 24 respectively, partially and directly into engagement with the corresponding plate 2, 12 or 22, thereby completing a magnetic circuit.

Various possible configurations may be employed to achieve this engagement. Three typical configurations will now be described.

5 Firstly, as shown in Figures 1 and 2, projections 2A and 4A protrude from the plates 2 and 4, respectively, and are adapted to be brought into engagement through engageable grooves 1A and 3B formed longitudinally of the magnet 1 and the plate 3, when the clasp is closed.

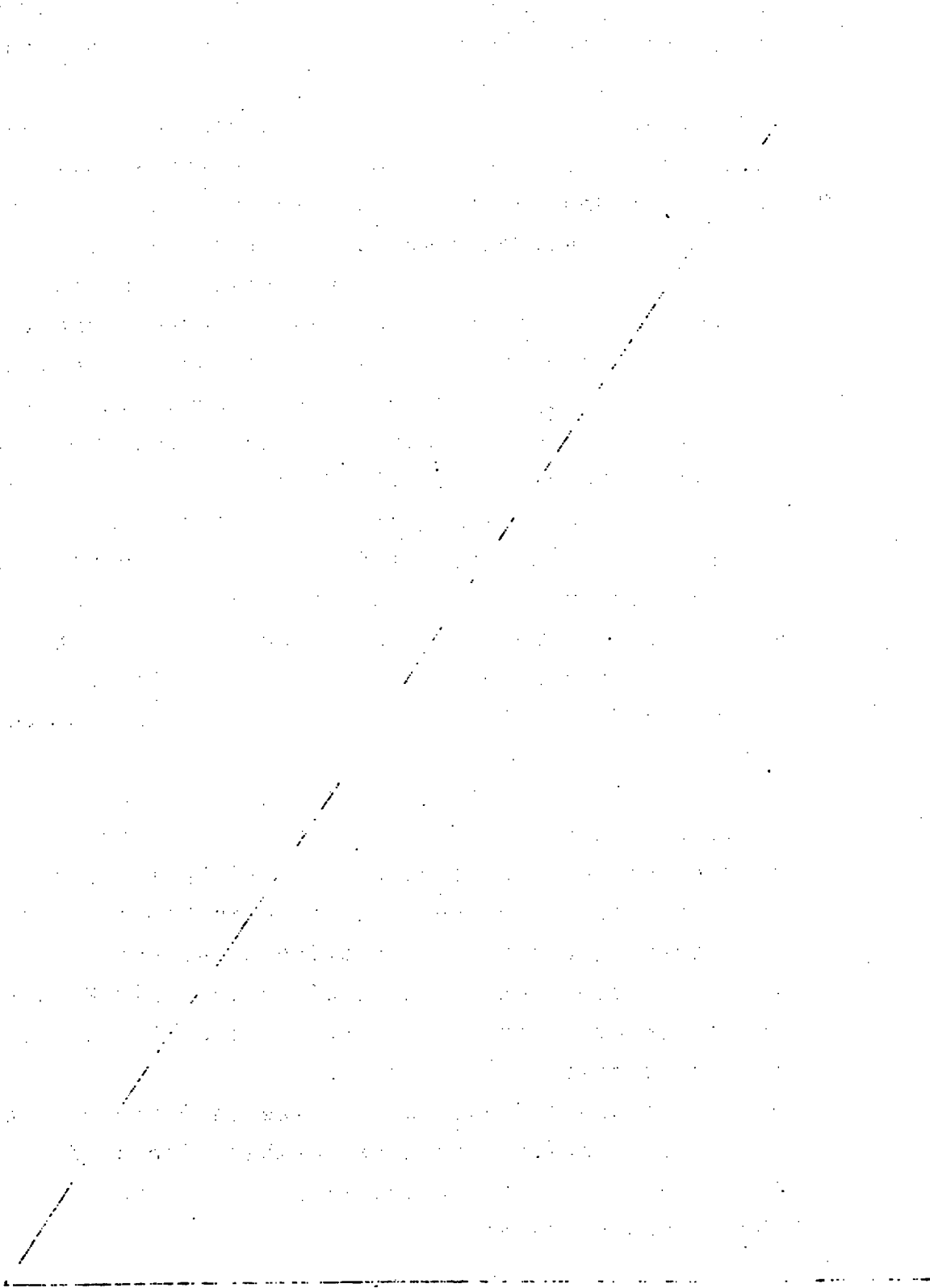
10 Secondly, as shown in Figures 3 and 4, one edge of the plate 14 is extended to form an engageable edge flange 14A adapted to be brought into engagement with plate 12 when the clasp is closed. A similar engageable edge flange may be provided on the plate 12, if necessary.

15 Thirdly, as shown in Figures 5 and 6, a hole 21A, here circular in section, is bored from one magnetic pole surface towards the other magnetic pole surface of the magnet 21. Alternatively the hole could be of square or any other four-cornered shape. A hole 23B is bored in the cover member 23 in a position corresponding to said hole 21A. A projection 22A protruding from the plate 22 is inserted through said hole 21A. A projection 24A protruding from the plate 24 is adapted to be brought into engagement with projection 22A through holes 23B and 21A when the clasp is closed. An arrangement 20 comprising a projection such as 24A but with said projection extending from plate 24 to come into direct contact with plate 22 when the clasp is closed without the need for projection 22A, will also achieve the 25 desired engagement.

30 As mentioned above, mounting means for the thus constructed magnetic clasp which allow it to be attached to, for example, opposed portions of containers such as bags, or handbags are disposed on the plates 2, 12, 22 and plates 4, 14, 24. The mounting means are approximately 35 U-shaped locking members 5, 15 and 25 comprising a base plate and a pair of legs extending from either side of one face thereof. The locking members are fixed to

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at a single point of attachment centrally disposed on rearward faces of the plates 2, 12 and 22, and of the plates 4, 14 and 24, by means of, for example, rivets such as 6 and 16.



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CLAIMS:

1. A closure device comprising first and second means adapted to be respectively mounted on two members arranged to be brought together to form a closure there-
5 between (such as the opposite sides of a handbag opening); the first means comprising a permanent magnet and a first ferromagnetic plate attached to one pole of the magnet; and the second means comprising a second ferromagnetic plate; at least one said plate carrying a solid integral
10 projection and the first and second means being so configured that, on bringing the first and second means together, the second plate is attracted to and magnetised by the other pole of the permanent magnet, and the pro-
jection and the other plate or the two projections are
15 brought into engagement thereby to complete a magnetic circuit; and wherein said first and second means are adapted to be respectively mounted on said two members by U-shaped locking members, each locking member com-
prising a base plate, fixed at a single point of attach-
20 ment centrally disposed on those faces of the first and second ferromagnetic plates which will form the outside faces of the assembled device, and a pair of legs extending from either side of the outside face of said base plate.
2. A closure device as claimed in Claim 1 wherein the permanent magnet is provided with a covering over its said other pole and around its peripheral surfaces.
3. A closure device as claimed in Claim 2, wherein the covering comprises a coating treatment.
4. A closure device as claimed in Claim 2, wherein the covering comprises a cover formed of brass or synthetic resin.
5. A closure device as claimed in Claim 4, wherein the cover carries engagement members for holding the first ferromagnetic plate in position against said one pole of the permanent magnet.



6. A closure device as claimed in any preceding Claim, wherein the permanent magnet comprises ferrite or pirotite $\text{FeS}_{1.15}$.

7. A closure device as claimed in any preceding Claim, wherein the permanent magnet is of square or rectangular shape in plan, or is shaped as a ring or as a partially concaved circle.

8. A closure device substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

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