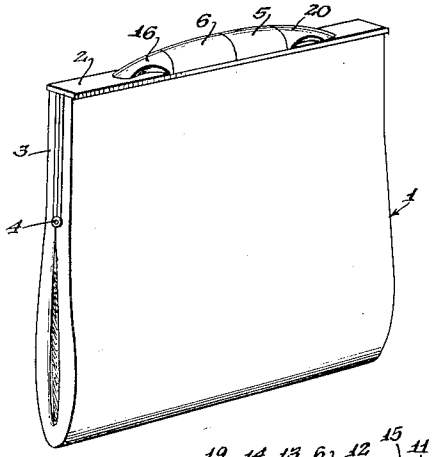
July 7, 1942. W. DUBILIER 2,288,688

MAGNETIC LOCK

Filed Aug. 5, 1939



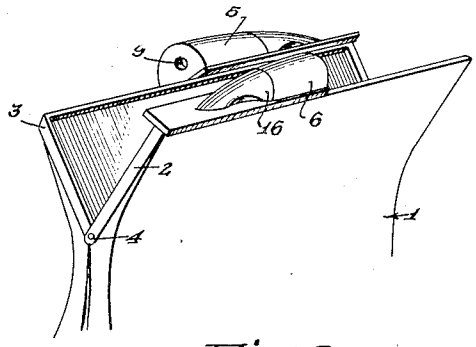
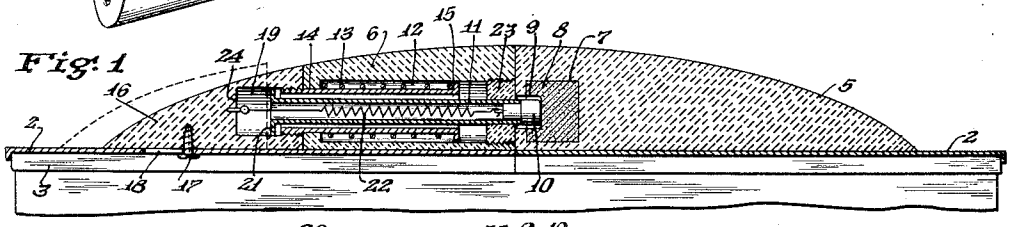


Fig. 2

Fig. 1



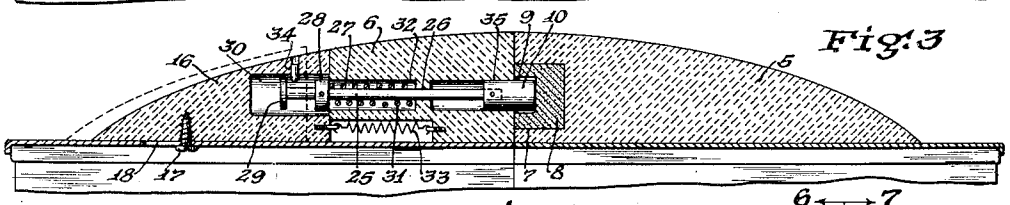
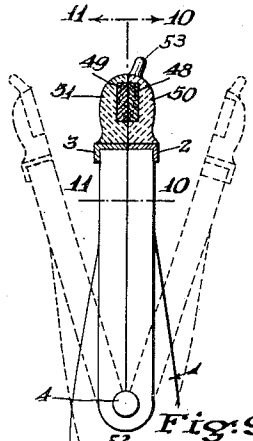


Fig. 3

Fig. 4



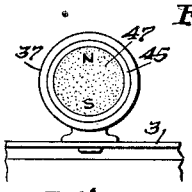


Fig. 6

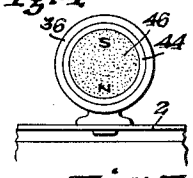


Fig. 7

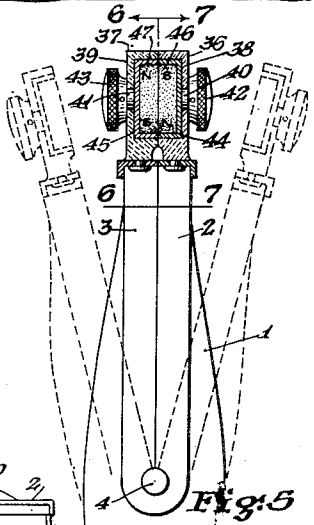


Fig. 5

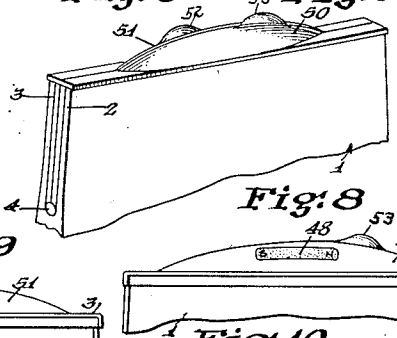


Fig. 8

Fig. 10

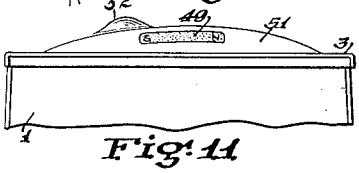


Fig. 11

Fig. 9

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MAGNETIC LOCK

William Dubilier, New Rochelle, N. Y.

Application August 5, 1939, Serial No. 288,504

7 Claims. (Cl. 292—144)

This invention relates to a lock or closure for cases, bags and like devices, and more specifically hand bags.

Locks of the type concerned by this invention are commonly made in such a way that one or both parts of the lock are made or controlled by resilient or springy means and held in closed position by elastic or spring action which is to be overcome if the lock is opened by means of a handle or key.

Locks of this type also usually include parts which project when the bag or case is opened and sometimes catch on gloves, handkerchiefs, dresses, etc. They are also apt to open by themselves, particularly when the spring used is fatigued and are quite easily and unobtrusively opened by pickpockets.

It is an object of the invention to provide a lock for cases and bags of the type referred to above which is kept closed by other than elastic or springy means.

It is another object of the invention to provide a lock which is kept closed by means which do not fatigue during long periods of use.

It is another object of the invention to provide a lock, the actuating means of which are somewhat hidden and cannot be located and operated by another person without making the carrier of the bag aware of it.

It is still another object of the invention to provide a lock which, in its opened state, does not reveal projecting parts which easily catch on gloves, handkerchiefs, veils, dresses or other soft articles kept in the bag or case or coming in contact with the lock during use.

It is a further object of the invention to provide a lock as a new article of manufacture which can be applied to any case, bag, handbag, etc. and frame thereof, and can be given any desired shape.

It is still a further object of the invention to provide a lock as a new article of manufacture which can be given any desired shape, appearance, or color, and can be made of moldable or any other easily-work material.

These and other objects of the invention will be more clearly understood when the specification proceeds with reference to the drawing in which Figure 1 shows in perspective view a handbag provided with lock, according to the invention, in closed position;

Figure 2 shows the top of that bag in open position;

Figure 3 shows a cross-section through the new lock on an enlarged scale in closed position, and in broken lines the handle of the lock in opened or retracted position;

Figure 4 shows a similar cross section as Figure 3 of another exemplification of the invention;

Figure 5 shows in side elevation and partly in cross-section, the top of a bag embodying another feature of the invention in closed position, and in broken line in opened position;

Figures 6 and 7 show front views of the two portions of the lock as shown in Figure 5, in front elevation;

Figure 8 shows another exemplification of the invention in perspective view;

Figure 9 shows in side elevation and parts in cross-section in a similar way as Figure 5; and

Figures 10 and 11 show in side elevation the top of the bag as exemplified in Figures 8 and 9 with the handle in positions corresponding to the closed and opened position of the handle, respectively.

Referring to Figure 1, a handbag 1 is provided with a frame of any suitable material and shape, consisting of two parts, 2 and 3 hinged at 4. The lock comprises two main portions 5 and 6; portion 5 is connected with frame portion 3, and portion 6 is connected with frame portion 2.

As is seen from Figure 3, portion 5 is provided with a hole 7, to receive a magnetic body 8. This body may consist of a magnetized steel alloy of great coercive force, such as an aluminum-nickel-cobalt alloy. A cylindrical recess 9 is provided in magnet 8 to receive a magnetizable stud 10 fixedly mounted on a sleeve 11 which is slidably arranged in the other portion 6 of any suitable material and shape.

In portion 6 a hole 12 is provided in which a helical pressure spring 13 is arranged around a sleeve 14 and resting against a flange 15 of the sleeve.

Another portion 16 which complements portion 6 to a shape equal to that of portion 5, is slidably secured to frame 3 by means of a screw 17 passing through a slit 18 in frame 3. The end of sleeve 14 is screwed into hole 19 of part 16 which is suitably shaped at the outside to form a handle. In order to open the bag or case, this portion 16 is to be actuated. A corresponding part 20 of portion 5 is preferably shaped in the same way as handle 16 so that from the outside and in closed position of the lock it cannot be recognized easily. Sleeve 11 passes with clearance through sleeve 14 and is provided with a flange 21 which is slidably arranged within cylindrical hole 19.

A tension spring 22 having less pull than the

pull exerted by magnet 8 is fastened at one end to a stud 10 and at its other end in the handle 16. A washer 23 having clearance for the tube 11 is screwed into the open end of the cylindrical hole 12. Sleeve 11 passes slidably through a cylindrical hole in the washer 23.

It will be appreciated that by moving handle 16 and attached sleeve 14 against tension of spring 13 into the position shown in broken lines, flange 21 engages abutment of the threaded end of tube 14 and is thereby carried to the left with handle 16, thus retracting sleeve 11 and attached pin 10 into handle portion 6, thereby allowing the bag to be opened into the position shown in Figure 2. It will further be appreciated that upon opening the bag the magnetic sphere of attraction between magnet 8 and stud 10 is destroyed and the tension of spring 22 will keep the stud in the retracted position and flush with locking end portion of handle 6. Since stud 10 has been retracted entirely into washer 23, there are no projecting parts that scratch articles or catch on gloves, handkerchiefs, veils, dresses, or other loose articles that are near the lock or come in contact with it when being opened.

The handle 16 is returned to its position shown in full line in Figure 3 by the action of spring 13 against flange 15 but sleeve 11 and attached stud 10 remain retracted due to the tension of spring 22. When the bag is closed the sphere of attraction between stud 10 and magnet 8 is re-established and the tension of spring 22 overcome, whereupon stud 10 is pulled forward into the recess 9, thus locking the bag.

Any unintentional opening of the closed lock is prevented by stud 10 being held with great force in magnet 8. As previously mentioned, pressure spring 13 holds handle 16 in the closed position and its pressure must be overcome as handle 16 is moved into its open position. The resistance offered by spring 13 is sufficiently great to call the attention of the carrier of the bag any attempt to open it that was not intended by him.

It will be further appreciated from Figure 1 that the lock has very smooth lines which gives the case or bag a most appealing appearance and that the lock is independent of any closing mechanism and is, therefore, suited to any style of bag, whether it be the very bulky style which fashion decrees now or the more slender and streamlined styles which are perennial favorites.

The feature illustrated in Figure 4 differs from that of Figure 3 in that the cylindrical stud 10 is mounted on a pin 25 which passes with clearance through a hole 26 of portion 6 beyond the rear end of a cylindrical hole 27 thereof. An abutment 28 is secured thereto pin 25 and another abutment 29 at the end of that pin within a cylindrical hole 30 of handle 16. A pressure spring 31 of less strength than the magnetic pull between the stud 10 and the magnet 8 is arranged between abutment 28 and the projecting portion 32. A tension spring 33 is arranged between portion 6 and handle 16. A stop 34 is inserted in handle 16 and projects between the abutments 28 and 29.

The operation is similar to that described in connection with Figure 3 as handle 16 is moved against tension of spring 33 into the position as shown in broken lines, stop 34 striking abutment 29 pulls along pin 25 and stud 10 from recess 9 thereby allowing the bag to be opened. Handle 16 is returned to the position shown in full lines by spring 33 while stud 10 is retained in the retracted position by spring 31 until the sphere of magnetic attraction is re-established as explained in connection with Figure 3, that as the bag is opened the magnetic sphere of attraction between stud 10 and magnet 8 will be destroyed and the stud 10 will be retained in and flush with portion 6 by action of spring 22 or 31, respectively. It will be apparent, that the portions 6 and 16 may be fixedly secured to frame 2 and the portion 5 containing magnet 8 slidably mounted on the frame 3. In such an arrangement spring 13 or 33 can be omitted, however, a suitable spring should be arranged to urge the portion 5 into the closed position as shown in full lines in Figures 3 and 4.

Instead of molding-in or mounting therein a solid magnet 8 of high coercive force, the magnet 8 can comprise a mixture of binder and powdery magnetizable material of steel or an alloy as mentioned above, which is thereafter molded with heat and/or pressure and then magnetized. In such case portion 8 will consist of a solidified mixture of about 90% magnetizable powdery material, and 10% binding material, such as thermoplastic or thermosetting material.

In the embodiment of the invention shown in Figures 5 to 7, on frame portions 2 and 3 hollow cylindrical bearings 36 and 37 are mounted facing each other with their openings and closed on the outside by walls 38 and 39. Pins 40, 41 are passed through openings in walls 38 and 39 and knobs 42, 43 are fastened thereto on the outside. On the inside ends of pins 40, 41, cups 44, 45 are mounted to receive cylindrical magnet pieces 46, 47 which are secured to and can be turned by knobs 42, 43. The cylindrical pieces are magnetized so as to form in one half a North pole and in the other half a South pole.

It will be appreciated that in the closed position of the bag, as shown in Figure 5, the cylindrical pieces 46, 47 are turned so that poles of opposite polarity of the pieces face and attract each other with great force, keeping the bag closed. By turning the cylindrical pieces relative to each other by about 90° by means of the knobs, the poles of the magnet are shifted relative to each other so that they do not attract each other any longer, and by turning the pieces by 180° from the closed position the lock will open automatically by repulsion between like poles. During the closing of the bag, due to the magnetic attraction between unlike poles, the magnets 46 and 47 will partly and automatically realign themselves into the locking position. If a more complete alignment is desired this may be done by turning the knobs 42 and 43 either manually or with suitable springs.

In the embodiment of the invention shown in Figures 8 through 11, magnetic oblong pieces 48, 49 are fixedly mounted in the portions 50 and 51 mounted on the frame portions 2, 3 and magnetized so that in the closed position of the bag opposite polarities of the magnetized pieces face each other and hold the bag in a closed position. It will be apparent that only one oblong piece need be a permanent magnet, the other piece being magnetized only during contact with the permanent magnet.

The size and strength of permanent magnets 48 and 49 or a permanent magnet and a soft iron piece should be such that sufficient magnetic attraction is obtained to hold the bag in the closed position but the magnetic attraction should not be too great to prohibit breaking the magnetic flux by separating pressure exerted between the raised portions 52 and 53.

It may be mentioned that in the embodiments of the invention shown in Figures 5 through 11 the bag will remain in the open position because of the long air gap between the magnets and the bag will not automatically close until the magnetic sphere of attraction is re-established between the magnets by partly closing the bag.

It will be evident from the above that the invention is not limited to the specific methods and arrangements disclosed and described herein for illustration but that the novel inventive and concept is susceptible of numerous variations and modifications coming within the broad scope and spirit of the invention as defined in the appended claims. The specification and drawing are accordingly intended to be regarded in an illustrative rather than a limiting sense.

What I claim is:

1. A lock for bags, cases and similar portable devices, in particular handbags, comprising two parts facing each other in substantially flush surfaces in closed position, a permanent magnet of great attractive force in one of said parts close to said surfaces, a movable magnetizable element in the other of said parts, said permanent magnet and said movable element when within the sphere of attraction of said permanent magnet in said closed position forming the lock and keeping it closed, and mechanical means for moving said magnetizable element outside of the sphere of attraction of said permanent magnet.

2. A lock for bags, cases and similar portable devices, in particular handbags, comprising two substantially identically shaped parts facing each other in substantially flush surfaces in closed position, a permanent magnet structure of great attractive force in one of said parts close to said surfaces, a magnetizable structure in the other of said parts close to said surfaces, said permanent magnetic structure and said magnetizable structure when within the sphere of attraction of said permanent magnetic structure in said closed position forming the lock and keeping it closed, at least one of said structures being movably arranged, and mechanical means forming a movable portion of one of said parts containing said movable structure for moving the latter into and out of the sphere of attraction of said permanent magnet.

3. A lock for bags, cases and similar portable devices, in particular handbags, comprising two substantially identically shaped parts facing each other in substantially flush surfaces in closed position, a permanent magnet of great attractive force in one of said parts and provided with a hole close to said surfaces, a movable magnetizable element in the other of said parts close to said surfaces and capable of entering said hole in closed position of the lock, and movable mechanical means for moving said magnetizable element into and outside of the sphere of attraction of said permanent magnet, said element automatically entering said hole when within said sphere.

4. A locking device comprising two cooperating hinged parts engaging each other in substantially flush surfaces when the lock is closed, a permanent magnet of great attractive force having a recess therein mounted in one of said cooperating parts, a magnetizable element movably mounted within the other said cooperating part and adapted to enter said recess in locking engagement upon establishment of a sphere of magnetic attraction between the magnet and the magnetizable element, and mechanical means for retracting said magnetizable element into its said cooperative parts, and further mechanical means to hold said magnetizable element in the retracted position when outside the sphere of magnetic attraction.

5. A lock for bags, cases and similar portable devices, in particular handbags, comprising two substantially identically shaped parts engaging each other in substantially flush surfaces when the lock is closed, a permanent magnet structure of great attractive force embedded in one of said parts close to said surfaces and provided with a hole open towards said surfaces, a magnetizable structure movably arranged in the other of said parts and capable of projecting over said surfaces into said hole and to be retracted from said hole beyond said surfaces into said other part, and movable mechanical means inconspicuously associated with and arranged within said other part for actuating said magnetizable element so as to move it into and outside of the sphere of attraction of said permanent magnet.

6. A lock for bags, cases and similar portable devices, in particular handbags, comprising two cooperating parts engaging each other in substantially flush surfaces when the lock is closed, an element in each of said parts close to said surfaces, one of said elements being a permanent magnet of high attractive force and both elements capable of cooperating magnetically when said parts engage each other and the lock is closed, one of said elements movably arranged in said part so as to lock said lock when said parts are in engagement and maintain their relative locking position essentially by magnetic force of said permanent magnet, and means for moving said movable element into its locking and unlocking position.

7. A lock for bags, cases and similar portable devices, in particular handbags, comprising two cooperating hinged parts engaging each other in substantially flush surfaces when the lock is closed, an element mounted within each of said parts close to said surfaces, each of said elements being a permanent magnet of high attractive force and both elements arranged to cooperate magnetically when said parts engage each other, one of said elements being movable substantially parallel to said surface of the part in which said element is mounted, means for moving said movable element into different positions relative to said other element, in one of said positions said elements to exert a magnetic attraction upon one another between unlike poles of them for keeping the lock closed, in the other of said positions said elements to exert a magnetic repulsion upon one another between like poles for opening the lock.

WILLIAM DUBILIER.