April 13, 1965 A. K. BEY 3,177,546

MAGNETIC CONNECTOR

Filed Oct. 8, 1962

fig.1.

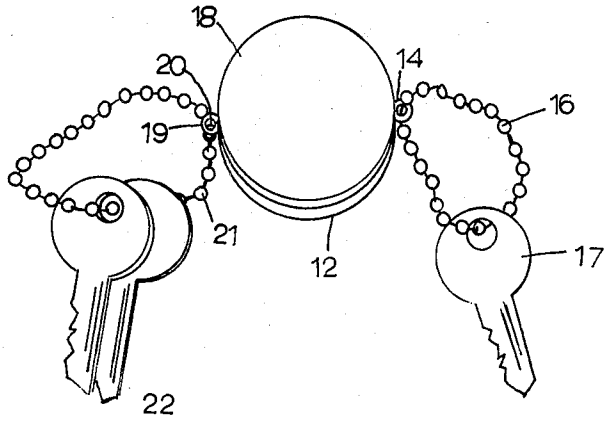


fig.2.

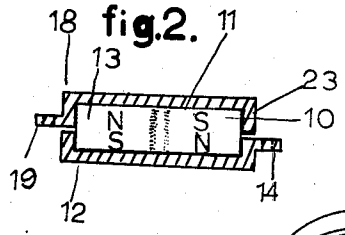
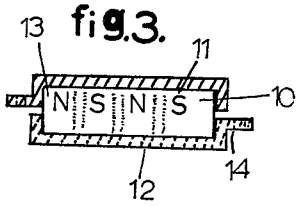


fig.3.



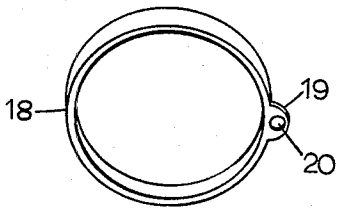
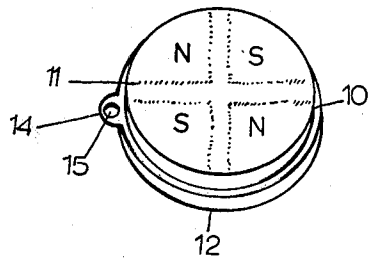


fig.4



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MAGNETIC CONNECTOR

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The instant invention relates to a two-part separable magnetic connector. Particularly, it relates to pull-apart key holders or the like.

A pull-apart key holder is a device that holds keys on various portions of the body of the device and which is adapted to be pulled apart and reassembled. In this manner, selected keys can be readily separated from each other and reconnected to the body as desired.

There have been developed a plurality of magnetic devices of the class described in which the separable parts of the housing are held together by magnetic force. However, competition in the market place compels a continuing development in this art to drive down the cost of the key holders.

In accordance with the instant invention, and as an object thereof, there is provided a most inexpensively manufactured pull-apart key holder.

Another object of the invention is to provide a pull-apart key holder comprising a magnetic member and a two-piece housing with one of the housing pieces being magnetically held on the magnet, and each of the pieces having a member adapted to connect keys to the device.

Other and further objects of the invention will become apparent from the following description and appended claim, reference being had to the accompanying drawings and the numerals of reference thereon.

On the drawings, FIG. 1 is a perspective view of one embodiment of the invention.

FIG. 2 is a sectional view of an embodiment of the invention.

FIG. 3 is a sectional view of an embodiment of the invention, illustrating a modification of the device in FIG. 2.

FIG. 4 is a an exploded view in perspective of another modified form of the invention.

Referring now more particularly to the drawings, and having reference to FIG. 3, the device comprises a permanent magnet **10**. The shape of the magnet **10** is preferably cake-like—that is, round or circular in cross section—however, various prism forms will be found to be satisfactory. The permanent magnet **10** is preferably of ferrite fabrication.

As illustrated in FIG. 3, the magnetization of magnet **10** is such that there are a plurality of polar areas on one face **11** of the magnet **10**. It is necessary that both north and south polar areas are disposed on the face **11**.

The poles or polar areas throughout the drawings are designated by the letters "N" and "S" which refer to the north and south magnetic poles, respectively.

The permanent magnet **10** is secured in a housing member or cup **12** by means of a suitable non-magnetic adhesive, well known to those skilled in the art. A portion **13** containing the polar face **11** extends outwardly from the cup or housing member **12**. The cup or housing member **12** in the form of the invention illustrated in FIG. 3 may be of either magnetic or non-magnetic fabrication, as retention of the cup or housing member **12** on the magnet **10** is not necessarily dependent upon any magnetic attraction. However, in employing the magnet illustrated in FIG. 2, with two poles on each magnet face, a housing **12** comprising a magnetizable disc of, for example, soft steel is preferred. That is because such magnetizable member will close the magnetic circuit of the magnet portion in housing **12** and thereby increase the magnetic flux about face **11**.

The cup or housing member **12** has a preferably integral eyelet or extension **14** having an aperture **15** which accommodates a key fastener such as an endless key ball chain **16** shown in FIG. 1. The key chain **16** is adapted to connect a key **17** to the cup or housing member **12**, in the manner illustrated.

Other modifications of the device are illustrated in FIGS. 2 and 4. These modifications vary from the embodiment of the invention illustrated in FIG. 3 only in the arrangement of the polar areas on the face **11** of the magnet **10**.

In the embodiment illustrated in FIG. 3, the face **11** contains four polar areas which are arranged in an alternate north and south pattern, as shown in the figure. The face **11**, shown in the modification illustrated in FIG. 2, has only two poles, one north and one south, with opposite poles thereto disposed on the face of the magnet which is secured in the cup or housing member **12**. In the modification in FIG. 4, the polar areas on the face **11** of the magnet **10** are arranged in quadrants with two north poles in one diagonal set of quadrants and two south poles in the other diagonal set of quadrants.

There is provided an armature in the form of a cap **18** fabricated from a magnetizable material, preferably of low magnetic reluctance and low magnetic retentivity, such as soft steel for example. The cap **18** has an inner dimension which snugly accommodates the magnet extension **13** in the manner illustrated in FIGS. 2, 3 and 4. The cap **18** is releasably secured on the magnet **10** by magnetic attraction, with the attraction being by reason of the magnetic flux.

The cap **18** has a preferably integral extension which is illustrated in the drawings in the form of an eyelet **19** having an aperture **20**. The aperture **20** is adapted to accommodate a ring such as an endless ball key chain **21**, the key chain **21** being adapted to secure keys **22** to the cap **18** in the manner illustrated in FIG. 1.

When it is desired to pull apart the device, an intended force is required to break the magnetic attraction between the permanent magnet **10** and the cap **18**. This may be done, obviously, merely by twisting or pulling the cap from the magnet to which an opposing force is simultaneously applied. The reassembly is relatively simple, as the magnet **10** is guided into its proper position in the cap **18** by a flange **23**.

Although the invention has been illustrated and described herein as being in the form of a two-part separable connector for keys, it is not necessarily limited to such use since various other uses for the separable connector are contemplated. For example, if desired, the device may be employed for releasably holding the two portions or sections of a watch band or bracelet in their connected relationship, or the device may supply the two counterpart elements of a jewelry clasp. Irrespective, however, of the particular use to which the invention may be put, the essential features thereof are at all times preserved.

As many changes or substitutions could be made in the above described construction, and as many apparently widely different embodiments of the invention within the scope of the claim could be constructed without departing from the scope and spirit thereof, it is intended that all matter contained in the accompanying specification shall be interpreted as being illustrative and not in a limiting sense.

I claim:

A two-part separable magnetic connector comprising a flat disk-like magnet having oppositely facing planar faces, one of which constitutes a pole face, a first shallow cup-shaped housing member formed of magnetic material and having a flat bottom wall and an upstanding continuous side wall, said magnet being seated with and filling said housing member with its other face in coextensive face-to-face contact with said bottom wall, means permanently

securing said magnet within said housing member, an armature in the form of a second and substantially identical shallow cup-shaped housing member of magnetic material and having a flat bottom wall and an upstanding continuous side wall, said magnet being removably seated within and filling said second housing member and held therein by magnetic attraction between said pole face and the bottom wall of said second housing member, the axial extent of said magnet being slightly greater than the combined height of said side walls whereby the rims of the two side walls are slightly separated, and a laterally turned rim extension on each side wall and having a hole therein, said rim extension constituting an eyelet for attachment to a key chain or the like.

References Cited by the Examiner

UNITED STATES PATENTS

2,637,887	5/53	Goodman et al.	
2,731,663	1/56	Thompson	24—201.2
2,752,764	7/56	Lederer	24—201.2
2,904,364	9/59	Korodi	292—251.5
2,953,970	9/60	Maynard	24—201.2
2,975,497	3/61	Budreck	24—201.2
3,027,617	4/62	Gray	24—201.2
3,086,268	4/63	Chaffin	24—201.2

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