

May 16, 1961

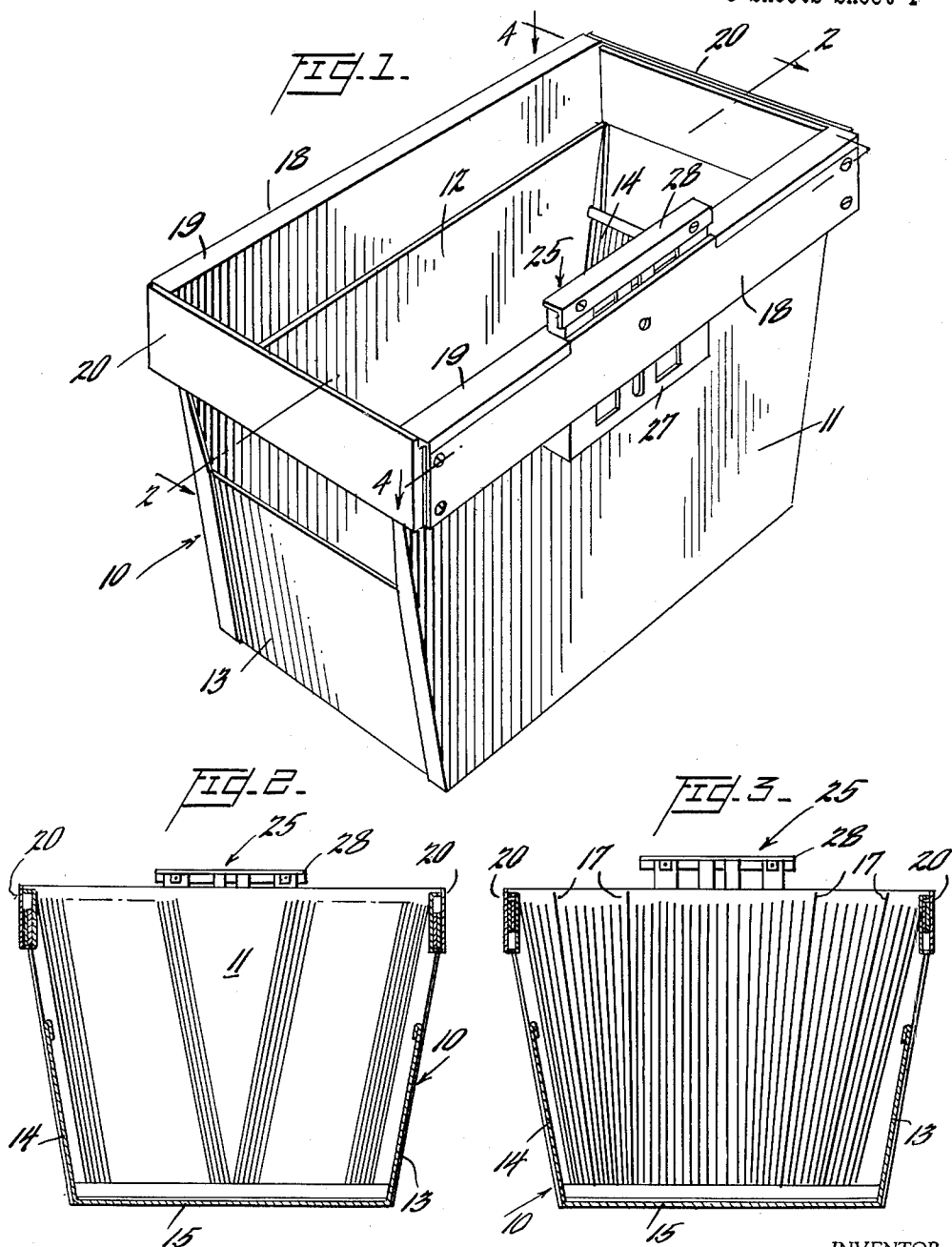
N. P. MATHIESEN

2,984,243

CARD FILE STRUCTURE WITH MAGNETIC CARD SPREADING

Filed Dec. 23, 1957

3 Sheets-Sheet 1



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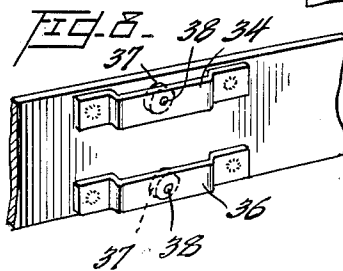
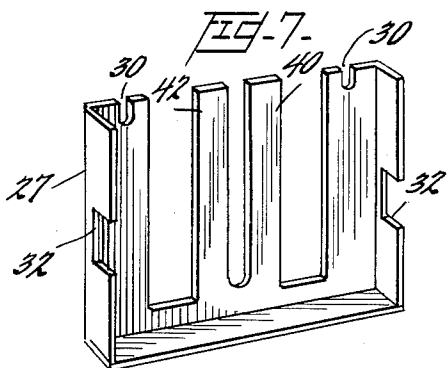
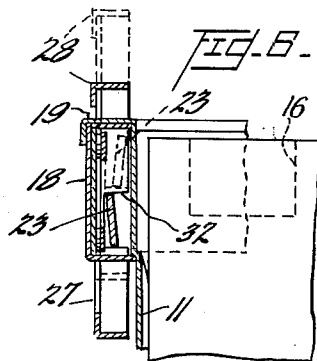
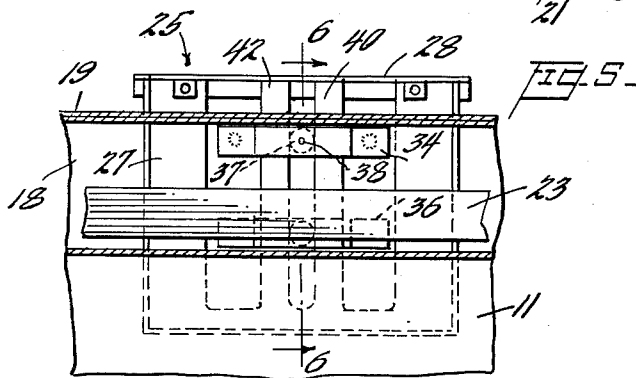
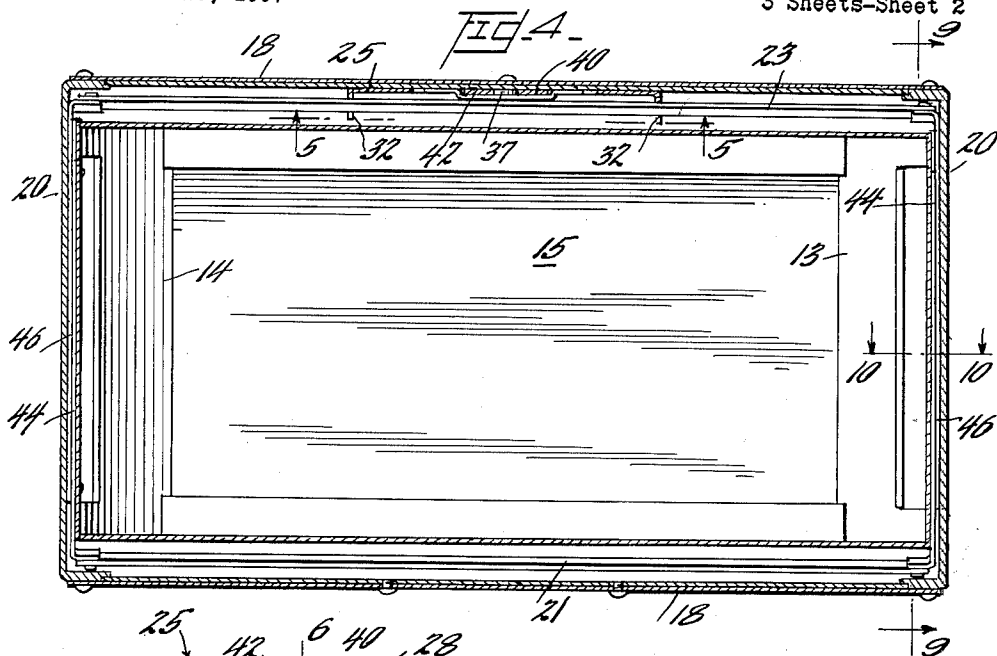
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CARD FILE STRUCTURE WITH MAGNETIC CARD SPREADING

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3 Sheets-Sheet 2



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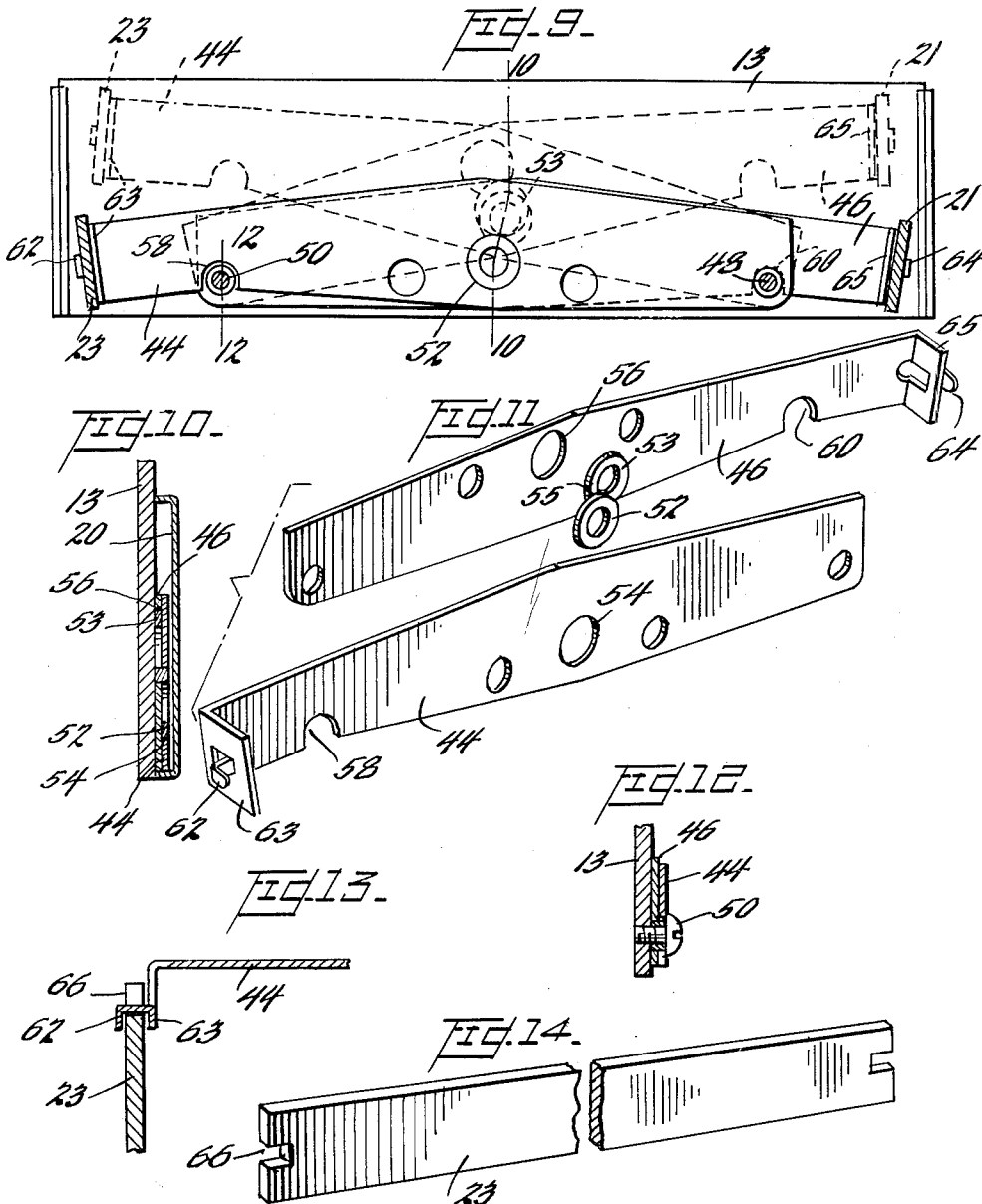
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CARD FILE STRUCTURE WITH MAGNETIC CARD SPREADING

Filed Dec. 23, 1957

3 Sheets-Sheet 3



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2,984,243

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Filed Dec. 23, 1957, Ser. No. 704,746

9 Claims. (Cl. 129—16)

The present invention relates to card filing devices and particularly to those devices utilizing magnetic force for causing the separation or "fanning" of a plurality of cards disposed in a tray or drawer, for facilitating the visual survey of such cards. A device of the general type in question is described and claimed in United States Patent No. 2,341,639, granted February 15, 1944, and one improvement upon the said patented device is described and claimed in United States Patent No. 2,656,091, granted October 20, 1953. Another improvement upon the above mentioned devices is described and claimed in United States Patent No. 2,722,936.

The above mentioned patents relate to devices in which the individual cards are provided with magnetic portions, for example thin pieces of soft iron, laminated between the paper layers of the card, said cards being disposed edgewise within a tray or drawer having vertical sides, one or both ends of the receptacle being inclined outwardly to permit the cards to assume a fan-wise relation, caused by magnetic repulsion acting between the soft iron inserts, in response to magnetic energy emanating from permanent or electrically energized magnets disposed longitudinally of the receptacle and laterally behind the side walls thereof. In one of the devices, a pair of similar permanent magnets, of relatively long and thin shape, and magnetized in the direction of their width, are pivoted, respectively, at opposite sides of the receptacle for swinging movement toward and away from the receptacle so as to vary the intensity of the magnetic field affecting the said soft iron inserts, and thus control the fanning effect.

It is an object of the present invention to provide an improved device wherein a single permanent magnet is disposed longitudinally of and outside each side wall of the receptacle and these magnets are interconnected by a novel linkage arrangement which cause them to swing simultaneously about their respective axes which are located in the end walls, such that they are moved upwardly and near to the edges of the magnetic card devices in their operative position and are moved downwardly and more distant from these card devices in the inoperative position. By virtue of this arrangement, the device is rendered more compact since the linkage is located in the end walls and only a relatively small space in the side walls is required to permit vertical and limited horizontal motion of the thin magnets.

A further object is the provision of a card file device in which the movement of the magnets is accomplished by the manipulation of a handle means located midway of the transverse length of one side and coupled through a simple recess arrangement to one of the magnets so that the magnets may be simultaneously moved through the linkage located in the end walls into and out of operative position by the slight movement of the handle.

It is a further object of this invention to provide a magnetic card filing device of the character described in which the magnets are each pivoted about an "x" type linkage having a pair of pivot points located in the

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end walls of the receptacle and these links are interconnected by means of a pair of rotatable members, such that the rotatable members limit the pivot angle of the levers.

It is still a further object of this invention to provide a magnetic card filing device of the character described comprising a receptacle, a pair of magnets, each extending along a side wall of the receptacle, said magnets being relatively long and thin and rather narrow and being magnetized in the direction of their width, the magnets being pivoted about a pair of points in the end walls whereby the magnets are pivoted vertically and into a region adjacent the edges of the magnetic members in the cards to an operative position and return to a position below and more distant from the magnetic members of the cards to an inoperative position.

Other and further objects, features, and advantages will be apparent from the description which follows, read in connection with the accompanying drawing in which:

Figure 1 is a perspective view of a card filing device in accordance with one illustrative embodiment of this invention.

Figure 2 is a section taken along the lines 2—2 of Figure 1 including a plurality of cards shown in the position which they assume when the magnets are in an operative position.

Figure 3 is the same section as Figure 2 except that the handle is raised moving the magnets into their operative position, thereby causing the cards to fan-out.

Figure 4 is a plan view of the device of Figure 1 showing a section along the lines 4—4 of Figure 1.

Figure 5 is a section on lines 5—5 of Figure 4.

Figure 6 is a section on lines 6—6 of Figure 5.

Figure 7 is a perspective view of a portion of the handle mechanism.

Figure 8 is a perspective view of the handle guide and associated bearings for the handle assembly.

Figure 9 is a section on lines 9—9 of Figure 4 on a larger scale.

Figure 10 is a section on lines 10—10 of Figure 4 on a larger scale.

Figure 11 is a perspective view on a larger scale of two of the levers and includes their connecting linkage, these elements being shown disassembled.

Figure 12 is a fragmentary section on lines 12—12 of Figure 9 on a larger scale.

Figure 13 is a fragmentary section illustrating the connection between the levers and the magnets.

Figure 14 is a fragmentary perspective of one of the magnets.

In order to facilitate an understanding of the invention, reference is made to the embodiment thereof shown in the accompanying drawings and detailed descriptive language is employed. It will nevertheless be understood that no limitation of the invention is thereby intended and that various changes and alterations are contemplated such as would ordinarily occur to one skilled in the art to which the invention relates.

Referring to Figures 1, 2, 3, and 4 of the drawing it will be noted that the receptacle 10 comprises side walls 11 and 12, end walls 13 and 14, and a bottom 15, all of which may be formed from a single piece of non-magnetic material, for example, aluminum or other suitable material. The end walls 13 and 14 are pitched or inclined outwardly from bottom to top so that the receptacle is longer at the top permitting the cards to separate or fan-out adjacent their upper edges. The cards are provided with magnetic inserts 16, Figure 6, for example, thin pieces of soft iron adjacent each side edge, as more fully described in the above mentioned United States Patent 2,656,091. Preferably, the cards are

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divided into groups by means of spaced separators 17 which may be inscribed with suitable lettering as desired. As best seen in Figure 6, a hollow rectangular enclosure 18 extends longitudinally of each side of the receptacle adjacent its upper edge, the enclosure 18 being formed from a strip of suitable non-magnetic material such as aluminum bent to a proper configuration and secured to the outwardly extending flange 19 provided at the top of each side wall of the receptacle. Each of these rectangular enclosures houses a single long thin narrow magnet such as 21 or 23.

Another hollow rectangular enclosure 20 extends across each end of the receptacle and provides a housing for the linkages, which interconnect the magnets, as will be subsequently explained.

A suitable handle mechanism 25 is slidably mounted in one of the rectangular enclosures 18, as best seen in Figures 1, 5, and 6 and is linked to magnet 23 by means of an arrangement in which the magnet is loosely fitted in slots in the handle to provide a means for manually actuating the magnets as will be subsequently explained.

As shown in Figures 5 and 7, the handle mechanism includes a slotted member 27 and a top member 28 which is connected to member 27 by suitable means such as screws projecting through slots 30. Member 27 is provided with a pair of notches 32 which engage magnet 23 rather loosely and thus permit magnet 23 to move laterally with respect to said notches while the edges of the notches control the vertical movement of magnet 23 within a limited range. Member 27 is connected to wall 11 by suitable means, such as a pair of brackets 34 and 36 welded to wall 11. Each of these brackets has a bearing 37 rotatably journaled on a shaft 38 which is secured between the bracket and wall 11, as best seen in Figure 8. As best seen in Figure 5, tongues 40 and 42 engage bearings 37 and thus guide the movement of handle 25. The handle may be manually moved to the position in which the magnets are in their inoperative position as shown in solid lines in Figure 6, or the handle may be moved to the position in which the magnets are in their operative position as shown in dotted lines in Figure 6, which position is closer to the magnetic inserts 16 than when the magnets are in their operative position.

Referring now to Figure 9 there is shown a pair of levers 44 and 46 connected respectively to magnets 23 and 21. Lever 44 is pivoted about pin 48 which is secured by suitable means to end wall 13 while lever 46 is pivoted about pin 50, also secured to end wall 13. Levers 44 and 46 are interconnected or linked by means of a pair of washers 52 and 53, which washers are best seen in Figure 11. Washers 52 and 53 are secured to each other, such as by welding at a point 55 on their radial faces, as best seen in Figure 11. Washer 52 is rotatably journaled in aperture 54 of lever 44 while washer 53 is rotatably journaled in aperture 56 of lever 46. These washers act as a pivoting means interconnecting the levers so that they rotate simultaneously to move the magnets 21 and 23, and limit the angle through which the levers are permitted to rotate. Lever 44 has a notch 58 which engages pin 50 when the lever is in its inoperative position. Similarly, lever 46 has a notch 60 which engages pin 48 when lever 46 is in its inoperative position. Tongues 62 and 64 are struck out of the perpendicular ends 63 and 65 of levers 44 and 46 respectively, and these tongues engage notches 66 in the magnets as best seen in Fig. 13. Advantageously, the length of levers 44 and 46 is such that the distance from pivot points 48 and 50 to the magnets 23 and 21 respectively is greater than half the width of the receptacle.

Advantageously, the magnet moving arms 44 and 46 can be moved apart or closer together relatively for use with wider or narrower receptacles and cards. To accomplish this, it is necessary to shorten or increase respectively the distance between centers of the pivot pins

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48 and 50. Such an arrangement prevents locking of the rotating washer linkage by limiting the angle through which the levers move such that the linkage cannot act to lock the levers into position. In order to insure against locking, the axis of the washer linkage should not be permitted to rotate more than approximately 10 degrees from the vertical.

The operation of surveying a group of cards reposing in a receptacle of the character described is greatly facilitated. As each group of cards is to be surveyed, the divider 17 separating that group from the next group is retracted to provide room for the particular group under inspection to assume a fan-wise relation, which immediately occurs when the magnets 21 and 23 are moved to their operative position as illustrated in the dotted lines of Figure 9. The fan-wise relation is best seen in Figure 3, which shows the handle 25 elevated to its operative position. When the operator desires to remove a particular card and to leave a gap indicating where that card is to be replaced in the group, he grasps such card with one hand and with the other hand moves the handle 25 downwardly as best seen in Figure 2 causing the magnets 21 and 23 to move downwardly and away from the magnetized elements in the cards, as shown in the solid lines of Figure 9. The cards of the group lying on either side of the selected card will immediately fall away from the latter causing the formation of a gap, as best shown in Figure 2.

What I claim is:

1. A magnetic card filing device comprising a receptacle having side and end walls and a bottom, a magnet extending longitudinally along and outside each side wall, each said magnet being relatively long and thin and being supported with its longer edges disposed horizontally, said magnets in an operative position being located substantially adjacent the upper edges of the side walls with their narrow dimension substantially vertical and in an inoperative position being located further from said side walls a distance substantially less than the narrow dimension of said magnets and substantially below the upper edge of the side walls with the narrow dimension substantially vertical, means for supporting said magnets for movement between said positions including a pair of pivot pins in each of said end walls spaced inwardly from said side walls and below the operative position of said magnets, a pair of elongated lever arms in each of said end walls, each elongated lever arm having one end pivotally connected to one of said pivot pins and the other end fixed to one of said magnets, means for interconnecting each of said pair of lever arms for simultaneous movement of said magnets wherein vertical movement of one of said magnets is accompanied by a corresponding vertical movement of the other of said magnets and handle means mounted in one side wall and coupled to one of said magnets for vertical movement thereof, said magnets being simultaneously movable from said operative positions to said inoperative positions and vice versa, by the movement of said handle means.

2. A device according to claim 1, wherein the distance from each said pivot pin to the magnet-engaging end of said respective lever exceeds one half the width of said receptacle, and wherein said means for interconnecting each of said pair of levers includes means pivoting said levers on each other.

3. A device according to claim 2, said pivoting means comprising an element formed to provide two adjacent disaligned pivots, each said lever engaging one of said pivots for angular movement relative thereto.

4. A device according to claim 3, wherein said disaligned pivots comprise a pair of circular members joined at points on their radial faces.

5. A device according to claim 4, wherein one of said pair of circular members is rotatably journaled in an aperture in one of said levers and the other of said pair

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of circular members is rotatably journaled in the other of said levers.

6. A magnetic card filing device comprising a receptacle having side and end walls and a bottom, a pair of rectangular magnets, each having its length extending along one side wall and its width vertically aligned, said magnets being magnetized in the direction of their width, handle means operatively connected to one of said magnets, said magnets in an operative position being located substantially adjacent the upper edges of the side walls with their narrow dimension substantially vertical and in an inoperative position being located further from said side walls a distance substantially less than the narrow dimension of said magnets and substantially below the upper edge of the side walls with the narrow dimension substantially vertical, means for supporting said magnets for movement between said positions including a pair of pivot pins on one of said end walls intermediate the side walls and below the operative position of said magnets, a pair of elongated levers, each having one end pivotally connected to one of said pins and the other end fixed to one of said magnets, each of said magnets having its transverse axis substantially perpendicular to the longi-

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tudinal axis of the lever secured thereto, and pivot means interconnecting said levers for simultaneous movement of said magnets in response to the movement of said handle means.

7. A device in accordance with claim 6, wherein said handle means comprises a member slidably mounted in one side of said receptacle, said member having a notch therein, the edges of which notch loosely engage one of said magnets for imparting vertical motion to said one magnet.

8. A device according to claim 6, wherein said means for pivoting said levers comprises an element formed to provide two adjacent disaligned pivots, each of said disaligned pivots being rotatably journaled in one of said levers.

9. A device according to claim 8, wherein said element comprises a pair of circular members joined at points on their radial surfaces.

References Cited in the file of this patent

UNITED STATES PATENTS

2,656,091	Mathiesen	Oct. 19, 1953
2,722,936	Mathiesen	Nov. 8, 1955