

Jan. 16, 1968

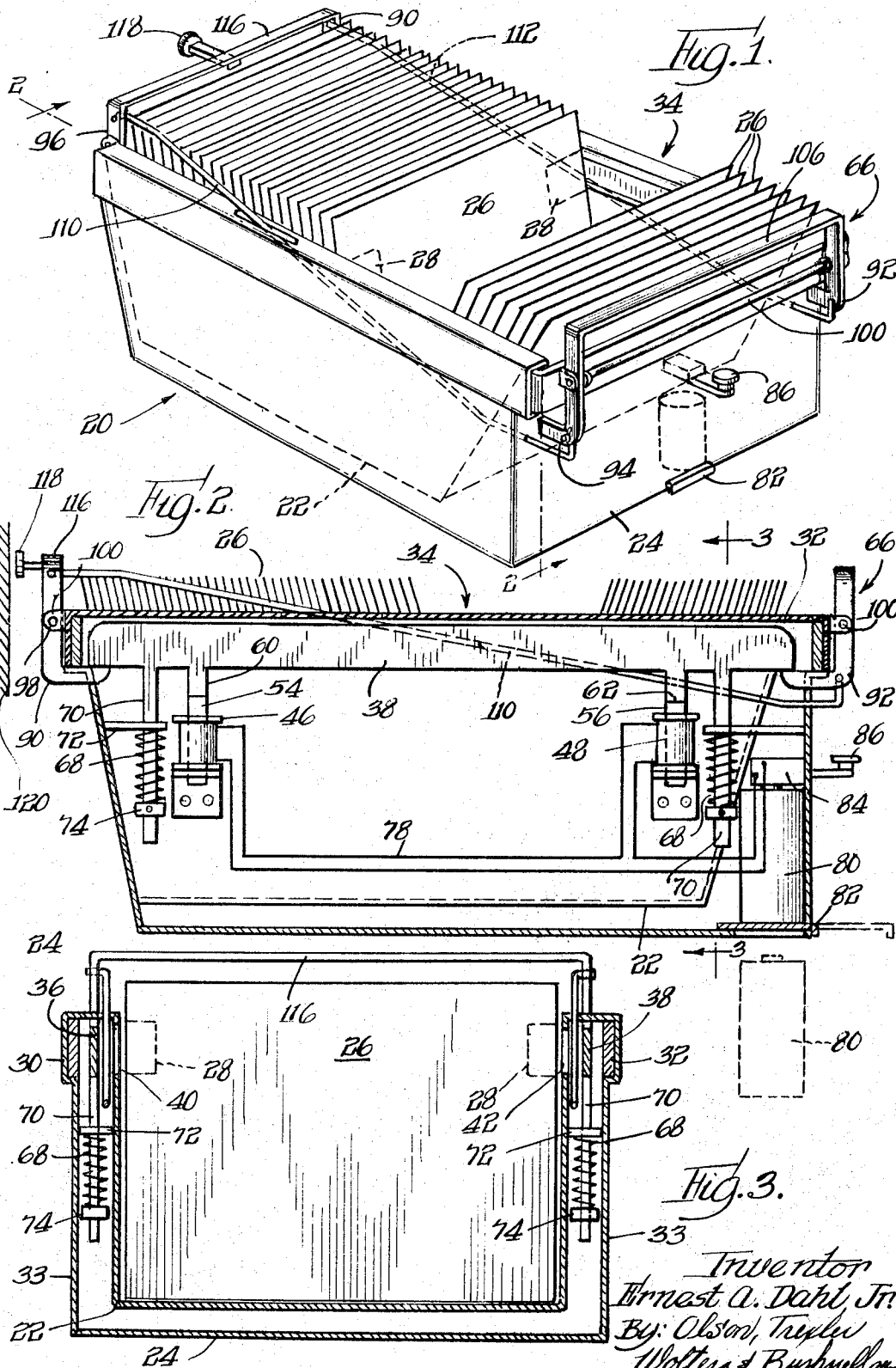
E. A. DAHL, JR

3,363,631

FILE CONTAINER

Filed Feb. 25, 1966

4 Sheets-Sheet 1



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FILE CONTAINER

Filed Feb. 25, 1966

4 Sheets-Sheet 2

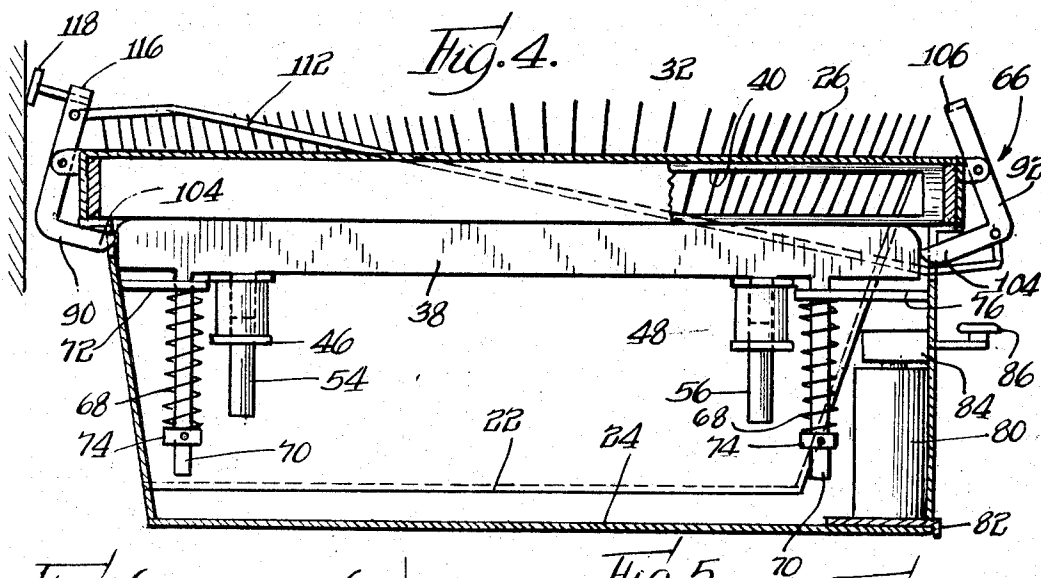


Fig. 6.

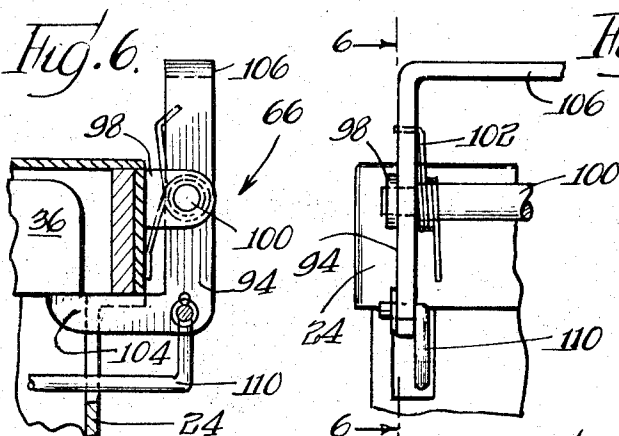


Fig. 5.

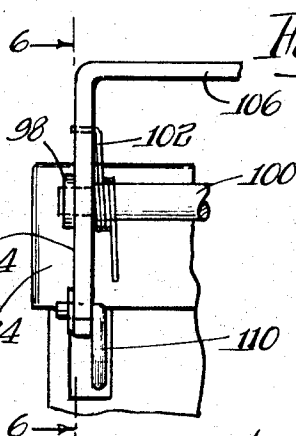


Fig. 7.

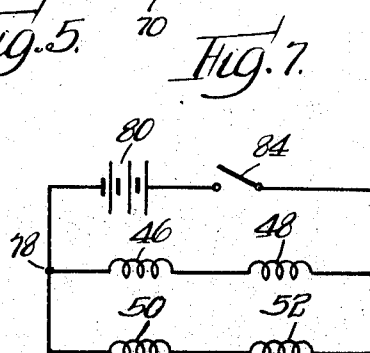
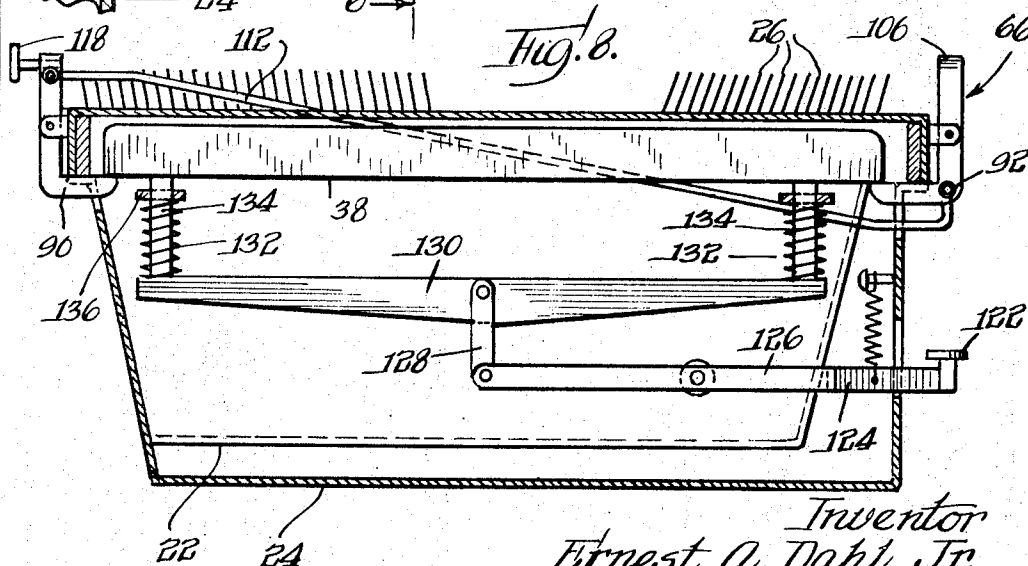


Fig. 8.



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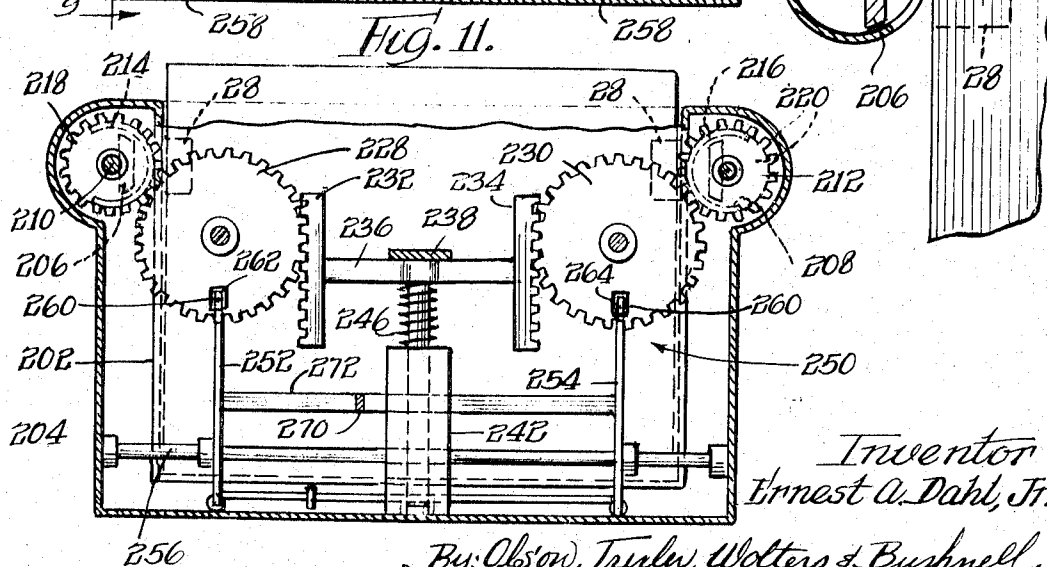
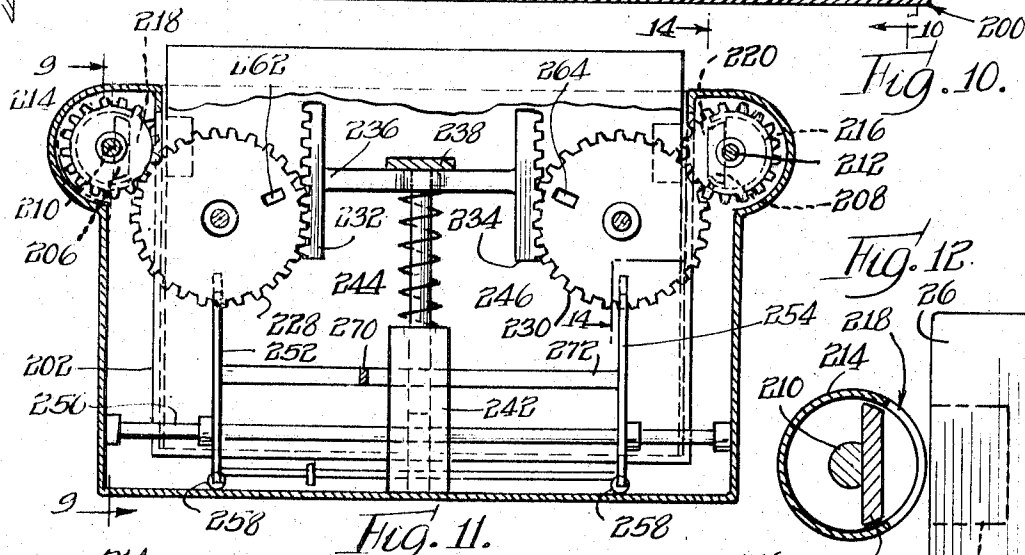
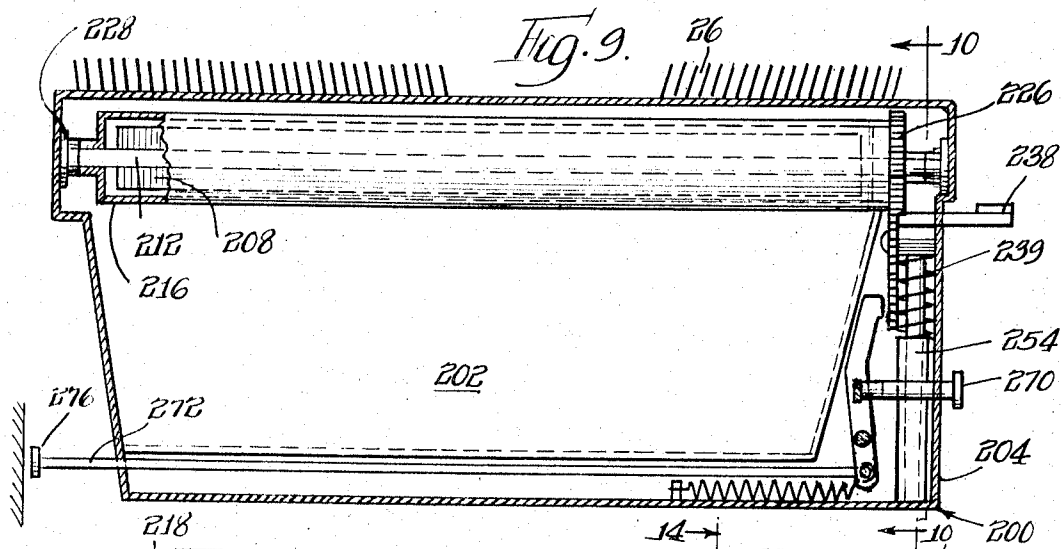
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FILE CONTAINER

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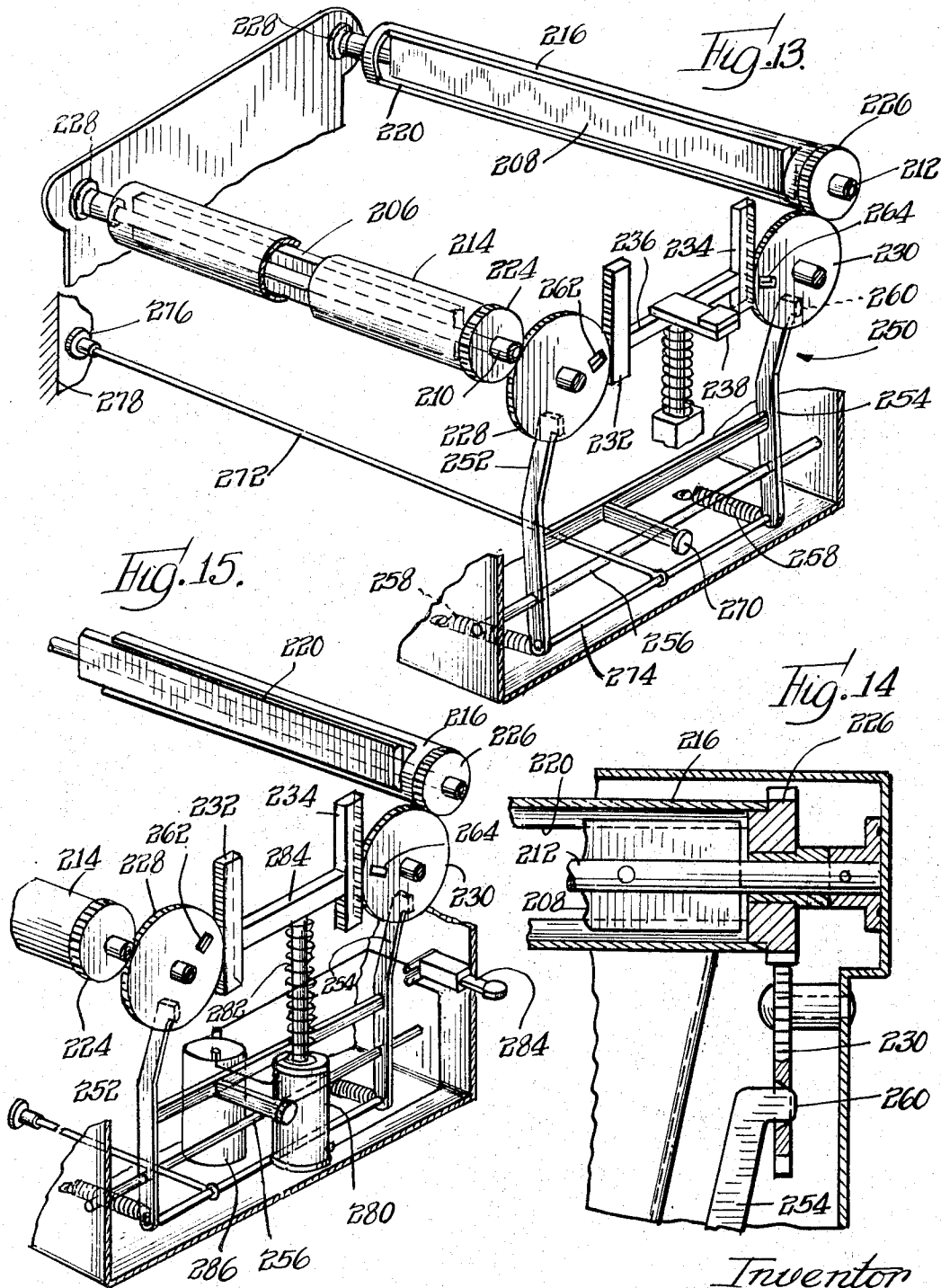
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4 Sheets-Sheet 4



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3,363,631

FILE CONTAINER

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35 Claims. (Cl. 129-16)

This invention relates generally to a card filing structure and more particularly to a card filing structure wherein magnetic repulsion is utilized to separate the filing cards.

Magnetic repulsion is often utilized to separate file cards to facilitate the locating of a desired card. When magnetic repulsion is utilized to separate file cards, it is a common practice to mount a pair of magnets on opposite sides of a file structure as a source of magnetic field. This magnetic field interacts with inserts of soft iron positioned between two layers of paper forming the file card on which data is printed. The inserts of magnetic material in the file cards will be magnetized with a similar polarity by the magnetic field. The similarly magnetized inserts will establish repelling magnetic fields which will cause the cards to separate in the manner set forth in Patent No. 2,954,032 to Ernest A. Dahl, Sr.

In using a magnetic card file, the cards are generally "rippled" or separated to expose the data on the cards to visual scrutiny when searching for a particular card. When the desired file card has been located, it is expedient to keep the file cards separated until the selected card is returned to its place in the file. However, the filing place for a particular card is soon lost since magnetic repulsion between the various cards will cause the file to quickly "spring back" or return to normal as soon as the selected card is removed from the file. Thus, the user of the file structure will not be able, without searching, to determine the location from which a particular card has previously been removed.

Therefore, one of the objects of this invention is to provide a magnetic card file structure wherein the cards will remain separated at a predetermined location.

Another object of this invention is to provide a disabling means for the magnets utilized in a magnetic card file structure so that the file cards will not return to their normal position after removing a card.

Another object of this invention is to provide a magnetic card file structure which has a compact and easily actuatable means for disabling the magnets.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description, taken in connection with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a first embodiment of the invention;

FIG. 2 is a detailed sectional view, taken along the line 2-2 of FIG. 1;

FIG. 3 is a detailed sectional view, taken along the line 3-3 of FIG. 2;

FIG. 4 is a detailed sectional view of the card file structure of FIG. 1 positioned on a storage shelf;

FIG. 5 is a fragmentary detailed view of the latch means for the card file structure of FIG. 1;

FIG. 6 is a detailed fragmentary sectional view, taken along the line 6-6 of FIG. 5;

FIG. 7 is a schematic drawing of the wiring diagram utilized in the card file structure of FIG. 1;

FIG. 8 is a detailed sectional view of a modified form of the embodiment shown in FIG. 1;

FIG. 9 is a detailed sectional view of a second embodiment of the invention;

FIG. 10 is a detailed sectional view along the line 10-10 of FIG. 9 when the magnetic shield members are in their neutral or inactive position;

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FIG. 11 is a detailed sectional view, similar to that shown in FIG. 10, with the magnetic shield members in their shielding position;

FIG. 12 is a detailed fragmentary view of the relationship between the magnet members and magnetic cards;

FIG. 13 is a fragmentary perspective view of the embodiment shown in FIG. 9;

FIG. 14 is a detailed fragmentary view along the line 14-14 of FIG. 10; and

FIG. 15 is a detailed fragmentary perspective view of a modified form of the invention shown in FIGS. 9 and 13.

Referring now to the drawings in greater detail, there is shown in FIGS. 1 to 7 a first embodiment of the invention. This embodiment includes a container 20 for file cards. The container 20 includes an inner card receiving receptacle 22, and an outer housing 24. Both the card receptacle 22 and outer housing are made of a suitable non-magnetic material, such as aluminum. A plurality of magnetic cards 26 are positioned in the card receptacle 22. The magnetic cards 26 include magnetic inserts 28 which are mounted between the laminations of paper on which data is displayed.

As is best seen in FIG. 3, a pair of bar magnets 30 and 32 are mounted parallel to each other on longitudinal sidewalls 33 of the container 20. The magnets 30 and 32 set up a magnetic field which magnetizes the elements 28 in the cards 26. The elements 28 will all be magnetized with the same polarity. Therefore, the magnetic elements 28 will repel each other and cause the cards 26 to be "fanned" or separated in a manner explained in greater detail in Patent No. 2,954,032.

With the cards 26 fanned, or separated, by the repelling magnetic inserts 28, visual locating of a particular desired card is greatly facilitated. Once the desired card has been located and removed from the file container 20, the position form which the card was removed should be clearly indicated to facilitate the return of the card to its proper position in the file container. However, the filing position for the removed card will be quickly lost, since the inserts 28 of magnetic material constantly repel each other.

In order that the magnetic cards 26 may be retained in a separated position to hold the filing place of a removed card, the magnetic field from the magnets 30 and 32 must be disabled. The means for disabling the magnets 30 and 32 includes a pair of shield members 36 and 38, which are mounted for substantially vertical movement between a first neutral or non-shielding position, as shown in FIG. 4, to a second active or shielding position as shown in FIGS. 2 and 3. The shield members 36 and 38 are made of a suitable non-magnetic material, such as aluminum and slide vertically from the non-shielding to the shielding position. When in the shielding or active position, the shield members are located intermediate the bar magnets 30 and 32 and the magnetic inserts 28. When the shield members 36 and 38 are in this position, the magnetic inserts 28 will be insulated from the magnetic field of the bar magnets 30 and 32 by the non-magnetic shield members 36 and 38. When the shield members 36 and 38 are moved to the neutral or non-shielding position shown in FIG. 4, the shield members 36 and 38 will be located immediately below an offset inwardly from their respective bar magnets. When the shield members 36 and 38 are in this position, it will be apparent that the magnetic inserts 28 will be subjected to the full influence of the magnetic field on the bar magnets 30 and 32.

Slots or apertures 40 are provided in the side of the card receptacle 22 to permit the field from the bar magnets 30 and 32 to extend directly to the magnetic inserts 28 in the magnetic card members 26. From an inspection of FIGS. 2 and 3, it will be seen that the longitudinal axes of the bar magnets 30 and 32, the shield members 36

and 38, and the slots or apertures 40 in the card receptacle are all positioned parallel to each other and extend for substantially the entire length of the card file container 20. Thus, the magnetic cards 26 will all be subject to the magnetic field of the bar magnets 30 and 32.

The shield member 38 is moved vertically from the neutral or non-shielding position shown in FIG. 4 to the active or shielding position shown in FIGS. 2 and 3 by means of solenoids 46 and 48 mounted on the right side of the container 20. A second pair of solenoids 50 and 52 are mounted on the left side of the container 20 to move the left shield member 36 vertically. The solenoids 46 to 52 are only shown schematically in the wiring diagram of FIG. 7. Core elements 54 and 56, of a magnetic material, are connected to the non-magnetic shield member 38 by legs 60 and 62 which extend from the shield member. It will be apparent that a similar pair of core elements are associated with the solenoids 50 and 52. When the solenoids 46 to 52 are actuated, the respective core elements and shield members are drawn upwardly, from the neutral to the shielding position.

Return springs 68 are connected to depending leg members 70 which are integrally formed with the shield members 36 and 38. The upper portion of the springs 68 abut a guide 72 which is fixed to the sidewalls of the container 20. The lower portion of the springs 68 abut an adjustable slide 74 which is connected by suitable means to the leg members 70. The position of the slides 74 may be varied to adjust the amount of compression which is initially present in the spring members 68.

When the shield members 36 and 38 are moved vertically upward to the shielding position, as shown in FIG. 3, the springs 68 will be compressed between the fixed guides 72 and the adjustable slides 74. The shield members are retained in this position, against the force of the compressed springs, by a latch means 66. When the latch means 66 is released, it will be apparent that the compressed springs 68 will cause the magnetic shield members 36 and 38 to move vertically downward from the shielding position, shown in FIG. 2, to the neutral position, shown in FIG. 4. Since the compression force of the springs 68 must be overcome by the solenoids 46 to 52 in moving the shield members 36 and 38 to the shielding position, and the weight of the shield members 36 and 38 will tend to cause them to return to the neutral position, it will be apparent that the springs 68 should advantageously exert a relatively small downward force on the shield members.

The solenoids 46 to 52 are connected by a circuit 78 to a battery 80. The battery 80 is mounted in the front portion of the container 20 between the front wall of the card receptacle 22 and the housing 24. A suitable switch 84 is mounted on the front wall of the outer housing 24 to complete the circuit between the battery and the solenoids 46 to 52. The switch 84 is closed by depressing a control or actuator key 86 which is mounted on the housing 24. The battery 80 may be replaced by sliding a door or closure member 82 to the position shown in dotted lines in FIG. 2 and removing the battery.

From the foregoing description it will be apparent that when the switch 84 is closed, by depressing the control key 86, the solenoids 46 to 52 will be simultaneously actuated. The actuation of the solenoids 46 to 52 will cause the shield members 36 and 38 to simultaneously be moved to the shielding position, shown in FIG. 3. The latch means 66 will retain the shielding members in the position shown in FIG. 3 until the latch means is released. While the shield members are in this position, the file cards 26 will not be under the influence of the magnetic field of the magnets 30 and 32 so that the cards will remain separated at the place from which a card has been removed. When the card is returned the latch means is released, the return springs 68 will then cause the two shield members 36 and 38 to move simultaneously to

the neutral or non-shielding position shown in FIG. 4. The magnetic inserts 28 of the file card 16 will again be subject to the full effect of the magnetic field in the bar magnets 30 and 32, to fan or separate the cards.

The latch means 66 includes four latch members 90, 92, 94 and 96 which are located at four corners of the file container 20. As is best seen in FIGS. 5 and 6, the latch members 90 to 96 are pivotally mounted on rods 100 which are connected by brackets 98 to the outer housing 24 of the file container 20. Four springs 102 are positioned adjacent to each of the latch members 92 to 96 in a substantially coaxial relationship with the shaft or rod 100 and are connected to an upper portion of the latch members 90 to 96. The springs 102 force the latch members into the latching or engaged position shown in FIG. 6. The springs 102 will be placed in tension when the latch members 90 to 96 are in the disengaged position, shown in FIG. 4. When the shield members 36 and 38 are moved from the neutral position to the shielding position the latch members 90 to 96 will pivot from a disengaged position, shown in FIG. 4, to an engaged position, shown in FIG. 2 under the influence of the springs 102. When the latch members 90 to 96 are in the engaged position nose portions 104 of the latch members will be engaged with the lower surfaces of the shield members 36 and 38. The latch members 90 to 96 will be retained in this position by the action of the springs 102.

Latch members 92 and 94 are interconnected by a latch release bar 106. The two latch members 92 and 94 are connected to the two rear latch members 90 and 96 by connecting links or rods 110 and 112. The connecting rods or links 110 and 112 interconnect the four latch members 90 and 96 so that they will move simultaneously to release both shield members 36 and 38 when the latch release bar 106 is depressed.

As will be seen from an inspection of FIG. 4, when the latch release bar 106 is depressed, the nose portions 104 of the latch members 90 to 96 will engage the end surfaces of the shield members 36 and 38. When the shield members 36 and 38 are moved to the shielding position, the end portions of the shield members 36 and 38 will slide on the ends of the nose portions 104 of the latch members 90 to 96. When the nose portions 104 of the latch members 90 to 96 have cleared the lower edge of the shield members 36 and 38, the latches will snap simultaneously to the position shown in FIG. 6 under the action of the springs 102. The shield members 36 and 38 will then be securely latched in the shielding position, as shown in FIG. 2.

The two latch members 90 and 96 are also interconnected by the bar 116 in much the same manner as the bar 106 interconnects the two latch members 92 and 94. Connected to the center portion of the bar 116 is the control release pad 118 which extends to the rear of the container 20. As will be apparent from an inspection of FIG. 4, whenever the file container 20 is placed on a storage shelf, the release or control pad 118 will engage the end wall 120 of the storage shelf and thereby move the bar 116 and the latches 90 to 96 to the release position. Thus, the release or control pad 118 will automatically cause the latch members 90 to 96 to be disengaged when the file container is returned to its storage position. When the file container 20 is subsequently withdrawn from the storage shelf, the magnetic cards 26 will be spread apart or "fanned" for an immediate search of the files.

In the embodiment of the invention shown in FIG. 8, the shield members 36 and 38 are actuated manually by means of a control key 122 which may be displaced downwardly to move the shield members to the shielding position. The control key 122 is connected by a bar or yoke 124 to a pair of levers 126 (only one of which is shown) which are pivotally mounted on the sidewalls of the container 20. The levers 126 are con-

ected to the shield members 36 and 38 by means of a linkage 128 and 130. The pivotally mounted connector link 128 connects the rearwardly extending end portion of the lever 126 to the beam member 130. When a control key 122 is pressed downwardly the end portions of the levers 126 will move the connector links 128 and beam levers 130 upwardly. This upward movement of the beam lever 130 will move the shield members 36 and 38 into the shielding position, as shown in FIG. 8. The latch means 66, as previously explained, will retain the shield members in the shielding position.

A pair of return springs 132 are mounted coaxially with the depending leg members 134 of the shield members 36 and 38. The upper end of the return springs 132 abut a spring retaining member 136 which is rigidly connected to the sides of the container 20. The lower end portion of the return springs 132 abut the beam member 130. It will be apparent that when the beam member 130 is raised to the position shown in FIG. 8, the return springs 32 will be compressed. Thus, when the latch bar 106 is depressed, to release the shield members 36 and 38 in the manner previously explained, the shield members 36 and 38 will move to the neutral or non-shielding position under the influence of the spring members 132.

For purposes of affording a more complete understanding of the invention, it is advantageous now to provide a functional description of the mode in which the component parts thus far identified operate. The file card container shown in FIG. 1 has a plurality of magnetic cards 26 located therein. The file cards are positioned in the magnetic field of a pair of magnets 30 and 32 mounted on the sidewalls of the container 20. The fields from the magnets 30 and 32 magnetize metallic inserts 28 in the file cards 26 so that the cards will become separated or fanned, as shown in FIG. 4. When it is desired to locate a particular card, it is merely necessary to look at the indicia placed adjacent the upper edge portion of the "fanned" cards 26. Upon locating the preselected card, the shield members 36 and 38 are moved simultaneously upwardly by depressing the control or actuator key 86. The depression of the control or actuator key 86 energizes the solenoids 46 to 52 to attract the core pieces associated with the solenoids to move the shield members 36 and 38 simultaneously upward to the shielding position. The shield members 36 and 38 will then be positioned intermediate the magnets 30 and 32 and the metallic inserts 28 in the cards 26. It will be apparent that the shield members 36 and 38, which are made of a non-magnetic material, will then insulate the metallic inserts 28 from the effect of the magnetic field radiating from the magnets 30 and 32. The shield members 36 and 38 will be retained in the shielding position, shown in FIG. 2, by the latch structure 66. The magnetic cards 26 will lie together in the position in which they are placed since the effect of the magnetic field from the magnets 30 and 32 has been eliminated. The preselected card may then be withdrawn from the card file. Since the cards will remain separated the location from which the preselected card has been removed is easily ascertainable for returning the card to its filing position.

The latch structure 66 may be actuated to release the shield members 36 and 38 by pressing the bar 106 which is mounted in a readily accessible position in the front portion of the file container 20. When the latch release bar 106 is pressed toward the rear of the filing container, the two front latches 92 and 94, which are connected to the latch release member 106, will swing outwardly so that the nose portion 104 (see FIG. 6) for the latch members 92 and 94 will become disengaged from the lower edge portion of the shield members 36 and 38. The two rear latch members 90 and 92 will be simultaneously moved to the disengaged position by the connecting bars 110 and 112 which are connected between the upper portion of the latch members 90 and 96 and the lower portion of the latch members 92 and 94.

The latch structure 66 may also be released by placing the file container 20 on a storage shelf which has a rear wall 120. The control or release pad 118 will engage the rear wall 120 of the storage shelf and will swing the rear latch bar 116 forwardly as the file container 20 is slid into the storage shelf. Since the connector bars 110 and 112 interconnect the back latches 90 and 96 with the front latches 92 and 94, the front latches 92 and 94 will be simultaneously released. Thus, the act of storing file container 20 would automatically release the latch structure 66 so that the file card 26 will be in the separated or "fanned" position to facilitate subsequent use of the card file container 20.

In the embodiment shown in FIGS. 1-7, a battery 80 is utilized for actuating the solenoids 46 to 52 to move the shield members 36 and 38 to the shielding position. Since the container 20 has its own source of power, the battery 80, the container may be moved from a storage position to any given location without the necessity of supplying a source of electrical energy at the location where the container is to be used. It will be apparent to those skilled in the art that an outside source of power could be utilized to actuate the solenoids 46 to 52.

In the embodiment shown in FIG. 8, a manual means for positioning the shield members 36 and 38 is shown. When the control or actuator key 122 is depressed, the linkage 124, 126, 128 and 130 will move the shield members 36 upwardly to the shielding position (as shown in FIG. 8). As previously explained, when the latch release bar 106 is actuated, the latches 90 and 92 will be simultaneously released to permit the shield members 36 and 38 to return to the neutral or non-shielding position. Since the linkage for the shield members is interconnected by the bar or yoke 124, the two shield members 36 and 38 will move simultaneously both to and from the shielding position.

Still another embodiment of the invention is shown in FIGS. 9 to 15. In this embodiment the magnetic file cards 26 are positioned in a file container 200 which has an inner card receptacle 202 and an outer housing 204. Both the inner receptacle 202 and the outer housing 204 are made of a non-magnetic material, such as aluminum.

A pair of spaced apart substantially parallel bar magnets 206 and 208 are securely mounted on a pair of shafts 210, 212 which are supported by the side walls of the container 200 in a position adjacent to the magnetic inserts 28 in the cards 26. A pair of cylindrical shield members 214 and 216, of a non-magnetic material, are journaled for rotation on the shafts 210 and 212 (see FIG. 14) about the magnets 206 and 208. The shield members 214 and 216 have a pair of slots 218 and 220 in their side surfaces which extend for substantially the entire length of the shield members 214 and 216. The slots 218 and 220 have a size and configuration which is substantially the same as that of the magnets 206 and 208 which are enclosed by the shield members 214 and 216 (see FIGS. 12 and 13). When the shield members 214 and 216 are rotated to a neutral position, with their slots 218 and 220 facing inwardly as shown in FIGS. 10 and 12, the metallic inserts 28 in the cards 26 will be subjected to the full force of the magnetic field from the magnets 206 and 208. The cards 26 will then be separated or "fanned" due to the magnetic repulsion between the inserts 28 in the manner previously explained in connection with the embodiment shown in FIGS. 1 to 8.

When the shield members 214 and 216 are rotated to the shielding position, with their slots 218 and 220 facing outwardly, as shown in FIG. 11, the non-magnetic material of the shield members 214 and 216 will be between the magnets 208 and 210 and the metallic inserts 28. The card members 26 will then be shielded from the magnetic field of the magnets 206 and 208 and will remain in a position to which they have been separated.

Since the shielding members 214 and 216 are made

of a non-magnetic material, it will be apparent that the flux field from the magnets 206 and 208 will be concentrated, by the shield members, at the slots 218 and 220 in the shield members. Thus, the effective strength of the magnetic field from the magnets 206 and 208 will be increased, since the magnetic field will be concentrated by the shield members. The magnetic fanning action of the magnets 206 and 208 on the magnetic cards 26 will be enhanced by the flux concentration characteristics of the rotatable shield members 214 and 216.

The magnetic shield members 214 and 216 are connected at one end portion to the gears 224 and 226 (see FIGS. 13 and 14) which are mounted for rotation on the fixed shafts 210 and 212. The opposite or rear end portion of the shield members 214 and 216 are connected to support mountings 228 (see FIG. 9). The gears 224 and 226 are rotated by the idler gears 228 and 230 which are driven by rack members 232 and 234. The rack members 232 and 234 are interconnected by a bar 236. A control or actuating key 238 is connected to the bar 236. From an examination of FIG. 13 it will be apparent that, when the control of actuator key 238 is pressed downwardly, the racks 232 and 234 will rotate the two idler gears 228 and 230. When the two idler gears 228 and 230 are rotated, the shield members 214 and 216 will be rotated, relative to the magnets 206 and 208 between the neutral position, shown in FIG. 10, and the shielding position, shown in FIG. 11.

The movement of the control or actuator key 238 is guided by a block 242 which encloses a guide bar 244 which is connected to the crossbar 236. A return spring 246 is mounted coaxially with the guide bar 244. The upper end portion of the return spring 246 abuts the crossbar 236 and the lower end portion of the spring 246 abuts the guide member 242. From a comparison of FIGS. 10 and 11, it will be apparent that the return spring 246 is compressed when the control or actuator key 238 is depressed to move the shield members 214 and 216 from the neutral position to the shielding position. Thus, the return spring 246 will tend to force the crossbar 236 and gears 228, 230 to the neutral position when the control or actuator key 238 is released.

The shield members 214 and 216 are retained in the shielding position by the latch mechanism 250. The latch mechanism 250 includes a pair of latch pawls 252 and 254 which are pivotably mounted on a rod or bar 256. A pair of springs 258 are connected to the lower end portions of the latch pawls 252 and 254. The springs 258 tend to rotate the latch pawls 252 and 254 clockwise, as shown in FIGS. 13 and 14, to hold nose portions 260 of the latch pawls in sliding contact with the rear surfaces of the gears 228 and 230. A pair of holes or apertures 262 and 264 are located in the gears for engagement with the nose portions 260 of the latch members 252, 254.

It will be apparent, from a comparison of FIGS. 10 and 11, that when the actuator member 238 is depressed, the racks 232 and 234 will rotate the gears 228 and 230. The rotation of the gears 228 and 230 will cause the apertures 262 and 264 to come into alignment with the nose portions 260 of the latch members 252 and 254. The latch members will snap into the apertures 262 and 264, under the influence of the springs 258, when the gears 228 and 230 are positioned as shown in FIG. 11. The holes or apertures 262 and 264 are located in the gears 228 and 230 in such a position that the nose portions 260 of the latch members 252 and 254 will engage the apertures when the slots 214 and 216 are in the shielding position, as shown in FIG. 11.

A latch actuator or release key 270 is connected by a crossbar 272 to the two latch members 252 and 254. When the actuator or release key 270 is depressed, the latch members 252 and 254 will swing rearwardly and the nose portions 260 of the latches will become disengaged from the apertures 262 and 264. When the latch members 252

and 254 are released, the spring 246, which was compressed as shown in FIG. 11, will force the shield control or actuator key 238, and the racks 232 and 234 upwardly. The upward movement of the racks 232 and 234 will rotate the two idler gears 228 and 230 to move the apertures 262 and 264 to the position shown in FIG. 10. The rotation of the idler gears 228 and 230 will be transmitted to the two gears 224 and 226 which are connected to the shield members 214 and 216. Thus, the shield members 214 and 216 will be rotated from the shielding position of FIG. 11 to the non-shielding or neutral position shown in FIG. 10 when the latch release key 270 is depressed.

A control member or rod 272 is connected to a lower portion of the two latch members 252 and 254 by a connector rod 274. A rearwardly projecting end portion of the control member 272 has an actuator pad 276 connected thereto. The actuator pad 276 will engage the rear surface 278 of a storage shelf to force the control member 272 forward when the card file container is slid into position on the storage shelf. When the control member 272 is pressed forwardly, the latch members 252 and 254 will be released. Thus, the latch members 252 and 254 will be automatically released, to enable the shield members 214 and 216 to return to the neutral position, whenever the card file container is positioned on a storage shelf.

In the embodiment of FIG. 15 a solenoid member 280 is utilized to position the shield members 214 and 216. The solenoid member 280 is associated with a magnetic core 282 which is connected by a crossbar 284 to the two racks 232 and 234. When the solenoid 280 is actuated, the core member 282 will be drawn downwardly into the solenoid 280 and the gears 228 and 230 rotated to move the shield members 214 and 216 from the neutral position to the shielding position. The solenoid member 280 is connected to a switch member 284 which is mounted on the front portion of the file container. When the switch member 284 is closed, the solenoid 280 will be actuated by means of electrical energy supplied by a battery 286. The battery 286 is mounted within the file container 200 intermediate the outer housing 204 in the inner file receptacle 202.

From the foregoing description it will be apparent that when the switch 284 is actuated the solenoid 280 will draw the two racks 232 and 234 downwardly to rotate the idler gears 228 and 230 and the shield members 214 and 216. The shield members 214 and 216 will be rotated from the neutral position to the shielding position as the core member 282 descends. When the apertures 262 and 264 are adjacent the nose portion 260 of the latch members 252 and 254, the idler gears 228 and 230 and the shield members 214 and 216 will be latched into the shielding position. When the latch release key or actuator 270 is raised, the two latch members 252 and 254 will be released to enable the shield members to return to the neutral or non-shielding position.

For purposes of affording a more complete understanding of the embodiment of the invention shown in FIGS. 9 to 15, a functional description of the mode in which the component parts operate will now be provided. When the control or actuator key 238 is depressed from the position shown in FIG. 13, the idler gears 228 and 230 will be rotated. The rotation of the idler gears 228 and 230 will be transmitted, by the gears 224 and 226, to the shield members 214 and 216. The shield members 214 and 216 will be rotated counterclockwise from the neutral position shown in FIG. 13 to the shielding position shown in FIG. 11. When the shield members 214 and 216 have been rotated to the shielding position, the magnetic file cards 26 will be insulated from the magnetic field of the two bar magnets 206 and 208. The file cards 26 will then remain separated to indicate the filing position from which a file card has been removed. The repositioning of the removed card in the file receptacle 202 will be greatly facilitated by the use of the shield members 214 and 216, since

file cards will remain separated as long as the shield members 214 and 216 are in the shielding position.

After the preselected card has been reinserted into the file container 200, the magnetic cards 26 can again be brought under the influence of the magnetic field of the two bar magnets 206 and 208 by depressing the latch release key 270. Depressing the latch release key 270 will pivot the latch members 252 and 254 to release the idler gears 228 and 230. The spring member 246 will then force the gear drive and the magnetic shield members to assume the neutral position, as shown in FIG. 10.

In the preferred embodiments thus far shown, it has been found to be advantageous to move the shields relative to the magnets. It is contemplated that the shields could, particularly in the embodiments shown in FIGS. 1 to 8, be retained in a stationary position while the magnets are moved. It is also contemplated that the idler gears, in the embodiments shown in FIGS. 9 to 15, could be eliminated and the shields driven directly by the racks 232 and 234. Thus, while specific embodiments of the invention have been shown and described herein, various changes in structure will, no doubt, occur to those skilled in the art. These changes in structure are to be understood as forming part of the invention insofar as they fall within the spirit and scope of the appended claims.

What is claimed is:

1. A card file structure including; a file container having first and second spaced apart sidewall means, a first magnet member mounted adjacent to said first sidewall means, a second magnet member mounted adjacent to said second sidewall means, magnetic file card means juxtaposed in said file container intermediate said first and second magnet members, a first shield member of a non-magnetic material movably mounted adjacent said first magnet member, a second shield member of a non-magnetic material movably mounted adjacent to said second magnet member, first shield actuation means connected to said first shield member for moving said first shield member from a neutral position to a shielding position intermediate said first magnet member and said magnetic material on said file card means, and a second shield actuation means connected to said second shield member for moving said second shield member from a neutral position to a shielding position intermediate said second magnet member and said magnetic material on said file card means, whereby in said neutral position of said shield member a magnetic field emanates from said magnet member to said magnetic card means to cause said card means to fan out and in said shielding position the magnetic field reaching said card means is reduced sufficiently to cause disabling of the fanned out position of said card means.

2. A card file structure as set forth in claim 1 further including; connector means interconnecting said first shield actuation means and said second shield actuation means so that said first and second shield members will be moved substantially simultaneously by said first and second shield actuation means.

3. A card file structure as set forth in claim 1 further including; a first latch member mounted on said file container to retain said first shield member against movement from the shielding position to the neutral position, and a second latch member mounted on said file container to retain said second shield member against movement from the shielding position to the neutral position.

4. A card file structure as set forth in claim 3 further including latch release means connected to said first and second latch members to enable said first and second latch members to be substantially simultaneously released, whereby said first and second shield members are enabled to move from the shielding position to the neutral position.

5. A card file structure as set forth in claim 3 further including; latch release means connected to said first and second latch members to enable said first and second

latch members to be automatically released when said file container is placed on a storage shelf, whereby said first and second shield members are enabled to move from the shielding position to the neutral position.

6. A card file structure as set forth in claim 3 further including first and second latch release means connected to said first and second latch members to enable said first and second latch members to be released, whereby said first and second shield members are enabled to move from the shielding position to the neutral position, said first latch release means including an actuator member mounted on said file container to enable said first and second latch members to be manually released, and said second latch release means includes a control member connected to said first and second latch members to enable said first and second latch members to be automatically released when said file container is placed on a storage shelf.

7. A card file structure as set forth in claim 1 wherein said first and second shield actuation means includes electric solenoid means for moving said first and second shield members relative to said file card means.

8. A card file structure as set forth in claim 7 further including battery means supported by said file container and connected to said electric solenoid means to supply energy for the operation of said electric solenoid means.

9. A card file structure as set forth in claim 1 further including a first latch member mounted on said file container to retain said first shield member in the shielding position intermediate said first magnet member and said magnetic material on said file card means, a second latch member mounted on said file container to retain said second shield member in a shielding position intermediate said second magnet member and said magnetic material on said file card means, first and second latch release means connected to said first and second latch members to enable said first and second latch members to be substantially simultaneously released whereby said first and second shield members are enabled to move to the neutral position, said first latch release means including an actuator member mounted on said file container to enable said first and second latch members to be manually released, said second latch release means including a control member connected to said first and second latch release means to enable said first and second latch members to be automatically released when said file container is placed on a storage shelf, and a connector means interconnecting said first shield actuation means and said second shield actuation means so that said first and second shield members will be moved substantially simultaneously by said first and second shield actuation means from the neutral position to the shielding position.

10. A card file structure as set forth in claim 9 wherein said first and second shield actuation means includes electric solenoid means for moving said first and second shield members relative to said file card means.

11. A card file structure as set forth in claim 1 wherein; said first and second shield members are mounted for substantially vertical movement from the neutral position to the shielding position.

12. A card file structure as set forth in claim 11 wherein; the neutral position for said first shield member is offset from and substantially beneath said first magnet, and the neutral position for said second shield member is offset from and substantially beneath said second magnet.

13. A card file structure as set forth in claim 12 wherein; conductor means interconnects said first shield actuating means and said second shield actuating means so that said first and second shield members move from said neutral position to said shielding position substantially simultaneously.

14. A card file structure as set forth in claim 1 wherein; said first and second shield members are journaled for rotation from the neutral position to the shielding position.

15. A card file structure as set forth in claim 1 wherein; said first and second shield members extend for substantially the entire length of said first and second magnets.

16. A card file structure as set forth in claim 1 wherein said first and second shield actuation means includes; a first solenoid means mounted adjacent to said first shield member, a second solenoid means mounted adjacent to said second shield member, first core means connected to said first shield member to enable said first solenoid means to move said first shield member, and second core means connected to said second shield member to enable said second solenoid means to move said second shield member.

17. A card file structure as set forth in claim 16 wherein; said first core means is connected to a lower portion of said first shield member and said second core means is connected to a lower portion of said second shield member.

18. A card file structure as set forth in claim 16 wherein; a circuit means interconnects said first and second solenoid means and a switch means is connected in said circuit means to substantially simultaneously actuate said first and second solenoid means to move said first and second shield members.

19. A card file structure as set forth in claim 18 wherein; said circuit means includes a battery supported by said file container.

20. A card file structure as set forth in claim 1 wherein; said first and second shield actuating means includes, a first linkage connected to said first shield member, a second linkage connected to said second shield member, and a control key connected to said first and second linkages to enable said first and second shield members to be moved substantially simultaneously when said control key is actuated.

21. A card file structure as set forth in claim 1 wherein; said first shield member is substantially cylindrical in shape and is mounted for rotational movement relative to said first magnet and said second shield member is substantially cylindrical in shape and is mounted for rotational movement relative to said second magnet.

22. A card file structure as set forth in claim 21 wherein; said first actuating means includes a first gear connected to said first shield member, said second actuating means includes a second gear connected to said second shield member, a first drive means is connected to said first gear means, a second drive means is connected to said second gear means, and a control means is connected to said first and second drive means to enable said first and second gear means to be rotated relative to said first and second magnets.

23. A card file structure as set forth in claim 21 wherein; said first shield member has a first aperture means the same size and configuration as said first magnet, and said second shield member has a second aperture means the same size and configuration as said second magnet.

24. A card file structure as set forth in claim 23 wherein; said first shield member is positioned in said neutral position when said first aperture means is positioned adjacent an innermost surface of said first magnet, and said second shield member is positioned in said neutral position when said second aperture means is positioned adjacent an innermost surface of said second magnet.

25. A card file structure as set forth in claim 21 wherein; said first actuating means includes a first gear connected to said first shield member, said second actuating means includes a second gear connected to said second shield member, a first drive means is connected to said first gear means, a second drive means is connected to said second gear means, a core element is connected to said first and second drive means, and a solenoid means is associated with said core element to enable said first and second gear means and shield members to be rotated simultaneously upon energization of said solenoid means.

26. A card file structure as set forth in claim 25 further including; a battery means supported by said container means, a switch means mounted on said container means, and electrical circuit means interconnecting said battery means, switch means, and solenoid means to enable said solenoid means to be energized by said battery means when said switch means is actuated.

27. A file card structure as set forth in claim 11 further including; a first latch means mounted adjacent to said first shield member to engage and retain said first shield member in the shielding position, a second latch means mounted adjacent to said second shield member to engage and retain said second shield member in said shielding position, and latch release means connected to said latch means to disengage said first and second latch means to enable said first and second shield members to move to said neutral position.

28. A file card structure as set forth in claim 27 further including; a second latch release means connected to said first and second latch means to enable said first and second latch means to be automatically released when said file container is placed on a storage shelf.

29. A file card structure as set forth in claim 22 further including; a first latch means mounted adjacent to said first drive means to engage said first drive means when said first shield member is in said shielding position, a second latch means mounted adjacent to said second drive means to engage said second drive means when said second shield member is in said shielding position, and a latch release means connected to said first and second latch means to disengage first and second latch means from said first and second drive means to enable said first and second shield member to move to said neutral position.

30. A file card structure as set forth in claim 29 further including; a second latch release means connected to said first and second latch means to enable said first and second latch means to be automatically released when said file container is placed on a storage shelf.

31. A card file structure including a container means, said container means having first and second spaced apart wall means, a first magnet mounted on said first wall means, a second magnet mounted on said second wall means, magnetic card means positioned in said container intermediate said first and second magnets, a first non-magnetic shield member of substantially the same length as said first magnet and mounted for substantially vertical movement from a neutral position offset and below said first magnet to a shielding position intermediate said first magnet and said magnetic card means, a second non-magnetic shield member of substantially the same length as said second magnet mounted for substantially vertical movement from a neutral position offset and below said second magnet to a shielding position intermediate said second magnet and said magnetic card means, a positioning means connected to said first and second shield members to enable said first and second shield members to be selectively moved between said neutral position and said shielding position, a first latch means positioned adjacent to said first shield member to retain said first member against vertical movement, a second latch means positioned adjacent said second shield member to retain said second shield member against vertical movement, and latch release means connected to said first and second latch means to permit said first and second latch means to be released, whereby in said neutral position of said shield member a magnetic field emanates from said magnet member to said magnetic card means to cause said card means to fan out and in said shielding position the magnetic field reaching said card means is reduced sufficiently to cause disabling of the fanned out position of said card means.

32. A card file structure as set forth in claim 31 further including electrical solenoid means operatively con-

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nected to said first and second shield members to move said first and second shield members vertically relative to said first and second magnets.

33. A card file structure including a container means, said container means having first and second spaced apart wall means, a first magnet supported by said first wall means, a second magnet supported by said second wall means, magnetic card means positioned in said container means between said first and second magnets, a first cylindrical non-magnetic shield member of substantially the same length as said first magnet and mounted for rotation around said first magnet, a second cylindrical non-magnetic shield member of substantially the same length as said second magnet and mounted for rotation around said second magnet, a first slot means in said first shield member, a second slot means in said second shield member, first positioning means connected to said first shield member to enable said first shield member to be selectively rotated between a neutral position wherein said first slot means is in a position intermediate said first magnet and said magnetic card means and a shielding position wherein said first slot means is at a more remote position relative to said magnetic card means, second positioning means connected to said second shield member to enable said second shield member to be selectively rotated between a neutral position wherein said second slot means is in a position intermediate said second magnet and said magnetic card means and a shielding position wherein said second slot means is at a more remote position relative to said magnetic card means, a first latch means mounted on said container means for

retaining said first shield member against rotation relative to said first magnet, a second latch means mounted on said container means for retaining said second shield member against rotation relative to said second magnet, and latch release means connected to said first and second latch means to permit said first and second latch means to be released, whereby in said neutral position of said shield member a magnetic field emanates from said magnet member to said magnetic card means to cause said card means to fan out in said shielding position the magnetic field reaching said card means is reduced sufficiently to cause disabling of the fanned out position of said card means.

34. A card file structure as set forth in claim 33 wherein said first and second positioning means includes gear means.

35. A card file structure as set forth in claim 34 further including electrical solenoid means operatively connected to said first and second positioning means to move said first and second shield members relative to said first and second magnets.

References Cited

UNITED STATES PATENTS

2,341,639	2/1944	Mathiesen.
2,656,091	10/1953	Mathiesen.
2,722,936	11/1955	Mathiesen.
2,984,243	5/1961	Mathiesen.
3,302,650	2/1967	Stuckel.

JEROME SCHNALL, *Primary Examiner.*

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,363,631

January 16, 1968

Ernest A. Dahl, Jr.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 27, for "exedient" read -- expedient --;
column 2, line 36, for "form which" read -- from which --;
column 7, line 22, for "of actuator" read -- or actuator --;
column 10, line 67, for "conductor" read -- connector --;
column 11, line 17, for "sead" read -- said --; column 12,
line 61, for "said first member" read -- said first shield
member --; column 13, line 20, for "first slots" read -- first
slot --; column 14, line 10, for "fan out in" read -- fan
out and in --.

Signed and sealed this 1st day of April 1969.

SEAL)

test:

Edward M. Fletcher, Jr.

Testing Officer

EDWARD J. BRENNER
Commissioner of Patents