Feb. 12, 1952 C. M. ABRAHAMSON 2,585,612

FOLLOWER FOR CARD FILING TRAYS

Filed June 22, 1946 3 Sheets-Sheet 1

Fig-1

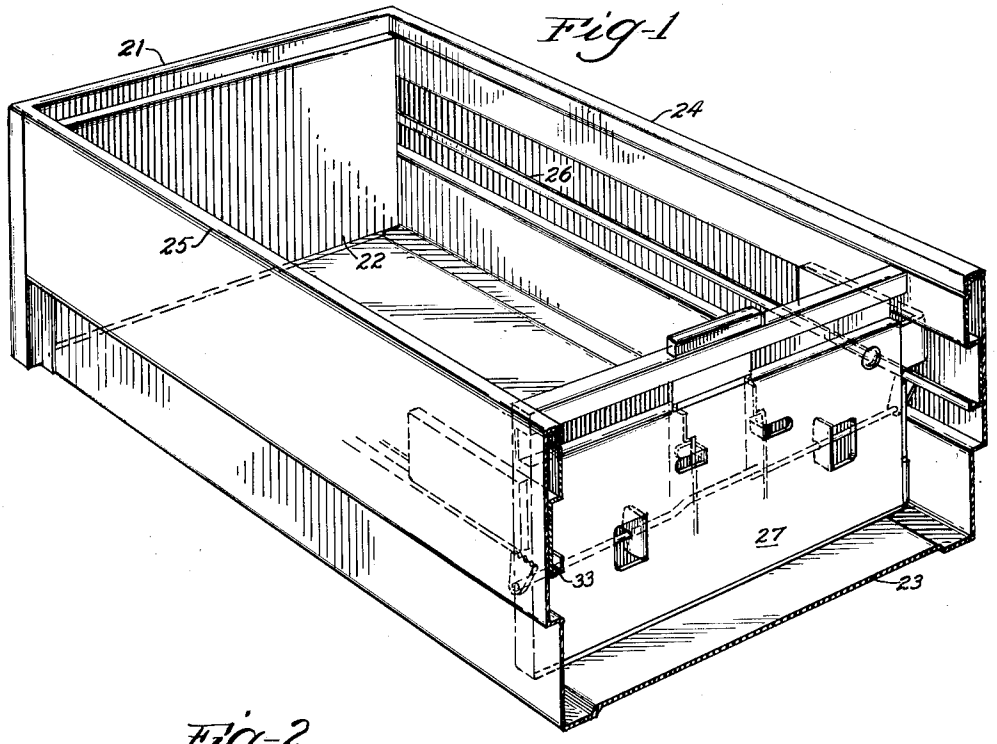
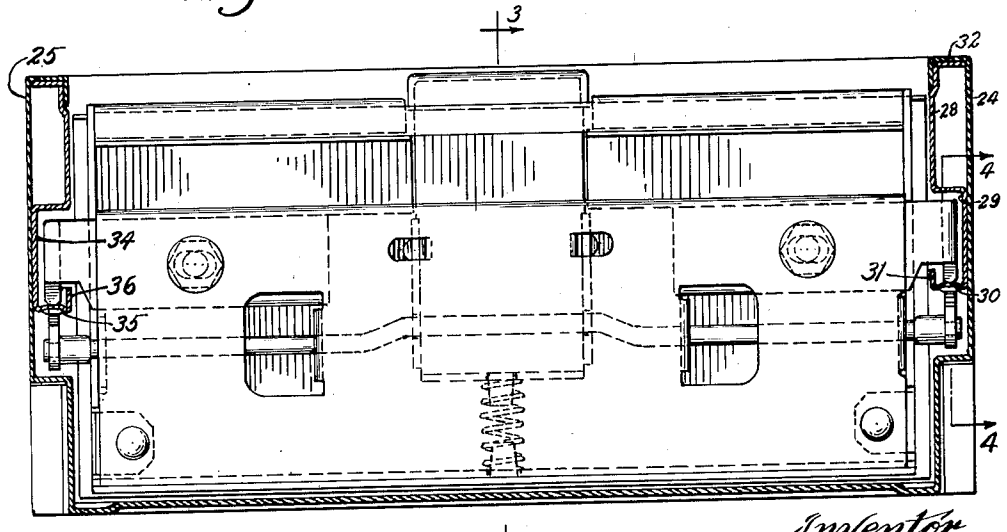


Fig-2



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FOLLOWER FOR CARD FILING TRAYS

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Fig-3

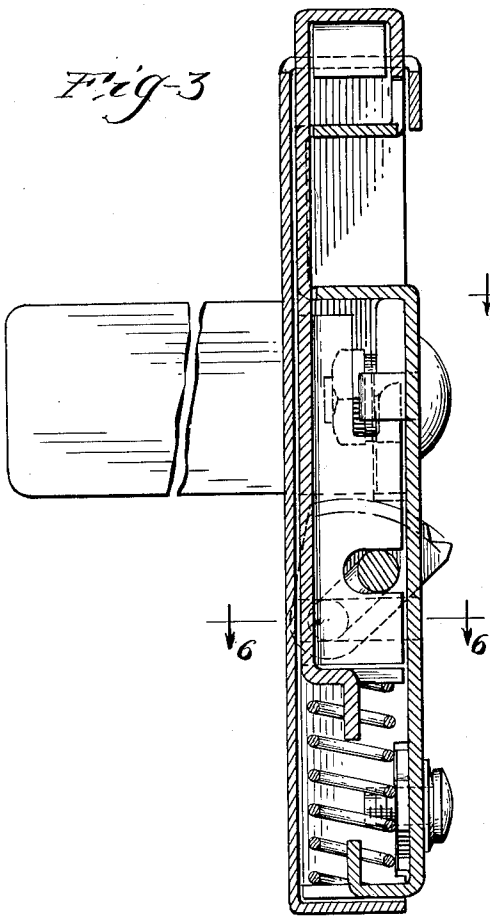


Fig-4

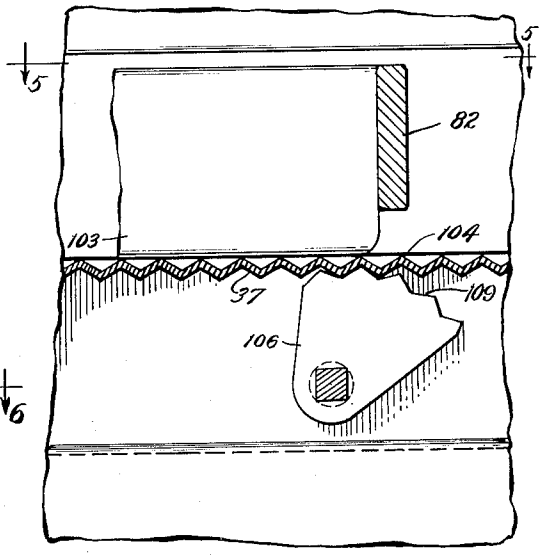


Fig-5

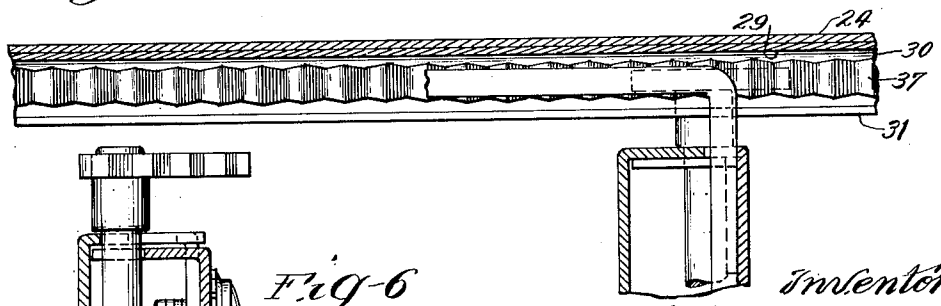
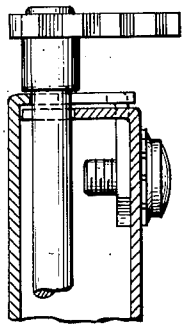


Fig-6



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Feb. 12, 1952 C. M. ABRAHAMSON 2,585,612

FOLLOWER FOR CARD FILING TRAYS

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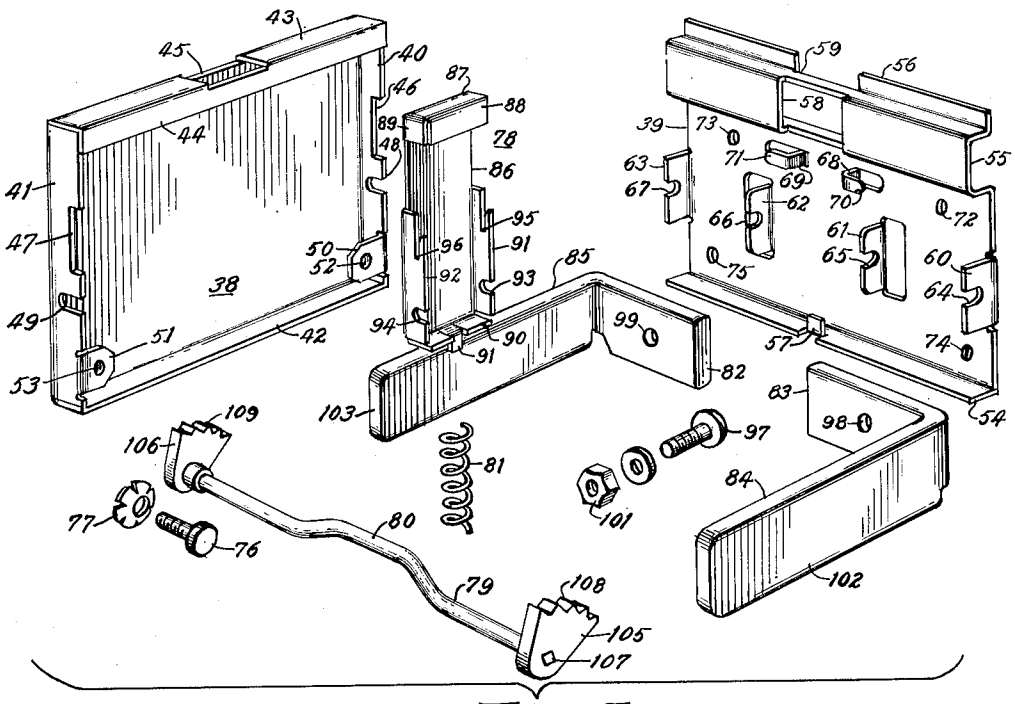


Fig-7.

Fig-8.

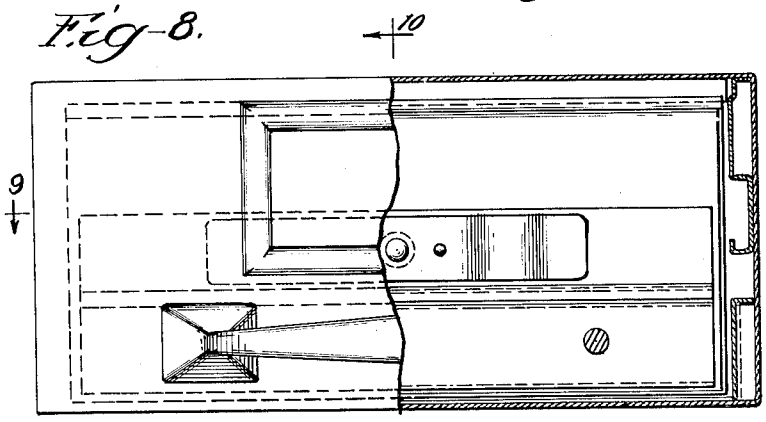


Fig-10

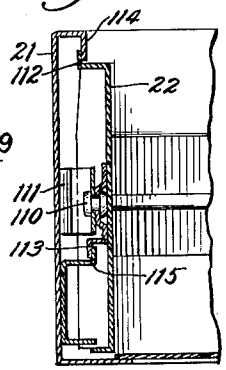
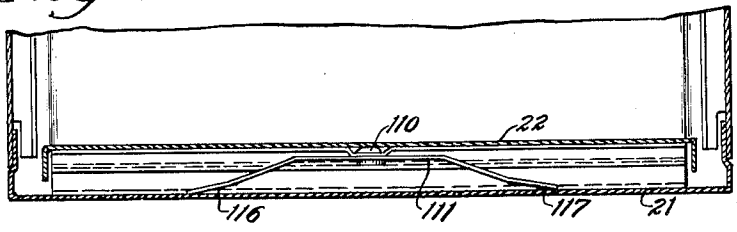


Fig-9



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UNITED STATES PATENT OFFICE

2,585,612

FOLLOWER FOR CARD FILING TRAYS

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Application June 22, 1946, Serial No. 678,632

7 Claims. (Cl. 129—28)

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This invention relates to a card filing device, and more particularly to a card filing device for tabulating and index cards and the like.

One of the requirements of a satisfactory card filing device such as a card tray, is that the cards can be retained therein positively so that, upon moving of the card tray, the cards will not become disarranged or spill out. When the cards are positioned on edge and upright within the card tray they will usually be retained therein by a back plate or follower which is adjustable to compress the cards against the front wall of the card tray. The back plate or follower should be capable of being locked tightly in a desired position by a positive retaining means, the locking effect of which will be increased rather than decreased by the pressure of the compressed cards, yet the follower should also be readily releasable so that the cards can be removed from the tray. Furthermore, the action of the follower in compressing the cards should be implemented by the action of the front wall of the tray, since cards of uneven thickness particularly those having tab members on the corners may have to be retained therein. The overall construction of the card filing device or tray, including the construction of the back plate or follower, should be sturdy, light in weight and the moving parts should move freely and without sticking. Furthermore, the follower should take up as little space as possible within the card tray, consistent with effective follower operation, in order to provide as much filing space as is possible for the cards.

Accordingly, it is an object of my invention to provide a new and improved card filing device, such as a card tray, and follower therefore wherein the follower is retained in card compressing position by a positive compressional gripping means, the effect of which is increased rather than decreased, by the pressure of the cards on the follower.

Other objects of my invention are to provide a new and improved card filing device, such as a card tray, and a follower therefor wherein the action of the follower in compressing the cards is implemented by the action of the front wall of the card tray; wherein the follower is supported by channels on the side walls of the card tray and the means for locking the follower to card compressing position grip and compress a portion of these channels to hold the follower in locked position; wherein a portion of the side guiding channel which supports the follower is roughened to provide better gripping action; wherein the follower takes up a minimum amount of space lengthwise of the card tray, and

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wherein the overall construction is sturdy, light in weight and the moving parts move freely and without sticking.

These and other objects and advantages of my invention will become apparent from the following detailed description, taken in conjunction with the attached drawings in which—

Fig. 1 is a perspective view of a card tray viewed from the left rear and above and showing a portion of the interior of the tray, the rear of the front wall of the tray and the back and top of the card follower;

Fig. 2 is a rear elevational view of the card tray shown in Fig. 1, and shows the back of the follower;

Fig. 3 is a cross sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a cross sectional view taken on line 4—4 of Fig. 2;

Fig. 5 is a cross sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a cross sectional view, broken away, taken on line 6—6 of Fig. 3;

Fig. 7 is a perspective view of disassembled parts of the card follower;

Fig. 8 is a front elevational view of the card tray with the front wall broken away in portion;

Fig. 9 is a cross sectional view taken on line 9—9 of Fig. 8 and omitting the name plate holder and the tray handle, and

Fig. 10 is a cross sectional view taken on line 10—10 of Fig. 8 and likewise omits the name plate holder and card tray handle.

Fig. 1 illustrates, in an embodiment of my invention, a card tray having a front wall 21 including a rear abutment 22, side walls 24 and 25, guide channels 26 and 33 which extend longitudinally along the inner sides of the side walls, a tray bottom 23, and a card follower 27 which is positioned transversely of the long axis of the card tray and extends substantially from side to side of the tray and has a vertical height nearly equal to that of the side walls 24 and 25. The follower 27 is supported by and guided by the guide channels 26 and 33, and is movable from front to rear and vice-versa of the tray. Elements of the tray assembly shown in Fig. 1 are made of light weight, strong sheet metal.

Details of the guide channel construction for guiding and supporting the card follower are best obtained from Figs. 2, 4 and 5. Referring to Fig. 2, it will be noticed that the tray side member 24 extends vertically and is bent over at the top at 32 to define the width of the tray side. Side member 28 is interfitted with the bent over

portion 32, extends vertically downward, and is recessed at 29 to form a channel guide having a horizontal portion 30 and a vertically extending flange 31 extending upward from the horizontal portion 30 and spaced from the side wall to define the width of the guide track 26. Similarly, the other side 25 of the card tray is recessed at 34 to form a channel guide having a horizontal portion 35 and a vertically extending side flange 36 which defines the width of the guide track 33. Guide tracks 33 and 26 are at the same height from the bottom of the card tray and extend longitudinally along the inner sides of the sides 24 and 25 of the length of the card tray.

In Figs. 4 and 5, it will be observed that the horizontal portion 30 of the guide track 26 includes a corrugated portion 37, the corrugations extending transversely of the length of the guide track. It is immaterial whether this configuration be called corrugated, toothed, or serrated, the object being to provide a roughened surface from a piece of sheet metal material of the type used in the construction of the card tray which can be gripped to give positive locking action. Similarly, a portion of the horizontal surface 35 of guide track 33 is corrugated. Deforming a piece of standard sheet metal stock to produce a roughened surface, such as the corrugated surface 37, provides a surface which is intrinsically thin yet is also strong and sturdy and can be gripped positively. Thus a surface is provided which facilitates locking of the follower in position and this surface is obtained from standard sheet metal stock without having to fold over or otherwise thicken the guide channel track.

The construction of the card follower 27 is best obtained from the perspective view of Fig. 7, showing the disassembled components thereof and the assembled construction is illustrated in Figs. 1 and 2. Cross sectional details of the assembled follower construction are shown in Figs. 3 and 6.

Shown in Fig. 7 are the front plate or wall 38 of the card follower, i. e., the side of the card follower that contacts the cards retained within the card tray, and the rear plate or wall 39 which is secured to the front plate 38 to form a housing for the mechanism which operates the card follower locking means. The front plate 38 has side flanges 40 and 41, a bottom flange 42 and a top flange 43 which is bent over at 44 to form a vertically depending skirt. The flanges 40, 41, 42 and 43 define the thickness of the card follower. Top flange 43 contains a cutout opening 45 and side flanges 40 and 41 contain recesses 46 and 47, and recesses 48 and 49. The side flanges also have formed integrally therewith bent-over ear members 50 and 51 which are parallel to the front plate 38. Ear member 50 contains the internally threaded opening 52 and ear member 51 contains the internally threaded opening 53.

Rear plate 39 is a substantially flat vertically extending wall having a horizontally extending bottom flange 54 and a recess portion 55 adjacent the top extremity 56 of the plate. The horizontal bottom flange 54 has an anchor post 57, which extends vertically upward, formed therefrom by cutting kerfs perpendicular to the length of the flange and bending the portion intermediate the kerfs vertically upward. Recessed portion 55 contains a cutout opening 58 and the top extremity 56 is likewise cut away at 59 to make the vertical sides of the cutaway portion 59 coextensive with the vertical sides of the cutout opening 58. The substantially flat wall portion of rear plate 39 has formed integral therewith

and perpendicular thereto a plurality of extensions 60, 61, 62 and 63 of substantially the same size. Recesses 64, 65, 66, and 67 are formed in these extensions as indicated. The recesses are aligned horizontally. Also formed integrally with the substantially flat wall portion of rear plate 39 are guide lugs 68 and 69 which include the portions 70 and 71, faced away from each other and parallel to the rear plate 39. The rear plate also includes bolt holes 72, 73, 74 and 75.

When the rear plate 39 is secured to the front plate 38, the upper extremity 56 is under the top flange 43 and rests against the inner side, i. e., the side toward the front plate 38, of the vertically depending skirt 44. The vertically extending edges of the recess 59 are aligned with the edges of the cutout opening 45 which are parallel to the long axis of the tray and likewise the vertically extending edges of cutout opening 58 are in similar alignment. Extension 63 lies along the inner face of side flange 40 and extension 60 lies along the inner face of side flange 41. Recess 48 is aligned with recess 67 to define a journal opening and recess 49 is aligned with recess 64 to define a similar journal opening. These journal openings are at the same height from the bottom flange 42. The bottom flange 54 rests against the upper surface of the bottom flange 42. Bolt hole 74 is aligned with threaded opening 53 and similarly bolt hole 75 is aligned with threaded opening 52. Thus, rear plate 39 is secured to front plate 38 by bolt members such as the threaded bolt 76, which extend through the openings 74 and 75, and are in threaded engagement with the internally threaded portions of openings 52 and 53. Preferably, bolt retaining means such as lock washer 77, are provided. Thus, the front and rear plates of the follower are retained together by being bolted together at the bottom and also by the engagement of the extremity 56 with the vertically depending skirt 44.

Housed intermediate the front plate 38 and the rear plate 39 of the card follower are the depressible plunger 78, shaft 79 having an eccentric portion 80, spring member 81, and the arms 82 and 83 of the follower guide members 84 and 85. Depressible plunger 78 includes a substantially flat vertically extending wall portion 86 having a horizontally extending top flange portion 87 containing vertically depending skirt portions 88 and 89. Plunger 78 also includes a bottom horizontal flange 90 integral with the plate portion 86, and a vertically depending anchor post 91 is formed from the flange 90 in the manner explained for anchor post 57. Aligned side flanges 91 and 92 contain matched recesses 93 and 94 and matched grooves 95 and 96.

Prior to attaching the rear plate 39 to the front plate 38, the follower guide members 84 and 85 are attached to the rear plate 39 by passing threaded bolt members, such as the bolt 97, through the aligned openings 72 in the follower rear plate and 98 in the arm 83 of follower guide member 84 and the corresponding openings 73 and 99, and threading nuts, such as is shown at 101, onto the bolts to retain the parts together. The follower guide members 84 and 85 are secured so that their arms 83 and 82 lie against the inner face of rear plate 39, i. e., the side of that plate which is toward the front plate 38. In this position, follower guide arms 102 and 103 extend, at the sides of the follower, horizontally forward of the follower. The shaft 79 is then placed in the aligned recesses 64, 65, 66 and 67, and the eccentric portion 80 of the shaft will lie

intermediate the extensions 61 and 62. Spring 81 is then placed vertically over anchor posts 57 and anchor post 91 is inserted into the upper end of spring 81 to compress it, and the depressible plunger 78 is faced toward the rear plate 39 so that recesses 93 and 94 engage the eccentric portion 80 of shaft 79, and retaining lug portions 70 and 71 engage the bottom of grooves 96 and 95 respectively. In this position, the depressible plunger is retained, against spring bias tending to force it upward, by lug portions 70 and 71. With this assemblage, the rear plate 39 is then secured to the front plate 38 in the manner heretofore described and it will be observed that the alignment of parts is such that the top flange portion 87 and depending skirt portions 88 and 89 of the depressible plunger 78 will extend upwardly through the cutout opening 45. Likewise, the recesses 46 and 47 will accommodate the arms 82 and 83, respectively, of the follower guide members 85 and 84. Aligned recesses 48 and 67 and 49 and 64 form a journal housing for shaft 79. Recesses 65 and 66 also support this shaft while recesses 93 and 94 of the depressible plunger flanges 91 and 92 engage the eccentric portion 80 of shaft 79. The depressible plunger 78 is guided in its movement by the side walls of the cutout openings 45 and 58 and movement upward of this plunger in response to the action of spring 81 is limited by the engagement of the bottoms of grooves 95 and 96 with lugs 71 and 70 respectively. Arms 102 and 103 of follower guide members 84 and 85 rest upon the upper surface of the corrugated portions, such as corrugated portion 37, of the follower guide channels 26 and 33. The follower 27 is thus maintained transverse to the long axis of the card tray and is movably supported on the follower guide channels 26 and 33. Excessive sidewise movement of the arms 102 and 103 of follower guide members 84 and 85 is prevented by the vertical side channel extensions 36 and 31. As the arms 102 and 103 of the follower guide members rest upon only the vertical peaks of the corrugated portions of the follower guide channels, such as peak 104 shown in Fig. 4, there is minimum frictional resistance to sliding movement of the follower forwardly and rearwardly of the card tray.

The ends of shaft 79 extend from the sides of the follower 27 to points adjacent the side walls 24 and 25 of the card tray. Naturally, the shaft ends lie under the horizontal portions 30 and 35 of follower guide channels 26 and 33. Each end of shaft 79 has mounted thereon a cam. Thus, cams 105 and 106 are shown supported on shaft 79 by means such as the square shaft portion 107. Each of the cams 105 and 106 has a roughened surface, such as the toothed surfaces 108 and 109. The cams are positioned beneath the corrugated portions of the side guide channels and adjacent thereto, thus also being beneath the arms 102 and 103 of the follower guide members that rest upon these corrugated portions. Also, the cams are arranged so that upon rotation of shaft 79 counter-clockwise the toothed surfaces 108 and 109 will engage and force the corrugated portion of each follower guide channel that lies between the toothed surfaces and the undersides of arms 102 and 103, against these undersides, thus compressing these corrugated portions. This compressing action can be observed in Fig. 4 where the toothed surface 109 is shown as engaging the corrugated portion 37 and forcing this portion against the underside of member 103. To secure uniform compression of the corrugated portion 37, the cam member 106 is approximately as thick as member 103.

As the spring member 81 urges the depressible plunger 78 upward, and because this plunger engages the eccentric portion 80 of shaft 79, the normal tendency is to rotate the shaft 79 in a counter-clockwise direction and thus retain the follower in locked position. By merely depressing plunger 78, which engages eccentric portion 80, shaft 79 is rotated in a clockwise direction thus moving the cams away from the undersides of the corrugated portions of the follower guide channels and allowing the card follower to move freely either backward or forward. Since the axis of shaft 79 lies below and forward of the axis of the eccentric portion 80 and forward of the greatest radial length of each cam, pressure against the front wall or plate 38 of the card follower, such as could be exerted by the cards being compressed, tends to cause further counter-clockwise movement of the shaft 79, which causes tighter gripping of the follower guide channels because of increased cam pressure and hence tighter locking of the follower in locked position.

To aid the follower 27 in retaining cards in compressed position within the card tray, the front wall 21 of the tray contains a resilient abutment 22 which also presses against the cards and tends to compress them. This construction is shown in Figs. 8, 9 and 10. In Fig. 10 it will be observed that the abutment 22 has attached thereto, by rivet construction 110, a leaf type spring 111, which bears against the inner surface of front wall 21 to urge abutment 22 to the rear. The extent of movement of abutment 22 to the rear is limited by the engagement of flanges 112 and 113, carried by this abutment, with the bent-over flange portions 114 and 115 of the front wall 21. However, abutment 22 can move forward, against the action spring 111, to the extent allowed by the free space between flange 114 and wall 21 and flange 115 and wall 21. As will be observed in Figs. 8 and 9, leaf type spring 111 is of elongated shape with two spring arms 116 and 117 bearing against the front wall 21 of the card tray. With this size and shape of spring the rear abutment is urged uniformly, i. e., is tended to be maintained transversely of the long axis of the tray, to the rear by the spring 111.

Movable abutment 22 can thus exert pressure, should it be urged toward front wall 21, and this pressure will aid in compressing the cards held within the tray. Furthermore, this added pressure will aid the follower in its card compressing action because, with a corrugated surface being engaged by a toothed cam, it may not always be possible to obtain exactly the same compressing force against the cards since the point of engagement of the cam teeth with the corrugated surface may lie slightly back of this maximum pressure point. The spring pressure exerted from the front of the tray tends to compensate for this. And the combination of this force exerted by the front portion of the tray together with the positive compressional locking means carried by the follower, enabling the follower to be locked tightly in a desired card compressing position, gives a highly workable card retaining means.

It will thus be seen that I have illustrated and described a lightweight, sturdy, and freely movable card filing device, including a follower assembly which can be positively locked in place. The follower is locked in position by the action of two members gripping and compressing between them a thin strong sheet metal member

which is deformed, i. e., roughened to provide a better gripping surface, and one of the gripping members is also deformed to facilitate better gripping. Furthermore, the action of the card follower compressing the cards within the tray is augmented by the resilient force exerted from the front of the tray and any tendency of the cards to push the follower back results in tighter gripping of the locking means. Because the mechanism for operating the follower locking means is housed within the follower, and the follower is relatively thin, the follower does not take up excessive card filing space. This is an important factor when it is considered that the filing space thus gained in each card tray is cumulative when a large number of trays are used.

While I have shown and described a particular embodiment of my invention, I wish it to be understood that I do not intend to be restricted thereto and that I intend to cover all modifications thereof which will be readily apparent to one skilled in the art and which come within the spirit and scope of my invention.

I claim:

1. The combination with a card tray having side walls provided with guide tracks extending longitudinally thereof, each of said guide tracks having a horizontally disposed sheet metal portion, of a follower shiftable longitudinally of said tray, said follower having follower guide members carried thereby and movable along said guide tracks and in contact with one side of said horizontal portion thereof, cams carried by said follower and located on the opposite side of said horizontal portion of said guide tracks from the follower guide members and in vertical alignment therewith, and means normally urging said cams toward said follower guide members and against said horizontal portion of said guide tracks to compress said horizontal portions between the cams and the follower guide members.

2. The combination with a card tray having side walls provided with guide tracks extending longitudinally thereof, each of said guide tracks having a horizontally disposed sheet metal corrugated portion, of a follower shiftable longitudinally of said tray, said follower having guide members carried thereby and movable along said guide tracks and in contact with each horizontal corrugated portion thereof, toothed cams carried by said follower and located beneath each horizontal corrugated portion of said guide tracks and also beneath said follower guide members, and means normally urging the cam teeth of said toothed cams toward said follower guide members and into contact with the under surface of each horizontal corrugated portion of said guide tracks to compress said horizontal portions between the toothed cams and the follower guide members and thereby lock the follower in position.

3. The combination with a card tray having side walls provided with inwardly faced channel-shaped guide tracks secured to the inner faces thereof, each of said guide tracks having a relatively thin horizontal portion, of a follower shiftable longitudinally of said tray and having a follower guide member movable along each of said guide tracks and resting upon the upper side of said horizontal portion of said guide track, a shaft carried by said follower, the ends of said shaft extending adjacent to each side wall of said card tray, a cam mounted adjacent each end of said shaft and affixed thereto to turn therewith, each of said cams being positioned beneath the horizontal portion of a guide track and in vertical alignment with a follower guide member, means normally rotating said shaft to bring said cams into contact with each horizontal portion of said guide tracks and hence to compress these horizontal portions between said cams and said follower guide members, and means to rotate said shaft to urge said cams away from each horizontal portion of said guide tracks.

4. The combination with a card tray having inwardly faced guide tracks extending longitudinally along the inner sides thereof, each of said guide tracks having a horizontally disposed, corrugated, sheet metal flange extending the length of the guide tracks, of a follower shiftable longitudinally of said tray, said follower comprising front and rear plate members, journal means, a rotatable shaft supported between said plate members by said journal means, said shaft extending from each side of said follower and adjacent to each side of said card tray, cam members having a plurality of teeth shaped complementary to the corrugations on said flange and rigidly affixed to said shaft, there being a cam member adjacent each end of said shaft and beneath the horizontal corrugated flange of each guide track, follower guide members attached to one of said follower plate members and resting upon the upper surface of each horizontal corrugated flange of said guide tracks directly above each cam member, means to urge each cam member against the underside of each corresponding horizontal corrugated flange of said guide tracks thus compressing said corrugated flange between the cam members and the follower guides, and means to release said cam urging means.

5. The combination with a card tray having inwardly faced guide tracks extending longitudinally along the inner sides thereof, each of said guide tracks having as a part thereof a horizontal corrugated flange extending substantially the length of the track, of a follower shiftable longitudinally of the tray and comprising front and rear plate members, journal means formed upon said plate members, a rotatable shaft supported between said plate members by said journal means, said shaft extending from each side of said follower and adjacent to each side of the card tray and said shaft having an eccentric portion intermediate its length, cam members rigidly affixed to said shaft, there being a cam member adjacent each end of said shaft and beneath the horizontal corrugated flange of each guide track, follower guide members attached to one of said follower plate members and resting upon the upper surface of each horizontal corrugated flange of said guide tracks above each cam member, a depressible plunger positioned between the front and rear plate members of said follower and extending through the top of the follower, said plunger being retained in position against the action of a spring located between said plate members and engaging said plunger to bias it upward, and said plunger engaging the eccentric portion of said shaft to urge each cam member against the underside of each corresponding horizontal corrugated flange of said guide tracks whereby, when said plunger is in raised position, the cam members compress the corrugated flanges against the follower guides, to lock the follower in fixed position, and when said plunger is depressed the cam members are moved away from said horizontal flanges to allow the follower to be moved lengthwise of the card tray.

6. The combination with a card tray having

inwardly faced guide tracks extending longitudinally along the inner sides thereof, each of said guide tracks having as a part thereof a horizontal flange extending substantially the length of the track, of a follower shiftable longitudinally of the tray and comprising front and rear plate members, journal means formed upon said plate members, a rotatable shaft supported between said plate members by said journal means, said shaft extending from each side of said follower and adjacent to each side of the card tray and said shaft having an eccentric portion intermediate its length, cam members rigidly affixed to said shaft, there being a cam member adjacent each end of said shaft and beneath the horizontal flange of each guide track, follower guide members attached to one of said follower plate members and resting upon the upper surface of each horizontal flange of said guide tracks above each cam member, a depressible plunger positioned between the front and rear plate members of said follower and extending through the top of the follower, said plunger being retained in position against the action of a spring located between said plate members and engaging said plunger to bias it upward, and said plunger engaging the eccentric portion of said shaft to urge each cam member against the underside of each corresponding horizontal flange of said guide tracks whereby when said plunger is in raised position the cam members compress the horizontal flanges against the follower guides to lock the follower in fixed position, and when said plunger is depressed the cam members are moved away from said horizontal flanges to allow the follower to be moved lengthwise of the card tray.

7. In a card tray having side walls, the combination of a follower shiftable longitudinally of the tray, guide means for maintaining the follower in a position transverse to the longitudinal axis of the tray during such movement, a horizontal sheet metal flange adjacent to and extending inwardly from each of said side walls, and locking means carried by said follower for gripping said flange to retain the follower in adjusted position in said tray, said locking means including a cam member and a guide member, one of said members being positioned over the horizontal flange and the other directly beneath it and in vertical alignment with said first-named member, a rock lever carried by the follower and secured to the cam member for rotating the latter to thereby compress the flange between said two members, and a spring normally biasing the cam member to locking position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
202,732	Lees	Apr. 23, 1878
1,069,477	Sampson	Aug. 5, 1913
1,891,522	Bullock	Dec. 20, 1932
1,910,689	Gronberg et al.	May 23, 1933
2,043,323	Gourley et al.	June 9, 1936