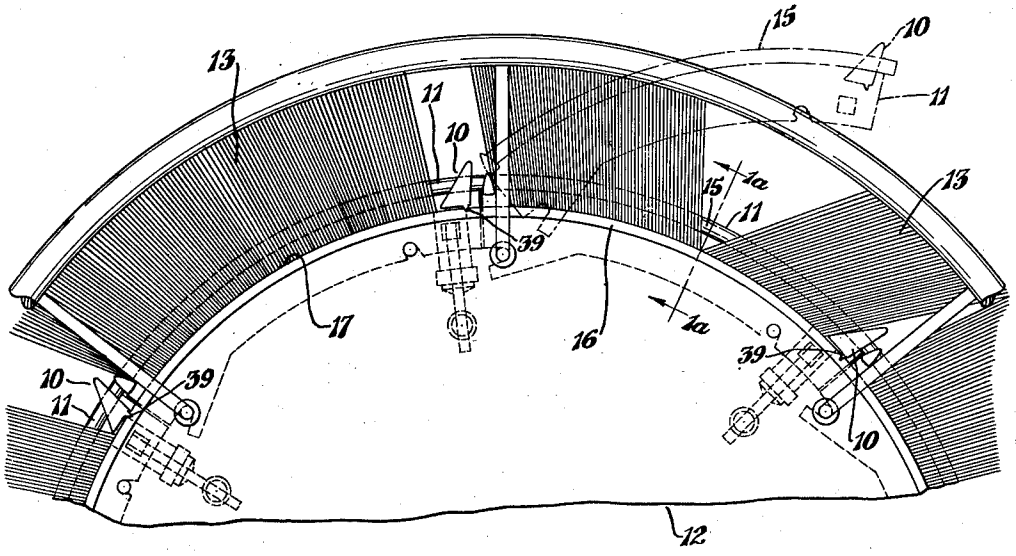
Nov. 27, 1945. K. H. MILLER 2,389,923

CARD TRAY FOLLOWER CONSTRUCTION

Filed Nov. 16, 1943 2 Sheets-Sheet 1

Fig. 1



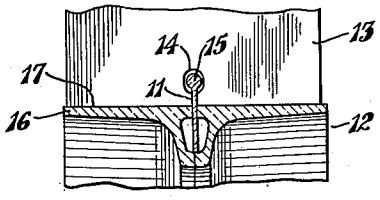


Fig. 1a

Fig. 2

Inventor
Karl H. Miller

By Frease and Bishop
Attorneys

Nov. 27, 1945. K. H. MILLER 2,389,923

CARD TRAY FOLLOWER CONSTRUCTION

Filed Nov. 16, 1943 2 Sheets-Sheet 2

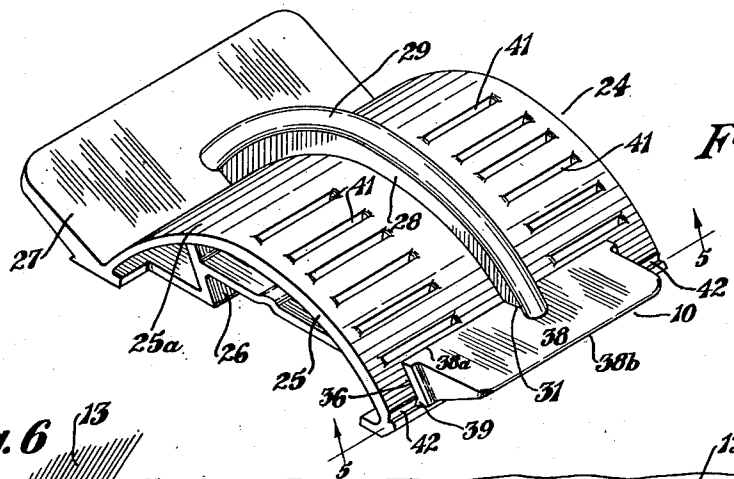


Fig. 3

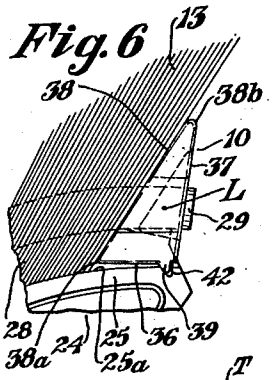


Fig. 6

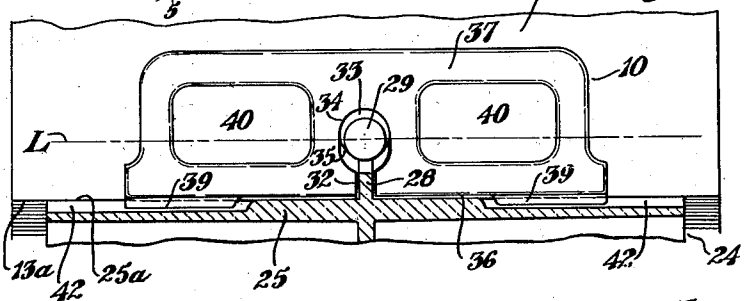


Fig. 5

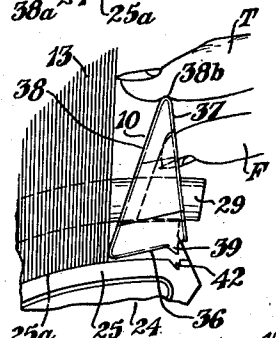


Fig. 8

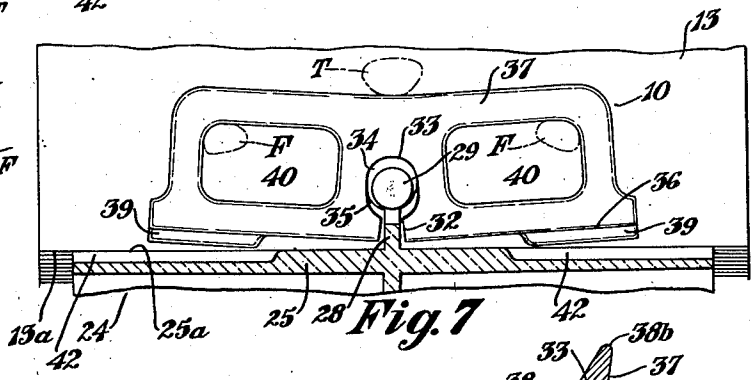


Fig. 7

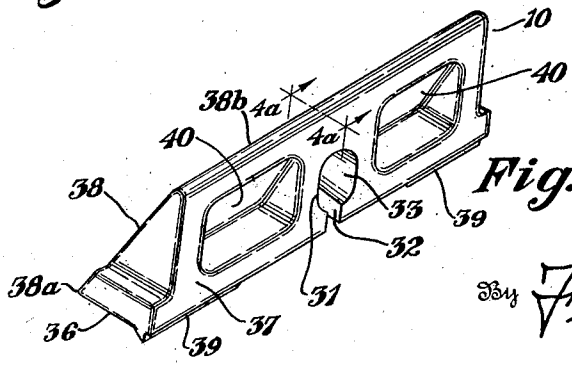


Fig. 4

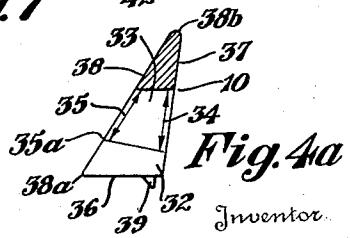


Fig. 4a

Inventor
Karl H. Miller

By Frease and Bishop
Attorneys

Patented Nov. 27, 1945 2,389,923

UNITED STATES PATENT OFFICE

2,389,923

CARD TRAY FOLLOWER CONSTRUCTION

Karl H. Miller, North Canton, Ohio, assignor to Diebold, Incorporated, Canton, Ohio, a corporation of Ohio

Application November 16, 1943, Serial No. 510,505

17 Claims. (Cl. 129—16)

The invention relates to a follower, compressor or stop construction for a filing tray. More particularly the invention relates to a removable tray end, follower, compressor or stop construction for card indexes wherein cards are mounted on a rail with an enlarged head by means of keyhole-shaped slots in the bottom edges of the cards. Also, the invention relates to a card index tray end or follower construction in which the rail may constitute a segment of a circle on which the cards are arranged more or less radially, and in which the rail is associated with or formed as a part of either a rotary card index or a desk tray for card inspection, reference or posting.

There are innumerable examples in the prior art of followers, compressors, etc. for material in filing drawers. End stop constructions also have been proposed for removable rail segments of a rotary index, for use when the detachable segment is mounted either on a wheel or on a separate desk tray, or when the segment is being transferred from the wheel to the tray.

However, such prior art devices are constructed with a large number of parts, many of which are of complicated design, and the prior devices are therefore expensive to manufacture and difficult to assemble. The prior art end stop devices for rotary indexes are fixed-position devices, and even though they include a number of parts, they are not adapted for ready adjustment or for use as card followers or compressors.

Rotary indexes have also been provided with substantially fixed-position dividers or partitions, but these divider or partition devices also are subject to the limitations and disadvantages noted.

Moreover, in a card index in which cards are mounted on a rail with an enlarged head by means of keyhole-shaped slots at the bottom edges of the cards, the cards in use are repeatedly slid back and forth on the rail. In such constructions any unnecessary wear on the keyhole slots or bottom edges of the cards must be prevented. Thus, the provision or use of a card follower in such a rotary index must not alter the perfectly smooth configuration of the enlarged headed rail throughout its length, or cause a scratching, pitting, denting or scoring of the smooth surface thereof; because the presence or occurrence of such conditions might increase the wear on cards sliding back and forth on the rail.

Finally, the provision of a follower on the enlarged head rail of a card index whereon cards are mounted by keyhole-shaped slots must not prevent end loading of the cards on selected rail sections, nor prevent the use of the cards either on a wheel or on a desk, nor limit in any way the size of cards which may be mounted on the rail.

It is therefore an object of the present invention to provide a simple but effective follower construction for a card file of the type in which cards are mounted by keyhole-shaped slots on a rail having an enlarged head.

Also it is an object of the present invention to provide a one-piece follower for the card carrying rail of a card file, which is simple in design and inexpensive to manufacture.

Furthermore, it is an object of the present invention to provide a follower construction for the card carrying rail of a card index which does not damage or alter the shape throughout the length of the uniform perfectly smooth surface of the rail and which does not cause increased card wear.

Moreover, it is an object of the present invention to provide a one-piece adjustable follower formed of flexible thermoplastic material for the card carrying rail of a card index, which follower may be readily and easily flexed to adjust the position of the follower on the rail, or to remove the follower from the rail.

Likewise, it is an object of the present invention to substantially reduce the number of parts required in providing a tray end for a rail section of a rotary card index.

Also, it is an object of the present invention to provide a simple device which may be used with different sized cards selectively as a card follower, card compressor or tray end for a rail section of a rotary index or card tray, irrespective of whether the rail is formed integrally with or held detachably on the rotary index or tray.

Furthermore, it is an object of the present invention to provide a card follower which may be used in combination with the improvements set forth in my Rotary card indexes and trays application, Serial No. 501,567, filed September 8, 1943, to minimize card wear.

Finally, it is an object of the present invention to provide a removable tray end or follower construction for a rotary card index of simplified and compact structure, and ease of assembly and operation.

These and other objects may be obtained, the stated results achieved, and the described difficulties overcome, by the devices, constructions, arrangements, combinations, sub-combinations, parts and elements which comprise the present invention, the nature of which is set forth in the following general statement, preferred embodi-

ments of which are set forth in the following description and shown in the drawings, and which are particularly and distinctly pointed out and set forth in the appended claims forming part hereof.

The nature of the improvements in removable card follower construction for a card index of the present invention may be stated in general terms as preferably including in a card filing device, a rail section comprising a head and a flange constructed and arranged to receive a multiplicity of cars having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail upon which the lower edges of the cards may rest; a follower member formed of flexible thermoplastic material having a tapered keyhole-shaped slot at its lower edge slidably engageable on the rail section; said follower member having an upwardly rearwardly slanting front wall surface for engaging the rear card of a group of cards, whereby the weight or pressure of the cards on the follower tends to tilt the follower on an axis passing through and transverse to the rail head, so that the lower forward portion of the follower below the rail head moves forwardly upwardly and the upper portion of the follower above the rail head moves rearwardly downwardly to wedge clamp the follower between the rail head and card supporting wall; interengageable means on the follower and card supporting wall for positively stopping rearward movement of the tilted follower at selected positions along the rail; the follower being adapted to be tilted on said axis in the other direction by simple pressure applied at the upper rear portion thereof toward the cards to slide the follower along the rail to engage and compress the cards; and the follower being adapted to be flexed upwardly at either side of the rail to move it away from the cards or to remove it from the rail.

By way of example, a preferred embodiment of the improved construction is illustrated in the accompanying drawings forming part hereof, wherein:

Figure 1 is a fragmentary side view of a portion of the wheel of a rotary index having removable rail segments provided with the improved follower construction;

Figs. 1*a* is a section taken on the line *1a—1a*, Fig. 1;

Fig. 2 is a perspective view of a desk card tray having a card rail section provided with the improved follower construction;

Fig. 3 is a perspective view of another form of desk tray provided with the improved follower construction;

Fig. 4 is a perspective view of the follower member illustrated in Figs. 1, 2 and 3;

Fig. 4*a* is a section taken on the line *4a—4a*, Fig. 4;

Fig. 5 is a section illustrating the improved follower construction taken on the line 5—5, Fig. 3;

Fig. 6 is a side view of the parts shown in Fig. 5;

Fig. 7 is a view similar to Fig. 5, but showing the follower member flexed for disengaging and removing the same from the card rail; and

Fig. 8 is a side view of the parts shown in Fig. 7.

Similar numerals refer to similar parts throughout the drawings.

The improved follower member is indicated generally at **10** and one may be slidably mounted on each detachable rail segment **11** of a well known type of rotary index indicated generally at **12** in Fig. 1 wherein cards **13** having keyhole-shaped slots **14** in their bottom edges are disposed generally radially of the index **12** with their keyhole-shaped slots **14** engaged around and carried by the enlarged head **15** at the top of the flange of removable or detachable rail segment **11**. The rail segments **11** are detachably mounted on the peripheral wall **16** of the wheel of rotary index **12** which is formed with an outer cylindrical card supporting wall surface **17**.

In Fig. 2, the card follower member **10** is shown associated with the desk tray generally indicated at **18**, which preferably has a curved card engaging rail **19** having a flange with an enlarged head **20**. The rail **19** may be detachably mounted on desk tray **18**, or may be formed integrally as one piece with the curved card supporting base wall **21**, the side walls **22**, and the end wall **23** thereof.

The improved follower **10** is illustrated in Fig. 3 associated with another form of desk tray **24** adapted for use either on a desk or for being detachably mounted on a wheel. The card tray **24** preferably includes a curved card supporting wall **25**, wheel engaging means **26**, end wall **27** and a rail **28** having a flange with an enlarged head **29**, all integrally formed in one piece.

For clarity in illustrating the invention, cards have been omitted from the trays illustrated in Figs. 2 and 3, although cards are shown at **13** in Figs. 5 to 8 iuclusive, having keyhole-shaped slots therein engaged over the enlarged head **29** of rail **28**. As best shown in Figs. 5 to 8 inclusive, the straight bottom edge **13***a* of each card **13** may rest on and be supported by the smooth curved surface **25***a* of the card supporting wall **25** with which the rail **28** is associated.

Referring particularly to Fig. 4, the improved follower **10** is preferably formed in one piece and has a generally triangular shape in cross section (Fig. 4*a*). A slot **31** generally keyhole-shaped in cross section is provided centrally through the follower **10** and the keyhole-shaped slot **31** preferably comprises a narrow entrance portion **32** and a larger generally oval-shaped portion **33**. The rear end of oval-shaped slot portion **33** (indicated by double ended arrow **34**, Fig. 4*a*) is longer vertically than the front end thereof (indicated by double ended arrow **35**, Fig. 4*a*) so that the slot portion **33** is tapered for a purpose to be hereafter described. The follower **10** has a base or bottom wall surface **36**, a substantially upright back surface **37** and an upwardly rearwardly slanting front wall surface **38**. The base or bottom wall surface **36** is provided with projecting, spaced, preferably saw-tooth-shaped transverse ribs **39**; and finger grip recesses **40** are preferably provided in the rear surface **37**.

A series of spaced preferably saw-tooth-shaped transverse grooves or slots **41** are preferably provided in the curved card supporting wall **25** of tray **24**; and the ribs **39** of the follower **10** are adapted to be engaged selectively in said grooves **41** for stopping rearward movement of the follower along rail **28**. The grooves **41** as shown, stop short of the outer side edges of wall **25** and also short of the central rail **28** so that the smooth peripheral surface **25***a* is not interrupted with any projections or with any continuous recesses that run to the edge thereof. Thus, the bottom edges **13***a* of cards **13** may slide back and forth

over the smooth surface 25a of wall 25 without any interference from recesses 41.

At the rear end of card supporting wall 25, spaced transverse slots 42 are provided which extend to the edges of wall 25 for indicating the last stop position with which ribs 39 of follower 10 may be engaged before removal of follower 10 from tray 24, as best indicated in Figs. 3 and 6.

Referring particularly to Fig. 6, the upwardly rearwardly slanting front wall 38 of the follower 10 is engaged by the rear card of the group of cards 13 illustrated; and the weight or pressure of cards 13 against follower 10 tends to tilt the follower on an axis transverse to the rail head indicated in the drawings by the line L. Thus, the lower front end 38a of the follower moves forwardly upwardly, and the top corner 38b of the follower moves rearwardly downwardly, to wedge clamp the follower between the rail head 29 and card supporting wall 25.

When this wedge clamping occurs, the lower front corner portions 35a of oval slot tapered walls engage the underside of rail head 29, as best shown in Figs. 5 and 6. At the same time, follower ribs 39 engage the top surface 25a of wall 25, or in one set of the series of grooves 41, or in end slots 42, depending upon the position of follower 10. The follower 10 engages, compresses or holds the cards at any place as it is slid forward along rail 28 to act as a card compressor or follower; and the sliding movement of follower 10 along rail 28 results from tilting the follower 10 in the other direction on the axis L by simply applying pressure at the upper corner 38b of the follower toward the back of the cards. Thus, the follower moves into card follower position by applying external pressure to the follower toward the cards to be held, and by then releasing such external pressure whereupon the pressure of the cards snaps the follower into wedge clamped position.

However, the follower 10 must be laterally flexed as by gripping a thumb T on the top edge 38b, and two fingers F in recesses 40 to bend or distort its shape, to enlarge the keyhole-shaped slot and to angle its base, as shown in Figs. 7 and 8, in order to release engagement of ribs 39 in grooves 41 or 42 for moving the follower from a wedge clamped position toward the open end or rear end of the tray 24, or for removing the follower from the tray.

In order to provide for flexing or bending the follower in the manner just described, the follower is preferably formed in one piece of moldable thermoplastic material, such as cellulose-acetate-butyrate plastic material, which has sufficient flexibility and elasticity to permit distortion in the manner illustrated and also to permit the follower to spring back to the normal shape shown in the drawings.

The trays 18 and 24 and likewise the segments 11 are also preferably formed of similar thermoplastic material in order to achieve the advantages of a card rail formed of such material described in my prior application Serial No. 501,567.

Moreover, when the follower 10 is formed of thermoplastic material, or when the follower 10, rail 11, 19 or 28 and card support surfaces 17, 21 or 25a are formed of thermoplastic material, the movement, positioning, wedge clamping or stopping the follower in any position along or on the rail does not mar, dent, pit or otherwise disturb the smooth surface of the rail and card supporting surfaces in such a way as to cause excessive wear upon cards sliding to and fro along the rail in use.

Although the rail in every instance is illustrated as a curved or arcuate rail, the improved follower construction may be used on trays that are flat with straight rails having enlarged heads and the rails may be formed integrally with or detachably mounted on the trays or wheels.

Referring particularly to Fig. 5, the follower construction does not impose any limitation upon the width or size of the cards 13; and if it is desired to use wider cards than those illustrated on the rotary index 12 or desk trays 18 or 24, for instance of a size that will not hold properly on one rail, two parallel rails may be provided and the follower 10 may be associated with one or both of such rails.

From the foregoing description it is understood that the follower 10 may be used as a tray end for a desk card tray, or as an end of a section of a rotary index 12 rotated with one rail segment 11 removed, or as an end for a rail segment 11, or tray 24 being transferred from a wheel to be used as a desk tray. Moreover, the improved follower member 10 functions as a card follower or compressor so that when the term "follower" is used herein and in the claims that term is intended to refer to a construction wherein a follower member may be used either as a card follower, or a card compressor, or a card stop, or a card tray or rail end.

Accordingly, the present invention provides a card follower construction for card files or card indexes, wherein cards are mounted on a rail with an enlarged head by means of keyhole-shaped slots in the bottom edges of the cards, in which the follower member has a very simple, one-piece design, easy and inexpensive to manufacture; which follower member may be adjusted to any desired position and used as a follower, compressor, end or stop member in rotary indexes or card trays; which construction does not cause or require variations in the shape of the rail on which the cards are mounted that increases wear on the cards; which construction permits end loading of the cards on the rail; which construction enables the cards to be used either on a rotary index wheel or on a desk tray; and which construction permits the use of any desired size of card.

The embodiment of the invention illustrated and described herein is by way of example, and the scope of the present invention is not limited to the exact details of construction of the various parts. When the term "rail" is used herein and in the appended claims, that term is used in its broadest sense and includes a rail either arcuate or straight, either detachably or integrally supported, and having a keyhole shape in cross section.

Having now described the features of the invention, the construction, operation and use of a preferred embodiment thereof, and the advantageous, new and useful results attained by the improved construction; the new and useful devices, constructions, arrangements, combinations, sub-combinations, parts and elements, and reasonable mechanical equivalents thereof obvious to those skilled in the art, are set forth in the appended claims.

I claim:

1. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card sup-

porting wall associated with the rail; and a follower member formed of flexible material having a keyhole-shaped slot at its lower edge slidably engageable on the rail and having spaced portions for wedge engagement with said rail head and said supporting wall.

2. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; and a one-piece follower member formed of flexible material having a keyhole-shaped slot at its lower edge slidably engageable in one direction on the rail and wedgeably engageable in the other direction on the rail, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

3. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; and a follower member formed of flexible material having a tapered keyhole-shaped slot at its lower edge slidably engageable in one direction on the rail and wedgeably engageable in the other direction on the rail, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

4. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; and a follower member formed of flexible material having a keyhole-shaped slot at its lower edge slidably engageable on the rail, and having an upwardly rearwardly slanted card engaging face whereby pressure of the cards on the slanted follower face tilts the follower to wedgeably engage the rail and supporting wall, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

5. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; a follower member formed of flexible material having a keyhole-shaped slot at its lower edge slidably engageable on the rail, said follower being tilted with respect to the rail by backward pressure of the cards; and interengageable means on the follower and said supporting wall for positively stopping rearward movement of the tilted follower at selected positions along the rail.

6. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall member associated with the rail; a follower member formed of flexible material having a keyhole-shaped slot at its lower edge slidably engageable on the rail; and groove means formed on one of the members and rib means formed on the other member, said groove and rib means being interengageable for positively stopping rearward movement of the follower at selected positions along the rail.

7. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; a follower member formed of flexible material having a keyhole-shaped slot at its lower edge slidably engageable on the rail; a series of grooves formed in said card supporting wall, and rib means formed on the bottom wall of said follower selectively engageable with said grooves.

8. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail having side edges spaced laterally of the rail; a follower member formed of flexible material having a keyhole-shaped slot in its lower edge slidably engageable on the rail; a series of transverse grooves formed in said card supporting wall and terminating short of the edges thereof, and ribs formed on the bottom of the follower selectively engageable in said grooves.

9. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; a follower member formed of flexible material having a keyhole-shaped slot with head and flange engaging portions at its lower edge slidably engageable on the rail, the follower member being substantially triangularly-shaped in cross section, the head-engaging portion of the keyhole-shaped slot being forwardly tapered; and a forward tapered corner of said head-engaging portion and the rear base corner edge of the follower being engageable respectively with the underside of the raid head and the supporting wall for wedge clamping the follower by rearward pressure of the cards against the follower.

10. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall formed integrally with the rail; and a one-piece follower member formed of flexible material having a keyhole-shaped slot at its lower edge slidably engageable in one direction on the rail and wedgeably engageable in the other direction on the rail, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

11. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; and a one-piece follower member formed of flexible thermoplastic material having a keyhole-shaped slot at its lower edge slidably engageable in one direction on the rail and wedgeably engageable in the other direction on the rail, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

12. In a card filing device, a rail comprising a head and flange formed of thermoplastic material constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; and a one-piece follower member formed of flexible thermoplastic material having a keyhole-shaped slot at its lower edge slidably engageable in one direction on the rail and wedgeably engageable in the other direction on the rail, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

13. In a card filing device, a rail comprising a head and flange formed of thermoplastic material constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall formed of thermoplastic material associated with the rail; and a one-piece follower member formed of flexible thermoplastic material having a keyhole-shaped slot at its lower edge slidably engageable in one direction on the rail and wedgeably engageable in the other direction on the rail, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

14. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall formed integrally of thermoplastic material with said rail; and a one-piece follower member formed of flexible thermoplastic material having a keyhole-shaped slot at its lower edge slidably engageable in one direction on the rail and wedgeably engageable in the other direction on the rail, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

15. In a card filing device, an arcuate rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; an arcuate card supporting wall having a smooth card-engaging surface associated with the rail; and a follower member formed of flexible thermoplastic material having a tapered keyhole-shaped slot at its lower edge slidably engageable in one direction on the rail and wedgeably engageable in the other direction on the rail, the flexibility of the follower permitting lateral distortion thereof to enlarge the slot and release the wedge engagement.

16. In a card filing device, a rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a card supporting wall associated with the rail; a follower member formed of flexible material having a keyhole-shaped slot at its lower edge slidably engageable on the rail; interengageable means on the follower and card supporting wall for positively stopping rearward movement of the follower at selected positions along the rail; and means on the follower whereby the follower may be gripped to flex it upwardly at either side of the rail for releasing engagement of the interengageable means to move the follower on the rail away from the cards.

17. In a card filing device, a curved rail comprising a head and flange constructed and arranged to receive a multiplicity of cards having keyhole-shaped slots at their lower edges; a curved card supporting wall associated with the rail; a follower member formed of flexible thermoplastic material having a tapered keyhole-shaped slot at its lower edge slidably engageable on the rail; said follower member being triangularly-shaped in cross section with an upwardly rearwardly slanting front wall surface for engaging the rear card of a group of cards, whereby the pressure of the cards on the follower tends to tilt the follower on an axis transverse to the rail, so that the lower forward portion of the follower below the rail head moves forwardly upwardly and the upper portion of the follower above the rail head moves rearwardly downwardly to wedge clamp the follower between the rail head and supporting wall; interengageable means on the follower and supporting wall for positively stopping rearward movement of the tilted follower at selected positions along the rail; the follower being adapted to be tilted on said axis in the other direction by pressure applied at the upper rear portion thereof toward the cards to slide the follower along the rail to engage and compress the cards; and the follower being adapted to be flexed upwardly at either side of the rail to move the follower on the rail away from the cards.

KARL H. MILLER.