

Jan. 24, 1956

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2,731,966

ROTARY CARD-FILING DEVICE

Filed March 26, 1953

4 Sheets-Sheet 1

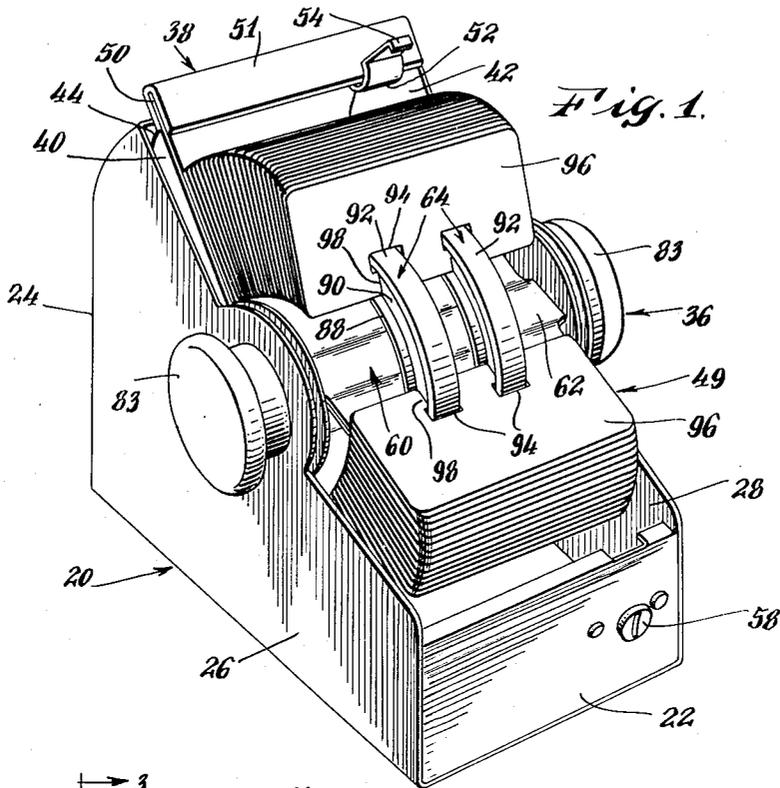


Fig. 1.

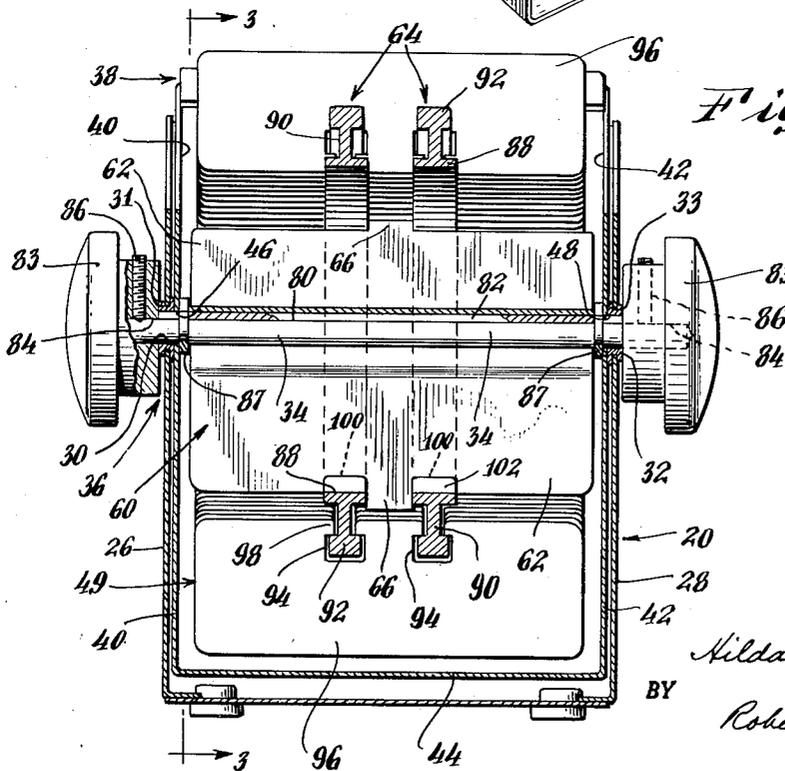


Fig. 2.

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Jan. 24, 1956

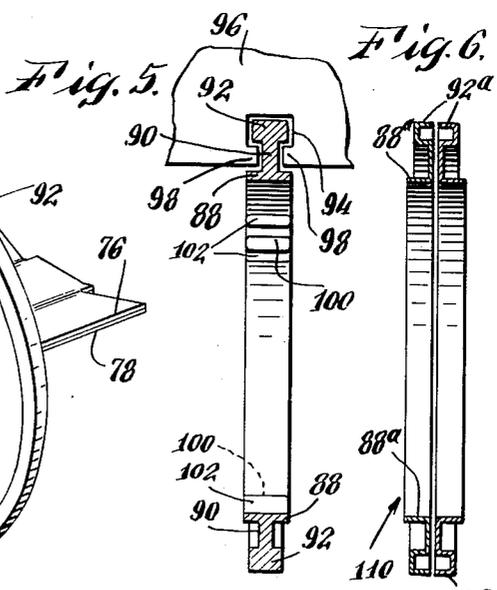
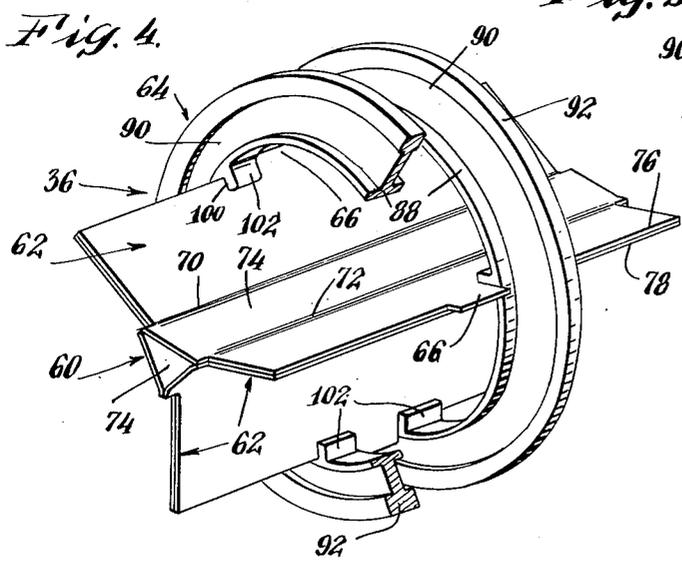
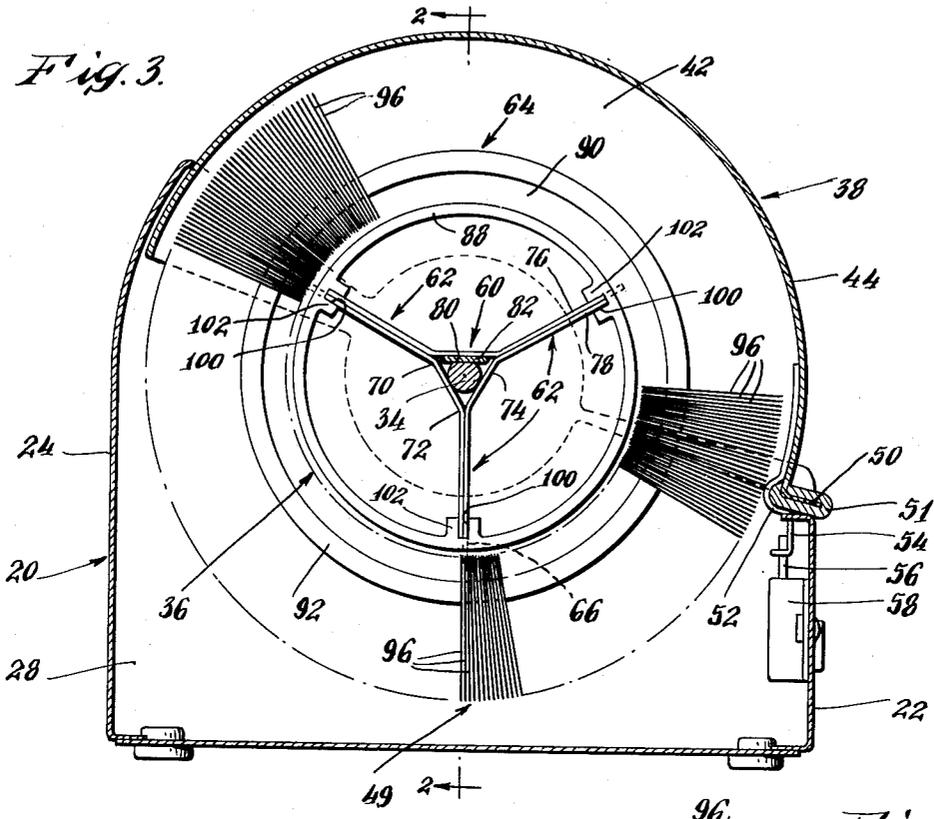
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ROTARY CARD-FILING DEVICE

Filed March 26, 1953

4 Sheets-Sheet 2



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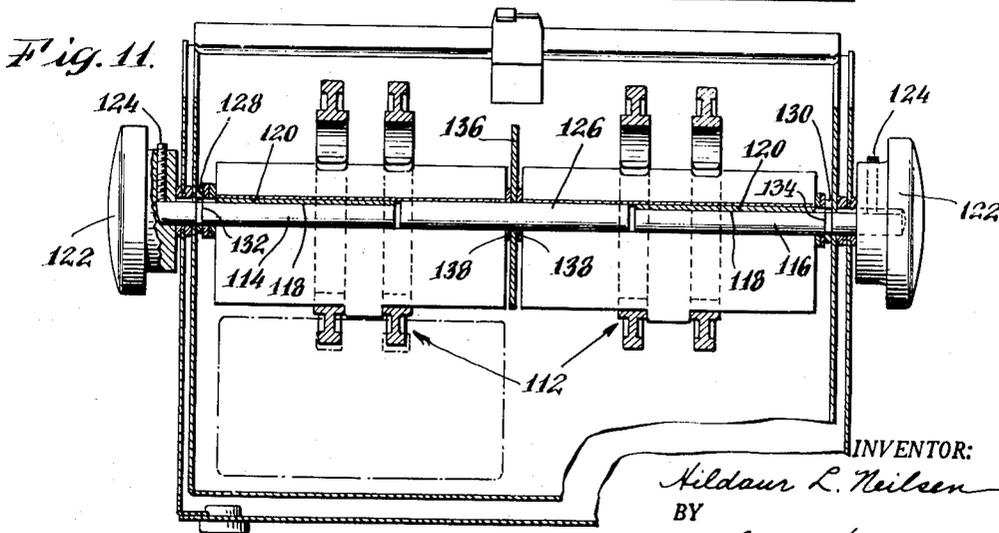
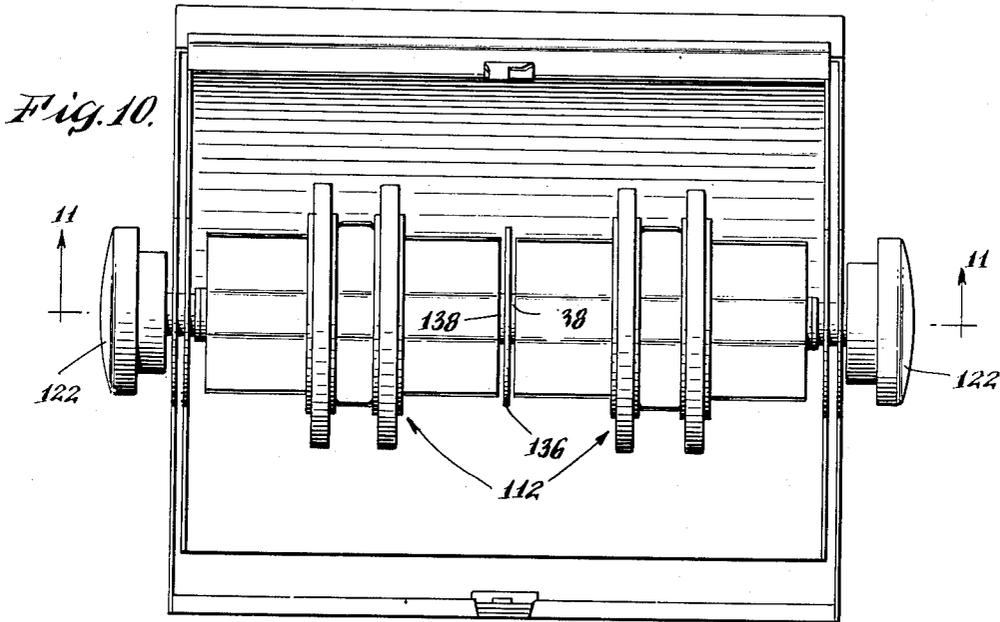
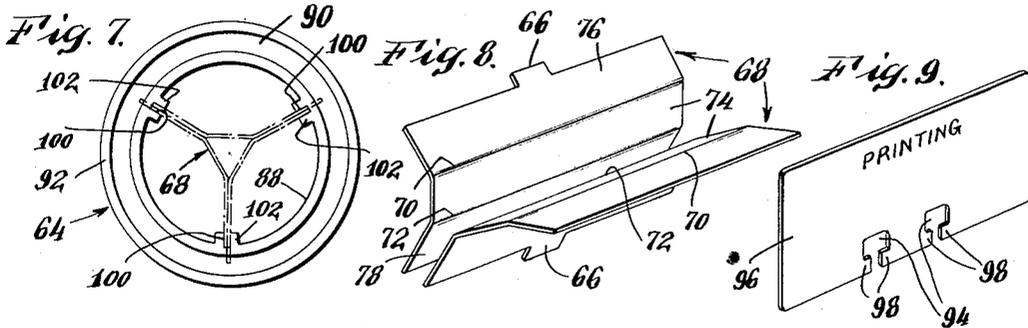
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ROTARY CARD-FILING DEVICE

Filed March 26, 1953

4 Sheets-Sheet 3



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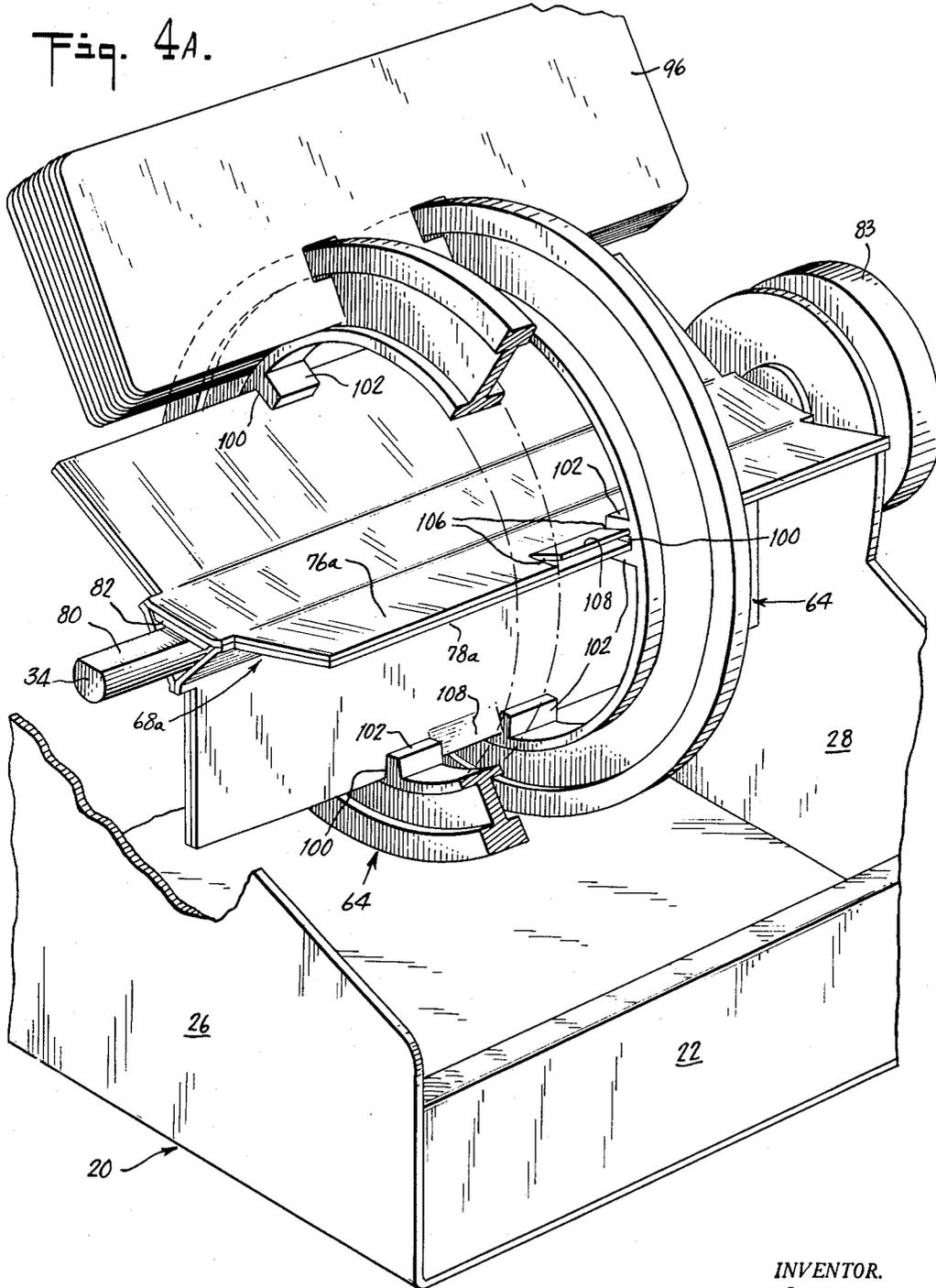
2,731,966

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Fig. 4A.



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## ROTARY CARD-FILING DEVICE

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Application March 26, 1953, Serial No. 344,749

8 Claims. (Cl. 129—16)

This invention relates to improvements in rotary card-filing devices in which a stack of file cards is arranged circularly around the periphery of a rotor in such manner that, by turning the rotor, any desired card in the stack may be brought into view and made accessible for the viewing of entries on said card or for the entry of further data thereon. More particularly, this invention relates to an improved card-carrying rotor and improved means for supporting said rotor in a card-filing device.

It is common practice, in rotary card-filing devices, to provide one or more circular, beaded, cardholding rails or rings suitably mounted upon a cross-rod or shaft in such manner that the rails and the cards thereon can be rotated about the shaft's axis; and to provide notches, usually at the bottom margins of file cards, to engage the rails therewithin in order to be held thereon. Ordinarily, the number of cards carried upon such rails is such that they will not be compacted very tightly so that there will be enough free space to permit cards at the top of the circular stack to be spread apart for inspection or for the addition of data thereon.

One problem which has created considerable difficulty in the production of these devices resides in the particular arrangement by which the rails are associated with the shaft. Hitherto, for example, a rotary drum has been mounted on the shaft and a circular bead rail or rails have been molded with or otherwise fixed to the drum in encircling position therearound. Another expedient has been to provide the bead rails at the outer peripheries of rotary disks and to mount the disks upon the shaft. The mentioned drum structure, while satisfactory from an operational standpoint, has been quite expensive to produce. The arrangement of the rails at the outer peripheries of disks is not all that could be desired, at least from the standpoint of appearance, because, when disks alone are used, an objectionable open space is present within the circular stack of cards. This objection has been overcome in a measure by the use of dress-up tubes between the disks and at opposite ends of the disk assembly, but, as the tubes are loose about the shaft and are not maintained concentric with the shaft and with the bead rails, such dress-up tubes are not entirely satisfactory.

An important object of the present invention, accordingly, is the provision of a rotary card-filing device having improved rotary means for carrying a circular stack of file cards.

Another important object is the provision of such a card-filing device with improved, rotary card-carrying means which are relatively inexpensive to produce.

Another important object is the provision of such a card-filing device having card-carrying means which are constrained to rotate with the shaft so that said means with cards thereon may be conveniently rotated by means of knobs fixedly secured to opposite ends of the shaft.

Another important object is the provision of such a card-filing device having rotary card-carrying means which are designed to support two distinct circular stacks of

cards, in side-by-side relationship, in such manner that each stack of cards may be rotated for reference to a selected card or for the addition of data thereon without in any way disturbing or rotating the other stack of cards.

The foregoing and other objects are accomplished according to the present invention by structures such as are shown, for illustrative purposes, in the accompanying drawings without, however, limiting the invention to those particular structures.

In the drawings:

Figure 1 is a perspective view of an open, rotary card-filing device having improved card-carrying means according to the present invention.

Fig. 2 is a vertical sectional view of the device, substantially on the line 2—2 of Fig. 3.

Fig. 3 is a vertical sectional view of the device, toward one side thereof, substantially on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view of a preferred form of card-carrying means for the device according to this invention, one of two card-holding bead rails being broken away to disclose certain details.

Fig. 4A is a perspective, fragmentary view, somewhat similar to Fig. 4, but showing modified card-carrying means within this invention.

Fig. 5 is a transverse sectional view of a card-holding bead or rail ring such as is included in the card-carrying means illustrated in Fig. 4, and shows also a fragment of a related file card.

Fig. 6 is a transverse sectional view of an alternative form of card-holding bead ring which may be employed instead of the ring shown in Figs. 4 and 5.

Fig. 7 is a side elevational view of the bead ring illustrated in Figs. 4 and 5, including a broken-line showing of rail or ring supporting parts of the card-carrying means.

Fig. 8 is a perspective view of two bent plates such as may be employed in forming the ring-supporting structure illustrated in the hereinbefore mentioned figures.

Fig. 9 is a perspective view of a slotted file card suitable for use with a rotary card-filing device according to the present invention.

Fig. 10 is a top plan view of a modified, open, rotary card-filing device according to this invention, in which the rotary card-carrying means are adapted to receive two distinct circular stacks of file cards in side-by-side relationship, the cards being omitted, however, to more clearly disclose other parts of the device.

Fig. 11 is a vertical sectional view substantially on the line 11—11 of the structure disclosed in Fig. 10.

Referring first to Figs. 1, 2 and 3, for a general understanding of the present invention, the device shown therein comprises a case 20, preferably of sheet metal, having a front wall 22, a back wall 24 and opposite side walls 26 and 28. The case is open at its top except when closed as hereinafter explained. The upper edges of the two side walls slope downwardly from the back to the front of the device and, at directly opposite intermediate points near these edges, the side walls are provided with openings 30, 32, which may either function as bearings or have separate bearing bushings 31, 33 therein to receive a horizontal shaft 34 upon which hereinafter described card-carrying means 36 are mounted.

Journalled on the shaft 34 is a sheet-metal cover 38 which is approximately in the form of a half of a drum or cylinder having opposite, approximately half-circular, end walls 40, 42 and an outer semi-cylindrical wall 44. To enable this cover 38 to be supported upon the shaft, the side walls 40, 42 are formed with openings 46 and 48 adjacent to the free edges of said walls and approximately intermediate the ends thereof so that, when the cover is in assembled relation to the case 20, it fits quite closely within the case and is capable of rotary movement through approximately 180° from a closed position,

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in which the cover closes the opening in the top of the case and covers a circular stack 49 of file cards therein, to an open position in which the cover extends almost completely within the case 20 in a position underlying and partially surrounding said stack of cards, as may best be understood by reference to Fig. 2.

The cover 38 is provided at its forward end with a radial flange 50 which, as best seen in Fig. 1, serves to limit the opening movement of the cover by an abutting or interfering contact with the upper edge of the back wall 24 of the case. This flange 50 serves also to limit the closing movement of the cover by abutting or interfering engagement with the upper edge of the front wall 22 of the case, as may best be understood from Fig. 3. The flange 50, preferably, is covered with a plastic material which is softer or at least less resonant than metal in order to minimize shock and noise when the cover is opened and closed. Optionally, means may be provided for locking the cover in closed position, for which purpose a tongue 52 may be welded toward the front inner surface of the circumferential wall 44 of the cover and have a latch portion 54 at its free end which may be engaged by a locking element 56 of a lock 58, in a well understood manner.

In addition to serving as a support for the cover in order to enable the latter to be pivoted between its opened and closed positions, the shaft 34 functions as an important part of the card-carrying means. It is important not only in the sense that it supports the mechanism which carries the cards but also because it serves as a means for rotating that mechanism and a circular stack of cards carried thereby.

The card-carrying means comprise, in addition to the mentioned shaft 34, a bead rail supporting structure having a hub portion 60 through which said shaft extends and plural fins or webs 62 extending radially outwardly from said hub portion. As viewed endwisely, as in Fig. 3, these webs or fins appear like the spokes of a wheel but, as may be seen from Fig. 4, the webs are of substantial length. Actually these webs, preferably, are of a length which is only slightly less than the inside cross-dimension of the cover 38. Thus, the several webs or fins 62 (three in number as illustrated in the drawings) are somewhat like a paddle wheel in appearance. Mounted upon this paddle wheel is at least one, but preferably two, circular card-holding bead rails or rings 64, of a preferred form of which the details may be ascertained by reference particularly to Figs. 4, 5 and 7. These bead rails or rings are so formed that they slide quite snugly onto the paddle wheel from opposite ends thereof and may be spaced apart by outwardly extending tongues 66 on the webs or fins 62.

It may readily be understood that the paddle wheel arrangement and the card-holding bead rails or rings may be formed in various ways well known to skilled artisans; nevertheless, it has been found that such a card-carrying structure as is illustrated and disclosed in this application is very satisfactory and can be produced quite economically. Thus, within the present invention, the card-carrying means include a paddle wheel structure and bead rails or rings either or both of which may be made either in molded plastic or in sheet metal or in various other ways.

Referring particularly to Figs. 3, 4, 7 and 8, such a paddle wheel structure may be formed by assembling a plurality of segments in the form of bent sheets 68 of flat metal. Each of these sheets may be formed with two parallel longitudinal bends at 70 and 72 to form an intermediate longitudinal portion 74 and outer longitudinal portions 76 and 78. As illustrated, the device includes three of the bent flat metal sheets 68, and in each of such sheets the portions 76, 78 are disposed at approximately 120° from each other, so that, when the three metal sheets are brought together, in the arrangement best seen in Fig. 3, the portion 76 of each of the metal

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sheets is in face-to-face association with the portion 78 of an adjacent one of the other of said metal sheets.

The intermediate longitudinal portions 74 of the three flat-metal sheets 68 combine, when those metal parts are associated as hereinbefore indicated, to form the hub portion 60 through which the shaft 34 extends. The three sheets 68 may be welded together, if desired, to form a unitary structure, but that is not necessary because of the manner in which those metal parts are associated with and held together by the card-carrying bead rings 64, as hereinafter explained.

The shaft 34, preferably, is formed with a flat 80 along one side thereof, and a shim strip 82, preferably, is inserted within the hub 60 between the flat 80 and the inner surface of an intermediate longitudinal portion 74 of one of the flat-metal sheets 68, in order to constrain the paddle wheel and the card-carrying bead rings, with the card thereon, to turn with the shaft. The flat 80 may advantageously extend for the entire length of the shaft, which, as best seen in Fig. 2, protrudes beyond opposite sides of the case 20, and knobs 83, of molded plastic or other suitable material, may be provided with suitable shaft-receiving bores 84, into which the ends of the shaft may extend and set-screws 86 in said knobs may be screwed tightly thereto so that their inner ends contact the flat 80 and thereby hold the knobs on the shaft and constrain the two to turn together. Washers 87, on the shaft 34 at opposite ends of the paddle wheel, serve to space the latter from the case and center it therein. Thus, one using the device may manipulate either of the knobs 83 and thereby turn the shaft 34 and the entire card-carrying mechanism with the cards thereon, in order to bring any desired card into an accessible position for the viewing of a selected card or for the entry of data thereon.

Although the tongues 66 may be provided on both the longitudinal portions 76 and 78 of each sheet-metal part 68, nevertheless, it may be understood that it suffices for the tongue 66 to be provided on either one of the longitudinal portions 76 or 78 of each sheet-metal part 68, as, in the assembled paddle wheel, such tongues function as means at three circumferential points for spacing the bead rings 64 from each other.

The bead rings 64, preferably, are similar and may advantageously be in the form shown in Figs. 4 and 5. Such rings or annuli may be molded of suitable rigid plastic material and, in order to enhance the strength and rigidity of said rings, they, preferably, are formed with an inner cylindrical flange 88. Extending outwardly from flange 88 is a radial web 90 which terminates at its outer periphery in an enlarged circular bead 92. This bead may be of various shapes in cross-section such as, for example, circular or elliptical, but it is shown in the drawings as being of substantially rectangular cross-section and of such dimension that it sets loosely but, nevertheless, quite closely within a more or less T-shaped slot 94 in a card 96 suitable for use with this device.

Each individual card 96, as shown in Fig. 9, is, of course, provided with as many slots 94 (two in the present illustration) as there are card-carrying bead or rail rings 64 provided in the structure. The slot 94 is slightly larger than the bead 92 and the thickness of the web 90 so that a card may slide quite easily along the said bead to the extent permitted by other adjacent cards in a circular stack on the rings. It should be understood that one or more cards 96 may be applied to the rail rings 64, or added to a stack 49 of such cards on said rings, by temporarily spreading apart the card portions 98 defining the narrow or neck portions of slots 94 so that the beads 92 may pass into said slots; whereupon the card portions 98 will resume their flat condition in holding position underneath the beads 92 whereby the cards will be held in place on the beads. The mentioned spreading of card portions 98 occurs when they are pushed upon the said beads with the cards disposed tan-

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gentially to the latter. A similar spreading action of card portions 98 occurs when the cards, in tangential position, are removed from the beads.

Each card-holding bead ring 64, preferably, is provided with plural, internal, axial slots 100, which, in the form of bead ring detailed in Figs. 4 and 5, are in the nature of spaces between pairs of internal lugs 102 formed integrally with cylindrical flange 88. In assembling the card-carrying means, the bent metal sheets 68 are welded or suitably held together in the form of the described and illustrated paddle wheel, whereafter the two similar card-holding bead rings are pushed onto the paddle wheel from opposite ends thereof with the outer margins of the three sets of outer longitudinal portions 76, 78 of the several bent metal sheets 68 sliding in the slots 100. These marginal metal sheet portions may be a rather tight frictional fit with respect to the bottoms and/or the sides of the slots 100 so that they may be held frictionally in their proper places, in abutment with tongues 66, as shown in Fig. 4. But such a tight fit is not essential because, in the absence thereof, the cards 96 carried thereby will hold the bead rings in their proper axial positions and the tongues 66 will keep the card stack 49 properly centered in the device. As shown in Fig. 2, the washers 87, on shaft 34 at opposite ends of the paddle wheel, serve with the knobs 83 to keep the paddle wheel centered on the shaft.

Fig. 4A shows that the tongues 66 may be omitted and their described function performed by providing a pair of short radial slits 106 in one of the portions 76a, 78a of the bent flat-metal sheets 68a and by bending angularly the metal between said slits to form a tongue 108. As the two portions 76a, 78a at the tongue 108 have an over-all thickness greater than the width of slot 100, it follows that tongue 108 will function like tongue 66 to limit the inward axial movement of the rings 64.

Fig. 6 illustrates another of numerous types of bead rings which may be employed within this invention. Said ring, numbered 110, is formed by pressing or otherwise giving, to a pair of sheet-metal annuli, opposing or facing S shapes in cross-section so that the radially outermost halves of the formed annuli constitute, together, a peripheral card-holding bead 92a, and the radially innermost portions of the formed annuli constitute a cylindrical flange 88a. This form of bead ring has no internal axial slots such as slots 100; therefore, it may be advantageous, where these rings are used, for the metal sheets, constituting the paddle wheel, to be welded or otherwise integrated. It should be obvious, also, that where this type of ring is employed, the paddle wheel preferably should have radially extending tongues such as tongues 66.

The embodiment illustrated in Figs. 10 and 11 differs from the hereinbefore described structures principally in having means for supporting two circular stacks of cards in the device in such manner that the two stacks may be turned independently of or relatively to each other by a user of the device. By such an arrangement, the user, in making entries on cards in the device or in bringing a particular card into view for inspection, need turn only half the mass of cards which, otherwise, would have to be turned in the use of a generally similar device of the same card capacity.

More particularly, the structure of Figs. 10 and 11 is provided with a pair of coaxially arranged card-carrying means 112 which may be of any suitable type but are disclosed herein, for illustrative purposes, as of the general character shown in Figs. 1-4. Instead of mounting these on only a single shaft such as shaft 34, separate stub shafts 114, 116 are provided with respect to each of the card-carrying means. These shafts are similar, each having a longitudinally extending flat 118 and a shim 120 between the flat and the surrounding hub to constrain said shafts with their related card-holding struc-

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tures to turn together. Knobs 122 are held fixedly by set screws 124 on the ends of the shafts 114, 116.

The shafts 114, 116 terminate at their inner ends within their directly related card-carrying means 112, and, to support the inner ends of said means, a free shaft 126 is provided within the hubs of the card carriers 112 and extending almost to the opposed inner ends of the shafts 114, 116. The free shaft 126 is completely cylindrical so that either of the card carriers may turn freely in relation thereto. Split snap rings 128, 130, yieldably snapped into grooves 132, 134 in the shafts 114 and 116 at points within the case of the device, serve to hold the shafts permanently in their proper positions, as shown in the drawings. A relatively large flat-metal disk 136, with washers 138 at opposite sides thereof, is provided on the shaft 126 between the two card carriers to prevent rotary interference between said carriers.

It may be understood by those familiar with such devices that the present invention provides novel rotary card-carrying means which, when assembled, are very rigid and satisfactorily hold a circular stack of cards in a rotary card-filing device; that such card-carrying means can be economically produced; and that such means fulfill the various stated objects.

It should also be observed that the underlying concept of this improvement may be utilized in various other ways than shown and described herein, while nevertheless, conforming to the present invention as set forth in the following claims.

I claim:

1. In a rotary card-filing device, a rotatable shaft, means rotatably supporting said shaft, a wheel mounted on said shaft and fixed against rotation relative thereto, a plurality of substantially circular bead rings fixedly mounted on said wheel and a plurality of cards engaged by said bead rings, said wheel being constituted of a plurality of substantially identical segments, each segment comprising an intermediate longitudinally extending hub portion engaging said shaft and an outer longitudinally extending fin portion integral with said intermediate portion and extending radially outwardly therefrom on each side thereof, the fin portions of adjacent segments being in parallel face-to-face contact, and said bead rings being annuli snugly surrounding said fin portions and each comprising a pair of internal adjacent lugs extending radially inwardly therefrom and frictionally engaging opposite side surfaces of a pair of said face-to-face fins.

2. In a card-filing device according to claim 1, one of said fin portions having a tongue located between said bead rings and said rings abutting said tongue whereby to be positioned axially relative to said wheel.

3. In a card-filing device according to claim 2, said tongue being constituted of the material of its respective fin and being defined by a pair of slits formed in said fin and extending radially inwardly from a longitudinal boundary of said fin, said tongue further extending in a plane forming an angle with the plane of said fin.

4. In a card-filing device according to claim 1, said segments being constituted of sheet metal and said face-to-face fins being welded together.

5. In a card-filing device according to claim 1, said hub portion having a flat internal surface and said shaft having a flat surface coating with said last-mentioned surface, whereby said wheel is fixed against rotation relative to said shaft.

6. A rotary card-filing device comprising shaft, means horizontally supporting said shaft, a wheel mounted on said shaft, a plurality of circular bead rings mounted on and extending about said wheel and a plurality of circularly arranged cards loosely attached to said bead rings; said wheel comprising a plurality of substantially identical segments each of which has an intermediate, longitudinally extending hub portion engaging said shaft, and

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outer, longitudinally extending fins integral with said hub portion and extending radially outwardly from opposite sides of said hub portion; the fins of adjacent segments being in face-to-face contact and said bead rings having internal, axially extending recesses within which extend outer marginal portions of one of said fins.

7. A rotary card-filing device according to claim 6, one of said intermediate hub portions being flat and an opposed surface of the shaft being flat, and the device further including a shim disposed between said one hub portion and said opposed flat shaft surface, constraining the shaft and wheel to turn together, and a manually operable member fixed upon said shaft against rotation relatively thereto, enabling rotation of the bead rings by manual rotation of said member.

8. A rotary card-filing device comprising a pair of devices, each according to claim 6, in side-by-side, co-

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axial relationship, the inner ends of said shafts terminating within the hub portions of their respectively related wheels, and the device, further, including an idling, supporting shaft extending coaxially of the other mentioned shafts and into the inner ends of said hub portions, adapting the wheels of said pair of devices to be rotated independently of each other.

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