

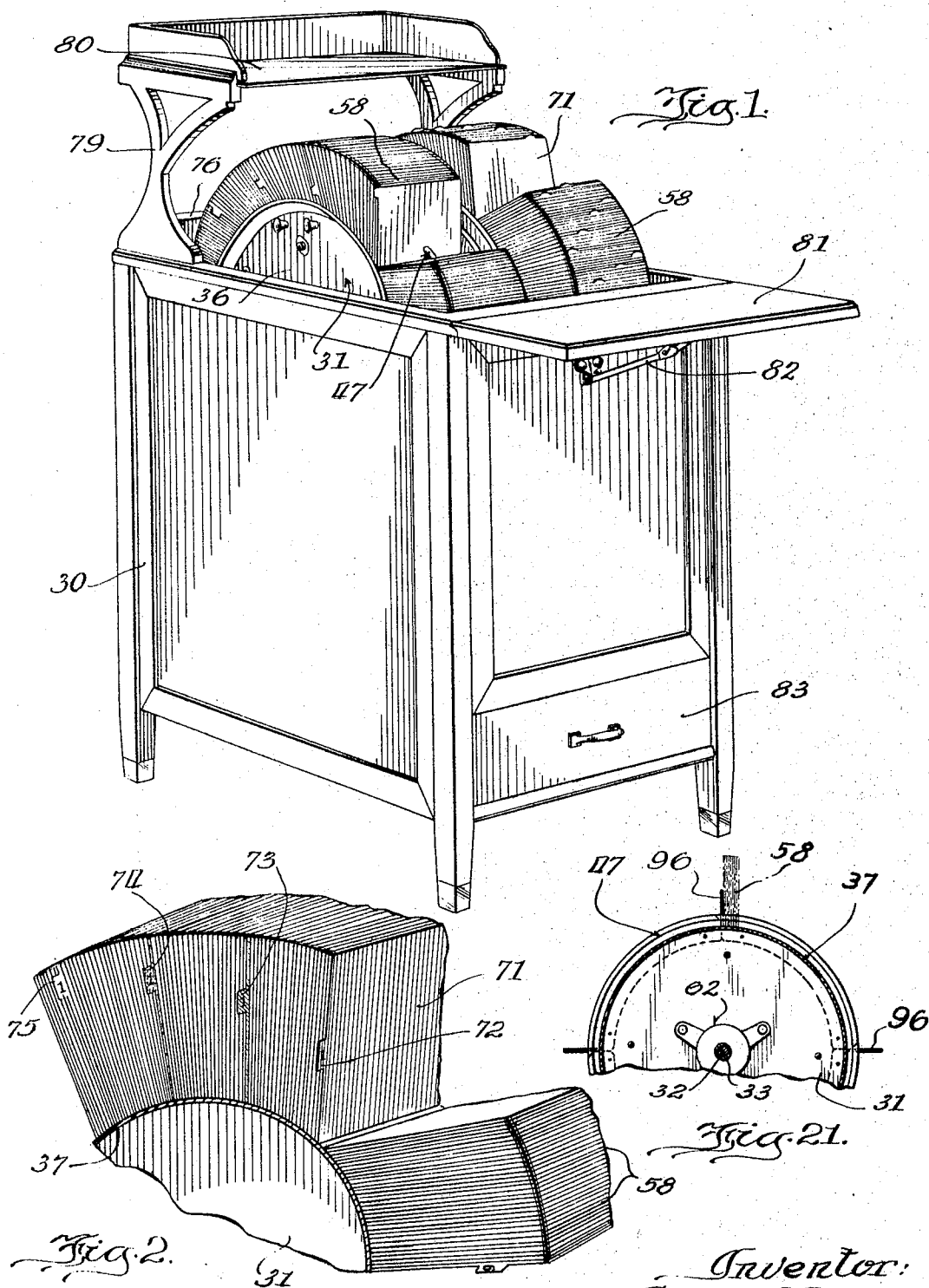
Aug. 8, 1939.

G. C. BRUEN

2,168,323

ROTARY CARD INDEX

Original Filed March 30, 1934 6 Sheets-Sheet 1



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Aug. 8, 1939.

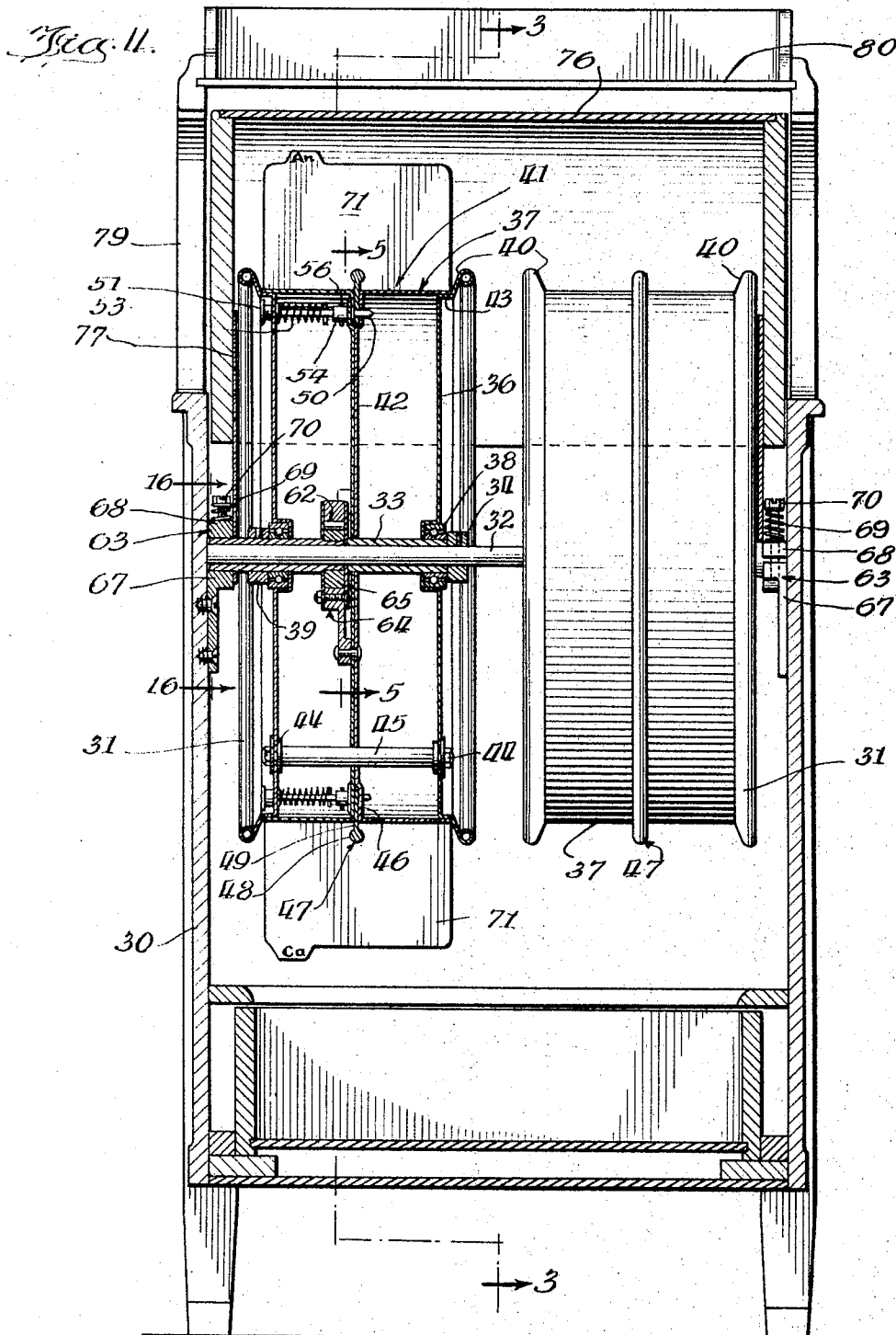
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ROTARY CARD INDEX

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6 Sheets-Sheet 3



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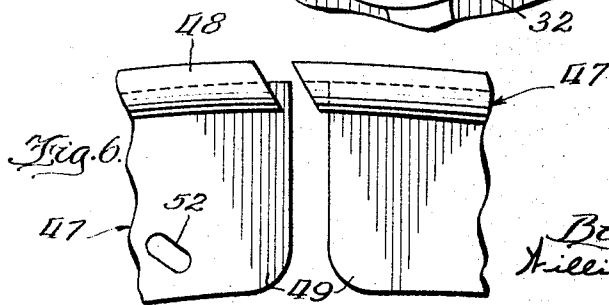
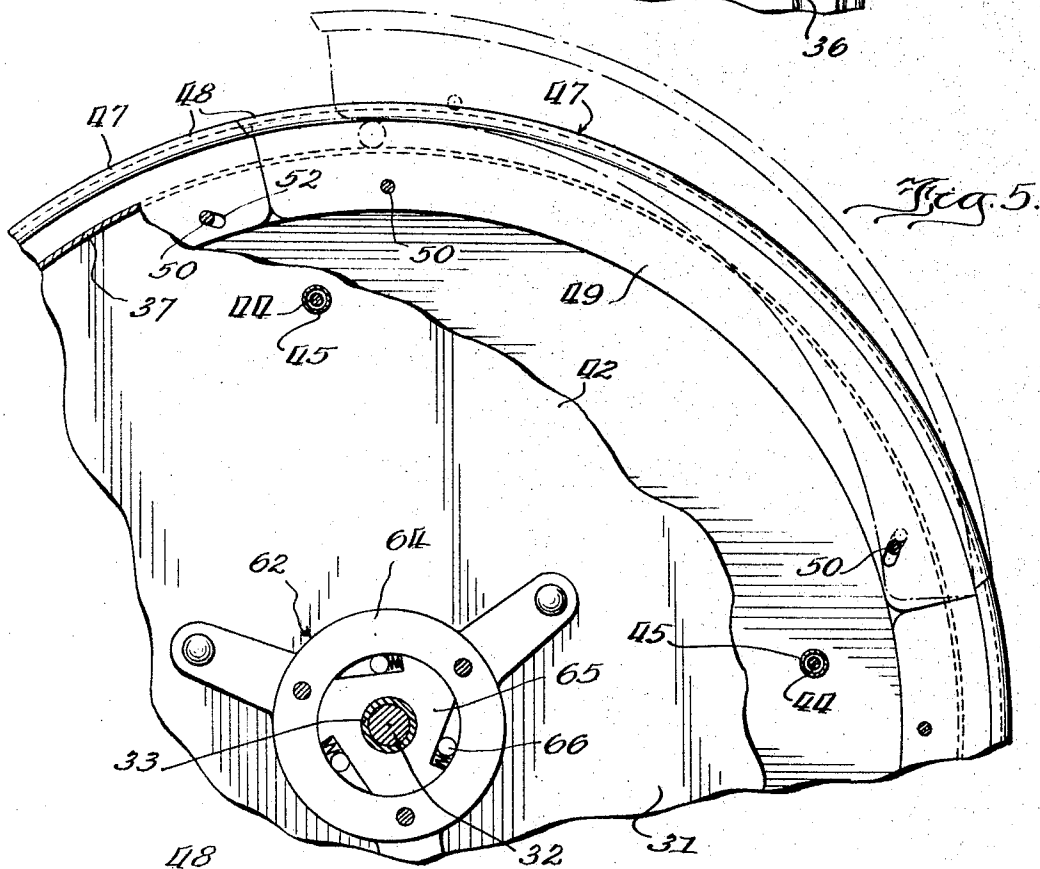
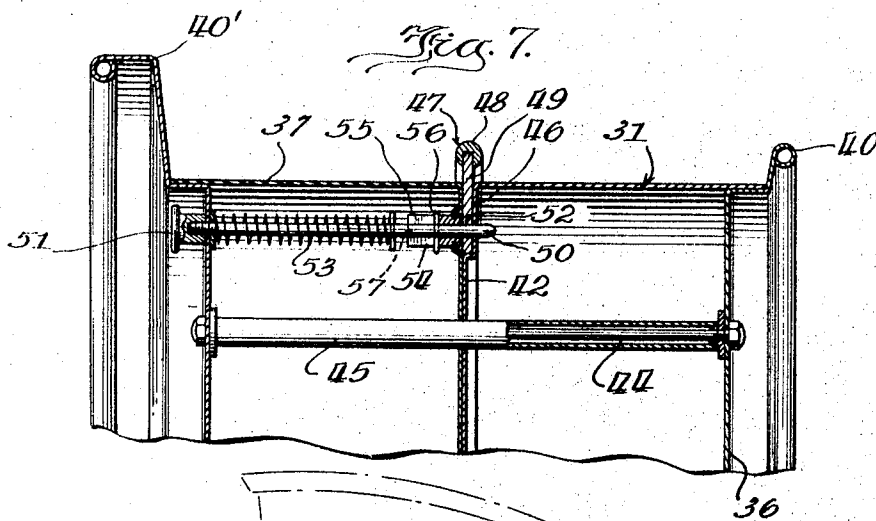
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ROTARY CARD INDEX

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6 Sheets-Sheet 4



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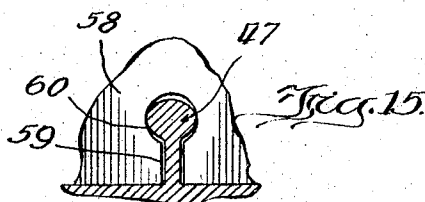
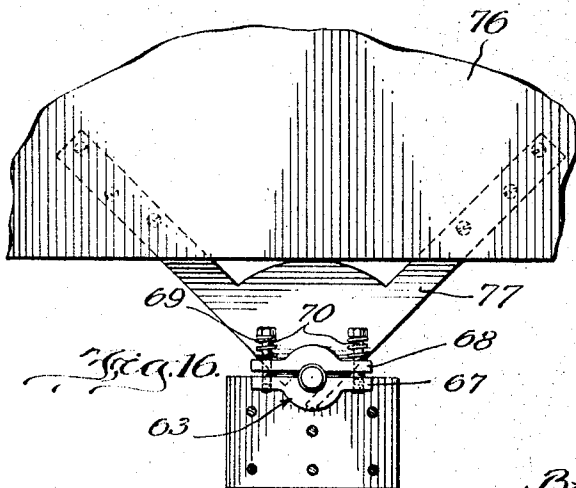
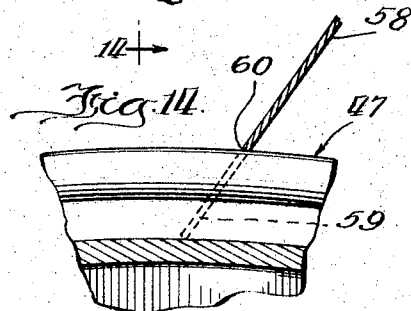
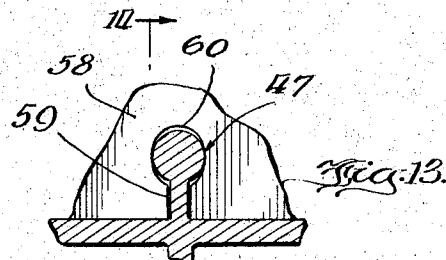
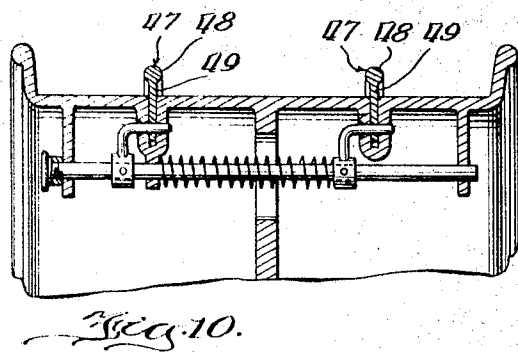
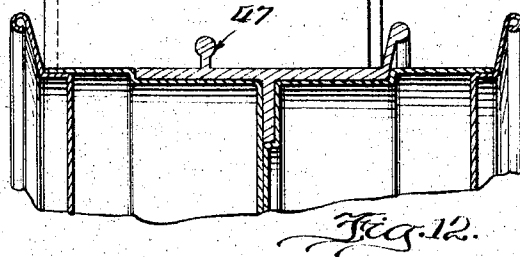
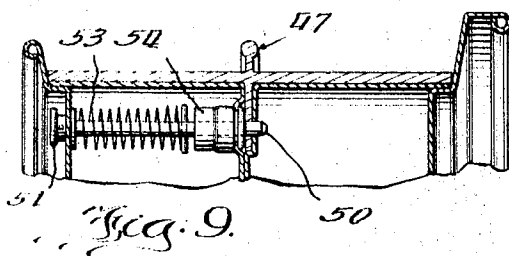
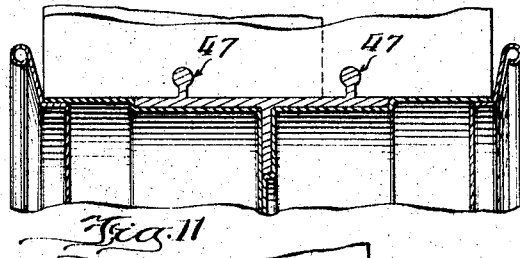
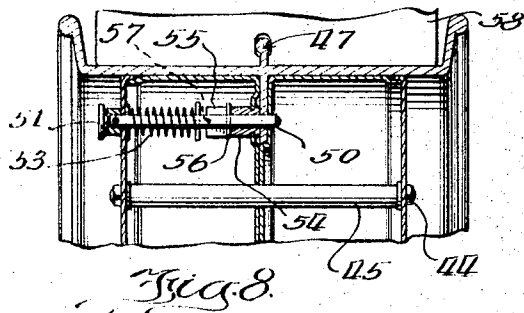
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ROTARY CARD INDEX

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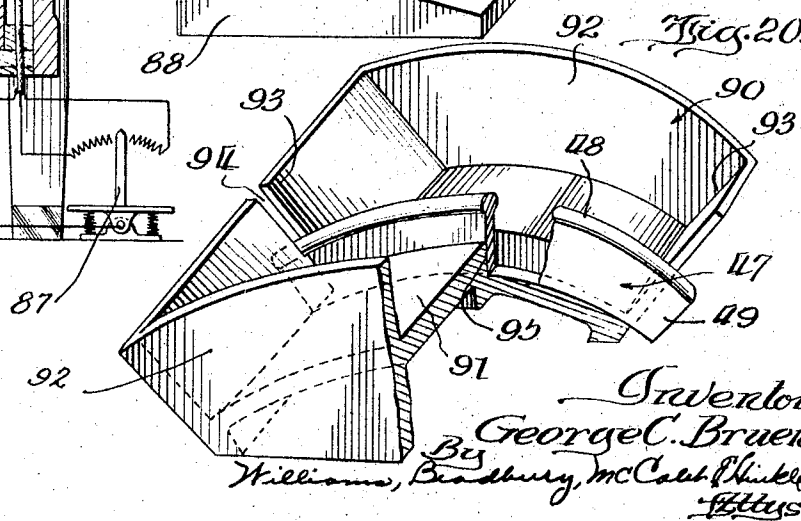
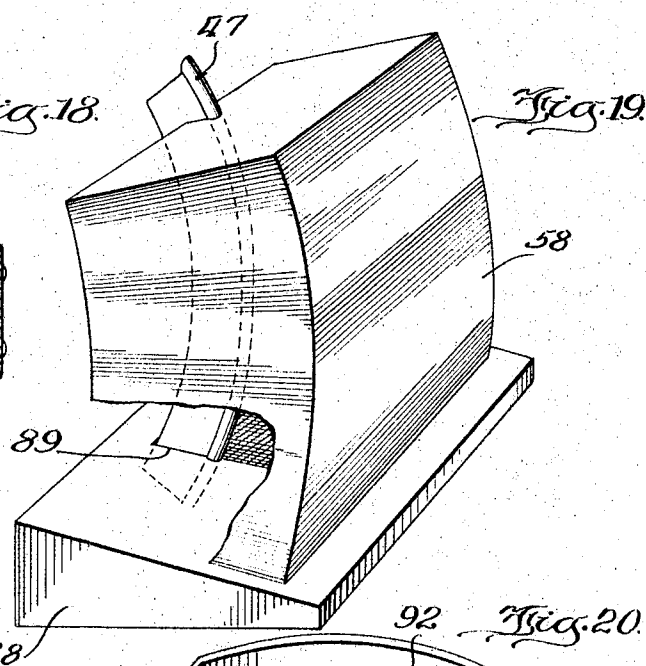
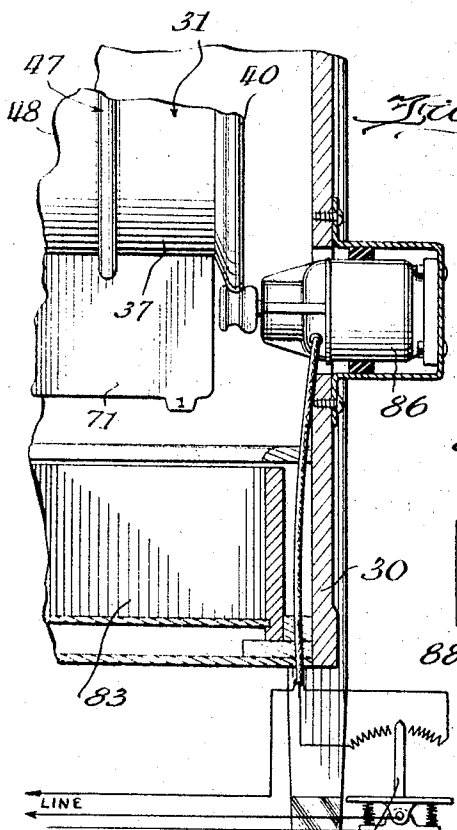
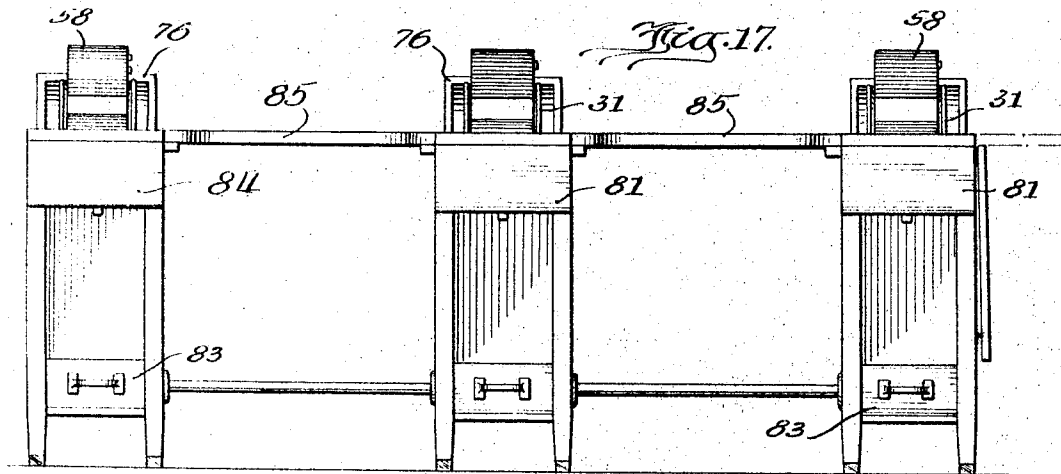
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G. C. BRUEN

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ROTARY CARD INDEX

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UNITED STATES PATENT OFFICE

2,168,323

ROTARY CARD INDEX

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Application March 30, 1934, Serial No. 718,126
Renewed September 1, 1937

38 Claims. (Cl. 129—16)

My invention relates to rotary card indexes and especially rotary indexes of the type where the cards are arranged more or less radially of the mounting drum or wheel and the latter is arranged on a horizontal axis.

Among the objects of my invention are: Provision for ready removal of groups of cards en bloc; provisions for counteracting the unbalancing effect on the rotary index of the bunching of cards at one side; improved cabinet and associated working surface in connection with the rotary index; an improved form of support for the cards whereby the cards and inter-leaving or auxiliary cards or papers may be held in place and suspended in place when they reach the bottom of the drum; an improved guide tab system; an improved power drive for operating the drum; receptacles or holders for cards and card holder sections when removed from the drum; and provision for minimizing the unbalancing effect of the bunching of cards upon the drum and the wear of the cards.

The foregoing, together with further objects, features and advantages of my invention, are set forth in the following description of specific embodiments thereof as illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a double or dual drum embodiment of my rotary card index mounted in a floor cabinet;

Fig. 2 is a detail perspective view of a group of card such as shown in Fig. 1, showing particularly the tab indicia arrangement;

Fig. 3 is a section through the cabinet and one of the card drums looking toward one side of the cabinet and taken at a normal to the axis of the drum, on the line 3—3 of Fig. 4;

Fig. 4 is a sectional view of the device of Fig. 1 looking toward the rear of the cabinet and on the vertical diameter of the drums, one drum being in section and the other in elevation, the section of Fig. 4 being taken on the line 4—4 of Fig. 3;

Fig. 5 is a fragmentary side elevation of the center head of one of the drums, taken on the line 5—5 of Fig. 4, showing the mounting of the arcuate rails and the over-running clutch for the drum;

Fig. 6 is a fragmentary view of the juxtaposed ends of two arcuate rail sections showing how the ends of the rail heads intermesh;

Fig. 7 is a fragmentary radial section of one of the drums, similar to that shown at the upper left-hand portion of Fig. 4, except that it shows a modified form of rim;

Figs. 8, 9, 10, 11 and 12 are generally similar to Fig. 7 but show modified arrangements of the rail drum periphery and rims;

Fig. 13 is a fragmentary section through a rail head showing the relation between the contour of the rail head and the mounting slot in the card;

Fig. 14 is a transverse section of the fragment shown in Fig. 13, but with the card swung out of the radial position of Fig. 13 to its maximum inclination thereto;

Fig. 15 is a view similar to Fig. 13 but showing modified contours of rail head and slot;

Fig. 16 is a section taken on the line 16—16 of Fig. 4 showing the mounting of the bearing and brake device for a tubular shaft of one of the drums;

Fig. 17 is a more diagrammatic front elevation of a series of single drum cabinet units interconnected by working shelves;

Fig. 18 is a fragmentary section of a cabinet and elevation of a portion of the drum installed therein, showing an operating motor for turning the drum;

Fig. 19 is a perspective view of a mounting stand for a rail section with its cards;

Fig. 20 is a perspective view, broken into section, of a tray for receiving a rail section and its cards when removed from the drum; and

Fig. 21 is a more diagrammatic section through a drum in a plane at a normal to the axis of the drum and on a reduced scale, showing a modified form of rail sections, which carry partitions or stop plates.

In my rotary card index the cards are mounted on the periphery of a drum and arranged more or less radially to the axis of the drum. The drum is preferably encased in a cabinet, at least a portion of which can be opened for convenient access to the cards when the index is in use. When the diameter of the drum is small the cabinet may rest upon a table or desk. When it is larger it is preferably built into a cabinet which rests on the floor and itself has provision for a desk or working surface.

The embodiments of my invention here shown are illustrated as incorporated in a floor cabinet. A single drum may be mounted in a cabinet, as is shown in the modification of Fig. 17, or a plurality of drums may be mounted side by side in the same cabinet. In Fig. 1 I show two drums co-axially mounted side by side in the cabinet. I prefer, and have here shown, only one circumferential set of cards on a single drum, rather

than two or more sets of cards side by side mounted around the periphery of the drum.

For simplicity I prefer to support both drums on a common supporting shaft 32 which extends between the lateral walls of the cabinet 30. For each drum there is a mounting shaft 33 which is telescoped upon the supporting shaft 32 and is rotatable thereon. The supporting shaft 32 may be, but is not necessarily, held stationary. Each shaft 33 is held against movement toward the other drum by a collar 34, and against movement away from the other drum by any suitable expedient such as the abutment of the outer end of the mounting shaft 33 with the side wall of the cabinet. Each drum 31 comprises a pair of opposed heads 36 and a peripheral wall 37. The drum heads 36 are stamped discs which may be rotatably mounted on the mounting shaft 33 by ball bearings 38. The drum is positioned axially of its mounting shaft 33 by the collar 34 and a collar 39 on the mounting shaft 33. The peripheries of the drum heads 36 are offset and extended obliquely outwardly and beaded to form a low side wall 40 of a peripheral channel 41 of the drum, the bottom of the channel being formed by the peripheral wall 37. The peripheral wall 37 is in turn formed by the cylindrical peripheral flanges of a pair of pan shaped members 42 arranged with their disc portions juxtaposed to form a center partition parallel with and intermediate the drum heads 36. The free edges of the peripheral flanges of the partition members 42 are embraced in the shoulder corner 43 formed by the offsets of the side walls 40 of the drum. The partition members 42 and the drum heads 36 are held in assembled position by bolts 44 and spacing sleeves 45.

The pan-shaped partition members 42 are formed to provide narrow slots 46 extending inwardly from the peripheral wall 37 at the middle line of the drum channel 41. In these slots are mounted a plurality—four are here shown—of arcuate card mounting rail sections 47. In radial cross section the rail sections 47 each comprise a circular head 48 and a flange 49 extending radially inwardly. The flanges 49 extend into the slots 46 to a depth less than the depth of the flange whereby a portion of the flange extends outwardly of the peripheral wall 37 of the drum and constitutes a neck for the head 48. The head and flange comprising the rail sections 47 may either be cast integrally, as shown in Fig. 4, or the flange may be stamped from flat sheet stock and the head formed from round rod stock material to receive the flange and bend arcuately about the flange, as shown in Figs. 5, 6 and 7. For retaining the rail sections in position in the slots 46, I prefer to employ one or more removable locking pins 50. In Figs. 5 and 7 I have shown two locking pins 50 for each rail section, for a reason which will presently be described, but I contemplate that a single locking pin may be employed which would preferably be near the mid-point of the rail section. Referring to Fig. 7, the locking pin has a finger button 51 externally of one of the drum heads and the pin extends through a hole in the drum head and through registering holes in the mid-partition portions of the pan-shaped members 42 and also through a registering hole 52 in the flange 49 of the rail section 47.

The locking pin 50 is urged to its locking position by a helical spring 53. For holding the locking pin 50 in its withdrawn position, I prefer to employ a hub piece 54 anchored on the ad-

jacent pan-shaped member 42 in registry with the locking pin opening therethrough. The hub piece 54 has an outwardly opening diametrical slot 55 into which a cross pin 56 on the locking pin 50 will slide when the locking pin is in locking position. When the finger button 51 is pulled outwardly to withdraw the end of the locking pin 50 from the hole 52 in the flange of the rail section, the button may be turned to swing the cross pin 56 through 90 degrees where it will lie in a shallow transverse slot 57 in the end of the hub piece 54 and be held in such position by the force of the spring 53. It will thus be seen that by pulling out the finger button 51, the associated rail section 47 may be pulled out of the slot 46 and removed from the drum (see also the subsequent explanation of how cards may be removed longitudinally of the rail section by exposing only one end thereof).

The cards 58, which I prefer to use in my rotary card index, may be of standard stock size and rectangular shape. At the mid-point of their bottom edges they are perforated with keyhole slots 59 comprising a circular head 60 and a neck interconnecting the head with the bottom edge of the card. The keyhole slots are but little larger than the contours of the protruding portion of the rail sections. I prefer that there be less difference in the dimensions of the two members transversely than radially of the drum, so that the cards may swing to an angle of, say, 45 degrees in reference to the rail section, as indicated in Fig. 14, while being held against any substantial lateral shifting relative to the rail section. This may be accomplished alternatively by a round head for the rail and a head for the slot which is slightly higher than round, as indicated in Fig. 13, or by using a round head for the slot but a rail head which has slightly less diameter in height than transversely, as indicated in Fig. 15. When a given card is at the top of a drum it rests either upon the peripheral wall 37 of the drum, or upon the top of the rail head and upon one corner of the card. When the given card is at the bottom of the drum it is hung from the rail head.

For best operating results, where no stops or fixed partitions are used to prevent the "floating" of the cards by the drum, I prefer to load the drum with cards so that the supporting rail is practically filled with cards. This more nearly balances the drum. After the drum has been rotated toward the operator, that is, clockwise or to the right in Fig. 3, the cards tend to assume the position indicated in Fig. 3. At the bottom arc of the drum the cards hang from the rail in practically vertical planes. At the rear arc of the drum they are quasi-tangential with their outer edges lower than their inner edges and this quasi-tangency obtains also across the top arc and forwardly thereof until the cards pass a substantially vertical position. At that point they fall forwardly, leaving a V-shaped opening which discloses the back side of the more or less horizontal exposed card and the front face of the immediately preceding and substantially vertical card. As the drum is pulled forwardly, as by the operator engaging the rim of the drum, the cards one by one "fan" across this opening, exposing them to review one by one giving somewhat the same result as an operator thumbing through a group of cards held in his hand. Where no fixed partitions are used between groups of cards on the drum, there is a slight floating of the cards upon the drum whereby the

cards have a slight cumulative lag behind the forward rotation of the drum. The peculiarity of this mounting of the cards on the drum is that there is an excessive bunching up of the cards in the lower rear quadrant of the drum. This results in greater weight to the rear side of the drum than to the forward side because there are more cards on that side. In consequence, there is a tendency of the drum, if left free to rotate, to move backwardly, coming to rest at 30 degrees backwardly. To overcome this tendency of the drum to rotate backwardly, I provide a non-recessional device for the drum or, more accurately, a device which causes a braking action, rather than an absolute stop, against backward rotation.

This braking device, referring to Figs. 3, 4, and 5, comprises an over-running clutch 62 between each drum and its mounting shaft 33 and a friction brake 63 between the shaft 33 and its journal on the side panel of the cabinet 30.

The over-running clutch 62 comprises a hub ring 64 on the center partition formed by the drum-shaped members 42. Within the bore of the hub ring 64 there is an inner or clutch ring 65 fixed on the shaft 33. The inner ring 65 carries a plurality of peripheral notches in which spring-pressed clutch rollers 66 are disposed, the parts being so arranged, according to well-known practice, to permit the drum to rotate forwardly without causing the mounting shaft 33 to move, but rotating the mounting shaft 33 with it when rotated backwardly.

The friction brake 63 (Figs. 4 and 16) comprises a horizontally split bearing 67 for journaling the outer end of the mounting shaft 33. The lower half of the bearing 67 is vertically flanged and thereby fixed to the inside of the side panel of the cabinet 30, as by the screws shown. The upper half 68 of the split bearing is pressed by the springs 69 against the periphery of the shaft 33, being held against rotation by the screws 70 passing through the springs 69 but permitting slight vertical movement of the upper bearing piece 68. The friction brake 63 thus exerts a braking effect upon rotation of the mounting shaft 33.

Any tendency of the drum to rotate backwardly engages the over-running clutch 62 to cause backward rotation of the mounting shaft 33. Backward rotation of the mounting shaft 33 is resisted by the friction brake 63 and the latter is adjusted to balance the normal backing force on the drum due to the bunching of the cards. In consequence, the drum will stay balanced but it can be rotated backwardly by the application of additional hand power by the operator. In normal operation the operator will find it more convenient and the "fanning" of the cards will be more constant, if the drum is rotated only forwardly. However, in those instances where the operator wishes to consult a card only a few degrees forwardly of the refilling or V-shaped opening formed between the cards, the operator may find it convenient to move the cards backwardly against the braking effect of the brake 63.

The guide tabs which I employ between cards for classifying them, may be tabbed either at the side or at the top. Or, they may be tabbed both at the top and one or more side edges. The latter may be effected either by having both lateral and top tabs on each guide or by having lateral tabs on some guides and top tabs on other guides, depending upon the classification requirements involved. In Fig. 1 I have indicated lateral

tabs on the guides for the cards on the left-hand drum, and top tabs on the guides for the cards on the right-hand drum. As shown in Fig. 2, the indicia printed on the front face of the tab for the guides are printed to be read when the inner or slotted edge of the guide is at the bottom. The corresponding indicia printed on the back side of the same tab is printed to be read when the outer edge of the cards is at the bottom. In other words, if an isolated card is held in the hand with the slot in the bottom with the front face toward the reader, the indicia on the tab will be in reading position; to read the indicia on the back side of the tab the guide must be turned over top for bottom and not end for end. By this method of printing the indicia, the operator may read the tab indicia both forwardly and backwardly of the V-shaped opening between the cards.

In indexing the tab guide cards, especially where the cards are filed numerically, I prefer to offset the tabs for each digit. Thus, in Fig. 2, the innermost tab 72 of the guide card 71 would indicate 10's. The next tab 73 by its position would indicate 100's. The next, 74, by its position would indicate 1000's and the outermost by its position would indicate 10,000's. This arrangement may be rendered still more effective by associating a different color with each different position, as indicated in Fig. 2, where the tab and, in fact, the entire guide card is of a color dependent upon the position of the tab.

The cabinet 30 indicated in Figs. 1, 3 and 4 has lateral, front and rear panels, the top being closed by a segmented-cylinder shaped top 76 mounted by a bracket 77, as shown in Fig. 16, at each end which has a bearing upon the mounting shaft 33. When the top 76 is in the closed position of Fig. 3 it rests against the upper rim of the cabinet. When it is in its open position it is swung down backwardly or counter-clockwise (Fig. 3) to rest against stops 78 on the inner side of each lateral wall of the cabinet. Rearward brackets 79 support an extensible upper shelf 80 upon which the operator may conveniently store papers or cards. A shelf 81 is hinged to the upper edge of the front side of the cabinet and when swung up to horizontal position and locked by a suitable bracket 82, as shown in Fig. 1, it forms a convenient arm rest and writing surface for the operator. A storage drawer 83 may conveniently be placed in the cabinet below the drum.

When, as in Fig. 1, two drums are mounted in a single cabinet, they may be serviced by a single operator or, two operators sitting side by side may work upon them simultaneously, preferably one on each drum.

In Fig. 17 I have indicated somewhat diagrammatically in front elevation, a battery of three spaced-apart single cabinets 84 each containing but one drum and with a table surface 85 between each drum. The operators sit between the cabinets, the operator sitting at the right-hand side of the cabinet on which he is working. The rightmost cabinet of the battery would preferably have its working table surface either in the form of a hinged shelf or otherwise supported.

For larger capacities of drums the diameters must be increased, and the point is reached where the physical force required of the operator in constantly turning the drum, becomes an important consideration. For facilitating the operation of large diameter drums, I employ a motor 86, as shown in Fig. 18, conveniently mounted on a lateral panel of the cabinet 30, the armature of

the motor having a rubber pulley which engages the rim of the drum—somewhat after the manner of a motor-driven sewing machine. I prefer to use a reversible motor and to control it by a pedal 87 which, rocked in one direction, operates a forward rheostat and rocked in the other direction operates a reverse rheostat.

For facilitating manual operation of the drum, one side wall 40 of the drum head may be extended to an increased diameter and broader surface, as indicated at 40' in Fig. 7, which affords a more convenient finger engagement.

For removing large groups of cards en bloc, an entire rail section 47 may, as previously explained, be withdrawn together with the cards on it by withdrawing the locking pins 50 which pass through the flange 49 of the rail section. An alternative way of removing a group of cards en bloc is to withdraw only one of the two locking pins 50 for a rail section, lifting one end of the rail section and rocking it about the other locking pin as a pivot, to the dotted line position of Fig. 5. This exposes one end edge of the rail section and permits the cards to be slid off the section or other cards to be slid on, without actually removing the section. To permit this pivoting of the rail section it is advisable—in the particular form shown—to slot the hole 52 for whichever pin 50 is used as the pivot, for otherwise abutting of the ends of the rail sections would impede such swinging. In Figs. 8 to 12 inclusive, I have shown some substitute rail and drum periphery constructions. In Fig. 8, the drum periphery or channel and the rail and mounting flange are all die cast as a unit in arcuate sections, being locked by a locking pin similar to that shown in Fig. 7.

In Fig. 9 only the bottom of the drum section is cast integrally with the rail section and flange, the drum heads carrying the side walls of the drum channel. In Fig. 10 the drum channel is cast as an integral whole and the rail sections—which may be double—are locked into slots cast or cut into the drum casting. The use of two spaced supporting rails of course requires two corresponding spaced slots in the bottom edges of the cards and it is especially desirable where the cards are of large size and light stock. I have shown the locking arrangement adapted to lock both rail sections simultaneously.

In Fig. 11 I have shown two spaced rails cast together in arcuate sections with a common mounting flange which, it will be understood, will be locked in position by the usual locking pin 50. As indicated by the dotted line card in Fig. 11, smaller cards may be interspersed with the larger cards, the smaller cards having only single slots. In Fig. 12 I have shown the drum construction of Fig. 11, which is peripherally depressed to receive the rail section, employed with a substitute rail section similar to the rail section of Fig. 11 except that in lieu of one rail section the cast section carries an auxiliary edge or side wall mating the side wall of the drum head but adapting the drum to the reception of a smaller size card.

When the rail section with its block of cards is wholly removed from the drum, as I have described, it is convenient to have some suitable holder or receptacle thereof to free the operator's hands for working on or re-arranging the cards.

In Figs. 19 and 20 I have shown two such holding devices. That in Fig. 19 comprises a wedge-shaped block 88 about the size of the card, which can be set or fixed upon a table or working surface and has in its upper face a keyhole-shaped slot 89 for the reception of one end of the removed rail

section. In Fig. 20 I have shown a device in the form of a basket 90 whose bottom 91 is in the rim of an arc of a cylinder, whose lateral walls 92 are vertical and whose front and rear walls 93 are angularly disposed. The front and rear walls 93 contain slots 94 for the reception of the head of a rail section, and the slots 94 continue as a deeper but narrower slot 95 across the bottom 91, for the reception of the flange 49 of the rail section 47. After the rail section, with the cards thereon, has been set into the basket 90, the rail section 47 may be arcuately withdrawn from the basket leaving the cards in place in the basket for convenient handling, removal, replacement or re-arrangement. The cards in the basket are always in position for the easy re-insertion of the arcuate rail section 47, after which the rail section with the newly arranged cards may be relifted from the basket and re-inserted in the drum.

Where entries such as posting are to be made on the cards, and a check is to be made on the posting, it is convenient to have some offsetting of the cards on which posting has been done, so that the checker may quickly determine which cards are to be checked. In Fig. 12 I have indicated a means of accomplishing this on my rotary card index. Here the slot on the card is about $\frac{1}{8}$ " off center and the width of the peripheral channel on the drum is a trifle greater than it would be if the cards were slotted on the center. When a card has been removed and posting entered on it, the operator, in putting it back on the rail, turns the card end for end, so that it is put back with the reverse side forward. The off center position of the slot in the card results in the card being offset to one side slightly in relation to other cards which are not reversed. After the checker has removed the card for checking, the card is re-inserted on the drum with the front side forward.

It is not always necessary to remove a card to make entries. Especially where the card forms are arranged for the entries to appear on the reverse side, such entries, if brief in character, may be made on the cards without removing them from the rails. As shown in Fig. 3, the exposed reverse side of the card adjoining the V-shaped open space is sufficiently horizontal for convenient writing in situ.

In Fig. 21 (Sheet 1) I have indicated somewhat diagrammatically a modified construction of drum in which there are a plurality of arcuately spaced fixed partitions 96. While these partitions may be fixed to the drum directly, I prefer that they be secured as plates at one end of each rail section 47, as shown in Fig. 21. If the rail sections be pivotally mounted on the drum the partitions are carried at the pivoted ends of the rail sections. The partitions are preferably of considerably lesser height than the cards. The use of partitions is particularly advantageous with larger diameters of drums with greater card capacities. They stop the "floating" of the cards relative to the drum, with the incidental gradual wear of the cards, particularly around the margins of the keyhole-shaped slots. The partitions also largely eliminate the grouping or crowding of the cards, as previously mentioned, which causes the tendency of the drum to rotate backwardly. The more partitions there are spaced about the drum, the less is the tendency to rotate backwardly. Consequently, less effort is required on the part of the operator to rotate the drum, because it is more perfectly balanced. When the partition is fixed on the end of a rail, and the rail,

together with a block of cards is removed from the drum, the partition forms a convenient stop on the end of the rail for holding the cards against sliding off the removed rail. Also, the partition on the otherwise exposed end of one of the remaining rail sections prevents the remaining cards from sliding off the rail. Without the partitions it is desirable to employ some convenient clamp to close off the exposed end of at least one of the remaining rail sections.

I have previously described the mounting shaft as a single shaft; but I find it more convenient in practice to make it in two sections as shown in Fig. 4, to facilitate mounting the clutch ring thereon.

While I have thus described the specific embodiments of my invention, I contemplate that variations and changes may be made thereover without departing from the spirit or scope of my invention.

I claim:

1. A rotary card index comprising a supporting wheel, a card mounting rail arranged peripherally on the wheel and adapted to receive a multiplicity of cards arranged more or less radially of the wheel and having slots for mounting them on the rail, the rail including an arcuate rail section, and means for pivoting the rail section about one end thereof to expose the other end thereof for the removal of cards endwise of the section.

2. A rotary card index comprising a supporting wheel, a card mounting rail arranged peripherally on the wheel and adapted to receive a multiplicity of cards arranged more or less radially of the wheel and having slots for mounting them on the rail, and arcuately spaced partitions about the wheel periphery between which partitions groups of the cards may be mounted for preventing the floating of the cards about the rail, the rail being subdivided into separate arcuate sections, one end of each section being movable radially from the wheel to expose an end thereof, and each partition being fixed to a rail section at the opposite end thereof.

3. A rotary card index comprising a supporting wheel, a card mounting rail arranged peripherally on the wheel and adapted to receive a multiplicity of cards arranged more or less radially of the wheel and having slots for mounting them on the rail, the rail being subdivided into arcuate sections, at least one end of each section being movable radially from the wheel for exposing an end thereof for the removal of cards from the rail, a slot in the wheel, a flange on each rail section entering the slot, and a withdrawable locking pin operable within the slot and engaging the flange for locking the rail in place upon the wheel.

4. A rotary card index comprising a horizontally journaled wheel, a rail arranged peripherally thereof and adapted to receive a multiplicity of cards arranged more or less radially of the wheel thereabout and having slots for mounting the cards upon the rail, the rail being subdivided into arcuate sections, means for securing the rail sections to the wheel peripherally thereof, and interlocking elements at the juxtaposed ends of the rail sections for transversely aligning the ends of the rail sections.

5. A rotary card index comprising a horizontally journaled wheel having lateral peripheral flanges defining a peripheral channel for the wheel, a slot extending into the periphery of the wheel intermediate the flanges, a plurality of rail sections arranged about the periphery of the wheel and having flanges entering the slot, and

means for removably locking the sections in the slot, each section having at one edge thereof an auxiliary lateral flange and having intermediate said auxiliary lateral flange and one flange of the wheel, a rail element, the rail elements being arranged with their ends aligned to constitute a continuous rail about the periphery of the wheel for mounting cards thereon.

6. A rotary card index comprising a horizontally journaled wheel having an outwardly opening channel-shaped periphery, a rail extending about the periphery of the wheel and comprising a head and a neck or flange portion, the rail being laterally offset slightly from the mid-point of the channel, and a multiplicity of cards arranged more or less radially upon the wheel, each card having at its inner edge a keyhole-shaped slot for removably engaging the rail, the slots in the cards being slightly offset laterally from the medial lines of the cards whereby, when some of the cards are mounted upon the rail with their faces reversed, they will be offset slightly from cards mounted on the wheels with their faces not reversed.

7. A rotary card index comprising a supporting wheel journaled upon a non-vertical axis, a card mounting rail disposed circumferentially thereof and having a radially displaceable end portion, the rail being adapted to receive a multiplicity of cards having apertured bottom edges for mounting upon the rail more or less radially of the wheel, and a readily releasable mounting for the rail normally holding the rail end portion against such radial displacement, the end portion when thus displaced presenting a free end for end loading or unloading of the cards onto or from the rail.

8. A rotary card index comprising a supporting wheel journaled upon a horizontal axis, a card mounting device disposed circumferentially thereof and divided into arcuate sections and adapted to receive a multiplicity of cards mounted on the mounting device more or less radially of the wheel, and a readily releasable mounting for the sections normally holding the sections in position upon the wheel, the construction and arrangement of the index being such that when the section mounting is released, one or more sections may be removed from the wheel with some of the cards thereon.

9. A rotary card index comprising a supporting wheel journaled upon a non-vertical axis, a card mounting rail, a mounting for the rail on the wheel peripherally thereof, the rail being adapted to receive a multiplicity of cards having headed slots for mounting them on the rail more or less radially of the wheel with the cards severally attachable to and removable from the rail by partial flexure of the cards coupled with movement radially of the wheel, the rail and its mounting being constructed and arranged to permit the exposure of the end of a rail for the removal of the cards en bloc therefrom in unflexed position by movement longitudinally of the rail.

10. A rotary card index comprising a supporting wheel, a series of arcuate card mounting rail sections, means for mounting the rail sections on the wheel peripherally thereof, the rail sections being adapted to receive a multiplicity of cards having headed slots for mounting them on the rail sections more or less radially of the wheel, the rail sections and the mounting means being constructed and arranged to permit the exposure of an end of each rail section for the removal of

cards therefrom by movement longitudinally of the rail section.

11. A rotary card index comprising a supporting wheel, a series of arcuate card mounting rail sections, and means for mounting the rail sections on the wheel peripherally thereof, the sections forming a continuous peripheral rail free to the movement of cards thereabout and being adapted to receive a multiplicity of cards having headed slots for mounting them on the rail sections more or less radially of the wheel, the rail sections and the mounting means being constructed and arranged to permit the exposure of an end of each rail section for the removal of cards therefrom by movement longitudinally of the rail section.

12. A rotary card index comprising a supporting wheel, a card mounting rail, a mounting for the rail on the wheel peripherally thereof, the rail being adapted to receive a multiplicity of cards having headed slots for mounting them on the rail more or less radially of the wheel with the cards attachable to and removable from the rail by movement transversely thereof and radially of the wheel, the rail and its mounting being constructed and arranged to permit the exposure of an end of the rail for removal of the cards therefrom by movement longitudinally of the rail, and arcuately spaced partitions for dividing the cards into groups and preventing the migration of cards about the rail.

13. A rotary card index comprising a supporting wheel, a plurality of rail sections arranged peripherally of the wheel and adapted to receive a multiplicity of cards having slots cooperating with the rail sections and arranged more or less radially of the wheel, a plurality of transverse partitions arcuately spaced about the wheel for dividing the cards into groups and anchored to prevent migration of the cards about the wheel, and means for mounting the rail sections on the wheel to permit the exposure of at least one end of each section for removal of the cards endwise therefrom, there being at least one such exposable rail section end between each two adjacent partitions.

14. A rotary card index comprising a supporting wheel, a card mounting rail, a mounting for the rail on the wheel peripherally thereof, the rail being adapted to receive a multiplicity of cards having headed slots for mounting them on the rail more or less radially of the wheel with the cards attachable to and removable from the rail by movement transversely thereof and radially of the wheel, the rail and its mounting being constructed and arranged to permit the exposure of an end of the rail for removal of the cards therefrom by movement longitudinally of the rail, and arcuately spaced partitions for dividing the cards into groups and preventing the migration of cards about the rail, the partitions being fixed in planes radially of the wheel.

15. A rotary card index comprising a non-vertically journaled wheel, a circumferentially disposed card mounting rail arcuately divided into sections, readily releasable mountings for the rail sections upon the wheel, the rail being adapted to receive a multiplicity of cards having apertures in their inner edges for cooperation with the rail to mount the cards thereon more or less radially of the wheel, and a stop carried by each rail section near one of its ends for preventing endwise movement of the cards from that end of the rail section, whereby each section may be severally removed from the wheel with cards mounted there-

on and prevented by the attached stop from passing off the end of the rail section, the opposite end of each rail section when thus removed being free for en bloc movement of the cards longitudinally of the rail onto and off the rail.

16. A rotary card index comprising a horizontally journaled wheel, a circumferentially disposed card mounting rail arcuately divided into sections, readily releasable mountings for the rail sections upon the wheel, the rail being adapted to receive a multiplicity of cards having apertures in their inner edges for cooperation with the rail to mount the cards thereon more or less radially of the wheel, and a stop carried by each rail section near one of its ends for preventing endwise movement of the cards from that end of the rail section, whereby each section may be severally removed from the wheel with cards mounted thereon and prevented by the attached stop from passing off the end of the rail section.

17. A rotary card index comprising a horizontally journaled wheel, card receiving and supporting devices disposed peripherally of the wheel and arcuately divided into sections, said devices being adapted to receive cards arranged thereon more or less radially of the wheel and about the wheel, readily releasable mountings for holding the sections upon the wheel, each section, when the section mounting is released, being removable from the wheel together with the cards mounted thereon.

18. A rotary card index comprising a wheel adapted to receive cards arranged more or less radially about its periphery; the wheel comprising a set of arcuate rail sections disposed end to end in circular alignment and having rails constructed and arranged to cooperate with slots in the cards for retaining the cards on the wheel, and means for mounting the rail sections for rotation as a unit, the mounting means being constructed and arranged to permit the ready removal of each rail section with some of the cards retained on the rail section.

19. A rotary card index comprising a wheel adapted to receive cards arranged more or less radially about its periphery; the wheel comprising a set of arcuate rail sections disposed end to end in circular alignment and having rails constructed and arranged to cooperate with slots in the cards for retaining the cards on the wheel, and means for mounting the rail sections for rotation as a unit, the mounting means being constructed and arranged to permit the exposure of an end of each rail for end movement therefrom of the cards carried thereby.

20. A rotary card index comprising a wheel adapted to receive cards arranged more or less radially about its periphery; the wheel comprising a set of arcuate rail sections disposed end to end in circular alignment and having rails constructed and arranged to cooperate with slots in the cards for retaining the cards on the wheel, means for mounting the rail sections for rotation as a unit, the mounting means being constructed and arranged to permit the exposure of an end of each rail for end movement therefrom of the cards carried thereby and a lateral flange for the wheel spaced to one side of the rails and adapted to engage the adjacent lateral edges of the cards.

21. A rotary card index comprising a rotatably mounted wheel-like support, a series of arcuate rail sections arranged about the support concentrically thereof as a substantially continuous card mounting rail in a plane at a normal to the

axis of the support and adapted to receive a multiplicity of cards arranged more or less radially of the support and having slots adjacent their inner edges whereby they are slidably mounted on the rail sections, and means for mounting each rail section on the support for ready removal therefrom with the cards on the rail section, each rail section when thus removed affording unloading of the cards therefrom endwise thereof.

22. A rotary card index comprising a rotatably mounted wheel-like support, a series of arcuate rail sections arranged about the support concentrically thereof as a substantially continuous card mounting rail in a plane at a normal to the axis of the support and adapted to receive a multiplicity of cards arranged more or less radially of the support and having slots adjacent their inner edges whereby they are slidably mounted on the rail sections, means for mounting each rail section on the support for ready removal therefrom with the cards on the rail section, each rail section when thus removed affording unloading of the cards therefrom endwise thereof, and card stops carried by at least some of the rail sections whereby migration of the cards is checked at arcuately spaced intervals.

23. A rotary card index comprising a rotatably mounted wheel-like support, a series of arcuate rail sections arranged about the support concentrically thereof as a substantially continuous card mounting rail in a plane at a normal to the axis of the support and adapted to receive a multiplicity of cards arranged more or less radially of the support and having slots adjacent their inner edges whereby they are slidably mounted on the rail sections, means for mounting each rail section on the support for ready removal therefrom with the cards on the rail section, each rail section when thus removed affording unloading of the cards therefrom endwise thereof, and a card stop carried at one end of each of at least some of the rail sections.

24. A rotary card index comprising a rotatably mounted wheel-like support, a series of arcuate rail sections arranged about the support concentrically thereof as a substantially continuous card mounting rail in a plane at a normal to the axis of the support and adapted to receive a multiplicity of cards arranged more or less radially of the support and having slots adjacent their inner edges whereby they are slidably mounted on the rail sections, means for mounting each rail section on the support for ready removal therefrom with the cards on the rail section, each rail section when thus removed affording unloading of the cards therefrom endwise thereof, and card stops positioned substantially at the junctions of the rail sections for stopping migration of cards at arcuately spaced intervals and for confining the cards to their respective rail sections.

25. A rotary card index comprising a rotatably mounted wheel-like support, a series of arcuate rail sections arranged about the support concentrically thereof as a substantially continuous card mounting rail in a plane at a normal to the axis of the support and adapted to receive a multiplicity of cards arranged more or less radially of the support and having slots adjacent their inner edges whereby they are slidably mounted on the rail sections, means for mounting each rail section on the support for ready removal therefrom with the cards on the rail section, each rail section when thus re-

moved affording unloading of the cards therefrom endwise thereof, and means for confining the cards to their respective rail sections.

26. A rotary card index comprising a rotatably mounted wheel-like support, and a card mounting rail for receiving and supporting a multiplicity of cards more or less radially of the support, the rail substantially surrounding the support in a plane at a normal to the axis thereof, the rail being constructed and arranged to receive and discharge cards individually by a combined flexure of the card and movement thereof radially of the support and also en bloc by movement of the cards longitudinally of the rail over the end thereof when an end is exposed, and means for mounting the rail on the support and for optionally exposing an end of the rail for en bloc removal of cards.

27. A rotary card index comprising a rotatably mounted wheel-like support, a card mounting rail for receiving and supporting a multiplicity of cards more or less radially of the support, the rail being carried by and substantially surrounding the support in a plane at a normal to the axis thereof, the rail being constructed and arranged to receive and discharge cards individually by a combined flexure of the card and movement thereof radially of the support, and means normally rendered ineffective for exposing an end of the rail for loading and unloading cards therefrom en bloc by movement longitudinally of the rail over the end thereof.

28. A rotary card index comprising a rotatably mounted wheel-like support, a card mounting rail for receiving and supporting a multiplicity of cards more or less radially of the support, the rail being carried by and substantially surrounding the support in a plane at a normal to the axis thereof, the rail being constructed and arranged to receive and discharge cards individually by a combined flexure of the card and movement thereof radially of the support, a plurality of arcuately spaced stops for segregating the cards into arcuate groups on the rail, and means normally ineffective for exposing an end of the rail between each two adjacent stops for the loading and the unloading en bloc from the rail of the cards thus segregated between the stops, by movement longitudinally of the rail over the end thereof.

29. A rotary card index comprising a rotatably mounted wheel-like support, a card mounting rail carried by, and extending concentrically about, the support in a plane at a normal to the axis thereof, the rail being constructed and arranged to receive a multiplicity of cards arranged more or less radially of the support and having slots adjacent their inner edges whereby they are slidably mounted on the rail, means for mounting portions of the rail on the support to allow exposure of a plurality of ends of the rail for removal of the cards endwise of the rail, and stops carried by the rail for segregating the cards into a plurality of arcuately spaced groups, one of said exposed ends coming effectively between the stops defining each said group of cards.

30. A rotary card index comprising a rotatably mounted wheel-like support, a card mounting rail carried by, and extending concentrically about, the support in a plane at a normal to the axis thereof, the rail being constructed and arranged to receive a multiplicity of cards arranged more or less radially of the support and having slots adjacent their inner edges whereby

they are slidably mounted on the rail, and stops carried wholly by the rail for segregating the cards into a plurality of arcuately spaced groups, the support being substantially sideless laterally of the cards radially beyond the periphery of the rail.

31. In a rotary card index, an arcuate rail section constructed and arranged to receive transversely a multiplicity of cards having slots adjacent their inner edges whereby they are slidably mounted on the rail section, a stop carried on one end of the rail section to keep cards from running off the end, the other end being open to permit end loading and unloading of the cards, and means on the rail section adapted to cooperate with a rotatably mounted wheel-like support for releasably mounting the rail section thereon.

32. A rotary card index comprising a rotatably mounted wheel-like support, a pair of parallel rails disposed about the drum supports concentrically therewith and in planes at a normal to the axis thereof, the rails being adapted to receive a multiplicity of cards arranged more or less radially of the support and having correspondingly spaced slots adjacent their inner edges whereby they are slidably mounted on the two rails, the pair of rails being subdivided into arcuate sections, and means for releasably mounting the arcuate sections on the support whereby they may be removed with the cards thereon and, when removed, the cards may be loaded and unloaded from the rails by longitudinal movement over the ends thereof.

33. A rotary card index comprising a wheel journaled for rotation, a rail extending peripherally about, and carried by, the wheel and constructed and arranged for receiving and mounting a multiplicity of cards arranged more or less radially of the wheel, the rail being divided into a plurality of arcuately spaced rail sections, and means for removably mounting the rail sections upon the wheel comprising a slot near one end of each rail section, a pin carried by the wheel for detachably engaging in each slot for positioning the one end of each rail section, and a locking member carried by the wheel for detachable engagement with each rail section near its other end.

34. A rotary card index comprising a wheel journaled for rotation and presenting a rim face, a peripheral slot extending inwardly from, and medially of, the rim face, a series of arcuately spaced rail sections peripherally surrounding the wheel for receiving and mounting a multiplicity of cards arranged more or less radially of the wheel, each rail section having a flange extending into the slot, and means for removably mounting the rail sections upon the wheel comprising a slot in the flange of each rail section near one end thereof, a pin carried by the wheel bridging the rim slot for detachably engaging in each flange slot for positioning the one end of each rail section, and a locking member car-

ried by the wheel for detachable engagement with the flange of each rail section near its other end.

35. A rotary card index comprising a right wheel half and a left wheel half, means for holding the wheel halves together as a supporting wheel, means for journaling the wheel for rotation, the wheel presenting a peripheral rim face, the juxtaposed sides of the wheel halves leaving a peripheral slot about the wheel medially of the rim face and extending inwardly therefrom, a rail disposed about the wheel and having a flange extending inwardly into the slot for supporting the rail, the rail having a head radially beyond the rim face for engagement in keyhole shaped slots at the inner edges of a multiplicity of cards for mounting the cards more or less radially of the wheel about the rim face.

36. A rotary card index comprising a wheel presenting a peripheral rim face, a slot extending into the rim and disposed medially about the rim face, a plurality of rail sections disposed about the rim face, each rail section comprising a head disposed radially beyond the rim face for engagement in keyhole shaped slots in a plurality of cards arranged more or less radially of the wheel for mounting the cards on the wheel, and a flange extending inwardly from the head and into the slot, and means for removably holding the rail sections on the wheel.

37. A rotary card index comprising a wheel mounted for rotation, a rail disposed about the periphery of the wheel for receiving and mounting a plurality of cards having headed slots for interengagement with the rail and arranged more or less radially of the wheel, the rail being divided into a plurality of arcuate sections, a card stop carried at one end of each rail section, and means for removably mounting the rail section on the wheel for independent removal, said mounting means being constructed and arranged for mounting all of the rail sections with their stops at their leading ends and also for optionally mounting all of the rail sections with their stops at their trailing ends, as regards forward rotation of the wheel.

38. A rotary card index comprising a rotatably mounted wheel-like support presenting a sectional drum face and a sectional peripheral rail extending radially and beyond in a plane at a normal to the axis of the support, the rail being adapted to receive a multiplicity of cards arranged more or less radially of the support and having slots adjacent their inner edges whereby they are slidably mounted on the rail sections with their inner edges substantially in contact with the drum face, means for mounting arcuate sections of the rail and associated drum face on the support for ready removal therefrom with the cards thereon, the rail section—when thus removed together with the associated drum face section—affording unloading of the cards from the removed rail section endwise thereof.

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