Jan. 2, 1951 R. P. SCHOLFIELD ET AL 2,536,574

FILING APPARATUS

Filed Aug. 25, 1943 2 Sheets-Sheet 1

Fig. 1.

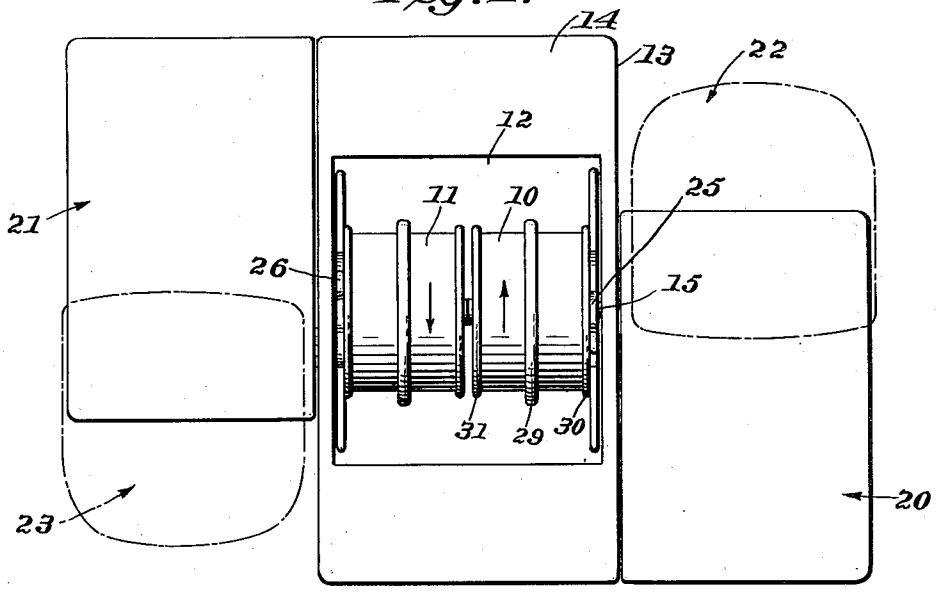


Fig. 4.

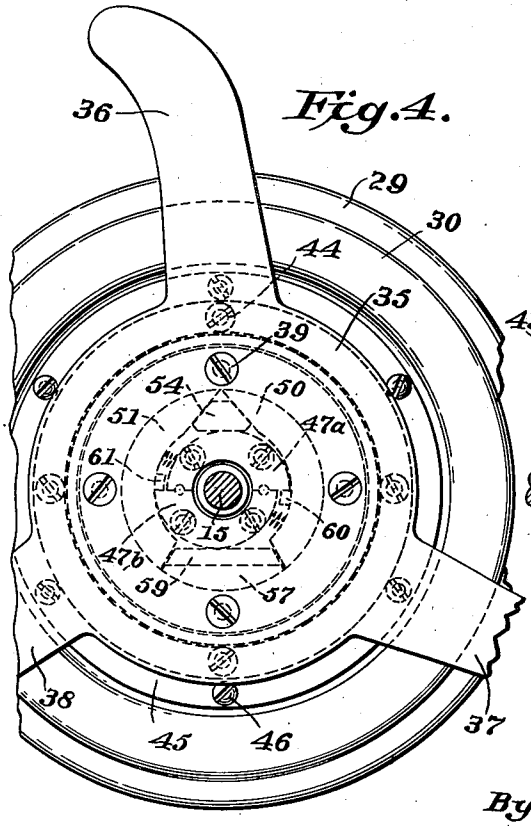
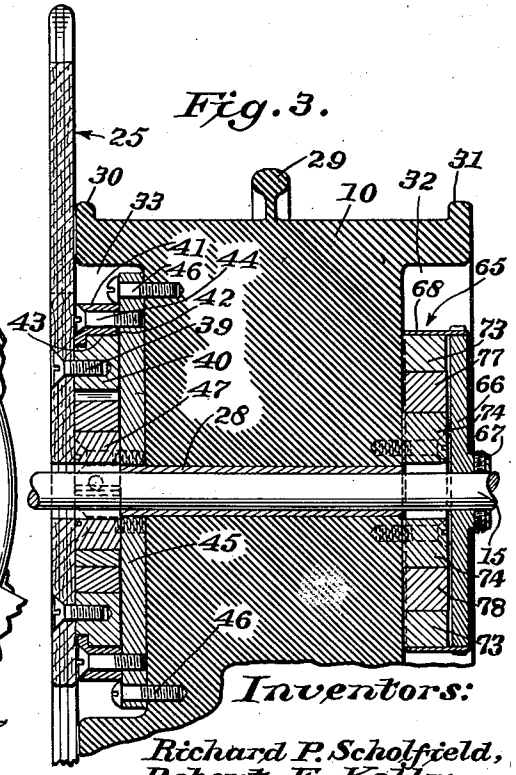


Fig. 3.



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Filed Aug. 25, 1943 2 Sheets-Sheet 2

Fig. 5.

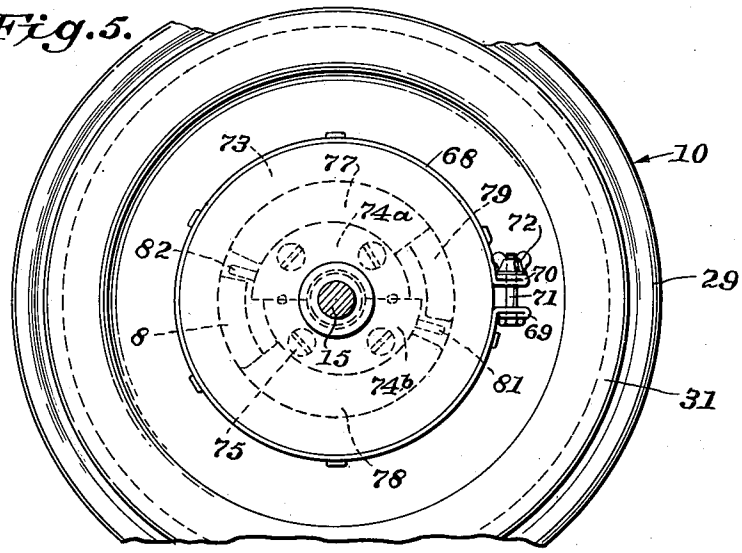


Fig. 6.

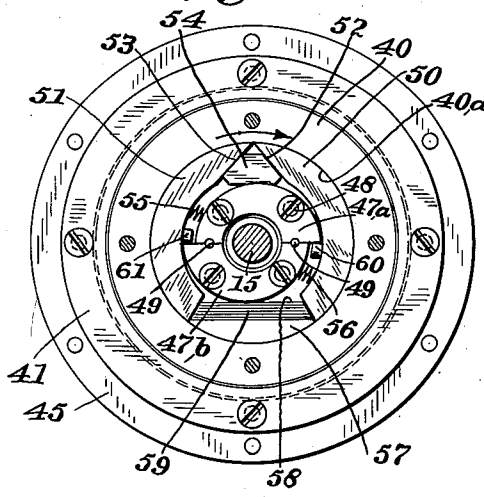


Fig. 7.

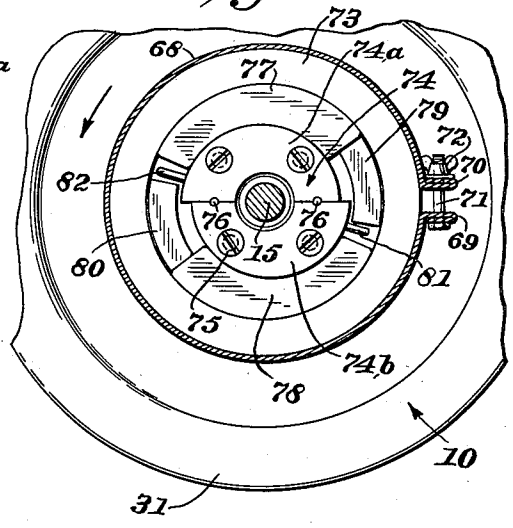
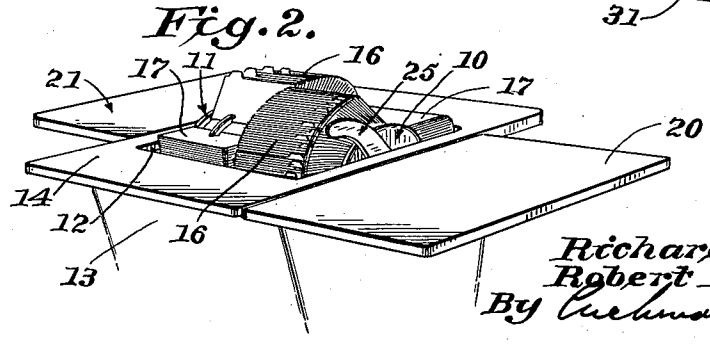


Fig. 2.



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UNITED STATES PATENT OFFICE

2,536,574

FILING APPARATUS

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Application August 25, 1943, Serial No. 499,966

10 Claims. (Cl. 129—16)

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The present invention relates to filing apparatus of the type wherein a plurality of filing cards are removably mounted upon the periphery of a rotatable filing drum or wheel. Examples of the type of apparatus to which the improvements of the present invention relates are shown in the patents to Scholfield, Nos. 2,046,655; 2,205,932, and 2,231,029.

One of the primary objects of the invention is to provide a novel cabinet structure and supporting means for rotatable files, in order to concentrate a maximum number of cards or records in a small space and to so arrange the cards and drums that they are in position for convenient access by a plurality of operators, file clerks, or the like. To this end, the invention provides a novel form of cabinet structure, housing a pair of drums and providing, in a minimum amount of floor space, positions for two operators who are so located with respect to the filing drums that they may work with a maximum degree of ease, convenience, and efficiency.

In accordance with this phase of the invention, a pair of filing drums are mounted substantially centrally in a supporting structure, for rotation about a horizontal axis in opposite directions, each toward the position of an operator, the operators being positioned at diagonally opposite corners of the structure as a whole. Hence, the drums are each positioned adjacent the right hand of the operator for convenient inspection of cards and posting of entries thereon. As stated above, the novel arrangement described in detail below results in the provision of an extremely compact apparatus and the saving of a substantial amount of floor space, while positioning the operators in such manner that the equipment may be handled with facility and efficiency.

Another important object of the invention is to provide improved means for rotating filing drums of the class under consideration, irrespective of whether the drums are mounted as suggested above or otherwise.

Another object is to provide handle means to facilitate rotation of the drums, which are always immediately accessible to the operator. To this end, the invention contemplates a one-way clutch connection between the operating handle or handles, so that the drum may be rotated forwardly by forward oscillations of the handle and the handle moved rearwardly, without imparting a corresponding rearward rotation to the drum.

Another object of the invention is to provide,

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in combination, a one-way brake, adapted to restrain, frictionally, rearward rotation of the drum, but permitting deliberate, forceful rotation in that direction, and handle means which, even though rotated rearwardly with the drum, are always in an accessible position. In order to accomplish this object, the handle means comprises a plurality of radially projecting, circumferentially spaced, handles so that, when one handle is moved rearwardly to an inaccessible position, another handle rises and move upwardly to a position of access.

Another important object of the invention is to provide locking means for the drum which will prevent inadvertent forward rotation thereof under the influence of relatively light turning force applied thereto, as during the posting of entries on forwardly projecting cards. It is well understood by those familiar with the use of rotatable filing drums, that such drums have a normal tendency to oscillate in a rearward direction a short distance, after they have been rotated forwardly to bring a particular card into view. The aforementioned patent to Scholfield et al. No. 2,046,655 discloses and covers broadly the use of a one-way brake, to prevent this rearward rotation of such a filing drum. When using certain types of filing drums, the cards are spread apart in front of the operator, and it is often necessary to post entries on the upper surface of the forwardly tipped, top card, thereby imparting some pressure to the cards and a light rotational force to the drum in a forward direction. The rotational tendency is normally resisted by the weight of the cards on the back half of the drum, but in some cases a firm support is desired for the posting of such entries, and one of the important objects of the present invention is to provide temporary locking means for preventing forward rotation of the drum under such relatively light forward rotational force.

Another object of the invention is to construct the locking means in such a manner that they will be automatically rendered effective by imparting to the drum a substantial push or rotational force in a rearward direction.

Another object is to provide means for automatically releasing the lock by imparting to the drum a forward rotational force of relatively strong or heavy degree.

Another object of the invention is to incorporate the locking feature in the one-way brake which normally frictionally restrains rotation of the drum in the rearward direction.

A further object of the invention is to provide specifically novel one-way brake and clutch constructions, interposed between the filing drum and its support, and between the handle and drum, respectively.

Other and further objects and advantages of the invention will be apparent from a consideration of the following description of certain specific embodiments thereof, illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a cabinet structure in accordance with the present invention, with a pair of drums mounted for rotation therein.

Figure 2 is a fragmentary perspective thereof, on a reduced scale.

Figure 3 is a fragmentary vertical sectional view of one of the drums and certain preferred clutch and brake mechanisms.

Figure 4 is an elevation, taken from the left in Figure 2.

Figure 5 is an elevation taken from the right of Figure 2.

Figure 6 is an elevation, with certain parts removed, showing a one-way clutch connection between the handle mechanism and the drum, and

Figure 7 is a similar view showing a preferred form of brake.

A pair of filing drums 10 and 11 are mounted for rotation about a horizontal axis in a central opening 12 in a cabinet structure 13, provided with a substantially rectangular, plane upper working surface 14. The drums are preferably journalled upon a common, stationary shaft or axle 15, supported at its ends in non-rotatable relation in appropriate sockets carried by the cabinet, but, of course, the drums may be mounted on individual stub shafts suitably supported in the cabinet, or the shafts may rotate with the drum and be journalled in bearings carried by the cabinet.

Preferably, the upper peripheries of the drums project upwardly a slight distance above the working surface 14, so that the cards 16 on the drums may be successively raised to a position of access thereabove, and the uppermost forwardly tipped cards 17 disposed to be in a plane substantially parallel to that surface for convenient posting of entries thereon by the operators.

In the embodiment of the invention illustrated in Figures 1 and 2, the cabinet 13 has a pair of shelf-like extensions 20, 21 horizontally connected thereto, for swinging movement into substantially the plane of the surface 14. It will be noted that the shelves are of less length than the cabinet and are so connected thereto as to provide positions 22, 23 for two operators at diagonally opposite corners of the apparatus, considered as a whole. Hence, an operator seated at position 22 will have the drum 10 adjacent her right hand and can rest her right forearm and elbow on the surface 14, directly in front of the drum 10. Similarly, the operator seated at position 23 finds the drum 11 in convenient position, directly to her right. The drums 10 and 11 are arranged, by the brake means hereinafter described, to rotate in opposite directions, as indicated by the arrows in Figure 1, toward the respective operators. Moreover, the drums are provided with handle mechanisms at 25 and 26, respectively, at the remote, left-hand ends of the drum, in convenient position to be grasped by the left hand of each operator, leaving the right hand free for the posting of entries and other manipulations.

The drum 10 shown in Figure 3 may be of any desired construction, such as wood impregnated with a synthetic resin, plastic material, sheet metal, or a combination of metal and other materials. It may be journalled upon the stationary shaft 15 by the use of anti-friction bearings or a simple sleeve 28. Its periphery carries a card retaining rail 29, adapted to be embraced by the margins of keyhole-shaped slots in the cards, as explained in the aforementioned patents, and marginal flanges 30, 31.

The end faces of the drum are preferably dished, as indicated at 32, 33, to provide spaces for the clutch and brake mechanisms now to be described.

The handle mechanisms 25 and 26 preferably comprise a central disk 35 having a plurality of circumferentially spaced, radially projecting arms 36, 37, 38, extending outwardly beyond the periphery of the drum. The central disk portion 35 of the handle mechanism is secured, as by suitable screws 39, to a ring 40 mounted coaxially with respect to the shaft 15 and held in place by an outer ring 41 having an inwardly projecting flange 42, overlying a stepped, shoulder portion 43 of the ring 40, the outer ring 41 being secured by screws 44 to a disc 45 carried by the end face of the drum and held in place by suitable screws 46.

The disk 45, or the end face of the drum itself, carries a cam 47 which is positioned in symmetrical relation to the axis of the drum, and which comprises two semi-circular eccentric pieces 47*a*, 47*b*, secured in place by screws 48 and held in accurately predetermined relation by dowel pins 49.

The cam 47 may conveniently be formed by drilling a circular disk somewhat off-center, thereby providing an eccentric bore therein. The plate so formed may be cut in two along the major axis of eccentricity and one-half turned over. When the margins of the inner half-circles are brought into circular relation, a cam of the shape shown in Figure 6 will be produced, comprising two semi-circular eccentric pieces 47*a*, 47*b*.

Interposed between the inner surface 40*a* of the ring 40 and the central cam are a plurality of clutch shoes and shoe expanding devices of novel constructional details. A pair of shoes 50 and 51 each extend around throughout substantially 135° of the ring 40 and have their outer surfaces in concentric contacting relation thereto. The shoes have adjacent bevelled ends 52, 53, for the reception of a wedge block 54 which has its wedge faces bearing thereagainst and its inner face disposed in contact with the outer surface of the cam 47*a*. Light compression springs 55, 56 may be interposed between the shoes and the cam, to assist in maintaining the parts in proper engagement.

A third shoe 57, interposed between the opposite ends of the shoes 50 and 51 has an outer surface in contact with the inner surface 40*a* of the ring 40 and the inner surface 58 bearing directly against the cam surface of element 47*b*.

If desired, the ring 40 and the several brake shoes may be formed of strong, tough, vulcanized fiber or other plastic material, but it is preferred to have the central cam and the wedge block 54 made of metal, such as hardened steel. Similarly, the surface 58 of the shoe 57 is preferably formed on a metal strip 59 to resist the wear resulting from its engagement with the cam surface.

Stop pins 60, 61, projecting inwardly from the

shoes 50 and 51 engage the end faces of the cam elements, to limit relative rotation of the shoes in a release direction.

When the ring 40 is rotated in the direction of the arrow in Figure 6, by rotational force imparted thereto from the handle mechanism, the shoes 50, 51 and 57 will tend to move in the same direction. This will cause the wedge block 54 to ride outwardly on the cam surface of the member 47a. This movement, even though very slight, will be transmitted, through a wedging action, to the adjacent ends of the shoes 50 and 51, thereby spreading the shoes, since their opposite ends are in abutment with the shoe 57. Simultaneously, the outer surface of cam 47b urges the shoe 57 outwardly with the result that all of the shoes firmly engage and grip the ring 40 and positively transmit rotational force therefrom to the central cam 47 and to the drum, thereby causing the drum to be rotated in a forward direction with the handle.

When the handle mechanism is reciprocated in the opposite direction, the ring 40 is free to rotate relative to the shoes 50, 51 and 57, since the wedge block 54 and the surface 58 of the shoe 57 ride down upon a low portion of the cam and relieve the outward pressure on the shoes.

In the normal operation of the mechanism, any one of the arms or handles 36, 37, or 38 of the handle mechanism may be in the upwardly projected position, and the others in a downwardly projecting position, as indicated in Figure 4, below the level of the upward working surface 14 of the cabinet structure. By reciprocating the handle back and forth, the drum is rotated forwardly. Should it be desired to rotate the drum rearwardly, against the resistance of the friction brake hereinafter described, the handle will necessarily rotate rearwardly with the drum, because of the one-way clutch just described. For instance, if an operator should rotate the drum forwardly a slight distance below the desired point, it would be inconvenient for her to rotate the drum through a complete forward revolution to reach the desired card, and for this or some other reason she might want to rotate the drum rearwardly through a partial rotation. This action might result in the handle being moved rearwardly below the table top. However, the same action will bring one of the other handles upwardly into an accessible position above the surface of the cabinet so that it may be used instead of the former.

The friction brake mechanism indicated generally at 65 in Figure 3 is preferably housed within the dished end 32 of the drum. It comprises a disk 66 coaxial with and fast upon the shaft 15, secured in predetermined relation by appropriate means, such as set screws 67. The disk carries a flexible, preferably metallic, brake band 68, having its ends turned outwardly, as at 69, 70 (Figures 5 and 7) for the reception of a bolt 71 and wing nut 72, so that its frictional engagement with a ring 73 may be gradually adjusted.

The adjacent end face of the drum 10 carries a central cam 74, consisting of two semi-circular eccentric elements 74a, 74b, held in place by screws 75 and dowels 76, as previously described. The cam 74 may be made in accordance with the method suggested above, and may be generally similar, except that its degree of eccentricity is very considerably less, for purposes hereinafter described. Moreover, this cam is preferably made of vulcanized fiber or some other material

having a higher co-efficient of friction than the metal employed in making the cam 47.

Interposed between the surfaces of the cam pieces 74a, 74b, and the inner circumference of the ring 73 are a pair of brake shoes 77, 78, having their inner and outer surfaces conforming to and lying in contact with the corresponding surfaces of the ring and cam. It should be noted that the taper of each shoe is rather slight, corresponding to the degree of eccentricity of the cam surfaces.

Short, arcuate blocks 79, 80 may be interposed between the rear, thick ends of the shoes 77, 78 and stop pins 81, 82, projecting outwardly from the high ends of the cam sections 74a, 74b.

From a consideration of the construction just described, it will be understood that the ring 73 is normally held stationary by frictional engagement with the band 68, carried by the disk 66, fast on the stationary shaft 15. When the central cam 74 and the drum 10 are rotated in the direction of the arrow in Figure 6, the shoes 77, 78 move relatively a slight distance, toward the low end of each cam, so that the cam and the shoes move freely with respect to the ring 73, thus permitting free rotation of the drum in the forward direction. When the drum tends to oscillate rearwardly, however, under the influence of the overbalancing weight of the cards on the rear portion thereof, the cam elements 74a, 74b tend to force the shoes 77 and 78 outwardly into engagement with the stationary ring 73, thereby preventing such rotation.

If rearward rotational force of substantial degree is imparted to the drum, however, the ring 73 will slip relative to the band 68, overcoming the frictional resistance therebetween, so that the drum may be rotated rearwardly.

The application of rearward rotational force of substantial degree causes the tapered shoes 77, 78 to move relatively toward the high ends of the cams 74a, 74b, with a jamming action, because of the slight eccentricity of the cams. The degree of jamming action is controlled by the stop pins 81, 82. When the parts jam in this manner, the drum cannot readily be rotated in a forward direction, since the cam, the shoes, the ring and the brake band are locked together. This locking action and the frictional engagement between the parts is sufficiently firm to permit the posting of entries on the cards on the drum, with the application of light forward rotational force thereto. However, if deliberate, substantial rotational force is imparted to the drum, in a forward direction (counter-clockwise in Figure 7) the cams 74a, 74b move relative to the shoes 77 in such a manner that the wedging engagement of the shoes with the ring 73 is released, and the drum rotates freely in the forward direction.

It will be understood that the frictional resistance between the ring 73 and the brake band 68 is sufficiently great to effect the above described jamming action, upon rearward rotation of the drum, and to release the same, upon forward rotation thereof. This frictional resistance may be adjusted by the wing nut 72.

It is thought that the principles and mode of operation of the apparatus of the present invention will be entirely clear to those skilled in the art from a consideration of the foregoing description. All modifications of the invention coming within the scope of the appended claims and their equivalents are intended to be included.

We claim:

1. A filing apparatus comprising a filing drum

having means on its periphery for securing a plurality of cards and being mounted for rotation about a substantially horizontal axis, a handle mounted for oscillation coaxially with the drum and projecting outwardly beyond its periphery, and a one-way clutch connected between the handle and drum whereby the drum may be rotated forwardly by the handle and the handle oscillated rearwardly independently of the drum.

2. A filing apparatus comprising a filing drum having means on its periphery for securing a plurality of cards and being mounted for rotation on a substantially horizontal axis, handle means coaxial with the drum comprising a plurality of circumferentially spaced, rigidly interconnected handles projecting outwardly beyond the periphery of the drum, and a one-way clutch between said handle means and the drum, whereby the drum may be rotated forwardly by the handles and the handles moved rearwardly independently of the drum, and whereby, when the drum is rotated rearwardly and the handles are caused to rotate therewith by the clutch, one handle is raised to a position of convenient access above and in front of the drum as another handle is moved rearwardly to a less accessible position.

3. A filing apparatus comprising a drum supported for rotation about its axis, means for loosely securing a plurality of cards on the drum for inspection and posting, a one-way brake between the drum and its support, permitting substantially free rotation in a forward direction but restraining rotation in a rearward direction, and locking means associated with said brake rendered effective by the application of deliberate rearward rotational force to the drum, for temporarily locking the drum steady when applying light forward rotational force thereto, as when posting entries on the cards, said locking means being automatically releasable upon the application of deliberate forward rotational force to the drum.

4. A filing apparatus comprising a drum supported for rotation about its axis, means for loosely securing a plurality of cards on the drum for inspection and posting, means for locking said drum against inadvertent rotation in a forward direction under the influence of relatively light turning force, as when posting entires on said cards, said means comprising jamming means operatively interposed between the drum and its support and rendered effective by the application of rearward rotational force of substantial degree to the drum, said means being automatically released by the application of relatively heavy forward turning force to the drum.

5. A filing apparatus comprising a drum supported for rotation about its axis, means for loosely securing a plurality of cards on the drum for inspection and posting, means for locking said drum against inadvertent rotation in a rearward direction and in a forward direction under the influence of a relatively light turning force, as when posting entries on said cards, said means comprising a one-way friction brake normally restraining rearward rotation of the drum, and jamming means operatively interposed between the drum and its support and rendered effective by the application of rearward rotational force of substantial degree to the drum, said jamming means being automatically released by the application of a relatively heavy forward turning force to the drum.

6. A filing apparatus comprising a drum supported for rotation about its axis, means for loosely securing a plurality of cards on the drum for inspection and posting, means for locking said drum against inadvertent rotation in a forward direction under the influence of relatively light turning force, as when posting entries on said cards, said means comprising a one-way friction brake normally restraining rearward rotation of the drum, and jamming means operatively interposed between the drum and its support and rendered effective by the application of rearward rotational force of substantial degree to the drum, said jamming means being automatically released by the application of a relatively heavy forward turning force to the drum, and means for limiting the degree of jamming action and thereby limiting the degree of forward rotational force required to release said locking means.

7. A filing apparatus comprising a rotatable filing drum, means for securing a plurality of cards to the periphery thereof, a stationary support for the drum, and a brake assembly operatively connected between the drum and the support, said brake comprising a brake band and a ring normally restrained against relative rotation by the frictional resistance therebetween, cam means mounted for relative rotation with respect to the ring, means between the ring and cam shaped to permit substantially free relative rotation in one direction and to establish driving connection and prevent relative rotation therebetween in the other direction, the last mentioned means and cam being so shaped as to jam and lock when relatively heavy turning force in the last mentioned direction is applied, thereby temporarily establishing a two-way connection between the cam and ring and restraining rotation of the drum in both directions.

8. A filing apparatus comprising a rotatable filing drum, means for securing a plurality of cards to the periphery thereof, a stationary support for the drum, and a brake assembly operatively connected between the drum and the support, said brake comprising a brake band and a ring normally restrained against relative rotation by the frictional resistance therebetween, cam means mounted for relative rotation with respect to the ring, wedge shoes between the ring and cam shaped to permit substantially free relative rotation in one direction and to establish driving connection and prevent relative rotation therebetween in the other direction, said wedge shoes and cam being so shaped as to jam and lock when relatively heavy turning force in the last mentioned direction is applied, thereby temporarily establishing a two-way connection between the cam and ring and restraining rotation of the drum in both directions.

9. Filing apparatus comprising a cabinet having an upper working surface provided with an opening therein, a filing drum journalled for rotation in the cabinet on a substantially horizontal axis, means for securing a plurality of cards to the periphery of the drum, a one-way brake between the drum and its support, normally permitting substantially free rotation in a forward direction to bring the cards successively to a posting position substantially parallel to said working surface, and locking means associated with said brake for temporarily preventing forward rotation of the drum under the influence of relatively light turning forces, as when posting.

10. Filing apparatus comprising a cabinet having a plane upper working surface provided with an opening therein, a filing drum journalled for

rotation in the cabinet on a substantially horizontal axis, means for securing a plurality of cards to the periphery of the drum, a one-way brake between the drum and its support, normally permitting substantially free rotation in a forward direction to bring the cards successively to a posting position substantially parallel to said working surface, and locking means associated with said brake for temporarily preventing forward rotation of the drum under the influence of relatively light turning forces, as when posting, said locking means being rendered effective by the application of substantially heavy rotational force to the drum in a rearward direction and being automatically released by a similar rotational force in a forward direction.

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