March 14, 1950 R. P. SCHOLFIELD 2,500,709

ROTARY FILE AND BRAKING MEANS THEREFOR

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Fig. 1

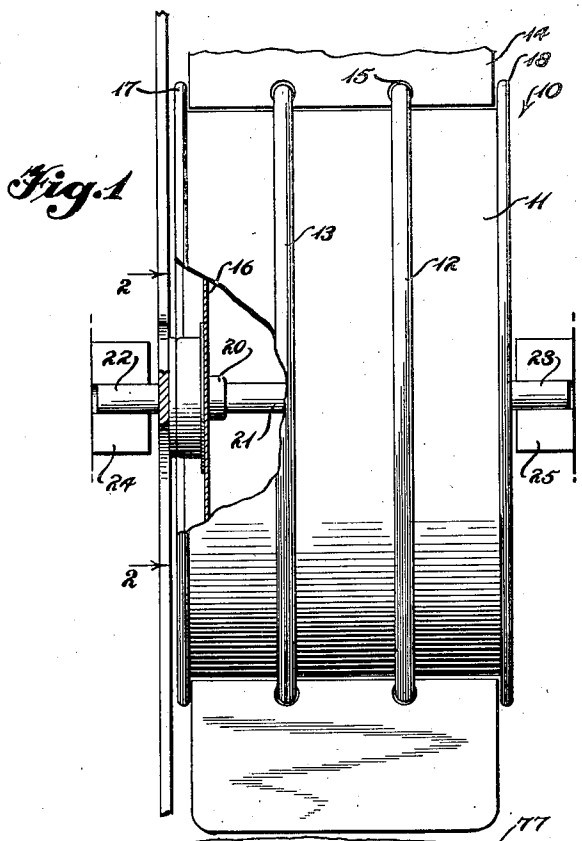
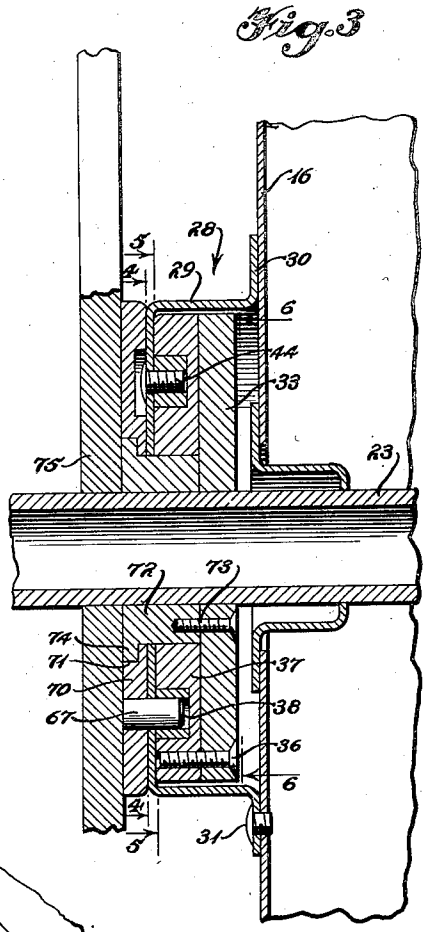


Fig. 3



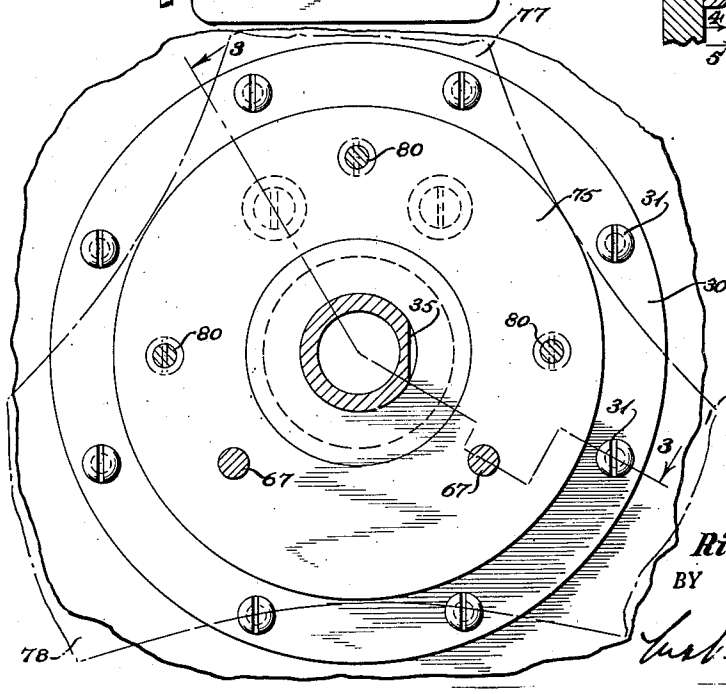


Fig. 2

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ROTARY FILE AND BRAKING MEANS THEREFOR

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Fig. 4

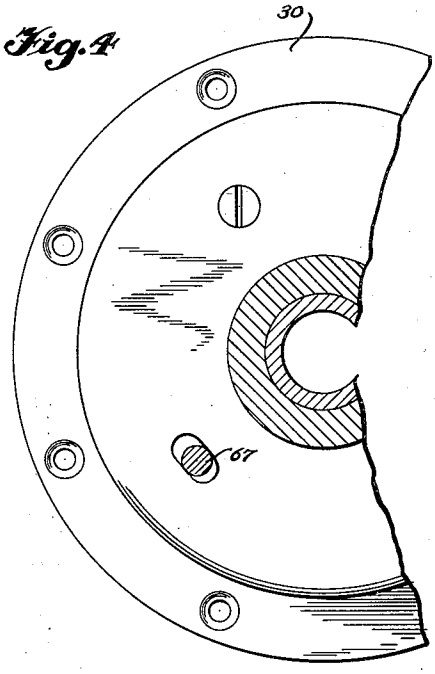


Fig. 5

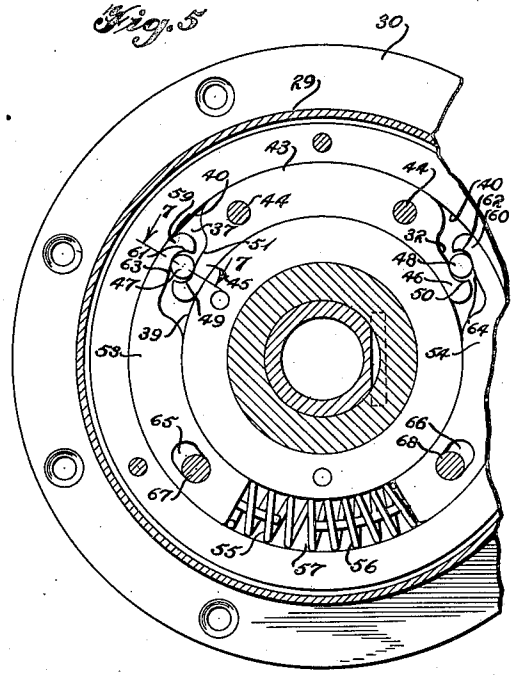


Fig. 6

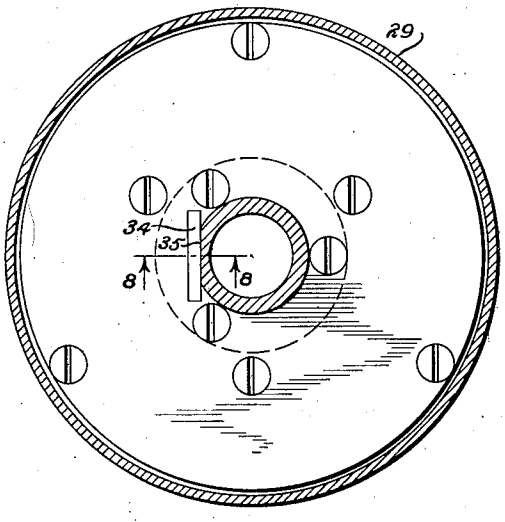


Fig. 7

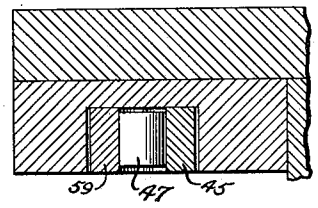
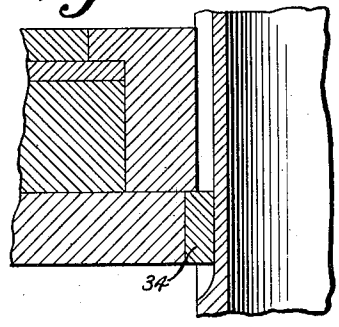


Fig. 8



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ROTARY FILE AND BRAKING MEANS THEREFOR

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Fig. 9

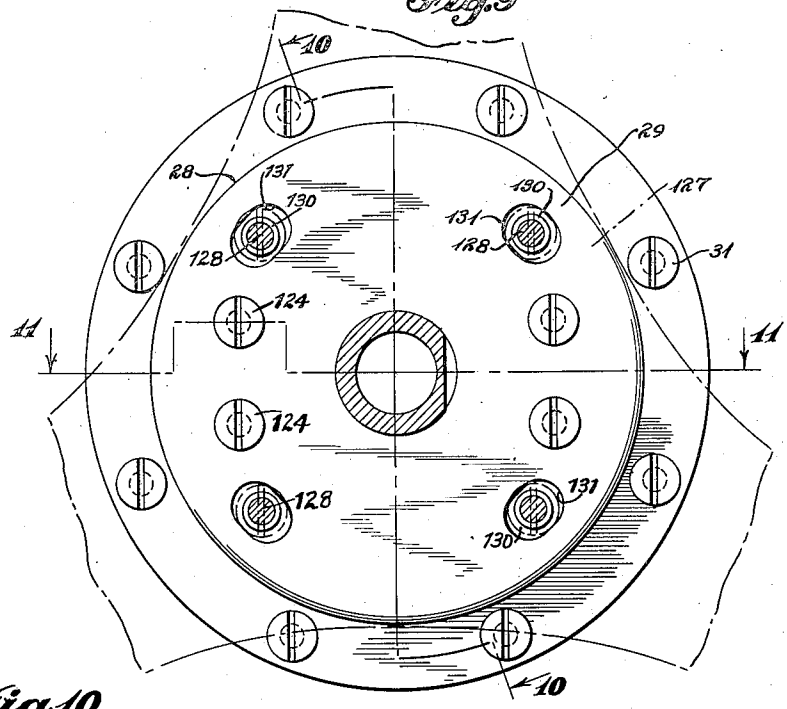


Fig. 10

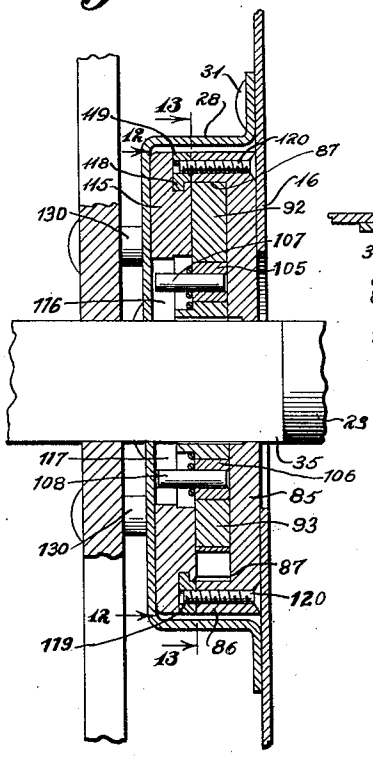
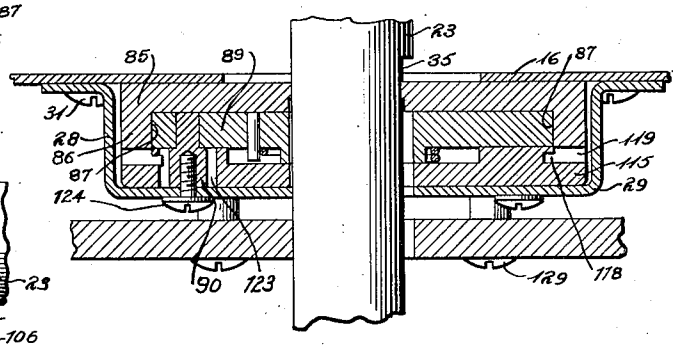


Fig. 11



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Fig. 12

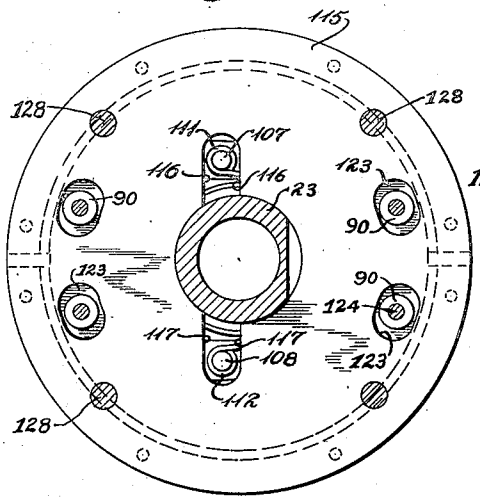


Fig. 13

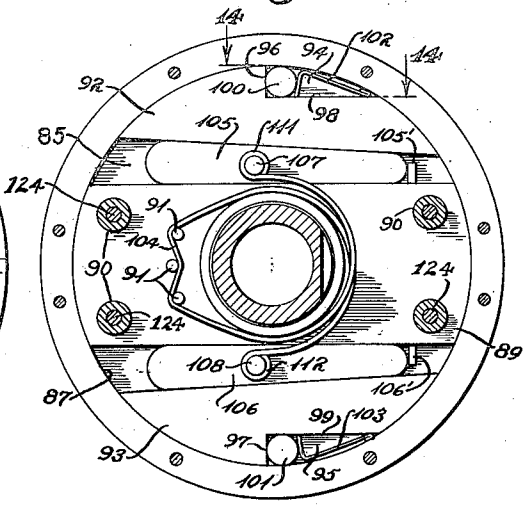


Fig. 14

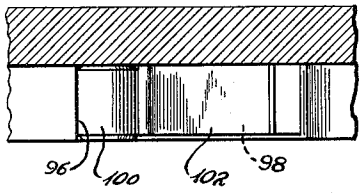
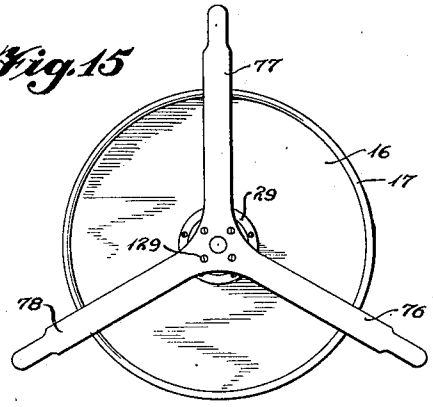


Fig. 15



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Patented Mar. 14, 1950 2,500,709

UNITED STATES PATENT OFFICE

2,500,709

ROTARY FILE AND BRAKING MEANS THEREFOR

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Application November 21, 1947, Serial No. 787,409

8 Claims. (Cl. 192—8)

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The present invention relates to rotary files and, more particularly, to files of the type comprising filing drums mounted for rotation about their axes and having means associated with their peripheries for removably securing thereto a plurality of filing cards.

Filing equipment of this type is used for keeping records of a wide variety of types, and it is often desired to post entries upon the cards while the same are mounted upon the drum periphery, while in other cases the cards are removed, entries are typed thereon, and the cards replaced. In either case, and during the operation of manually inspecting the cards, to locate a particular one or the like, it is of the utmost importance that the rotatable drum be restrained against rotation and held firmly in one position, to resist the turning forces imparted thereto by the operator and by the unbalanced weight of the cards on the drum.

In the prior patent to Scholfield et al., No. 2,046,655, a one-way brake, between the rotatable drum and a non-rotatable supporting shaft is shown, to prevent rotation of the drum in a rearward direction, and the construction there provided has been of substantial utility and constitutes an improvement over prior rotary files. However, the construction of that patent includes no means for preventing rotation of the drum in a forward direction, for instance, upon the application of turning forces thereto, as a result of the posting of entries by the operator upon cards secured to the forward, downwardly turning surface of the drum periphery.

The primary object of the present invention is to provide, in combination with a rotary file, a brake mechanism which will prevent rotation of the drum in both directions, upon the application of turning forces to the drum in either direction, yet which will be instantly released, to permit rotation of the drum in either direction upon the application of turning forces to a handle mechanism associated with the drum.

A further object of the invention is to provide, in combination with a rotary file, an improved, automatic brake mechanism and handle mechanism for releasing the brake and turning the drum.

Another object of the invention is to provide automatically operating two-way brakes for rotary files which will resist relatively great turning forces applied to the card carrying drums in either direction, yet which will be substantially free running in both directions, when released, thereby permitting easy turning of the drums

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through the instrumentality of associated handle mechanisms.

Another object is to provide specific improvements in such brake mechanisms.

Other and further objects and advantages of the invention will be apparent from a consideration of the following description of certain preferred embodiments of the invention shown in the accompanying drawings, in which,

Figure 1 is a plan view and partial section of a filing drum and its supporting elements;

Figure 2 is a fragmentary section and elevation on an enlarged scale looking from the left of Figure 1, substantially on the line 2—2 of Figure 1;

Figure 3 is a section on line 3—3 of Figure 2;

Figures 4, 5, and 6 are fragmentary sections on lines 4—4, 5—5, and 6—6, respectively, of Figure 3;

Figure 7 is an enlarged fragmentary section on line 7—7 of Figure 5;

Figure 8 is an enlarged fragmentary section on line 8—8 of Figure 6;

Figure 9 is a view similar to Figure 2 of a modified form of brake mechanism;

Figures 10 and 11 are sections on lines 10—10 and 11—11, respectively, of Figure 9;

Figures 12 and 13 are sectional views taken on lines 12—12 and 13—13, respectively, of Figure 10;

Figure 14 is an enlarged section and elevation, on line 14—14 of Figure 13, and

Figure 15 is a diagrammatic, side elevation, on a reduced scale, of a preferred form of handle mechanism.

The filing drum 10 preferably comprises a rim member 11 having a plurality of outwardly projecting, circumferentially extending, headed card retaining rails 12, 13, associated therewith, upon which a plurality of cards 14 may be removably retained, for instance, by means of keyhole shaped slots 15, as is well understood in the art. The rim is preferably mounted upon shoulders associated with dished heads 16, one of which is shown in Figure 1, terminating in outwardly projecting flanges 17, 18, arranged to lie along the lateral edges of the cards 15.

The drum heads may be journalled by suitable bearings 20 upon a non-rotatable shaft 21, having its ends 22, 23, supported in suitable socket members 24, 25, the shaft ends and sockets being provided with cooperating flat surfaces to prevent rotation of the shaft.

The brake mechanism, represented generally at 28, is housed within a casing 29 having an

out-turned flange 30 which may be removably secured to the drum head 16 by a circumferential series of screws 31. Within the housing there is an inner plate 33, keyed to the shaft by a key 34 engaging a flat 35 on the shaft, to prevent rotation of the plate, but making it possible to slide the entire brake assembly axially on the shaft.

Secured to the outer face of the plate 33 by screws 36 is an annular brake member 37, having a circumferential channel 38 formed in its outer face, defined by concentric inner and outer walls 39 and 40, constituting brake surfaces. Slidably mounted in the channel 38 for relatively free movement with respect thereto is a shoe 43, fixedly attached to the housing 29 by screws 44. The shoe 43 is provided with terminal extensions 45, 46, having outer surfaces shaped to provide seats for rollers 47, 48, the bottoms of the seats being inclined radially outwardly away from the ends of the extremities so that they are deeper at the outer ends 49 and 50 and shallower at the inner ends 51, 52.

Also slidably mounted in the channel 38 of brake member 37 are two oppositely disposed shiftable brake shoes 53, 54, having their side walls in free sliding engagement with the walls of the channel and carrying at their adjacent ends, pins 55 and 56, serving as retaining means for a coil compression spring 57, urging the shiftable shoes towards the shoe 43 fixedly attached to the housing 29.

The shiftable shoes are provided with terminal portions or fingers 59, 60, having surfaces shaped to provide seats cooperating with the rollers 47 and 48, the seats being deeper at the free ends 61, 62, and inclined toward the shallower ends 63, 64.

Adjacent their opposite ends, the shiftable shoes are provided with circumferentially elongated slots 65, 66, which receive pins 67, 68, carried by an outer plate 70 having a shouldered central aperture 71. A hub member 72 secured by screws 73 to the inner plate 33, is provided with a flange 74, mating with the shoulder of the plate 70 and preventing axial movement of the latter end of the intermediate parts relative to plate 33.

Surrounding the shaft 23 is a handle 75, which may have three or more arms 76, 77, 78, the central portion of which is attached to the outer plate 70 by suitable means, such as screws 80 (Figure 2).

It is thought that the operation of the first form of the invention, just described, will be clear from a consideration of the relationship of parts shown in the accompanying drawings. The inner plate 33, brake surface channel member 37 and hub 72 are all fixed to the non-rotatable shaft 23 and are therefore non-rotatable, whereas the housing 29, brake shoes 43, 53, and 54, outer plate 70 and handle 75, together with the filing drum 10 are rotatable with respect to the shaft. With the parts in the position of rest, however, as shown in Figure 5, the brake mechanism is effective to prevent rotation of the drum under the influence of turning forces imparted thereto in either direction. For instance, if rotational force is imparted to the drum and, therefore, to the housing 29 and shoe 43 in a clockwise direction, the shallow end 52 of the seat for roller 48 will engage the roller and will tend to roll the same up upon the shallow end 64 of the shiftable brake shoe 54, thereby forcing the latter shoe outwardly against the outer wall 40 of the channel 38, causing the parts to jam.

During this attempted movement, of course, the other brake shoe 53 is ineffective, since the roller 47 is at the deep end of the two seats.

If rotational force is imparted to the drum in a counterclockwise direction, exactly the opposite effect is produced and roller 47, riding up onto the shallow ends 51 and 63 of the two seats forces the shiftable shoe 53 outwardly into engagement with the outer wall 40 of the channel, preventing rotation of the drum in a counterclockwise direction, the other brake shoe 54 being ineffective at this time.

Thus, the drum is normally locked against rotation in both directions, under the influence of turning forces applied to the drum.

If, however, the handle mechanism 75 is shifted in a clockwise direction, Figures 2, 4, and 5, pin 68 disposed in slot 66 pulls the shiftable shoe 54 downwardly so that the roller 48 lies in the deep ends 50 and 62 of its seats. Turning forces are transmitted through the roller 48 to the shoe 43 and from the latter through screws 44 to the housing 29, thereby to turn the drum in a corresponding direction, the brake shoe 53 being ineffective to restrain rotation in this direction.

Similarly, when turning forces are imparted to the handle in a counterclockwise direction, the pin 67 in the slot 65 of shiftable shoe 53 draws the latter downwardly, causing the roller 47 to lie in the deep ends 49 and 61 of its seats and transmitting turning forces through the roller to the terminal portion 45 of shoe 43 and from the latter to the filing drum.

Of course, when the handle is released the brake is instantly and automatically applied to restrain rotation in eitiher direction.

Another form of brake mechanism, shown in Figures 9–14, may be mounted within the same housing 29, secured by screws 31 to the drum head 16. In this case, an inner plate 85 is similarly keyed to the flat portion 35 of shaft 23, the plate being provided with an axially outwardly projecting flange 86 having a radially inner circumferentially continuous wall 87 constituting a fixed brake surface. Within the central recess defined by the flange 86, there are arranged a plurality of brake elements, including a centrally apertured shoe 89 rotatably surrounding the shaft 23 and having a plurality of centrally bored and tapped studs 90 projecting outwardly therefrom. The shoe 89 also carries three pins 91, serving as retaining devices for a spring, hereinafter described.

Laterally of the central shoe 89 are a pair of segment shaped shoes 92, 93, having their arcuate surfaces mating with the inner surface 87 of the flange 86. The outer surfaces of the shoes 92, 93, however, are recessed as at 94, 95, and provided with substantially radially disposed, flat end surfaces 96, 97 and angularly disposed chordal bottom surfaces 98, 99, providing recesses for rollers 100, 101, the rollers being constantly urged toward the end walls 96, 97 by leaf springs 102, 103, seated in recesses 94 and 95.

Between the adjacent surfaces of the segmental shoes 92, 93 and the central member 89 are a pair of wedge members 105, 106, having studs 107, 108 projecting outwardly therefrom. A wishbone type spring 109 having a central section 104 threaded between the pins 91, has its ends 111 and 112 embracing the studs 107, 108, thereby constantly urging both of the wedge members 105 and 106 into operative position, toward the right in Figure 13, this movement being limited by stop pins 105' and 106' projecting from the edge faces of the central shoe 89.

At the outer face of the shoes 89, 92, and 93, there is an annular plate 115, having a central aperture surrounding the shaft 23 and merging into laterally projecting slots 116, 117, into which the studs 107 and 108 loosely project. The axially inner end of the outer surface of plate 115 is shaped to provide an undercut groove 118, for the reception of a split ring 119, having its inner surface shaped to mate therewith, and adapted to be secured to the inner plate 85 by screws 120.

The outer plate 115 has a plurality of enlarged openings 123 which loosely receive the studs 90, for limited circumferential lost motion. A plurality of screws 124 extends through holes in the housing 29 and into the tapped bores of studs 90, to secure the various parts to the housing.

The handle 127 is secured in outwardly spaced relation to the housing 29 and the plate 115 by a plurality of headed screws 128 extending through spacer sleeves 130, disposed in enlarged openings 131 in the housing 29 and bearing against the outer surface of the plate 115, for relative circumferential lost motion of the handle with respect to the housing.

In the operation of this form of the invention, turning forces imparted to the drum are transmitted through housing 29 and screws 124 to the central shoe 89 of the brake mechanism and from the latter, through the wedges 105, 106 to the arcuate shoes 92 and 93. Rotation in a clockwise direction, Figure 13, would be permitted by roller 100 in the slot 94, since, when the roller is in the deep end of the recesses, abutting the rear wall 96, its circumference is substantially out of contact with surface 87 of the fixed flange 86. However, rotation in this direction is restrained by the other roller, 101, which immediately jams between the circumferential surface 87 and the chordal bottom 99 of recess 95. Similarly, rotation as a result of forces imparted to the drum in the opposite direction is restrained by roller 100, jammed between the surface 87 and the bottom 98 of recess 94.

Turning forces imparted to the handle mechanism are directly transmitted through screws 128 to the outer plate 115, rotation of the latter relative to the housing 29 being permitted by the space between the margins of the enlarged openings 131 and the sleeves 130. Rotation of the plate 115 in the clockwise directions causes engagement of the margin of slot 117 with pin 108 carried by wedge 106, thereby withdrawing that wedge and permitting the shoe 93 to move radially inwardly. Spring 103 engaging roller 101 limits the rolling movement of the latter along the bottom 99 of recess 95 and prevents the jamming of the roller. With shoe 93 in the relieved or retracted position, turning forces are imparted to the studs 90 by the margins of the openings 123 in plate 115, whereby the drum may be rotated in a clockwise direction, since the studs are fixedly attached to the housing 29 by screws 124.

Turning forces imparted to the handle in the opposite, counterclockwise direction function in a similar manner. Wedge 105 is withdrawn, to relieve the outward force on shoe 92, thereby preventing the roller 100 from jamming between the surface 87 and the bottom 98 of recess 94. Hence, the drum may be rotated quite readily in a counterclockwise direction by appropriate manipulation of the handle mechanism.

It will be understood that, upon release of the handle, the brake shoes are immediately and automatically shifted to their operative positions, thereby preventing rotation of the drum under the influence of turning forces imparted thereto.

The invention is not limited to the details of construction shown in the accompanying drawings and described above, but includes all modifications coming within the appended claims and their equivalents.

I claim:

1. A rotary file comprising a non-rotatable supporting shaft, a filing drum journalled for rotation thereon, a handle mounted for rotation coaxially of the shaft, a brake mechanism interposed between the drum and the shaft, and connections between the handle and the brake mechanism, said mechanism comprising a circumferentially continuous braking surface fixed to the shaft, a shoe fixed to the drum slidable along said surface, a pair of shiftable shoes cooperating with the fixed shoe, means normally causing one shoe to jam against said surface upon attempted rotation of the drum in one direction, means normally causing the other shoe to jam against said surface upon attempted rotation of the drum in the other direction, whereby the drum is normally restrained against rotation in both directions, and a connection between said handle and the shiftable shoes to shift the latter away from said surface and preventing jamming thereof upon the application thereto of turning forces in the first mentioned directions, whereby the drum may be rotated in either direction by the handle.

2. A rotary file comprising a non-rotatable supporting shaft, a filing drum journalled for rotation thereon, a handle mounted for rotation coaxially of the shaft, a brake mechanism interposed between the drum and the shaft, and connections between the handle and the brake mechanism, said mechanism comprising a circumferentially continuous braking surface fixed to said shaft, a pair of shiftable shoes rotatable with the drum, a roller associated with each shoe adapted to jam against said surface when turning forces are imparted to the drum and to the shoes in opposite directions, said rollers being free in the other directions, said connection between the handle and each shoe serving to shift the shoes to inoperative positions upon the application of turning forces thereto.

3. A rotary file comprising a non-rotatable supporting shaft, a filing drum journalled for rotation thereon, a handle mounted for rotation coaxially of the shaft, a brake mechanism interposed between the drum and the shaft and connections between the handle and the brake mechanism, said mechanism comprising a brake drum fixed to the shaft having an internal braking surface, a pair of jam type oppositely acting one-way brake shoes in the brake drum connected for rotation with the filing drum, each shoe being shiftable inwardly to an inoperative position, a movable wedge behind each shoe, and spring means normally urging the wedges to shift the shoes outwardly, said connections between the handle and the brake mechanism comprising a lost motion connection between the handle and each wedge, effective to shift the wedge and the associated shoe to the inoperative position upon the application of turning force to the handle in the direction normally restrained by the shoe, whereby the filing drum may be rotated by the handle in either direction, but rotation of the drum is restrained in both directions by the shoes, upon the application of turning forces to the filing drum.

4. A rotary file comprising a non-rotatable supporting shaft, a filing drum journalled for rotation thereon, a handle mounted for rotation coaxially of the shaft, a brake mechanism interposed between the drum and the shaft and connections between the handle and the brake mechanism, said mechanism comprising a brake drum fixed to the shaft, having a circumferentially continuous internal braking surface, a pair of shoes rotatable with the filing drum disposed within the brake drum, mounted for radial shifting from an outer, operative position to an inner, inoperative position, a pair of wedges behind the shoes, spring means normally urging the wedges in a direction to project the shoes in an outer position, and a roller interposed between each shoe and the braking surface, one arranged to jam and prevent rotation of its associated shoe in one direction, and the other in the opposite direction, whereby the filing drum is normally restrained against rotation in both directions, said connections including a lost motion connection between the handle and each of said wedges, effective to move each wedge against the force of said spring means to shift the associated shoe to the inoperative position when turning force is imparted to the handle in the direction normally restrained by the associated roller.

5. An apparatus in accordance with claim 4 characterized in that each shoe has an arcuate peripheral surface mating with the brake drum surface and interrupted by a recess having a bottom on a chord of the arc, and in that the rollers are disposed in said recesses.

6. An apparatus in accordance with claim 4 characterized in that each of said brake shoes has an arcuate peripheral surface mating with the braking surface and interrupted by a recess defined by a substantially radial end wall and a chordal bottom, and in that the rollers are disposed in the recesses so formed.

7. An apparatus in accordance with claim 4 characterized in that each of said brake shoes has an arcuate peripheral surface mating with the braking surface and interrupted by a recess defined by a substantially radial end wall and a chordal bottom and in that the rollers are disposed in the recesses with a spring associated with each roller normally urging the same toward the radially disposed end wall of its recess.

8. A rotary file comprising a non-rotatable supporting shaft, a filing drum journalled for rotation thereon, a handle mounted for rotation coaxially of the shaft, a brake housing carried by the drum, rotatable therewith and surrounding a portion of the shaft, a brake mechanism in the housing, and connections between the handle and the brake mechanism, said mechanism comprising a member fixed to the shaft having a circumferentially continuous, radially inwardly facing, stationary braking surface, a shoe fixed with respect to and rotatable with the casing and positioned for free sliding movement in both directions relative to said surface, and a pair of shiftable shoes connected to receive rotational force from the fixed shoe and having oppositely acting, one-way jamming connections with said surface under the influence of such force to restrain rotation of the drum and casing in both directions, said connection between the handle and the brake mechanism comprising means extending from the handle through the casing with capability of lost motion with respect thereto, operatively connected to the shiftable shoes for shifting each to the inoperative, non-jamming position upon the application of turning force to the handle in the direction of drum rotation normally restrained by that shoe.

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