No. 759,846. PATENTED MAY 17, 1904.

A. T. & C. T. ATHERTON.

ROTARY RING SPINNING MACHINE.

APPLICATION FILED DEC. 28, 1903.

NO MODEL.

Fig. 1.

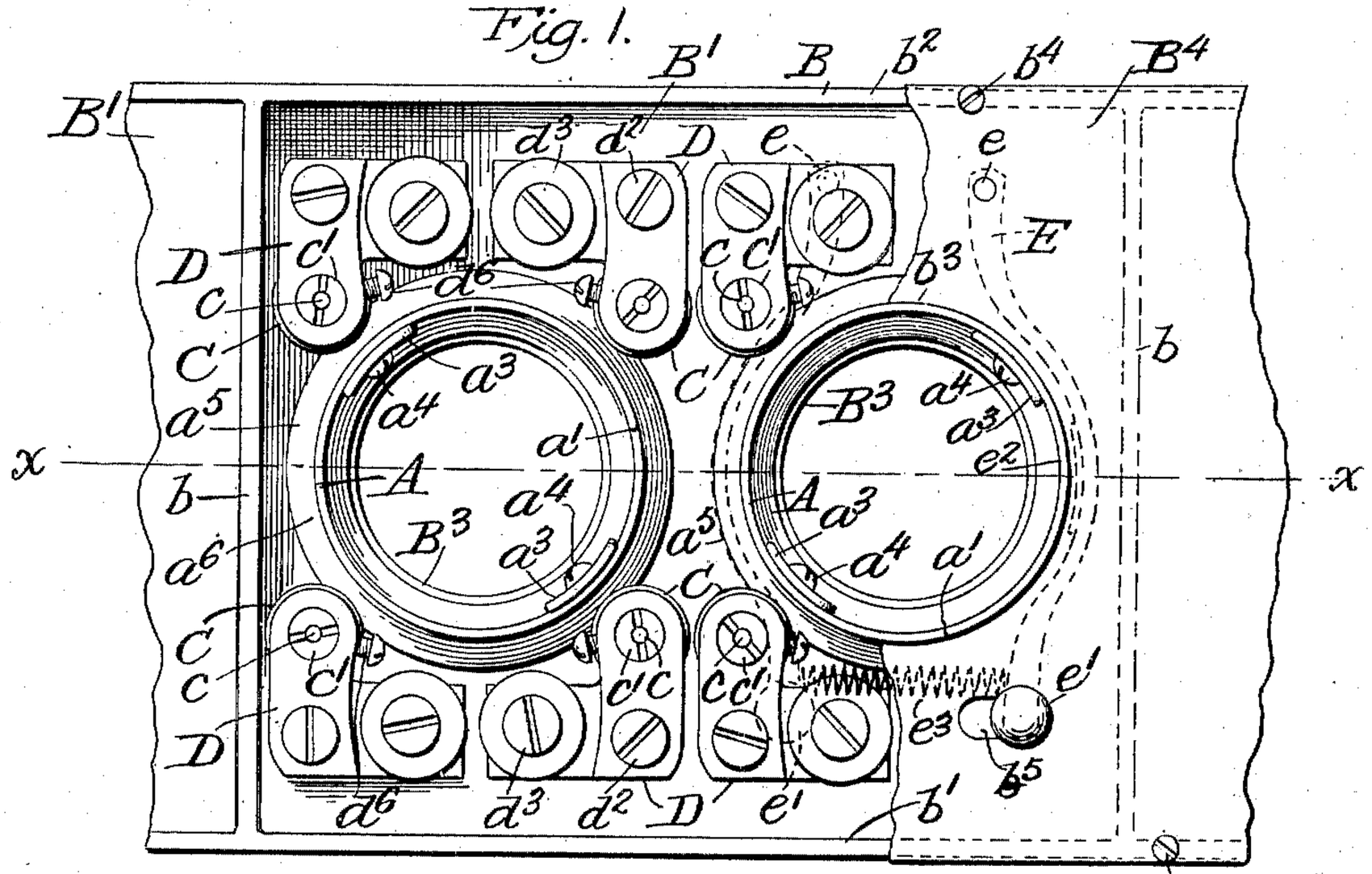


Fig. 2.

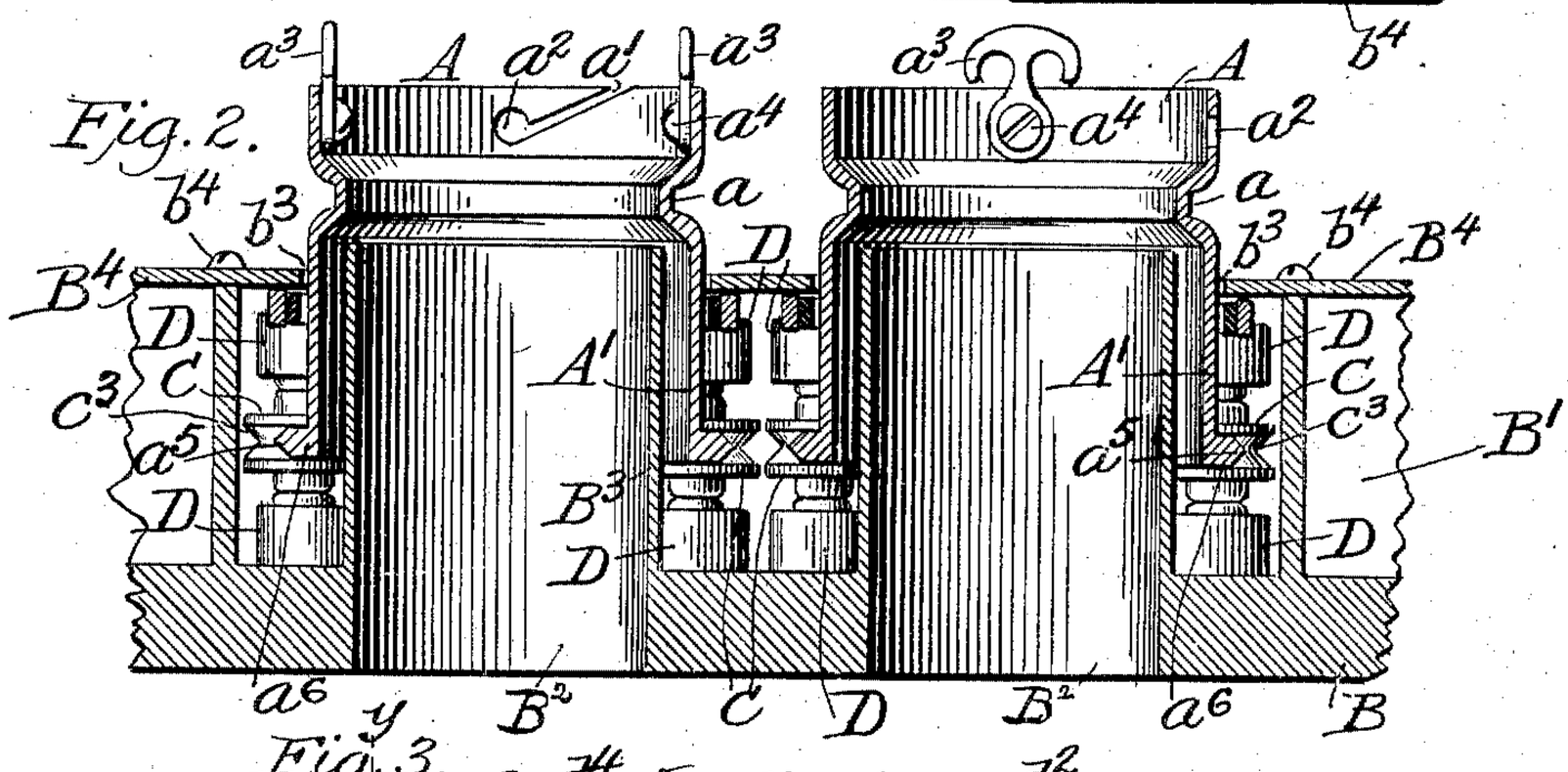


Fig. 3.

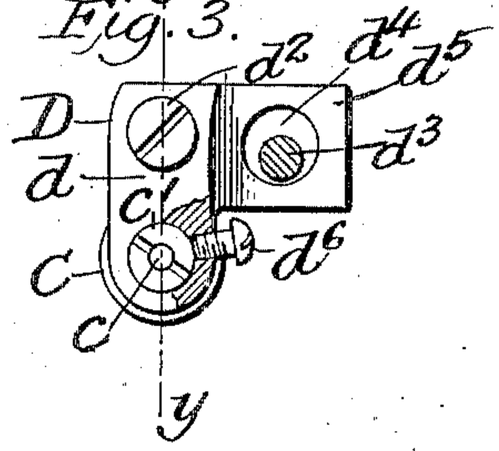
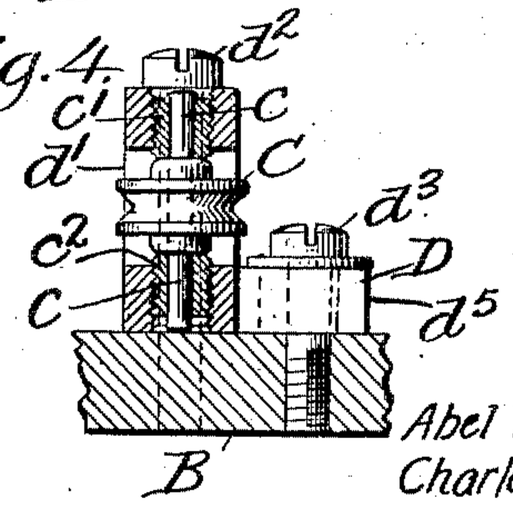


Fig. 4.



Witnesses
James L. Duhamel,
R. F. Sweeny.

Abel T. Atherton,
Charles T. Atherton,
Inventors,
By their Attorney Wm. H. Appleton.

No. 759,846. Patented May 17, 1904.

UNITED STATES PATENT OFFICE.

ABEL T. ATHERTON, OF BAYSIDE, AND CHARLES T. ATHERTON, OF PROVIDENCE, RHODE ISLAND, ASSIGNORS OF FIFTY-TWO ONE-HUNDREDTHS TO THE MASON MACHINE WORKS, OF TAUNTON, MASSACHUSETTS, A CORPORATION.

ROTARY RING-SPINNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 759,846, dated May 17, 1904.

Application filed December 28, 1903. Serial No. 186,763. (No model.)

To all whom it may concern:

Be it known that we, ABEL T. ATHERTON, a resident of Bayside, in the county of Kent, and CHARLES T. ATHERTON, a resident of Providence, in the county of Providence, State of Rhode Island, citizens of the United States, have invented certain new and useful Improvements in Machines for Spinning and Twisting Fibrous Materials, of which the following is a specification.

Our invention relates to that form of spinning and twisting machines in which the spinning and twisting are effected through the intervention of a rotating ring which carries an appropriate thread carrier or carriers and coöperates with what is known in the art as a "dead-spindle," or one that is rotated by the strain of the thread or yarn as it is wound upon the same or upon a bobbin carried by it during the spinning and twisting operation, the objects of the invention being to provide means whereby these rotating rings, in addition to being more firmly secured in place and rendered capable of vertical and lateral adjustment, may at the same have their rotation more efficiently and conveniently arrested when desired than has been possible with the rings of this character as heretofore employed.

To these ends the invention consists, first, in the means through which the friction pulleys or rolls that carry and sustain the rings are supported and made adjustable; second, in the means whereby the rotation of the ring may be arrested when it is desired to mend or "piece up" an end after having been broken or otherwise, and, third, in various other constructions and combinations of parts, all as will hereinafter more fully appear.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a plan of the portion of a ring-rail, showing two rings with our invention applied in connection therewith, a portion of the top plate or cover of this rail being broken away and certain parts being shown in dotted lines; Fig. 2, a longitudinal vertical section of the same, taken in the plane $x\,x$ of Fig. 1; Fig. 3, a plan of one of the friction-rolls with its supporting-bracket detached, showing the screws by means of which the bracket may be secured in place with one of these screws in section and a portion of the bracket broken away; and Fig. 4, a vertical transverse section of the parts shown in Fig. 3 and of the ring-supporting rail, taken in the plane $y\,y$ in that figure and showing the friction-roll and its supporting-stud in elevation.

In all the figures like letters of reference are employed to designate corresponding parts.

A indicates the rings, and B the rail in which they are or may be supported. These rings, of which we have shown two in the drawings, are or may be provided with suitable yarn or thread guides and are severally constructed with downwardly-extending sleeves A′, with suitable grooves a formed circumferentially around them for reception of a band by means of which the ring may be rotated from the ordinary driving-drum or other source of power. (Not shown.) In some instances we form these thread-guides as slots a', which extend downwardly from the upper edges of their respective rings in an inclined direction and severally terminate at their lower ends in orifices a^2. At other times we find it desirable to form them in the shape of reversely-arranged or anchor-shaped hooks a^3 and to secure them to the inner surface of the ring by appropriate screws a^4 or otherwise, and either or both of these forms of thread-guides may be employed and the rings operate with equal efficiency. When, however, the hook form of thread-guide a^3 is employed, we find it advantageous to employ two of them on each ring and to locate them on opposite sides of the axis thereof, as thereby the employment of one is counterbalanced by the presence of the other. The rail B, on the other hand, is preferably constructed of the necessary length to suit it to the required number of rings that are to be employed, whether a single ring or a plurality of rings are made

use of, and is provided with a channel B′ in its upper surface, which extends from one end wall thereof to the other and is or may be divided up into a number of separate chambers for reception of lubricants or otherwise by transverse partitions *b*, extending across from its front wall *b′* to its rear wall *b²*, either between the adjoining individual rings or between adjoining groups of rings, as may be preferred. With the rail provided with the partitions and walls *b b′ b²*, as thus described, it is likewise provided with circular orifices B², which extend upwardly through the same for reception at the spindles, with their axes in approximate coincidence with that of their respective spindles and the orifices severally equipped with an upwardly-extending sleeve B³, which may be formed either integrally with the rail or separate therefrom and fixedly secured therein. In the drawings, however, we have shown these upwardly-extending sleeves B³ as made integrally with the rail; but either construction may be adopted, as preferred. As thus constructed, the rings A are mounted in the chambers formed by the channel B′ in the top of the rail and are or may be rotatively held therein by friction-rolls C, of which a plurality are preferably employed in connection with each ring. In the form of the invention which we have selected for purposes of illustration we have shown four of these rolls for each ring; but this is unessential, and a greater or lesser number may be availed of for that purpose, as desired; but whatever their number these rolls are preferably disposed around the rings at proper distances apart and are mounted in brackets D, of which there is a separate bracket for each roll. In the construction of these brackets various forms may be adopted. We prefer, however, to construct them in bell-crank form, with one arm *d* of each provided with a groove or recess *d′*, formed in and extending across its free end for reception of the friction-roll C, which is arranged therein. As thus constructed these brackets are severally secured at the proper points in the channel B′ of the rail B by appropriate screws *d²* and *d³*, of which the former pass downwardly through the angular portions of their respective brackets and engage at their lower ends with threaded orifices in the rail, while the latter, *d³*, pass downward through suitable orifices *d⁴*, formed in the arms *d⁵* of their appropriate bell-crank levers and similarly engage at their lower end with like threaded orifices therein. The brackets being thus secured in the channel of the rail B, the adjustment of their respective rolls C toward and away from the axis of the spindle may be effected by loosening the two screws *d²* and *d³* and rotating the brackets upon their respective screws *d²* as pivots, after which the securement of the brackets in place may be accomplished by tightening up both of these screws again by a screw-driver or otherwise, and in order to allow of this rotary movement being imparted to the brackets the orifices *d⁴*, formed in the arms *d⁵* of the respective brackets D, are made somewhat larger in diameter than that of the screws *d³*, as shown in Fig. 3. The brackets D being thus adjustably secured in the channel of the rail B, the rolls C are rotatively mounted therein through the intervention of suitable axes or studs *c*, to which the appropriate rolls are or may be fixedly secured, and through suitable bearings *c′* and *c²*, which are respectively mounted in the brackets above and below the pulleys, as shown in Fig. 4. These bearings may be constructed in various forms and may be supported in various ways. We prefer, however, to construct them in the form of threaded sleeves with screw-driver-receiving nicks or slots in their upper ends and to support them in their respective brackets above and below the pulleys by threading them in suitable orifices formed in such brackets, whereby they may be made vertically adjustable therein. As thus constructed and mounted the adjustment of these bearings, and through them the rolls C, in the direction of the axes of the bearings may be effected by simply rotating the bearings in their respective brackets to the proper extent to bring the rolls to the required elevation by a screw-driver or otherwise, when they may be held in the positions to which they may have been thus adjusted by set-screws *d⁶*, which, threaded in suitable orifices formed in the brackets, severally contact at their inner ends with the peripheries of the bearings with which they respectively coöperate. While the rings A are thus supported by their respective friction-rolls C, the contacting surfaces between the rings and their supporting-rolls may be of various contours. In the drawings, however, we have shown them as formed of projecting V-shaped tracks *a⁵* and coöperating V-shaped grooves *c³*. Of these the tracks *a⁵* are preferably formed on the edges of circumferential flanges *a⁶*, which are constructed around the downwardly-extending sleeves A′ of the rings A, while the coöperating grooves *c³* are formed in the peripheries of the friction-rolls C circumferentially of the same. With the contacting surfaces between the rings and rolls constructed as thus described the rings, while supported in proper positions and capable of easy rotations thereon, are positively restrained from any substantial vertical or angular motion with respect to the rail and may partake of any adjustments laterally or vertically that may be imparted to the rolls C. The form of the contacting surfaces thus described, however, while efficient in operation, is merely illustrative, and the tracks and coöperating grooves, as is obvious, may be made circular, rectangular, inclined, or of other appropriate contour in cross-section, and the relationship of parts reverse with the rêëntrant surfaces

in the flange a^6 of a depending sleeve A′ and the projecting coöperating surfaces formed upon the peripheries of the rolls C, as shown, for instance, in United States Letters Patent No. 699,203, which were granted May 6, 1902, and the parts operate with equal efficiency. The rings A, with their various supporting adjuncts, being thus supported upon the rail B, the channel-way B′ in the latter is or may be closed by a suitable cover or plate B^4, which, provided with suitable orifices b^3, through which the rings A project, may be secured to the upper surface of the rail by appropriate screws b^4 and may extend throughout the entire length of the rail or may be made up of sections that are independently secured in place.

With the parts constructed as above described are employed means by which the rotation of the rings may be arrested when it is desired to mend or piece up broken ends. These means may be of various forms and may be located in different relations with respect to the rings. We prefer, however, to employ two levers E for this purpose, which, pivoted at their inner ends by suitable pivots e to the under side of the plate B^4, extend forward to near the front edge of the rail and curving around the ring are provided at their front ends with thumb-pieces e', which extend upwardly through suitable slots b^5 to the upper side thereof, whereby to be readily grasped by the hand of the operator. As thus arranged the rotation of the ring may be arrested when in operation by bringing the forward ends of the lever together, when the stopping of the ring will be effected by the friction occasioned between its periphery and the interior of the levers. In some instances these levers E may be employed without any additional frictional devices applied to their contacting surfaces. We prefer, however, to employ friction-pads e^2, which may be made of leather or other appropriate material and are secured to the inner sides of the levers, as shown. While thus the rotation of the rings is arrested by bringing the levers against their peripheries, these levers when the rings are in rotation will be normally held out of contact therewith. For holding these levers in these inoperative positions various means may be employed. We have shown this result accomplished, however, by a spiral spring e^3, which is interposed between the forward ends of the levers and is connected at its opposite ends to the oppositely-arranged levers; but this is only illustrative, and other equivalent means may be employed therefor if preferred.

With the parts constructed as above described the efficient mounting of the rings upon the supporting-rail is effected, and not only are the rings made capable of vertical adjustment, as well as their coöperating rolls, to bring them into proper horizontal relationship with respect to the contacting surfaces on the rings, but in consequence of each of the supporting friction-rolls being mounted in a separate bracket a more easy and accurate adjustment of the rolls laterally to bring the rings into appropriate axial relationship with respect to their coöperating spindles insured than is possible when two or more of these rolls are mounted in a single bracket. Moreover, by securing the brackets for the ring-supporting rolls upon the bottom of the channel-way B′ in the rails B instead of to the cover thereof greater firmness and stability of these parts is insured, with the consequent result of a freer and more accurate operation of them. The rings and their supporting adjuncts being thus supported upon the rail B, this rail may in turn be supported upon suitable guide-rods, whereby to have a vertical traverse to cause the rings to properly lay the yarns upon their respective bobbins, or the same may be fixedly secured in place and the spindles, with their appropriate bobbins, moved upwardly and downwardly with respect thereto; but as these features form no part of our present invention they have not been shown in the drawings and require no further description herein.

It will thus be seen from the foregoing that we provide means for mounting the rings upon their supporting-rails and for arresting their rotation when required, which, while simple in construction and efficient in operation, permits of the adjustment of the rings both vertically and laterally when required to bring them into their proper relationships.

Although in the above we have described the best means contemplated by us for carrying our invention into practice, we wish it distinctly understood that we do not limit ourselves strictly thereto, as it is obvious that we may modify the same in various ways without departing from the spirit thereof.

Having now described our invention and specified certain of the ways in which it is or may be carried into effect, we claim and desire to secure by Letters Patent of the United States—

1. The combination, with a ring, a support therefor, and friction-rolls by which the ring is mounted upon the support, of means whereby these rolls are journaled upon such support and rendered adjustable thereon in the direction of their axis to bring the ring into proper relationship, substantially as described.

2. The combination, with a ring, a rail, and friction-rolls by which the ring is rotatably mounted upon the rail, of a separate bracket for each of these rolls, and vertically-adjustable bearings for such rolls arranged in said brackets, whereby the rolls may be separately adjusted toward and away from the ring as well as in a vertical direction, substantially as described.

3. The combination, with a ring, a rail, and

friction-rolls by which the ring is rotatively mounted upon the rail, and having surfaces which intermesh with those on the ring, of a separate bracket for each of these rolls, and vertically-adjustable bearings for such rolls arranged in said brackets, whereby each of the rolls may be adjusted toward and away from the ring and both the rolls and ring adjusted vertically, substantially as described.

4. The combination, with the rail, and a friction-roll, of a bell-crank-shaped bracket provided with bearings for receiving and supporting such friction-roll, and with vertically-arranged screw-holes respectively located in its angular portion and near the extremity of one of its arms, and screws extending downwardly through such holes and engaging with the rail, whereby the securement of the roll and bracket to the rail and their lateral adjustment around the screw which extends downwardly through the bracket at its angular portion may be effected, substantially as described.

5. The combination, with a bell-crank-shaped bracket provided with a recess extending across the end of one of its arms, a friction-roll, and an axis or stud upon which this roll is mounted, of bearings for this axis or stud threaded in suitable orifices formed in the bracket, whereby by rotating these bearings in the required direction in the bracket the raising and lowering of the bearings and with them the roll with its carrying axis or stud may be effected, substantially as described.

6. The combination, with a rotating ring, and a rail upon which it is mounted and supported, of a pair of levers pivoted to the rail and extending past the ring and normally out of contact therewith, with one of the levers on one side of its axis and the other of the levers on the other, whereby the rotation of the ring may be arrested by pressing the free ends of these levers inward toward each other, substantially as described.

In witness whereof we have hereunto set our hands this 22d day of December, 1903.

ABEL T. ATHERTON.
CHARLES T. ATHERTON.

Witnesses:
ISAAC HAHN,
EFFIE V. ROBINSON.