

Dec. 8, 1925.

1,564,749

F. D. BENNETT ET AL

RING TRAVELER AND MOUNTING THEREFOR FOR SPINNING MACHINES

Filed Sept. 21, 1922

3 Sheets-Sheet 1

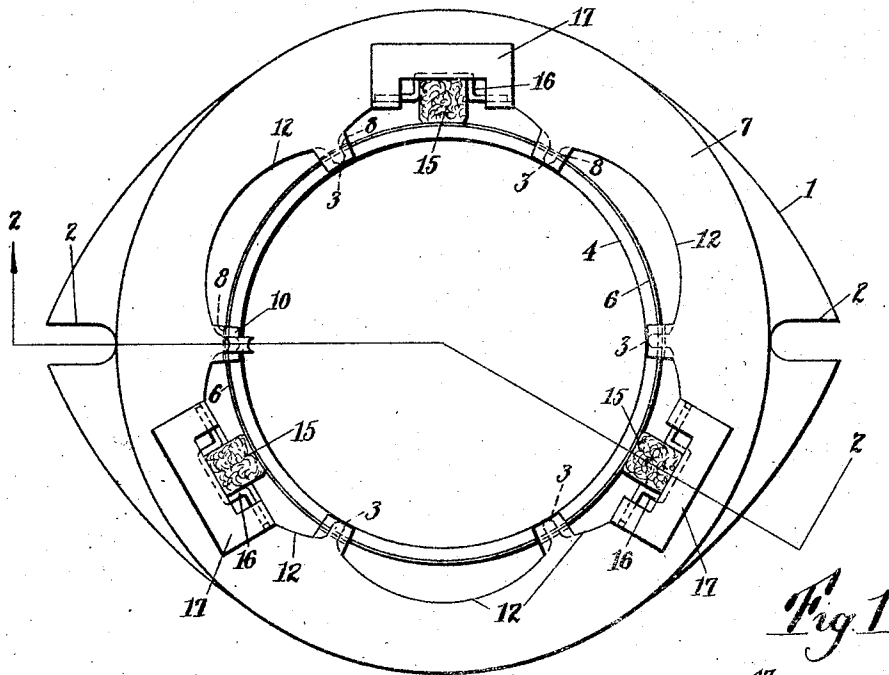


Fig. 1

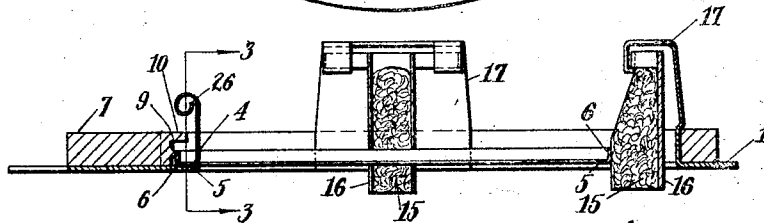


Fig. 2

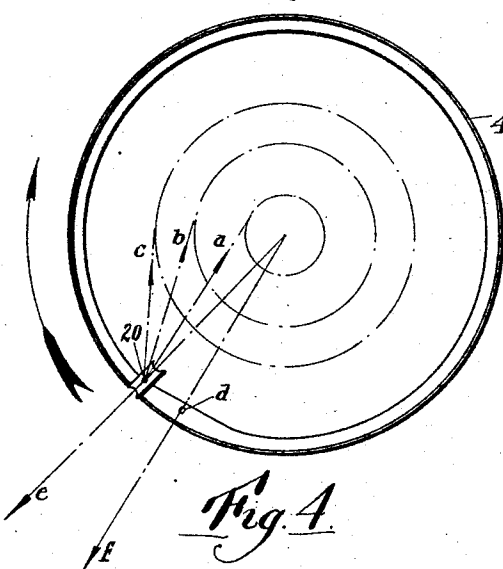


Fig. 4



Fig. 3

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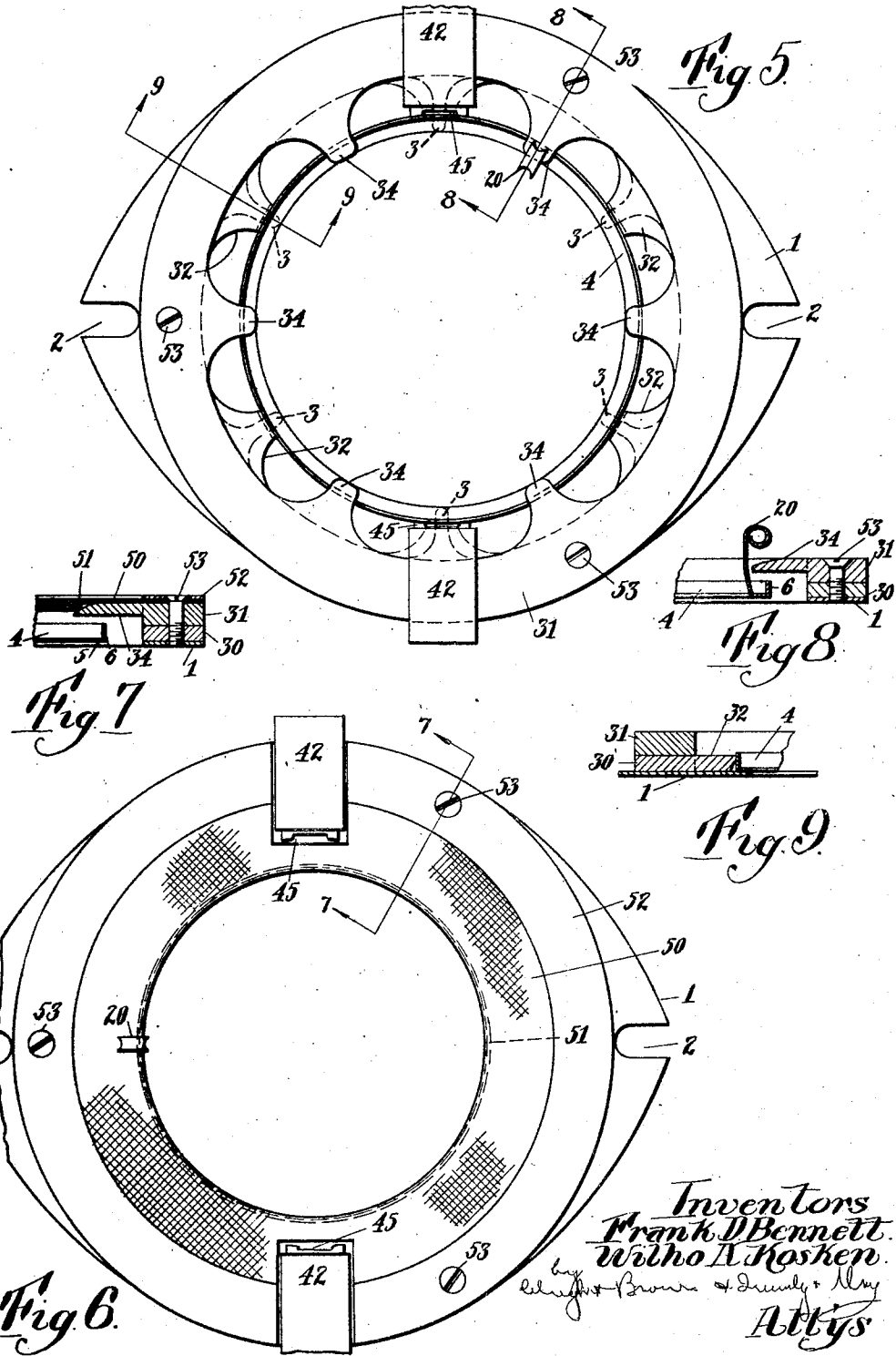
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3 Sheets-Sheet 3

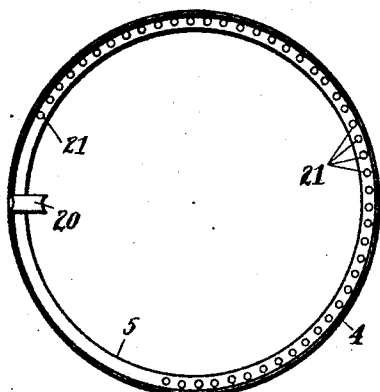


Fig. 10

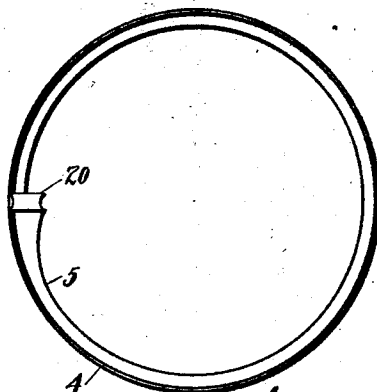


Fig. 11

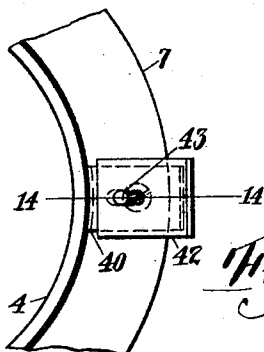


Fig. 13

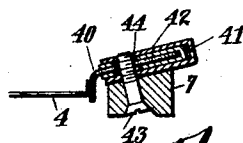


Fig. 14

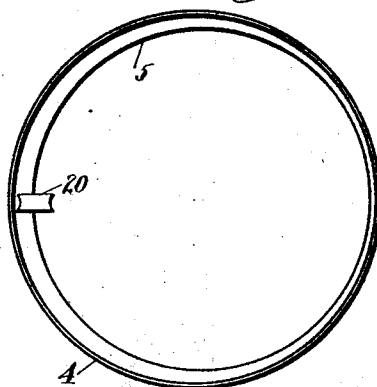


Fig. 12

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UNITED STATES PATENT OFFICE.

FRANK D. BENNETT, OF PLAINFIELD, NEW JERSEY, AND WILHO A. KOSKEN, OF BOSTON, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO BENJAMIN FARNHAM SMITH, OF CONCORD, MASSACHUSETTS.

RING TRAVELER AND MOUNTING THEREFOR FOR SPINNING MACHINES.

Application filed September 21, 1922. Serial No. 589,579.

To all whom it may concern:

Be it known that we, FRANK D. BENNETT, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, and WILHO A. KOSKEN, a citizen of the Republic of Finland, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Ring Travelers and Mountings Therefor for Spinning Machines, of which the following is a specification.

This invention relates to spinning machines of the ring type and relates particularly to the ring traveler and its mounting.

One feature of this invention relates to a construction of ring whereby it is substantially balanced when in operation.

Cotton fibers contain a waxy material which causes trouble with ring travelers as heretofore constructed, this waxy material, together with lint and dirt, gradually clogging the raceway in which the traveler rotates, finally stopping it and breaking the yarn, and often causing sufficient friction to heat the ring sufficiently to seriously injure, if not destroy, it. A further feature of this invention, therefore, relates to a construction of holder by which the accumulation of such material is prevented, the motion of the traveler relative thereto keeping both the raceway and the traveler clean.

As a further feature of this invention, cleaners have been provided to act on the ring during its rotation.

A novel ring construction particularly designed to avoid heating also forms a part of this invention.

Further features and advantageous details and combinations of parts will appear from a more complete description of certain embodiments disclosed in the accompanying drawings in which—

Figure 1 is a plan view of one form of traveler and ring carrier.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a fragmentary section on line 3—3 of Figure 2.

Figure 4 is a plan of a ring traveler showing diagrammatically the forces acting thereon while it is in operation.

Figure 5 is a view similar to Figure 1, but showing a modified construction.

Figure 6 is a similar view showing a cover in position.

Figure 7 is a section on line 7—7 of Figure 6.

Figures 8 and 9 are sections on lines 8—8 and 9—9, respectively, of Figure 5.

Figures 10, 11 and 12 are plan views of different forms of traveler.

Figure 13 is a fragmentary plan showing one form of cleaner or wiper.

Figure 14 is a section on line 14—14 of Figure 13.

Referring first to Figures 1 and 2 the ring for supporting the traveler comprises a plate portion 1 which may, if desired, be formed with slotted ears 2 for the reception of screws by which the ring may be fixed in position. Projecting inwardly at spaced points from the inner edge of the ring are a plurality of narrow ears 3 forming supporting bearings for the traveler which is shown at 4. This traveler is of ring shape and angular in cross section having a circular base portion 5 and a marginal upstanding flange 6 at its outer edge. The base portion 5 is adapted to rest on the ears 3 when the traveler is stationary.

Superposed on the plate 1 is an annular cage member 7, which is preferably formed of fiber or similar material. Above the lower edge of this cage member or ring 7 it has formed thereon a plurality of side bearing elements 8, these elements having bearing portions as 9 considerably narrower vertically than the height of the traveler flange 6. The member 7 also has ears 10 projecting over the upper edge of the flange 6 and against which it may ride during its operation. The bearing elements or ears 10 are spaced sufficiently above the lower bearing ears 3 to permit a limited amount of

axial play of the traveler 4 during its rotation and the amount of this play is so adjusted relative to the width of the side bearing portions 9 which engage on the flange 6 that the portions of the flange contacting with such side bearing portions may sweep entirely across the side bearings, this action causing any accumulation of foreign material on the traveler to be wiped off by such relative lateral motion. The upper edge of the flange 6 is also very narrow and there is sufficient play laterally of the traveler within the ring to permit a like relative movement between the flange and the ears so that accumulation of foreign matter tending to clog the traveler at these points is prevented. With this construction the bearing points of the ring are reduced to very small areas so disposed that a laterally wiping action of the rotating traveler thereon is produced. This small bearing area effectively eliminates much of the friction tending to retard the motion of the traveler and the wiping action provides clean bearing surfaces where contact is made. Preferably the material of the base portion 1 and the section 7 is cut away between the bearing portions 3, 8, and 10, as shown at 12 to permit a free passage for dirt or other foreign material between the ring and the traveler. The provision of the flange on the traveler not only makes it possible to provide the bearings on the ring as above described, but materially stiffens the traveler so that it is prevented from being pulled out of the ring by sudden jerks imparted thereto.

To further insure against the accumulation of gummy material or other foreign matter one or more cleaners may be employed, one construction of cleaner, as indicated in Figures 1 and 2, comprising a strip of felt or similar fibrous material as 15 partially enclosed within a frame 16 which may be suspended at its upper end from a bracket 17 fixed to or integral with the ring, as shown this bracket being formed integral with the base portion 1. The pivotal connection between the bracket and finger or wiper is so positioned that the wiper tends by gravity to press lightly against the outer face of the flange 6 of the traveler.

The traveler is preferably constructed so that it may rotate substantially freely within the ring or casing and for this purpose it is preferably somewhat unbalanced in stationary position. The reason for this will be apparent from an inspection of Figure 4. Referring to this figure, at 20 is indicated a yarn or thread eye through which the yarn passes and from which it is directed to the bobbin on the usual spindle. During action of the traveler, passage of the

yarn through this eye and to the cop causes a pull to be exerted thereon in the direction toward the winding contact of the yarn on the cop. This is indicated by arrows in Figure 4, the arrow *a* indicating the direction of this pull when the bobbin is substantially empty and the arrows *b* and *c* indicating the line of action of this pull as the bobbin becomes successively more nearly filled. It is apparent that if the traveler is balanced while stationary without making provision to compensate for this pull on the yarn eye it will be considerably out of balance in running condition due to this pull.

One feature of this invention therefore relates to a construction of traveler by which this force applied by the yarn is somewhat neutralized. For this purpose the portion of the ring at the thread eye is made heavier than on the other side of the ring to bring its center of mass eccentric to its center of rotation so that centrifugal force set up by the unbalanced mass rotating eccentrically may counteract the pull exerted by the yarn on the eye. While desirable results may be obtained by the use of an unbalanced mass located at the eye, as for example, by making the eye comparatively heavy, a better effect may be obtained by locating the mass somewhat back of the eye in the direction of rotation as shown, for example, at the point *d* in Figure 4. The action of the traveler will be apparent from an inspection of this figure, in which, with the unbalanced mass located at the eye, the line of centrifugal force is in the direction indicated by the arrow *e*, whereas the force exerted by the pull of the yarn is successively in the direction of the arrows *a*, *b*, and *c*. If the center of this unbalanced mass is located as shown at the point *d*, the centrifugal force acts in the line of the arrow *f*, which it is seen is more nearly opposed to the direction of force exerted by the pull of the yarn. As this direction of force varies as the bobbin becomes wound it is apparent that it cannot be fully compensated for by a fixed unbalanced mass in the traveler, but its action may be materially improved by the construction outlined so as to be in substantially rotation balance. The amount of unbalanced mass and its best location depend on the character and size of the strand, the speed of rotation of the traveler and other factors, but with this construction the same traveler may be used successfully with a greater range of yarn sizes and speeds than can a traveler as ordinarily constructed.

A construction wherein the unbalanced mass is located at the eye is indicated in Figure 12 in which the traveler is formed with the opening through the base 5 eccen-

trically disposed so as to provide a wider portion at the eye than diametrically opposite thereto.

In Figure 11 is shown a construction somewhat similar to Figure 4 in which the unbalanced mass is located slightly to the rear of the yarn eye by a substantial widening of the base portion 5 at this point.

In Figure 10 is shown a further modification in which a concentric traveler is employed, the weight of the eye alone being relied upon to give the unbalanced mass, or if desired, the base portion 5 may be provided with perforations as at 21 extending through a portion only of the circumference, the eye being located nearer one of these series of perforations than the other to bring the center of mass to the rear of the eye. These perforations also furnish an additional function in the operation of the traveler, as they form ventilating openings for the passage of air therethrough to aid in maintaining the traveler cool, as well as to lighten the traveler without materially impairing its strength or stiffness.

The yarn eye, as shown more particularly in Figures 2 and 3, is preferably constructed at the end of a tapered strip 25 fixed to or integral with the base portion 5 of the traveler. The upper end of this strip is coiled into volute form, the end of the strip being turned somewhat more than a complete convolution and the eye portion being flared at opposite sides as shown in Figure 3. With this construction it is an easy matter to insert the yarn between the end portion 26 and the body portion of the strip and to slip it into the eye formed within the convolutions.

In Figures 5, 8, and 9 is shown a somewhat modified construction of ring or cage which is regarded as the preferred construction. In these figures the base plate of the ring or cage is constructed in the same manner as the base plate 1 in the form shown in Figure 1 having bearing ears 3 thereon against which the traveler may rest. The remaining cage portion of this ring is composed of a pair of members of fiber or other suitable material indicated at 30 and 31. The member 30 is preferably provided with the inwardly directed side bearing portions 32 which may be similar to the side bearing portions 8, and they may, if desired, be arranged in axial alinement with the ears 3. The upper portion 31 carries the retaining ears 34 which may be similar in construction to the ears 10 in the first described form. In this instance, however, they are preferably out of axial alinement with the ears 3 and the side bearing members 32, this being shown in Figure 5. With this construction there are no bearing pockets surrounding three sides of the ring at any one point to retain foreign matter as in the first out-

lined construction. In this construction also a modified form of wiper has been shown, but the form shown in Figures 1 and 2 might be employed if desired.

Another form of wiper is shown in Figures 13 and 14 and comprises a strip of felt or other similar material shown at 40 carried in a metallic or other suitable socket 41 which is slidably mounted in an inclined socket 42 carried by a portion of the ring frame, this socket being shown as made fast thereto by a screw 43 passing through one of the members of the ring at opposite sides of the socket 42 and through a slot 44 in the socket 41. When this form of wiper is applied to the construction shown in Figures 5 to 9, it is preferable to locate it over one of the bearing members 34 and when so located it will be necessary to notch the depending portion 40 of the felt or other wiping element which engages the traveler, in order to straddle the ear 34. This has been shown in Figure 5 at 45.

While the use of a single cleaner or wiper is regarded as within the scope of this invention it is deemed preferable to employ two, or three, spaced about the periphery of the traveler so as to better balance the structure.

Figures 6 and 7 show the same ring construction shown in Figures 5, 8, and 9, but in addition thereto an annular cover is made fast over the ring to prevent ready access of lint or other foreign matter from above. This cover may consist of an annular screen shown at 50 having its inner edge finished in any suitable manner as by rolling the screen about a wire ring 51. This screen may be fixed in position by means of a clamping ring 52 made fast by screws 53 which may also be used to fasten the elements 30 and 31 to the base plate 1. It should be noted that in these latter forms of the ring, also, the ring is spaced from the periphery of the traveler at substantial distances except at the bearing points, to permit the free passage of foreign matter axially therebetween.

Having thus described certain embodiments of this invention it should be evident to those skilled in the art that many changes and modifications might be made therein without departing from the spirit or scope as defined by the appended claims.

We claim:

1. A ring traveler having its mass so distributed as to be in substantial rotational balance while in operation.
2. A ring traveler constructed to oppose the inward pull of the yarn thereon by centrifugal force.
3. A ring traveler having a yarn eye at one side thereof, said traveler having its center of mass eccentrically disposed in the general direction of said eye.

4. A ring traveler having a yarn eye at one side thereof, said traveler having its center of mass eccentrically disposed to lie somewhat back of the radial position of said eye in the direction of rotation thereof.

5. A traveler comprising a ring of angular cross section having a yarn eye at one side, the center of mass of said traveler being eccentrically disposed toward said eye.

6. A traveler comprising a ring having a strip portion tapering therefrom, the outer end of said portion carrying a yarn eye.

7. A traveler comprising a ring having a strip portion tapering therefrom, the outer end of said portion being formed into a yarn eye.

8. In combination, a ring traveler having a marginal stiffening flange, and a spinning ring having spaced bearing portions against which said flange may engage.

9. In combination, a ring traveler having a marginal stiffening flange, and a spinning ring having spaced bearing portions against which said flange may engage, said bearing portions being of less width than said flange.

10. In combination, a ring traveler, and a spinning ring within which said traveler may rotate permitting it a limited axial play, said ring having spaced surfaces against which the outer periphery of said traveler may bear, said surfaces being of less width than the amount of axial play permitted said traveler.

11. In combination, a ring traveler, and a spinning ring within which said traveler may rotate permitting it a limited axial play, said ring having spaced surfaces against which the outer periphery of said traveler may bear, and said surfaces being of less width than the amount of axial play permitted said traveler.

12. In combination, a ring traveler having a marginal stiffening flange, and a spinning ring within which said traveler may rotate permitting it a limited axial play, said ring having spaced surfaces of less width than the amount of said axial play and against which said flange may bear, whereby the total width of said surfaces may be wiped over laterally during the rotation of said traveler to prevent the accumulation of foreign matter therebetween.

13. In combination, a ring traveler having a marginal upstanding stiffening flange, a spinning ring having a lower bearing plate having spaced inwardly projecting ears on which said traveler may rest and spaced surfaces against which the periphery of said flange may bear, and an upper bearing plate having spaced retaining ears projecting inwardly over the upper edge of said flange, said upper and lower bearing plates being spaced apart to permit a limited axial play of said traveler, and said peripheral

bearing surfaces being of less width axially of said traveler than the amount of its possible axial play.

14. In combination, a ring traveler having a marginal upstanding stiffening flange, a spring ring having a lower bearing plate having spaced inwardly projecting ears on which said traveler may rest and spaced surfaces against which the periphery of said flange may bear, and an upper bearing plate having spaced retaining ears projecting inwardly over the upper edge of said flange, said upper and lower bearing plates being spaced apart to permit an axial play of said traveler of less extent than the width of said flange, and said peripheral bearing surfaces being narrower than said flange.

15. In combination, a ring traveler, and a spinning ring within which said traveler may rotate, said ring having bearing portions disposed at opposite sides of said traveler axially thereof to limit its axial movement and spaced bearing portions against which the periphery of said traveler may engage, said peripheral bearing portions being out of axial alinement with certain of said axial bearing portions to leave spaces therebetween for the free passage of foreign material.

16. In combination, a ring traveler, and a spinning ring for supporting said traveler for rotation therein, said ring being spaced from the periphery of said traveler for substantial distances to permit the free passage of foreign matter axially therebetween.

17. In combination, a ring traveler, and a spinning ring for supporting said traveler for rotation therein, said ring being spaced from the periphery of said traveler for substantial distances to permit the free passage of foreign matter axially therebetween, and a shield extending partially over one end of said ring to prevent the entry of certain foreign matter to said spaces.

18. In combination, a ring traveler, and a spinning ring for supporting said traveler for rotation therein, said ring being spaced from the periphery of said traveler for substantial distances to permit the free passage of foreign matter axially therebetween, and a foraminous annular shield extending partially over one end of said ring to prevent the entry of certain foreign matter to said spaces.

19. In combination, a ring traveler, a spinning ring in which said traveler may rotate, and one or more cleaning members carried by said ring and acting on said traveler to insure free rotation thereof in said ring.

20. In combination, a ring traveler, a spinning ring in which said traveler may rotate, and one or more cleaning members carried by said ring and urged by gravity toward the periphery of said traveler,

whereby foreign matter may be prevented from entry between said ring and traveler to impede free rotation of said traveler.

21. In combination, a ring traveler, a
5 spinning ring in which said traveler may rotate, and one or more wipers carried by said ring and urged by gravity toward the periphery of said traveler, whereby foreign

matter may be prevented from entry between said ring and traveler to impede free 10 rotation of said traveler.

In testimony whereof we have affixed our signatures.

FRANK D. BENNETT.
WILHO A. KOSKEN.