No. 729,708. PATENTED JUNE 2, 1903.

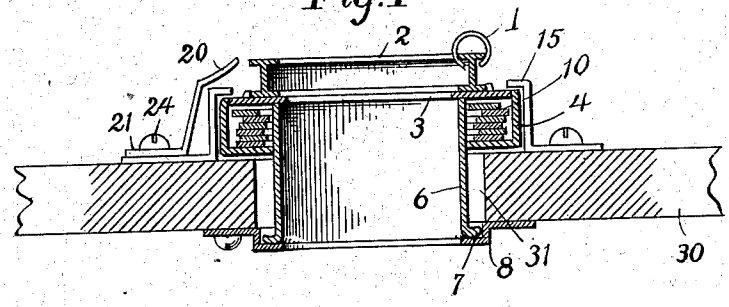
G. M. WARREN.

SPINNING RING.

APPLICATION FILED MAY 9, 1901.

NO MODEL.

Fig. 1



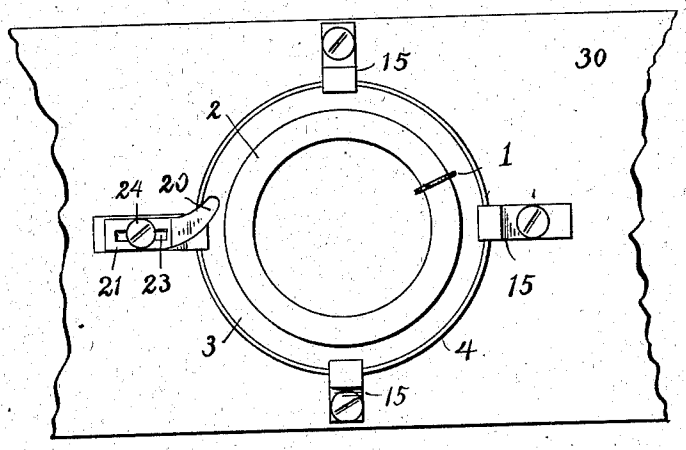
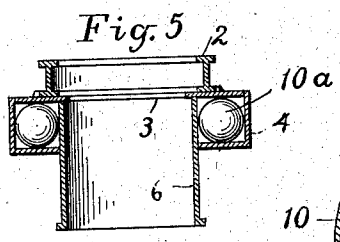


Fig. 2

Fig. 5



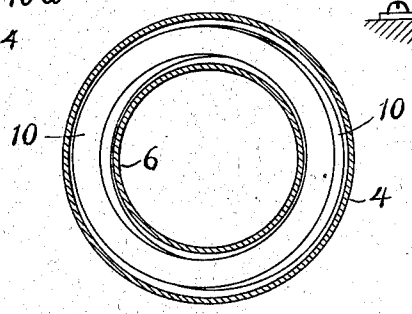


Fig. 3

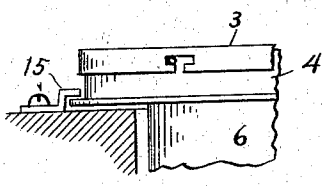


Fig. 4

Witnesses;

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By A. B. Upham,

His Attorney

No. 729,708. Patented June 2, 1903.

UNITED STATES PATENT OFFICE.

GEORGE M. WARREN, OF NEWTON, MASSACHUSETTS.

SPINNING-RING.

SPECIFICATION forming part of Letters Patent No. 729,708, dated June 2, 1903.

Application filed May 9, 1901. Serial No. 59,452. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. WARREN, a citizen of the United States, residing at Newton, in the county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Spinning-Frames, of which the following is a full, clear, and exact description.

The object of my invention is the construction of a spinning-ring which shall be capable of revolving with practically perfect uniformity at high rates of speed and which shall further embody certain improvements in detail hereinafter set forth.

Referring to the drawings, forming part of this specification, Figure 1 is a central section of a part of a lifting-rail and of my spinning-ring connected therewith. Fig. 2 is a plan view of the same. Fig. 3 is a horizontal section of my spinning-ring. Fig. 4 is a side view of a modification of the invention, and Fig. 5 a sectional view of another modification.

The lifting-rail 30 is formed with holes 31, within each of which is supported a ring having a raceway 2 and traveler 1. Said ring is made double-flanged in the usual manner and is removably secured to the annular plate 3 in the customary way. Said plate is formed as the removable cover of the annular box or chamber 4, the inner wall of which comprises the cylinder 6. The lower edge of said cylinder is supported by the flanged seat 8, secured to the under side of the lifting-rail, while the dogs 15 keep the ring from unduly rising.

Within the chamber 4 are several thin rings or annuli 10, loosely fitting the same and serving to produce the steadiness of rotation so desired for the ring. The manner in which the annuli accomplish this result is as follows: It is necessary that the ring be sufficiently weighted to prevent the pull of the yarn upon the traveler from raising the ring unduly up from its supporting-bearings, and thereby setting up the irregular motion and wabbling complained of. On the other hand, the ring should be as light as possible in order to necessitate but little expenditure of energy in its rotation, especially when on account of a temporarily-increased resistance between the yarn and the traveler produced by an unevenness or lumpiness of the yarn the friction between the traveler and ring is greater and the ring impelled forward thereby. The ring being light and unhindered by inertia quickly acquires the added speed. These two paradoxical conditions of weight and lightness are obtained by the annuli 10 referred to. Weighted by said annuli the ring is prevented from being raised from its bearings; but at the same time these annuli being loose within the chamber 4 do not prevent the light ring from receiving any quick accessions of speed. For a moment, therefore, the ring may be revolving faster than the annuli within; but this difference quickly ceases and said parts rotate in unison again. It will hence be clear that these annuli serve to prevent the objectionable lifting of the ring, and thereby keep it from retardation.

In addition any slight inequality of weight in opposite sides of the ring is compensated for by the shifting of the annuli in the usual manner; but this is the least important function performed thereby.

Another advantage obtained by the employment of the annuli is this: As above described, the plate 3 is removable from the chamber 4, a comparatively slight force being required to spring the said plate out from between the inwardly-bent edges of the chamber-wall. This is done in order to remove or add one or more annuli, and to thereby bring all the rings of the set on the lifting-rail to a perfect equality as to weight, for it is found commercially difficult to manufacture a large number of rings of exactly equal weight; but the annuli being each very thin and light, much more than illustrated, the addition or subtraction of one, two, or three will usually produce the equality desired. This equalization of weight is found advantageous in order that the rings may revolve more uniformly and the quality of the yarn be thereby more nearly perfect.

In the rings as previously made it is difficult to have the weight divided in such a manner as to cause it to run smoothly; but with my device, because the annuli will always counteract any tendency on the part of the traveler to pull the ring to one side so that its center of gravity will not coincide with its center of rotation, any possibility of

unevenness of motion will be reduced to a minimum. Hence greater production will follow because of the greater speed which can be uniformly maintained, the traveler will last longer because of the diminution of its motion relative to the ring, and there will be practically no excuse for the yarn's breaking and becoming tangled up among the other threads, with the consequent vexation and loss of time, as previously so frequently happened on account of the suddenly-increased friction given to the traveler by the temporary losses of equilibrium and retardation of the rings.

The advantages resulting from my arrangement of the removable plate 3 are, additional to the allowance of the removal of the annuli, the following: It is found impossible to use the same traveler and traveler-race for all kinds of yarn; that a traveler which will spin 20's, for instance, is incapable of spinning 70's. Hence it is customary to change the traveler and rings whenever a different grade of yarn is to be spun on the machine. This is expensive and troublesome, inasmuch as the ring-frame and what I term the "raceway" 2 must be changed together. With my invention it is only necessary to change the raceway 2 and the plate 3 holding the same, each raceway, whatever its diameter, being mounted on the same size of plate 3, and hence capable of instant removal from and applicability to the ring-frame.

Another advantage embodied in this device is that of a rotative bearing for the ring-frame of greatly-reduced diameter, and hence equally-reduced frictional resistance. In addition to this is a bearing so arranged that it is a considerable distance below the center of gravity of the ring, and thereby gives a far more stable rotation than when the bearing-support is in the same plane with the ring's center of gravity. In this respect its action is practically like that of a boy's top, and its tendency to wabbling is therefore still further reduced. Both these advantages are obtained by means of the downwardly-extended cylinder 6, the lower edge of which is slightly flanged, as at 7, and supported on the seat 8, preferably secured to the under surface of the lifting-rail.

The traveler-cleaner 20, as shown in Fig. 2, is secured to the lifting-rail by means of a screw 24, inserted through a slot 23 in the base 21 thereof. By this means said cleaner is made adjustable toward and from the raceway in order both to present the cleaner end thereof at the exact point for more perfectly clearing or cleaning the traveler of its accumulated lint and to properly adjust the same to different sizes of ring-races or raceways.

Although the annuli 10 perform all the functions desired to be obtained, yet I do not restrict myself thereto as the only possible form of loosely-held weights. For instance, a series of balls 10^a, movable within the chamber 4, as shown in Fig. 5, will serve the purpose of equalizing the motion of the ring.

I do not by my use of the term "spinning-ring" design to restrict myself to a ring for spinning alone, but employ the term to include the allied operation of twisting, the same invention being applicable either to a spinning-ring or a twisting-ring with but slight modification.

What I claim as my invention, and desire to secure by Letters Patent, is as follows, to wit:

1. A spinning-ring formed with an annular chamber wholly inclosed against the accidental admission of lint or other clogging material, in combination with the thin annular weights located within said chamber and loosely fitting the same, whereby the ring is provided with an automatic load-equalizer which cannot be rendered inoperative through any accumulations of dust or lint, substantially as described.

2. The spinning-ring comprising the inner cylinder, and the annular chamber, the annular plate removably closing said chamber, and the annular weights carried in said chamber, substantially as described.

3. The spinning-ring comprising the rotatably-supported member, the annular plate removably secured to said member, and the raceway carried by said plate, whereby various sizes of raceways and travelers can be applied to the same rotatable member, substantially as described.

4. The combination with the lifting-rail having the opening through it, the bearing comprising the flanged seat at the under side of said rail, the shell rotatably supported on said seat and extending upward above the rail, and the raceway held by the upper part of said shell, substantially as described.

In testimony that I claim the foregoing invention I have hereunto set my hand this 8th day of May, 1901.

GEORGE M. WARREN.

Witnesses:
A. B. UPHAM,
J. W. RUSSELL.