

No. 792,338.

PATENTED JUNE 13, 1905.

A. A. LOVEJOY.
SPINNING SPINDLE.
APPLICATION FILED MAY 20, 1904.

2 SHEETS—SHEET 1.

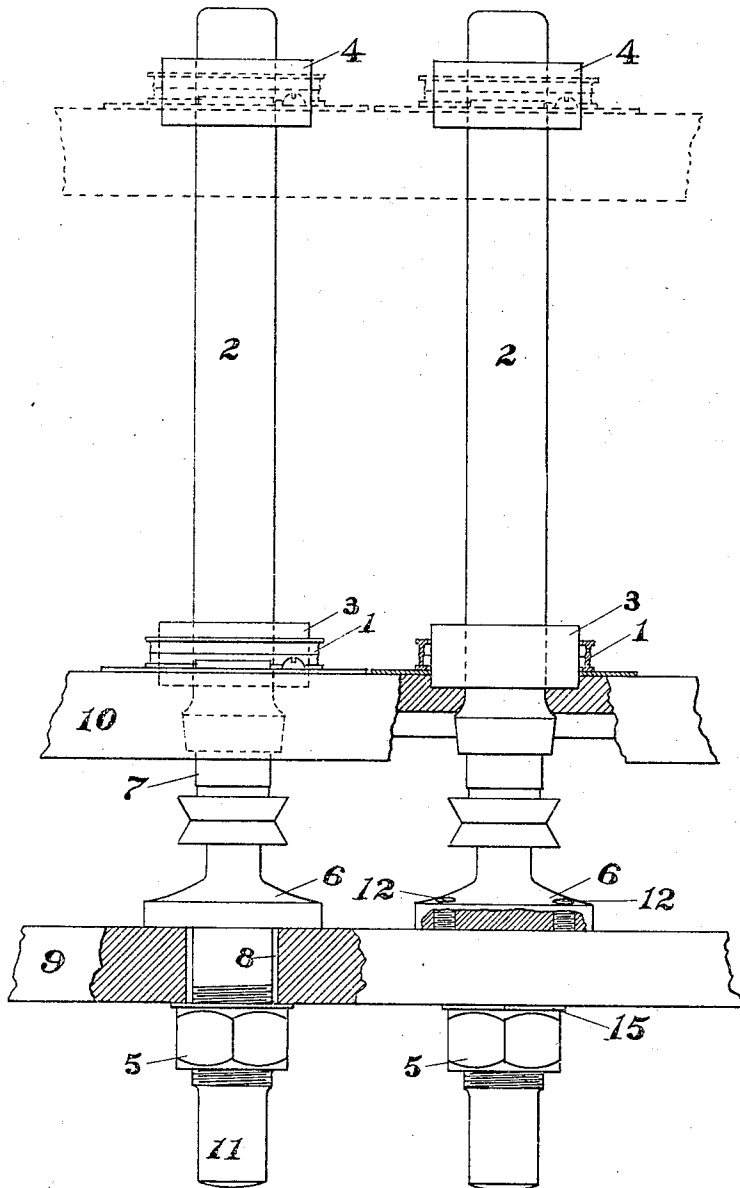


Fig. 1.

Witnesses.

Richard H. Pearson
John G. Gordon

Inventor.

Alfred A. Lovejoy,
by his attorney,
Charles W. Pearson

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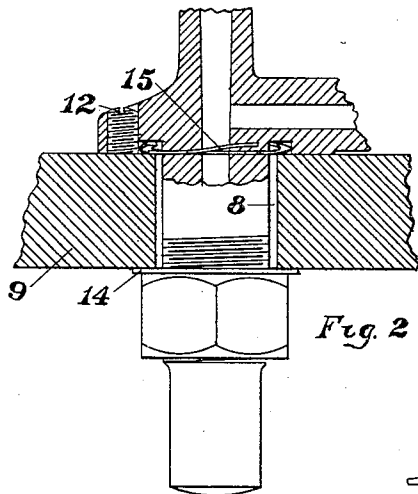


Fig. 2

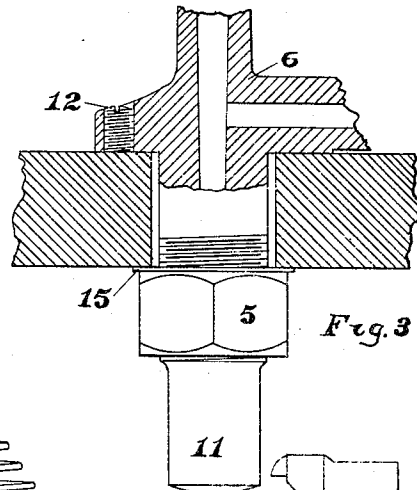


Fig. 3



Fig. 9

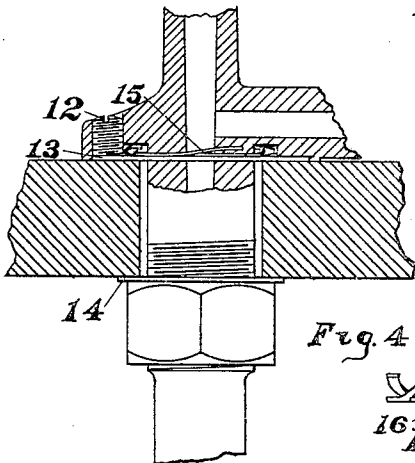


Fig. 4

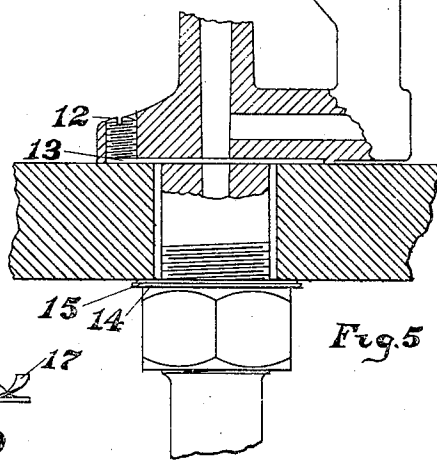


Fig. 5

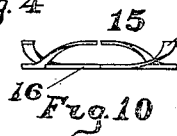


Fig. 10

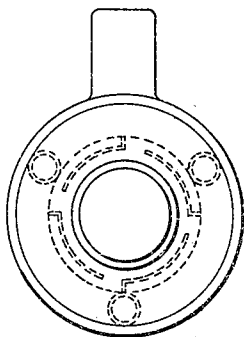


Fig. 6

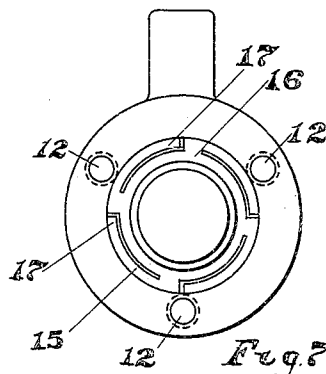


Fig. 7

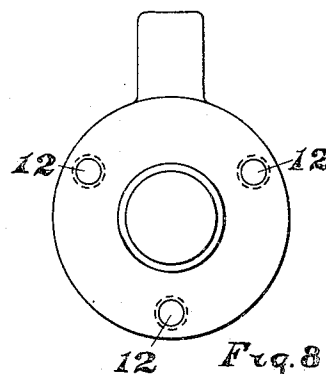


Fig. 8

Witnesses.

Walter H. Carson
John G. Gordon

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Alfred A. Lovejoy,
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Gardner W. Carson

UNITED STATES PATENT OFFICE.

ALFRED A. LOVEJOY, OF LOWELL, MASSACHUSETTS.

SPINNING-SPINDLE.

SPECIFICATION forming part of Letters Patent No. 792,338, dated June 13, 1905.

Application filed May 20, 1904. Serial No. 208,866.

To all whom it may concern:

Be it known that I, ALFRED A. LOVEJOY, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Spinning-Spindles, of which the following is a specification.

My invention relates to the spinning of textiles, and has special relation to what are known as "ring-spinning" frames. In a general way these frames consist of one or more stationary rails, which carry the spindles and corresponding rails above them, which are arranged to move up and down, carrying the spinning-rings whereby the yarn is wound evenly upon the cops or bobbins carried by the spindles.

My invention is illustrated in the following drawings, in which—

Figure 1 shows a spindle-rail, a ring-rail in two positions, an ordinary spindle-base at the left, and my improved base at the right of the figure. Figs. 2, 3, 4, and 5 show different applications of my invention. Fig. 6 is a bottom view of the base shown in Fig. 4. Fig. 7 is a bottom view of the base shown in Fig. 2. Fig. 8 is a bottom view of Fig. 3. Fig. 9 is another form of tension-washer. Fig. 10 is a side view of my preferred form of tension-washer.

It is very desirable, if not necessary, that the center of each ring should be at the axis of its corresponding spindle at every point of its travel up and down. At present the usual method of centering the ring and spindle is as follows, (see the figure at the left in Fig. 1:) The ring 1 is placed in position first and is leveled by the usual methods. The adjusting-bobbin 2 is provided with wooden bosses 3 and 4 at bottom and top of a slightly less diameter than the inside diameter of the spinning-ring. This adjusting-bobbin is placed upon the spindle 7, and the ring-rail 10 is depressed until the ring encircles the lower boss of the bobbin, as shown by the full lines in Fig. 1. If the boss 3 and ring 1 are not upon the same center, the clamping-nut 5 is slightly loosened and base 6, carrying spindle 7, and bobbin 2 are moved, usually by tapping or knocking, to such a position that the centers coincide. To allow base 6 to be moved laterally, the opening 8 in spin-

dle-rail 9 is made of a greater diameter than the bolt 11, which forms a continuation of base 6 and serves to hold it in place when it is once adjusted correctly.

According to the former method of centering the lower part of the spindle sometimes the ring was moved to make its center coincide with the center of the spindle; but now the ring is usually set in a recess counterbored in the ring-rail and cannot be moved laterally at all, or else it is held in place by screws, as shown in Fig. 1, allowing slight lateral adjustment. Nut 5 is again tightened, and the ring-rail is moved up until the ring encircles the upper boss 4 of bobbin 2, as shown by the dotted lines in Fig. 1. Now if the ring in its upper position does not center with the upper boss the top of the spindle must be thrown until the centers coincide. The usual way of accomplishing this "plumbing the spindle," as it is called, is to again loosen clamping-nut 5, which allows the top of bobbin 2, carrying upper boss 4, to be moved. The top of bobbin 2 is then carefully tipped over in the direction of the desired center, great care being used not to throw the bottom of base 6 out of place except by raising it, and enough thin sheets of paper are then inserted under the raised edge to hold it on center or plumb. It is often necessary to repeat this "shimming" process several times before the correct center is found and held. When it is correctly centered at the top, the clamping-nut 5 is tightened to hold the base and spindle in place and the ring-rail is depressed until the ring again encircles lower boss 3.

It frequently happens that in the process of centering the top of spindle 7 the base 6 is pushed or knocked out of place and it becomes necessary to repeat the whole process. When finally correctly plumbed, the paper is cut off close around base 6 by a sharp knife. Besides this when clamping-nut 5 is loosened the second time the least touch or jar will push the base off center, and the ring-rail must be brought down again, and the first centering process must be done over. This sometimes happens several times with one spindle. By this process the adjustment cannot be closer than the thickness of the paper allows.

The process described takes considerable time at best, and after it is finished as oil, &c., soak into the paper and the pressure of the working parts is constant the paper is compressed, and the spindle is thus thrown off center again. This usually happens in about a month after the spindle is set and cannot be corrected except by resetting. When the spindle is off center, the filling is subjected to an irregular strain and there is greater danger of breaking ends.

By my improved device the bottom of the spindle is centered, as described, and the nut 5 is tightened while the ring-rail is raised. In order to throw the top of spindle 7 into the same center as the ring, I use three or more frog-screws 12 12 12 for leveling-screws, tapped through base 6 and of such length that their heads will not protrude above the top surface of base 6 when base 6 rests flat upon spindle-rail 9, but that the bottom ends of said frog-screws may protrude through the bottom thereof when they are tightened. (See Figs. 2, 3, 7, 8.) These screws may rest directly upon spindle-rail 9, as shown in Figs. 2 and 3, or may rest upon washer 13, countersunk into base 6, as shown in Figs. 4 and 5. The purpose of interposing a washer between the base 6 and rail 9 is to prevent marring and wearing of the rail by the frog-screws. Such a washer can be hardened to resist the wear of the frog-screws, while it would be very difficult to harden the whole top surface of the spindle-rail. To plumb the spindle with this arrangement, it is only necessary to slightly loosen clamping-nut 5, and by then loosening and tightening the appropriate screws the top of spindle 7 may be thrown in any direction without disturbing the base, and it can be adjusted to the ring-center with great accuracy. When the spindle is properly centered, clamping-nut 5 is again tightened and the spindle and base are rigidly held in their correct position. A washer 14 is usually interposed between clamping-nut 5 and the bottom of spindle-rail 9. As the parts are all metal, there is no yielding substance, like the paper of the old method, to shrink and throw the spindle out of place. When once plumbed, the spindle always remains in place. To assist in holding the spindle in position after its base has been centered to the ring and after clamping-nut 5 is loosened, while the top is being adjusted I interpose a tension-washer 15 or 18 somewhere between nut 5 and base 6. This tension-washer should be of such design that when it is compressed it presents substantially flat bearing-surfaces on its top and bottom.

The form shown in Figs. 7 and 10, consisting of a flat annular body 16 and spring-ears 17, stamped therefrom and rising at regular intervals to form three or more points of contact, or a cone-spring 18 capable of being collapsed within itself, as shown in Fig. 9, may

be used. This washer may be countersunk in base 6 above washer 13, as shown in Fig. 4, or if washer 13 is not used it may be countersunk in the base, as shown in Fig. 2. It may be merely interposed between the bottom of spindle-rail 9 and nut-washer 14, as shown in Fig. 5. It may be used in place of nut-washer 14, as shown in Fig. 3, or it may be countersunk in the top or bottom of spindle-rail 9. The preferred and most compact form is shown in Fig. 4. The purpose of this spring-washer is to maintain a tension between spindle-rail 9 and adjacent parts, thus maintaining a considerable frictional contact to prevent any slight touch or jar from moving the spindle-base off its center while the top of the spindle is being centered.

The operation is as follows: The spinning-ring is placed in position and leveled, the adjusting-bobbin 2 is placed upon the spindle, and the ring-rail is depressed until the ring encircles the lower boss of the bobbin. The clamping-nut 5 is slightly loosened, and if lower boss 3 and the ring are not concentric the base 6 is moved about, usually by tapping it on the side with a hammer or wrench, until the centers coincide. Clamping-nut 5 is then tightened. Ring-rail 10 is then raised until ring 1 encircles the upper boss 4. All this is substantially the same as in the old way. Now with my arrangement of frog-screws in connection with clamping-nut 5 I can work said nut and screws coöperatively together by means of a wrench on the nut and a screw-driver or other suitable tool on the screws, so that as the clamping-nut is loosened one or more frog-screws are tightened, and vice versa. The clamping pressure on spindle-rail 9 is thus practically never released, and there is therefore no time when the base can be knocked or pushed off center by reason of there being no considerable frictional contact between it and spindle-rail 9. It will thus be seen that my invention can be successfully operated without the spring-washer herein described. By interposing the spring-washer, however, clamping-nut 5 can be loosened up more, thus allowing more play for the frog-screws, and at the same time the elasticity of the spring keeps sufficient pressure between the parts to prevent any slight touch throwing the base out of place. The spring-washer can be located at any of the points described and will work equally well; but the most compact and neatest way of using it is by having it countersunk above washer 13, as shown in Fig. 4.

It is to be observed that the present construction affords means for plumbing the spindle on the rail without loosening the clamping member to such an extent as to endanger the central adjustment previously secured. This is an important feature of the invention and contributes materially to its utility. Of course in the embodiment of my invention in

which the spring-washer is employed this feature of the construction is still more emphasized. As has been suggested, the use of a washer under the lower ends of the adjusting-screws conduces to the virtues of the construction, because it distributes their pressures over wider areas and effectually prevents such compression of the surface of the rail as would mar the same or raise a bur which would delay or render more difficult adjustment of a new spindle in place of an old one. Another feature of practical importance resides in the complete inclosure of the adjusting-screws within the body of the flange, so that no parts thereof project above the flange to delay wiping up of the frame. It is of great practical importance to reduce to the lowest the amount of labor required upon a machine, and this feature substantially contributes to this end.

What I claim as my invention, and desire to cover by Letters Patent, is—

1. In a spinning-frame, the combination with a spindle-rail provided with an orifice, of a spindle-base provided with a depending threaded portion extended loosely through said orifice, and with an extended flange resting upon the upper surface of the rail, frog adjusting-screws for plumbing the spindle received entirely within the said flange so that they are completely inclosed by the flange, and a nut screwed on the depending portion of the base for rigidly securing the base in adjusted position on the rail, substantially as described.

2. In a spinning-frame, the combination with a spindle-rail provided with an orifice, of a spindle-base provided with a depending threaded portion extended loosely through said orifice, and with an extended flange resting upon the upper surface of the rail, frog adjusting-screws for plumbing the spindle received entirely within the said flange so that they are completely inclosed by the flange, a nut screwed on the depending portion of the base for rigidly securing the base in adjusted position on the rail, and a washer located under the lower ends of the screws to receive and distribute the thrust thereof over the surface of the rail to prevent marring of the rail, substantially as described.

3. In a spinning-frame, the combination with a spindle-rail provided with an orifice, of a spindle-base provided with a depending threaded portion extended loosely through said orifice, and with an extended flange rest-

ing upon the upper surface of the rail, frog adjusting-screws for plumbing the spindle received entirely within the said flange so that they are completely inclosed by the flange, a nut screwed on the depending portion of the base for rigidly securing the base in adjusted position on the rail, and a washer located under the lower ends of the screws to receive and distribute the thrust thereof over the surface of the rail to prevent marring of the rail, the lower surface of the said flange being recessed to receive the said washer, substantially as described.

4. In a spinning-frame, a spindle-base, and a spindle-rail provided with an orifice, combined with leveling-screws tapped through said base and adapted to positively adjust its axis, a bolt forming an extension of said base through the orifice in the ring-rail and of smaller size than said orifice, a clamping-nut carried by said bolt, and a spring-washer interposed between said base and nut as described.

5. In a spinning-frame, a spindle-base, and a spindle-rail provided with an orifice, combined with a washer countersunk in the bottom of said base, leveling-screws tapped through said base to rest upon said washer, a bolt forming an extension of said base and adapted to pass loosely through said orifice, a clamping-nut carried by said bolt, and a spring-washer interposed between said base and clamping-nut as described.

6. In a spinning-frame, a spindle-base, and a spindle-rail provided with an orifice, combined with a washer countersunk in the bottom of said base, leveling-screws tapped through said base to rest upon said washer, a bolt forming an extension of said base and adapted to pass loosely through said orifice, a clamping-nut carried by said bolt, and a spring-washer countersunk in the bottom of said base above said washer, as described.

7. In a spinning-frame, a spindle-base, and a spindle-rail combined with means of adjustably clamping them together, and a tension-washer consisting of the annular body 16 and three or more elastic ears 17, 17, integral therewith and adapted to lie flat when compressed.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALFRED A. LOVEJOY.

Witnesses:

JOHN J. GILLEY,
DAVID MOORE.