D. H. RICE.

SPINDLES FOR SPINNING-MACHINES.

No. 172,498. Patented Jan. 18, 1876.

Fig. 2

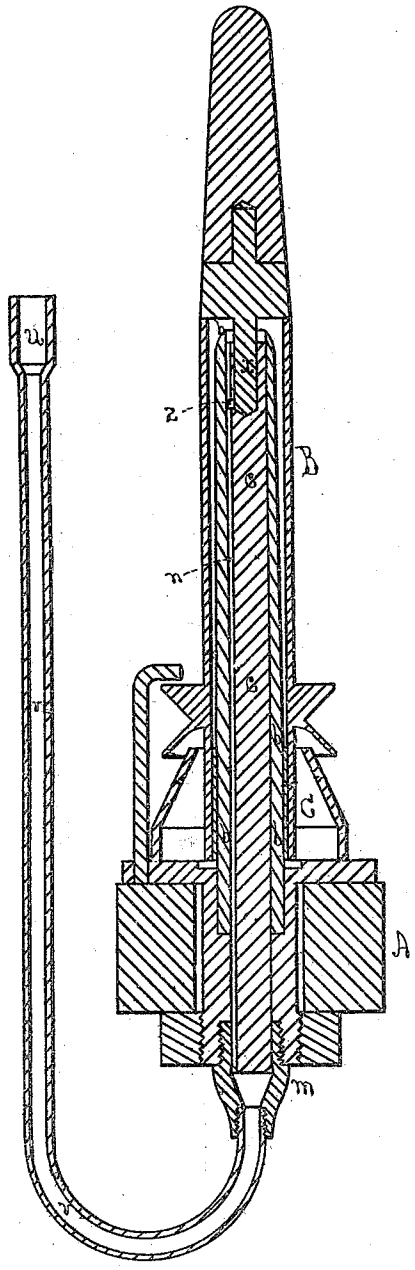
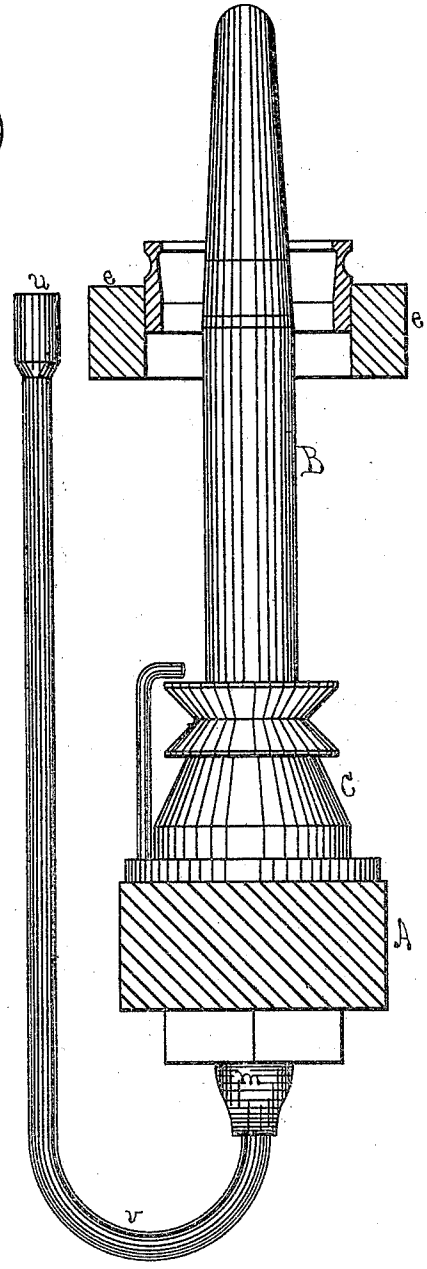


Fig. 3

Fig. 1



Witnesses.
George S. Tubmans
Charles E. Russ

Inventor
David Hall Rice

UNITED STATES PATENT OFFICE.

DAVID HALL RICE, OF LOWELL, MASSACHUSETTS.

IMPROVEMENT IN SPINDLES FOR SPINNING-MACHINES.

Specification forming part of Letters Patent No. **172,498**, dated January 18, 1876; application filed March 15, 1875.

To all whom it may concern:.

Be it known that I, DAVID HALL RICE, of Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain Improvements in Spindles for Spinning-Machines, of which the following is a specification:

This invention relates to that class of spindles commonly known as "dead" and "live" spindles; and consists, first, in the connection of a fountain-reservoir with the upper bearing of the live-spindle by means of a passage-way made through the dead-spindle from a point below outside lower bearing; and its object is to insure the constant lubrication of the upper spindle-bearing, (independently of the supply of oil contained, or which passes up between the surfaces of the dead and live spindles, when the latter is in rotation,) whereby the oil reaches the upper spindle-bearing continuously in a natural and limpid state, as hereinafter described.

In the drawings, Figure 1 represents an elevation of a spindle and bolster with my improvements. Fig. 2 represents a vertical section of Fig. 1. Fig. 3 is a horizontal section of my dead-spindle, showing the oil-passages.

A is the rail of the spinning-frame. B is the live-spindle. C is the bolster and oil-cup for the lower spindle-bearing. This bolster is attached to the rail of the frame by a nut, in the usual way. Into this bolster is inserted the dead-spindle, which is formed of two parts: a tube or shell, *b*, and an internal post or standard, *c*, which is slipped into and made to fit closely to the internal bore of the tube *b*. In the top of the post *c* is formed the upper bearing *x* of the live-spindle. On one side a vertical groove, *n*, is cut in the post *c*, before it is slipped within the tube, the groove *n* extending the entire length of the post. This groove is thus made to form a passage for the flow of oil when the tube and post are slipped or crowded together. The advantages of thus forming this passage are, that it is cheaply and easily done, and the combination of the post and tube forms it substantially through a solid steel dead-spindle of great rigidity, while if the tube were used alone it would not be stiff enough to carry the live-spindle steadily without increasing its size and bearings too much, and no small tube can be successfully made with a sufficiently small and long hole through it to leave it rigid without boring out the solid steel at so great expense as to render its application to spindles impracticable. At the lower end of the upper spindle-bearing *x* a passage, *z*, is made through the post *c*, connecting the groove *n* with the bearing. The tube *b* is made to extend a little higher than the post *c*, so as to form a small oil-cup at its upper end. At the lower end of the tube *b* it is capped with a cover, *m*, fixed securely to it, and serving to support the post *c*, which rests the cover *m* vertically in position within the tube. Through the center of the cover *m* a small hole is bored, and a tube, *v*, has one end screwed into this hole, and is bent around and carried vertically upward behind the rail of the frame, and sustains upon its upper end a fountain-reservoir, *u*, at the same height as the upper end of the dead-spindle. The top of the reservoir *u* extends upward, however, somewhat higher than the dead-spindle.

It is manifest that, the reservoir *u* being supplied with oil, the upper bearing *x* of the spindle will be kept lubricated by means of the tube *v*, groove *n*, and passage *z*, without the oil being exposed to the action of the rotation of the internal surface of the live-spindle around the external surface of the dead-spindle, which tends to consolidate the oil and clog the passage of it to the upper bearing. Besides, the action of the oil while being lifted by the rotation of the live-spindle causes friction between the contiguous surfaces of the live and dead spindles, and requires more power to drive the spindle, all of which is avoided by my present improvement.

The fountain-reservoir *u* may be provided with a cover to exclude dirt, if desired. The lower spindle-bearing is upon the tube *b* at the bottom end of the live-spindle, and when the post *c* is fitted to the internal bore of the tube *b* it is made with what is known as a running fit—that is, so as to be readily slipped in and out of the tube without having any lateral play. It may be fitted more or less tightly, but I prefer to fit it as above described.

The effect of this construction is that the vibration imparted to the tube *b* by the lower

bearing and whirl will not pass into or affect the post *c*, and thus impair the steadiness of rotation of the upper spindle-bearing. I thus obviate one of the difficulties heretofore experienced in running dead and live spindles.

When it is desired to oil the lower bearing *a* without removing the spindle from the bolster, the fountain-reservoir *u* is filled to the brim, and the oil in it above the top of the dead-spindle will overflow the latter and run down between the dead and live spindles into the oil-cup C, where it will lubricate the lower bearing. The tube *v* is made to screw into the cover or cap *m*, so as to be attached to the latter after the bolster is inserted into the rail of the spinning-frame, as it would be difficult, and in some cases impossible, to insert the bolster into the rail with the tube *v* and its fountain attached to the bolster. This detachable joint also enables the spindle to be taken apart and readily cleaned, if any of its oil-passages become clogged. The vertical portion of the tube *v* and its fountain-reservoir *u* are carried far enough away from the live-spindle vertically upward to allow the ring or traverse rail E of the frame to pass up and down around the bobbin and spindle alongside the fountain and tube *v*, and in front of them, and the fountain and tube are behind the rails of the frame, out of the path of the traverse, and do not interfere with the operations of spinning and doffing, while accessible to the spinner to oil the spindle, which is of great advantage.

What I claim as new and my invention is—

1. The combination of the fountain-reservoir *u* and its tubular extension *v*, with the upper spindle-bearing *x*, and the passage *n* formed within the dead-spindle from a point below the lower spindle-bearing, substantially as described.

2. The combination of the fountain-reservoir *u* and its tubular extension *v*, extending higher than the top of the dead-spindle, with the lower spindle-bearing and the passage *n*, and hollow live-spindle B, substantially as described.

3. The combination of the fountain-reservoir *u* and its tubular extension *v*, with the passage *n*, the two having a detachable joint, substantially as described.

4. The combination of the fountain-reservoir *u*, placed behind out of the way of, and alongside the path of, the traverse or ring rail, and its tubular extension *v*, with the spindle, substantially as described.

5. The oil-passage *n*, formed within the dead-spindle from below the lower spindle-bearing to its upper end, substantially as described.

DAVID HALL RICE.

Witnesses:

CHARLES E. PRATT,
GEORGE S. TUBMAN.