(No Model.) 2 Sheets—Sheet 1.

W. G. MORRISON.

SPINDLE FOR SPINNING MACHINES.

No. 492,415. Patented Feb. 28, 1893.

Fig. 1.

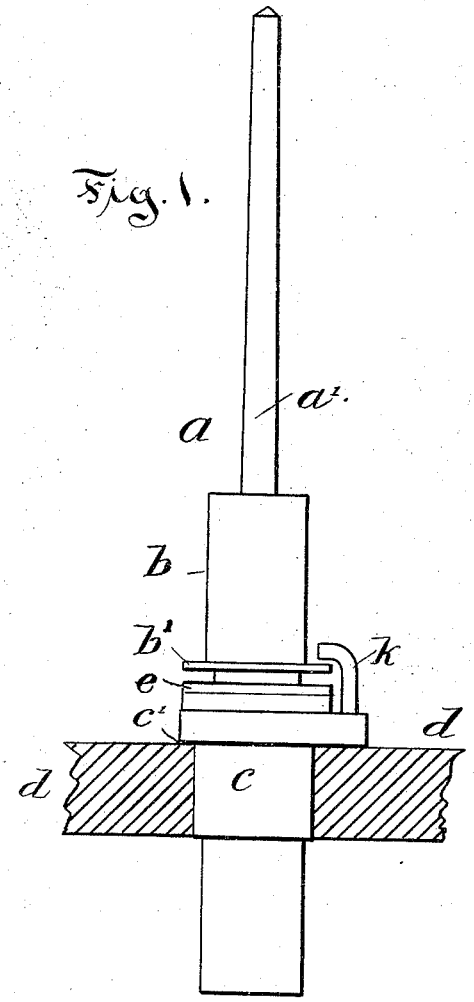
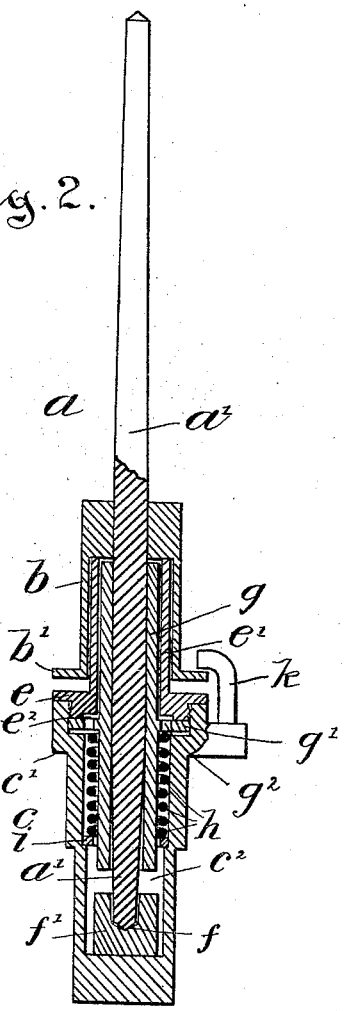


Fig. 2.



Witnesses:

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Arthur P. Jenkins.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

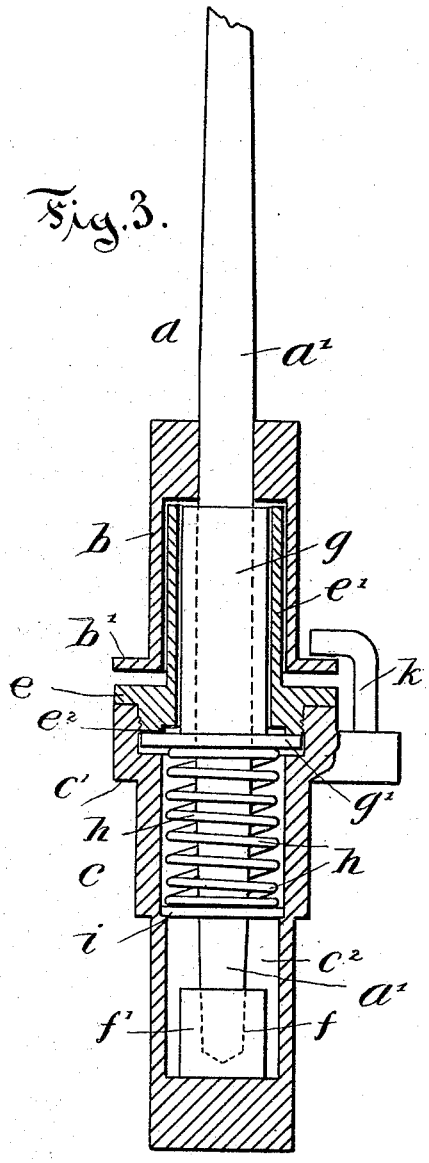


Fig. 4.

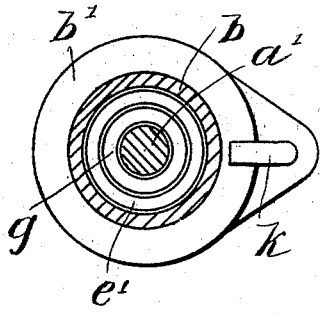
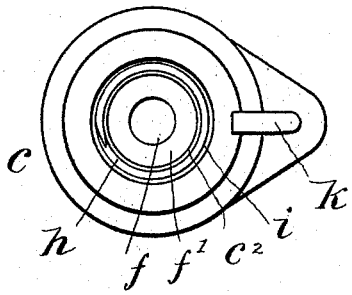


Fig. 5.



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UNITED STATES PATENT OFFICE.

WALTER G. MORRISON, OF WILLIMANTIC, CONNECTICUT.

SPINDLE FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 492,415, dated February 28, 1893.

Application filed October 22, 1892. Serial No. 449,628. (No model.)

To all whom it may concern:

Be it known that I, WALTER G. MORRISON, of Willimantic, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Spindles for Spinning-Machines, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates to the class of spindles that are adapted for use in a spinning frame or the like and it particularly relates to that class that are so mounted in the rail of a spinning frame as to permit a yielding movement of the spindle laterally to enable it to adapt itself to an unbalanced load and run true.

To this end my invention consists in the details of the several parts making up the spindle as a whole and in the combination of such parts as more particularly hereinafter described and pointed out in the claims.

Referring to the drawings: Figure 1 is a view in elevation of a spinning spindle made in accordance with my invention. Fig. 2 is a detail view in central vertical section of the spindle. Fig. 3 is a detail view in vertical section of the spindle with parts broken away to show the construction. Fig. 4 is a detail view in cross section of a spindle looking down on the top of the bolster bearing. Fig. 5 is a detail plan view of the cup.

In the accompanying drawings the letter *a* denotes a live spindle provided with a sleeve whirl *b* having a flange *b'* and mounted in a support that comprises a step bearing and also a bolster bearing.

Within the oil cup *c* is located the step bearing of the spindle, the cup being usually cylindrical in outline and adapted to be placed in a socket in the rail *d*. It may be secured in said socket as by means of a clamp screw or collar but is preferably somewhat loosely mounted in the rail, the diameter of the socket being slightly greater than the diameter of that portion of the cup that lies immediately within the socket. The cup rests on the rail on a shoulder *c'* the upper part of the cup being enlarged and having its inner surface threaded to receive a cap *e* that has a threaded shank fitted to and extending a short distance within the cup. The socket c^2 within the cup contains a step bearing *f* preferably formed in a block *f'* that is smaller in diameter than the socket and capable of lateral movement within it while resting upon the bottom of the socket.

The blade or main part *a'* of the spindle projects the usual distance upward to receive the bobbin and also extends downward within the oil cup where its lower end fits loosely within the step bearing *f* (as illustrated in Fig. 2) that forms the vertical support of the spindle.

The spindle has lateral support in a tube *g* containing the bolster bearing and having an exterior flange *g'* about midway as shown in Fig. 2 of the drawings, or at the lower end of the tube, as shown in Fig. 3. The latter form is preferred. This bolster bearing rests directly upon a spring *h* preferably of coiled wire that is supported as by means of a washer *i* resting on a shoulder formed by counterboring the socket in the oil cup. The pressure of this spring holds the flange of the bearing up against the lower side of the cap *e* with a yielding pressure, the tube forming this bearing fitting loosely within the opening through the cap so as to permit a yielding or sidewise rocking movement of the tube and enabling the spindle to adjust itself to an unbalanced load. The step bearing *f* moves laterally a sufficient distance to permit this rocking movement of the bolster bearing.

The cap *e* is preferably provided with a tubular neck *e'* that extends upward within the sleeve whirl *b* with a space left between the outer surface of the tube *g* which contains the bolster bearing of the spindle and the inner wall of the cap *e* and neck *e'*. This cap has a double function. First, to have on its under side a bearing for the flange of the bolster tube *g* and second, to provide within the sleeve whirl *b* a receptacle for a lubricant that enables it to be carried much higher upon the bearing than has heretofore been possible in this class of spindles. This is owing to the large quantity of oil that in my improved form of spindle may be supplied from the reservoir from within the cup, the absorption and evaporation not reducing the height as quickly with the large quantity of oil as when a smaller quantity is used. This forms an important feature of the structure.

The step of this spindle is shown as con-

oidal but it may be of any other desired form and have any suitable support within the cup *c*.

The live spindle is held in place in the socket by means of the usual hook *k* that is screwed into a socket in a projecting part of the cup and has an end adapted to be moved so as to overhang the flange of the whirl. The spindle is driven by means of a band running in contact with the outer surface of the whirl in the usual manner.

Provision is made for the free movement of the oil in a vertical direction by providing a sufficient number of openings g^2 through the flange and as an aid to this movement an oil chamber e^2 is formed in the under surface of the cap and adjacent to the opening through it.

There is no provision made for any adjustment of the cushion or elastic support of the bolster bearing as none is needed to the perfect working of the device. I have found by experiment that an improvement in the running of an unbalanced bobbin may be made by having the oil cup secured within the rail by means that do not bind it in the socket but allow it a slight lateral or rocking play. When the supporting cup is held and bound by a set screw it often causes a jarring when an unbalanced load is on the spindle but by loosening the hold of the clamp screw this jar is entirely prevented and the spindle runs true and smoothly.

A collar or like device secured to the cup just below the under side of the rail so as to prevent the cup from being lifted bodily out of the socket in doffing the spindle may be used as fastening means in place of a set screw.

I claim as my invention—

1. In combination with a base piece containing an oil cup and adapted to be mounted in a spindle-rail, a cap secured to the upper part of said base piece, a flanged bolster bearing tube with the flange held below the cap, a spiral spring located within the base piece and thrusting upward against a shoulder on the bolster bearing tube, and a live spindle extending and supported within the said tube, and having a separate step bearing within the cup, all substantially as described.

2. In combination with a base piece containing an oil cup and adapted to be mounted in a spindle-rail, a cap with an upward extending tubular neck removably secured to the upper part of the said base piece, a bolster bearing tube with the flange located below the cap, a spiral spring located within the cup and thrusting upward against a shoulder on the bolster bearing tube, and a live spindle extending within the bolster bearing tube and having a step bearing within the cup, all substantially as described.

3. In combination with a base piece containing an oil cup and adapted to be mounted in a spindle-rail, a cap removably secured to the upper part of said base piece, a flanged bolster bearing tube with its flange held below the cap, a spiral spring located within the cup below the bolster bearing tube and thrusting upward against a shoulder thereon, and a live spindle extending through the bolster bearing with its end supported in a movable block containing the step bearing, all substantially as described.

4. In combination with a spindle-rail, an oil cup adapted to be loosely mounted in the rail, a live spindle extending through a bolster bearing tube and with its support formed in a step bearing, a movable step bearing for the spindle located within the cup, the flanged bolster bearing tube mounted on a yielding cushion, and the yielding cushion located within the base piece, all substantially as described.

WALTER G. MORRISON.

Witnesses:
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