(No Model.)

J. H. McMULLAN.

SUPPORT FOR SPINNING SPINDLES.

No. 420,086. Patented Jan. 28, 1890.

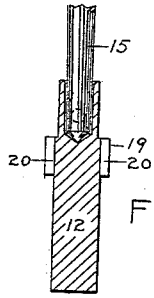

Fig.4.

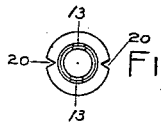

Fig.5.

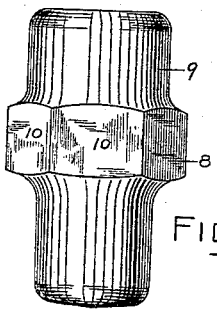

Fig.3.

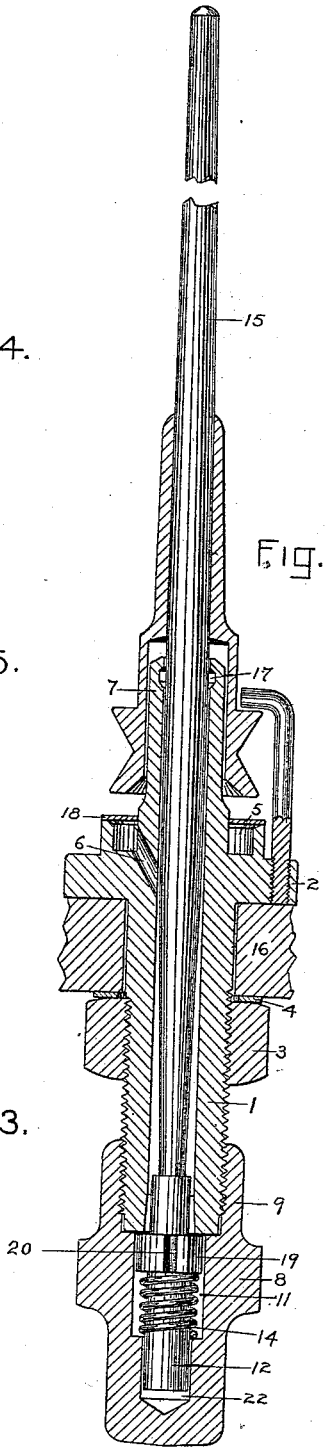

Fig.1.

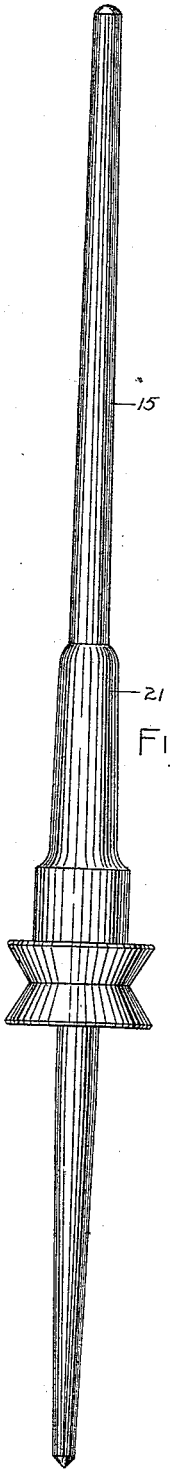

Fig.2.

WITNESSES:
Benj. N. Goodale
William P. McMullan

INVENTOR:
Jas. H. McMullan

UNITED STATES PATENT OFFICE.

JAMES H. McMULLAN, OF PORTLAND, MAINE, ASSIGNOR TO THE SAWYER SPINDLE COMPANY, OF BOSTON, MASSACHUSETTS.

SUPPORT FOR SPINNING-SPINDLES.

SPECIFICATION forming part of Letters Patent No. 420,086, dated January 28, 1890.

Application filed November 14, 1887. Serial No. 255,074. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. McMULLAN, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Supports for Spinning-Spindles, of which the following is a specification.

My invention is an improvement relating more especially to such supports for spinning-spindles as are secured to a single spindle-supporting rail, and also to that class in which the rotating parts are so supported that they may be deflected to a certain extent by the effect of an unbalanced load; and it consists of the construction and combination of parts, as hereinafter set forth.

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

Figure 1 is an elevation, partly in central vertical section, of a single-rail spinning-spindle with the supports therefor. Fig. 2 is an elevation of the spindle with a sleeve-whirl attached thereto. Fig. 3 is an elevation of that form of step-support which I prefer to use. Fig. 4 is a central sectional elevation of a spindle-step with a portion of the spindle that is supported therein, and Fig. 5 is a plan of said step.

Similar reference-numbers refer to similar parts in all of the views.

In the drawings, 1 represents the bolster-bearing support, which is preferably provided with the external collar 2, the nut 3, and the washer 4, said nut engaging with a screw-thread upon the exterior of said support. I prefer to form an oil-chamber 5 in the upper part of the collar 2, as shown, and to form an oil-conduit 6 through the side of the support 1 and communicating with said chamber. Whenever it may be desired to do so, a washer 18 may be placed encircling the elevated part 7 of the bolster-bearing support and covering the top of the oil-chamber 5 in the usual manner.

At the base of the support 1 is secured the step-case 8 in any convenient manner, the construction which I prefer being shown in the drawings. This preferred form of step-case is provided with a sleeve 9, screw-threaded in its interior, and which engages with a screw-thread upon the surface of the support 1. The step-case of this form is usually provided with flattened surfaces 10, which are adapted to receive a wrench. Below the bottom of the threaded part of the sleeve 9 is the step-well 11, in which the step 12 is supported. Said step-well is preferably provided with an extension 22, smaller in diameter than the main well, and which is used to support and guide the lower end of the step 12, while the upper part of the well supports and guides the collar 19 upon the step 12 and contains the open-coiled spring 14, which surrounds said lower end of the step, although said extension may sometimes be dispensed with and the lower end of the step be supported by the spring 14. The step-case, when made in this manner, forms an oil-cup of considerable size, which receives the oil set free when the step is removed for examination or for the purpose of being cleansed, and thus prevents other parts of the spinning-frame and the floor from becoming soiled by the discolored oil at such times.

I prefer to make the step 12, as shown in the drawings, with the collar 19 surrounding it and a little below the lower end of the bearing of the spindle in said step, although the construction thereof may in some cases be changed very materially, it being understood that the step is not so made as to form a combined step and bolster bearing. The cavity in the step 12, which supports the spindle, is preferably made of the shape of the spindle and so large that the spindle fits loosely therein, and provided with oil-holes 13, leading from the space surrounding the step to said cavity in the interior thereof. The diameter of the various parts of the step 12, including that of the collar 19, is such that the step may yield laterally in all directions to a slight extent without coming in contact with the sides of the step-well or central hole in the bolster-bearing support 1. The weight of the step, as well as that of the spindle and its load supported by said step, is preferably borne by the open-coiled metallic spring 14, one end of which rests upon the bottom or a shoulder in the side of the step-well 11, and

the other end of which bears against the collar 19 upon the step 12. This spring 14 is, when made as illustrated, preferably made longer than the space which it occupies in the completed structure, and is thus in a state of compression when in its place, in consequence of which the collar 19 is pressed with considerable force against the lower end of the bolster-bearing support 1. In order that the sediment which forms within this structure when it is in operation may pass into the step-well 11 without difficulty, conduits 20, or their equivalents, are formed to allow said sediment to pass by the collar 19. These conduits may be made in any convenient way, it only being necessary that the step-well 11 and the interior of the lower end of the bolster-bearing support 1 should freely communicate with each other.

Prior to my invention spindle-steps supported loosely, so that they may move laterally, have been restrained from rotation with the spindle by a pin or projection. The use of such pin or projection, while preventing the rotation of the step, is objectionable, because the lateral movement of the step is obstructed in some directions; but herein the step 12 is adapted to yield laterally with equal freedom in all directions, for which reason the lower end of the bolster-bearing support 1 is preferably made a plane surface, or nearly so, as is also the upper surface of the collar 19 for the same reason.

The pressure of the step against the fixed support above it by the spring is sufficient to keep the step in place under usual loads after the step has once assumed substantially correct position, the step being, however, free to be moved laterally in any and every direction when the strain inside the step overcomes the friction between the step and the support, and with usual unbalanced loads the step rotates but little; but with any unusually unbalanced loads the rotation of the step is faster, but in no case should the step rotate as fast as the spindle.

The rotation of the step at a slow speed has been found of advantage in that the interior of the step is worn more evenly than when the step is not permitted to rotate, as when its rotation is restrained by a pin or projection. The spring constitutes an elastic support for the step.

The step-case 8 serves to hold the step 12 in such a position that the upper side of the collar 19 rests against a fixed surface in connection with the bolster-bearing support 1. Any other construction of the parts whereby a pressure is brought to bear against the lower end of the spring 14, and whereby the step 12 is held firmly by said spring upwardly against a fixed support, may in some cases be equivalently substituted for said step-case.

I do not desire to limit myself in all cases to the use of the exact form of spring that is illustrated for supporting the step 12, since I am aware that other forms of spring may sometimes be equivalently substituted therefor.

The lower part of the spindle 15 is preferably made of a small diameter and terminating in a sharp point, although any other suitable construction of these parts may be adopted at the will of the maker of the device to meet any unusual requirements. When the lower end of the spindle is made of a small diameter, as shown, the spindle increases in diameter as the bolster-bearing is approached from its lower end. The bolster-bearing is preferably cylindrical. The spindle is preferably provided with a sleeve-whirl, the plane of whose band-groove crosses said bearing in its bolster.

The fit of the spindle 15 in its bolster-bearing should be a rather loose one, in order that the blade or upper unsupported end of the spindle may be able to yield slightly to the force exerted thereon by an unbalanced load. The central hole in the bolster-bearing support 1 is shown as a cylindrical one for the greater part of its extent, and slightly larger than the diameter of the spindle, although I do not in all cases desire to limit myself to this exact construction. I prefer to form near the upper part of the bolster-bearing an oil-retaining groove 17, to prevent oil in considerable quantities from passing over the top of the bolster 1 when the spindle is being used.

I have found that a spindle of the kind described runs very well indeed at the usual speeds at which such spindles are operated, and that it is perfectly practicable to remove the step-case for the purpose of cleansing it and removing the sediment, which is intentionally allowed to settle therein below the lower end of the spindle, even when the spindle is in operation and spinning yarn.

I prefer to make the fit of the lower end of the bolster-bearing support 1 with the shoulder of the step-case, with which it is usually in contact, so perfect that the joint between them may easily be made impervious to oil by screwing up the step-case tightly, although a soft metallic or other suitable washer may sometimes be advantageously inserted at this joint as an equivalent for such perfect fit.

The much-desired and so-called "gyrating capacity" of spindles is possessed by my invention to a considerable degree on account of the looseness of the fit of the spindle in the step and bolster bearings and of the freedom of the step to move laterally to a slight extent in all directions. When an elastic spring supports the step, as herein described, the spindle runs with very little jar indeed at the highest desirable speeds. The form of the lower end of the spindle insures that the bolster-bearing is properly lubricated when there is sufficient oil in the interior of the bolster, the oil being carried upward by the action upon it of centrifugal force.

Another great advantage of the spindle as

illustrated is the cheapness of its construction and the ease with which all its parts are reached for the purposes of examination and cleansing.

I do not desire to limit myself in the use of my invention in all cases to the particular forms of the various parts of the structure which are herein illustrated, since such forms of some of the parts may in some cases be much changed without departing from the invention. I am especially aware that it may in some cases be desirable to make the combined bolster-bearing and bolster-bearing support in two or more pieces; and I do not consider it to be a departure from my invention, as hereinafter claimed, to interpose a washer or other similar bearing-surface between the top of the collar 19 and the bottom of the bolster-bearing support 1, or otherwise in connection with said support, since the action of the various parts of the structure would not be substantially changed thereby.

I do not broadly claim the combination, with a spindle and a bolster case or tube having therein a rigid upper lateral bearing for the spindle, of an independent yielding lateral bearing for the lower end of the spindle, located in the said bolster case or tube, and a yielding or elastic support therefor within said tube; nor do I broadly claim the combination, with a sleeve-whirl spindle and a bolster case or tube having therein a rigid upper lateral bearing for the spindle, of an independent yielding lateral bearing for the lower end of the spindle, located in the said bolster case or tube, and a yielding or elastic support therefor within said tube.

What I herein claim as new, and desire to secure by Letters Patent, is—

1. A spindle, a step-case, a bolster-bearing support, and a loose step, combined with an elastic support for the step to act upon the said step and press or bear it toward or against the said bolster-bearing support with a force measured by the said elastic support, the said step thus held being adapted to not only move laterally uniformly in every desired radial direction, but also to rotate in the direction of rotation of the spindle at a slower speed, substantially as described.

2. The spinning device which consists of a bolster-bearing support with a bolster-bearing formed integrally therewith, a detachable step-case at the base of said support, a step, and a spring within said step-case, said spring supporting said step and forcing it upwardly against a fixed surface in connection with said bolster-bearing support, said step being free to move laterally in all directions with respect to said step-case and bolster-bearing support, and a spindle provided with a sleeve-whirl the plane of whose band-groove crosses said bolster-bearing, substantially as described, and for the purposes set forth.

JAS. H. McMULLAN.

Witnesses:
BENJ. N. GOODALE,
WILLIAM P. McMULLAN.