(No Model.)

S. L. WIEGAND.

SUPPORT AND DRIVING MECHANISM FOR SPINNING SPINDLES.

No. 589,994. Patented Sept. 14, 1897.

FIG. 1.

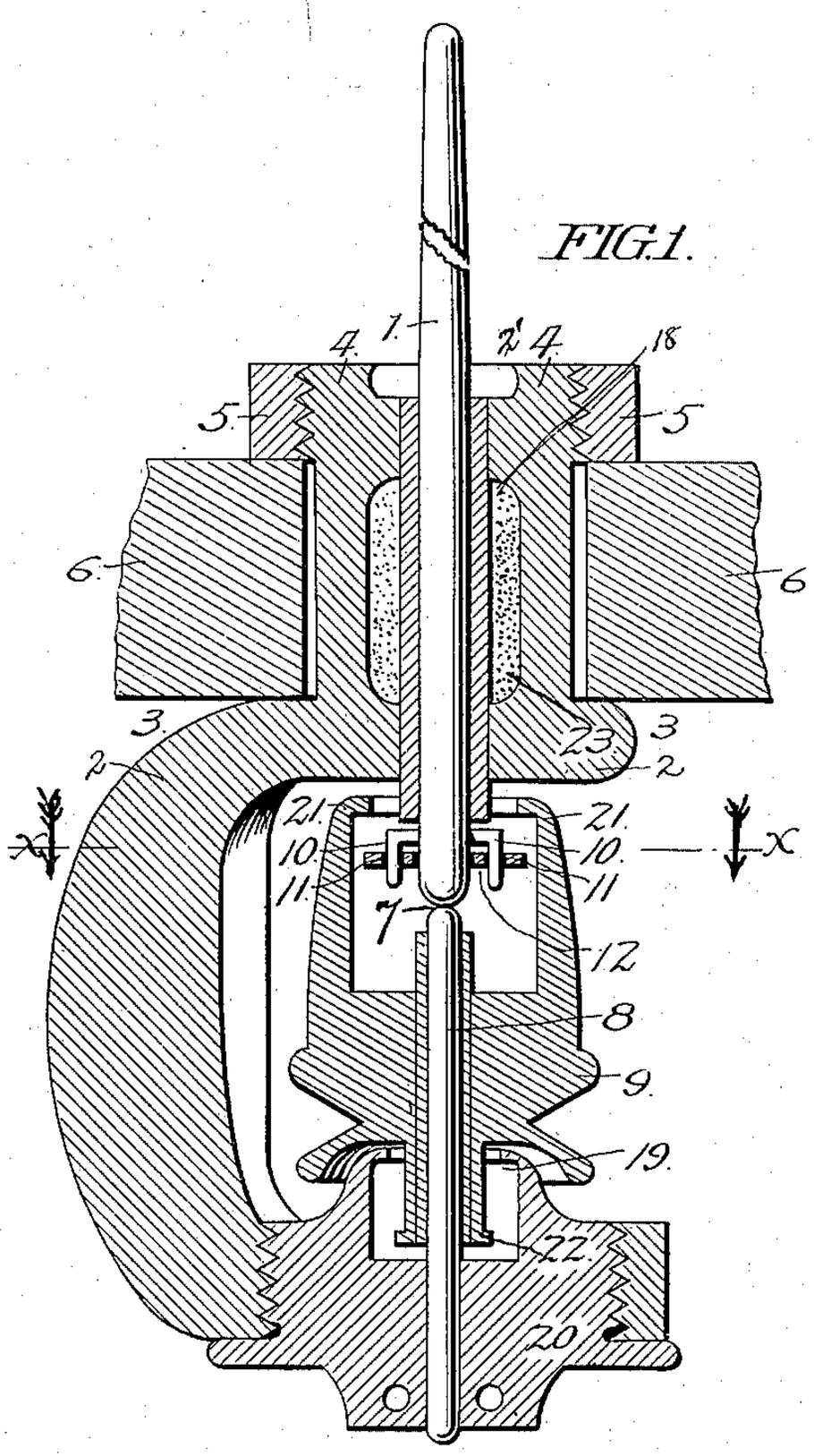


FIG. 3.

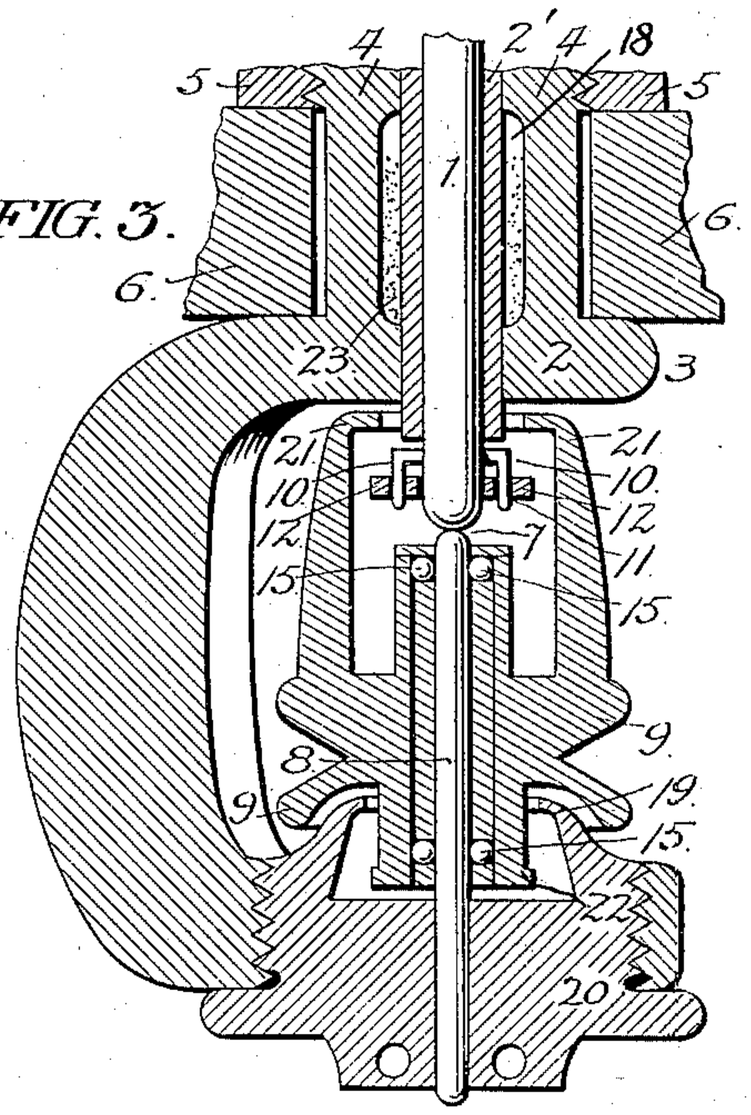


FIG. 4.

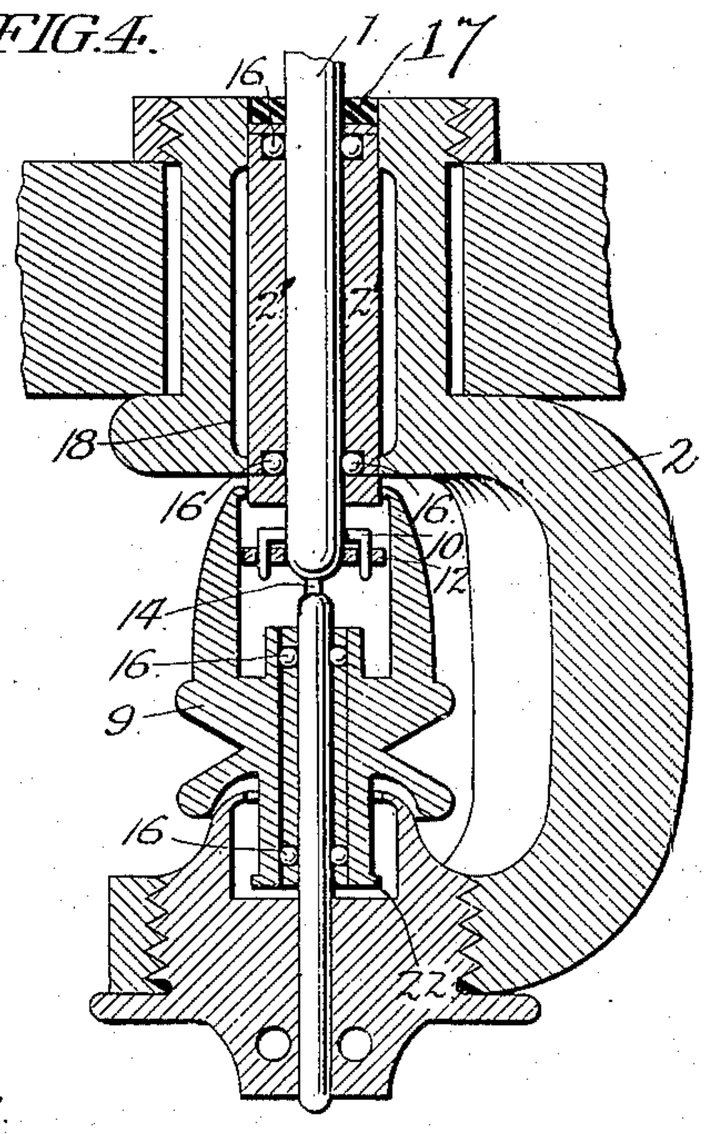


FIG. 2.

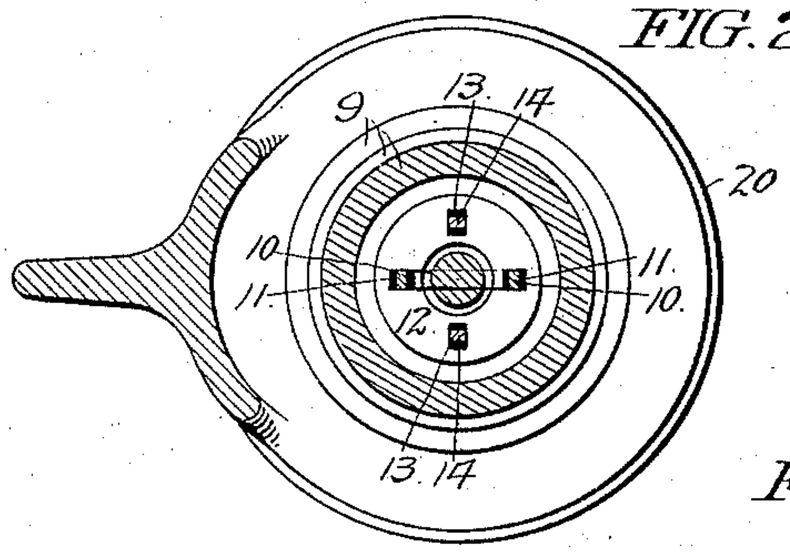
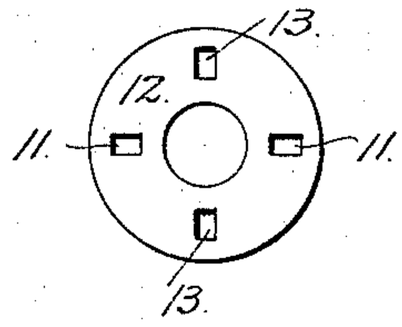


FIG. 5.



WITNESSES:

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SUPPORT AND DRIVING MECHANISM FOR SPINNING-SPINDLES.

SPECIFICATION forming part of Letters Patent No. 589,994, dated September 14, 1897.

Application filed September 16, 1890. Renewed September 20, 1893. Serial No. 486,032. (No model.)

To all whom it may concern:

Be it known that I, S. LLOYD WIEGAND, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Supports and Driving Mechanisms for Spinning-Spindles; and I do hereby declare the following to be a sufficiently full, clear, and exact description of the invention as to enable others skilled in the art to make and use the same.

This invention relates to spindles for spinning fibers into yarns and threads, and has for its object the steady support of such spindles and the application of rotary motion thereto without producing any lateral or vibratory motion therein.

To this end this invention consists in a support fitting accurately on the spindle, in which it turns freely and through which the lower portion of the spindle projects, and is connected by a flexible carrier to a revolving whirl supported on a spindle below the spinning-spindle and which forms a step or end bearing for the support of the spinning-spindle.

This invention also embraces devices for applying and retaining lubricants and for avoiding friction, all of which devices are hereinafter fully described and shown in the accompanying drawings, in which—

Figure 1 shows a vertical section of a spindle and support embodying this invention in its simplest form; Fig. 2, a horizontal section in the plane indicated by the dotted line $x\ x$ in Fig. 1 looking downward. Figs. 3 and 4 show modifications of the lower portion of the device with appliances for avoiding friction, and Fig. 5 shows an enlarged detached plan view of the carrier-plate used to transmit rotary motion from the whirl to the spindle.

Referring to the drawings, 1 represents the spindle, which in the upper portion may be of any of the usual forms.

The lower portion of the spindle 1 fits in a bushing 2′, so as to turn freely therein without vibration or shaking, and may be cylindric or conical, the former being most cheaply made, and the latter is susceptible of being refitted when worn by letting it down farther into the sleeve.

The outer surface of the sleeve 2 is concentric with its internal bearing surface or bore and has a shoulder 3 formed at the lower part and at the upper end 4 is screw-threaded and fitted with a nut 5, whereby it can be drawn up tightly into position in the rail 6 of a spinning-frame, the shoulder 3 resting against the under side of the rail 6 and the nut 5 on the top of said rail. The shoulder 3 being at right angles to the axis of the bearing secures the perpendicular position of the sleeve 2, the bushing 2′, and spindle 1.

The bushing 2′ may be made integrally with the sleeve 2 or separately and inserted.

The lower end of the spindle 1 extends below the bushing 2′ and rests upon a step or bearing 7, which is formed in the top of a spindle 8, upon which the whirl 9 is fitted to turn freely. Upon the upper part of the whirl 9 is formed a rim 21, which surrounds the lower end of the bushing 2′ with a clear space between them. Upon the lower end of the spindle 1 are fitted two diametrically opposite projections 10, reaching downward, which fit in slots 11 in a plate or collar 12, fitting loosely around the spindle 1, but without contact therewith. In the collar 12 at right angles to the slots 11 are two other slots 13, into which fit projections 14, fitted in the whirl 9, extending upward therefrom.

The projections 10 on the spindle 1 and those 14 of the whirl 9, fitting in the slots 11 and 13, so as to slide in pairs in directions at right angles to each other, are free to slide radially, and while they transmit rotary motion are incapable of transmitting lateral or vibratory motion from the whirl to the spindle 1, because the projections 10 slide in one pair of radial slots 11 in the plate 12 and the projections 14 slide in the other pair of slots 13 in a direction at right angles to the slots 11, and any lateral or vibratory motion of the projections 14 in the slots 13, if in the direction of such slots, is lost by the sliding of the projection, and any vibratory motion of the projections 14 in the other direction imparted to the plate 12 is lost by the sliding of the projections 10 in the slots 11 in the plate 12, and since any lateral vibratory motion in the whirl in any direction and its connected projections 14 is resolvable into the two di-

rections of the slots 11 and 13 or combinations thereof the spindle 1 remains unaffected thereby.

In the form of the invention depicted in Fig. 3 ball-bearings 15 are introduced in the whirl 9 to avoid friction, and in the form shown in Fig. 4 ball-bearings 16 are introduced both around the spindle 1 and within the whirl 9, and the spindle 1 is supported by a shoulder 17 instead of resting upon the step 7 on top of the spindle 8.

Lubrication of the spindle 1 may be effected by means of absorbents 23, containing oil stored in cavities 18, surrounding the bushing 2'. The oil being introduced from the top and passing downwardly to the whirl serves to lubricate it and is restrained from flying off by centrifugal effect by a rim 22 on the whirl 9, inclosed in a stationary rim 19 on the base 20 of the whirl-bearing.

By placing the whirl upon a spindle separate and distinct from the spinning-spindle a much smaller diameter of journal-surface in the whirl-spindle becomes admissible, because the chief requirement for stiffness in the spinning-spindle is to avoid vibration, and the principal cause of vibration is the unequal impulses imparted to the whirl by the driving-band.

The whirl being independently supported and having no connection with the spinning-spindle by which vibratory or lateral strain or motion can be imparted from one to the other secures the best accuracy of motion of the spinning-spindle with the smallest practicable spindles and a saving of material in construction and of power in working results, and the spindle being free from vibration can be run at higher speed and have consequently greater productive capacity.

The revolving slotted plate and pairs of diametrically opposite projections engaging said plate for the transmission of rotary motion from the whirl to the spindle are elements in the claims of another application for Letters Patent, serially numbered 360,720, and filed on the 1st day of August, 1890, in the United States Patent Office.

Having described this invention and the operation thereof, what I claim is—

1. In a spinning-spindle supporting and driving mechanism, a spinning-spindle, a rigidly-supported bearing through which both ends of said spindle project, a stationary spindle normally in line with the spinning-spindle and arranged to support the lower end of the spinning-spindle, and a whirl fitted to rotate on said stationary spindle, in combination with diametrically opposite projections on the lower end of said spinning-spindle a radially-slotted plate fitting upon said projections to slide thereon and diametrically opposite projection secured upon said whirl and fitted to slide in said plate in a direction transverse to the motion of said plate on the projections attached to the spinning-spindle substantially as and for the purpose set forth.

2. In a spinning-spindle supporting and driving mechanism, a spinning-spindle, a frame having a screw-threaded and shouldered upper portion adapted to fit in the rail of a spinning-frame, a bearing concentric with the screw-threaded and shouldered portion adapted to fit the spinning-spindle, a lower portion internally screw-threaded in axial line with the spindle-bearing, a base fitting said lower screw-threaded portion provided with a stationary spindle in axial line with the spinning-spindle, a whirl fitted to turn upon said stationary spindle having a downwardly-projecting rim inclosed in a chamber in said base surrounding the base of said stationary spindle and a chamber contracted at the upper end surrounding the lower end of the spinning-spindle in combination with propelling projections attached to the whirl, propelling projections attached to the spinning-spindle and a revolving slotted plate or ring connecting said projections substantially as set forth.

3. In a spinning-spindle-supporting mechanism, a frame provided at its upper end with a screw-thread and nut and an opposed shoulder adapted to secure the frame in the rail of a spinning-machine, a concentric seat for a spindle-supporting bushing, a downwardly-projecting arm provided with a female screw-thread in line with the axis of the spinning-spindle bearing, in combination with a screw-threaded base fitting said female screw, an oil-receptacle formed in said base and a central stationary spindle adapted to form a bearing for a whirl and an end support for the spinning-spindle substantially as set forth.

4. In a mechanism for supporting and driving spinning-spindles, a bushing, a spinning-spindle supported laterally in said bushing a stationary spindle supporting said spinning-spindle endwise, a whirl turning upon said stationary spindle and provided with a pair of opposite driving projections, a pair of driving projections on the spinning-spindle in combination with a ring having pairs of radial slots embracing the projections upon the whirl and the spinning-spindle substantially as set forth.

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