

No. 644,572.

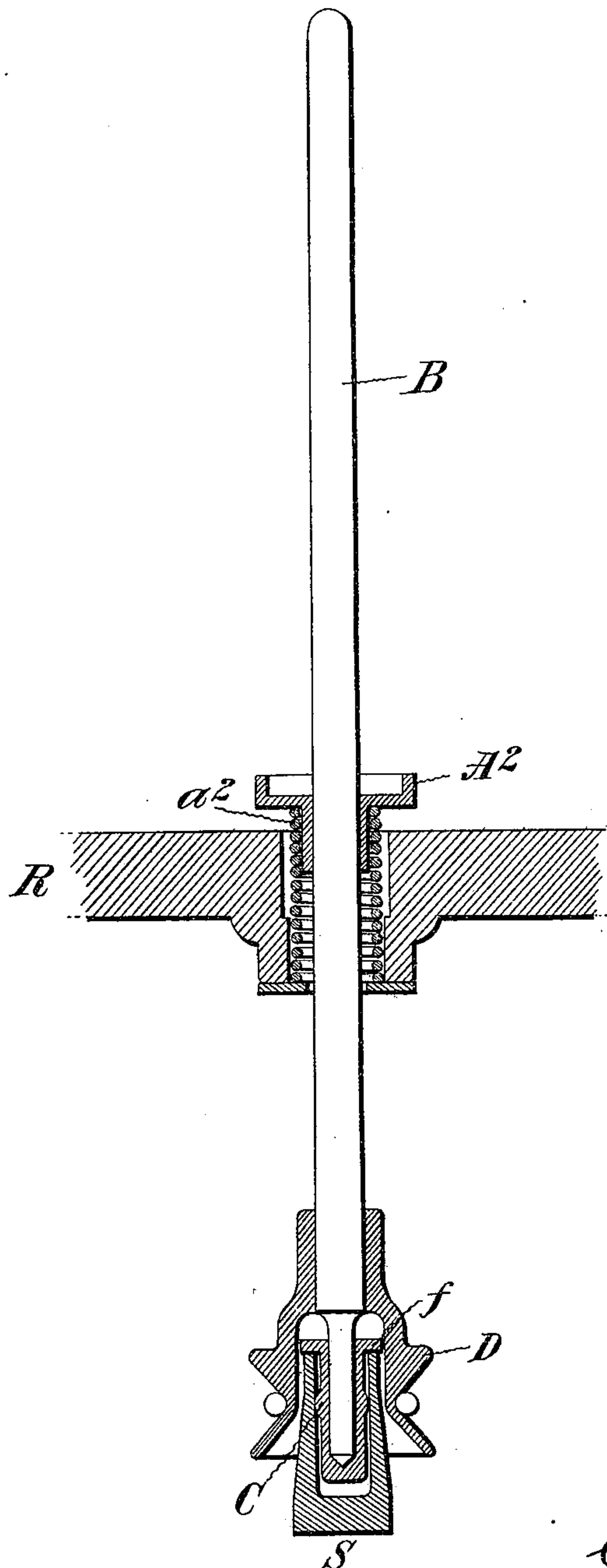
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C. BERGMANN.

SPINDLE FOR SPINNING, TWISTING, DOUBLING, AND WINDING MACHINES.

(Application filed Feb. 12, 1898.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

CARL BERGMANN, OF MEISSEN, GERMANY.

SPINDLE FOR SPINNING, TWISTING, DOUBLING, AND WINDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 644,572, dated March 6, 1900.

Application filed February 12, 1898. Serial No. 670,141. (No model.)

To all whom it may concern:

Be it known that I, CARL BERGMANN, a subject of the German Emperor, and a resident of 55 Thalstrasse, Meissen, Germany, have invented certain new and useful Improvements in Spindles for Spinning, Twisting, Doubling, and Winding Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which forms a part of this specification.

My invention has relation to spinning, twisting, doubling, and winding machine spindles, and in the drawing annexed is shown a sectional elevation of such a spindle constructed and adapted to perform the functions hereinafter to be described and in accordance with my invention.

It has been the practice to mount the spindles in machines such as referred to so as to revolve in fixed bearings, and, as is well known, the draft or strain upon the spindles or their bobbins by the yarn or thread, which tends to draw such spindles out of the line of their axes of rotation, results in increased frictional resistance, which has to be overcome by a corresponding increase of the driving power, with the further disadvantage of the more rapid wear of the bearing-surfaces and the liability of the yarn or thread to break.

This invention has for its object the provision of means whereby these difficulties are effectually overcome by providing a bearing for the spindle in which the latter has universal motion, or substantially so, and by driving the spindles in such a manner that the power applied will constantly tend to maintain said spindle in a normal plane perpendicular to the plane of application of the power. It is obvious that a spindle mounted as described and driven to revolve about a vertical axis would require but a single bearing so long as said spindle remained unaffected by extraneous or secondary forces.

Inasmuch as in machines such as referred to the spindles are acted upon by forces other than the driving power—namely, by the yarn or thread being wound thereon—and which acts upon the spindles in planes perpendicu-

lar or angular to their planes of rotation their tendency is to tilt, and consequently bind in their bearings.

It is furthermore obvious that were it possible to return the spindle into its normal position whenever moved out of it by draft or strain thereon by the driving power so applied to the spindle as to tend to maintain it in its said normal position above stated a second spindle-bearing would likewise become unnecessary, while the spindle would be free to yield to draft or strain, or, in other words, move in the direction of such draft or strain without thereby producing increased frictional resistance due to the relative displacement of the bearing-surfaces. I have found, however, that the driving power when applied to the spindle so as to maintain it in a normal position is not sufficient to counteract the draft or strain exerted on the spindle by the yarn or thread. In order that such spindle may be free to move in the direction of draft or strain thereon and for the purpose of moving said spindle back to a normal position when moved out of it, I provide a second elastic or resilient bearing, so that the draft or strain will be antagonized by a yielding power sufficiently great to move the spindle back into a normal position whenever moved out of it by such draft or strain.

From what has been said it will be readily understood that the invention can be practically carried out in various ways without departing from its nature or character, the essential features of which consist in a universal bearing for the spindle combined with an auxiliary elastic, springy, or resilient bearing. The universal bearing consists of a socket or auxiliary bearing C, in which the spindle B is stepped and in which it is free to revolve, said socket being provided with a ball-shaped enlargement that is fitted in the main step S, and a flange *f*, that rests upon the main step S, by means of which the socket C and the spindle are supported.

The driver D for the spindle B is secured thereto, so that power will be applied in a plane passing horizontally through the center of the ball or enlargement on the socket C, so that the latter can not only revolve in a vertical plane, but also in a plane at an angle thereto under draft or strain exerted thereon

by the thread or yarn, in which latter case the socket C will have a slight vertical movement within the step S due to the bearing of the flange *f* on the top of the step, which flange
5 then has a slight sliding movement in the direction of pull. The power applied to the spindle to revolve it has a constant tendency to maintain said spindle in a plane normal to that in which the power is applied.
10 For the purpose of moving the spindle B back to a normal vertical position a second bearing A² is provided, which has bearing or is supported in the upper end of a coil-spring *a*², surrounding the spindle and secured to
15 the spindle-rail R.
The essential advantage derived from my invention lies in the great economy of power for driving the spindles as compared with the power required to drive spindles that revolve
20 in fixed bearings.
A further advantage is derived from the fact that the portions of thread between the point of delivery and the point at which it winds on the spindle or its bobbin remain
25 yielding at all times, since the spindle is free to move out of its normal plane of rotation, so that the winding is effected elastically and the breaking of the thread or yarn avoided

whenever brought under sufficient tension from any cause. 30

My invention is applicable to all systems of spinning-machines, whether ring or fly or other systems, and of course also to doubling, twisting, and winding machines.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is— 35

The combination with a spindle, a step-bearing therefor and a fixed socket in which said step-bearing is suspended and adapted 40 to rock on a pivot, and the whirl secured to the spindle so that the power will be applied in a plane passing through the pivotal axis of the step-bearing; of a coiled spring having free motion in any direction, a seat for said 45 spring above the whirl and a bearing for the spindle supported in the free end of said spring, for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses. 50

CARL BERGMANN.

Witnesses:

HERNANDO DE SOTO,
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