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PATENTED JAN. 12, 1904.

C. T. & A. T. ATHERTON.
SPINNING AND TWISTING MACHINE.

APPLICATION FILED MAR. 26, 1903.

NO MODEL

Fig. 1.

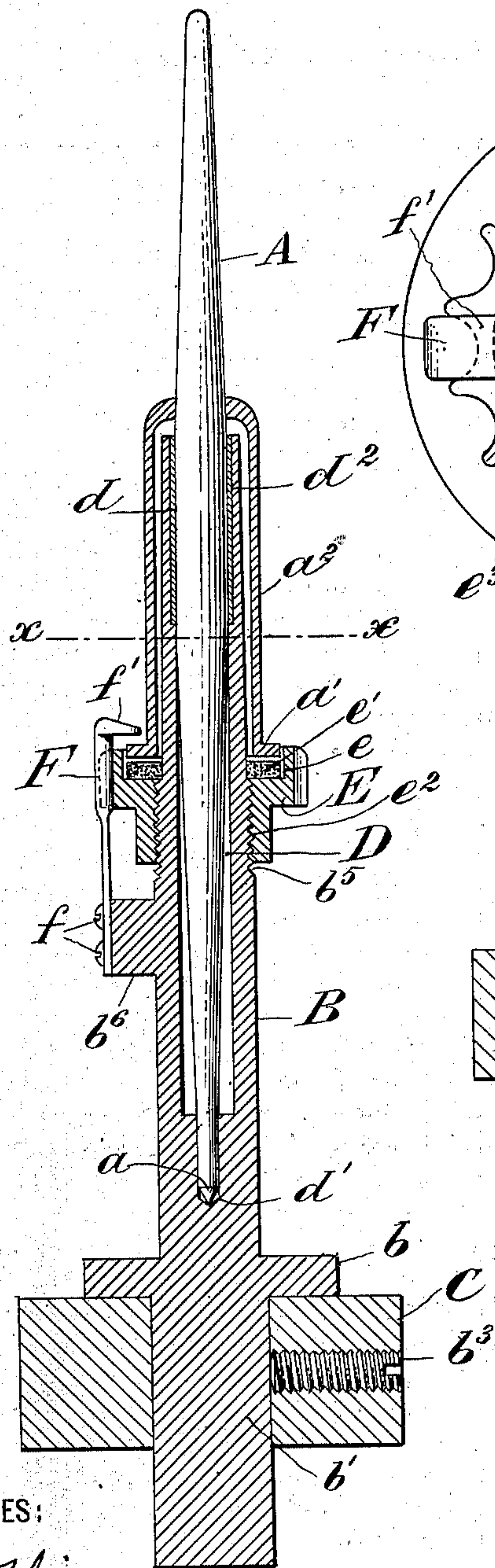


Fig. 2.

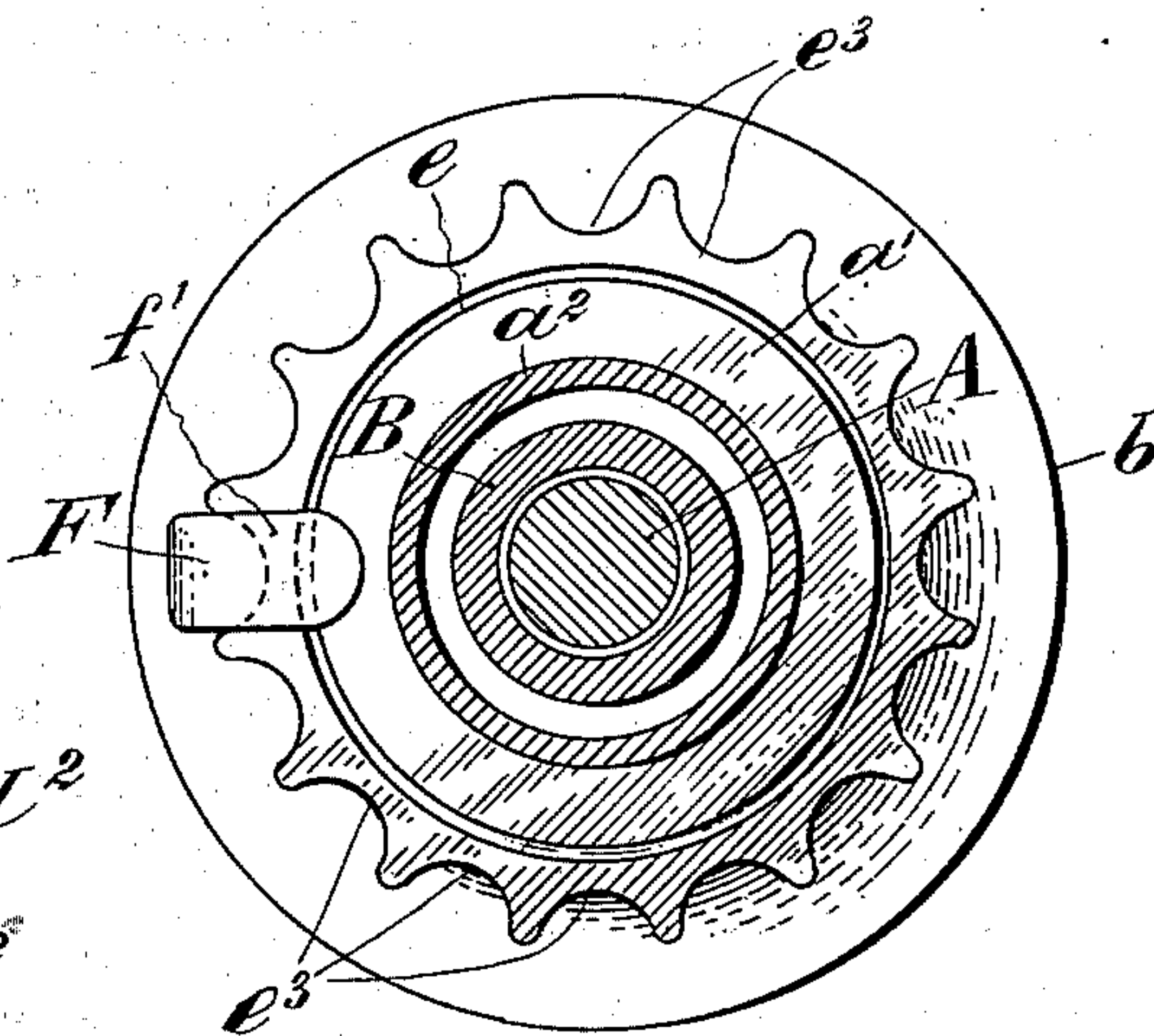
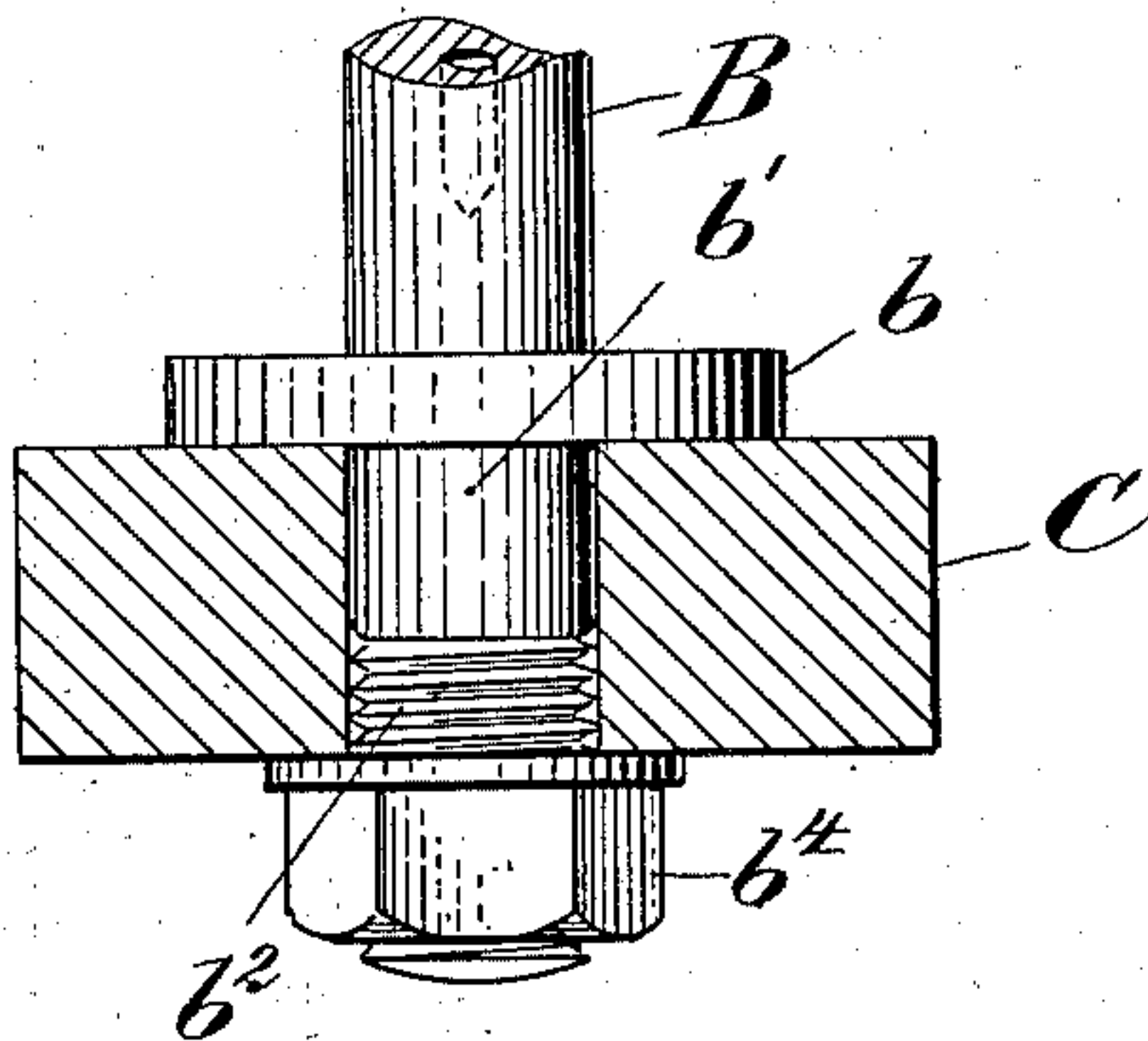


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES T. ATHERTON, OF PAWTUCKET, AND ABEL T. ATHERTON, OF
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SPINNING AND TWISTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 749,470, dated January 12, 1904.

Application filed March 26, 1903. Serial No. 149,675. (No model.)

To all whom it may concern:

Be it known that we, CHARLES T. ATHERTON, of Pawtucket, in the county of Providence, and ABEL T. ATHERTON, of Warwick, in the county of Kent, State of Rhode Island, have invented certain new and useful Improvements in Spinning and Twisting Machines, of which the following is a specification.

Our invention relates to those forms of spinning and twisting machines in which the spindles are rotated by the strain of the yarn or thread upon them and are usually known to the art as "dead-spindles," its object being to provide not only a spindle of this class which is simple in construction and capable of a free and easy rotation with the minimum of resistance, but also means whereby it may be mounted upon the appropriate part of the machine and the amount of this resistance varied and controlled to suit the spindle to the varying conditions under which it may be employed.

To these ends the invention consists, first, in the peculiarities of construction of the spindle itself; second, in the means whereby the resistance offered by the spindle to rotation may be varied and controlled, and, third, in various combinations and arrangements of these devices, all as will hereinafter more fully appear.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a vertical axial sectional elevation of the spindle and its support, showing also the rail upon which they are supported in transverse section; Fig. 2, an enlarged horizontal section of the spindle, taken in the plane $x x$ of Fig. 1 and showing parts below; and Fig. 3, a side elevation of the lower portion of a holder or support of a slightly-modified construction and a vertical transverse section of the rail to which it is secured.

In all figures like letters of reference indicate corresponding parts.

A indicates a spindle, which is or may be constructed in any ordinary or preferred form. As shown in the drawings, however, it is constructed of approximately cylindrical

form near the middle portion of its length and gradually tapers from this cylindrical portion to its top and bottom ends, with the lower extremity of the latter properly fashioned to form a step a . As thus constructed the spindle is mounted upon the spindle rail or rails through the intermediary of a holder or support B. This support may be constructed in various forms and may be employed in connection with either a single rail or a plurality of rails, as may be desired. In the form of the invention which we have selected for purposes of illustration, however, it is shown applied in connection with a single rail C and is preferably, though not necessarily, constructed of approximately cylindrical form, with its lower end provided with means whereby it may be secured to the spindle-rail and its upper portion equipped with a cylindrical recess or socket D, extending downwardly into the same axially thereof. In the upper portion of the recess as thus disposed is located the bolster or lateral bearing d for the spindle, which is preferably made cylindrical to conform to the cylindrical portion of the spindle at this location, while in the lower end of the recess is formed a step-bearing d' , which receives the step a and supports the spindle A against the action of gravity.

In some instances the bolster-bearing d will be formed by the interior surface of the recess D, which will be properly fashioned to receive and afford lateral support to the spindle. We prefer, however, to employ a bushing d^2 for that purpose, which may be made of brass or some antifriction material, in which cases the upper end of the support B will be counter-bored and the bushing d^2 arranged therein, as shown.

For securing the spindle in the spindle-rail the support B may be provided a short distance above its lower end with an outwardly-extending flange b , which rests upon the upper surface of the rail, and the portion b' below may be constructed of a size to fit an appropriate hole in that rail and be either cylindrical throughout, as shown in Fig. 1, or have

its lower extremity reduced in diameter and provided with a screw-thread b^2 , as shown in Fig. 3. When the first of these forms of construction is employed, the holder or support
 5 will preferably be secured by a set-screw b^3 in an appropriate hole formed through the rail. On the other hand, when the other of these constructions is employed the holder after the portion b' has been passed down-
 10 ward through the hole in the rail may be secured in place by a suitable nut b^4 .

With the holder or support constructed as above described it receives the spindle A, which is free to rotate therein, and in order
 15 to provide for increasing or decreasing the resistance offered by the spindle to rotation to thereby adapt it to the different requirements of its use and control the same we provide the spindle A with an outwardly-extending friction-flange a' and employ in connection with it appropriate friction means and
 20 devices whereby they may be brought into contact with such flange with more or less pressure or carried out of contact therewith, as may be desired. In some instances this flange
 25 a' may be secured directly to the spindle. We prefer, however, to secure it to the lower end of a sleeve a^2 , which, secured at its upper end to the spindle, extends down over the upper
 30 portion of the holder or support B, and to employ in connection with this flange the controller E, which, surrounding the spindle A and provided with a chamber e in its upper end for reception of a sheet or sheets of felt e' or
 35 other appropriate friction material, is threaded upon the exterior of the holder or support by cooperating screw-threads e^2 and b^5 , as shown. As thus arranged the degree of resistance offered to the rotation of the spindle may be varied and controlled by rotating the controller
 40 E in one or the other direction, the result of which will be to carry the felt or other friction material e' into contact with the under surface of the flange a' on the spindle A with greater
 45 or lesser pressure or away from the same, as may be required, and in order to lock the controller in any of the positions into which it may be thus adjusted we preferably provide its upper portion with appropriate flutes e^3
 50 and employ in connection with them a spring-detent F, which, secured by screws f' or otherwise to a lug b^6 , formed on or secured to the support B, engages with one or the other of the flutes as it is brought opposite to it, and
 55 thereby firmly locks the controller in the position to which it may have been adjusted. In addition to thus serving as a lock for the controller E this spring-detent F may also serve as a means for preventing the removal
 60 of the spindle A from the holder or support B when the bobbin or yarn load is removed therefrom either to piece up or mend a broken thread or yarn or during the doffing operation; but this is merely illustrative, and other
 65 forms of device may be employed for the pur-

pose—as, for instance, the usual hook. When, however, the detent is made use of for the accomplishment of this result, we preferably overturn its upper end f' , whereby to extend
 70 it inward over the friction-flange a' , and thereby cause it to serve as a stop against which the flange abuts when the spindle is raised above certain limits.

The spindle and its supporting devices being constructed and arranged as above described may be employed to support bobbins or other yarn-carriers from which the yarn or thread is to be unwound in reeling, spooling, or throwing machines, as they may also
 75 be used to receive the yarn or thread delivered to the spindle or to a bobbin or other thread or yarn carrier carried by it from a flyer or other thread or yarn spinning or twisting device of a spinning or twisting machine; but
 80 as these are merely suggestions of purposes and uses to which the spindle and its supporting devices may be supplied and form no part of our invention their arrangement in these machines has not been shown in the drawings, and further description of them herein is not
 85 considered necessary.

From the foregoing, therefore, it will be seen that we produce a spindle and a support therefor which while simple in construction and capable of application to various forms of
 90 machine permits of the disinclination of the spindle to rotation being varied and controlled to suit it to yarns and threads of different sizes and strengths and the other requirements incidental to the use of spindles of this general class.

Although in the above we have described the best means contemplated by us for carrying our invention into practice, we wish it distinctly understood that we do not limit our-
 95 selves strictly thereto, as it is obvious that we may modify the same in various ways without departing from the spirit of the invention.

Having now described the invention and specified certain of the ways in which it is or
 100 may be carried into effect, we claim and desire to secure by Letters Patent of the United States—

1. A spindle provided with a friction-surface and a sleeve by which this surface is supported from the spindle, substantially as described.

2. The combination, with a spindle provided with a friction-surface, and a holder or support, of a cooperating friction-surface, and means whereby this last-mentioned friction-surface may be moved toward and away from the first-mentioned friction-surface, substantially as described.

3. The combination, with a spindle provided with a friction-flange, and a sleeve by which this flange is supported from the spindle, of a holder or support in which the spindle is mounted, a friction-surface, and a controller by which the friction-surface carried by the
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holder or support may be adjusted toward and away from the friction-flange on the spindle, substantially as described.

4. The combination, with a spindle provided with a friction-flange supported from the spindle, and a holder or support in which the spindle is mounted, of a controller carrying a friction-surface for cooperating with the friction-flange on the spindle, threaded upon the holder or support, whereby the friction-surface may be adjusted toward and away from the friction-flange to vary the resistance offered by the spindle to rotation, substantially as described.

5. The combination, with a spindle provided with a friction-flange, a holder or support in which the spindle is rotatively mounted, a friction-surface, a controller by which this friction-surface is carried, threaded upon the exterior of the holder or support and provided with a fluted head, of a spring-detent having an overturned upper end, for engaging with the flutes in the head of the controller and with the friction-flange on the spindle, whereby to lock the controller in adjusted position and prevent the removal of the spindle when the yarn or thread is withdrawn therefrom, substantially as described.

tion-surface is carried, threaded upon the exterior of the holder or support and provided with a fluted head, of a spring-detent having an overturned upper end, for engaging with the flutes in the head of the controller and with the friction-flange on the spindle, whereby to lock the controller in adjusted position and prevent the removal of the spindle when the yarn or thread is withdrawn therefrom, substantially as described.

In testimony whereof we have hereunto set our respective hands this 18th day of March, 1903.

CHARLES T. ATHERTON.

ABEL T. ATHERTON.

Witnesses:

CHARLES M. READ,

FREDERICH D. CHESBROUGH.