(No Model.) 2 Sheets—Sheet 1.

F. ASHTON.

APPARATUS FOR GRINDING ENDS OF SPINDLES.

No. 566,122. Patented Aug. 18, 1896.

FIG. 1.

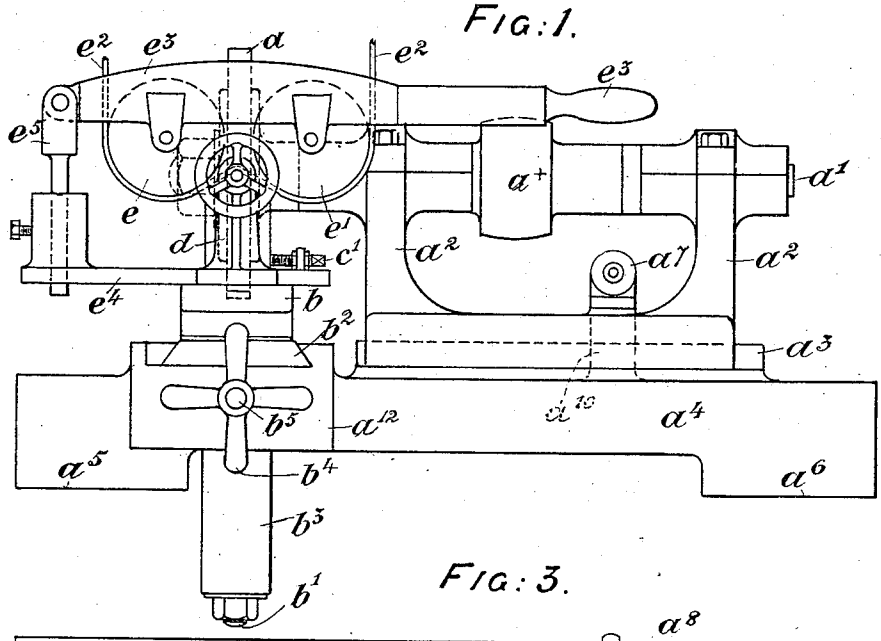
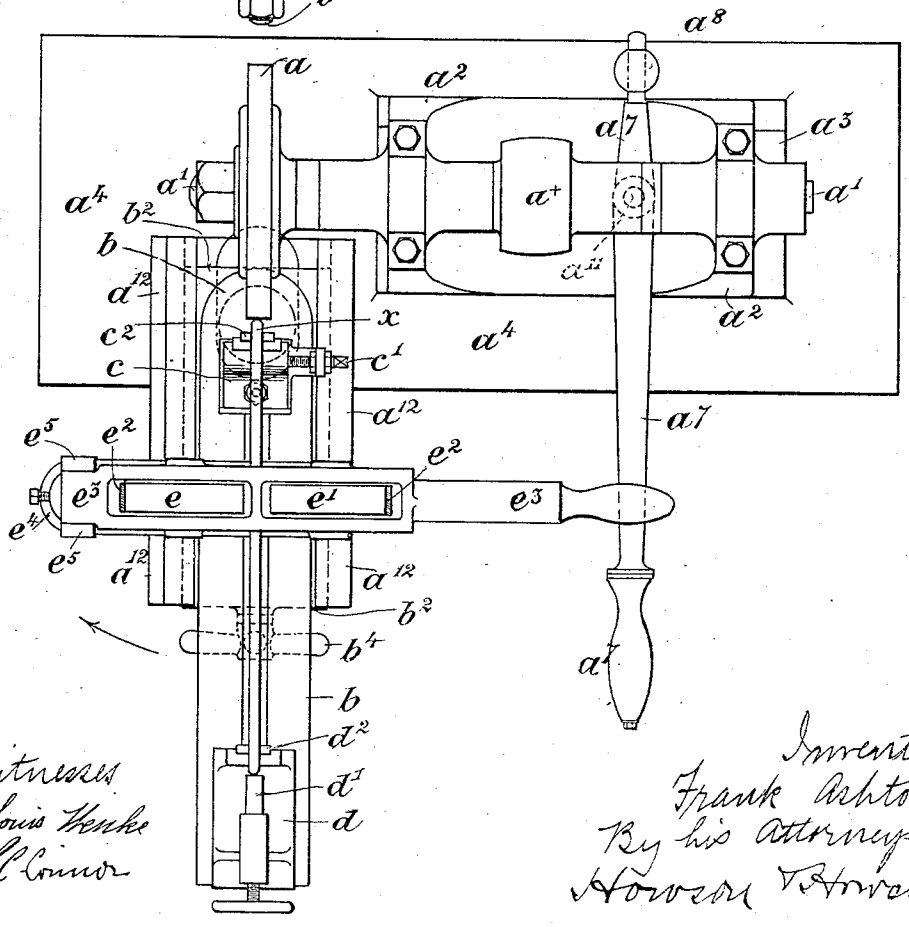


FIG. 3.



Witnesses
Louis Henke
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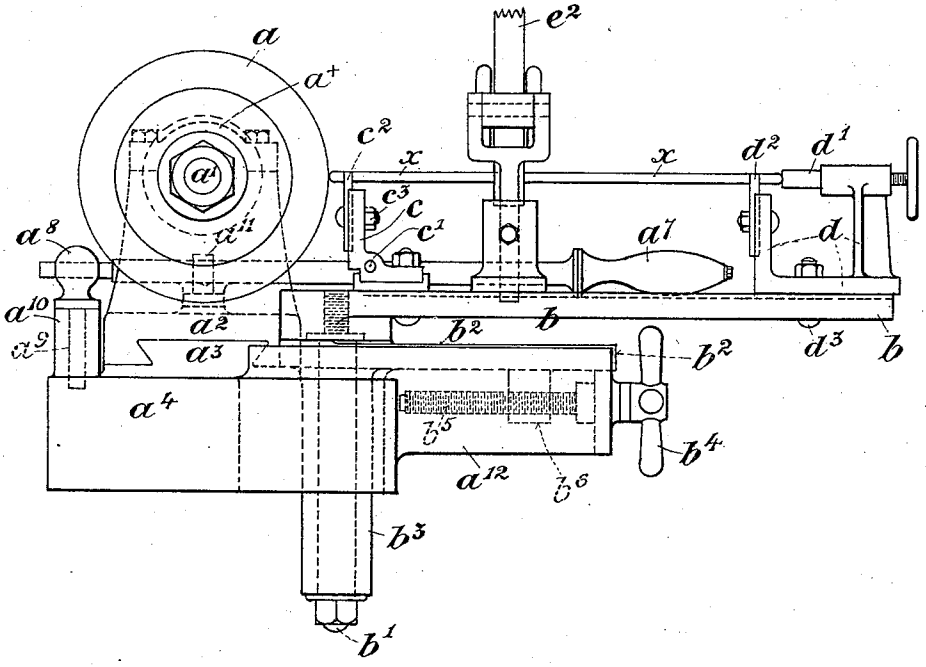
(No Model.) 2 Sheets—Sheet 2.

F. ASHTON.

APPARATUS FOR GRINDING ENDS OF SPINDLES.

No. 566,122. Patented Aug. 18, 1896.

FIG. 2.



Witnesses
Louis Wenke
S. C. Connor

Inventor
Frank Ashton
By his attorneys
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UNITED STATES PATENT OFFICE.

FRANK ASHTON, OF OLDHAM, ENGLAND, ASSIGNOR OF ONE-HALF TO WILLIAM BODDEN, OF SAME PLACE.

APPARATUS FOR GRINDING ENDS OF SPINDLES.

SPECIFICATION forming part of Letters Patent No. 566,122, dated August 18, 1896.

Application filed March 2, 1896. Serial No. 581,545. (No model.)

To all whom it may concern:

Be it known that I, FRANK ASHTON, a subject of the Queen of Great Britain, residing at Hargreaves Spindle Works, Oldham, in the county of Lancaster, England, have invented new and useful Improved Apparatus for Grinding the Ends of Spindles, of which the following is a specification.

This invention relates to apparatus to be employed for grinding and rounding the end or ends of any kind of spindles as used in the spinning and preparing machinery for cotton, woolen, flax, or other fibrous materials, and is especially applicable to mule, ring, throstle-flier, and roving spindles. It is, however, applicable to grinding any spindle rod or shaft which requires the end to be hemispherical or partially hemispherical in shape.

In order that this invention may be understood, I refer to the accompanying drawings.

Figure 1 is a front elevation. Fig. 2 is an end elevation looking at the left-hand end of Fig. 1, and Fig. 3 is a plan view of the apparatus or machine.

The same letter is attached to corresponding parts in all three views shown.

According to this invention I use a grinding-wheel a of suitable diameter and width mounted upon a horizontal revolving shaft a', driven by the pulley $a^{\times}$ and mounted upon a stand or head-stock a^2, capable of a movement sidewise, that is endwise with regard to the said shaft a'. This stand or head-stock a^2 can slide upon an ordinary V-slide a^3 upon a bed a^4, which can be placed upon a bench or mounted upon suitable legs and fastened at a^5 a^6. The sliding of the said head-stock a^2 is or may be performed by a lever a^7, having its fulcrum at a^8. I prefer to form the part a^8, through which the end of the lever a^7 is passed, with a shank a^9, capable of turning in a bearing a^{10}, which is a fixture on the bed a^4.

The lever a^7 is centered on a stud a^{11}, fixed to the head-stock a^2, so that by moving the lever to the left or right the head-stock a^2 and also the grinding-wheel a are moved therewith. Upon a projecting part a^{12} in front of this wheel a I mount a table b on a vertical pivot b', the table b and pivot b' being adjustable nearer to or farther from the edge of the grinding-wheel a. The said table b is also capable of turning or revolving partially round the center of the pivot b'.

The part a^{12} of the bed a^4 is formed with a V-slide, in which a carriage b^2 fits and is capable of sliding. On the bottom of this carriage is a long boss b^3, through which fits the long stud or pivot b', the upper end of which is fixed into the table b, which is thus free to revolve through a portion of a circle around the center of the stud b'.

The carriage b^2 is or may be adjusted to increase or diminish the distance of the center of rotation b' of the table b from the grinding-wheel a by turning the small handle b^4, fastened to the screw b^5, which passes through a nut b^6, fixed to or forming part of the carriage b^2. Upon this table and not far from the center of the pivot is fixed an adjustable bracket c or carrier to support the spindle x or other article near the end to be operated upon, the other end being supported by a suitable adjustable center d d' d^2, hereinafter described, also fastened onto the table b.

The bracket c is adjustable sidewise (that is in a direction across the table) by means of the screw c', and it carries a vertically-adjustable plate c^2 with a V or notch in its upper end for the spindle or rod x to revolve in, its adjustment being performed, according to the diameter of the said spindle or rod x, by the nut and bolt c^3.

A pair of carrier-drums e e', driven by a single band, strap, or belt e^2 from a shaft overhead, are carried by a hand-lever or bracket e^3, which is hinged to an adjustable bracket e^4 on the table b, so that the said drums e e' can be brought down over the spindle or rod x, and thus by the friction of the belt e^2 make the spindle or rod x to revolve on its own axis. The hand-lever e^3 can then be raised, carrying the drums e e' and strap or belt e^2 with it, and the spindle or rod x may be removed. I prefer to hinge the hand-lever e^3 to the forked rod e^5, adjustable vertically in the adjustable bracket e^4.

The aforesaid adjustable center supporting the spindle or rod x and carried by the swinging or revolving table b is adjusted as follows, so as to make the right length of the spindle x, the spindle being in such a state

that a small quantity has to be ground from the end:

The bracket d carries a foot-bearing and length-gage d', capable of adjustment nearer to or farther from the grinding-wheel a, and also a vertically-adjustable plate d^2, similar to the plate c^2. The bracket d is also adjustable in a slot running almost the whole length of the table b by means of the bolt d^3. The parts d, d', and d^2 thus form an adjustable center.

The method of using the apparatus or machine is as follows: The table b is brought into the position as shown in Fig. 3, the grinding-wheel a is moved to the right by means of the lever a^7, so that the said grinding-wheel will be clear of the end of the spindle or rod; the grinding-wheel a and the endless belt e^2 are set in motion, the handle e^3 is lifted up and with it the pulleys e e'. A spindle or rod x is then placed in the V-supports c^2 and d^2, as shown in the drawings, and the belt e^2 brought down on top of it; the lever a^7 is moved to the left, causing the grinding-wheel a to pass across the point of the spindle or rod x, grinding a flat part on the end thereof; the lever a^7 is brought back, so that the end of the spindle x is in contact or opposite to the face of the grinding-wheel a. The table b is then moved to the left upon its pivot, as shown by the arrow, Fig. 3, carrying the revolving spindle or rod x with it, so that the end in contact with the grinding-wheel is rounded off. The table b is then brought back to its original positon and the lever a^7 moved to the right. The lever e^3 is then lifted up and the spindle x removed. It is unnecessary to stop the grinding-wheel a or the driving-belt e^3 for insertion or removal of the spindles or rods.

By this means a spindle rod or shaft may have formed on its end a hemisphere or a portion of a hemisphere, the radius of the round part formed in the end of the spindle being the distance from the face of the grinding-wheel a to the center line produced vertically of the stud b', measured in a horizontal direction.

I claim as my invention—

1. The combination with a grinding-wheel and means for rotating the same, of a table capable of being rotated for part of a revolution upon a vertical axis, the said table carrying supports for a spindle or rod and means for rotating the said spindle or rod, the vertical axis of rotation of the said table being in such a position with regard to the said grinding-wheel that the revolution of the latter and of the spindle or rod and the partial (say one-quarter) revolution of the table shall cause the end of the spindle or rod to be ground to the form of a true part (say half) of a sphere.

2. The combination with a revolving grinding-wheel and means for rotating the same, of a table capable of being rotated for part of a revolution upon an adjustable vertical axis, the said table carrying supports for the spindle or rod to be ground and means for rotating the said spindle or rod substantially as hereinbefore set forth.

3. The combination with a sliding stand carrying a revolving grinding-wheel and means for rotating the same, of a table capable of being rotated for part of a revolution upon an adjustable vertical axis, the said table carrying adjustable supports for the spindle or rod to be ground and means for rotating the said spindle, and the said stand being provided with means for moving the grinding-wheel in or out of place in front of the end of the spindle or rod, substantially as hereinbefore set forth.

4. The combination with a sliding stand carrying a revolving grinding-wheel and means for rotating the same, of means for sliding the said stand in front of a table capable of being rotated for part of a revolution upon an adjustable vertical axis, the said table carrying adjustable supports for the spindle or rod to be ground and an adjustable bracket carrying a lever upon which are mounted drums around which a single strap is passed driving the said spindle or rod to be ground substantially as hereinbefore set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK ASHTON.

Witnesses:
GEORGE DAVIES,
CHARLES A. DAVIES.