

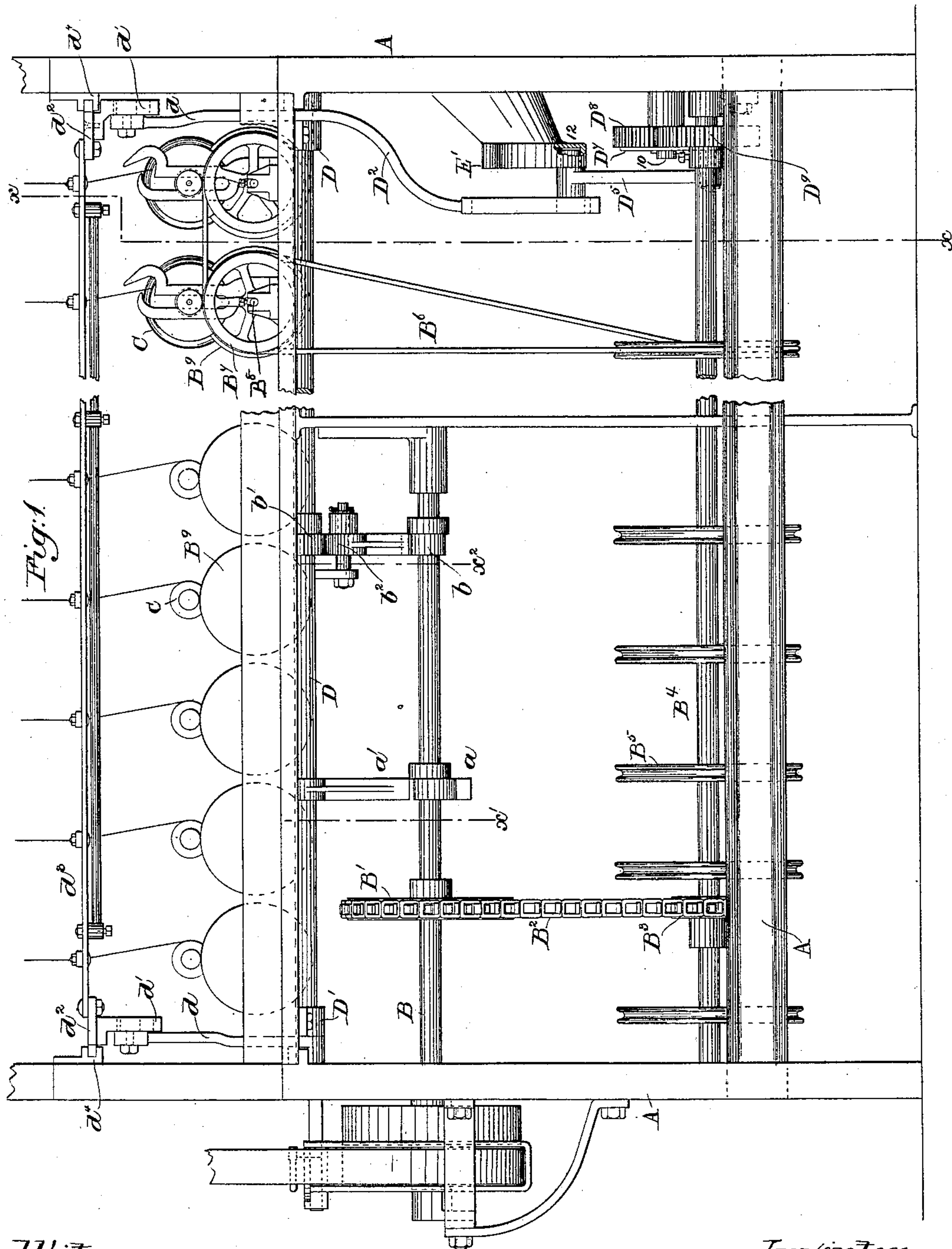
(No Model.)

2 Sheets—Sheet 1.

J. W. FOSTER.
YARN WINDING MACHINE.

No. 435,560.

Patented Sept. 2, 1890.



Witnesses:

Edgar A. Goddard
Frederick L. Emery

Inventor:

John W. Foster,
by Crosby & Morgan
Attys.

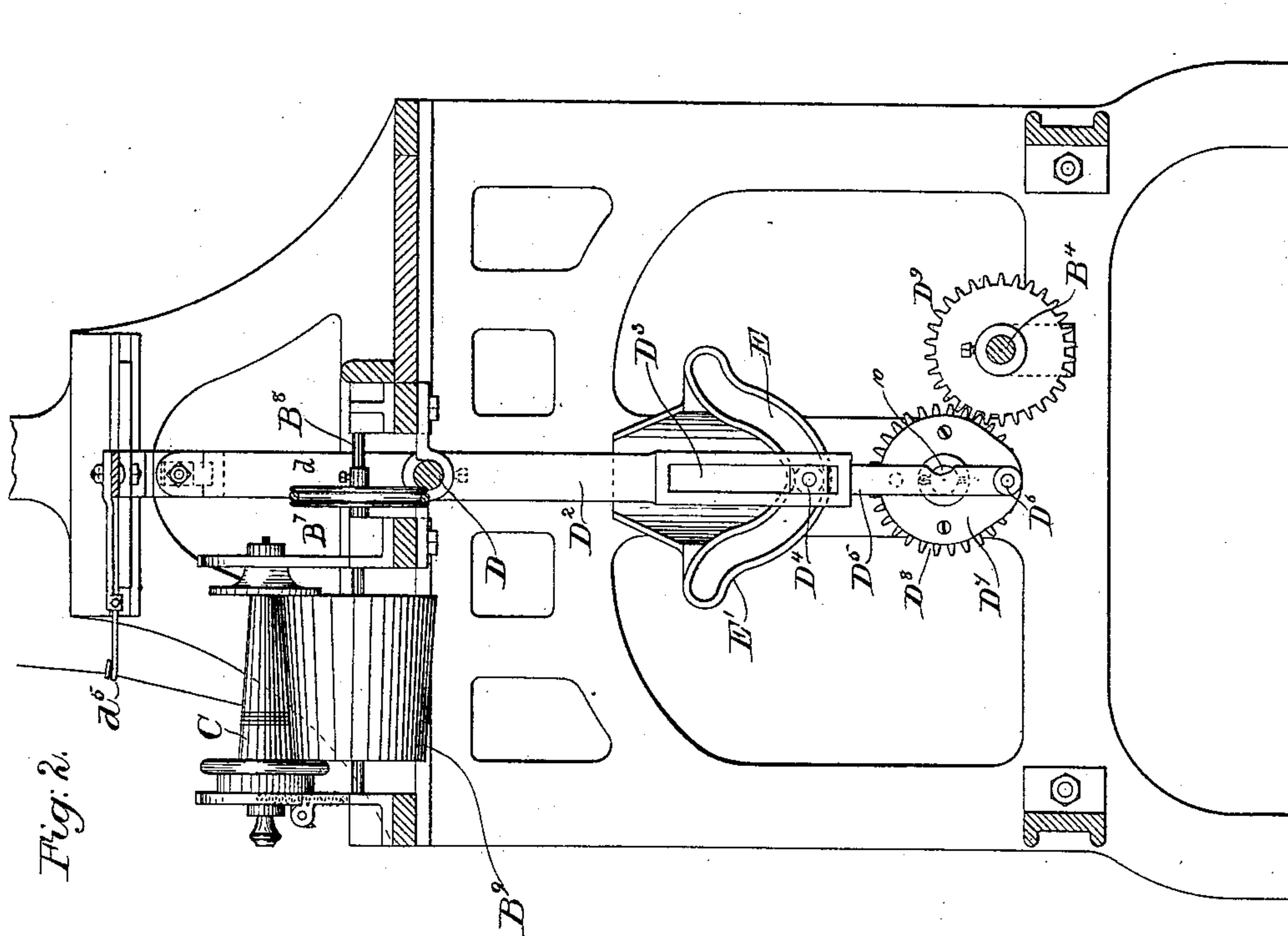
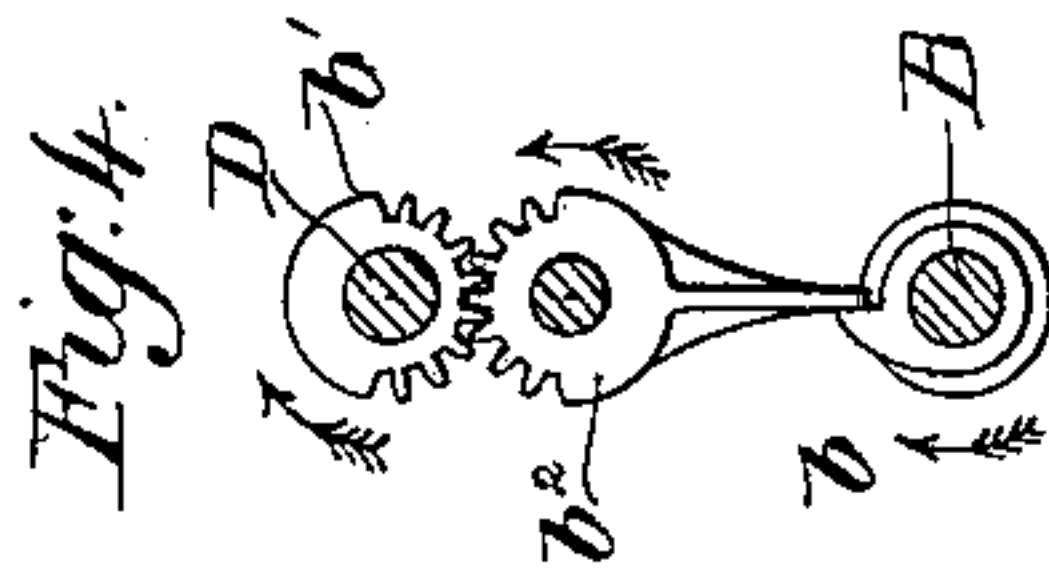
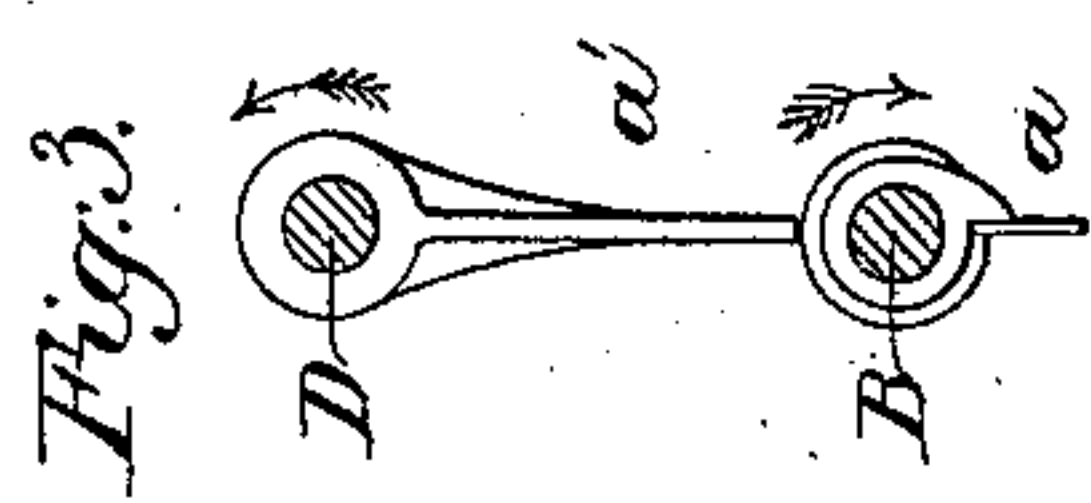
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UNITED STATES PATENT OFFICE.

JOHN W. FOSTER, OF FALL RIVER, MASSACHUSETTS.

YARN-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,560, dated September 2, 1890.

Application filed October 22, 1889. Serial No. 327,782. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. FOSTER, of Fall River, county of Bristol, State of Massachusetts, have invented an Improvement in Yarn-Winding Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction of machines for winding yarn onto bobbins, spools, &c.

One part of my invention consists, essentially, in novel means for actuating the traverse motion.

Figure 1 represents in side elevation a sufficient portion of a winding-machine to enable my invention to be understood, part of the machine being broken away to save space on the drawings. Fig. 2 is a section in the line x , Fig. 1; and Figs. 3 and 4 are sections in the lines x' and x'' , Fig. 1.

The frame A, of any usual shape to sustain the working parts, has bearings for the main shaft B, driven by power in any usual way, and has, as shown, a sprocket-wheel B', which by chain B², extended over a wheel B³, rotates the shaft B⁴, provided with the belt-pulleys B⁵, which receive the bands B⁶, extended over the pulleys B⁷, fast on the shaft B⁸ of the drums B⁹, on which rest the bobbins or spools to be wound. These parts are and may be all as usual.

The parts for holding and rotating the bobbin C are and may be all as in United States Patent No. 404,831, granted to me June 11, 1889, for rotating the spools, with the exception that the surface of the drum herein shown is conical to accord with the surface of the barrel of the bobbin.

The main shaft B has two projections a b , (see Figs. 3 and 4,) made as collars, the said projections being diametrically opposite each other, or at opposite sides of the center of the said shaft.

The rock-shaft D, supported in suitable bearings D', has an arm D², slotted at D³, the said slot receiving in it a roller-stud D⁴ at the upper end of a link D⁵, which at its lower end embraces a crank-pin D⁶, connected to a plate D⁷, connected to or made to form part of a

gear D⁸, mounted on a stud 10. (Shown by dotted lines in Fig. 2.)

The gear D⁸ is engaged and rotated by a gear D⁹, fast on the pulley-shaft B⁴, and as the gear D⁸ is rotated a roller or other stud 12 at the upper end of the link (see Fig. 1) in the heart-cam groove E of the cam-plate E' is made to travel in the said groove from one to the other end, so that the roller or other stud D⁴ in the slot of the arm D² causes the rock-shaft D to be turned.

The rock-shaft D has upwardly-extended arms d , provided each with a suitable stud or projection to enter or engage ears, as d' , of carriages d^2 , to which are joined the opposite ends of a bar d^3 , having a series of guide-eyes d^5 .

The carriages, bar, and guide-eyes constitute the traverse-bar, and as the said bar is reciprocated in the guideways d^4 , attached to the frame ends, the guide-eye containing the thread is made to travel from one to the other end of the bobbin as the roller B⁹ is rotated.

The shape of the cam-groove E is such that the traverse-bar has a rather quick motion, so as to wind the thread in a rather long spiral.

To carry the stud 12 from one side of the point of the heart-cam groove well over to the other side of the point from the position shown in Fig. 2, I have provided the rock-shaft D with an arm a' and with a segment-gear b' , which latter is engaged by a toothed sector b^2 , having an arm which is at times in the range of movement of the projection b .

In practice the shaft B⁴ is made to rotate twice while the driving-shaft B is rotated once, and the shaft B⁸, carrying the drum B⁹, is rotated twice while the shaft B⁴ is rotated once, and the traverse-bar reciprocated by the lever D², actuated by the shaft B⁴, is made to go back and forth for a sufficient distance to enable the yarn to be laid from one to the other end of the bobbin and back again while the drum B⁹, on which the bobbin rests, rotates four times.

The slowest motion of the traverse-bar is while the roller or other stud 12 is at the point of the heart-cam, as in Fig. 2, and at this position of the parts, as shown in Figs.

1 and 4, the projection b strikes the arm of the sector b^2 , and through the segment-gear b' turns the rock-shaft D for a slight distance, just sufficient to cause the arm D^2 , acting on the roller-stud D^4 , to move the upper end of the link D^5 laterally far enough to carry the stud 12 past the point of the heart-cam groove, the arm D^2 for an instant becoming the mover of the link D^5 ; but as soon as the stud 12 passes the point of the heart-cam groove the crank-pin D^6 in its further rotation moves the stud into the steeper part of the cam-groove and thereafter the stud D^4 acts as the motor for the rock-shaft D and turns it, while the stud 12, having been thrown across the point of the heart-cam groove, travels up to the left-hand end of the groove shown in Fig. 2 and back again to the point of the heart-cam groove, at which time the projection a , in the rotation of the shaft B, comes against the arm a' and turns the rock-shaft D in the opposite direction, or in the direction of the arrow thereon, which causes the arm D^2 to throw the upper end of the link D^5 to the right from the position Fig. 2, and across the point of the heart-cam.

In this my invention it will be seen that the irregular motion of the traverse-bar is controlled by a stationary cam rather than by a rotating cam, as heretofore common.

As a heart-cam is commonly employed to move the traverse-bar, I have selected the name of heart-cam groove to designate the groove E.

I do not desire to limit my invention to the exact mechanism shown for throwing the stud 12 past the point of the cam, as instead I may employ any other usual or equivalent devices capable of effecting such purpose.

The slowest speed of the traverse-bar due to the link and crank-pin is when the stud 12 is at the center of the heart-cam groove, the speed being faster as the said stud travels in the said groove at opposite sides of the said center; but it will be understood that the motion given to the stud as it arrives at the

center of the heart-cam groove is accelerated by the action of the projections a and b , as described.

I have shown but one set of drums, bobbins, and traverse wires; but the same may be duplicated at the opposite side of the machine, as in my patent No. 404,831.

I claim—

1. The traverse-bar, the rock-shaft having arms to move said traverse-bar, and an arm D^2 , and a cam-plate having a cam-groove combined with a link in engagement with both the said cam-plate and the said arm, and means for actuating the link, to operate substantially as described.

2. The traverse-bar, the rock-shaft having arms to move the traverse-bar and having an arm D^2 , the cam-plate having a groove, a rotating crank-pin, a link actuated thereby and engaging at its opposite end the said arm D^2 and the said cam-groove, combined with means to give to the said rock-shaft an independent and quicker movement as the upper end of the link, in its movements derived from the crank-pin, arrives at the central part of the said cam-groove, substantially as described.

3. The shaft B, having the projections a b , the shaft B^4 , gearing between the said shafts, the gears D^9 D^8 , the link D^5 , actuated from the said gears and having studs D^4 and 12, the cam-plate having the cam-groove, the traverse-bar, the rock-shaft D, having arms to move the traverse-bar and an arm D^2 , and having an arm a' and a segment-gear b' , combined with the sector b^2 , to operate substantially as described.

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

JOHN W. FOSTER.

Witnesses:

HENRY H. SHERMAN,
HENRY H. EARL.