(No Model.)

2 Sheets—Sheet 1.

J. T. MEATS.

RING SPINNING FRAME.

No. 400,934. Patented Apr. 9, 1889.

Fig. 1.

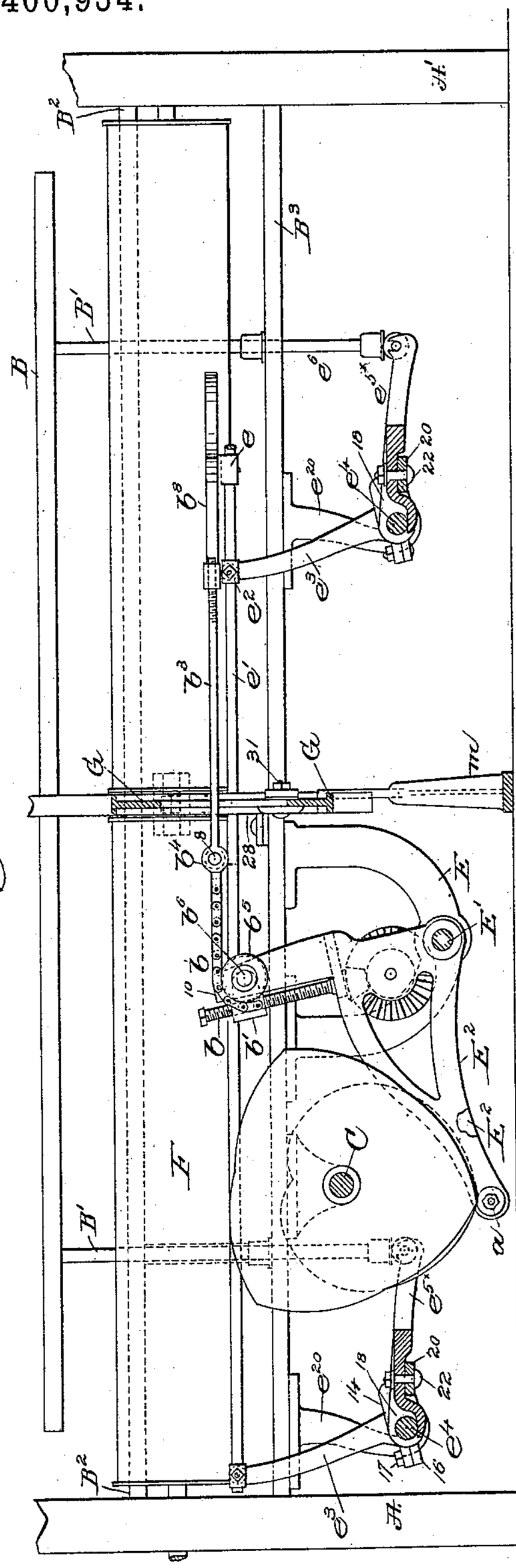
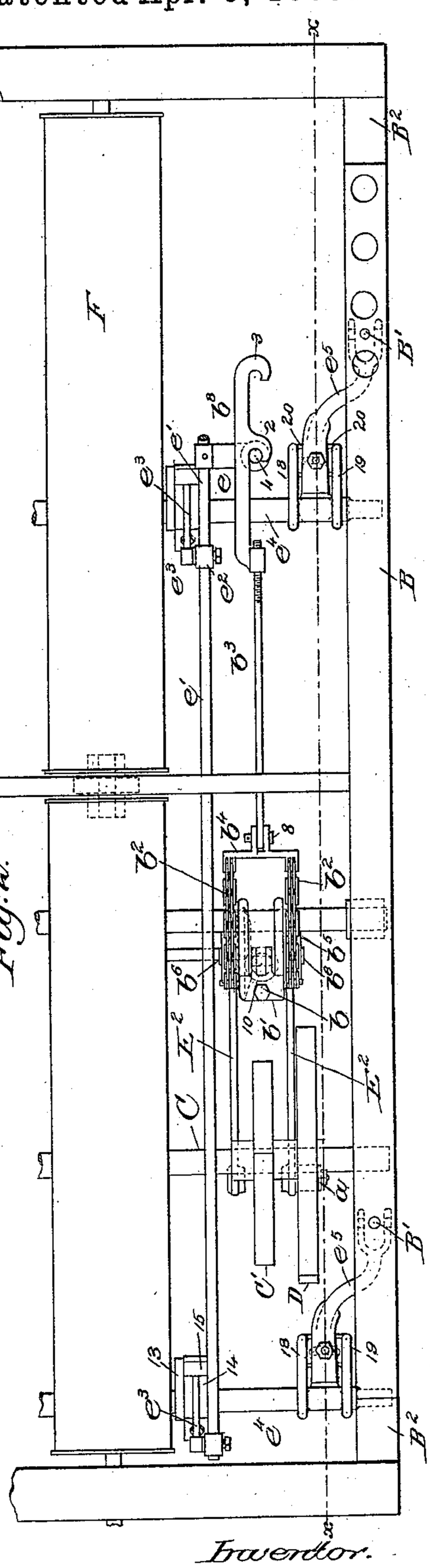


Fig. 2.



Witnesses.
Fred. L. Grumb of
Fred. L. Emery.

Inventor.
John T. Meats.
by Lemby & Gregory
Attys.

(No Model.) 2 Sheets—Sheet 2.

J. T. MEATS.

RING SPINNING FRAME.

No. 400,934. Patented Apr. 9, 1889.

Fig: 3.

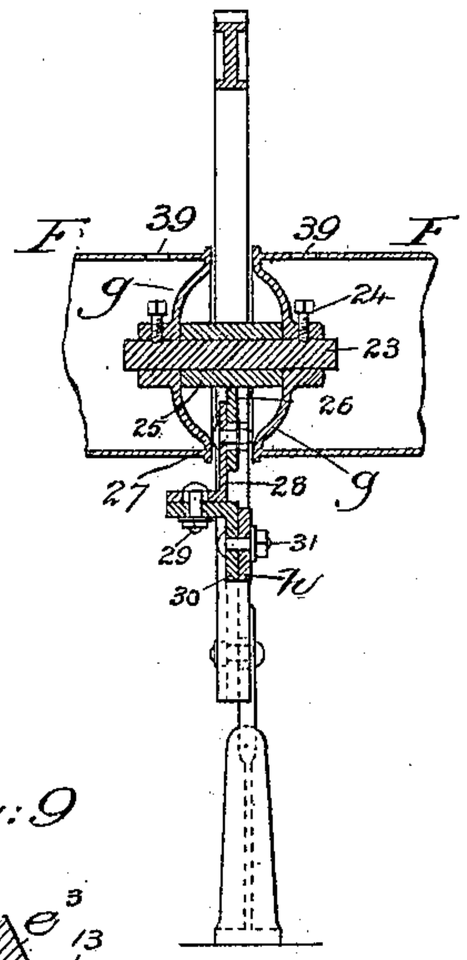


Fig: 4.

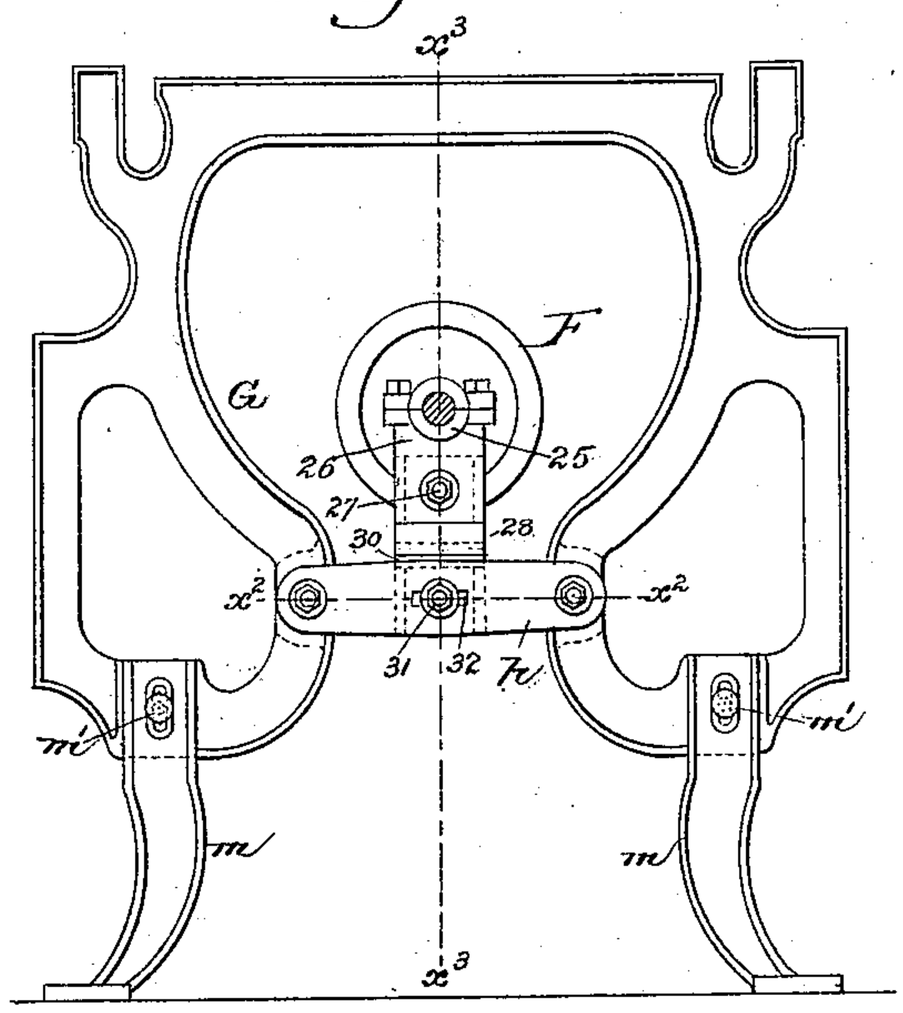


Fig: 9

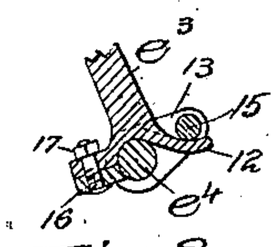


Fig: 8.

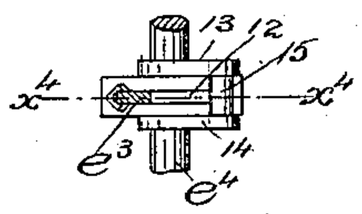


Fig: 5.

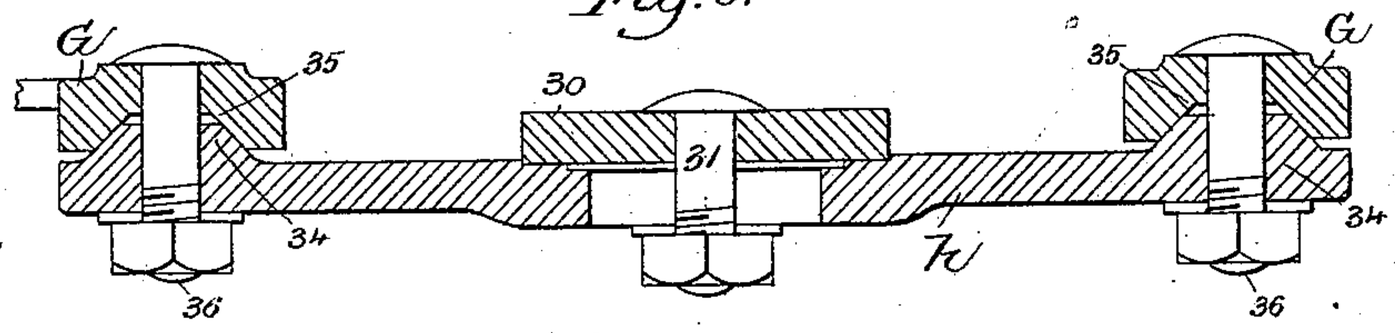
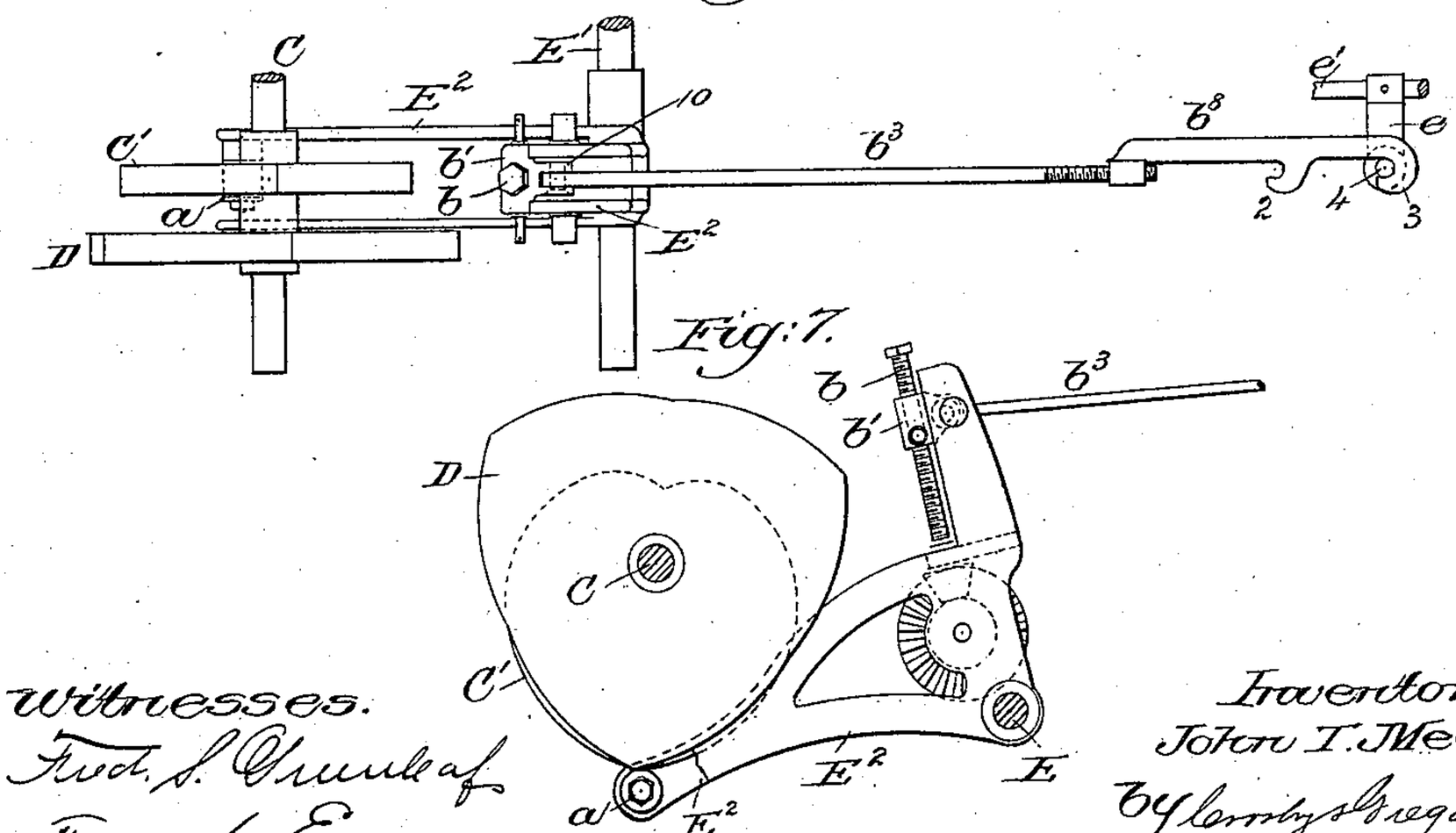


Fig: 6.



Witnesses.
Fred. L. Emery.

Inventor.
John T. Meats
by Merrill Gregory Attys.

UNITED STATES PATENT OFFICE.

JOHN T. MEATS, OF TAUNTON, MASSACHUSETTS.

RING-SPINNING FRAME.

SPECIFICATION forming part of Letters Patent No. 400,934, dated April 9, 1889.

Application filed December 3, 1887. Serial No. 256,891. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. MEATS, of Taunton, county of Bristol, and State of Massachusetts, have invented an Improvement in Ring-Spinning Frames, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

One feature of my invention relates to what is called the "winding motion," and another to a novel construction of the frame, whereby the spindle-driving drum may be readily adjusted or removed from the frame.

In modern ring-spinning machines the bobbins are wound in one of two ways—that is, with either the warp-wind or the filling-wind—each frame being adapted to wind bobbins with one or the other wind, but not both, so that in mills where the relative quantities of warp and weft yarns required vary it becomes a great desideratum to be able to change the frame to wind bobbins either with the warp-wind or the filling-wind. Under this head of my invention I have provided the frame with means whereby the operator may readily change from the warp-wind to the filling-wind, or vice versa. I have also improved the construction of the levers employed to reciprocate the ring-rail in such manner as to do away with the usual screws commonly employed by which to attach to the rock-shafts the arms which act upon the lower ends of the usual lifting-rods, thus making a more firm and durable construction and insuring greater uniformity of motion in the ring-rail. The warp-wind is that in which the ring-rail has its maximum movement at the beginning of the operation of the spinning and winding a set, the traverse being gradually shortened both at its upper and lower ends at each stroke of the winding mechanism until the mass of yarn upon the bobbin is of the proper diameter. The filling or weft is that in which the traverse of the ring-rail is uniform in extent; but in operation the ring-rail at each ascent rises a little higher than at the previous ascent and descends not quite so far as at the previous descent, all as is well understood.

My invention consists in a lifter or builder-rail and a quadrant-lever, and intermediate connections between it and the said rail for raising it and permitting it to descend, combined with two cams, either of which may be made to act at will upon the quadrant-lever to move the said rail for either the warp or weft wind, substantially as will be described.

Other features of my invention will be pointed out in the claims at the end of this specification.

Figure 1 is a longitudinal sectional elevation of a sufficient portion of a ring-spinning frame in the line *x*, Fig. 2, to enable my invention to be understood, parts which in practice will be as commonly employed in ring-spinning frames and not of my invention being omitted, the ring-rail, lifting-rods, guide-rails therefor, the arms $e^{5\times}$, and bearings e^{20} and E being supposed to be those at the opposite side of the frame, the arms e^{5} at the front side of the frame being in section. Fig. 2 is a top or plan view of a sufficient portion of but one side of a ring-spinning frame from the ring-rail down to enable my invention to be understood, only a portion of the rail being shown as having been bored for the rings. Fig. 3 is an enlarged detail, in section, showing a portion of the support for the meeting ends of the spindle-driving drums, and of a stand in the line x^3, Fig. 4; Fig. 4, a detail of one of the central stands of the frame and its feet, together with the bearing for the spindle-driving drum. Fig. 5 is a sectional detail on a larger scale, the section being in the line x^2, Fig. 4. Fig. 6 is a detail plan view of the bar and its connections and the cams for determining the movement of the ring-rail, the parts shown being arranged for the warp-wind; Fig. 7, a partial side elevation of Fig. 6; and Figs. 8 and 9 are details showing the manner of connecting the arm with the rock-shaft e^4.

In the drawings I have shown but one stand intermediate the gear-end and pulley-end of the frame; but it will be understood that there may be more than one such stand according to the length of the frame.

The gear end A and the pulley end A′ of the frame, the ring-rail B and its lifting-rods B′, and the guide-rails B^2 B^3 for the lifting-rods are and may be all as usual. Power is applied to the cam-shaft C of the builder motion to rotate the same in any usual manner.

This shaft has fast upon it the heart-cam C′, which effects the movement of the ring-rail, as will be described, when the bobbins are to be wound with the warp-wind, and it also has fast upon it the cam D, (herein shown as a three-pointed cam,) it effecting the movement of the said ring-rail to enable the usual bobbins to be wound after the manner of the weft-wind. Each rail B^3 has depending from it a bracket, as E, partially broken out in Fig. 1, which supports a stud, E′, which serves as the fulcrum for the quadrant-lever E^2, it having the usual quadrant-screw, *b*, upon which is a nut, *b′*, which in the operation of the machine to wind the yarn for weft is gradually lowered by the rotation of the screw, all as common in usual quadrants, and so need not be herein further described. This quadrant-lever at its lower or left-hand end has two like arms, in a hole of either of which may be placed the stud *a*, according to which cam is to act on the said stud to move the quadrant-lever.

When the cam D is being used to effect the weft-wind, as in Figs. 1 and 2, the nut *b′* in its descent by the rotation of the screw *b* gradually draws the chains b^2, connected to it and to the draw-bar b^3 of the builder mechanism, through the tie b^4 or equivalent down about like rolls b^5 on like studs b^6 near the upper double-armed or bifurcated end of the quadrant-lever E^2. The draw-bar b^3 (see Fig. 2) has a hooked ear, b^8, preferably made adjustable on the draw-bar, in the present instance by screw-threading the end of the draw-bar, as shown, so as to enable the relative position of the ring-rail or builder-rail B to be properly adjusted with relation to the top of the spindle when spinning or, it may be, twisting is commenced.

When the cam D operates to move the lever E^2, the draw-bar b^3, its hook 2 being then engaged with the stud 4 of the arm *e*, attached to the rod *e′*, causes the said rod, through suitable collars, e^2, having studs which enter eyes at the upper ends of levers e^3, to turn the said levers and through them rock the rock-shafts e^4, to which are attached, as will be described, the arms e^5, which act against the lower ends of the usual lifting-rods, e^6. As the chains b^2 pass over the rolls b^5, it will be understood that the draw-bar b^3 is always moved by the lever E^2 with the same length of stroke; but as the chain b^2 is gradually drawn down by the nut *b′*, it will be obvious that the ring-rail will descend each time not quite so far as before, and will rise just a little higher at each successive rise until the usual weft-bobbins are wound.

To change to the warp-wind, the pin 8, connecting the draw-bar b^3 with the tie b^4, will be removed, the hook 3 of the draw-bar will be engaged with the stud 4, as in Fig. 6, and then the pin 8 will be used to connect the left-hand end of the draw-bar b^3 directly to the part 10 of the nut *b′*, as shown in Figs. 6 and 7, and the stud *a* will be changed into the other branch of the quadrant-lever E^2, so as to be acted upon by the cam C′, that cam—a regular heart-cam—thereafter moving the quadrant-lever. The upper part of the quadrant-lever is also bifurcated, as best shown in Figs. 2 and 6, so that as the nut *b′* is gradually lowered, as before, the end of the draw-bar b^3 connected to it may also descend, the end of the draw-bar gradually approaching the fulcrum E′ of the lever E^2, and as a result thereof the draw-bar has given to it gradually a shorter and shorter stroke, so that the ring-rail is moved over a shorter and shorter distance to effect the winding of the yarn for warp or after the manner of the warp-wind. When the cam C′ is in operation, the chains b^2 are omitted. This change from weft to warp-wind can be effected in a very few moments.

The arm e^3, instead of having at one end a hub to surround the rock-shaft and be attached thereto by a screw, as usual, is provided with a foot, as 12, (shown best in the detail plan, Fig. 8, and the section, Fig. 9,) and the rock-shaft e^4, instead of being a plain shaft, is a shaft preferably cast and provided with arms, as 13 14, connected by a cross-bar, 15, the rock-shaft having also a threaded lug, 16, as shown by the detail, Fig. 9. The foot 12, concaved at its lower side to embrace the shaft, has its toe extended under the cross-bar 15, as shown in Fig. 9, and the heel of the foot is secured to the lug 16 by a bolt, 17.

The shaft e^4 has as part of it, near each end, two other ears, as 18 19, (see Fig. 2,) connected by a cross-bar, 20, leaving a space between the said cross-bar and shaft for the introduction between them of the shouldered inner end of the like arms, e^5 and $e^{5\times}$, as shown in Fig. 1, the arms e^5 being connected to the shaft e^4 at the front of the machine, while the arms $e^{5\times}$, like them in every particular, are connected to the shaft e^4 in like manner at the rear side of the machine.

The section-line *x*, Fig. 2, cuts through the arms e^5; but in Fig. 1 the arms $e^{5\times}$, supposed to be at the other side of the machine, are shown.

In Fig. 2 I have omitted the rear side of the machine, it being a counterpart of the front side. The arms e^5 and $e^{5\times}$, both alike, are joined to the said cross-bar 20, as shown in Fig. 1, by a screw or bolt, as 22. By attaching the arms e^3, e^5, and $e^{5\times}$ to the shaft e^4, as described, all set-screws binding against the shaft e^4 are dispensed with, and consequently there is no tendency for the arms to slip on the shafts. If the arms slip, the movement of the parts or their timing is spoiled.

The spindle-driving drum F, as herein shown, is composed of two sections, the meeting ends of which (see Fig. 3) have concave heads *g*, open centrally for the passage of the bolt 23, used to couple them together, suitable set-screws, 24, holding the bolt in place.

The bolt 23, between the heads *g*, passes through a box, 25, having a depending leg, 26, which is adjustably connected by a bolt, 27, with an upright, 28, having a right-angled slotted foot, (see Fig. 3,) which rests on and is connected adjustably by a bolt, 29, with an angle or other suitable plate, 30.

The bolts referred to will pass through slots in the various parts, so made as to permit the box to be adjusted both vertically and horizontally across the machine and lengthwise the machine, to thus enable the drum-shaft to be kept in proper line and also kept in proper position to actuate the spindle-bands uniformly.

The parts 25, 26, 28, and 30 constitute an adjustable bearing for the drum-shaft. This adjustable bearing is attached to a cross-bar, *h*, by a screw, 31, in a slot, 32. The ends of the bar *h* (see Fig. 5) have conical bosses 34, which enter conical seats 35, cast in the intermediate stand, G, the said cross-bar being attached to the stand by bolts 36, after the bosses 34 enter the seats 35, the bosses and seats co-operating to insure the proper assembling of the parts.

The stand G is of peculiar construction (see Fig. 4)—*i. e.*, it is open at its center, where the cross-bar *h* is bolted to it, to permit the removal of the cross-bar *h* from the stand when it is desired to remove the drum. Before removing the drum the operator, with a suitable key or tool inserted through the holes 39, will loosen the bolts 24. By removing the bar *h* the drum may be readily lowered to the floor, and then, to permit the drum to be removed from the frame, the feet *m* of the stand are removed by taking out the bolts *m'*. The bolts *m'* pass through slots in the stand and legs, so that the latter may be adjusted vertically to bear upon the floor of the mill in order that the frame may be made level and stand firmly on the floor from end to end of the frame. When the drum is put in place in the frame and the box 25 lifted, the bosses 34 on the cross-bar *h* enter the conical seats 35, which bring the bar *h* and stand immediately in position without waste of time for adjustment, which is a matter of very considerable convenience.

The drum F at the gear end of the machine may in practice have a fixed box or bearing; but at the pulley or foot end, or at the right-hand end, as in Fig. 1, the bearing (not shown) for the drum-shaft may be of any usual form of adjustable bearing, or an adjustable bearing such as shown in Fig. 4.

I do not broadly claim adjustable feet, as I am aware that many articles have had adjustable feet; but I am not aware that a spinning-frame, or, in fact, any other article having rigid legs or frame-work at its ends, has had intermediate stands provided with adjustable feet.

It will be understood that I may employ usual rock-shafts between the rod *e'* and the lifting-rods without departing from my invention. By providing the inner end of the arms e^5 and $e^{5\times}$ with a shoulder, as shown in Fig. 1, it is possible to pass the said arms under the shaft e^4, and thus remove substantially all strain from the bolts 22. The shafts e^4 have bearings, as e^{20}, depending from the lower guide-rails, B^3, at each side of the frame.

I claim—

1. The lifter or builder-rail and the bifurcated quadrant-lever having stud-receiving openings therein, a quadrant-screw, nut, and pulley thereon, and intermediate connections between it and the said rail to raise the latter and permit it to descend, combined with two cams side by side, as C' and D, in line with and adapted to actuate the bifurcated quadrant-lever, either of which cams may be made to act upon one of the bifurcations of said lever by means of a stud placed in the opening therein to move the said rail for either the warp or weft wind, substantially as described.

2. The rail B, the shaft C, the two cams C' and D, fixed side by side thereon for warp and weft wind, respectively, and the bifurcated quadrant-lever having a screw, a nut, and a pulley, and a removable stud, *a*, which may be adjusted to be acted upon by either of the said cams, combined with the screw-threaded draw-bar b^3, adapted to be attached to the quadrant-nut either directly or through a chain or flexible connection, and with the rod *e'*, the stud, and intermediate connections between the said rod and the rail, substantially as and for the purpose described.

3. The combination, with the lifting-rod, of the rock-shaft e^4, having the ears 18 19, and cross-bar 20 of the arm e^5 connected thereto, and having its inner end extended under and engaging the said shaft, substantially as described.

4. The rod *e'* and rock-shaft having the ears 13 and 14, and cross-bar 15 to connect them, combined with the arm e^3, having the foot and connected to the said rock-shaft, substantially as described.

5. The combination, with the intermediate stand, G, of a spinning-frame, the said stand being open at its center, and the drum, of the independent bearing therefor transversely adjustable by means of the slotted and removable bar *h*, to which it is removably attached by the bolt 31, whereby the drum may be lowered to the floor, substantially as described.

6. The combination, with the intermediate stand, G, of a spinning-frame open at its center, and the drum, of the independent removable bearing consisting of the parts 25, 28, and 30, adjustably bolted together and supported by the cross-bar *h*, removably attached to said stand, whereby the drum may be lowered to the floor, and with the detachable legs *m*, substantially as described.

7. The combination, with the stand G, having conical seats therein, of the cross-bar *h*, provided with bosses adapted to fit into the said seats to enable the cross-bar and stand to be readily assembled, the bearing adjustable upon the cross-bar, and the bolts 36, substantially as described.

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

JOHN T. MEATS.

Witnesses:
G. W. GREGORY,
C. M. CONE.