(No Model.) 3 Sheets—Sheet 1.

J. IMBS.

RING SPINNING MACHINE.

No. 454,823. Patented June 23, 1891.

fig. 1

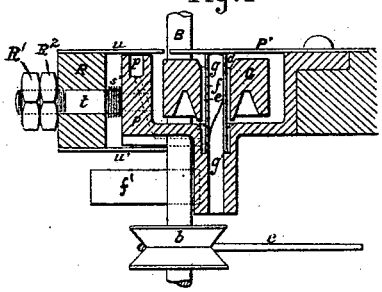


fig. 1bis

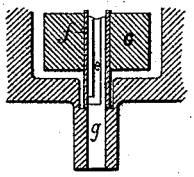


fig. 3

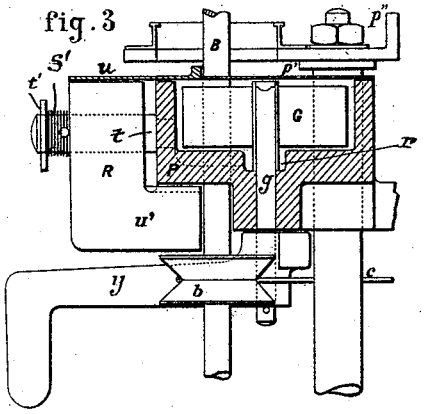


fig. 2

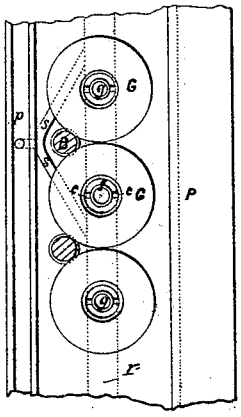


fig. 5

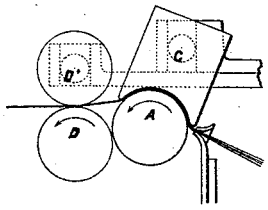


fig. 2bis

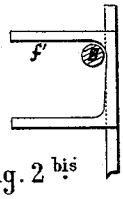
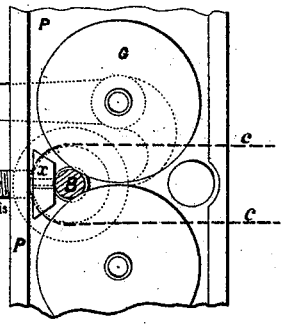


fig. 3bis



Witnesses

Inventor

Joseph Imbs

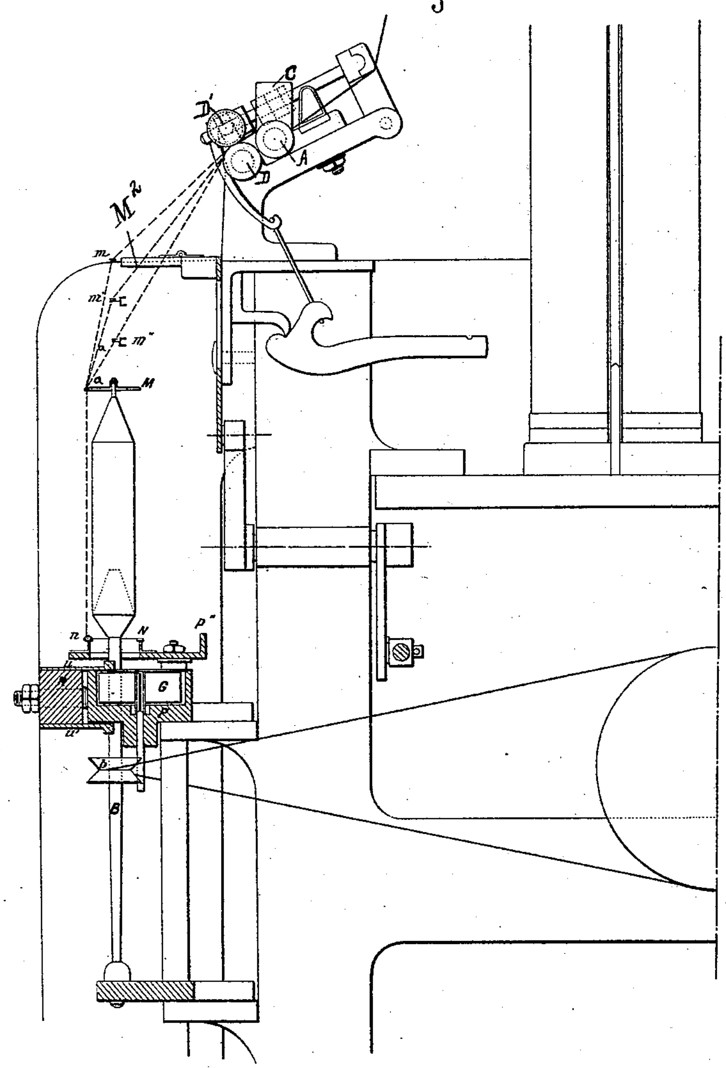
(No Model.) 3 Sheets—Sheet 2.

J. IMBS.

RING SPINNING MACHINE.

No. 454,823. Patented June 23, 1891.

fig. 4



Witnesses

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(No Model.) 3 Sheets—Sheet 3.

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RING SPINNING MACHINE.

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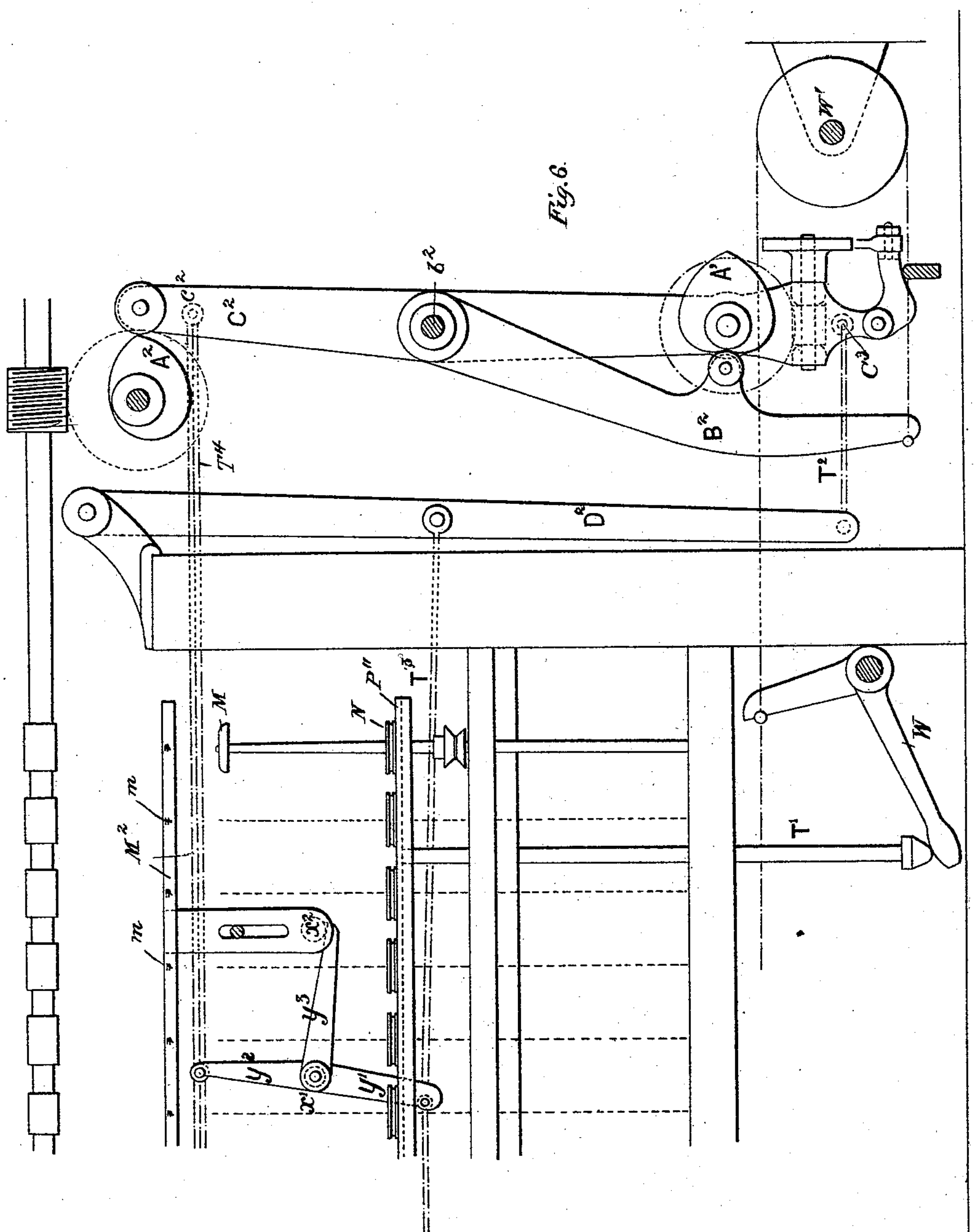

Witnesses.

Jos. Imbs.

Inventor.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH IMBS, OF PARIS, FRANCE.

RING-SPINNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 454,823, dated June 23, 1891.

Application filed July 10, 1890. Serial No. 358,281. (No model.) Patented in France June 4, 1886, No. 176,558 and in England July 13, 1888, No. 10,205.

To all whom it may concern:

Be it known that I, JOSEPH IMBS, a citizen of France, residing at Paris, in the Department of the Seine, France, have invented a new and useful Improvement in Ring-Spinning Machines, (for which I have obtained patents in England, No. 10,205, dated July 13, 1888, and in France, No. 176,558, dated June 4, 1886,) of which the following is a specification.

My invention relates to improvements in spinning-machines, part of which improvements—namely, that relating to the drawing-rollers—is applicable to preparatory machines. In carrying out the first part of my invention I reduce the frictional resistance brought about by the tension of the spindle-cords upon the collars of the spindles, either in self-acting mules or in throstle-frames. For this purpose I substitute for the ordinary collars of any arrangement friction-rollers, which are not in contact with but in close proximity to one another and upon which the spindles revolve. These rollers, driven by the spindles upon which the cords bear, rotate with a very reduced speed. I inclose them so as to shelter them from dust, and I further provide their axles with a continuous-oiling arrangement.

In the accompanying drawings, Figures 1 and 1^{bis} are views in vertical section; Fig. 2, a plan showing two neighboring spindles, and Fig. 2^{bis} a detail. Figs. 3, 3^{bis}, and 4 illustrate the application of the invention to ring and traveler throstles, Fig. 3 being a sectional elevation, Fig. 3^{bis} a plan, Fig. 4 a side elevation, and Fig. 5 is a detail view of an improvement hereinafter described. Fig. 6 is an elevation showing devices that may be used to move the ring-plate and yarn-guide in opposite directions.

B is a spindle with its whirl *b*, (which in ring and traveler throstles may be placed either above or below the plate-bolster P.)

C is the cord proceeding from the driving-drum. The plate-bolster P is provided with perforations through which the spindles B pass freely.

The friction-rollers G, which are of large diameter relatively to the spindles B, are arranged close together on axles *g*, which are or may be stationary. Preferably the rollers are made of hard wood and are provided each with a thin gun-metal core *f*, which turns on the axles *g*. These cores *f* rest in a groove *r* in the plate-bolster, being prolonged beneath the rollers. The groove *r* forms an oil-reservoir. As shown in Figs. 1 and 2, the plate P is provided with an exterior groove *p*, and with channels *s*, which communicate with the interior groove *r*. As shown in Fig. 1^{bis}, the oil will be drawn up by the rotation of the core *f*, and will return by a passage *e* through the interior of the fixed axle *g*. The continuous oiling of the axles is thus effected.

The spindles B bear directly against two adjacent rollers, there being one spindle in each space between the rollers. The spindles being of small diameter may be driven at a very high speed, while the rollers themselves will rotate at a much reduced speed. This arrangement of the ordinary mule-jenny spindles is found very advantageous.

A plate P′, Figs. 1 and 3, incloses and covers the space in bolster P which contains the rollers, said plate extending to the spindles B. In front of the spindles upon pins *t*, fixed to the bolster P, is a rail or bar R, carrying horizontal plates *u u′*, which are designed to prevent rearward vibration. The bar R is adjustable. As shown in Fig. 1, its adjustment is effected by means of the nuts R′ R^2, which, in moving the bar toward the plate-bolster, compress the small springs *s′*. In the construction shown in Fig. 3 the pin *t* has a head *t′* for turning, and the spring *s′* is between this head and the bar R.

The foot of the spindle may rest, as usual, in a step-bearing; but the spindles being practically vertical must have a support from the outside. To this end the projecting plates *u u′* may extend sufficiently far to make contact with the spindles. In this case the construction of Fig. 3 shows a convenient arrangement in which, after the bar is set to the proper position by screws *t*, the spring *s* holds the edges of the supports *u u′* in light contact with the spindles. It is also desirable to place against each spindle a rest or bearing *x*, mounted on a regulating-screw V, which is tapped into the flange of plate P. Each spindle is provided with a brake—such as the

piece y, Figs. 3 and 3^{bis}—which is a brake-lever adapted to be operated by the knee of the workman, and to be pushed either right or left.

In Figs. 1 and 2^{bis} is shown a bolt-brake f', which form is preferred. The construction is best shown in Fig. 2^{bis}, in which the brake is seen out of contact with spindle B. The edge of the brake on the right side of the spindle is inclined, so that by moving the brake forward the spindle will be separated from the rollers G and wedged against the adjacent parts $u\ u'$ or the rest or bearing x.

In order to utilize in ring and traveler throstles the excess of speed which is obtained by the construction and arrangement of the spindles, as hereinbefore described, it is desirable also to relieve the resistance of the travelers upon the ring, which resistance becomes particularly injurious in cases when in making conical bobbins the traveler is winding on the summit of the cone—that is to say, upon a very small diameter. This result may be obtained at the desired moments by the following construction, as shown in Fig. 4, which is or may be as usual in this class of machines.

I place tightly on the top of the spindle a light disk or cap M, having a diameter about equal to that of the ring N. This disk or cap, as will be readily understood, may be removed in order to effect the gathering of the bobbins. It is of circular form; but its shape and material may be varied according to requirements. I may make it of solid and arched sheet metal or of other suitable material or form. The yarn coming from the guide in order to descend upon the traveler n, necessarily is deflected inwardly around the disk or cap M, upon which it finds a bearing-point. The rounded and more or less polished edge of this disk or cap thus tends during the rotation of the spindle to constantly urge the yarn forward and pull the traveler n. On the other hand, the angle a, between the yarn and disk, depends, as shown in the figure, on the distance at which the guide m is placed above the spindle. I cause the said yarn-guide m, by acting on its supporting-rail M^2, to move vertically in a direction contrary to that of the bolster P″ of the rings—that is to say, the yarn-guide m is gradually lowered to the positions indicated by m' and m'', while the bolster P″ rises to effect an ascending winding, and vice versa. The limits of travel of the yarn-guide from m to m' and to m'' may be constant in length or position, or gradually varied and brought nearer to the top of the spindle in proportion as the making of the bobbin progresses. The angle a always becomes smaller in proportion as the bolster P″ carries the yarn onto the smaller diameter of the cone, and hence in proportion the tension of the yarn tends to increase in order to pull the traveler. The increase of the tension on the yarn and the closing of the angle a thus simultaneously cause a proportionate increase of the drawing action exerted by the disk or cap M upon the yarn and upon the traveler. By thus regulating the resistance of this traveler and the effective tension of the yarn it is possible to utilize the whole of the speed which it is desired to impart to the spindles.

Various means may be employed to give the desired motion to the plate P″ and yarn-guide m. In Fig. 6 I have shown devices that may be employed for the purposes specified. The bolster-plate P″ is carried by a rod T″, whose lower end rests against one arm of a bell-crank lever W, its other end being connected by a cord passing around pulley W′ with the end of an arm B^2, which is pivoted on a lever C^2. Arm B^2 has a bearing against the cam A′, which, by moving said arm, raises the bolster-plate P″. Lever C^2, which is pivoted at b^2, is oscillated by a cam A^2, and its movements are imparted to the rail M^2, which carries the yarn-guide m. These movements are communicated to the bell-crank lever y' y^2 y^3, and the arm y^3 acts on a roller x^2, carried by an arm depending from rail M^2. The bell-crank lever may be connected directly to the lever C^2 at c^2 by a rod (indicated by broken lines) T^4, or it may be connected to an intermediate lever D^2 by a rod T^3, lever D^2 being connected by T^2 to the lower end of lever C^2 at c^3. Fig. 4 shows likewise a general view of a ring and traveler throstle as I arrange it, and provided with improved means for use in drawing yarn. Fig. 5 shows separately a section of this improvement, which is especially applicable to a case in which materials having very irregular fibers have to be spun, and which furnish slivers containing many short staples or fibers mixed with long ones, and even with knots or burrs, as happens with cotton waste, for instance. The use of ordinary drawing-rollers does not allow the regular drawing of such slivers, as it is not possible to place the rows of rollers in very close proximity to one another, as would be required for short fibers, and, furthermore, a very slight separation can never be attained with ordinary rollers whose decrease of diameter has a limit.

I feed the so-called "drawing-rollers" D D′ by a roller A, provided with a covering-cap C, forming a prolonged and polished contact with the roller A and on which it lies, either by its natural weight or by means of additional pressure. This cap is supported in slides upon the carriage, as indicated in dotted lines. It may thus be adjusted around the feed-roller, and may also be removed readily, or its pressure may be regulated by ordinary adjusting means. It will be observed that the rollers are mounted on the carriage, that they have a decided hitch or inclination, which is advantageous for continuous spinning. Notwithstanding this inclination the yarn or roving leaves the feed-roller tangentially, or nearly so. This arrangement is advantageous for a continuous operation.

I am aware that prior to my invention it

has been proposed to arrange fliers to rotate against flanged rollers, and that rings surrounding the spindle proper have also been provided with bearings against collars or friction-rollers. According to my invention the spindle itself—that is, the slender axle, which is the spindle proper—is caused to rotate directly against rollers of large size.

This improvement in effect furnishes a new spindle in connection with ring-throstle systems, giving superior results.

Having now described my said invention, what I claim is—

1. The combination of the bolster-plate, the mule-jenny spindles passing freely through the same, friction-rollers of relatively large diameter journaled in said bolster-plate, said spindles each rotating directly against and between two adjacent rollers, and the driving-cords whose tension holds the spindles against their supporting-rollers, substantially as described.

2. The combination of the bolster-plate, the spindles passing freely through the same, and the friction-rollers inclosed in said bolster-plate and forming bearings for said spindles, said bolster-plate being provided with oil-passages leading to the inclosed bearings of said friction-rollers, substantially as described.

3. The combination of the bolster-plate having at the bottom an interior oil reservoir or channel and an upper oil channel or passage communicating therewith, the friction-rollers provided with cores prolonged beneath said rollers and resting in said oil-reservoir channel, and spindles resting against said rollers, substantially as described.

4. The combination, with the spindles, the friction-rollers inclosed in boxes through which the spindles pass, said spindles being held by the action of the driving-cords against said rollers, of the supports (such as plates u u') on the side of the spindles opposite to said rollers, substantially as described.

5. The combination, with an inclined carriage and drawing-rollers and feed-rollers mounted thereon, of a cap resting freely upon the feed-roller and inclined away from the drawing-roller, and adjustable slides in which said cap is supported, substantially as described.

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

JOSEPH IMBS.

Witnesses:
H. SONE,
V. FAUR.