2 Sheets, Sheet 1

E. Bazin,

Spinning Mach.

No. 108,233. Patented Oct. 11, 1870.

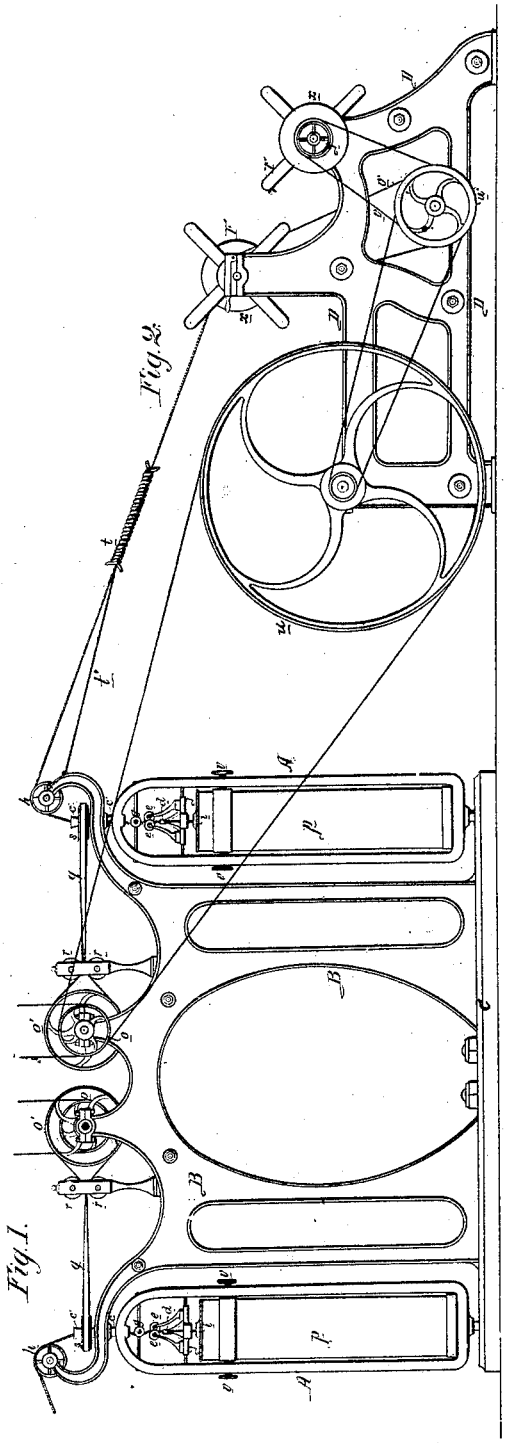

Fig. 1.

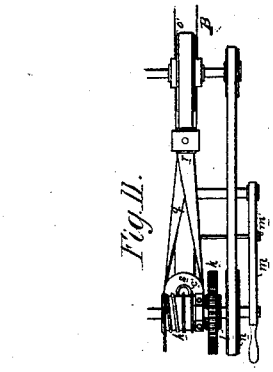

Fig. 2.

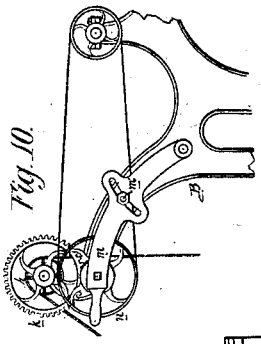

Fig. 10.

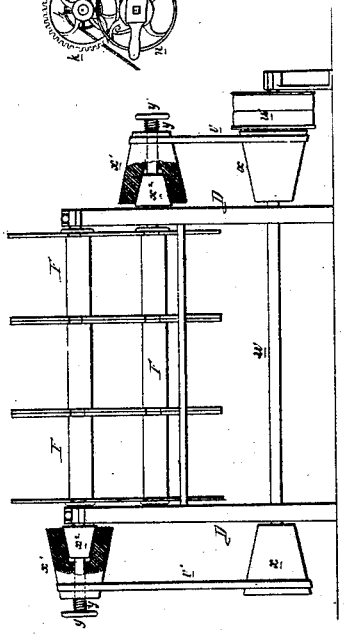

Fig. 3.

Witnesses: Wm. A. Steel, John Parker

E. Bazin by his Attys Dewson & Son

2 Sheets Sheet 2.

E. Bazin,

Spinning Mach.

No. 108,233. Patented Oct. 11. 1870.

Fig 8.

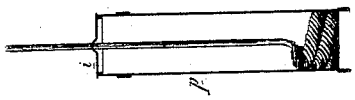

Fig 9.

Fig 7.

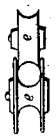

Fig 5.

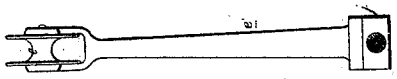

Fig 6.

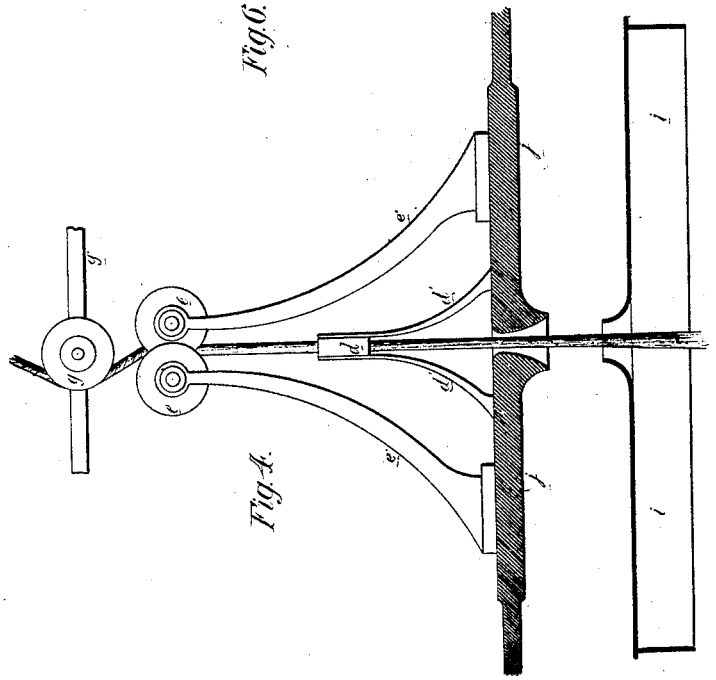

Fig 4.

Witnesses { Wm. A. Steel. John Parker

E. Bazin By his Attys Howson & Howson

United States Patent Office.

ERNEST BAZIN, OF PARIS, FRANCE.

Letters Patent No. 108,233, dated October 11, 1870.

IMPROVEMENT IN APPARATUS FOR SPINNING HEMP, FLAX, AND OTHER FIBROUS SUBSTANCES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ERNEST BAZIN, of Paris, France, have invented certain improvements in spinning apparatus, of which the following is the specification.

Nature and Object of the Invention.

My invention consists of certain improvements in apparatus for spinning hemp, flax, and other fibrous substances, which improvements are too fully described hereafter to need preliminary explanation.

Description of the Accompanying Drawing.

Figure 1, sheet 1, is an elevation of the improved spinning-machine;

Figure 2, an elevation of the reels and frame;

Figure 3, an end view of fig. 2, partly in section;

Figures 4, 5, 6, and 7, sheet 2, detached views of part of the machine, drawn to an enlarged scale;

Figures 8 and 9, sectional views of the vessel in which the sliver is deposited; and

Figures 10 and 11, sheet 1, views of the tension and drawing devices, slightly modified.

General Description.

A and A′ are two sets of fliers, arranged at the opposite sides of a light frame, B, of cast-iron, which rests upon the general base C. But two of these fliers are represented in fig. 1, but it is proposed to arrange six, twelve, or a greater number, in line with each other, at one side of the machine, and in such a manner that they can be worked independently of a similar set at the opposite side of the machine.

These fliers are pivoted at the bottom upon the base C, and they terminate at the top in a hollow spindle, *c′*, which passes through and turns in the frame B.

Each flier carries a vessel or cylinder, *p*, which contains the material to be spun, and above this cylinder are arranged the pinching device *d*, the rounding or cylindering rollers *e*, and the twister *g*, all of which will be more particularly referred to hereafter.

Each vessel is attached to its flier by means of set-screws *r*, which enable it to be accurately centered.

The material to be spun is prepared in the form of a ribbon or sliver, and is placed in each vessel or cylinder in the peculiar manner best observed in figs. 8 and 9; that is, in the form of a spiral coil, composed of small annular folds, arranged above, but eccentrically, as regards each other, the result being that, from the top to the bottom of the cylinder, there is left a very small central space, the coil itself being in contact with the inner surface of the cylinder. When the cylinder is filled the coil is crowded into the interior by the cover *i*.

This method of coiling, which can be readily used for hemp and flax, I have found in practice to possess the following advantages:

A greater quantity of material can be introduced into a vessel of given size than by any other method of coiling. It prevents the displacement of the material by centrifugal force during the rapid rotation of the vessel with the flier, and removes all risk of the intanglement and consequent breaking of the sliver during the drawing of the latter from the vessel.

The sliver passes through the lid *i* of the vessel, (see fig. 1,) and through an opening in a horizontal cross-piece, *j*, which is bolted to the opposite sides of the flier. It is thence conducted between the curved pinching-plates *d*, figs. 4 and 5, which are hung to elastic spring rods *d′*, and which press upon and serve to partially condense the sliver.

The rollers *e e*, hung to adjustable arms *e′* of the cross-piece *j*, next receive the sliver between them, and compress and round the same, to prepare it for being twisted. These rollers also oppose the requisite resistance to the drawing of the sliver, in order that the fibers may be perfectly parallel, while the twisting is being performed by the roller *g*.

The latter is so hung to a cross-piece, *g′*, above the rollers *e e*, that the thread is thrown out of the center, in order to pass into the groove of the said roller, and it is this eccentricity which twists the thread. Of course, with this arrangement, the degree of twist given to the thread will depend upon the speed of the flier in relation to that of the drawing device, which can be easily and simply regulated.

The twisted yarn, after leaving the roller *g*, passes through the hollow spindle *c* of the flier, and is thence submitted to the drawing devices.

In fig. 1 the yarn passes over a plane pulley, *h*, and the drawing is accomplished by means of the reels, illustrated in fig. 2; but, where the drawing is to be effected by the spinning-machine, I prefer to use the arrangement shown in figs. 10 and 11.

In this case the pulley takes the form of a drum or cylinder, having upon its surface spiral grooves or creases, traversed by the thread or yarn before it is conducted to the reels.

This prevents the thread from slipping, and enables the drawing to be accomplished by the roller, and the speed of the latter and consequent degree of twist of the thread is regulated as follows:

Upon the axis of the drum *h* is a cog-wheel, *k*, driven by a pinion, *l*, the spindle of the latter turning in a lever, *m*, which is hung to the frame B. On the same spindle is a pulley, *n*, which derives its motion from the prime motor.

To change the speed of the drum *h* the lever *m* is lowered, and the pinion *l* replaced by another of larger or smaller diameter, after which the lever is raised, so as to bring the pinion into gear with the wheel *k*, and the lever, which has a curved slot, is retained in its proper position after adjustment, by means of a screw, *m*.

This, however, may be considered a modification of my invention, which may be carried into effect without these devices, the plan shown in figs. 2 and 3 il-

lustrating my usual mode of drawing twisted yarn from the spinning mechanism.

The required rotary motion is communicated to the fliers in the following manner:

Upon the axis of the driving-pulley *o*, fig. 1, is another larger pulley, *o'*, from which a bell, *q*, after passing between guide-rollers *r*, is conducted to a horizontal pulley, *s*, which is hung to the hollow spindle *c'* of each of the fliers. In this way the fliers are rapidly rotated while the sliver is drawn from the vessels *p* of the same, and twisted and conducted to the reels.

Before being wound upon the reels, however, the thread undergoes the action of a polisher *t*, which consists of a coil of wire attached to the frame B by a cord, *t'*, and, having an aperture extending through it of sufficient diameter to receive the thread, the resistance and friction imparted to it in passing through this coil polishes and stretches it out, and reduces it to an even and regular diameter.

When the yarn is to be used for rope-making it may also, while being conducted to the reels, be submitted to a tarring or pitching operation, by being passed over governing cylinders in a vessel of heated pitch or tar, arranged between the spinning-machine and the reels.

Reels of ordinary construction, arranged upon a strong frame-work of wood, may be employed in connection with the above machine; but I prefer the arrangement illustrated in figs. 2 and 3, which consists of an iron frame, D, supporting in tiers or ranges the reels F. This form of frame enables a large number of reels to be employed in a limited space.

The reels may be driven by power transmitted from the driving-pulley *o* of the spinning-machine, through the medium of the bands and pulleys *u u'*, *r* and *r'*, as shown in figs. 1 and 2.

In order that the yarn may be wound regularly upon the reels, it should be conducted onto each of the same by a reciprocating guide or arm, similar to those in common use.

As the thread is wound and accumulated upon the reels it is necessary that the speed of the latter should be diminished, and, to obtain this differential motion, I employ cones *x* and x^1, fig. 3, for transmitting motion to the reels.

The cones *x* are secured to the shaft *w*, to which the driving-pulley *u'* is hung, and are connected, by driving-bands, to the cones x^1 of the reels.

The latter cones fit over small cones x^2, which are covered with leather, felt, or cloth, to promote adhesion, and the friction may be increased, as desired, on compressing the spring *y*, by proper adjustment of the springs *y'*.

To stop the reels the screws are turned in a contrary direction, so as to diminish the pressure of the springs, and thus relieve the friction, and permit the cones x^1 to turn loosely upon and independently of the inner cones x^2.

The shifting of the bands which connect the cones *x* and x^1, so as to gradually diminish the speed of the reels as the thread is wound upon them, may be accomplished either automatically or by hand.

Claims.

1. The rotating flier A', carrying a case, *b*, rounding-rollers *e e*, and eccentric twisting-roller *g*, in combination with drawing-rollers, substantially as described.

2. The combination, with the rotating cylinder and twisting-roller *g*, of rounding-rollers *e e*, carried by elastic arms, and adapted to each other, as specified.

3. The combination of the rounding-rollers *e e*, clasping the sliver, and a twisting-roller arranged above, but out of a line with the rounding-rollers, the whole being carried by the rotating flier A, as described.

4. The combination of the rollers *e e* and *g*, carried by the rotating flier A and roller *h*, with the hollow spindle of the flier.

5. A polisher, *t*, constructed substantially as described, and arranged for the reception of the twisted yarn between the spinning and drawing devices, as set forth.

6. The cone-pulley x^1, adapted to the smaller cone x^2, and controlled by a spring and screw, all substantially as described.

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

E. BAZIN.

Witnesses:

F. OLCOTT,

G. RICHARDS.