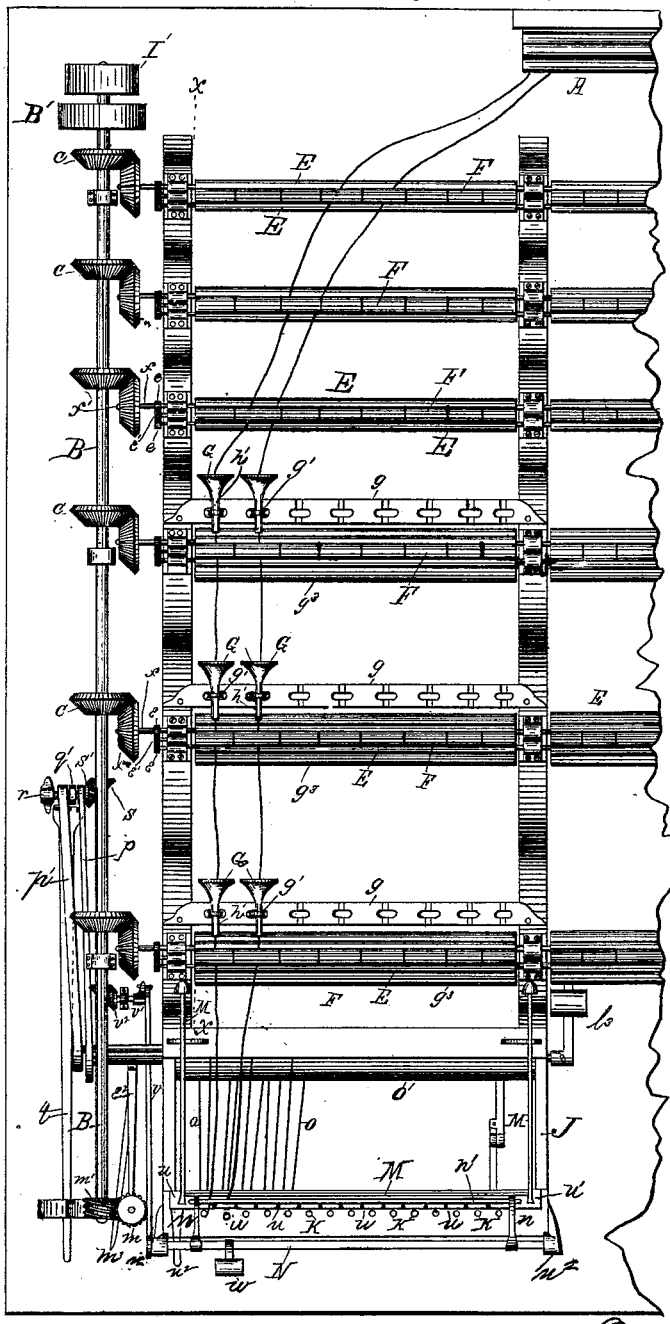
4 Sheets—Sheet 1

W. D. ISETT.

Spinning Frame.

No. 204,436. **Patented June 4, 1878.**

Fig: 1.



William D. Isett
INVENTOR

WITNESSES

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James N. Lange.

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ATTORNEYS

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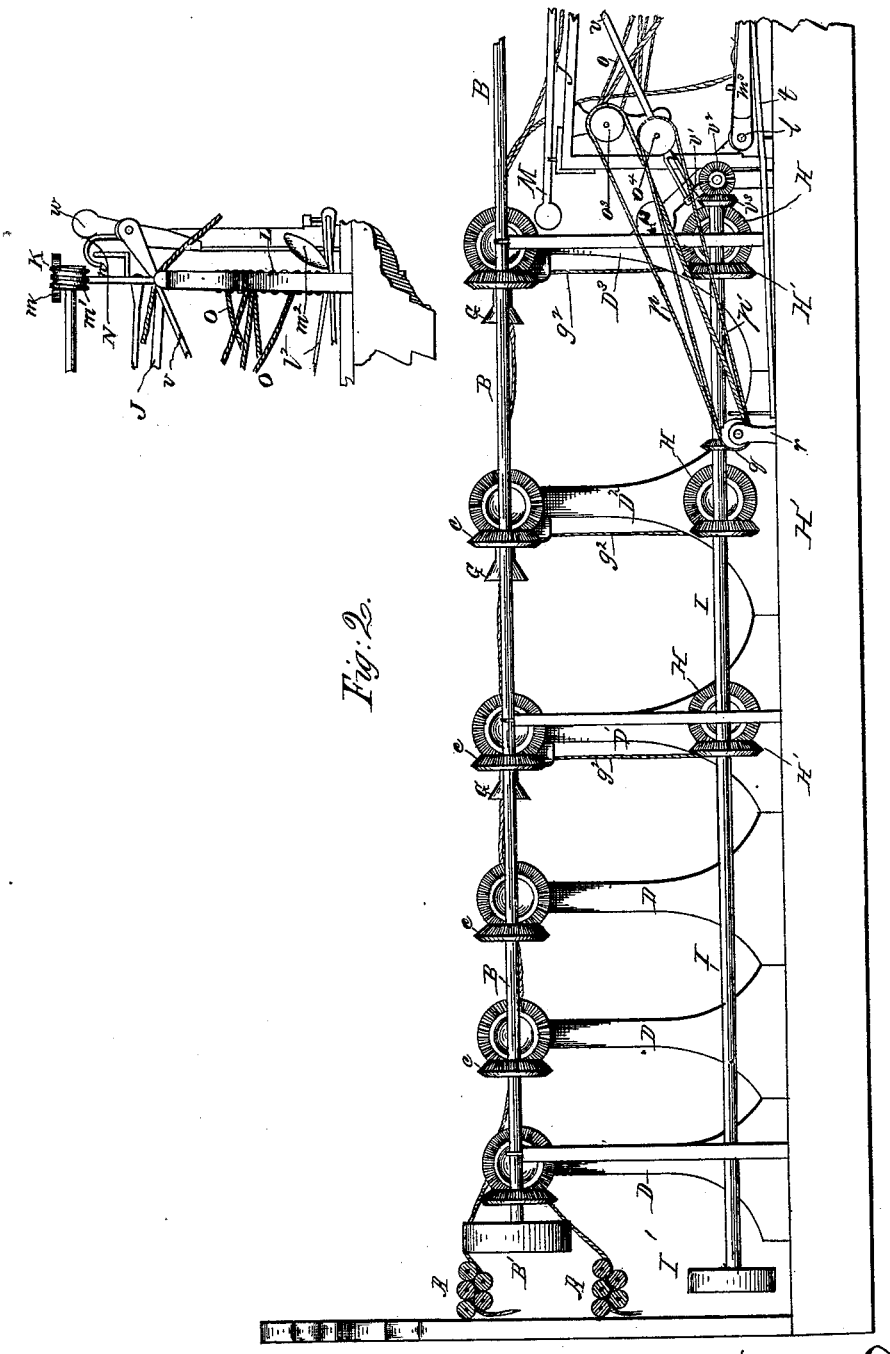

Fig. 2.

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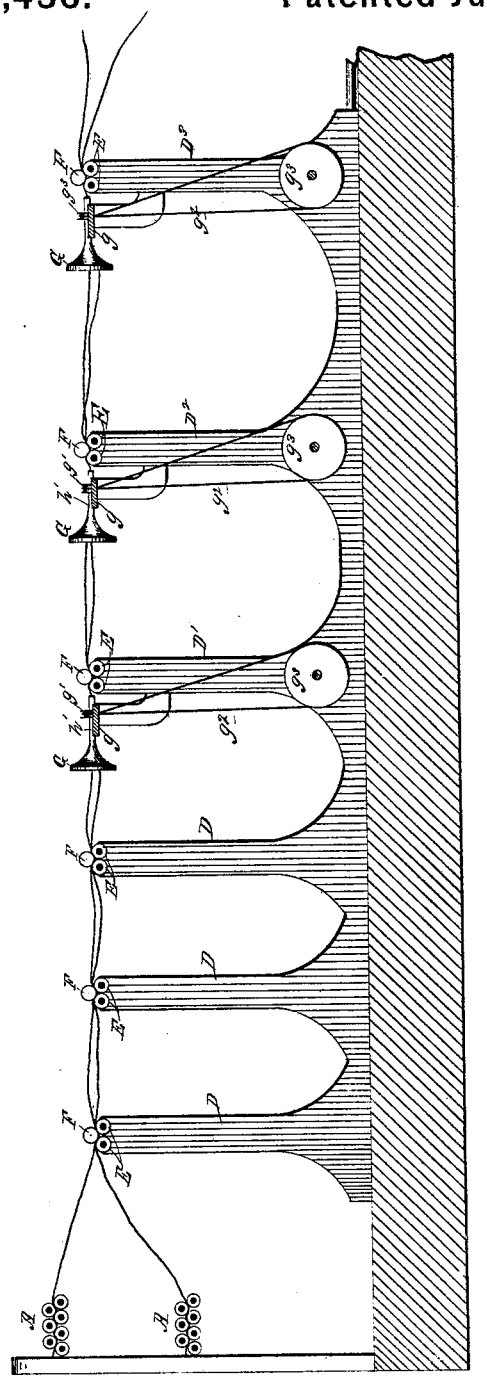

Fig. 3.

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4 Sheets—Sheet 4.

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No. 204,436. **Patented June 4, 1878.**

Fig: 4.

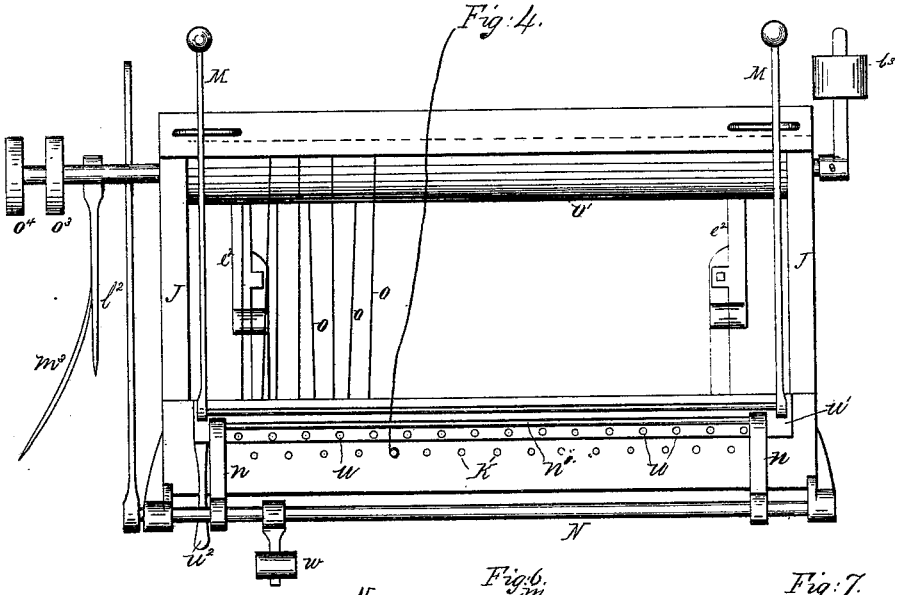


Fig: 5

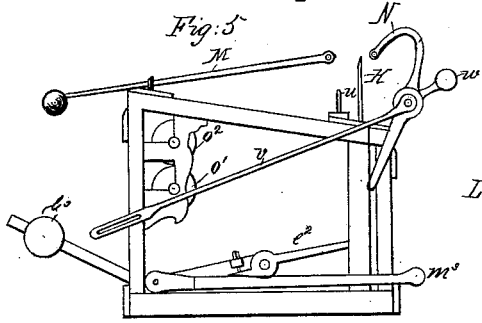


Fig: 6.

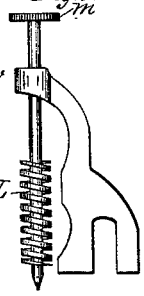


Fig: 7.

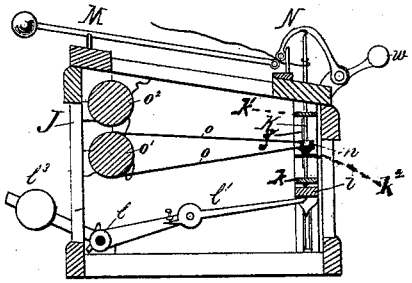


Fig: 8.

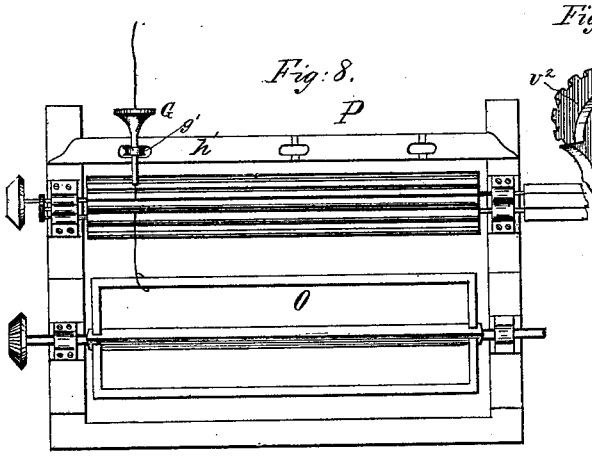


Fig 10.

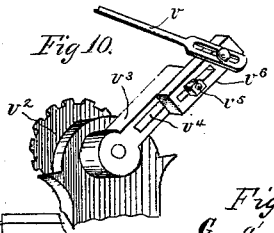
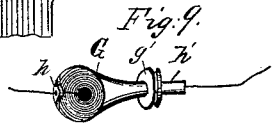


Fig: 9.



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UNITED STATES PATENT OFFICE.

WILLIAM D. ISETT, OF SPRUCE CREEK, PENNSYLVANIA.

IMPROVEMENT IN SPINNING-FRAMES.

Specification forming part of Letters Patent No. **204,436**, dated June 4, 1878; application filed July 21, 1877.

To all whom it may concern:

Be it known that I, WILLIAM D. ISETT, of Spruce Creek, in the county of Huntingdon and State of Pennsylvania, have invented certain new and useful Improvements in Spinning-Frames; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1, Sheet 1, is a plan view of my improved spinning-frame. Fig. 2, Sheet 2, is a side elevation thereof. Fig. 3, Sheet 3, is a longitudinal section through the dotted line *x x* of Fig. 1. Fig. 4, Sheet 4, is an enlarged detached plan view of the spindle-rail, supporting-frame, &c. Fig. 5 is a side elevation of the same. Fig. 6 is a detached side elevation of the spindle-rail-operating screw or worm. Fig. 7 is a transverse vertical section of the spindle-rail-supporting frame. Fig. 8 is a plan view of certain adjuncts of my machine, and Fig. 9 is an enlarged detached perspective view of one of the spinning-bells, and Fig. 10 is a detached view of the connection between the slotted pitman which operates the faller and its gear-wheel.

Corresponding parts in the several figures are denoted by like letters.

This invention relates to certain improvements in spinning-frames; and it consists in giving the roving the desired twist; of mechanism for operating the spindles and for lowering the spindle-rail; and of belt-shipping medium for the drums which drive the spindles, substantially as hereinafter more fully set forth.

In the annexed drawing, A A refer to two sets of sub-rolls, which receive and between which passes the roving. These sub-rolls are suitably mounted in position, so as to have both a rotary and endwise movement, the mechanism for producing which not being shown, as the same forms no part of this invention.

B is a driving-shaft, suitably journaled in position upon uprights, and having a number of beveled gear-wheels, C C C, and a drum, B′. D D^1 D^2 D^3 are a number of uprights or supports, arranged in pairs, and the distance between each successive pair increasing as they relatively recede from the sub-rolls A A. Upon each pair of these supports are journaled two rollers, E E, upon each set or two of which rests an intermediate roll, F, between which and the rollers E E passes the roving. To the free ends of the axes of the rollers E E, which pass through slotted bearings or boxes upon the supports D D^1 D^2 D^3, are attached gears-wheels *e e*, one of which is attached to a shaft, *f*, having upon one end a beveled wheel, *f′*, gearing with a gear-wheel, C, from which motion is obtained. Intermediate gearing *e′ e′* transmit the motion of the gearing upon the shafts *f f* to the opposite gearing *e e*.

By varying the speed or diameters of the gearing *f′* C, the speed of the rollers can be varied so as to obtain greater or less "draw" of the roving. Arranged in front of and in proximity to the rollers E E of the supports D D^1 D^2 D^3, and upon supports *g g*, are the spinning-bells or trumpets G G G, through which and their eyes, to be hereinafter described, the roving passes and is twisted, as presently more fully specified. Upon the tubular portions of the bells or trumpets G G are pulleys g^1 g^1, around which pass belts g^2 g^2, connecting with drums or shafts g^3 g^3, Fig. 3, driven by beveled gearing H H thereon and corresponding gearing H′ H′ upon a second driving-shaft, I, suitably journaled in position and driven by a drum, I′, connecting with a motor.

By varying the diameters of the gearing H H′, or their speed, the speed of the bells or trumpets will, of course, be varied, and the twisting of the roving likewise be affected. By the arrangement of the uprights or supports D D^1 D^2 D^3, as above set forth, their rollers E E are accordingly arranged, each successive set a greater distance from the other as they recede from the sub-rolls A A, to impart the desired twist to the roving. This is obvious from the fact that, since the greater the length of roving a bell or trumpet has to operate on, and which consequently is susceptible of a greater number of waves, and the axis of each wave being a center of twist, the greater will be the amount of twist obtained in a given time over that imparted to

a shorter length, velocity and tension in both cases being equal. The spinning-bells or trumpets G G are provided, in their forward or flaring portions, with eyes *h*, Fig. 9, through which and their tubular portions *h' h'* the roving, as above stated, passes and is twisted. The eyes *h* of the bells or trumpets being arranged in a plane to one side of that of the tubes *h' h'* of said bells, it will be seen, upon the rotation of said bells or trumpets, that the roving will be carried around in a circle concentric to the said tubes, and thus be twisted. From the last series of these bells or trumpets the roving or yarn is passed to and wound upon bobbins upon spindles, or around a reel, as occasion may require, as will be hereinafter explained.

J is a frame disposed in proximity to and in rear of the last series of bells or trumpets and rollers. Between and within grooves in the forward uprights or legs of said frame is adjusted a bar, *i*, termed the "spindle-rail," which supports the steps of the spindles K, Fig. 7. To retain the spindles in place upon the rail *i*, they are provided with projections or shoulders beneath a bar, *k*, of the rail *i*, up through which they pass. To further retain the spindles in place, they are passed up through a second bar, k^1, after which they extend up through the top of the frame J, it being provided with apertures for that purpose, and thence receive bobbins, upon which the roving or yarn is wound. The spindles K are provided with whirls *n* for their rotation, and feathered at *j*, which feathers pass through slots in the said whirls, by which, as the said spindles rotate, they are allowed to also have a vertical movement, for the purpose hereinafter explained.

To the lower ends of the rear legs or uprights of the frame J is journaled a shaft or axis, *l*, having two or more arms, l^1 l^1, extending forward under and supporting the spindle-rail *i*. Upon one end of the shaft *l* is a weighted lever, l^3, to counterbalance the weight of the spindle-rail and its load. From this shaft or axis also projects a pointed bar, l^2, which engages the thread or groove of an upright worm, L. The upper end of the shaft of this worm is provided with a gear-wheel, *m*, which is operated by a worm, *m'*, upon the driving-shaft B. The bar l^2, by its ascent of the screw or worm L, elevates the spindle-rail *i* with the spindles in readiness to receive the roving or yarn upon their bobbins. The descent of the bar l^2 upon the worm or screw L causes the spindle-rail and the spindles to descend when their bobbins are filled with yarn. The spindles have both a vertical and rotary motion, as above stated, to permit of the yarn or roving being properly wound thereon. The lower end of the worm-shaft is provided with a lever, m^2, for the retraction of the bar l^2 from said worm, when desired.

There are twice as many spindles as there are spinning-bells or trumpets, one-half being filled at a time, while the others are at rest, in readiness to be filled as soon as the filling of those in motion is accomplished.

Belts *o o*, passing around the whirls *n* of the spindles and rollers or drums o^1 o^2, suitably journaled in the frame J, rotate the two sets of spindles. The whirls *n* are tapered upon their lower ends, and bear upon the bar k^2, Fig. 7.

Upon one of the ends of the shafts of the drums or rollers o^1 o^2, are pulleys o^3 o^4, around which pass belts *p p'*, Fig. 1, also passing around drums *q*. Between these drums is a stationary drum, *q'*. The said drums are journaled between uprights *r*, secured contiguous to the driving-shaft I.

The revolving pulleys or drums *q* receive their motion from the driving-shaft I and beveled gearing *s s'*. *t* is a belt-shipper, for use in connection with the pulleys or drums and belts *p p'*, and fulcrumed in position so as to have a lateral or horizontal movement, and provided with vertical projections or arms, as seen in Fig. 2, extending up along side of the belts *p p'*, to enable the shipper to control or adjust the said belts from one drum to another.

When the bobbins upon one set or half of the spindles have been filled, the belt-shipper *t* is moved by hand so as to ship the belt of those spindles which have been idle upon one of the drums or pulleys *q*, setting the latter-mentioned spindles in motion and causing the roving or yarn to be wound upon their bobbins. At the same time the shipper *t* is moved, as above described, it will ship the belt of the spindles with the filled bobbins upon the stationary drum *q'*, and allow the said bobbins to be removed while those upon the other spindles are being filled, and so on. This action of the shipper is due to there being two sets of vertical arms (above described) acting simultaneously upon the two belts *p p'* at one movement of the shipper.

u^1 is a slide, having a series of pins, *n n*, and connected to the top of the frame J, so as to be susceptible of a sliding or endwise movement. To operate this slide it is provided with a hand-lever or arm, n^2. The object of this slide and pins is to pass the roving or yarn from the filled to the empty bobbins, as will be more fully understood hereinafter.

M is the roving or yarn tension regulating device, suitably mounted upon the frame J, and so as to rest slightly against the roving or yarn.

N is the faller, having its axis bearing in uprights n^2 n^2 of the frame J, and provided with curved arms *n n*, connected together by a wire or rod, n^1. The faller is also provided with a counterbalancing-weight, *w*.

To one end of the faller-axis or shaft is connected a rod, *r*, which, in turn, is connected by a cam, crank, or eccentric, v^1, to the shaft of the gearing r^2, receiving motion from the gearing v^3 upon the driving-shaft I. The motion thus imparted to the faller through the

cam, crank, or eccentric, and its rod v and gearing just described is a gradual uniform rising and falling motion. This being the case it will be seen that, as the roving or yarn is being wound upon the bobbins of the spindles, the faller-wire, in its ascent and descent, as the spindles are ascending and descending, will aid to produce the proper tension on the roving or yarn by pressing slightly upward against it, and so guiding the said yarn or roving upon said bobbins in layers, one upon the other.

In order to disconnect the yarn from those bobbins which have been filled and put out of motion and attach it to the empty bobbins set in motion upon stopping the filled bobbins, a little loose or slack yarn, unwound by hand from the filled bobbins, is passed by the pins $u\ u$ of the slide w' to the empty or running bobbins. The slack or loose yarn or roving, the moment it touches the running or empty bobbins, will, of course, adhere to the same, and be wound thereon, in which act the slack will be taken up, and as a consequence be severed from the stationary or filled bobbins, to allow them to be removed and replaced by empty bobbins while the others are being filled.

Upon the axis of the gear-wheel v^2 is the crank v^3, or its equivalent, having a slot, v^4, which receives a headed and nutted bolt, v^5, adjustably connecting an arm, v^6, thereto, which arm is also provided with a slot and headed projection or pin entering the slot of the pitman v, the object of which is to vary the movement of the faller as occasion may require.

In Fig. 8 is a reel, O, for reeling the yarn when the bobbin-winding mechanism is removed or not in use. In the same figure is also a frame, P, with one spinning-bell or trumpet to two or three upon the spinning-frame which is used with the reel O in the manufacture of stocking-yarn.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a spinning-frame, the combination of a series of twisting-bells with two or more pairs or sets of rollers, E E, arranged each successive pair or set a greater distance from the other as they recede from the sub-rolls A A, substantially as and for the purpose set forth.

2. The spindle-rail i and feathered spindles K K, having whirls $n\ n$, in combination with the belts $o\ o$, drum o^1, pulley o^3, belt p, and drums $q\ q$, substantially as and for the purpose set forth.

3. The spindle-rail i and feathered spindles K K, having whirls $n\ n$, in combination with the belts $o\ o$, drums $o^1\ o^2$, pulleys $o^3\ o^4$, belts $p\ p'$, drums $q\ q'$, and shipper t, substantially as and for the purpose set forth.

4. In combination with the spindle-rail i, the axis or shaft l, having arms $l^1\ l^1$ and bar l^2, and upright worm or screw L, gearing with the driving-shaft, substantially as and for the purpose set forth.

5. The spindle-rail i and spindles K K, having whirls $n\ n$, belts $o\ o$, drums $o^1\ o^2$, pulleys $o^3\ o^4$, belts $p\ p'$, shaft l, having arms $l^1\ l^1$ and bar l^2, and upright worm or screw L, in combination, substantially as and for the purpose set forth.

6. The feathered and shouldered spindle K, having a whirl, n, in combination with frame J, provided with the rail i and bars $k\ k^1\ k^2$, shaft l, having arms $l^1\ l^1$, pitman l^2, and screw or worm L, substantially as and for the purpose set forth.

7. The combination, with the faller N and slotted pitman v, of the gear-wheel v^2, the axis of which is provided with a crank or its equivalent, having an arm or projection entering the slot of said pitman, substantially as and for the purpose described.

8. In combination with the faller N and slotted pitman v, the slotted crank v^3, having an arm, v^6, adjustably connected to said crank by a headed and nutted bolt, v^5, and provided with a projection entering the slot of said pitman, substantially as set forth.

In testimony that I claim the foregoing as my own I hereunto affix my signature in presence of two witnesses.

WILLIAM D. ISETT.

Witnesses:
J. WM. MISTER,
JAMES H. LANGE.