2 Sheets—Sheet 1.

# J. E. CROWELL.

## SPINNING FRAME.

No. 65,650. Patented June 11, 1867.

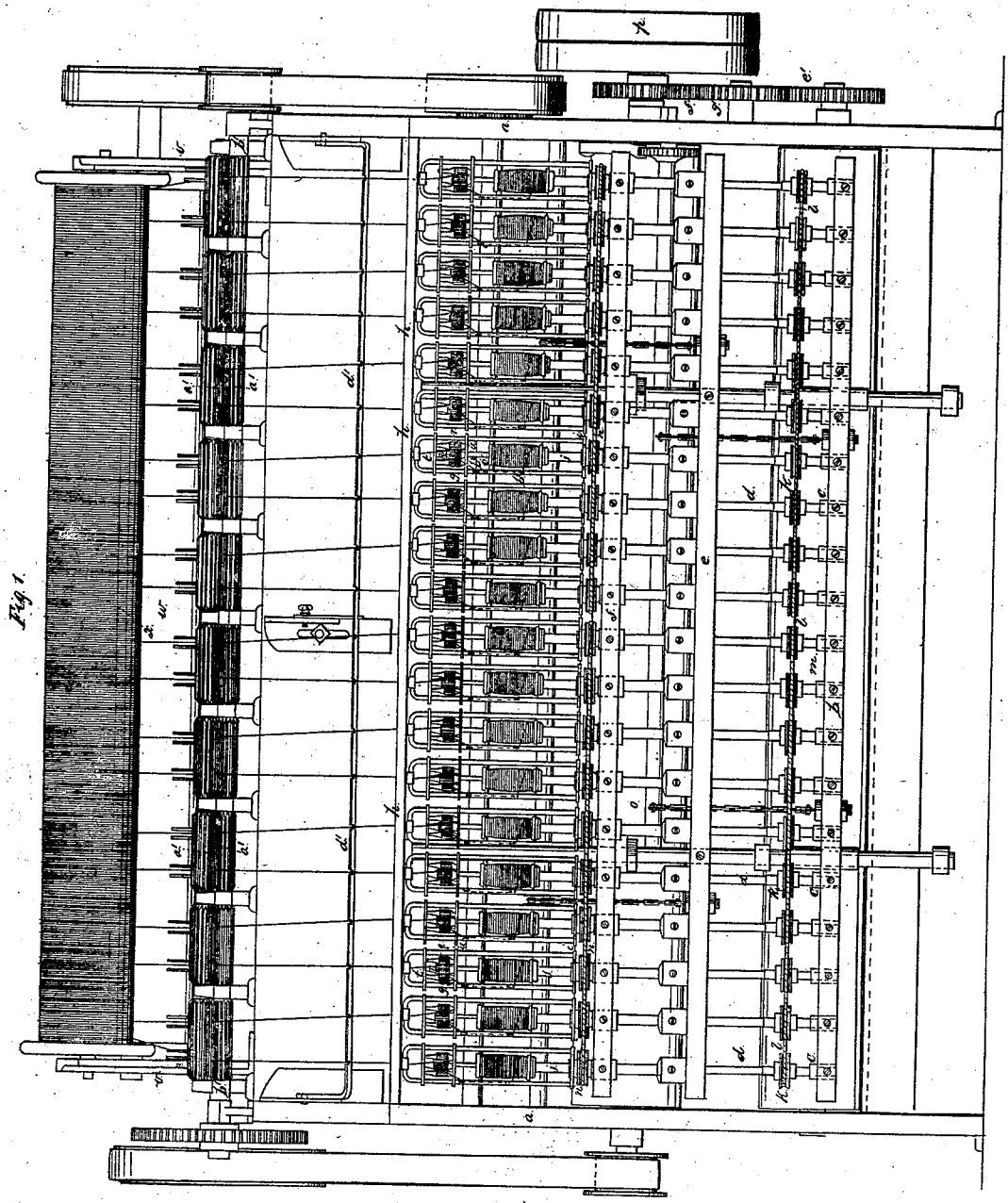

Fig. 1.

Witnesses
M. W. Fitzhugham
E. B. Riddle

Inventor
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his Attys
Crosby & Gould

2 Sheets—Sheet 2.

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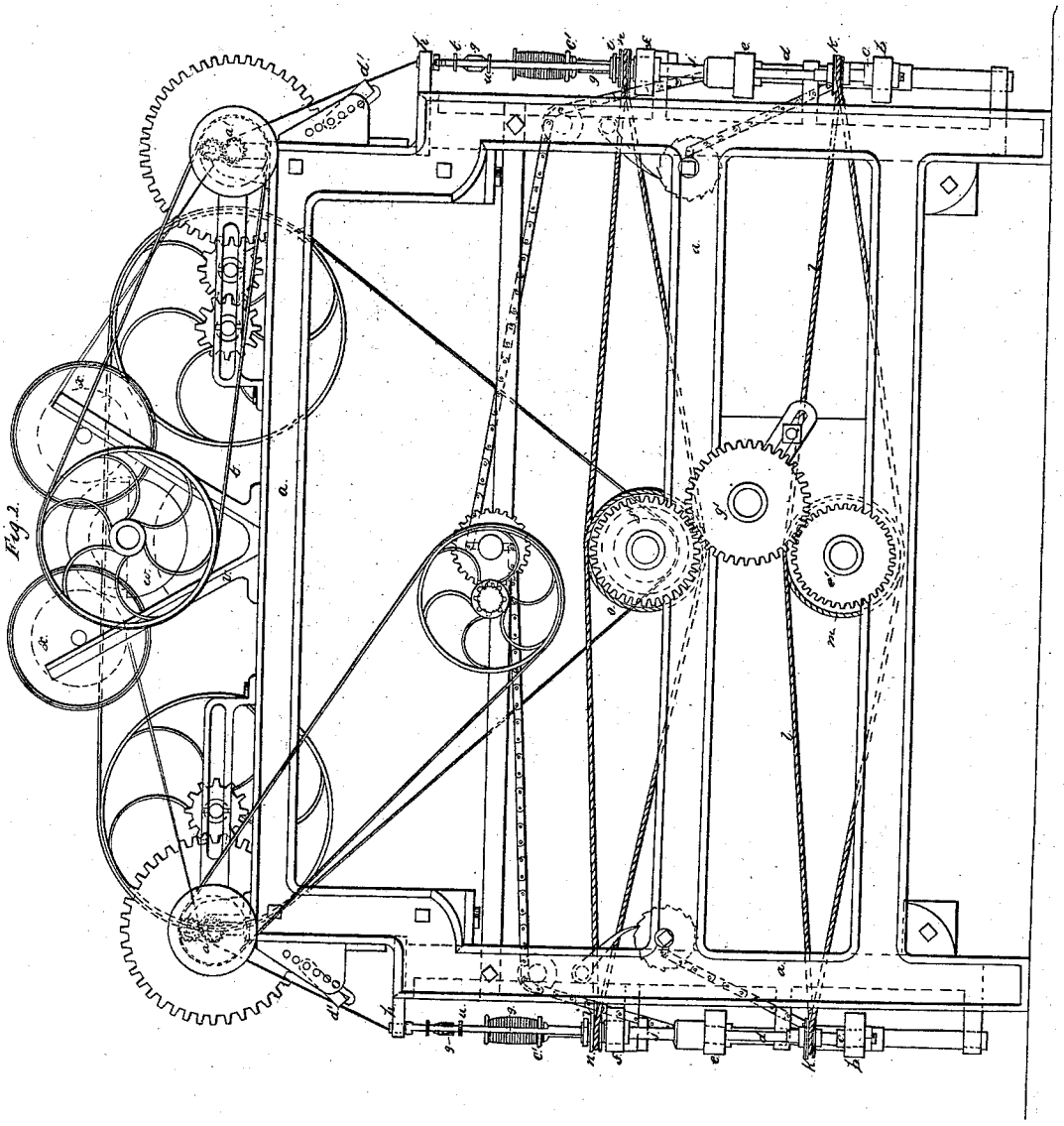

Fig. 2.

Witnesses
M. W. Fitzingham
J. B. Kidder

Inventor.
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# United States Patent Office.

J. E. CROWELL, OF CHELSEA, MASSACHUSETTS.

*Letters Patent No.* 65,650, *dated June* 11, 1867.

## IMPROVEMENT IN SPINNING-FRAME.

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, J. E. CROWELL, of Chelsea, in the county of Suffolk, and State of Massachusetts, have invented an Improved Spinning-Frame; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

The invention relates generally to mechanism for spinning cotton and wool, and the object of the invention is to substitute a stationary spinning-frame for the ordinary mule or jack, and for the ordinarily arranged drawing-rolls thereof, by combining directly with each flyer, or so as to form part thereof, a series of flyer-rolls for drawing out and taking up the sliver while the flyer is imparting the twist thereto, the sliver passing directly from a sliver-spool upon which it is wound to and through the nose of the flyer, and thence between the drawing-rolls in the flyer-frame. The invention consists, therefore, in combining with the flyers of a spinning machine drawing-rolls placed in the flyers, or so as to form part of them, the flyers receiving the sliver directly from a spool or roll, and producing the draw and twist thereof without the intervention of intermediate drawing-rolls, thus greatly simplifying the spinning mechanism and producing a more uniform and finer yarn than can be spun by the ordinary mule or jack spinning. The invention further consists in the employment of an adjustable detaining bar located between the flyers and the sliver-spool, and so constructed and arranged that the twist or the full degree of twist may be so regulated as to be prevented from extending back to the delivery-rolls. The drawings represent a spinning-frame embodying the invention, and showing a full set of spindles and flyers applied thereto—

Figure 1 showing a front elevation, and

Figure 2 an end elevation of the same.

*a* denotes the frame constructed to receive upon each side of it a spindle rail, *b*, in which is a series of socket-bearings, *c*, for a series of spindles, *d*. Each spindle extends up loosely through a traverse rail, *e*, and flyer rail, *f*, and through a flyer, *g*, and the bobbins are placed upon the spindles in the ordinary manner. Each flyer *g* is journalled at top in a nose-plate, *h*, and has at bottom a base-plate, *i*, secured upon the top of a tubular spindle or shaft, *j*. Each spindle, *d*, has upon it a pulley, *k*, from around which a band, *l*, passes to and around a drum, *m*, and each flyer-shaft *j* has upon it a pulley, *n*, from around which a band passes to and around a drum, *o*, the drums *m* and *o* being geared together through an intermediate gear and receiving motion from a driving-pulley, *p*. Within each flyer there is fixed upon or so as to rotate with its spindle *d*, a drawing-roll, *q*, which roll is corrugated or has gear-teeth cut upon its surface that mesh into and drive two similar rolls *r s* journalled in bearing-plates *t u* in the flyer *g*. Now the pulleys *k* and *n* are driven and rotate the spindle *d* and flyer *g* in the same direction, but the relation between the pulleys and drums is such that the spindle is rotated at a greater speed than the flyer, thus producing a relative and increased rotation of the drawing-roll *q* and its connected rolls *r s*. Over the top of the frame is a spool-holder, *v*, consisting of two crotched standards supporting the shafts of a horizontal roll, *w*, against the surface of which the sliver, wound upon two long spools, *x*, rests. Through suitable connections this roll receives motion from the driving-pulley *p*, and by contact turns the spools and allows the slivers to run therefrom. On each side of the frame *a*, at its top, is a series of pairs of delivery-rolls, *a'*, one pair for each two spindles, and the lower rolls of each series are on a common shaft, $b^1$, (supported in stationary bearings,) which receives motion from the driving-shaft, and the upper rolls (whose shafts turn in open bearings) rest upon and receive rotation from the lower rolls. These rolls may be fluted, and their office is to deliver or feed the slivers from the sliver-spool, the sliver passing from the spool between these rolls and thence to the noses of the respective flyers. Passing through the nose of each flyer, the sliver thence passes between the spindle-roll *q* and the roll *r* on one side of it, and thence partially around the roll *q* and between it and the roll *s*, from whence it passes through guiding eyes or hooks $b^2$ to and is wound around the bobbin $c'$ in the usual manner. Now, it will be readily seen that when the mechanism is in operation, and as the sliver is delivered by the rolls *a'*, the twist will be imparted to the sliver by the rotation of the flyer, and that by the increased speed of the spindle in the same direction the drawing-rolls *q r s* will simultaneously draw out the twisted sliver, the twisting and drawing taking place simultaneously over the same portion of the sliver, (or that portion between the bobbin and the delivery-rolls,) thus not only producing a uniform twisting and draw-

ing action upon the sliver, but, from the manner of doing this, enabling the sliver to be much more finely spun and safely attenuated than by the old methods of spinning. To prevent the full degree of twist from extending back to the delivery-rolls, a detainer-bar, *d'*, is interposed between the delivery-rolls and the nose-plate, which bar may be provided with notches, through which the slivers run. This bar is made adjustable, and so that it may be set in such position as to produce such bend or angle in the sliver between the flyer-nose and the delivery-rolls, as may be necessary. The impingement of the sliver upon the edge of this bar keeps most of the twist below the bar, allowing only such degree of the twist to extend above the bar to the delivery-rolls as shall be in accordance with the quality of the slivers being spun or the kind of yarn to be produced. This allows such degree of strain upon the sliver as it will admit of nearest the delivery-rolls, which strain is increased as the twist increases below the detainer-bar. By fixing the bar in a higher or lower position the degree of twist extending above the bar may be increased or diminished, as circumstances may require. The spindle drum *m* is geared to and driven by the driving-shaft of the flyer-drum *o* by gears *e' f'* on the respective drum-shafts and an intermediate gear, *g'*. The spindle-drum gear *e'* and the intermediate gear *g'* are made removable, and may be replaced by others of different diameters so as to produce changes between the relative speed of the spindles (and their drawing-rolls) and the flyers. If, with a given delivery, we wish to have greater twist in the yarn, a larger gear is placed on the spindle-drum shaft so as to increase the revolutions of the spindle and its drawing-rolls, and to obtain less twist the lower gear is replaced by a smaller one. If we wish to deliver the sliver faster from the sliver-spool we place a large gear on the shaft, which drives the gear on the delivery-roll, replacing the gear on the delivery-roll by a corresponding smaller one. As the mechanism for producing the rise and fall of the bobbins (to effect the even laying of the yarn upon the same) and for lowering the spindle rail for removal and replacement of bobbins, and the other mechanism, apart from that described for drawing and twisting the sliver, are not of the essence of this invention, it need not be particularly described.

I claim, in combination with the flyers of a spinning-frame, drawing-rolls arranged within the flyers, when one of said rolls in each flyer is directly upon the spindle and meshes into and drives the others, substantially as shown and described.

I also claim combining with the drawing-rolls and the flyers of a spinning-frame a detainer-bar interposed between the drawing and twisting mechanism and the delivery-rolls, substantially as and for the purpose described.

J. E. CROWELL.

Witnesses:

J. B. CROSBY,

FRANCIS GOULD.