

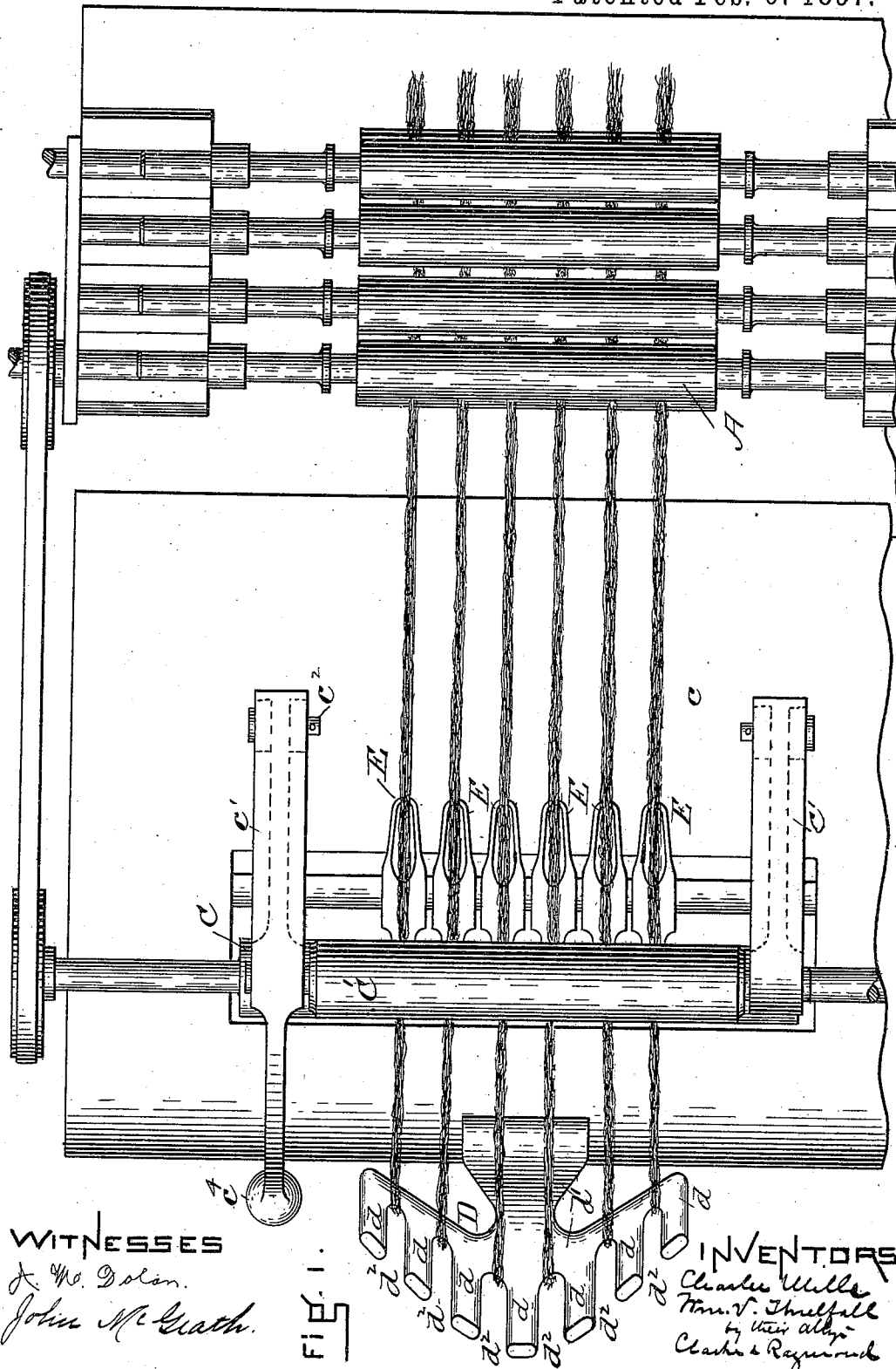
(No Model.)

2 Sheets—Sheet 1.

W. V. THRELFALL & C. MILLS.
DRAWING FRAME.

No. 576,736.

Patented Feb. 9, 1897.



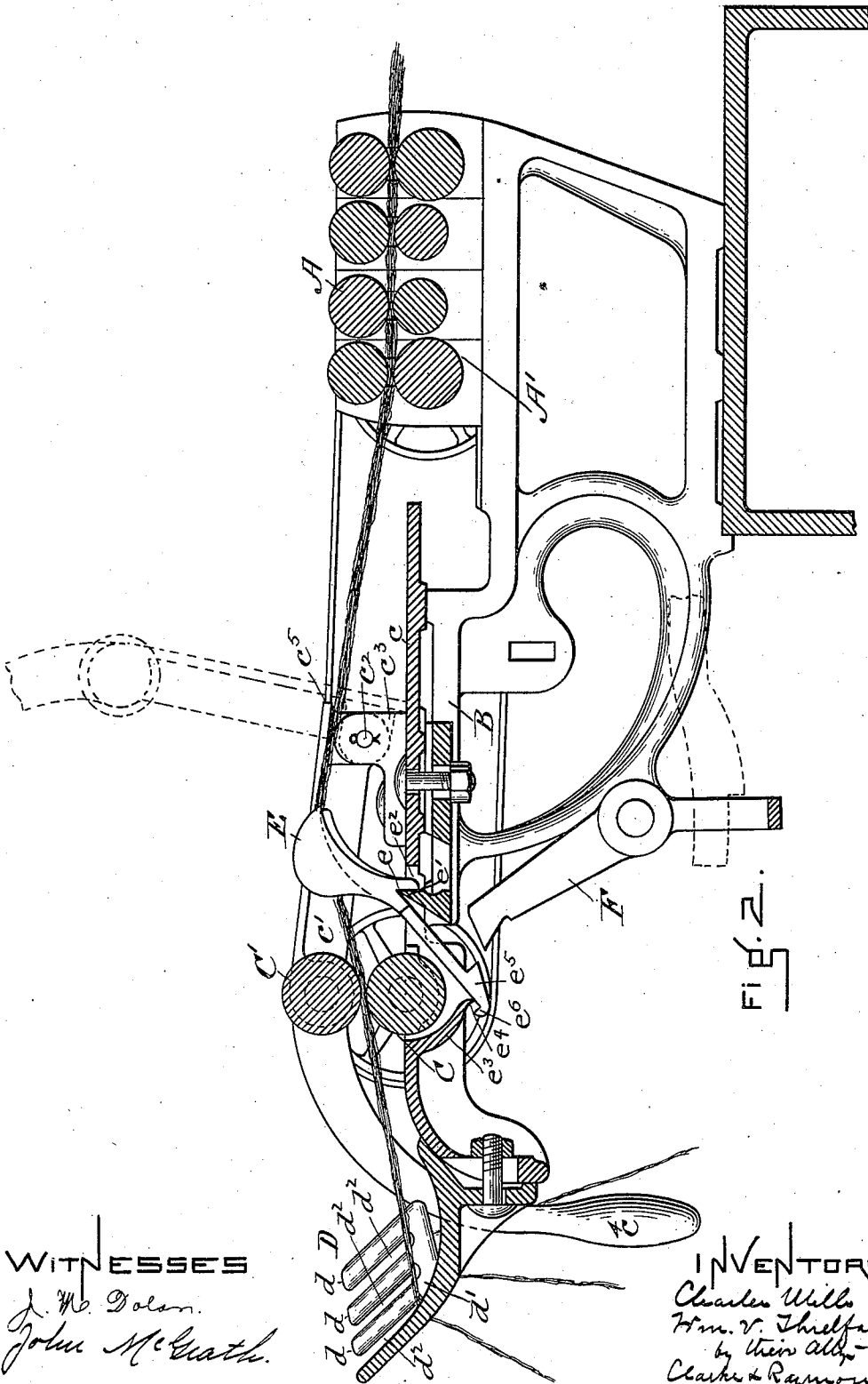
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WITNESSES

J. M. Dolan.
John McQuath.

INVENTORS.

Charles Mills
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UNITED STATES PATENT OFFICE.

WILLIAM V. THRELFALL AND CHARLES MILLS, OF NEWTON, MASSACHUSETTS, ASSIGNORS TO THE PETTEE MACHINE WORKS, OF SAME PLACE.

DRAWING-FRAME.

SPECIFICATION forming part of Letters Patent No. 576,736, dated February 9, 1897.

Application filed August 1, 1894. Serial No. 519,136. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM V. THRELFALL, a citizen of the United States, and CHARLES MILLS, a subject of Victoria, Queen of Great Britain, residing in Newton Upper Falls, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Drawing-Frames, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

Drawing-frames as heretofore organized have had devices called "spoons" for operating, through a vibrating bar, a stop-motion in case a strand of sliver becomes broken; but this mechanism fails of accomplishing all that is desired in that the point or place where the breaking of the strand occurs cannot be defined in advance, and it often happens that the breaking is so close to the drawing-rolls that the end of the strand has passed within the rolls before the machine comes to rest, and the splicing together of the broken ends cannot then be readily accomplished.

By our invention the parting-point of the sliver is definitely established at a distance so remote from the drawing-roll that the machine is stopped before the end of the broken strand can reach the drawing-roll, and this result is accomplished by locating back of the spoons a pair of rolls between which the strands of sliver are passed and one of which is positively driven, and which rolls are timed so that their surface speed very nearly approximates that of the first pair of drawing-rolls. This insures no or very little tension upon the strands of sliver while passing from the safety-rolls over the spoons to the drawing-rolls, and breakage between the safety-rolls and the drawing-rolls cannot, therefore, take place, and any breakage occurring from any of the well-known causes, such as unevenness or twisting, knotting, or any other irregularity, must occur back of the safety-rolls; and in case of breakage after the end of the strand passes the safety-roll its spoon immediately operates and the machine is stopped before the end of the strand reaches the drawing-roll and is left in a position

where the broken end can be immediately attached to it without causing any delay.

The invention further relates to safety-rolls located as above specified and one of which is made removable from the other to permit a broken strand to be quickly led between the rolls.

It further relates to a form of sliver-guide which we have termed a "diagonal" guide, and also to the means for mounting the rolls upon the frame of the machine.

It further relates to various details of construction and organization, all of which will hereinafter be described.

In the drawings, Figure 1 is a view in plan of a machine having the features of our invention. Fig. 2 is a view in vertical central section of the parts shown in Fig. 1.

A represents the group of drawing-rolls. They are of the ordinary type and are operated in the manner common to this type of machine. The frame upon which they are mounted has extended backward a bracket or section B, to which is bolted a plate *c*, which carries the safety-rolls C C' and the sliver-guide D.

The spoons E are of the usual type excepting that they are a little heavier at the tail end and are provided with stops, as herein indicated. They are fulcrumed at *e* on the fulcrum-bar *e'*, which extends upward from the bracket or support B through a hole *e²* in the plate *c*.

The spoons are quicker working than the old type of spoon; but they operate the stop-motion mechanism of the machine through the vibrating bar F in a way common to this class of machine.

The table *c* has preferably cast integral with it downward-extending sections or arms *e³*, the lower ends or edges *e⁴* of which act or acts as a stop or stops in preventing first the forward movement of the upper ends of the spoons beyond the desired point, the lower ends *e⁵* of the spoons coming in contact therewith. It or they also prevent the spoons from becoming dislodged from the fulcrum support *e* by any upward movement, as each spoon is provided at its lower end with an upward-extending lug or stop *e⁶*, which projects when

the spoons are in use below the said plate or stop and thereby prevents the spoon from having more than a slight upward movement. (See Fig. 2.)

5 The roll C is positively driven and is mounted in bearings upon the plate *c*, the plate having a hole for the roll, so that its bearings are flush or substantially flush with the upper surface of the plate. The said roll is positively driven and at a surface speed preferably slightly less than the surface speed of the first pair A' of the drawing-rolls.

10 The roll C' is mounted in a swinging frame *c'*, which is pivoted at *c*² to a bracket *c*³, fastened to the plate *c*, and which has a curved downward-extending handle *c*⁴. By lifting the frame the roll C' is removed from the roll C to the position represented by dotted outline in Fig. 2, and the end *c*⁵ of the frame then acts as a stop or foot for supporting the frame in vertical position, the frame being supported so that the roll is carried slightly beyond the pivotal center and thereby maintains its vertical position by gravity.

15 The diagonal sliver-guide D is bolted to the end of the plate *c*, and it has a series of upwardly-extending fingers *d*, which are inclined outwardly from a common support *d'* and upon diagonal lines backward. These fingers form guiding spaces or recesses *d*², through which the sliver passes and which permit the strands of sliver to be more closely associated or brought together in starting into the machine than would be possible if the guide were upon a straight line; that is, with proper regard for the size of the guiding-recesses and the strength of the fingers which support the guide.

20 In operation the sliver is taken from the cans located back of the machine and passes through the guiding-recesses *d*², one strand through a recess, and between the rolls C' C over the spoons E, which are depressed by them to the position represented in the figures, and thence to the drawing-rolls.

25 Inequalities in the sliver occur before the safety-rolls C C' are reached, and the inequality of such a strand may be detected and held by one of the guides *d*² or by the rolls C C'. 30 Whichever way it is detected, the strain upon the sliver by the drawing action of the safety-rolls C C' causes it to be parted or break upon the back side of the safety-roll; or, in other words, the sliver cannot break from these causes at a point in front of the safety-roll. This gives to the spoons E sufficient time to operate the stop-motion through the vibrating bar before the end of the broken strand passes the space between the safety-rolls and the drawing-rolls and the machine comes to rest with the broken strand exposed.

35 It will be observed that the rolls C C' are located back of the spoons E, so that the strands of sliver are caused to be acted upon by them before they pass over their respective spoons to the drawing-rolls, and it is this relation of the said rolls C C' to the spoons and to the

drawing-rolls which enables them to exert the draft upon the passing strands of sliver between them and the drawing-rolls which is desired, and which also permits them to act as detectors and to part or break the imperfect strands back of the spoons and permits the machine to be stopped before the broken strand is drawn into the drawing-rolls. 70

75 It will be understood that the detector-roll C' is held down by its own weight and by the weight of its frame *c'* sufficiently to resist the tendency of a bunch or enlargement of the sliver to lift it and pass under it. 80

Having thus fully described our invention, we claim and desire to secure by Letters Patent of the United States—

1. In a machine of the character specified, the combination of the drawing-roll, the stop-motion of the machine, the spoons arranged back of the drawing-rolls and connected with and operating the stop-motion as specified, the positively-driven roll C back of the spoons E, the frame *c'* pivoted to the frame of the machine at its inner end, the roll C' connected with said pivoted frame, the said frame locating the said roll C' upon the roll C back of the spoons E and providing means by which it may be moved to a position remote from said roll C, and the said roll thereby uncovered and exposed, as and for the purposes set forth. 85 90 95

2. The combination in a drawing-frame of the bracket B supporting the spoons E, with a plate *c* bolted or attached to said bracket, and the safety-rolls C, C' held by said plate in a position back of the spoons, as and for the purposes set forth. 100

3. The combination in a drawing-frame of the table *e* having the downwardly-extending stops *e*⁴ with the spoons E, the lower ends of which are adapted to come into contact with said stops *e*⁴. 105

4. The combination in a drawing-frame of the spoons E having the stops *e*⁶ at their lower ends, with the plate *e* having the stops *e*⁴, as and for the purposes set forth. 110

5. In a drawing-frame the stationary sliver-spacing guide D comprising a series of inclined fingers or arms extending upward and outward from a support over which the sliver runs, and which support is formed at an angle which brings its forward ends nearer the frame of the machine and its center farther removed from the frame to produce the spaces *d*² between the said fingers which are inclined and brought together, thereby providing for the relatively wide spacing of the strands of sliver as they enter the guide from the sliver-cans and the close spacing of the said strands as they leave the guide and pass to the drawing-rolls. 115 120 125

6. In a drawing-frame the combination of the drawing-rolls, the spoons E placed closely together, the stop-motion with which the said spoons are connected, and the sliver-spacing guide D comprising an angular support over which the strands of sliver are drawn, 130

and the forward ends of which are nearer the frame of the machine than its center, and spacing-fingers extending upward from said support, whereby the strands of sliver are brought and fed or drawn through the machine closely together and a close setting of the spoons permitted, as and for the purposes specified.

7. In a drawing-frame, a sliver-guide comprising a support *d'* bolted or attached to the frame of the machine and having integral arms formed at an angle to each other as specified, and outwardly extending or inclined fingers *d* to form guiding spaces or recesses of the character described.

8. The combination in a drawing-frame of the drawing-rolls, the stop-motion, the spoons connected with and operating the stop-motion as specified, the rolls C, C' arranged back of the spoons and adapted to cooperate therewith and with the drawing-rolls as described, and the angularly-arranged sliver recesses or guides back of said rolls C, C', as and for the purposes set forth.

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Witnesses:

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