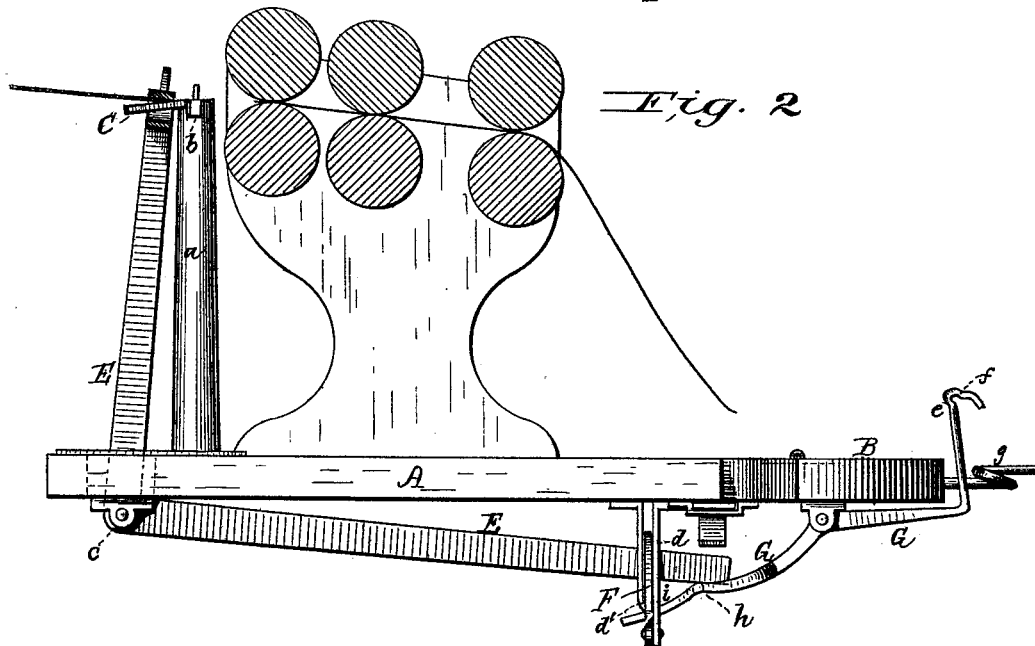
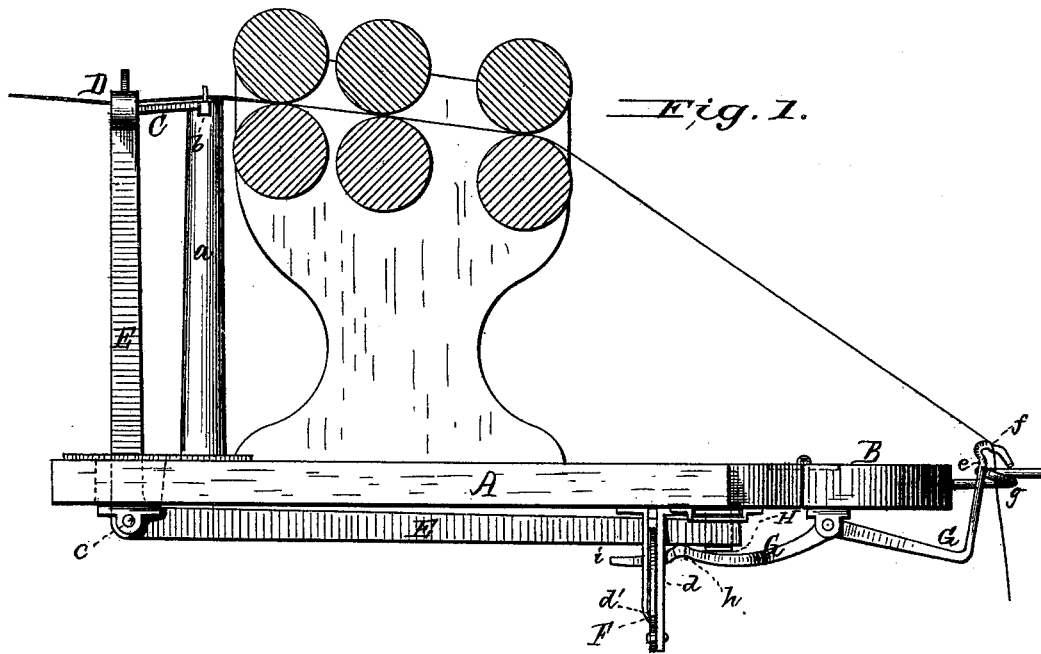


H. C. GRAYSON. 2 Sheets—Sheet 1.  
 Stop-Motion for Spinning-Machines.  
 No. 214,124. Patented April 8, 1879.

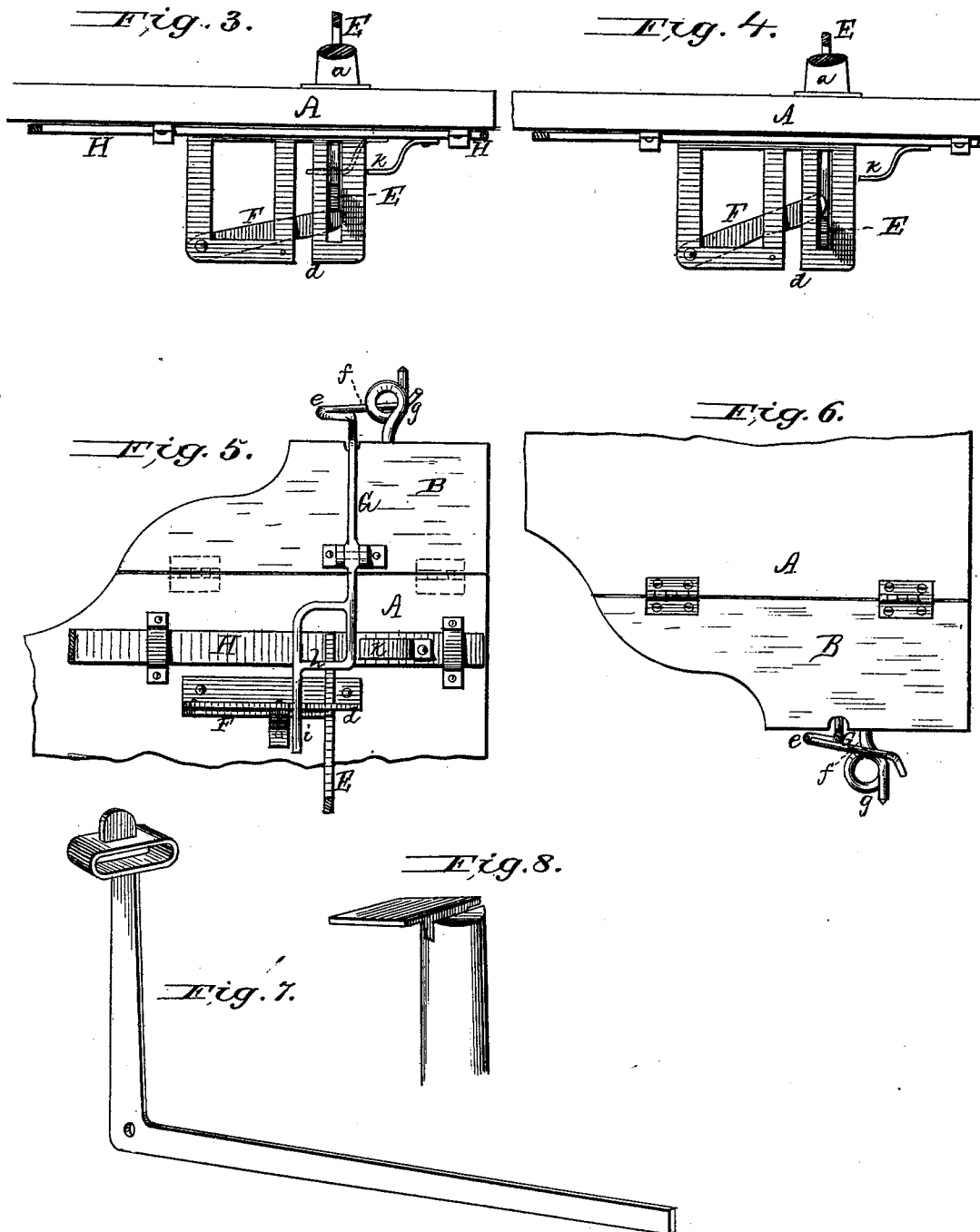


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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN STOP-MOTIONS FOR SPINNING-MACHINES.

Specification forming part of Letters Patent No. **214,124**, dated April 8, 1879; application filed May 29, 1878.

*To all whom it may concern:*

Be it known that I, HENRY C. GRAYSON, of Centreville, in the county of Kent and State of Rhode Island, have invented certain new and useful Improvements in Stop-Motions for Spinning-Machines; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part thereof, is a true, clear, and complete description of my invention.

My said improvements relate to spinning-frames, and have for their prime object the saving of waste which is incident to broken ends, and this is effected by breaking the roving between its spool and the back rolls whenever an end breaks between the front rolls and spindle.

Mechanism has been heretofore devised for accomplishing this end; but, so far as my knowledge extends, it all requires special hand control while piecing up a broken end, and this is an operation which can only be promptly and practically executed by the use of both hands of the spinner, thereby rendering it impracticable to devote the use of one hand solely to controlling the stopping mechanism during the piecing operation.

The main feature of my invention consists in the combination, with a lever and a roving-breaker which breaks the roving between the back rolls and spool, and is controlled through the lever by the yarn between the front rolls and spindle, of a latch or stop which maintains said lever in a non-operative position during the piecing up of an end. This latch or stop may be combined with levers and roving-breakers as heretofore constructed, or to the particular kind of levers and breakers hereinafter described, with the same general result, in that, after the roving has been broken, the lever may be placed in an operative position, but prevented from breaking the roving during the piecing up of an end, after which the latch or stop may be disengaged from the lever and leave it in a condition to automatically stop the roving by breaking it whenever a broken end next occurs.

I do not limit this portion of my invention to any particular form of latch or stop, nor to any particular form of lever, as it is obvious that any equivalent form may be employed, because this latter may be provided with any suit-

able roving-breaker, and it may be arranged at its front end so as to be engaged directly by the yarn; or an intermediate lever may be employed therewith for contact with the yarn, as hereinafter described.

The combination, with the roving-breaker, of its lever and the auxiliary lever constitutes stopping mechanism of practical value, because it is very sensitive, and is capable of being very nicely adjusted, and said combination constitutes a portion of my invention, although therewith the operative, having no latch or stop to maintain the breaker in a non-operative position, must use one of his hands for that purpose, as heretofore.

Another feature of my invention consists in the combination, with a roving-breaker, its lever, and a latch or stop, of an auxiliary or yarn lever, which is controlled at one end by the yarn between the front roll and spindle, and controls with its opposite end the roving-breaker lever and its latch.

With this combination of mechanism I am enabled to mount my stop-motion in spinning-frames which have hinged guide-eye boards, and locate the yarn-bearing of the auxiliary lever adjacent to the guide-eye.

By setting the roving-breaker lever and its latch the roving-breaker will be rendered inoperative, and meanwhile permit the roving to pass from spool to rolls during the piecing of an end, and when the end is pieced and the yarn bears upon the auxiliary lever this latter releases the latch and assumes automatic control of the roving-breaker and its lever.

Whenever a spinning-frame is idle the yarn between the front rolls and spindles is slack to that extent that it would be liable to permit such movement of the lever with which the yarn is in contact as would cause the roving-breaker to be so set that the rovings would be broken when the frame was next started up unless each breaker was first thrown back by hand. So, also, when the belt is thrown off, the slackening of speed on the spindles causes the yarn to be slackened, and this might so far permit the roving-breakers to operate as to break all the rovings before the frame came to a full stop.

In order to provide for these contingencies, my invention further consists in the combination, with a series of roving-breakers in a spin-

ning-frame, of a stop-rod which renders all the breakers inoperative. This stop-rod may be made in various ways. It may be partially rotative, and carry a bent finger or cam beneath the lever of each breaker, or adjacent to any moving portion thereof, so that when turned the several fingers will, by their contact, prevent any movement of the breaker; or it may be a sliding rod with fingers for engaging with each breaker or some moving portion thereof. This stop-rod may be rotated or moved longitudinally by hand, or it may, as is preferable, be connected with the belt-shipper, which is readily effected with a sliding stop-rod.

In all roving-breakers which are controlled by the yarn between the spindles and front rolls that lever or portion of a lever which is in contact with the yarn may properly be termed a "yarn-lever," even if it be directly connected with the breaker.

It is important that mechanism of this class be so arranged with relation to the rolls and roller-beam that it will not be liable to derangement during the wiping up or cleaning of the frame. I have, therefore, mounted my roving-breaker lever beneath the roller-board, so that, as heretofore in similar machines, said lever offers no obstruction to wiping adjacent to and beneath the rolls.

The importance of keeping the roller-beam comparatively free from lint and dust is well known, as its presence in undue quantities, as before stated, is conducive to bad spinning.

To more particularly describe my invention, I will refer to the accompanying drawings, in which—

Figure 1 represents, in section, a set of rolls with my stop-motion shown in side view, as if operating normally. Fig. 2 represents the stop-motion when uncontrolled by the yarn and the roving broken. Figs. 3 and 4 represent, in front views, the roving-breaker lever, its guide and latch, and show, respectively, the lever supported by the latch and free therefrom, and they also illustrate the stop-rod. Fig. 5 represents the under side of the guide-eye board and roller-beam for showing the auxiliary lever. Fig. 6 represents, in top view, the front side of the roller-beam, the guide-eye board, and the outer end of the auxiliary lever. Fig. 7 represents, in perspective, the roving-breaker lever. Fig. 8 represents, in perspective, a knife-plate.

The drawing-rolls are mounted, as usual, in standards supported by the roller-beam A, to the front edge of which is hinged, as usual, the guide-eye board B, it being thus mounted so that it may be lifted when bobbins are to be removed from the spindle.

The roving-breaker may be variously constructed; but the one herein shown is novel in that it consists of a knife-plate and an elongated open eye, which are so arranged with relation to each other that the plate occupies the eye when the roving is to be broken.

The knife-plate C is stationary, and is mount-

ed on the roller-beam behind the back roll on a standard, a, which is usually cast solidly with the plate, and provided with a vertical slot, b, for receiving a traversing rod, which carries roving-guides.

The roving-eye D has an elongated aperture, which can freely receive the end of the knife-plate. This eye may be open at its under side, if desired, for the ready insertion of roving. The knife-plate C and eye D constitute the roving-breaker, however the latter may be operated, so long as these parts are brought into such relations that when separated the roving can pass freely to the rolls, and when in conjunction they will break the roving.

The surfaces of the knife-plate and roving-eye are perfectly smooth, so as not to be liable to catch and retain dirt, lint, &c.

The roving-eye D is mounted, in this instance, on the upper end of the vertical arm of a bell-crank lever, E. The vertical arm occupies an opening in the roller-beam, and the lever is pivoted at c to the under side thereof, near the opening. The horizontal arm of lever E extends forward to a point near the front edge of the roller-beam, and occupies a slot in a guide-plate, d, which prevents any lateral movement. This arm of the lever is sufficiently heavy to promptly drop whenever it is unsupported.

The latch or stop F is pivoted at its lower end, so that it may freely move within certain limits in a plane at right angles to the lever, adjacent to the guide-plate d, and partially across its slot. When the end of the lever is raised the latch can fall partially beneath and sustain the lever until the latch is displaced by hand or otherwise. This latch or its equivalent, in combination with any kind of roving-breaker and lever, constitutes an important feature of my invention, whether the latch or stop be arranged to support the lever or to otherwise maintain the lever in a fixed position for rendering the roving-breaker inoperative during the piecing of an end, instead of requiring the breaker to be controlled with the hand during said operation, as heretofore.

The auxiliary or yarn lever G is pivoted to the under side of the hinged guide-eye board B, and at its front end it is bent upward, and then laterally at nearly right angles to its length, as at e, so as to afford a proper surface at f for the yarn to bear upon on its way from the rolls to the spindle through the guide-eye g, and when this end is depressed by the yarn it rests upon or is closely adjacent to the upper surface of the guide-eye, which serves as a seat for steadying the yarn-lever.

At the rear end of the auxiliary lever there is an arm, h, which affords on its upper surface a bearing for the adjacent end of the roving-breaker lever, so that when the outer end of the auxiliary lever is depressed, and so held by the yarn, its inner end will support lever E and permit the roving to freely pass through the roving-breaker.

The combination of the roving-breaker, its lever, and the auxiliary lever, without the latch, constitutes a stop-motion of great value, because the yarn exercises a depressing force upon the auxiliary lever, instead of being subject to a supporting strain, as would be the case if the outer end of a roving-breaker lever were suspended on the yarn. Moreover, the yarn is in contact with the auxiliary lever closely adjacent to the guide-eye, where the yarn is more firm and solid than it is nearer the rolls; and if a lever be suspended or supported on the yarn, it would require to be in contact therewith sufficiently above the guide-eye or roller-board to admit of sufficient fall to properly operate the roving-breaker.

With suspended levers, if such be used, as heretofore, with top-roll lifters, the latch would serve as a supporting device to prevent the lever from falling during the piecing up of an end, which would leave both hands of the operative free to be engaged in piecing. The latch, in such cases, may be wholly controllable by hand, both for engaging with the lever and disengaging therefrom; or one or both of these movements may be effected automatically through the movement of the roving-breaker lever and the auxiliary lever. I have so constructed my stop-motion that both movements of the latch are effected through the movements of the roving-eye and the auxiliary lever. The latch is so mounted that normally it rests edgewise on the bottom of its guide-slot at *d'*, Figs. 1 and 2, which is on the rear of the plate *d*, with its upper end slightly across the lever-slot therein, so that when the operative, with his finger, pushes the roving-eye back and away from the knife-plate *C* the latch is moved outward by the lever, and then falls inward under the lever, as shown in Fig. 3, and supports it. Now, in order to release the lever from the latch, I have provided the auxiliary lever at its rear end with a latch-finger, *i*, which lifts the latch away from the roving-breaker lever and allows said lever to rest upon the top of arm *h* of the auxiliary lever whenever the outer end of said lever is depressed.

The stop-rod *H* is preferably mounted beneath the roller-beam at the front of the latches. It is mounted in suitable bearings and provided with fingers *k*, there being as many of these as there are breakers. When (see Figs. 3 and 4) this rod is wholly moved to the right hand the fingers are not below the levers *E* of the roving-breakers, and these are therefore free to operate; but when moved toward the left, all the breakers on that side of the frame are rendered inoperative because each lever *E* will be maintained or supported by its adjacent finger *k*.

It will be seen that this rod might be located above the roller-beam, and its fingers arranged to engage with the roving-eyes for holding them back; and I do not limit myself to any particular arrangement of the stop-rod, so long as it be the equivalent of the one shown, and capable of rendering the several breakers in-

operative during the stopping and starting of the spinning-frame.

Referring now to Fig. 2, the mechanism is shown in position following the breaking of an end. If there were no roving-breaker, the sliver or roving would continue to pass through the rolls until the end was pieced, thus causing that much soft waste; but as the roving is broken immediately following the breaking of the end, the only waste which occurs is a length of sliver equal to the distance through the rolls. The particular waste referred to is not the only objection, because the running sliver is liable to float to the right or left, and by mingling with other adjacent ends either cause their breakage or follow with them to their spindles and make imperfect yarn, which must eventually result in waste or injury to the fabrics into which they may be woven. As soon as an end breaks the outer end of the auxiliary lever rises, its rear end falls, permits the adjacent end of lever *E* to fall, and causes the roving-breaker to operate. The latch is controlled by the latch-finger *i* on auxiliary lever *G* during this movement, so that the latch cannot engage with lever *E*, and so prevent its proper fall. When the operative proceeds to piece up the broken end he first clears the front roll, or the roll-board of the short length of sliver, then with his finger throws back the roving-eye *D*, whereby the front end of the lever *E* is lifted above the latch, which then falls inward and supports it, thus leaving the roving-breaker inoperative, and the roving-eye ready to receive the roving, which is then passed through it and between the rolls. The broken end having been regained from the bobbin and united with the sliver, as usual, the auxiliary lever having meantime been depressed, the latter is maintained in that position by the yarn until the next break occurs. The depression of the front end of the auxiliary lever displaces the latch from beneath the lever *E*, so that the only manipulation necessary is at the roving-eye and at the outer end of the auxiliary lever.

It will be seen after the guide-eye board is turned upward and then back to its original position that the rear end of the auxiliary lever resumes its controlling position with relation to the latch and roving-breaker lever.

It will also be seen that when the roving-eye has moved forward the strain on the roving causes the eye to engage closely with the knife-plate and insures a prompt breakage of the roving.

I do not limit myself to a latch or stop of any particular construction, for it can be largely varied, provided it be the equivalent of that shown, and can maintain the roving-breaker in an inoperative position. It will, in the combination stated, constitute a portion of my invention, whether it is automatically moved for releasing the roving-breaker from its control, or whether it requires special handling for that purpose.

Having thus described my invention, I claim

as new and desire to secure by Letters Patent—

1. The combination, with a roving-breaker which breaks the roving in a spinning-machine back of the rolls and a lever which is controlled by the yarn between the spindle and front roll, and which controls the roving-breaker, of a latch which maintains the lever and roving-breaker in an inoperative position, substantially as described, whereby the roving may freely pass through the roving-breaker and the rolls during the piecing of a broken end, as set forth.

2. The combination, with a roving-breaker and a lever which is connected to and by its weight operates the breaker, of an auxiliary yarn-lever which is controlled by the yarn and

controls the roving-breaker, substantially as described.

3. The combination, with a roving-breaker, its lever and latch, of an auxiliary lever which is controlled by the yarn and controls the roving-breaker and its latch, substantially as described.

4. The combination, with a series of roving-breakers in a spinning-machine, of a stop-rod which renders all of the breakers inoperative during the stopping and starting of the machine, substantially as described.

HENRY C. GRAYSON.

Witnesses:

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PHILIP A. SWEET, 2d.