2 Sheets—Sheet 1.

F. FEARON.

Stop-Motion Device for Twisting-Machines.

No. 220,363. Patented Oct. 7, 1879.

Fig. 1.

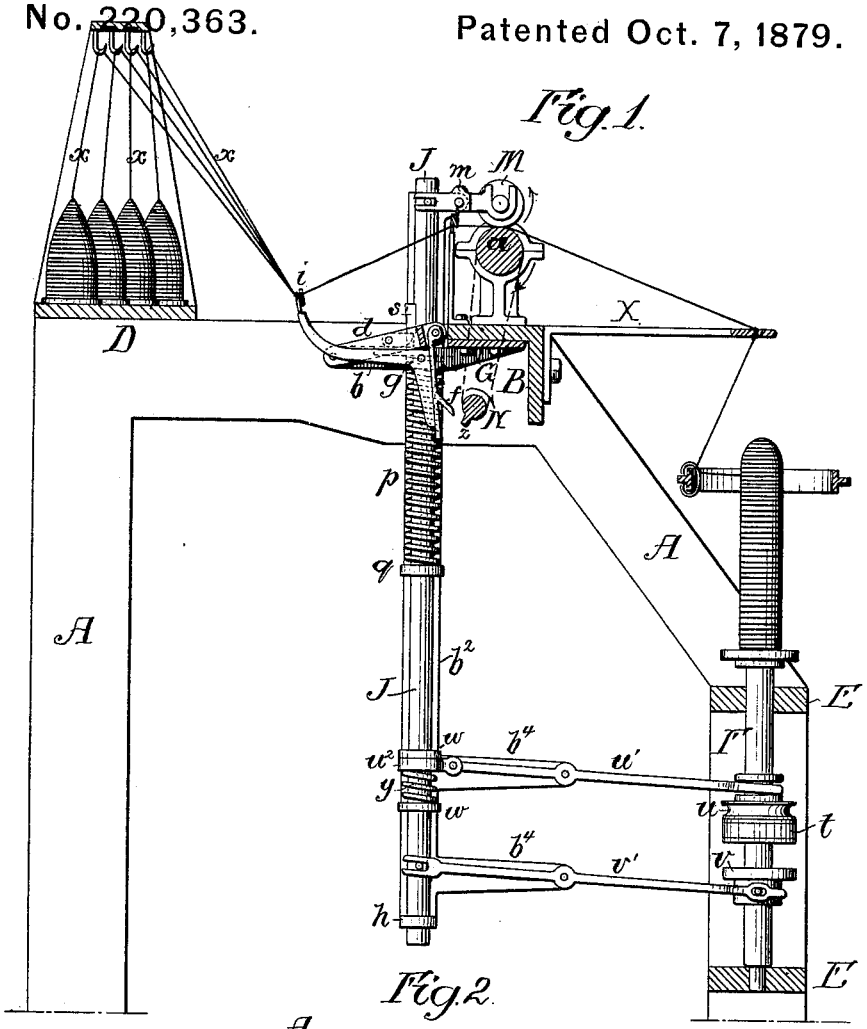
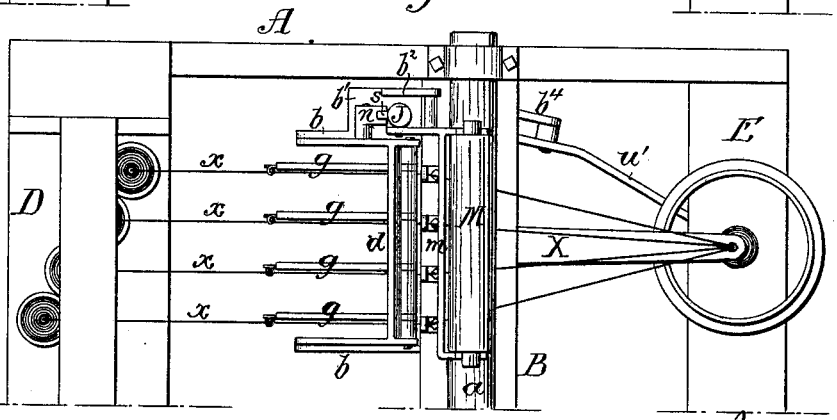


Fig. 2.



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2 Sheets—Sheet 2.

F. FEARON.

Stop-Motion Device for Twisting-Machines.

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Fig. 3

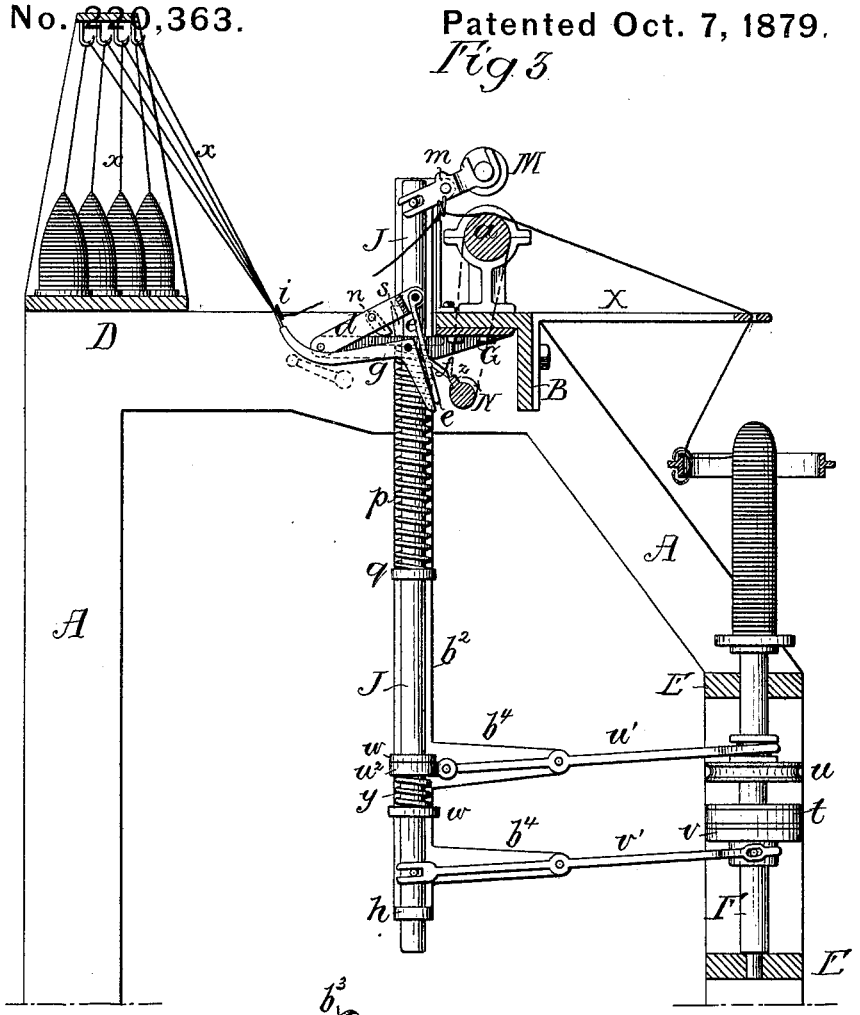
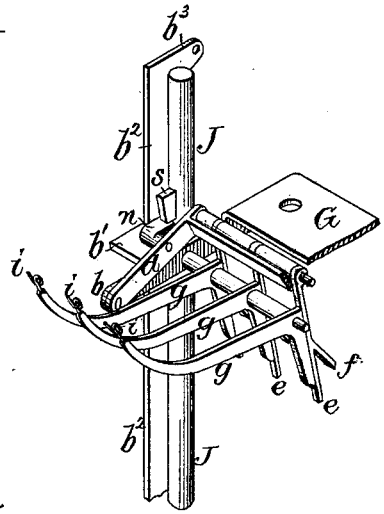


Fig. 4



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UNITED STATES PATENT OFFICE.

FRANCIS FEARON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN STOP-MOTION DEVICES FOR TWISTING-MACHINES.

Specification forming part of Letters Patent No. **220,363**, dated October 7, 1879; application filed June 27, 1879.

To all whom it may concern:

Be it known that I, FRANCIS FEARON, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Stop-Motion Devices for Twisting-Machines, of which the following is a specification.

The object of my invention is to construct a simple and effective stop-motion device for attachment to twisting-machines; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1, Sheet 1, is a transverse section of sufficient of a twisting-frame to illustrate the application of my improvements thereto; Fig. 2, a plan view of the same; Fig. 3, Sheet 2, a transverse section similar to Fig. 1, but with the parts in different positions; and Fig. 4, a perspective view of part of Fig. 1.

A represents one of the end frames of the machine; B, the roller-beam; D, the back board, and E E bearings for the spindles F, of which one only is shown, with its corresponding strands and stop-motion devices, the thread to be produced consisting of four strands.

On the top of the beam B are bearings for a shaft, *a*, which extends longitudinally from end to end of the machine, and is rotated by any suitable means; and to the under side of the beam is secured a plate, projecting from and forming part of which are arms *b b*, a table, b^1, and an upright standard, b^2, the upper end of the latter having a projection, b^3, and its lower end two arms, b^4 b^4. To the outer ends of the arms *b* is hung a frame, *d*, and to a rod at the front end of the latter are pivoted a series of bars, *e*, each having on its front edge a finger, *f*. These bars *e* rest upon, and are supported by, the short arms of a series of bell-crank levers, *g*, hung to the arms *b*, and having long arms provided with eyes *i*.

A vertical shaft, J, is adapted to a bearing in the table b^1 and in a lug, *h*, at the lower end of the standard b^2, the upper end of the shaft carrying pins adapted to the slotted end of a lever, *m*, which is hung to the projection b^3 of the standard, and is forked at the front end, so as to form bearings for the journals of a short roll, M, arranged directly above the shaft *a*.

To one of the arms of the frame *d* is pivoted a trigger, *n*, which bears upon the table b^1, and under the circumstances described hereinafter co-operates with a projection, *s*, on the shaft J, so as to support or release the latter, a coiled spring, *p*, intervening between the under side of the table b^1 and a collar, *q*, on the shaft.

The spindle F has a fixed collar, *t*, and two sliding sleeves, *u* and *v*, the former being grooved for the reception of a belt from the adjacent driving-shaft or drum, and being so hung to the end of a lever, u^1, that it can turn freely on the spindle. The sleeve *v* is carried by the end of a lever, v', and is so secured thereto that it cannot turn on the spindle.

The levers u^1 and v' are hung to the arms b^4 of the standard b^2, and the short arms of said levers are connected to the shaft J in the manner shown in Figs. 1 and 3, the end of the lever v' being forked and slotted for adaptation to pins on the shaft, and the end of the lever u^1 carrying a pivoted ring, u^2, which embraces the shaft, and is arranged between two collars, *w*, thereon, a spring, *y*, intervening between the ring and the lower collar.

Extending longitudinally across the machine in front of the fingers *f* of the pivoted bars *e* is a shaft, N, on which is a rib or projection, *z*, this shaft being rotated in the direction of the arrow by a belt from the shaft *a*, as shown by dotted lines, or in any other suitable manner.

The operation of the device is as follows: When the machine is running properly the parts are in the positions shown in Fig. 1, the shaft J being elevated and supported by the trigger *n*, the driving-sleeve *u* being in contact with the collar *t* on the spindle E, and the sleeve *v* free from contact therewith. The threads *x* pass from the cops on the back-board, first over hooks on an elevated frame; thence through the eyes *i* on the levers *g*; thence through eyes on projections on the beam B; thence between the shaft *a* and the roller M, which rests thereon; thence through an eye on a projecting plate, X, in front of the

beam B, and, finally, to the device by which the strands are twisted and delivered to the bobbin, an ordinary ring and traveler being shown in the present instance for effecting this operation.

The rotation of the shaft *a* in the direction of the arrow causes a rotation of the roll M in the direction of its arrow, and a consequent drawing of the strands *x* from the cops and feeding of the same forward, as required. The tension on the strands causes the elevation of the long arms of the levers *g*, the bars *e* consequently hanging in such a position that their fingers *f* are out of the path of the rib *z* on the revolving shaft N, as shown in Fig. 1. Should one of the strands break, however, as shown in Fig. 3, the long arm of its lever *g* will fall, and the short arm of said lever will thrust forward the bar *e*, which rests thereon, the finger *f* being thus brought into the path of the rib *z*, which strikes the finger, raises the bar, and with it the front end of the frame *d*, to which said bar is hung. The effect of this movement is to withdraw the trigger *n* from beneath the lug *s* on the shaft J, and the latter, under the action of the spring *p*, is instantly depressed, so as to lift the roll M clear of the shaft *a*, and operate the levers u^1 and *v'*, so as to remove the sleeve *u* from contact with the collar *t* on the spindle F and bring the sleeve *v* into contact therewith. The separation of the roll M from the shaft *a* causes a stoppage in the feeding of the strands, and the sleeve *v* acts as a brake on the collar *t*, and effects the stoppage of rotation of the spindle F.

After the broken ends of the strand have been connected the lever *g* is lifted by means of the vibrating rod shown by dotted lines in Fig. 3, or by a cam or other suitable means, and held in an elevated position thereby, while the shaft J is elevated until the trigger *n* can again catch under the lug *s*, so as to support the shaft, the effect of the elevation of the latter being to bring the roller M again into contact with the shaft *a*, and to remove the sleeve *v* from contact with the collar *t* and bring the sleeve *u* into contact therewith, thus resuming the rotation of the spindle F and the feeding of the strands.

The object of the spring *y* between the ring u^2 of the lever u^1 and the collar *w* of the shaft J is to prevent the straining of the lever due to an undue elevation of the shaft, the spring being compressed if the upward movement of the shaft is continued after the sleeve *u* comes into contact with the collar *t*.

When the shaft J is depressed the end of the trigger *n* bears against the face of the lug *s*, and thereby maintains the frame *d* in the elevated position shown in Fig. 3, so as to prevent the rib *z* on the shaft N from striking the fingers *f* of the bars *e*.

When the proper tension is again imparted to the strands *x* after starting the machine, the supporting-rod is turned down, so as not to interfere with the falling of any of the levers *g* on the next breaking of the strand.

In carrying out my invention the exact construction shown in the drawings need not be adhered to in all cases. For instance, a vibrating arm might be substituted for the ribbed shaft N, and the arm or shaft might act directly on the lower ends of the bars *e* instead of on fingers *f*. The spring *p* might also be dispensed with, and the shaft J allowed to fall by its own weight or with the aid of a supplementary weight; and rigid arms on the shaft might be substituted for the levers u^1 and *v'*, the position of the sleeves *u* and *v* in such case, however, being reversed.

I claim as my invention—

1. The combination of the plate G, having arms *b b* and table *b'*, the lever *m*, the feed-roll M, carried thereby, the shaft J, connected to said lever *m*, and provided with a lug or projection, *s*, the frame *d*, having a trigger, *n*, and bars *e*, the levers *g*, and a device for acting on the bars *e* when the latter are projected, all substantially as set forth.

2. The combination of the spindle F, having a collar, *t*, the sleeve *u*, the lever u^1, and its ring u^2, the shaft J, having collars *w w*, and the spring *y*, as specified.

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

FRANCIS FEARON.

Witnesses:

ALEXANDER PATTERSON,

HARRY SMITH.