

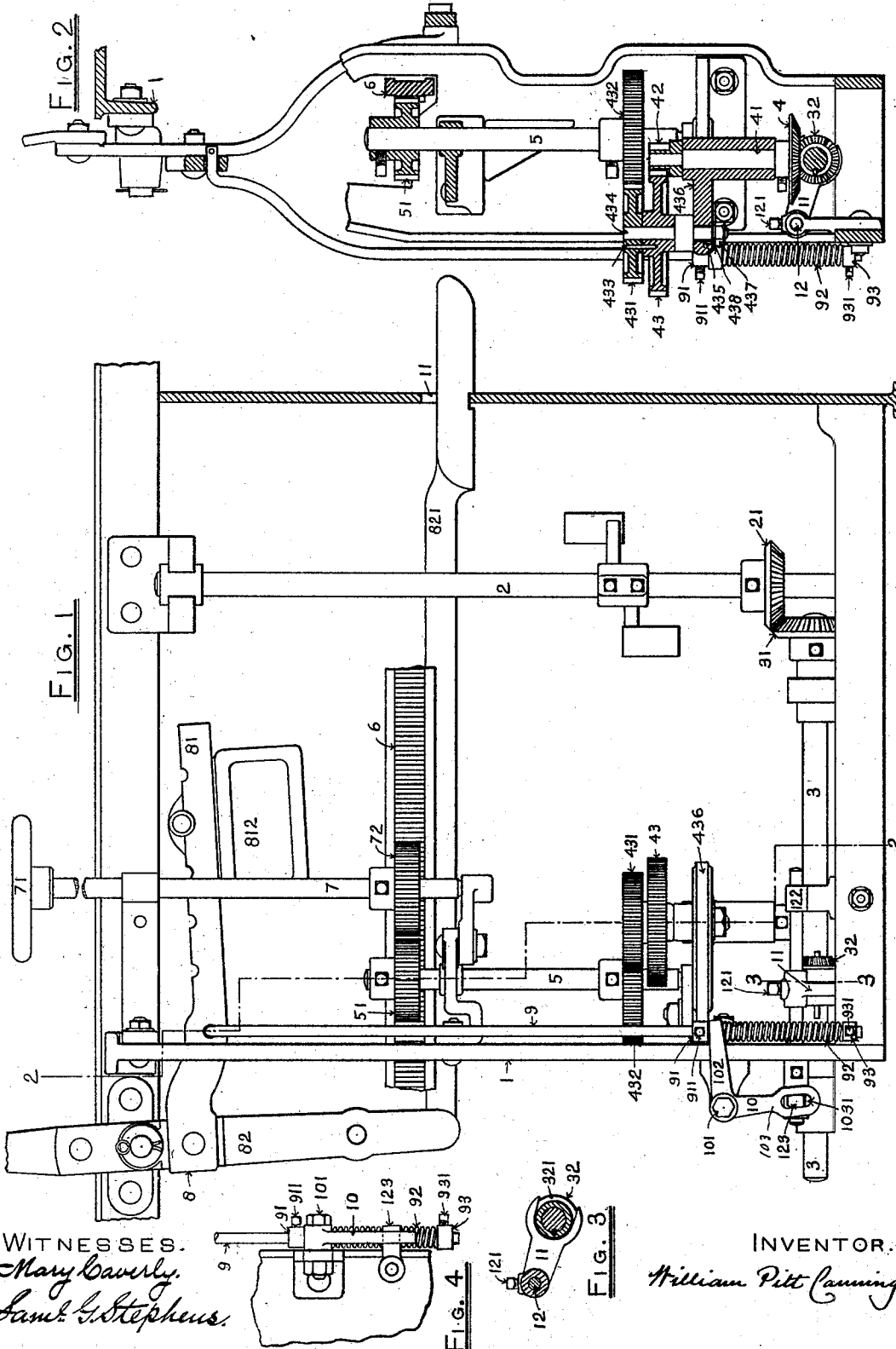
(No Model.)

2 Sheets—Sheet 1.

W. P. CANNING.
FLY FRAME.

No. 505,436.

Patented Sept. 26, 1893.



WITNESSES.
Mary Sawyer.
Sam'l Stephens.

INVENTOR.
William Pitt Canning

(No Model.)

2 Sheets—Sheet 2.

W. P. CANNING.
FLY FRAME.

No. 505,436.

Patented Sept. 26, 1893.

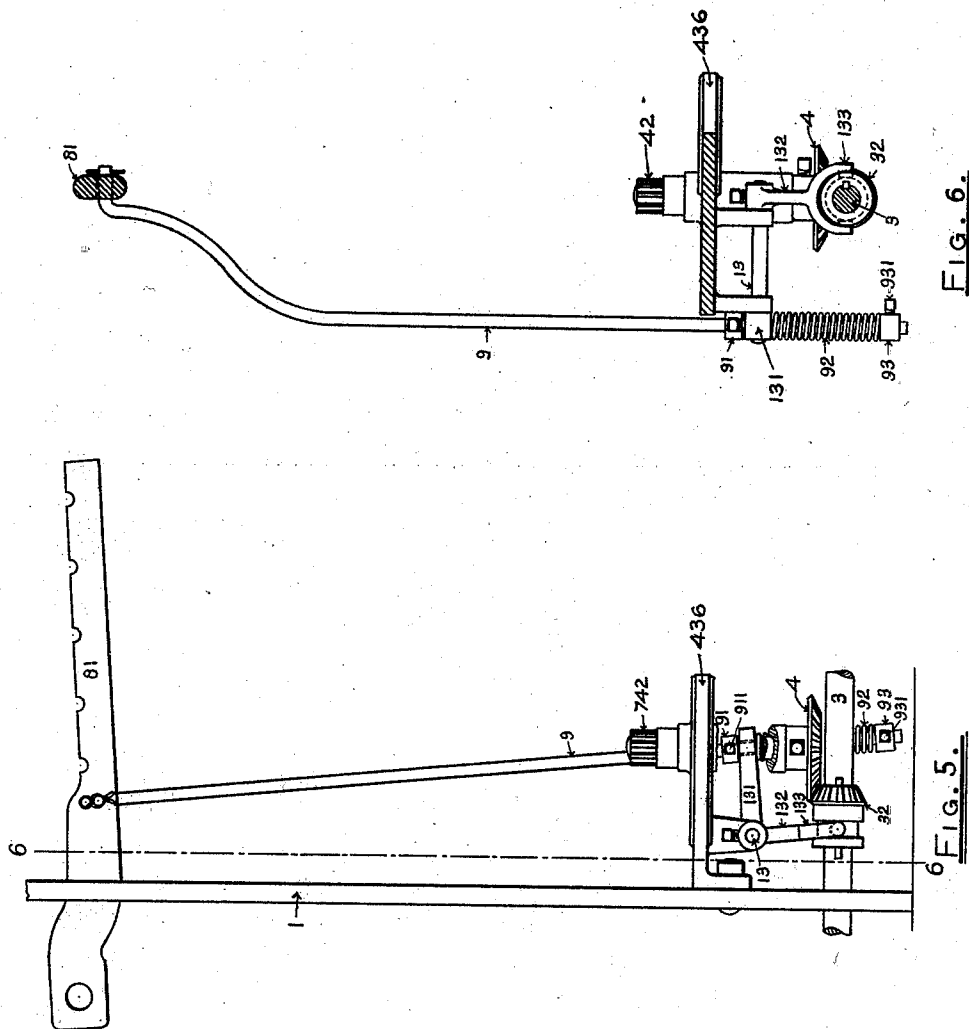


FIG. 6.

FIG. 5.

WITNESSES.

Mary Beverly.

Sam'l G. Stephens.

INVENTOR.

William Pitt Canning.

UNITED STATES PATENT OFFICE.

WILLIAM PITT CANNING, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE
LOWELL MACHINE SHOP, OF SAME PLACE.

FLY-FRAME.

SPECIFICATION forming part of Letters Patent No. 505,436, dated September 26, 1893.

Application filed May 8, 1893. Serial No. 473,402. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PITT CANNING, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Fly-Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to spinning machines of the class known as fly-frames, and, in particular, it relates to the devices which are employed in fly-frames for the purpose of moving the cone-rack to shift the cone-belt along the cone-pulleys, and to the connections between such devices and the stop-motion devices which are employed in such frames.

United States Letters Patent No. 484,776, granted to me October 25, 1892, shows and describes, and also claims, a certain form and arrangement of the parts whereby motion is transmitted automatically from the tumbling-shaft of a fly-frame to the cone-rack, and presents, also, connections with the automatic stop-motion devices of the fly-frame, of such character that, whenever the shipping devices of the fly-frame are operated automatically to effect the transfer of the driving-belt from the fast pulley on the driving-shaft to the loose pulley on the said shaft, a break or disconnection shall be occasioned in the train of transmitting gearing. This break or disconnection leaves the cone-rack free to be moved by hand into any desired position in the fly-frame during the stoppage of the fly-frame, such movement by hand being effected, for instance, in winding up the frame by hand after the completion of the winding-on upon one set of bobbins and preparatory to restarting the fly-frame with a fresh set of bobbins.

The present invention is in the nature of an improvement upon the invention which is mentioned above as being presented and covered by the patent just mentioned, and its main objects are to secure a simplified construction and arrangement of parts, and to enable the break or disconnection in the gearing, and the re-engagement, to be occasioned without danger of unintentionally gaining or losing a tooth in consequence of slight move-

ments of the gears occurring during the time of the break or disconnection.

My present invention consists in a certain novel construction and combination of parts which I shall now proceed to describe with reference to the accompanying drawings, in which latter are represented the best embodiments thereof that have yet been devised by me.

The characteristic features of the invention are particularly pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a view in rear elevation of part of a fly-frame with my invention applied thereto, sufficient of the fly-frame being shown to render evident the relations and connections of my improved devices. Fig. 2 is a view thereof in vertical section on the dotted line 2—2 of Fig. 1, looking from the right in the latter figure. Fig. 3 is a view in detail in vertical section on the dotted line 3—3 of Fig. 1. Fig. 4 is a detail view showing in elevation, as viewed from the left, in Fig. 1 certain of the parts which are represented in the latter. Fig. 5 is a view in rear elevation showing a modification. Fig. 6 is a view in vertical section on line 6—6 of Fig. 5, looking toward the right in the latter figure.

In the drawings, 1 is the machine-frame.

2 is the tumbling-shaft.

3 is a horizontal shaft which is geared to the lower end of the tumbling-shaft by gears 21 and 31, 32 is a bevel-pinion mounted on said shaft, 3, and in mesh with a bevel-gear, 4, on a short upright shaft, 41, which carries at its upper end a spur-pinion, 42, that serves to transmit motion through a train of spur-gears and pinions, 43, 431, 432, to the upright shaft, 5, the latter having mounted on its upper end a spur-pinion, 51, in mesh with the teeth of the cone-rack, 6. The gear, 43, and pinion, 431, are connected, as by a pin, 433, and turn together upon a stud, 434, the lower end of which passes through a slot at 435 which is provided in a supporting piece, 436, the stud being clamped in place in said slot by means of a nut, 437, and washer, 438, on its threaded end below the supporting piece,

436. The pinion, 431, may be replaced by others of varying sizes, and, after change thereof, the stud, 434, may be shifted in slot 435 in known manner to place the teeth of the pinion, 431, in proper mesh with those of the gear, 432, which last is mounted on the shaft, 5. By the described devices intermittent motion is transmitted automatically to the cone-rack while the fly-frame is in regular operation.

The general working and relations of the foregoing parts will be understood from my patent hereinbefore mentioned, and that granted to me November 1, 1892, No. 485,171.

At 7 is shown an upright shaft provided with a hand-wheel, 71, whereby it may be rotated by hand when desired, and also provided with a spur-pinion, 72, in mesh with the teeth of the cone-rack, 6, the said shaft serving to enable adjustment of the position of the cone-rack to be effected by hand, as will be made to appear hereinafter.

At 8 is the usual stop-motion lever, it having a notched arm, 81, extending out substantially horizontally and loaded with a weight, 812, and also having a depending arm, 82, to which is pivotally connected one end of a hooked or notched latch, 821, the hooked or free end whereof projects through a hole, 11, in a portion of the framing, and remains engaged with the edge of the said hole in the manner shown in Fig. 1 during the regular working of the fly-frame.

In my Patent No. 484,776, I have shown the stop-motion lever, 8, combined with a certain arrangement of parts whereby, when the hooked or notched latch is disengaged from its hold on the stationary framing, and the said lever is allowed to turn under the influence of the weight that is applied thereto in manner as described herein, a break is occasioned in the train of gears by which the upright shaft corresponding with that marked 5 herein is operated from the horizontal shaft herein marked 3. In the said patent, the break is effected by raising a movable arm or gear-carrier supporting a series of spur-gears and pinions. Herein, I combine the said stop-motion lever with an arrangement of parts which it is intended shall secure the same general result; but herein the parts are much simplified and are differently arranged and operated. I employ herein a rod, 9, resembling the rod shown in the said patent, such rod being pivotally connected herein at its upper end with the arm, 81, of the stop-motion lever, 8, and, as in the patent, serves for connecting the stop-motion lever, 8, with the arrangement whereby the engagement of the gearing is broken and re-established. I now cause the said rod, 9, to actuate a rocker having connected therewith a fork entering a groove in the hub of the bevel-pinion, 32, and I spline the said bevel-pinion on the said shaft, 3, or otherwise connect the bevel-pinion, 32, with the shaft, 3, in equivalent man-

ner, so that the bevel-pinion may move endwise of the shaft while still turning therewith.

Figs. 1, 2, and 4, show an embodiment of my invention in which the rocker is constituted by a simple bell-crank lever, 10, pivoted at 101, the arm, 102, of the said lever being connected with the rod, 9, and the arm, 103, thereof, being connected with the fork. The fork is shown at 11, (see also Fig. 3,) its arms entering the groove, 321, in the hub of the bevel-pinion, 32. The eye of the fork is slipped upon a rod, 12, and secured in desired position thereon by a clamping-screw, 121, one end of the said rod passing through a guide, 122, carried by the framing, while the other end thereof passes through a hole in a vertical part of the framing, see Fig. 4, and is provided with an arm, 123, which plays in a slot, 1031, formed in the arm, 103, of the bell-crank lever, 10, as shown clearly in Figs. 1 and 4.

Figs. 5 and 6 show a rocker consisting of a horizontal rock-shaft, 13, provided with a horizontally extending arm, 131, with which the rod, 9, connects, and with a depending arm, 132, having directly connected therewith the fork, 133, which engages with the bevel-pinion, 32, the connection between the arm 132 and fork 133 being effected by casting the two in one piece. In both constructions, the rod, 9, passes through a hole in the arm of the rocker with which it connects, a collar, 91, being placed on the rod above the arm and fixed in place by a clamping-screw, 911, and a spiral spring, 92, being placed on the rod below the arm and compressed between the latter and a collar, 93, which is fixed in place on the end of the rod by a clamping-screw, 931. The object of this spring is to prevent injury and breakage from resulting when the teeth of the sliding bevel-pinion, 32, do not re-enter properly into mesh with the teeth of the bevel-gear, 4, after being disengaged. Should the teeth fail to enter properly into mesh at first, the spring will yield as the stop-motion lever, 8, is moved into the position which it occupies during the running of the fly-frame, and when the rotation of the bevel-pinion, 32, with the shaft, 3, has moved it a sufficient angular distance to place its teeth in proper position relative to those of the bevel-gear, 4, for re-engagement, the spring will operate to throw the bevel-pinion into proper engagement with the bevel-gear. When the stop-motion lever is shifted in position in order to occasion the stopping of the fly-frame, the connections herein presented slide the bevel-pinion, 32, away from the bevel-gear, 4, leaving the cone-rack, 6, free to be adjusted in the direction of its length into any desired position by means of shaft, 7, and its hand-wheel, 71, and spur-pinion, 72.

In consequence of occasioning the break in the gearing by sliding the bevel-pinion, 32, longitudinally of the shaft, 3, on which it is splined, there is no danger of the gearing be-

coming deranged in position in a manner which will interfere with the bevel-wheels becoming re-engaged precisely as they were before, unless the parts are intentionally moved during the time of the disengagement.

In some fly-frames, the rocker may be operatively connected with some member of the stop-motion devices other than the stop-motion lever herein shown.

I claim as my invention—

1. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of said wheels is splined, of a movable member of the stop-motion devices, and connections intermediate the said splined wheel and the said movable member whereby the splined wheel is slid lengthwise of its shaft when the said member of the stop-motion devices is moved, and thereby is disengaged from the other bevel-wheel, substantially as described.

2. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a movable member of the stop-motion devices, a rocker having connected therewith a fork in engagement with the splined wheel and whereby the latter may be slid lengthwise of its shaft, and connections between the said rocker and the said movable member of the stop-motion devices whereby the rocker may be moved from the said member, substantially as described.

3. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a movable member of the stop-motion devices, a fork mounted to move in the direction of the length of the said shaft and in engagement with the splined wheel, and a rocker having an arm which is operatively connected with the said fork, and also having a second arm which is operatively connected with the said movable member of the stop-motion devices, substantially as described.

4. The combination with the cone-rack, and devices for automatically moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a shaft having a pinion in engagement with the cone-rack and a hand-wheel for effecting adjustment by hand, a movable member of the stop-motion devices, and connections intermediate the said splined wheel and the said movable member of the stop-motion devices whereby the splined wheel is slid lengthwise of its shaft when the said member of the stop-motion devices is caused to act, and thereby is

disengaged from the other bevel-wheel, substantially as described.

5. The combination with the cone-rack, and devices for automatically moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a shaft having a pinion in engagement with the cone-rack and a hand-wheel for effecting adjustment by hand, a movable member of the stop-motion devices, a rocker having connected therewith a fork in engagement with the splined wheel and whereby the latter may be slid lengthwise of its shaft, and connections between the said rocker and the said movable member of the stop-motion devices whereby the rocker may be moved from the said member, substantially as described.

6. The combination with the cone-rack, and devices for automatically moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a shaft having a pinion in engagement with the cone-rack and a hand-wheel for effecting adjustment by hand, a movable member of the stop-motion devices, a fork mounted to move in the direction of the length of the said shaft and in engagement with the splined wheel, and a rocker having an arm which is operatively connected with the said fork, and also having a second arm which is operatively connected with the said movable member of the stop-motion devices, substantially as described.

7. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a movable member of the stop-motion devices, a rocker having connected therewith a fork in engagement with the splined wheel and whereby the latter may be slid lengthwise of its shaft, and yielding connections between the said rocker and the said movable member of the stop-motion devices whereby the rocker may be moved from the said member, substantially as described.

8. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a movable member of the stop-motion devices, a fork mounted to move in the direction of the length of the said shaft and in engagement with the splined wheel, and a rocker having an arm which is operatively connected with the said fork, and also having a second arm and yielding connections intermediate the said second arm and the said movable member of the stop-motion devices, substantially as described.

9. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a movable member of the stop-motion devices, a rocker having connected therewith a fork in engagement with the splined wheel and whereby the latter may be slid lengthwise of its shaft, and yielding connections comprising a rod and spring between the said rocker and the said movable member of the stop-motion devices whereby the rocker may be moved from the said member, substantially as described.

10. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of the said wheels is splined, of a movable member of the stop-motion devices, a fork mounted to move in the direction of the length of the said shaft and in engagement with the splined wheel, and a rocker having an arm which is operatively connected with the said fork, and also having a second arm and yielding connections comprising a rod and spring inter-

mediate the said second arm and the said movable member of the stop-motion devices, substantially as described.

11. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of said wheels is splined, of means for moving the splined wheel lengthwise of its shaft, substantially as described.

12. The combination with the cone-rack, and devices for moving the same endwise as required for shifting the cone-belt, the said devices embracing a pair of intermeshing bevel-wheels and a shaft on which one of said wheels is splined, of a rocker having connected therewith a fork in engagement with the splined wheel and whereby the latter may be slid lengthwise of its shaft, and means for moving the rocker, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM PITT CANNING.

Witnesses:

MARY CAVERLY,
SAML. G. STEPHENS.