No. 735,974. PATENTED AUG. 11, 1903.

C. T. HAWLEY.

ROVING CLAMP.

APPLICATION FILED APR. 11, 1903.

NO MODEL.

Fig: 1.

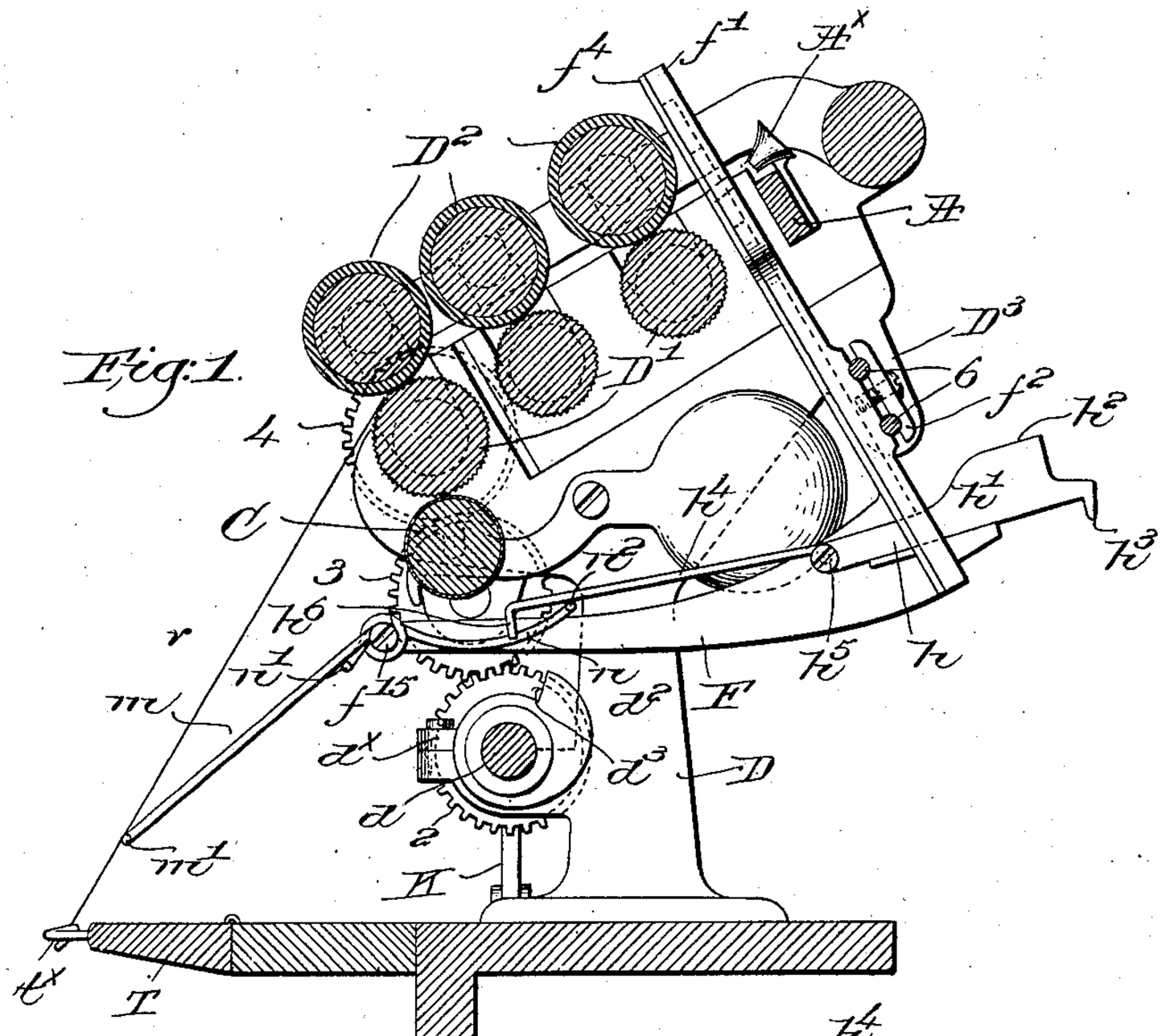


Fig: 4.

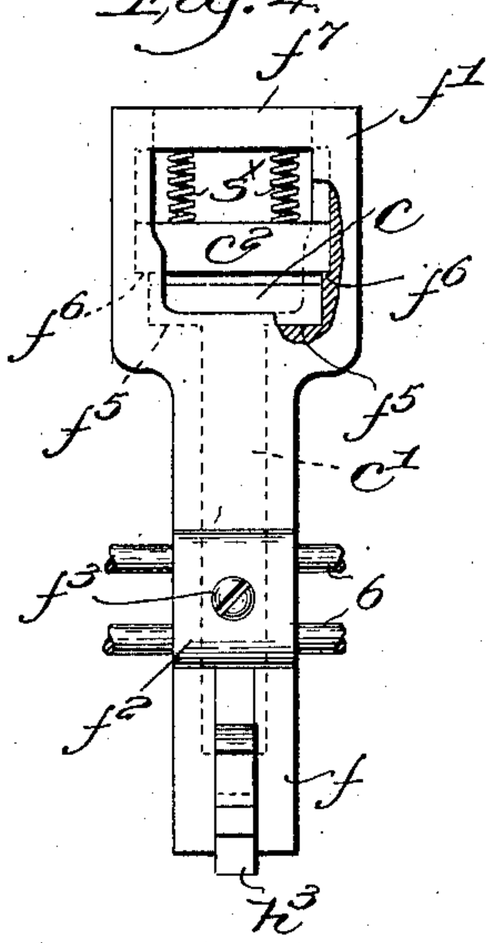


Fig: 5.

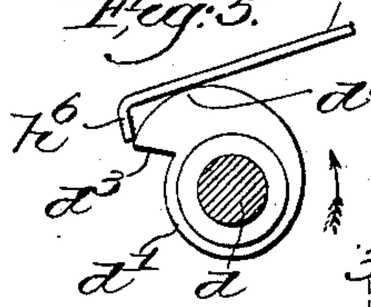


Fig: 2.

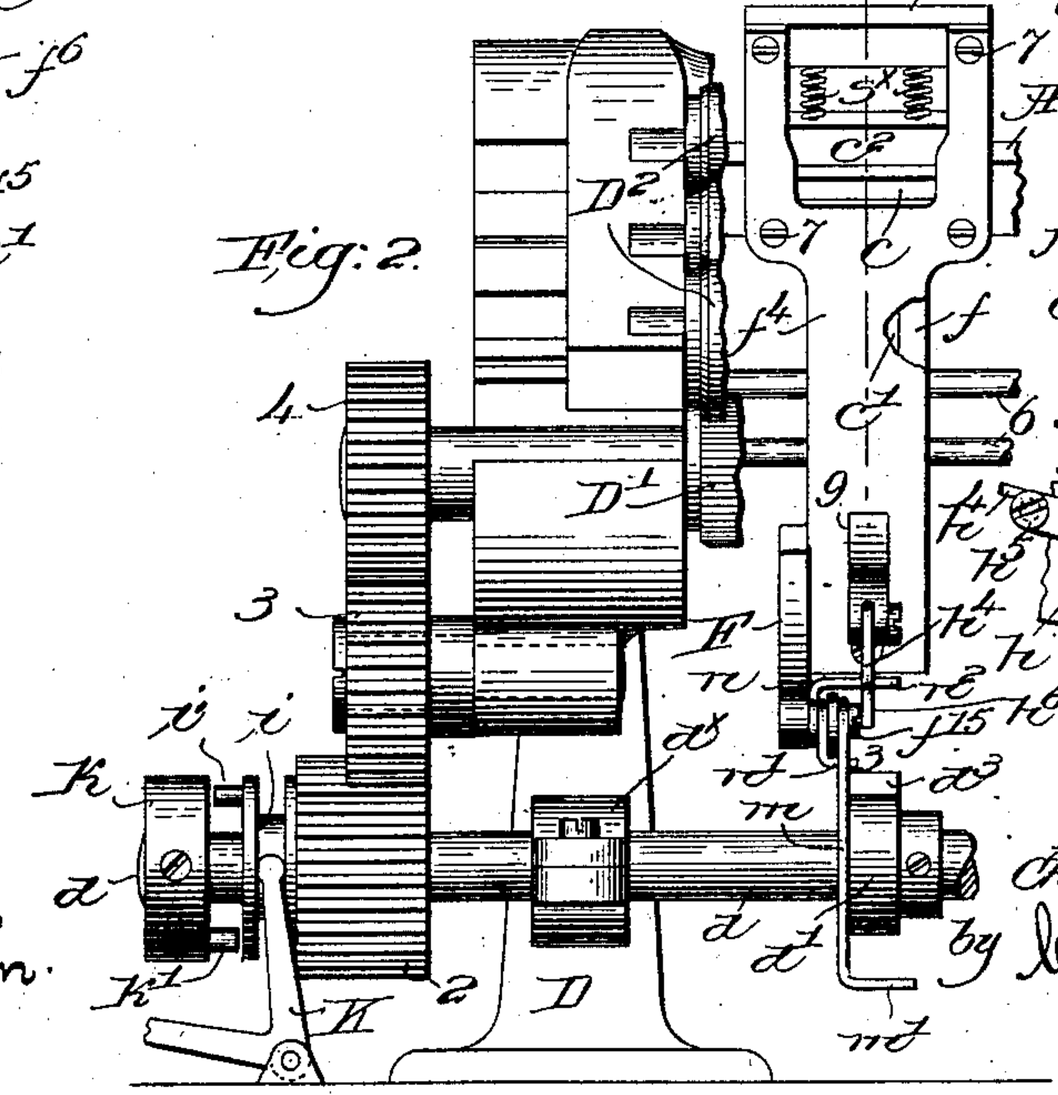
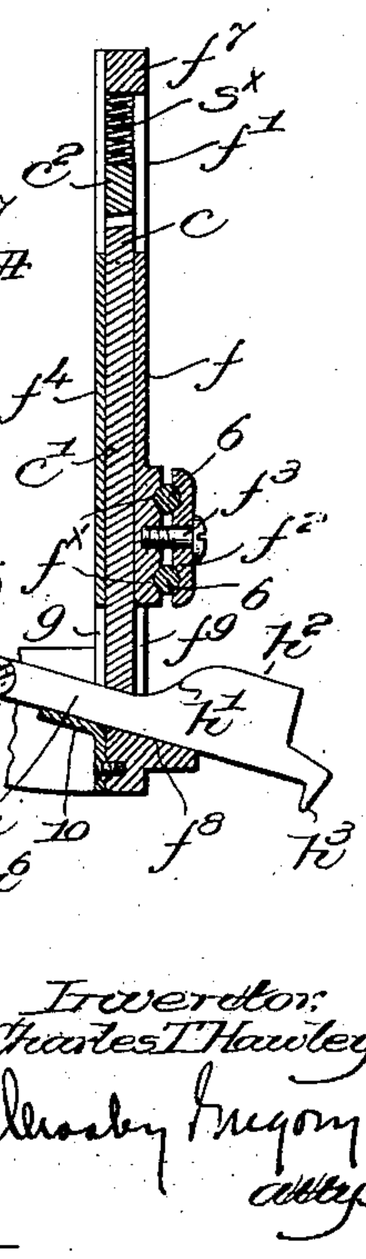


Fig: 3.



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No. 735,974. Patented August 11, 1903.

# UNITED STATES PATENT OFFICE.

CHARLES T. HAWLEY, OF GARDNER, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

## ROVING-CLAMP.

SPECIFICATION forming part of Letters Patent No. 735,974, dated August 11, 1903.

Application filed April 11, 1903. Serial No. 152,149. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES T. HAWLEY, a citizen of the United States, and a resident of Gardner, county of Worcester, State of Massachusetts, have invented an Improvement in Roving-Clamps, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of a novel roving-clamp for spinning and roving machines to stop the delivery of roving to the drawing-rolls upon breakage or undue slackness of a roving, and thereby prevent waste and improve the operation of the apparatus.

In accordance with my invention the operation of the clamp is effected automatically and positively at the proper time, a very light detecting device calling into action the actuating means for the clamp upon the occurrence of an abnormal condition in the roving.

The various novel features of my invention and the several advantageous results obtained thereby will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a partial transverse sectional view of the upper part of a spinning or roving machine with one practical embodiment of my invention applied thereto, the parts being shown in normal running condition. Fig. 2 is a part front elevation thereof, the drawing-rolls being broken off to show the roving-clamp and coöperating parts. Fig. 3 is a vertical section on the line 3 3, Fig. 2. Fig. 4 is a rear elevation of the roving-clamp, partly broken out, showing the clamping-jaws and the support therefor; and Fig. 5 is a detail illustrating the manner of releasing the clamp-actuator and the transmitting member after the operation of the clamp has been effected.

Referring to Fig. 1, the stand D, drawing-rolls D′, top rolls $D^2$, the thread-board T, having usual pigtails, one of which is shown at $t^\times$, the clearer-roll C to clear the roving from the front drawing-roll if the thread or roving breaks between the drawing-rolls and the spindle, and the traverse-bar A, having the usual trumpets, one of which is shown at $A^\times$, Fig. 1, may be and are all of well-known construction and operate in well-known manner. Brackets $d^\times$ on the roll-stands below the drawing-rolls support a shaft $d$, running longitudinally of the frame and continuously rotated in any convenient manner, as by a train of gears 2, 3, and 4, the latter gear on the front roll-shaft.

Upon the shaft $d$ are secured a number of actuators, as many being employed as there are spindles, each actuator being shown as a cam $d'$, having a high portion $d^2$ and a quick drop or shoulder $d^3$, slightly ahead of the high part.

The roll-stands at the back are provided with depending brackets $D^3$, one of such brackets being shown in Fig. 1, to receive two longitudinally-extended and parallel supporting-rods 66 and located one a short distance above the other. An upright elongated casting having a body portion $f$ and an open head $f'$ is mounted on the rods 6, one casting for each actuator $d'$, the casting at its back having rod-seats $f^\times$, Fig. 3, and a cap $f^2$ is clamped to the casting and upon the rods by a clamp-screw $f^3$. The casting is made box-like to constitute a guide and support for the roving-clamp, and a sheet-metal cover-plate $f^4$ is detachably secured to the front of the casting by screws 7, Fig. 2.

As shown in Fig. 1, the upper end of the casting is located between the trumpets $A^\times$ and the receiving side of the drawing-rolls, the cap $f^4$ at its upper end being branched to correspond with the shape of the open head $f'$ of the casting. The head is shaped interiorly to present transverse shoulders $f^5$, Fig. 4, at opposite sides and a second pair of transverse shoulders $f^6$ above them, the former pair normally supporting the lower clamping-jaw $c$, said jaw having a depending foot $c'$, adapted to slide longitudinally in the body of the casting. An upper clamping-jaw $c^2$ normally rests upon the shoulders $f^6$, as shown in Fig. 4, and is maintained seated thereon by suitable springs $s^\times$, interposed between the top of the jaw and a cross-bar $f^7$, rigidly attached to the head $f'$ of the casting. The elongated space between the jaws is located in front of the trumpet and permits the lat-

eral traverse of the roving from side to side as the trumpet is reciprocated by the traverse-bar A. At its lower end the body portion $f$ of the casting is extended to form a bearing $f^8$ below a slot $f^9$ in the casting, the face-plate $f^4$ being correspondingly slotted at 9.

A sliding jaw-closing device, shown as a bar $h$, having at its rear end a cam having a rise $h'$ and a straight part or dwell $h^2$, is extended fore and aft through the slots beneath the lower end of the foot $c'$ of the lower jaw $c$ and is slidably supported on the bearing $f^8$. (See Figs. 1 and 3.)

A portion of the metal struck out from the slot 9 is bent forward at 10 to assist in supporting the sliding member $h$, the latter having a downturned stop-lug $h^3$ at its rear end.

When the slide member is drawn forward, as will be described, the rise $h'$ acts upon the foot $c'$ and raises the lower jaw $c$, clamping the roving between it and the upper jaw $c^2$, and the continued movement of the slide member then lifts the two jaws, the roving being still gripped between them, until the foot rests upon the flat or dwell portion $h^2$. When the jaws first clamp the roving, the pull of the drawing-rolls severs it at the receiving side of the rolls, and thereafter the rise of the two jaws lifts the clamped end of roving above the bite of the rolls. When the member $h$ is pushed back by the attendant to piece up, the jaws descend, bringing the end of the roving back to the bite of the rolls before the jaws separate, such separation taking place when the jaw $c^2$ seats on the shoulders $f^6$ and the jaw $c$ moves down to the shoulders $f^5$. The end of roving thus presented to the rolls will ordinarily be caught and fed into the rolls by the rotation of the latter. Normally the separation between the jaws is amply sufficient to permit a free passage of the roving therebetween as it travels from the trumpet to the rolls.

The size of the yarn or roving is immaterial, as the springs $s^\times$ can be made of the desired strength without adding any weight to the roving when the apparatus is running properly.

An elongated arm F, secured to or forming a part of the casting which supports and guides the clamping-jaws, projects forward beneath and beyond the clearer C and is provided with a horizontal headed stud $f^{15}$, which forms a fulcrum for a two-part controlling device or drop-wire $m$ $n$, the part $m$ extending forward and being bent laterally at its end at $m'$ to rest against the thread or roving $r^\times$ between the drawing-rolls and pigtail $t^\times$. The part $n$ is loosely coiled around the stud $f^{15}$, and its short outer end is bent at $n'$ beneath the part $m$ or detector proper, while its inner lower end is bent at $n^2$ beneath a stout rod $h^4$, pivotally connected at $h^5$ with the bar $h$. The front end of the rod overhangs one of the cams $d'$ and is downturned or hooked at $h^6$. Under normal conditions the thread acting upon the drop-wire $m$ maintains the end $n^2$ of the wire $n$ lifted, and the rod $h^4$ is held in the position shown in Fig. 1 above the cam $d'$; but upon breakage or undue slackness of the thread the hooked rod $h^4$ drops and the shoulder $d^3$ of the cam engages the hook $h^6$, and the rotation of the cam pulls the bar $h$ forward, operating the jaws, as described, to clamp and stop delivery of the roving to the rolls. The flat part or dwell $h^2$ of the cam locks the jaws in raised position and overcomes any tendency to pull the hook $h^6$ backward into the path of the shoulder of the cam, the hook remaining at its extreme forward position. After having pulled the hooked rod fully forward the high part $d^2$ of the actuating-cam acts upon the rod $h^4$ and lifts the hooked end out of the path of the cam-shoulder, as shown in Fig. 5, reducing wear and rendering the operation of the parts easy. I prefer to make the drop-wire in two parts, so that the part $m$ or detector proper can be swung up out of the way when the board T is raised for doffing. If made in one piece, the rear part $n$ would at such time strike the shaft $d$ and interfere with the operation. There is only enough pressure on the yarn to insure the descent of the part $n$ and the fall of the hooked rod $h^4$ upon breakage or undue slackness of the yarn.

It is usually found necessary to put a roving-breaker out of operation when stopping to doff and generally at any time when the frame is stopped in order to prevent the loose or slack yarns causing all of the roving to be broken when again starting up. I have shown means to throw all the roving breakers or clamps out of operation when starting up by providing a simple clutch between the shaft $d$ and the gear 2, the latter being loose on the shaft. The end of the shaft extends through said gear and has fast upon it a clutch member $k$, having one or more pins $k'$, while a sliding cooperating clutch member $i$ is mounted on the shaft and rotates with the gear 2, said clutch member having one or more pins $i'$, the pins $k'$ and $i'$ being extended oppositely and parallel to the shaft, as shown in Fig. 2. A shifter K slides the gear 2 and clutch member $i$ on the shaft to move the pins on the two clutch members into or out of each other's path, as it is desired to rotate or stop rotation of shaft $d$.

Any suitable form of clutch may be employed, and by stopping the shaft $d$ the frame can be started without blocking or rendering each clamp inoperative separately, and when the slack is taken up the shaft $d$ is thrown into operation.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Drawing-rolls, a roving-clamp at the receiving side and normally adjacent the bite thereof, an actuator therefor, and normally inoperative means between the actuator and clamp to coöperate with the actuator upon

breakage of a roving and positively operate the clamp and lock it in operative position and thereafter to move the clamp away from the bite of the rolls.

2. Drawing-rolls, a roving-clamp, comprising a yieldingly-supported, and a positively-movable, clamping member, and means operative upon breakage of a roving to move the latter member and clamp the roving between it and the yieldingly-supported member.

3. Drawing-rolls, a roving-clamp adjacent the receiving side thereof, comprising a yieldingly-supported member and a positively-movable member to coöperate therewith, and means operative upon breakage of a roving to first clamp the roving between said members and thereafter to move said members together beyond the bite of the adjacent rolls.

4. Drawing-rolls, a traversing trumpet, a roving-clamp interposed between the trumpet and the rolls and normally opposite the bite of the latter, and means to operate the clamp, said means including a continuously-rotating member, and a sliding member rendered operative by or through breakage or slackness of a roving to coöperate with the rotating member, such coöperation causing the sliding member to first positively effect clamping of the roving behind the rolls and stop its delivery thereto and then to move the clamp beyond the bite of the rolls.

5. Drawing-rolls, a trumpet, a roving-clamp interposed between the trumpet and the rolls, said clamp comprising a yieldingly-supported upper jaw and a positively-movable lower jaw, the roving normally passing between them to the rolls, a depending foot secured to the lower jaw, and means to operate the clamp, said means including a sliding cam to engage and lift the foot, and cause the jaws to clamp the roving, and an actuator for and to coöperate with the cam upon breakage of a roving.

6. Drawing-rolls, a roving-clamp comprising jaws between which the roving passes to the rolls, a depending foot on one of the jaws, a cam having a jaw-closing portion and a locking portion, a rotating actuator for the cam, and a member connected with the latter and normally maintained by a normal roving out of engagement with the actuator, breakage of a roving permitting said member to coöperate with the actuator to effect the operation of the cam.

7. Drawing-rolls, a roving-clamp, means to actuate it, said means including a sliding cam having a pivotally-connected hook, and a rotating actuator having a shoulder to engage the hook and thereby move the cam to operate the roving-clamp, and means governed by a normal roving to retain the hook in inoperative position.

8. Drawing-rolls, a roving-clamp, actuating means therefor, including a sliding cam having a pivotally-connected hook, and a rotating, shouldered actuator to engage the hook and slide the cam, said actuator having a releasing device to disengage the hook after movement of the cam, and means governed by a normal roving to retain the hook in inoperative position.

9. Drawing-rolls, a roving-clamp behind them and including opposed and normally open clamping-jaws, and means operative automatically by or through breakage of a roving to close the jaws upon the roving and stop its delivery and thereafter to move bodily the closed jaws above the bite of the adjacent rolls, manual return of the jaws to normal condition first moving the roving opposite the bite of the rolls and then releasing it.

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

CHARLES T. HAWLEY.

Witnesses:
THATCHER B. DUNN,
FLORENCE L. MOORE.