

(No Model.)

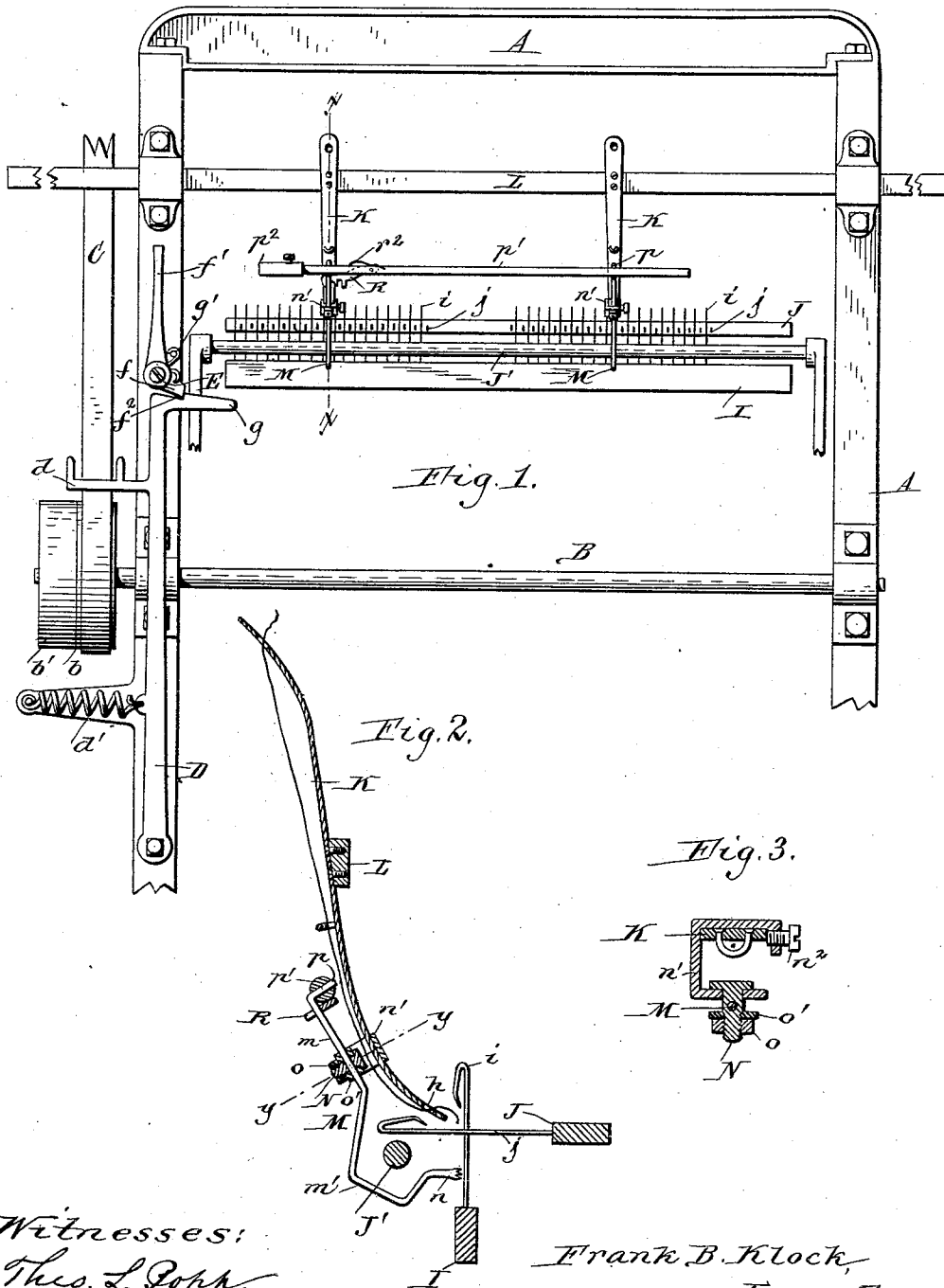
2 Sheets—Sheet 1.

F. B. KLOCK.

STOP MOTION FOR KNITTING MACHINES.

No. 484,594.

Patented Oct. 18, 1892.



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Fig. 4.

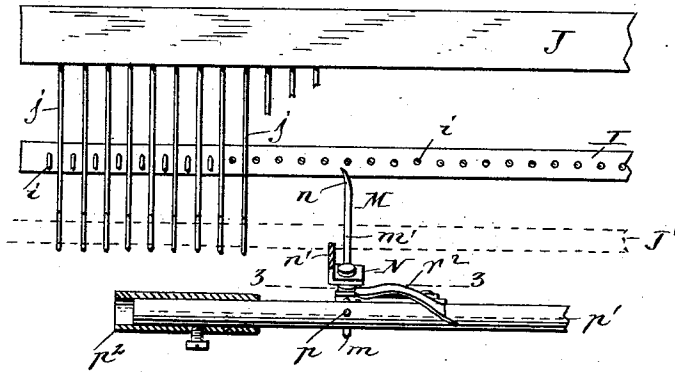


Fig. 5.

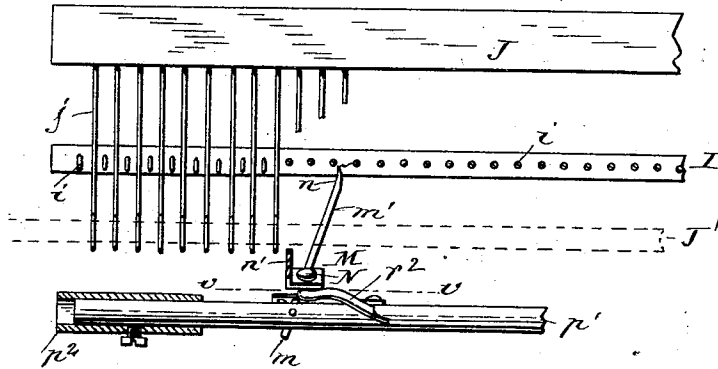


Fig. 6.

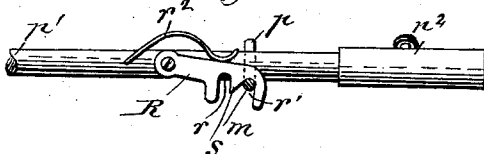
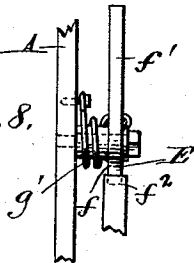


Fig. 7.



Fig. 8.



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UNITED STATES PATENT OFFICE.

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STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 484,594, dated October 18, 1892.

Application filed December 31, 1891. Serial No. 416,687. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. KLOCK, a citizen of the United States, residing at Little Falls, in the county of Herkimer and State of New York, have invented a new and useful Improvement in Stop-Motions for Knitting-Machines, of which the following is a specification.

This invention relates to a stop-motion for 10 knitting-machines, and is intended to arrest the motion of the machine when yarn ravelings or accumulations of yarn collect upon the needles.

In the accompanying drawings, consisting 15 of two sheets, Figure 1 is a fragmentary front elevation of a flat-rib knitting-machine provided with my improvements. Fig. 2 is a vertical transverse section in line $x x$, Fig. 1, on an enlarged scale. Fig. 3 is a cross-section in 20 line $y y$, Fig. 2, on an enlarged scale. Fig. 4 is a plan view of a fragment of the knitting-machine, showing the feeling-finger and connecting parts in their normal position. Fig. 5 is a similar view showing the parts shifted 25 to the position which they occupy when stopping the operation of the machine. Fig. 6 is a fragmentary rear view of the shifting-bar and its catch in their normal position, with the feeling-finger shown in a section taken in 30 line $z z$, Fig. 4. Fig. 7 is a similar view showing the parts shifted and the section taken in line $v v$, Fig. 5. Fig. 8 is a fragmentary end elevation of the trip-pawl and connecting parts at right angles to Fig. 1.

35 Like letters of reference refer to like parts in the several figures.

A represents the main frame of the knitting-machine, and B the driving-shaft, from 40 which the various parts of the knitting-machine are actuated in any well known and suitable manner. This driving-shaft is provided with tight and loose pulleys $b b'$, around which a driving-belt C passes.

D represents an upright shifting-lever, 45 which is pivoted with its lower end upon the main frame and provided near its upper end with an outwardly-projecting fork d , in which the driving-belt runs, and whereby the latter can be shifted from one pulley to another, 50 thereby starting or stopping the machine.

d' is a spiral spring, which connects the shifting-lever with the main frame, and where-

by the lever is moved outwardly when free to shift the belt upon the loose pulley.

E represents a trip-pawl pivoted to the 55 main frame above the shifting-lever and holding the latter against outward movement in the position in which the lever holds the driving-belt upon the tight pulley. This pawl is provided with a short locking-arm f , which 60 extends inwardly, and a long shifting-arm f' , which projects upwardly. The locking-arm engages with a notch f^2 , formed in the upper side of an inwardly-projecting nose g at the upper end of the shifting-lever. The trip- 65 pawl is normally held in engagement with the notch f^2 by a spiral spring g' , surrounding the pivot of the pawl.

I represents the vertically-reciprocating needle-bar carrying the vertical needles i . 70

J represents the horizontally-reciprocating needle-bar arranged in rear of the vertical needles and carrying the horizontal needles j , which project forwardly between the vertical needles. These needles and needle-bars 75 may be of any suitable construction, and are arranged and operated in the usual and well-known manner. As represented in Fig. 1, two sets, each composed of horizontal and vertical needles, are arranged side by side, 80 whereby two pieces of fabric are knitted simultaneously on the machine.

J' represents the usual horizontal supporting-bar, arranged underneath the horizontal 85 needles.

K represents a yarn-guide, one for each set of needles. These upright curved guides are 90 secured with their middle portions to a transverse carrying-bar L, which is supported horizontally upon the main frame and reciprocated in the usual manner. The eye h at the lower end of each yarn-guide is arranged between the hooks of the vertical and horizontal series of needles.

M M represent feeling-fingers which are op- 95 erated by catching against the ravelings or accumulations of yarn upon the vertical needles. Each of these feeling-fingers consists of an upper arm m and a lower arm m' , and passes with its central portion through a per- 100 forated pivot-bolt N. The lower arm of the feeling-finger is bent downwardly around the front end of the horizontal needles and the horizontal supporting-bar, so as to clear the

same, and then upwardly, and is provided at its end with a serrated claw *n*. This claw is arranged so closely to the front sides of the vertical needles that it will clear the same, when the latter are free in moving past the needles with the yarn-guide, but will catch against any ravelings of yarn which may accumulate on any one of these needles. The pivot-bolt *N* of the feeling-finger is pivoted upon the outer portion of a bracket *n'*, which is adjustably secured to the yarn-guide by a clamping-screw *n²*, Fig. 3. The feeling-finger can be moved lengthwise through the opening in the pivot-bolt for adjusting its claw with reference to the needles, and the finger is held in its adjusted position by a screw-nut *o*, applied to the outer screw-threaded end of the pivot-bolt, and a washer *o'*, pressing against the feeling-finger. The upper arm of the feeling-finger is provided with a pin *p*, which projects rearwardly and upwardly and engages in an opening formed in a horizontal trip-bar *p'*, arranged transversely in the machine in front of the yarn-guides. This trip-bar is attached to the yarn-guides by means of the feeling-fingers, and is moved back and forth with the yarn-guides. The end of this bar which is nearest the trip-pawl is provided with an adjustable sleeve *p²*, which is adapted to strike against the upwardly-extending shifting-arm *f'* of the trip-pawl. When the parts are in their normal position, this trip-bar approaches the trip-pawl on its forward stroke, but does not touch it. When a feeling-finger is caught by any ravelings or accumulations of yarn, its lower arm is retarded, and as its pivot is being moved on by the yarn-guide it is turned on its pivot, throwing its upper arm and the shifting-bar attached thereto forward. In this shifted position the trip-bar strikes with its sleeve the trip-pawl and disengages the latter from the shifting-lever, thereby permitting the spring of the latter to move the lever and shift the belt from the tight pulley to the loose pulley, whereby the machine is stopped.

In order to prevent the shifting-bar from being shifted in a reverse direction or away from the trip-pawl by a feeling-finger catching during the return movement of the yarn-guide and to prevent the shifting-bar from being accidentally displaced after it has been shifted toward the trip-pawl, it is locked by a catch *R*. This catch has the form of a hasp or latch, which is pivoted at one end to the rear side of the trip-bar and provided on its under side with two notches *r r'*, arranged one behind the other. These notches are separated by a lug *s*, having an abrupt rear side, which forms the front side of the rear notch *r*, and an inclined front side, which forms the rear side of the front notch *r'*. The front side of the front notch and the rear side of the rear notch are both abrupt. When the feeling-finger and the trip-bar are in their normal positions, the catch rests with its front notch *r'* upon the upper arm of the feeling-

finger, as represented in Figs. 4 and 6. When the feeling-finger is being shifted during its forward movement with the yarn-guide, its upper arm presses against the inclined front side of the lug *s* and thereby raises the catch out of the way until the upper arm has passed the lug *s*, when the catch drops and engages with its rear notch *r* on the upper arm. The rear notch having abrupt sides holds the trip-bar rigidly in position and prevents it from being moved back accidentally or by contact with the trip-pawl. The catch is preferably held yieldingly against the upper arm of the feeling-finger by a spring *r²*, attached to the trip-bar. When the feeling-finger catches against ravelings on the needles while traveling backwardly, the abrupt side of the front notch *r'* holds the finger and trip-bar against movement, and so prevents the bar from being shifted in the wrong direction or away from the trip-pawl. When the needles are free from any accumulations of tangled yarn, the feeling-fingers reciprocate freely in front of the needles and the machine remains in operation, as the trip-pawl is out of reach of the trip-bar. When any yarn accumulates upon any one of the vertical needles, it catches the feeling-finger during its forward movement and the shifting-bar is shifted toward the trip-pawl and the latter is struck by the trip-bar at the end of its forward movement, thereby stopping the machine. After the feeling-finger has been shifted it disengages itself from the tangled yarn on the needles by the continued movement of the yarn-guide.

My improved mechanism stops the machine before any considerable quantity of yarn-ravelings has accumulated on the needles and so prevents the needles from becoming broken and the ravelings from being worked up into the fabric.

I claim as my invention—

1. The combination, with the belt-shifter and the knitting-needles, of a finger having one end arranged near the needles, a trip-bar connected with the finger, and intermediate mechanism whereby the belt-shifter is released upon the catching of the finger, substantially as set forth.

2. The combination, with the belt-shifter and the knitting-needles, of a trip-pawl engaging with said shifter, a finger having one end arranged near the needles, and a trip-bar connected with the finger and adapted to strike the trip-pawl, substantially as set forth.

3. The combination, with the belt-shifter, the knitting-needles, and the reciprocating yarn-guide, of a finger pivoted upon said guide and having one end arranged near the needles and intermediate mechanism whereby the belt-shifter is released upon the catching of the finger, substantially as set forth.

4. The combination, with the belt-shifter, the knitting-needles, and the reciprocating yarn-guide, of a trip-pawl engaging with said shifter, a finger pivoted upon the yarn-guide and having one end arranged near the needles

dles, and a trip-bar attached to the finger and provided with an adjustable portion which is adapted to strike the trip-pawl, substantially as set forth.

5 5. The combination, with the belt-shifter and the knitting-needles, of a finger having one end arranged near the needles, a trip-bar attached to the finger, a catch connecting the
10 trip-bar with the finger, and intermediate mechanism whereby the belt-shifter is released upon the catching of the finger, substantially as set forth.

6. The combination, with the belt-shifter and the knitting-needles, of a finger having
15 one end arranged near the needles, a trip-bar attached to the finger, a catch pivoted to the trip-bar and provided with a notch having abrupt and inclined sides which engage with the finger in the normal position of the parts,
20 and a notch having two abrupt sides which engage with the finger when the trip-bar is shifted, and intermediate mechanism whereby the belt-shifter is released upon the catching of the finger, substantially as set forth.

25 7. The combination, with the belt-shifter, the knitting-needles, and the yarn-guide, of a bracket secured to said guide, a perforated

pivot-bolt arranged on said bracket, a finger secured to said bolt and having its lower end arranged near the needles, a trip-bar pivot- 30 ally attached to the upper end of the finger, and intermediate mechanism whereby the belt-shifter is released upon the catching of the finger, substantially as set forth.

8. The combination, with the knitting-nee- 35 dles, the yarn-guide, and the belt-shifter provided with a notched nose, of a trip-pawl yieldingly held in engagement with said notch, a feeling-finger pivoted upon said yarn-guide and having its lower end arranged near the 40 needles, a trip-bar pivoted upon the upper end of the feeling-finger and adapted to engage against the trip of the pawl and release the belt-shifter, and a catch pivoted upon the shifting-bar and engaging with the up- 45 per end of the feeling-finger, substantially as set forth.

Witness my hand this 22d day of December, 1891.

FRANK B. KLOCK.

Witnesses:

THEO. L. POPP,
F. C. GEYER.