

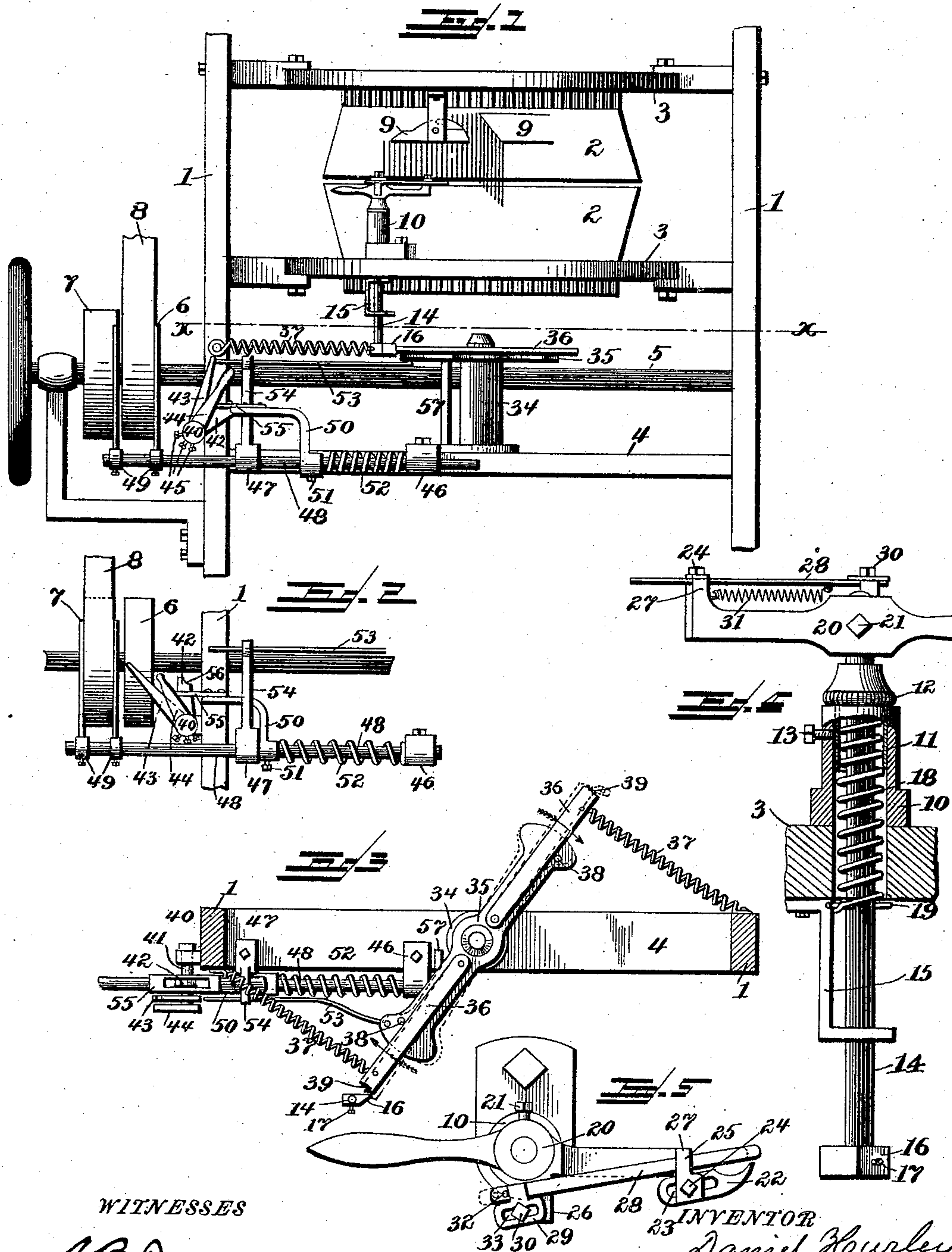
(No Model.)

D. HURLEY.

STOP ATTACHMENT FOR KNITTING MACHINES.

No. 572,680.

Patented Dec. 8, 1896.



WITNESSES

A. B. Degees
J. H. Griffin

INVENTOR
Daniel Hurley
By
M. D. Peck
His Attorney

UNITED STATES PATENT OFFICE.

DANIEL HURLEY, OF BENNINGTON, VERMONT, ASSIGNOR TO CHARLES COOPER, OF SAME PLACE.

STOP ATTACHMENT FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 572,680, dated December 8, 1896.

Application filed February 28, 1896. Serial No. 581,140. (No model.)

To all whom it may concern:

Be it known that I, DANIEL HURLEY, a citizen of the United States, residing at Bennington, in the county of Bennington and State of Vermont, have invented certain new and useful Improvements in Stop Attachments for Knitting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to mechanism for stopping a knitting-machine automatically in the event of a stitch being dropped or of a loose thread, the yarn bunching or running in double.

The object of the invention is to improve such mechanisms; and to that end it consists in the several details of construction and combination of parts hereinafter fully described, and more particularly pointed out in the claims.

Referring to the drawings, Figure 1 is an elevation of a portion of a knitting-machine with my invention attached thereto, the mechanism being set ready to shift the driving-belt from the fast to the loose pulley. Fig. 2 shows a portion of the mechanism released and the belt shifted to the loose pulley. Fig. 3 is a partial top view of the belt-shifting mechanism released on the section-line $x x$ of Fig. 1. Fig. 4 is an elevation, partly in section, of the tripping device, which is operated by defects in the work; and Fig. 5 is a top view of the same.

Similar reference-numerals indicate corresponding parts in each figure of the drawings.

1 represents the frame of the machine; 2, the upper and lower needle-cylinders; 3, the cylinder-supporting rings; 4, a shelf secured to the frame; 5, the driving-shaft; 6, the fast pulley, and 7 the loose pulley, on the shaft; 8, the driving-belt, and 9 the cams for operating the needles.

10 is a hollow post secured to the lower needle-cylinder-supporting ring 3. Fitting within the upper end of this post is a sleeve 11, the outer end of which is enlarged and milled,

as indicated at 12 in Fig. 4, to form a finger-hold. The sleeve is adapted to turn in the post and be locked thereto by the set-screw 13.

14 represents a rod passing through the sleeve 11, post 10, supporting-ring 3, and extending some distance below the latter. The lower portion of the rod is held in a vertical position by a bracket 15, secured to the supporting-ring 3. At the lower end of the rod 14 a dog 16 is adjustably secured by a set-screw 17. Around the rod 14 a spring 18 is coiled, the upper end of the spring being secured to the sleeve 11 and its lower end to a pin 19, which passes through the rod 14 immediately below the supporting-ring 3. One end of this pin 19 normally engages a stop, preferably the bracket 15, and serves to limit the rotary movement normally imparted to the rod 14 by the spring 18. The tension of the spring can be regulated by turning the sleeve 11 in the post 10, and the set-screw 13 will hold it in the adjusted position. To the upper end of the rod a lever 20 is adjustably secured about midway of its length by a set-screw 21. One end of the lever serves as a handle to operate it with when necessary, and its other end is upwardly and laterally extended, as indicated by 27, to form a support for the hook 22. The hook is provided with an elongated opening 23 to enable it to be adjusted longitudinally on its support, and it is clamped in position by a set-screw 24, which passes through a plate 25 and the opening 23 into the upward and lateral extension 27 of the lever. The lever has also a lug 26 on one side opposite the rod 14. This lug is provided with a groove, and the extension 27 is also grooved. In these grooves a finger 28 is supported and held therein by the plate 25 and a plate 29, secured to the lug 26 by a set-screw 30. A spiral spring 31 is secured at one end to the extension 27 and at its other end to the finger 28, and tends normally to draw the finger 28 forward and over the extension 27. This movement is, however, limited by the pin 32, which extends upwardly from the finger and engages the plate 29, as clearly shown in Fig. 5. The plate 29 is provided with an elongated opening 33, through which the set-screw 30 passes, and the plate can therefore

be adjusted on its support to thereby increase or diminish the movement of the finger.

34 is a standard supported on the shelf 4, and on the top of this standard a bar 35 is pivoted midway of its length. On the upper face of the bar 35 two levers 36 are pivoted near the pivot of said bar and extend in opposite directions beyond the ends of the bar. Each lever 36 is connected at its outer end to the main frame by a spring 37. Pins 38 project upwardly from the bar 35 and engage the levers 36, as shown in Fig. 3. The springs 37 tend to turn the bar 35 on its pivot in the direction of the arrows in Fig. 3. The outer ends of the levers 36 are notched, as indicated at 39, and these notches receive the ends of the dogs 16, as indicated in dotted lines in Fig. 3, when the belt is on the fast pulley. The bar 35 and its levers extend across the machine below the cylinders, and the tripping mechanism, already described, and indicated by the numerals 10 to 33, inclusive, is duplicated on the opposite side of the machine.

40 represents a shaft journaled in a bracket 41, secured to the main frame of the machine. On the shaft 40 are mounted a dog 42, a tripping-lever 43, and a hand-lever 44. These three devices are respectively secured on the shaft, to turn with it, by the set-screws 45.

46 and 47 are brackets secured to the shelf 4, and in these brackets a rod 48 is supported to have longitudinal movement therein. On the outer end of the rod 48 a belt-shipper 49 is secured to engage the belt 8. Between the brackets 46 and 47 an angle-bar 50 is adjustably secured to the rod 48 by a set-screw 51, and between the angle-bar 50 and the bracket 46 a spiral spring 52 surrounds the rod 48 and tends to force the said rod lengthwise in the direction of the pulleys.

53 is a rod pivoted at one end to the bar 35 and loosely supported at its other end in a standard 54, extending upwardly from the bracket 47. The free end of the rod 53 engages the upper end of the tripping-lever 43 when the belt 8 is on the fast pulley, as shown in Fig. 1.

55 is a slotted plate secured to the top of the angle-bar 50 and serves as a guide for the dog 42. The end of the dog 42 is provided with a recess 56, into which the end of the angle-bar 50 fits when the parts are in the position shown in Fig. 1.

57 is a stop projecting from the shelf 4 to limit the movement of the bar 35.

The operation of the device is as follows: When the knitting-machine is in operation, the parts will be in the position shown in Fig. 1, the spring 52 being compressed and held in such condition by the dog 42, engaging the end of the angle-bar 50. The dog 42 is arranged on the shaft 40 at such an angle and the recess in its end is so formed that when in the position indicated in Fig. 1 it will hold the arm 50 and the rod 48 against the expansive force of the spring 52. The tripping-lever 43 will be in engagement with

the end of the rod 53, which latter will be in its retracted position. The bar 35 and its levers 36 will occupy the position indicated by the dotted lines in Fig. 3, the springs 37 being expanded, and they will be held in this position by the engagement of the dogs 16 with the notches in the ends of the levers 36, and the dogs will be normally held in their position by the springs 18 on the rod 14. The finger 28 will be retracted against the force of the spring 31, as indicated in dotted lines in Fig. 5, and its forward end will be in engagement with the fabric where the knitting-needles have been withdrawn from it by the cam 9. The point of the hook 22 will be substantially on a line with the end of the finger 28. Now if a stitch be dropped a hole will be left in the fabric and the spring 31 will force the end of the finger 28 into it, and the continued movement of the cylinders and fabric will carry the finger with them and thereby turn the rod 14 and disengage the dog 16 from its lever 36, when the spring 37 will pull the lever against pin 38 and then suddenly force the bar 35 in the direction of the arrows in Fig. 3 until it strikes the stop 57, thereby causing the rod 53 to move the tripping-lever 43 slightly to the left. This will result in slightly turning the dog 43 upward, so that it will no longer hold the angle-arm 50 and rod 48 against the force of the spring 52, and the latter will then be free to exert its force to move the bar 48 to the left and shift the belt 8 from the fast to the loose pulley and thereby stop the machine. The several parts of the belt-shifting mechanism will then occupy the position shown in full lines in Figs. 2 and 3. The several parts can be again set in the position indicated in Fig. 1 by moving the hand-lever 44 to the right. The machine can also be stopped at any time by moving the hand-lever 44 to the left without disturbing the tripping mechanism, since the dog 42 can be turned by the hand-lever 44 to the necessary angle to release the spring 52 and permit it to act on the bar 48 to shift the belt.

In the event of any loose threads or bunching of the yarn which might pass by the finger 28 such threads or bunch will be caught by the hook 22, and the tripping mechanism will be operated in the same manner as heretofore described.

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

1. In a knitting-machine, the combination with the belt, of a spring-actuated sliding rod 48, a belt-shipper on said rod engaging the belt, a shaft journaled in a suitable bearing on the frame of the machine, a tripping-lever, a dog, and a hand-lever secured on said shaft to turn therewith, an angle-arm on the rod 48 engaging said dog to lock the rod against the action of its spring, a spring-actuated rod 53 engaging the tripping-lever, and a tripping device actuated by defects in the knitted fab-

ric and serving to lock the rod 53 against the action of its spring, substantially as and for the purpose set forth.

2. In a knitting-machine, a belt-shipping
5 mechanism, consisting of a pivoted bar, a lever pivoted at one end on said bar, a spring connecting the free end of the bar to the frame of the machine, a projection on the bar engaging said lever, a shaft journaled on the
10 frame of the machine, a tripping-lever, a dog, and a hand-lever secured to said shaft to turn therewith, a spring-actuated sliding rod carrying a belt-shipper, an angle-bar on said rod with which the dog engages to hold the slid-

ing rod against the action of its spring, a rod 15 pivoted at one end to the pivoted bar and engaging at its other end the said tripping-lever, and a tripping device to engage the free end of the lever on the pivoted bar to hold it against the action of its spring, substantially 20 as and for the purpose set forth.

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

DANIEL HURLEY.

Witnesses:

JAMES HAYES,
CHARLES S. KEHOE.