

(No Model.)

2 Sheets—Sheet 1.

D. F. SULLIVAN & E. F. STAPLES.
STOP MECHANISM FOR KNITTING MACHINES.

No. 490,758.

Patented Jan. 31, 1893.

Fig. 1.

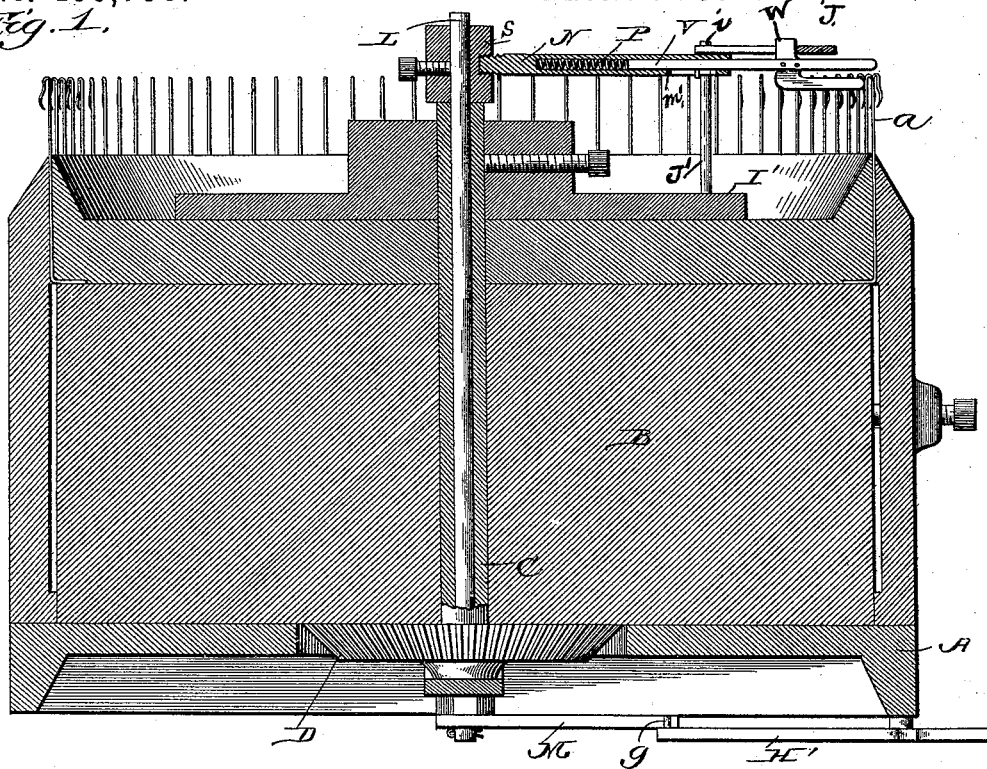


Fig. 4.

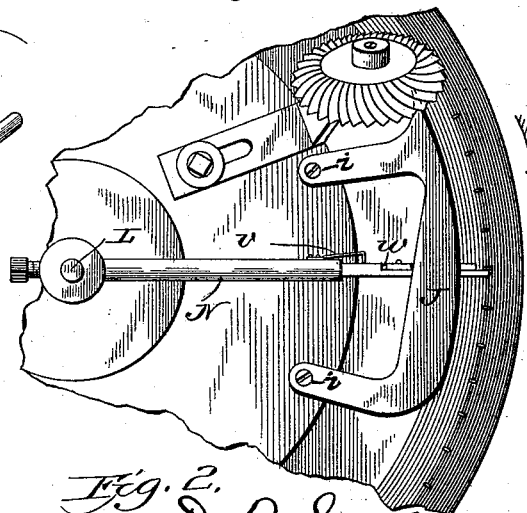
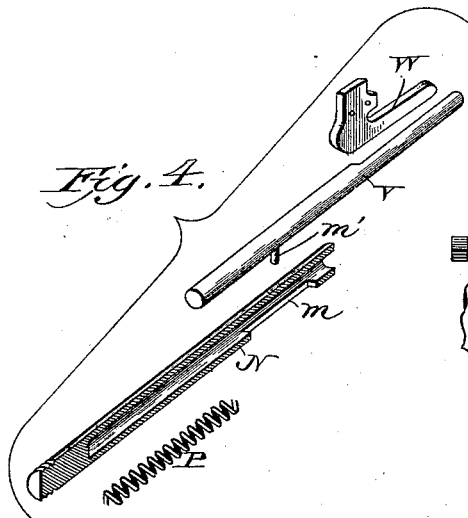


Fig. 2.

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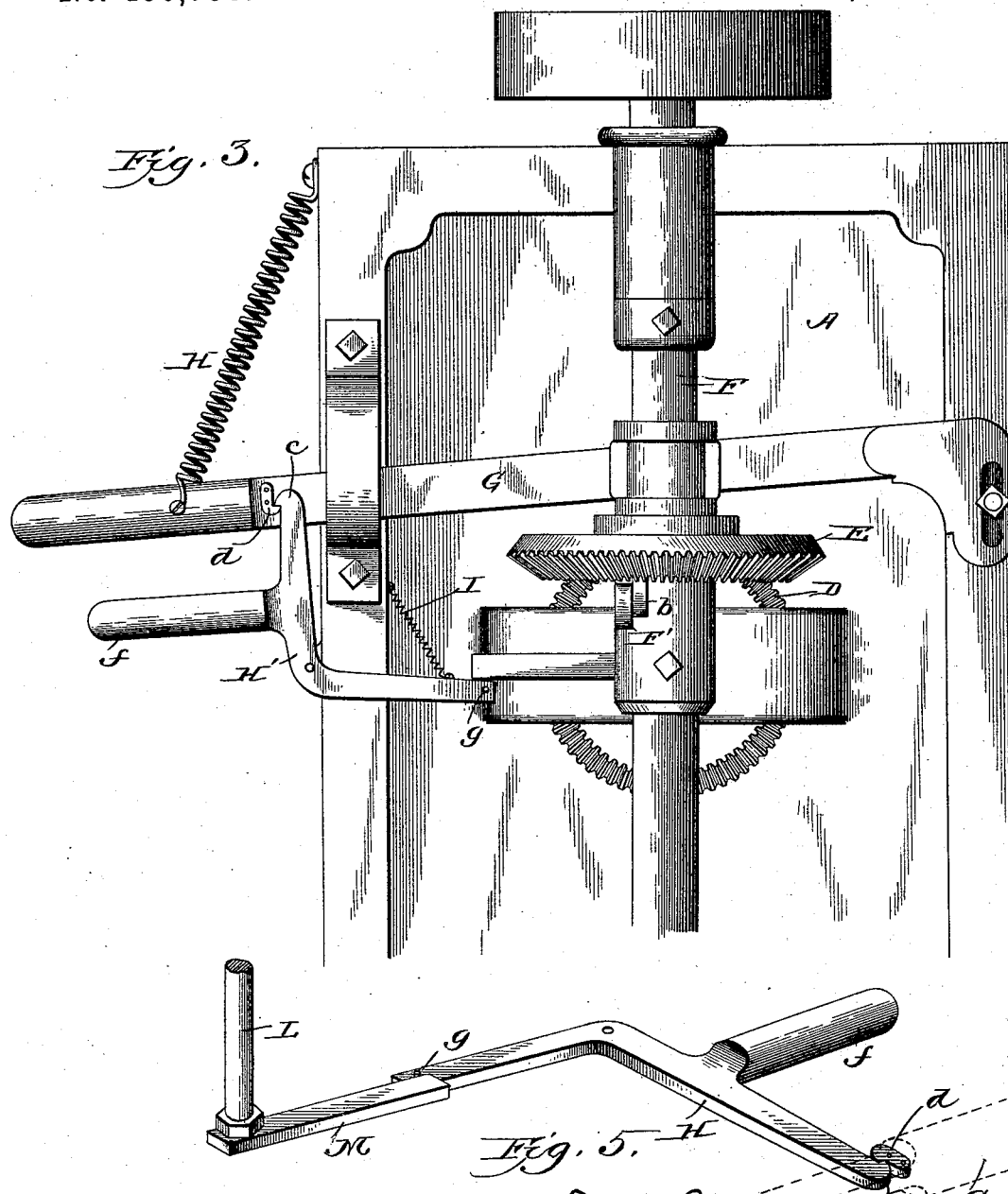
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UNITED STATES PATENT OFFICE.

DANIEL F. SULLIVAN AND EDWARD F. STAPLES, OF LOWELL, MASSACHUSETTS.

STOP MECHANISM FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 490,758, dated January 31, 1893.

Application filed March 10, 1892. Serial No. 424,443. (No model.)

To all whom it may concern:

Be it known that we, DANIEL F. SULLIVAN and EDWARD F. STAPLES, citizens of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Stop Mechanism for Knitting-Machines; and we 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.

Our invention has relation to stop-motion mechanism for knitting machines, and it has for its general object to automatically stop the motion of a machine when a stitch has been dropped or missed and a hole consequently formed in the textile being knitted.

Another object of the invention is to effect the stoppage of the machine by the movement of the textile after the same has been engaged by the automatic detector.

Another object of the invention is to provide a detector of such construction that when it automatically engages the textile, it will also engage the circle of needles, whereby the strain of the stoppage movement will be taken from the textile and damage thereto consequently obviated, and:

With the foregoing objects in view, the invention will be fully understood from the following description and claims when taken in conjunction with the accompanying drawings, in which

Figure 1 is a vertical, diametrical section of a machine embodying our invention; the driving mechanism being omitted; Fig. 2 is a partial plan view of the same; Fig. 3 is an inverted plan view of the machine, illustrating the driving mechanism; Fig. 4 includes perspective views of the detector, its needle engaging arm, the spring for backing the detector, and the sleeve or tube for sheathing the same, which latter is shown in longitudinal section; and: Fig. 5 is an enlarged detail perspective view of the angular keeper lever, &c.

In the said drawings similar letters designate corresponding parts throughout the several views, referring to which:

A, indicates the bed of the machine, and B,

indicates the needle head or cylinder, to which the circular series of needles *a*, is connected in any approved manner. This needle head or cylinder B, which is loosely mounted upon a vertical hollow shaft as C, which has a bearing at its lower end in a cross piece shown in Fig. 1 is provided upon its lower side with a bevel gear-wheel D, which is formed thereon, or suitably secured thereto, and is designed to be normally engaged by the movable, beveled gear-wheel E, which is loosely mounted upon the drive shaft F, and is arranged to be moved endwise upon said shaft by means of the shipper-lever G, to engage it with or disengage it from the gear D, and is also arranged to be connected to the drive shaft so as to revolve therewith when in engagement with the gear D, preferably by means of the pin *b*, upon the gear E, and the dog F', firmly secured upon the shaft F.

One of the usual wheels for forming the stitch in co-operation with the circular series of needles *a*, all arranged in a well-known manner, is shown in Fig. 2, but as such wheels, &c., form no part of our invention they need not be further described here.

Suitably connected at one end to the shipper lever G, which is preferably fulcrumed and guided as shown, is a retracting spring H, which is suitably connected at its opposite end to the main frame or bed A, and is designed to move the lever G, and disengage the gear-wheel E, carried thereby from the gear-wheel D, of the needle head or cylinder B, when the said lever G, is released by the angular keeper lever H', better illustrated in Fig. 3, of the drawings. This keeper-lever H', which is of an approximately-right-angular form, and is fulcrumed as shown, has one of its ends formed into a hook *c*, to engage a hook *d*, upon the shipper lever G, and it is normally held into engagement with said lever G, to mesh the gears E, and D, by a tension spring I, as shown.

Preferably formed integral with one of the branches of the keeper lever H', and extending laterally therefrom is a hand-grasp *f*, whereby the said lever may be manipulated by hand to release the shipper lever G, and stop the machine when desirable.

From the foregoing description it will be

readily perceived that in order to stop the machine, the keeper lever H', must be disengaged from the shipper lever G; and in order to facilitate the engagement of the said lever

5 H, by automatic devices presently described, we have provided the same adjacent to its free end with a stud or lug g, as shown.

Suitably fixed upon or formed integral with the hollow, stationary shaft C, above the
10 needle head or cylinder B, is a platform I', upon which is mounted the stationary cam J, which has its engaging edge inclined inwardly, with respect to the direction of rotation of the head B, and the center thereof, and serves
15 to return the automatic detector to its normal position, as will be presently described. This cam J is supported upon rods J', which rise from platform I', the said cam being held in place by screws i at the upper ends of said
20 rods.

Journalled within the hollow, stationary shaft C, and extending above and below the same, is a vertical shaft L, to the lower end of which is fixedly connected a swinging arm
25 M, which, when the shaft L, is rotated, is designed and adapted to swing and engage the lug g, upon the keeper-lever H', and disengage said lever from the shipper lever G, for the purpose before stated. Secured upon the
30 upper portion of the shaft L, is a collar s, having a screw thread therein, adapted to receive the screw threaded end of the sleeve or socket N, which is designed to receive the detector V, and the spring P, backing the same,
35 and is provided in its under side at an intermediate point in its length with a longitudinal slot m, to receive the depending lug m', of the detector and prevent said detector from jumping out of the sleeve or socket when
40 pressure upon the forward or outer end thereof is removed. This spring-pressed detector V, which is normally at rest, and bears against the knitted fabric as it revolves with the needles and is fed up therefrom, is provided
45 adjacent to its free end with an arm W, which is connected to or formed integral with the detector and is designed and adapted, when the detector takes through a hole in the textile, to take through the series of needles
50 a, and thus take the strain of turning the shaft L, and manipulating the keeper-lever H', from the textile being knitted.

In operation, the drive shaft F, is driven by any suitable motor and the shipper lever
55 G, and keeper-lever H', are set so that the gear wheel E, on the drive shaft will engage and mesh with the gear-wheel D, of the needle head or cylinder B, so as to rotate said head in the direction of the arrow in Fig. 2.
60 The yarn may be fed in any ordinary or approved manner to the machine, and as the textile rises from the needles carried by the rotatory head, it will be perceived that each course of stitches will be subjected to the
65 impingement of the detector, which, when it finds a hole, caused by a dropped or missed stitch, or in any other manner, will take

through it and the arm W, of said detector will take through the series of needles a, when the detector, its sleeve or socket, the
70 vertical shaft L, and the arm M, of said shaft, will turn with the head or cylinder B, a sufficient distance to enable the said arm M, to engage the keeper lever H', from the shipper lever G, to disengage the gears E, and D,
75 and stop the machine. After the gears E, and G, have been disengaged as just described, the momentum of the needle head or cylinder B, will carry the inner end of the detector arm W, to the forward inner end of
80 the cam J, through the medium of which the detector will be removed from the hole in the textile and the said arm W, of the detector disengaged from the needles. After
85 the hole in the textile has been darned or otherwise repaired by the attendant, the machine can again be set in operation by connecting the levers G, and H, as better shown in Fig. 3 of the drawings.

Although it is preferable to employ the
90 arm W, for engaging the needles and taking the strain from the fabric when a hole is discovered, we do not desire it to be understood that said arm is absolutely essential, inas-
95 much as an automatic stoppage will be effected simply by the detector taking through the textile and being swung or turned there-
with.

Although we have, in some respects, specifically described the construction and rela-
100 tive arrangement of the several elements of our improved machine, yet we do not desire to be confined to the same, as such changes or modifications may be made as fairly fall within the scope of our invention.
105

In order to prevent the arm of the detector from engaging the needles of the cylinder B, when the same is rotated without stock, we have provided a spring arm as v, provided
110 with bent end which is designed to engage a notch w, in the detector V, to hold the same away from the needles.

Having thus described our invention, what we claim and desire to secure by Letters Patent, is:—
115

1. In a knitting machine, substantially as described, the combination with a movable series of needles, and means for moving the series of needles; of a spring-pressed detector normally impinging against the textile as it
120 is taken up from the needles and adapted to take through said textile when it finds a hole therein, an arm connected to the detector and adapted to take through the series of needles when the detector takes through the textile,
125 and mechanism connected with and actuated by the detector adapted to stop the movement of the series of needles; substantially as and for the purpose set forth.

2. In a knitting machine, substantially as
130 specified, the combination with the drive shaft, a movable gear wheel mounted thereon, the needle cylinder or head carrying needles, a gear-wheel carried by said cylinder or head,

a shipper lever loosely connected to the gear on the drive shaft and having a hook adjacent to one end, a retracting spring connected to said lever, and a keeper lever fulcrumed at an intermediate point in its length and having a hook adjacent to one end to engage the hook of the shipper-lever, and a lug adjacent to the other end; of a central, vertical shaft having an arm at its lower end adapted to engage the lug of the keeper lever, the sleeve or socket extending radially from said shaft, and

the spring-pressed detector adapted to normally impinge against the textile; substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

DANIEL F. SULLIVAN.
EDWARD F. STAPLES.

Witnesses:

WALTER E. WRIGHT,
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