No. 871,953. PATENTED NOV. 26, 1907.

H. PULSTER.

STOP MECHANISM.

APPLICATION FILED FEB. 8, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

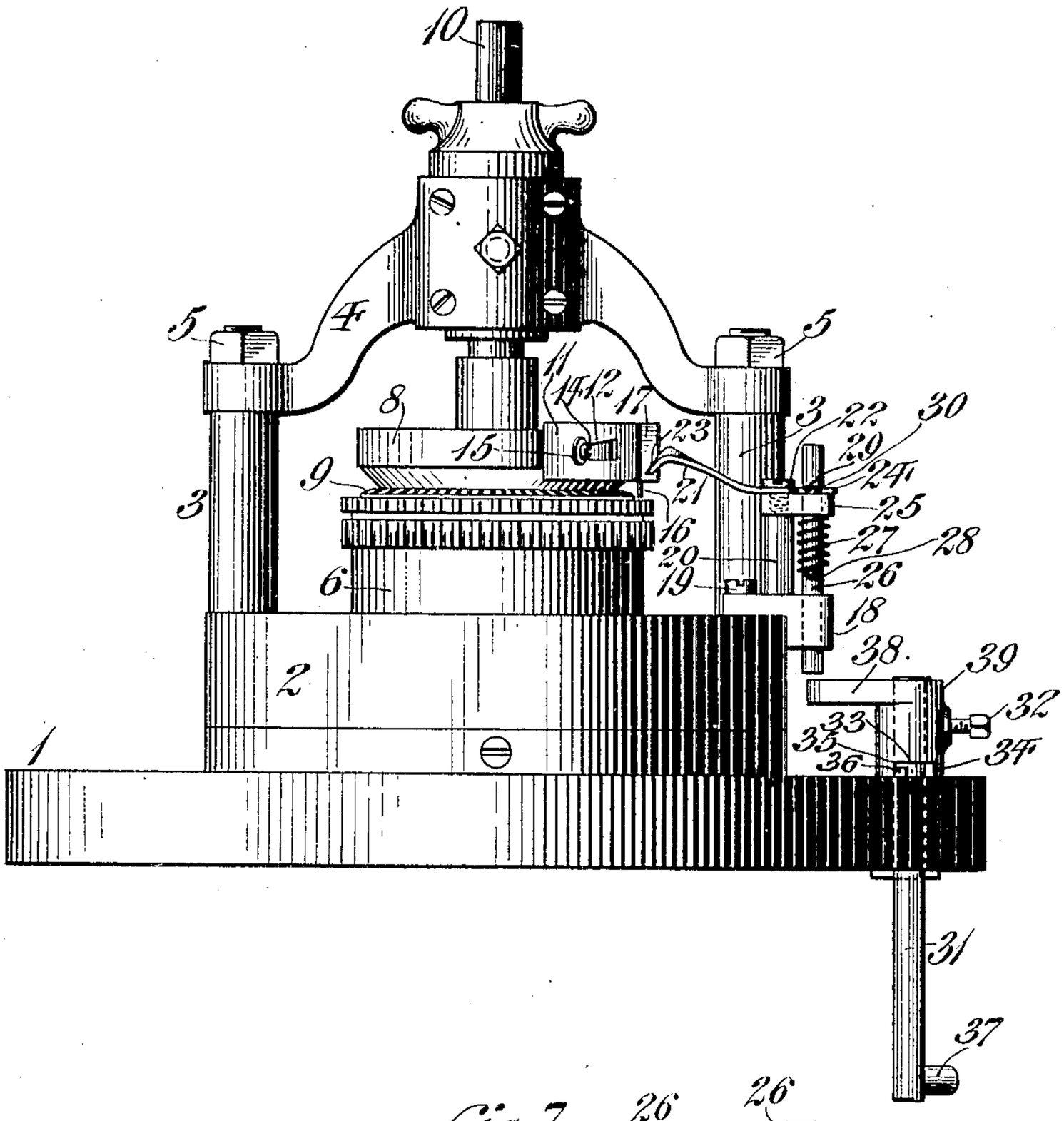


Fig. 5.

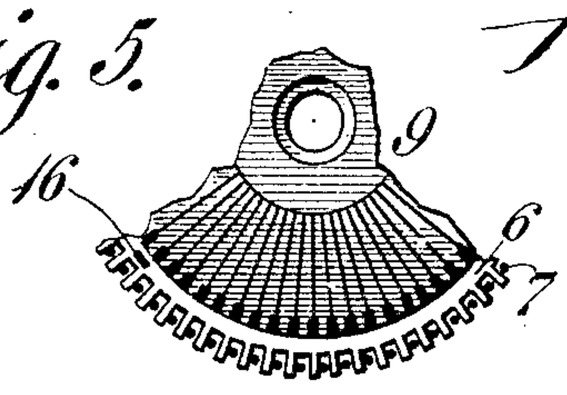


Fig. 7.

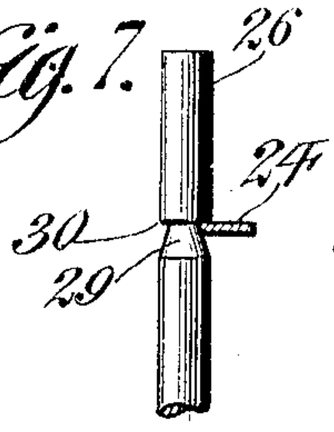


Fig. 8.

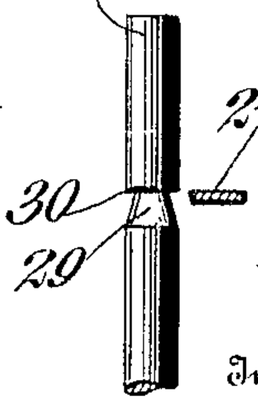
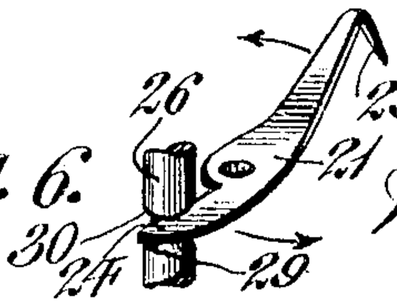


Fig. 6.



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STOP MECHANISM.

APPLICATION FILED FEB. 8, 1906.

2 SHEETS—SHEET 2.

Fig. 2.

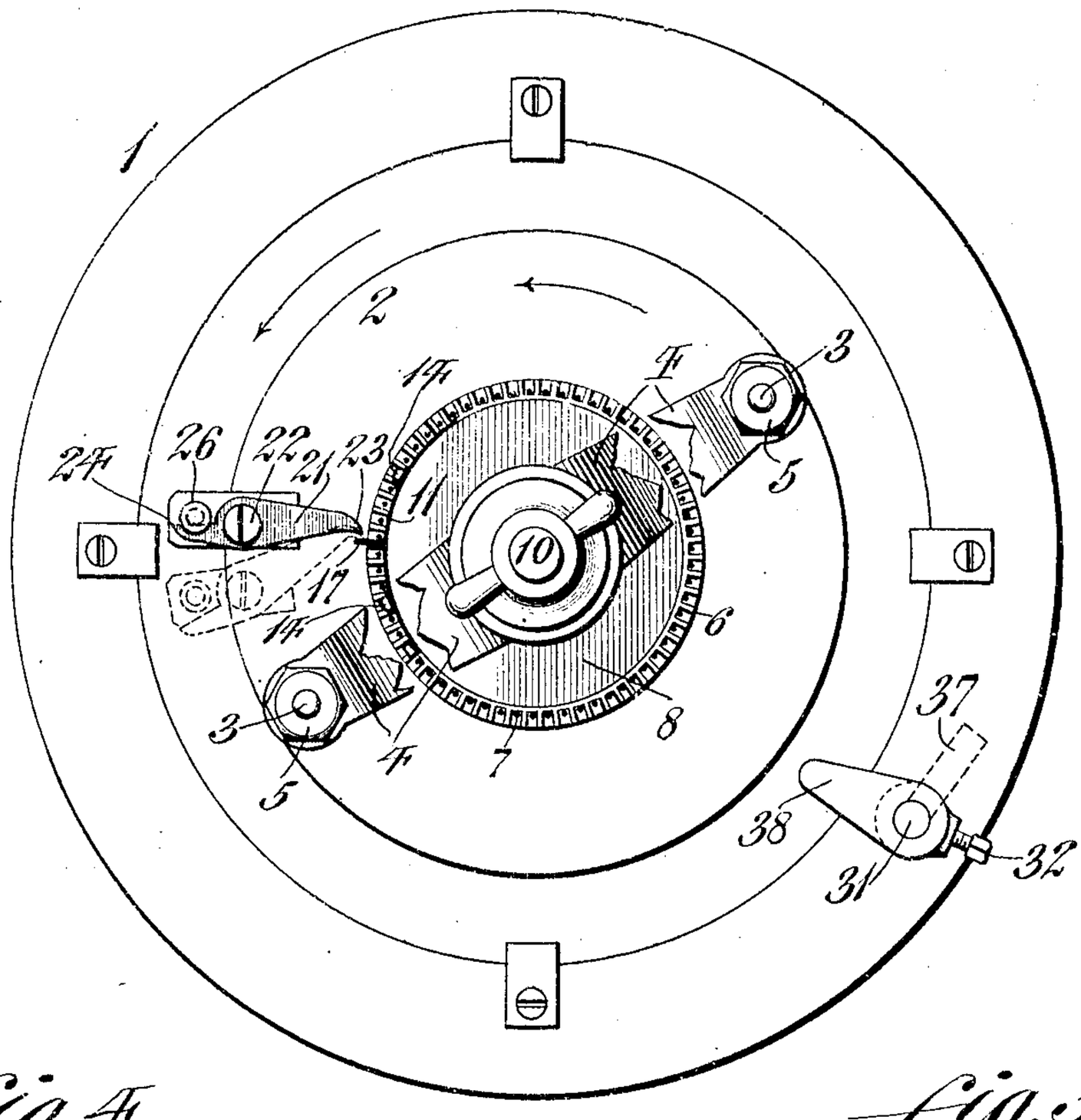


Fig. 4.

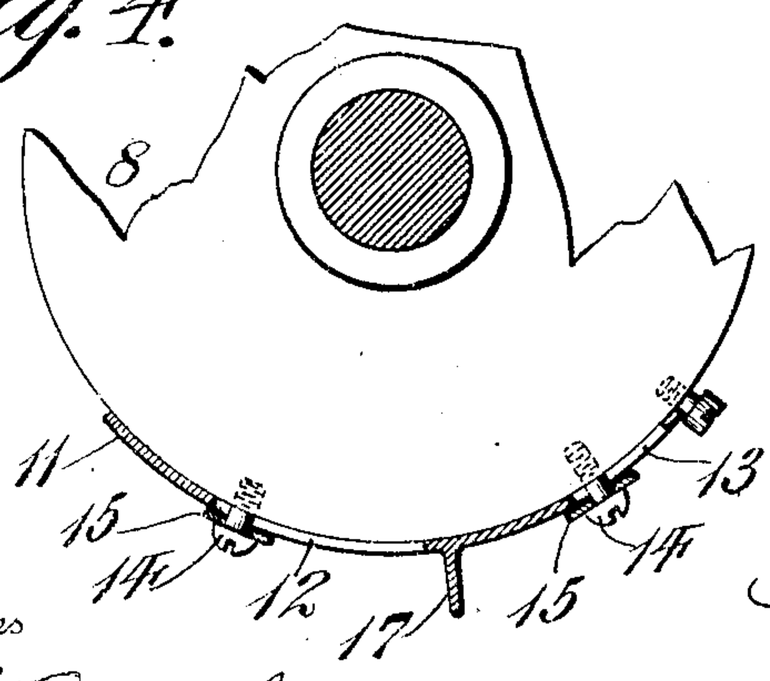
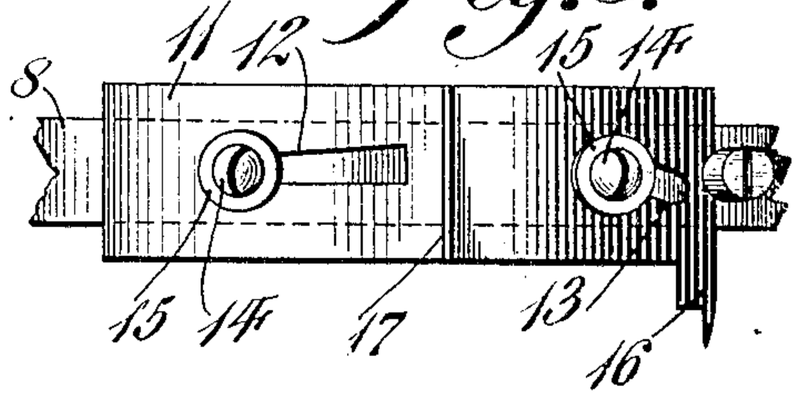


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY PULSTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WALLACE WILSON, OF PHILADELPHIA, PENNSYLVANIA.

STOP MECHANISM.

No. 871,953. Specification of Letters Patent. Patented Nov. 26, 1907.

Application filed February 8, 1906. Serial No. 300,058.

To all whom it may concern:

Be it known that I, HENRY PULSTER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Stop Mechanism, of which the following is a specification.

My present invention consists of a novel construction of a stop mechanism for circular knitting machines by means of which the machine is automatically stopped whenever a needle becomes broken or when a defect in the work occurs.

It further consists of a novel construction of an attachment having a plurality of cam grooves therein through which the fastening devices pass which secure the attachment to the dial cap, whereby when the depending pointed end of the attachment engages a defect in the work the attachment will be moved rearwardly and upwardly so that the depending end thereof will be out of the way of the needles.

It further consists of a novel construction of an attachment movably carried by the dial cap which is adapted to engage any enlargement caused by defective webbing and thereby cause said attachment to be moved from its normal position with respect to said dial cap and actuate a plunger which coacts with the mechanism for starting and stopping the machine.

It further consists of a novel construction of a spring pressed rod or plunger which is actuated by a lever coacting with the plate secured to the dial cap.

It further consists of a novel construction of a device which prevents what is technically known as a "smash" occurring from double yarn running in the machine.

It further consists of novel features of construction, all as will be hereinafter fully set forth.

Figure 1 represents a side elevation of a portion of a knitting machine having a stop mechanism, embodying my invention, secured thereto. Fig. 2 represents a plan view of Fig. 1. Fig. 3 represents, on an enlarged scale, a side elevation of a portion of a dial cap in detached position having a plate, embodying my invention, secured thereto. Fig. 4 represents a sectional view of Fig. 3. Fig. 5 represents a plan view of a portion of the machine in detached position and having the dial cap removed. Fig. 6 represents a perspective view of a portion of the device in detached position. Figs. 7 and 8 represent side elevations of a portion of the plunger in detached position showing the coacting lever in section and in different operative positions with respect thereto.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the stationary bed of a circular knitting machine of any usual or conventional type having rotatably mounted thereon a head 2 having supporting standards 3 thereon to which the end of the yoke 4 is secured by means of nuts 5.

6 designates a stationary needle cylinder having needles 7 thereon.

8 designates a dial cap in suitable relation with a dial 9 and having a suitable dial or cam shaft 10.

11 designates a plate having cam grooves 12 and 13 therein, and secured to the dial cap 8 by means of screws or equivalent devices 14 passing through said cam grooves, there being washers 15 interposed between the heads of the screws 14 and the plate 8, if desired. Suitably located on this plate 11, in the present instance, at the forward end thereof, is a depending pointed member 16, the purpose of which will hereinafter appear, it being noted that this end is normally located so near the needles and yarn that the slightest defect in either will engage said end.

17 designates a flange or lug extending from the plate 11.

It will be understood by those skilled in this art that the screws or fastening devices 14 are adapted to permit the relative movement of the plate 11 with respect to the dial cap 8 as is clearly indicated in Fig. 4.

18 designates a bracket or block secured to the head by means of a screw 19.

20 designates a rod or support rising from the block 18 and having pivoted thereto a lever 21 by means of a pin or screw 22, said lever having the two ends 23 and 24.

25 designates an arm or lug at the upper end of the support 20 in which a rod or plunger 26 is movably mounted, said plunger also extending through the block or bracket 18.

27 designates a spring interposed between

the arm 25 and a pin or other fixed point 28 on the rod 26, whereby the tension of the spring tends to move said rod downwardly and maintain the same in its lowermost position. This rod has an annular groove or recess 29 at a suitable point thereon so as to form a shoulder 30 with which the end 24 of the lever 21 engages and by means of which said rod is maintained in its raised position. The end 16, as best seen in Fig. 5, travels in its normal position above the needle cylinder and between the needles thereon and the dial needles in the dial.

39 designates a block or bracket movably mounted in the bed 1 and provided with an outwardly extending arm or lug 38.

31 designates a rod or shaft extending through the block 39 and fixedly secured thereto by means of a set screw or equivalent device 32. The block 39 is recessed at 33 so as to form the sides or walls 34 and 35.

36 designates a lug or pin secured to the bed 1 and located within the recess 33, whereby the mount of rotation given to the block 19 is regulated by the contact of the walls 34 and 35 with the stop 36.

37 designates an arm or lever extending from the rod 31 and secured in any suitable manner to the starting and stopping mechanism of the machine so that when the arm 38 is partially rotated, by reason of the contact of the lower end of the spring pressed rod 26, the rod 31 will be rotated and thus throw the machine out of action.

I have deemed it unnecessary to describe in detail the construction of the knitting machine, since the same is well known in the art and forms *per se* no part of my present invention.

The operation is as follows:—As indicated by the arrows in Fig. 2, the head 2 rotates to the left and under normal conditions there is no relative movement between the attachment 11 and the lever arm 21. If a needle becomes broken or the latch of a needle falls out, thereby producing bad webbing, the depending end 16 of the attachment will come into contact with the knot or bunch of yarn formed thereby and as the dial cap moves in unison with the head, the attachment 11 will be moved rearwardly and owing to the provision of the cam grooves 12 and 13, the depending needle point 16 will be carried upwardly out of the way of the needles of the machine. The flange or lug 17 will press against the end 23 of the lever arm 21 and cause the other end thereof to be moved out of engagement with the shoulder 30 of the spring pressed plunger 26 and owing to the tension of the spring 27 this plunger will be moved downwardly so that the lever or lug 38 on the block 39 will be in the path of the lower end of this plunger. This will cause the block 39 to be partially rotated and also the rod 31, secured thereto by means of the set screw 32, so that the lower end 37 which is connected with the starting and stopping mechanism of the machine, not shown, will be actuated and the machine thrown out of action. The partial rotation of the block 39 is controlled by the engagement of the lug 36 secured to the bed 1 with the sides 34 and 35 of the recess 33 in the block 39. If a hole is made in the webbing from heavy yarn or a knot in the yarn, the depending end 16 of the attachment 11 will contact with the bunch or enlargement of yarn formed thereby and cause the machine to be automatically thrown out of action. The machine is also prevented from producing what is technically known in the trade as a "smash", since if any double yarn runs in the machine the point 16 will engage with the enlargement caused by the defective work and cause the machine to be thrown out of action.

It will thus be apparent that the machine will always be automatically stopped as soon as any defective webbing is produced, it being seen that the head 2 can only make a single revolution or a partial revolution after the point engages with the snarl of yarn or the like before the lower end of the spring pressed plunger 26 engages the arm 38 and causes the knitting machine to be thrown out of action. There is no possibility of the depending end 16 coming in contact with either the cylinder needles or the dial needles and as soon as the point engages a broken or misplaced needle, a snarl of yarn or a knot in the yarn or defective yarn, this end 16 will be carried upwardly above the plane of said needles, as is evident. A stop mechanism constructed according to this specification may be very cheaply manufactured and has been found in practice to be very efficient and reliable in its action, since the occurrence of a smash and a breakage of parts due thereto is prevented and the machine is rendered much safer and furthermore as soon as any defective webbing begins to be produced, the machine will be at once automatically thrown out of action so that the cause which produces the defective webbing may be overcome or remedied by the operator before a material amount of defective webbing has been produced. In the present instance, I have shown the plate 11 as having a plurality of cam grooves therein but it will be apparent that I may obtain the same result if a single cam groove is employed and still be within the scope of my invention and that the construction and arrangement of the block 18 and its adjuncts may be otherwise varied, it being only essential that the rod or plunger be so moved that when the plate 11 causes said rod to be actuated, it will be moved into such a position

that the arm or lug 38 will be in the path thereof and thus throw the machine out of action.

It will be further apparent that there are no complicated parts about the stop mechanism and that while the same may be very cheaply and readily constructed, it is very durable and not liable to get out of order.

Having thus 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 dial cap, and the needles, of a device movably mounted thereon and adapted to move axially with respect thereto in a plane inclined to the horizontal, said device being located in a position to encounter an abnormally placed needle or a bunch or knot of yarn drawn up above the meeting line of said needles and means co-acting with said device for throwing the machine out of action.

2. In a stop mechanism for knitting machines, a dial cap, a plate movably carried thereby and adapted to move axially with respect thereto in a plane inclined to the horizontal on its engagement with defective work, said device being located in a position to encounter an abnormally placed needle or a bunch or knot of yarn drawn up above the meeting line of the needles of the machine and means co-acting with said plate for throwing the machine out of action.

3. In a stop mechanism for knitting machines, a dial cap, a plate having a cam groove therein, fastening devices passing through said groove and engaging said dial cap, said plate having a depending end located in close proximity to the work and means coacting with said plate for throwing the machine out of action.

4. In a stop mechanism for knitting machines, a rotatable dial cap, a rotatable head, a plate movably carried by said cap and having a lug and a depending end located in close proximity to the work, and means carried by said head engaging said lug and coacting with the movement of said plate to throw the machine out of action.

5. In a stop mechanism for knitting machines, a dial cap, a plate having cam grooves therein and a pointed end, fastening devices passing through said grooves and engaging said cap, said plate having a lug thereon, a head rotatably mounted, a spring pressed plunger carried thereby, a lever engaging said lug and coacting with said plunger, and means actuated by said plunger for throwing the machine out of action.

6. In a stop mechanism for knitting machines, a dial cap, a plate having cam grooves therein movably carried thereby, said plate having a lug thereon and a depending end, located in proximity to the work, a head rotatably mounted, a block carried thereby, a plunger mounted in said block, a spring carried by said plunger and tending to move the same downwardly, a lever pivotally supported, one end of said lever engaging said lug and the other end thereof engaging said plunger and maintaining the same in raised position, and means coacting with said plunger for throwing the machine out of action.

7. In a stop mechanism for knitting machines, a dial cap, a plate carried thereby and angularly movable with respect thereto, said plate having a lug thereon and a pointed end, a head rotatably mounted, a lever carried by said head, one end of said lever engaging said lug, a plunger vertically mounted with respect to said head and adapted to be engaged by the other end of said lever and maintain said plunger in raised position, a spring adapted to move said plunger downwardly, and means adapted to coact with said plunger to throw the machine out of action.

8. In a stop mechanism for knitting machines, a dial cap, a plate carried thereby and movable with respect thereto, said plate having a lug thereon and a depending end, a head rotatably mounted, a block carried thereby, a support carried by said block, a lever pivoted to said support, an arm carried by said support, a plunger movably mounted in said arm and said block, a pin secured to said plunger, a spring interposed between said pin and said arm, said lever coacting with said lug and said plunger, said plate being moved with respect to said cap when said end engages the defective webbing, and means coacting with said plunger for throwing the machine out of action.

9. In a stop mechanism for knitting machines, a dial cap, a plate carried thereby, and movable with respect thereto, said plate having a lug thereon and a depending end, a lever carried by said head, one end of which engages said lug, and is actuated by the movement of said plate, a spring pressed plunger movably carried by said head and engaged by said lever to maintain said plunger in raised position, a spring for moving said plunger downwardly after being released by said lever, a stationary bed, a block rotatably carried thereby, an arm extending from said block and in the path of said plunger when the latter is in its lowermost position, and means actuated by said block for throwing the machine out of action.

10. In a stop mechanism for knitting machines, a dial cap, a plate movably carried thereby, said plate having a lug thereon and a depending end, a rotatable head, a lever carried thereby, one end of which engages said lug, a plunger carried by said head and engaged by the other end of said lever to

maintain said plunger in raised position, a spring adapted to move said plunger downwardly on its release from said lever, a bed, a block carried thereby, an arm projecting therefrom and in the path of said plunger when in its lowermost position, a rod secured to said block and adapted to throw the machine out of action on the partial rotation of said block, and a stop for said block carried by said bed.

HENRY PULSTER.

Witnesses:
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