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J. D. HEMPHILL.
FEEDING DEVICE FOR KNITTING MACHINES.

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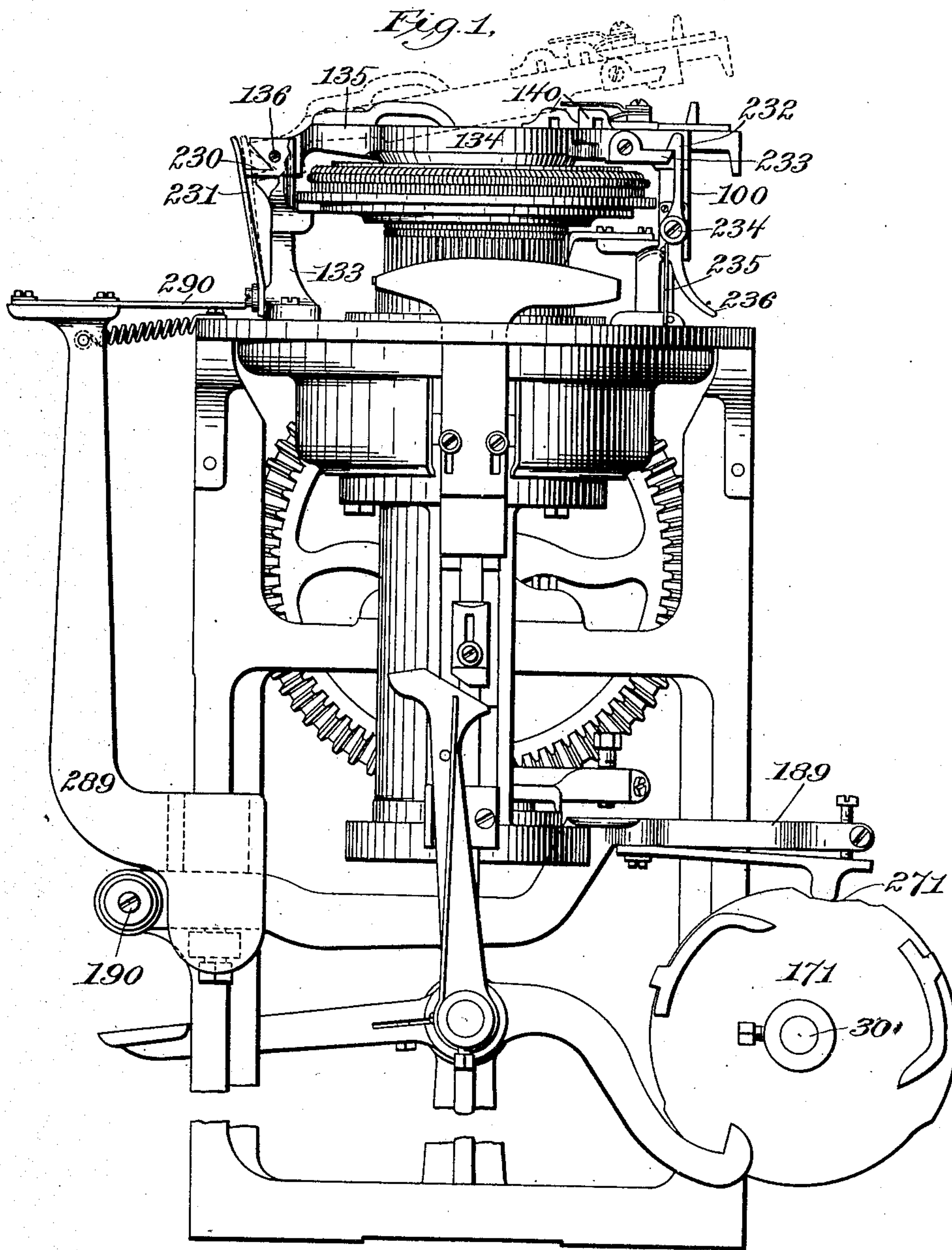
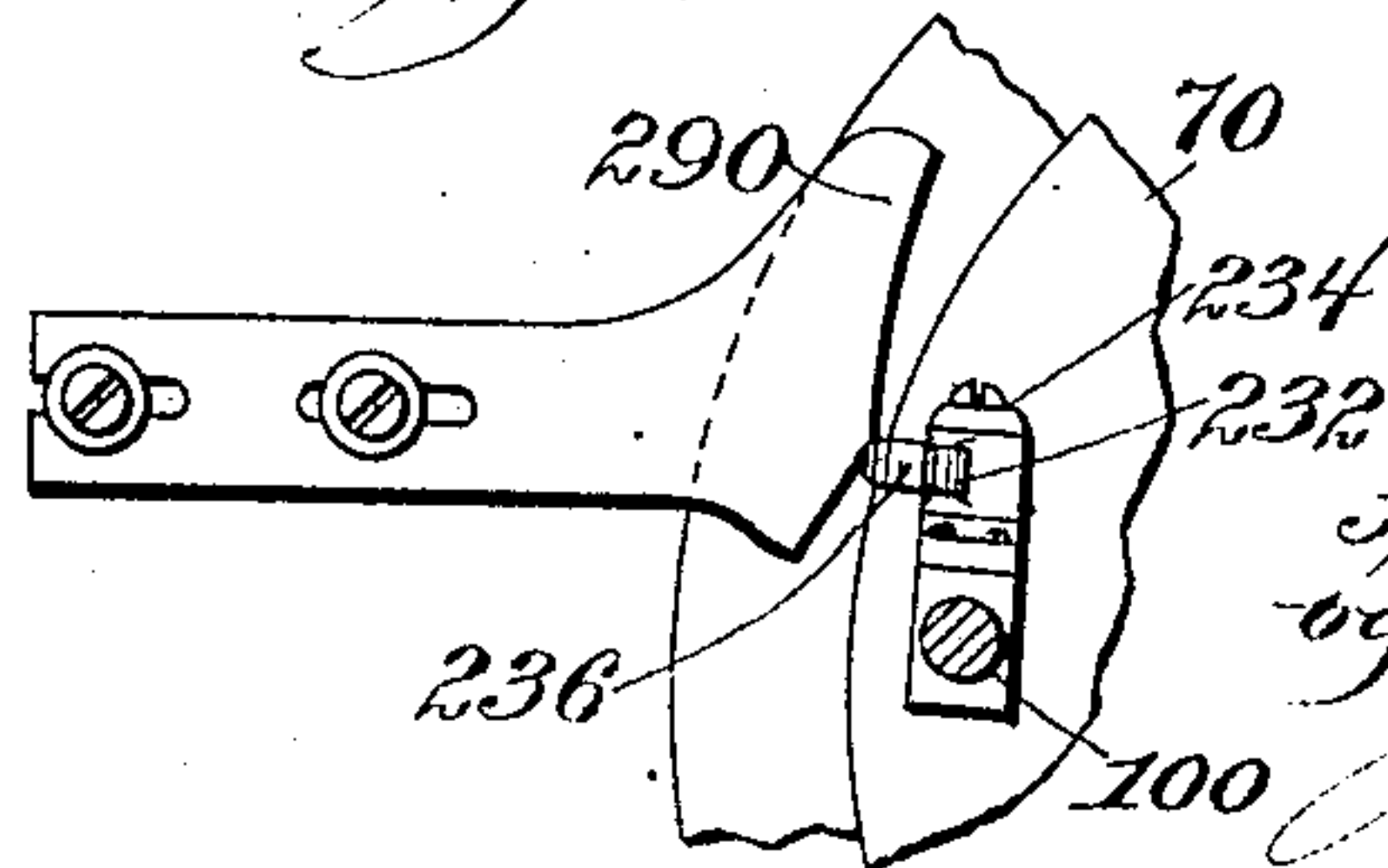


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSHUA D. HEMPHILL, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR TO MAYO KNITTING MACHINE AND NEEDLE COMPANY, OF FRANKLIN FALLS, NEW HAMPSHIRE, A CORPORATION OF NEW HAMPSHIRE.

FEEDING DEVICE FOR KNITTING-MACHINES.

No. 892,663.

Specification of Letters Patent.

Patented July 7, 1908.

Application filed June 30, 1905. Serial No. 267,819.

To all whom it may concern:

Be it known that I, JOSHUA D. HEMPHILL, a citizen of the United States, residing in Pawtucket, county of Providence, and State of Rhode Island, have invented an Improvement in Feeding Devices for Knitting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention is embodied in a circular knitting machine of the kind commonly employed in knitting hosiery, and relates especially to appliances for running the finished work off from the needles when a stocking is completed.

The invention consists mainly in appliances hereinafter described for controlling the needle-latch guard-ring carrying the yarn guide through which the yarn is delivered to the needles.

In accordance with the present invention, the latch guard ring which carries or is provided with the yarn guide is pivotally supported at one side of the needle cylinder in the usual manner, and is acted upon by a spring tending to throw the latch guard ring up from its normal position far enough to cause the yarn guide to cease to deliver the yarn to the hooks of the needles, said spring pressed latch guard ring being provided with a latch or holding device which normally fastens the same in the horizontal or working position in which the yarn guide delivers the yarn to the hooks of the needles properly to be knit. Means are also provided for operating the latch or holding device for the latch guard ring so as to disengage or release the latter at a predetermined point in the knitting operation governed by the usual controlling cam and pattern mechanism which governs the changes in control of the needles required at the different points in the knitting of the stocking. Thus, when the final course of a completed stocking has been knit, the locking device of the latch guard ring is tripped, and the said ring is thrown by its spring into position to cause the yarn guide to cease to deliver yarn to the needles which, in their next round of operation, run off the finished work. The machine may then be stopped by the operator, or by the usual

automatic stop mechanism, and properly prepared for the knitting of the next stocking, after which the latch guard ring is returned to working position and engaged by its holding latch, and the machine is set in operation. The operation may then be continuous and automatically controlled up to the point where the stocking is completed when the latch guard ring is automatically tripped to cause the work to be run off, as before explained.

Figure 1 is a side elevation showing a sufficient portion of a knitting machine to illustrate the present invention; and Fig. 2 is a detail showing the latch and its controlling device in plan.

The invention is shown as embodied in a knitting machine of the kind shown in Patent No. 629,503, granted to me July 25, 1899, but may be applied to other knitting machines of similar character wherein the cam cylinder or cam carrier is provided with a latch guard ring normally standing above the top of the needle cylinder, and carrying the yarn guide through which the yarn is delivered to the needles as the knitting proceeds.

For an understanding of a complete machine in connection with which the present invention may be employed, reference may be had to my former patent No. 629,503, above mentioned, the reference characters herein used being the same, so far as practicable, as those employed for like parts in said former patent. The latch guard ring 134, carrying the yarn guide or guides 140, is connected with an arm or lever 135, pivoted at 136 on a standard 133 on the cam carrier 70 for the knitting cams, at one side of the needle cylinder, and the end of the said lever 135, at the opposite side of the needle cylinder normally rests upon a standard 100 on the cam carrier at the other side of the needle cylinder.

In accordance with the present invention, the latch ring arm 135, near its pivoted end, is constructed as shown at 230 to be acted upon by a spring 231 which tends, by its pressure on the portion 230 of the lever 135 to throw the said lever from its horizontal working position, shown in full lines, to a slightly inclined position, as shown in dotted

lines, Fig. 1, while said spring permits the lever 135 to be turned to an approximately vertical position for affording access to the needles, or to the horizontal working position shown in full lines, Fig. 1.

In order to retain the latch guard ring in normal or working position, in which the yarn guide 140 delivers the yarn to the needles so as to be knit into the work, a holding device, shown as a spring latch 232, is provided, arranged to engage with a projection 233 on the lever 135 of the latch guard ring near the supporting upright 100. The said holding device 232 is pivotally supported at 234 on the upright 100, and is acted upon by a spring 235 tending to throw the holding device into engagement with the projection 233 and to retain it there when the latch guard ring is placed in horizontal position by the operator.

It will be seen that pressure on the end 236 of the latch 232 sufficient to move it inward towards the cam cylinder will cause the latch to disengage the projection 233 and release the latch guard ring, which will then be raised by the spring 231 and remove the yarn from the reach of the needles. The latch 232 is automatically operated to release the latch guard ring when the stocking is finished by mechanism controlled by the cam disk 171 on the shaft 30, which cam shaft and disk make one complete rotation for each stocking or unit of product of the machine, being advanced from time to time to effect the proper changes in the knitting cams and driving mechanism after the desired number of courses have been knit with the knitting cams and cooperating parts in the position determined by said cam shaft before its advance movement is made. In the movement of the cam disk 171, which takes place when a stocking is completed, a depression 271 in the cam surface which controls the lever 189 permits the said lever to drop to a lower position than any occupied during the knitting of the stocking. The said lever 189 is pivoted on the frame at 190, and is provided with an arm 289 which extends up to approximately the level of the knitting cam carrier 70 of the machine, and is provided at its upper end with a trip cam 290 (see Fig. 2) which stands at the side of the cam carrier 70 and at the level of the end 236 of the latch 232 for the latch guard ring 134.

As before stated, the depression 271 in the controlling cam 171 permits the end of the lever 189 resting on said cam to occupy a lower position than any which it has during the knitting of the stocking, and it also causes the trip cam 290 to be moved radially inward towards the axis of the cam cylinder to such position that the end of the said cam 290 engages the end 236 of the latch 232 when the latter comes around in the rotation of the knitting cam carrier 70. The cam 290 thus

presses the end 236 of the latch inward, thus disengaging the latch from the projection 233 of the latch guard ring which is then thrown by the spring 231 to the position shown in dotted lines, Fig. 1, thus carrying the yarn guide 140 to such position that the yarn is no longer laid into the hooks of the needles, so that in the following rotation of the cam carrier the needles cast off the last course of stitches, and the finished stocking is thus entirely disengaged from the needles.

During the operation of the knitting machine after the latch guard ring has been thus released, the cam disk 171 is again advanced and raises the lever 189 and moves the cam 290 radially outward far enough to clear the end 236 of the latch, so that when the latch guard ring is subsequently moved down by the operator and engaged by the latch 232, it will be retained in working position until the cam disk 171 has made another full rotation corresponding to the completion of another stocking and brought the depression 271 in the cam surface to position again to act upon the lever 189. After the work has been run off by the tripping of the latch 232, as above described, the machine may be stopped in any usual manner as, for example, by appliances operated by the cam shaft 30, as described in Patent No. 629,503 and may, thereafter, be prepared for knitting another stocking and started in any suitable way as, for example, in the way described in the said Patent No. 629,503. In said Patent No. 629,503, the lever 189 is employed to raise and lower the needle cylinder slightly during the knitting operation to control the length of the stitches as determined by the surface of the cam 171, and inasmuch as its operating movements do not require that it be placed in such position as to cause the cam 290 to act upon the latch 232, the same lever, in connection with the depression 271 in the cam disk 171, may be employed as a part of the mechanism for controlling the operation of the latch 232, although it obviously is not material that the same lever should be employed to control the latch, that is employed for controlling the position of the needle cylinder during the knitting operation. The downward movement of the lever 189 to cause the trip cam 290 to operate the latch 232 does not affect the height of the needle cylinder, as the latter is otherwise supported in its lowest position, and the lever 189 serves merely to raise the needle cylinder from its lowest position when the said lever 189 encounters the elevated or projecting portions of the cam disk 171.

The appliances forming the subject of the present invention effect a saving in time on the part of the operator which would otherwise be required in removing the yarn from the path of the needles and turning the machine by hand to run off the previously fin-

ished work preparatory to transferring a ribbed cuff to the machine and starting the machine on the next stocking.

Claims.

1. The combination of the latch guard ring of a circular knitting machine provided with a yarn guide; of a spring tending to move said latch guard ring and yarn guide from the position in which the yarn guide presents the yarn to the needles; a latch for holding the said latch guard ring in working position; and a tripping device for acting upon said latch to cause the release of said latch guard ring at a predetermined time in the operation of the machine, substantially as described.
2. The combination of the latch guard

ring having a pivotal support at one side of the needle cylinder; with a spring tending to turn the same about its pivotal support to non working position; a latch to hold the ring in working position; a controlling cam shaft for governing the changes in the knitting operation; and a trip for said latch called into action by said controlling cam shaft, substantially as and for the purpose described.

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

JOSHUA D. HEMPHILL.

Witnesses:

ALEX. D. SALINGER,
J. JEROME HAHN.