March 7, 1944. H. W. START ET AL 2,343,485

STRAIGHT-BAR KNITTING MACHINE

Original Filed April 20, 1942

Fig. 1

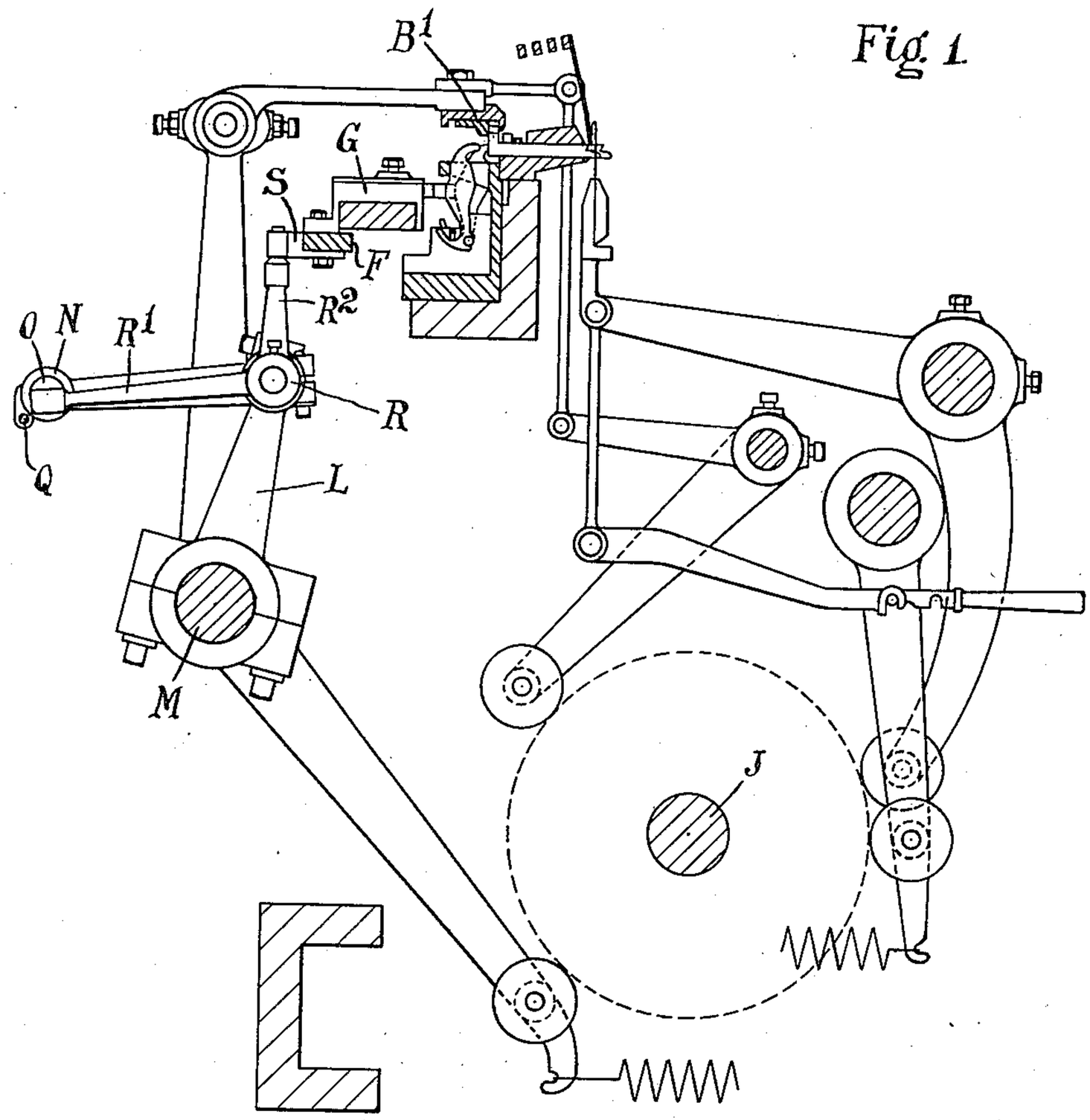
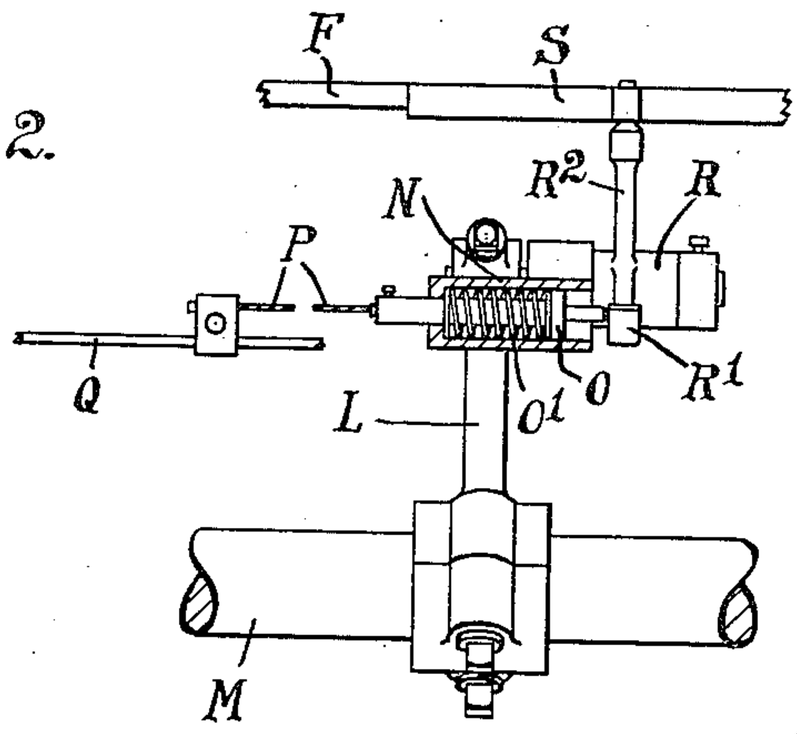


Fig. 2.



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Patented Mar. 7, 1944 2,343,485

UNITED STATES PATENT OFFICE

2,343,485

STRAIGHT-BAR KNITTING MACHINE

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Original application April 20, 1942, Serial No. 439,773. Divided and this application January 14, 1943, Serial No. 472,370. In Great Britain February 8, 1941

4 Claims. (Cl. 66—157)

This application is a division of our pending application Serial No. 439,773, filed April 20, 1942.

This invention relates to improvements in straight-bar knitting machines and refers to safety mechanism associated with the draw, that is the mechanism which operates the slur cocks and thread carriers. In straight-bar knitting machines the draw is driven in well known manner by a dog clutch which is engaged by a cam on the main shaft and as the driving member of the clutch is engaged whilst the machine is running it is subjected to a considerable strain and may be moved on its shaft. In the event of the driving member of the clutch being moved on its shaft the timing of the draw will be delayed relatively to the other motions of the machine and as the catch-bar is normally timed to operate immediately the draw is completed it will, under these circumstances, be moved into operation before the draw is completed. The catch-bar motion is so arranged that normally it first moves the dividing sinkers up to the falling bar to divide the loops sunk on the needles by the jack sinkers. The catch-bar is then lowered to engage with all the sinkers and withdraw them to permit the needles to perform their normal knitting motion to complete the knitting of the course and then advance them to hold the work down as the needles rise. It will therefore be seen that if the timing of the draw becomes delayed the catch-bar will first move up to the falling bar the dividing sinkers and those jack sinkers which have not been advanced by the slur cock and consequently the thread guide will foul the jack sinkers so advanced causing damage thereto. The next motion of the catch-bar is to withdraw all the sinkers but this will be prevented because the slur cock will not have moved clear of the jacks and some of the jack sinkers will be held in their forward position by the slur cock. Consequently the catch-bar will jump out of engagement with the sinkers and on its next forward motion will strike the back of the sinkers causing serious damage to the machine.

The object of the present invention is to stop the latter in the event of the timing of the draw mechanism becoming incorrectly adjusted.

According to this invention stop mechanism is provided which will automatically disconnect or cut off the driving power if the catch-bar mechanism operates before the draw mechanism has completed its motion.

The invention will now be more particularly described with reference to the accompanying drawing in which:

Fig. 1 is a cross section of part of a straight-bar knitting machine showing stop mechanism constructed according to our invention, and

Fig. 2 is a rear elevation of part of the mechanism shown in Fig. 1.

Like letters indicate like parts throughout the drawing.

In carrying out this invention an arm L is secured on the shaft M adapted in well known manner to transmit the forward and backward motion to the catch-bar B^1 and hereinafter referred to as the catch-bar shaft, and connected to the free end of the arm L in any convenient manner is a sleeve N in which is located a spring actuated plunger O. The plunger is connected by suitable means much for example as a flexible cable P to a control rod Q which when moved longitudinally is adapted to disconnect or cut off the driving power from the machine. The plunger O is normally held, with the spring O^1 compressed, by a catch which is tripped by the draw mechanism as will be hereinafter explained in the event of the timing of the latter becoming incorrectly adjusted, permitting the spring to move the plunger and operate the control rod to stop the machine.

The catch may be in the form of a bell-crank lever R pivoted to the end of the arm L secured on the catch-bar shaft M and so disposed that one arm R^1 is normally in the path of the plunger O to retain it in position against the action of the spring as shown in Figs. 1 and 2. When the catch-bar shaft M is angularly adjusted to operate the catch-bar B^1 in well known manner by cams on the main shaft J of the machine the arm L secured thereto and consequently the plunger and bell crank R carried by the arm L oscillate about the catch-bar shaft centre.

In order to release the plunger O if the timing of the draw becomes wrongly adjusted an abutment is provided which moves, during the draw, into the path traversed by the free arm R^2 of the bell-crank lever R so as to angularly adjust the latter about its pivot to release the plunger. The abutment may comprise a cam S secured on the tie bar F which connects the slur boxes G together and is reciprocated in well known manner and the cam S is of such a length and is so disposed that it is moved into the path of the arm R^2 at the commencement of the draw and remains in the path thereof until the completion of the draw. It will therefore be seen

that in the event of the timing of the draw becoming incorrectly adjusted, immediately the shaft M moves to actuate the catch-bar B^1 the cam S on the tie bar F will engage the arm R^2 and angularly adjust the bell-crank lever R moving the arm R^1 out of the path of the plunger O which will be released and the rod Q moved longitudinally to disconnect or cut off the driving power.

When the machine is running any movement of the driving member of the clutch will be in a direction tending to retard the timing of the draw mechanism. The timing may however be advanced when the machine is turned back by hand for any reason. In either case the stop mechanism will be brought into action to disconnect or cut off the driving power of the machine.

What we claim as our invention is:

1. A straight-bar knitting machine comprising in combination, needles, a thread guide, jack and dividing sinkers, a catch-bar, means to raise and lower the catch-bar, a catch-bar shaft angularly adjusted by a cam on the main shaft to advance and withdraw the catch-bar, jacks to advance the jack sinkers, a slur cock carried on a reciprocating bar to operate the jacks, a control rod longitudinally adjusted to disconnect or cut off the driving power and means interposed between the catch-bar shaft and the slur cock, to move the control rod longitudinally if the catch-bar shaft moves during the motion of the slur cock.

2. A straight-bar knitting machine comprising in combination, needles, a thread guide, jack and dividing sinkers, a catch-bar, means to raise and lower the catch-bar, a catch-bar shaft angularly adjusted by a cam on the main shaft to advance and withdraw the catch-bar, jacks to advance the jack sinkers, a slur cock carried on a reciprocating bar to operate the jacks, a control rod longitudinally adjusted to disconnect or cut off the driving power, a spring actuated plunger connected to the control rod, a catch to hold the plunger with the spring compressed and means to trip the catch if the catch-bar shaft moves during the motion of the slur cock.

3. A straight-bar knitting machine comprising in combination, needles, a thread guide, jack and dividing sinkers, a catch-bar, means to raise and lower the catch-bar, a catch-bar shaft angularly adjusted by a cam on the main shaft to advance and withdraw the catch-bar, jacks to advance the jack sinkers, a slur cock carried on a reciprocating bar to operate the jacks, a control rod longitudinally adjusted to disconnect or cut off the driving power, an arm on the catch-bar shaft, a sleeve connected to the arm, a spring actuated plunger disposed in the sleeve and connected to the control rod, a catch pivoted on the arm to hold the plunger with the spring compressed and a cam on the reciprocating bar to trip the catch if the catch-bar shaft moves during the motion of the slur cock.

4. A straight-bar knitting machine comprising in combination, needles, a thread guide, means to operate the thread guide, jack and dividing sinkers, a catch-bar, means to raise and lower the catch-bar, a catch-bar shaft angularly adjusted by a cam on the main shaft to advance and withdraw the catch-bar, jacks to advance the jack sinkers, a slur cock carried on a reciprocating bar to operate the jacks, a control rod longitudinally adjusted to disconnect or cut off the driving power, an arm on the catch-bar shaft, a sleeve connected to the arm, a spring actuated plunger disposed in the sleeve and connected to the control rod, a bell-crank lever having one arm adapted to hold the plunger with the spring compressed and a cam on the reciprocating bar to engage with the other arm of the bell-crank lever and angularly adjust it to release the plunger if the catch-bar shaft moves during the motion of the slur cock.

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