

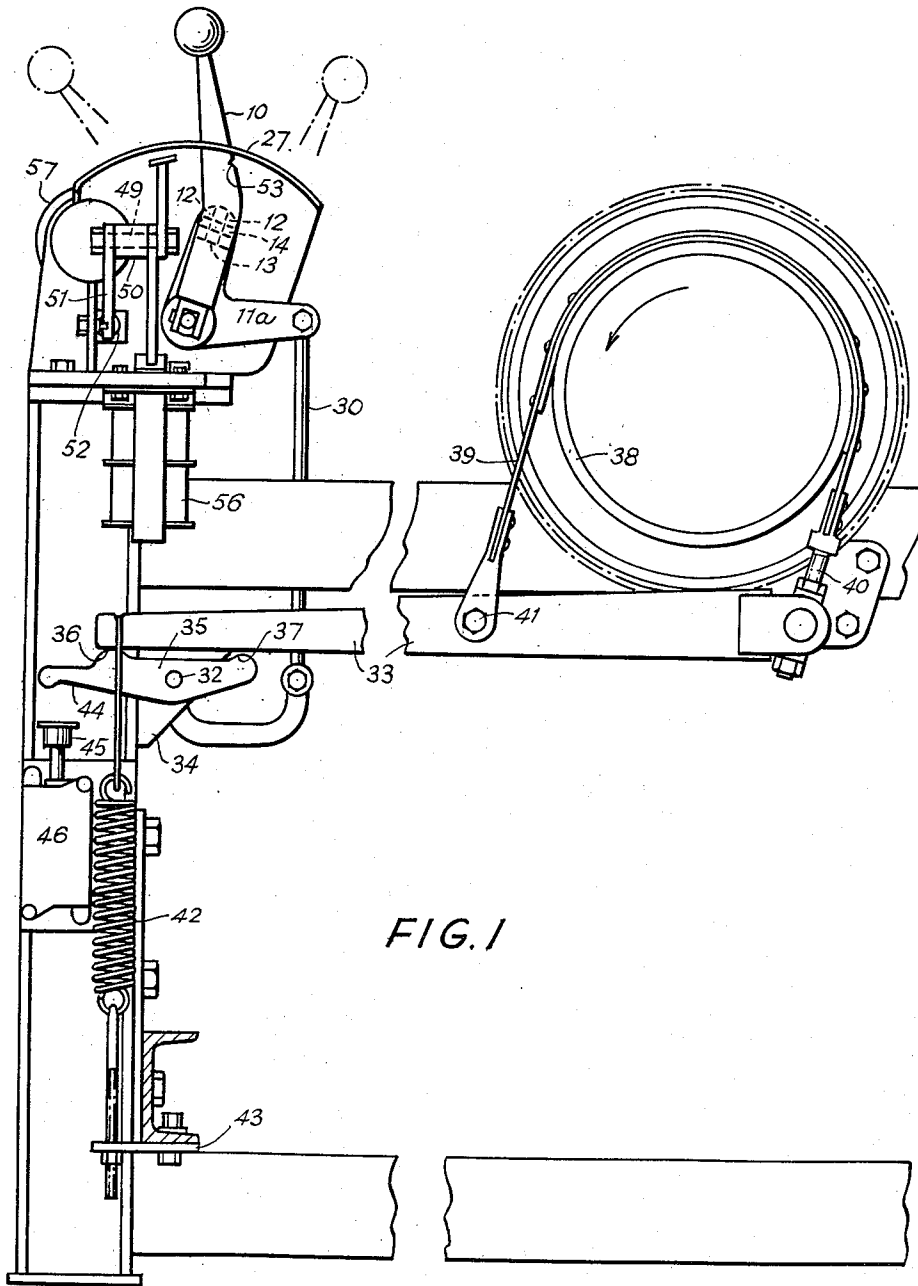
July 13, 1954

F. DAVIES
LOOM FOR WEAVING

2,683,471

Filed July 16, 1951

5 Sheets-Sheet 1



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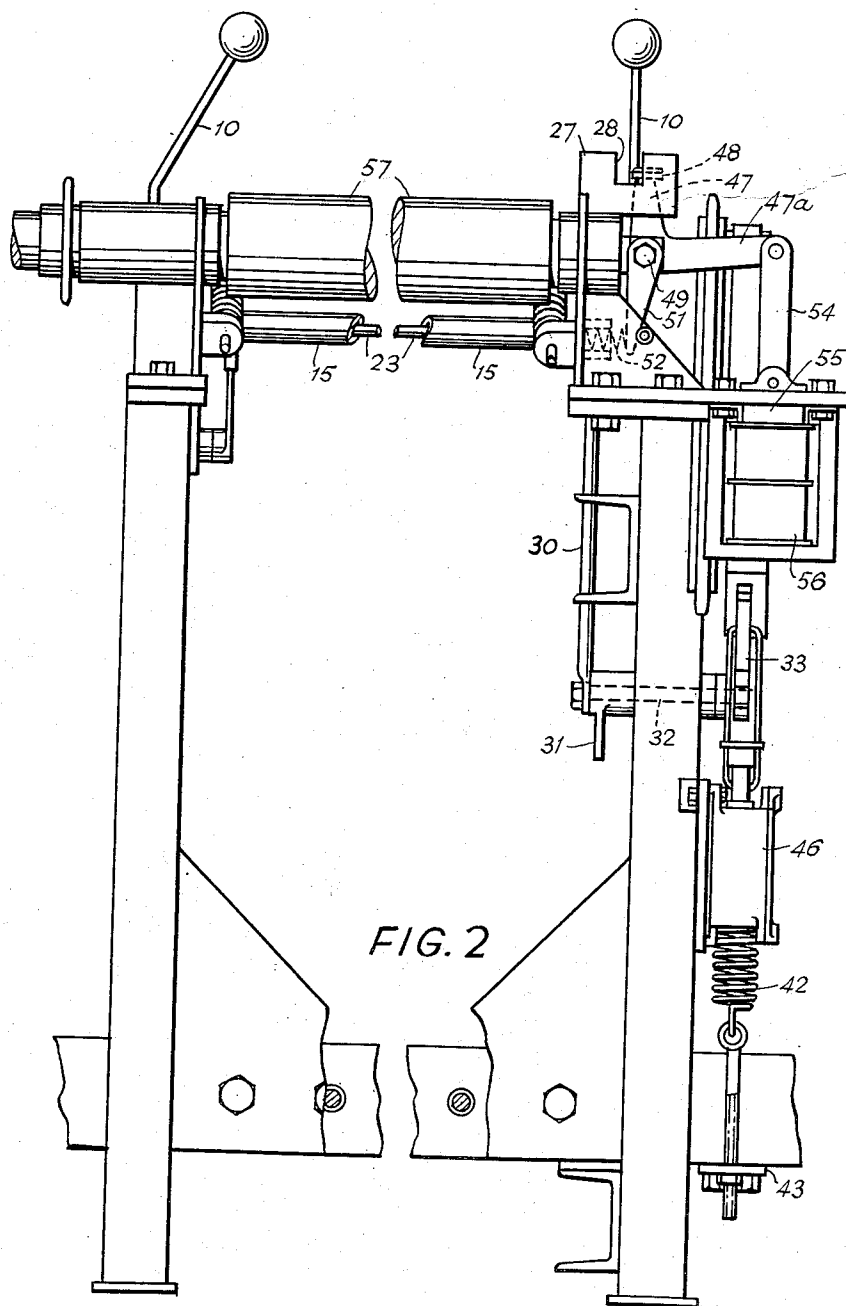
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5 Sheets-Sheet 2



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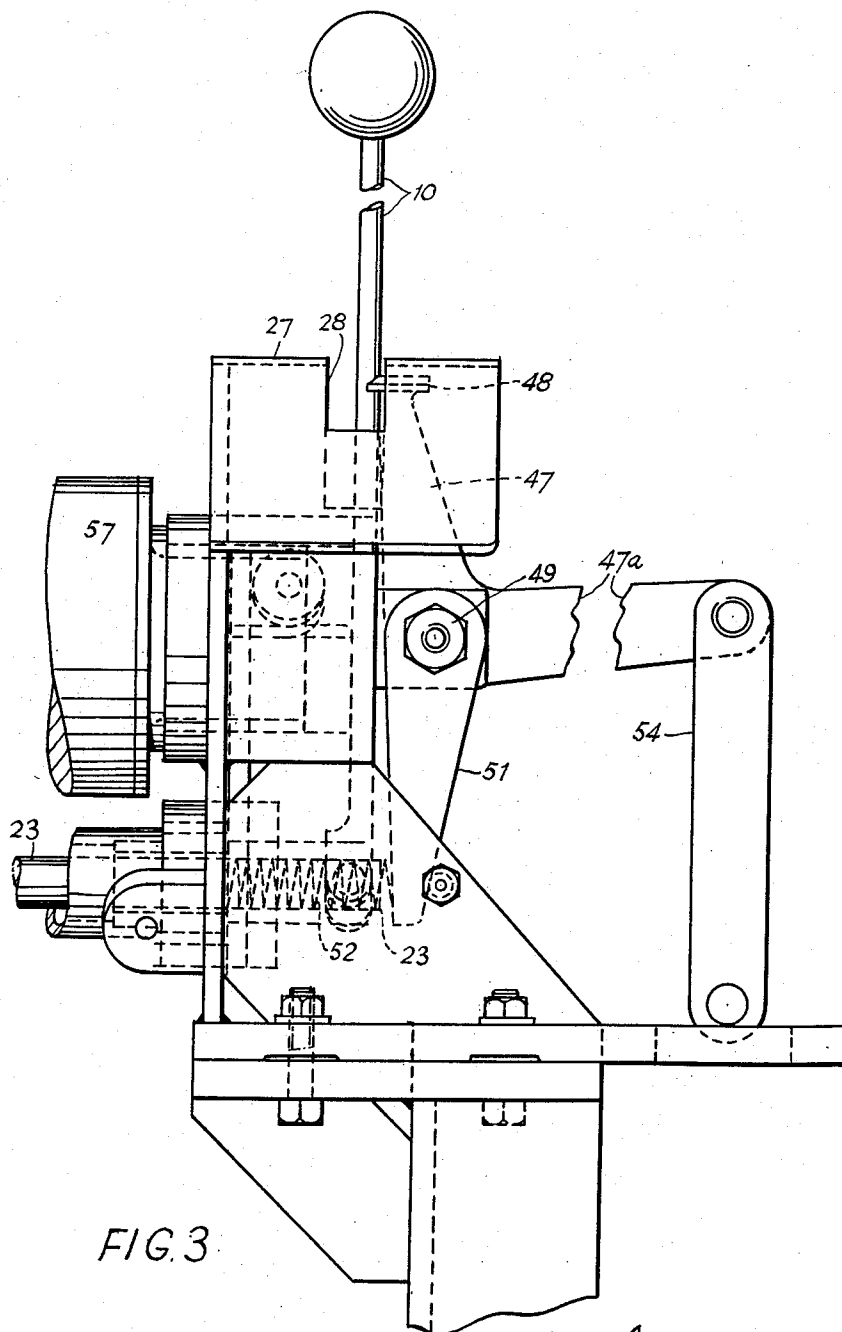
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5 Sheets-Sheet 3



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July 13, 1954

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Filed July 16, 1951

5 Sheets-Sheet 4

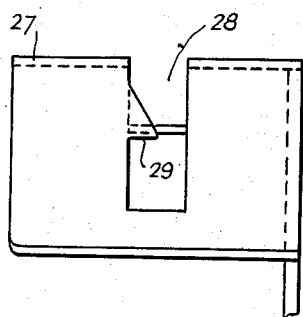


FIG. 6

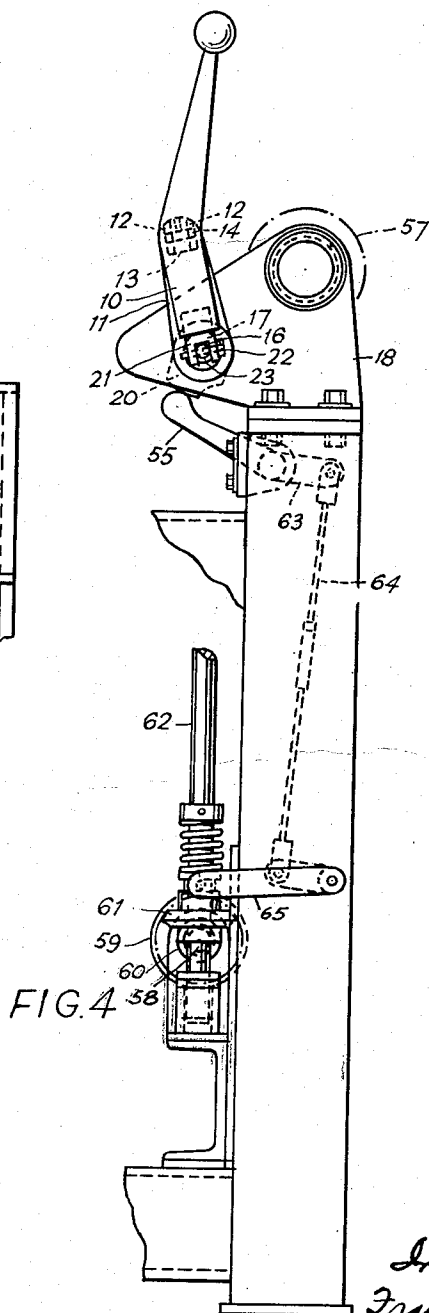


FIG. 4

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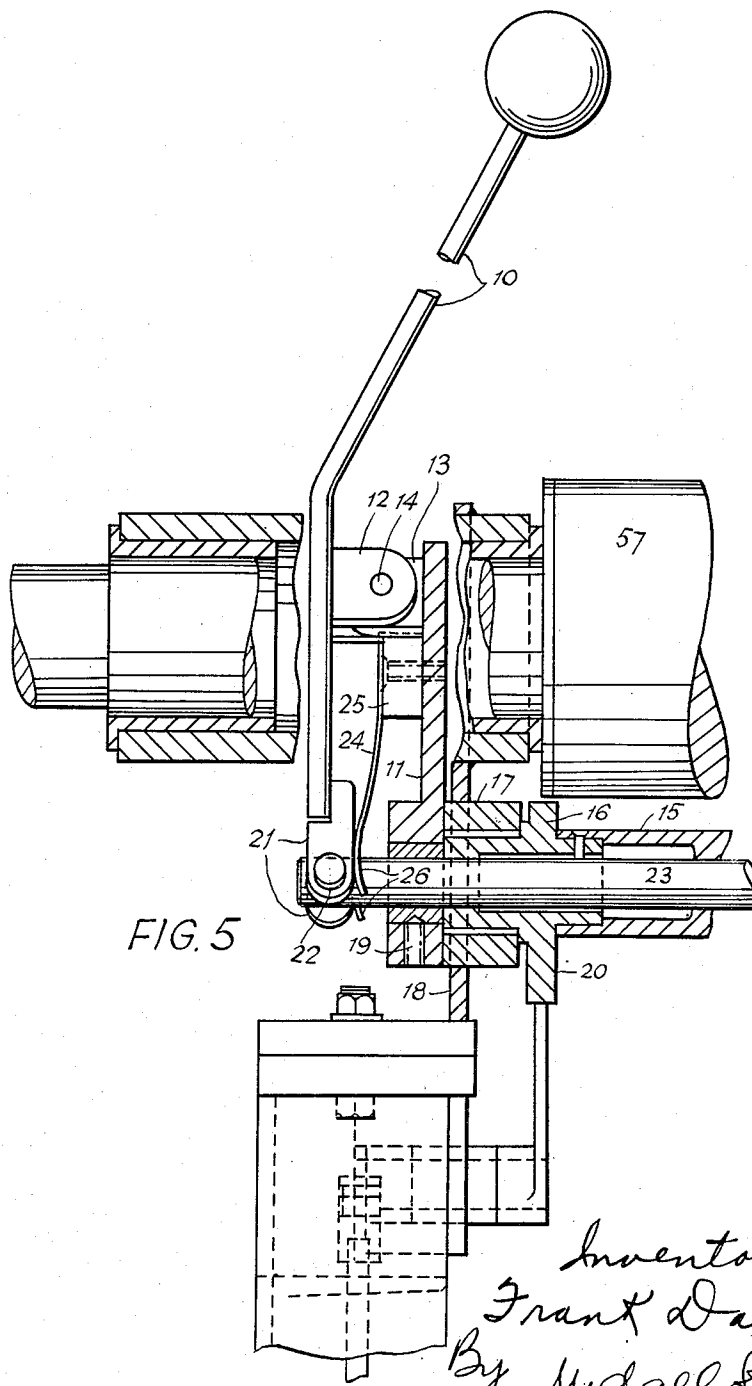
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2,683,471

LOOM FOR WEAVING

Filed July 16, 1951

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UNITED STATES PATENT OFFICE

2,683,471

LOOM FOR WEAVING

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Application July 16, 1951, Serial No. 236,923

Claims priority, application Great Britain
 July 18, 1950

13 Claims. (Cl. 139—336)

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This invention relates to looms for weaving and in particular to the stopping and starting control mechanism therefor.

On many looms the starting handle and brake lever are independent units but they are inter-
 5 connected in such a way that for the two posi-
 tions of the starting handle for "on" and "off" respectively, when the starting handle is "on" (i. e. when the loom is running), or moved "on" to start, then the brake is "off" or moved off, and
 10 when the starting handle is knocked off, whether by the weaver or automatically then the brake is applied automatically through such interconnection. When the loom is at rest, the weaver can manipulate the brake lever by hand to re-
 15 lease the brake without starting the loom, as when desiring to turn the loom over by hand. A number of looms more especially those of greater width, are provided with a duplicate starting handle at each side of the loom, so that the weaver can operate the same from the handle most conveniently within reach, and it has also been proposed similarly to duplicate the brake
 20 release handle for separate actuation as afore-said.

It is also known in a loom to provide mechanism operable to disengage the take-up so that, when the loom is stopped, such mechanism may be operated to enable the take-up to be turned back, or to enable the loom to be manually turned over without actuating the take-up.

The object of the present invention is to simplify the stopping and starting control mechanism.

According to the invention, the brake and driving control mechanisms are additionally inter-
 25 connected so that the brake can also be released without starting the loom by moving the starting handle to a third position whereby a single control handle only need be provided.

Preferably, the single three-position control handle is duplicated at the other side of the loom.

According to a further feature of the invention still further interconnection is provided with the take-up mechanism so that when the single control handle is in the second or third position the take-up mechanism is automatically disconnected.

In the accompanying drawings:

Fig. 1 is a side view showing one example of the control mechanism of a loom made in accordance with the invention, as seen from the right hand side of the loom, only those parts of

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the loom being shown as are necessary for the description of the invention.

Fig. 2 is a view looking from the front of the loom.

Fig. 3 is a front view of the right hand handle to show the constructional details hidden in Fig. 2.

Fig. 4 is a side view similar to Fig. 1 as from the left hand end of the loom and showing particularly the left hand handle and parts associated therewith.

Fig. 5 is a front detail view of the left hand handle and parts associated therewith.

Fig. 6 is a rear view of the quadrant plate.

In the example of the invention shown in the drawings a master starting handle is pivotally mounted at the brake side or right hand side of the loom, for pivotal movement both towards and away from the fell, and to a limited extent transversely of such direction. A duplicate handle is provided at the other end of the loom, as seen more clearly in Fig. 5 each lever is in two parts and consists of a handle 10 and an arm 11. The handle has a pair of lugs 12 and the arm a single complementary lug 13 for a pivot pin 14 providing the said transverse pivotal movement. The arm 11 is attached to a tube 15 extending across the loom by means of a plug 16 secured in the end of the tube and journaled in a bearing lug 17 of the side frame 18 of the loom, the arm being attached to an extension of the plug 16 by means of a grub screw 19. At the left hand side of the loom, the lug 16 has a cam 20 while the handle 10 at the left hand side differs from that at the right by being cranked inwardly. The lower end of the handle 10 has a pair of bifurcated lugs 21 carrying a pivot pin 22 by which it is connected to a rod 23 located slidably in the end plugs 16 of the tube 15. A leaf spring 24 is provided, secured to a block 25 on the arm, said spring being bifurcated at its lower end to provide tongues 26 engaging the bifurcated lugs 21, so as to urge the rod 23 towards the left hand side of the loom. Adjacent the right hand handle is a quadrant plate 27 having a slot 28, the starting handle being movably located therein, said slot having a single handle-holding notch 29 at its fell end into which notch the handle is adapted to be urged laterally by the spring 24 aforesaid. At the right hand end of the loom the arm 11 is part of a bell-crank lever the other arm 11a of which projects substantially at right angles from the handle towards the fell and such other arm is connected by a link 30 to a lower arm 31 fixedly

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mounted on a spindle 32 below a brake lever 33, said spindle being in a bracket 34 secured to the side frame of the loom, the spindle 32 carrying at its other end a double-ended lever 35, which is normally horizontal as shown in Fig. 1 when the starting handle is substantially vertical and at the centre of the slot in the arc of the quadrant. Such double-ended lever has at each side of its pivot cam-shaped formations respectively 36 and 37 on its upper edge engageable with the under side of the brake lever 33. On the main driving shaft is a brake drum 38 on which is located a band brake 39 one end of which band is adjustably anchored by a screw 40 while the other end is connected at 41 to the brake lever extending away from the fell to over-ride the double-ended lever aforesaid, immediately above both the cam-shaped formations thereof, said brake lever being loaded downwardly by a spring 42 almost onto such double-ended lever. The lower end of the spring is adjustably attached to a bracket 43 on a lower frame member of the loom. The double-ended lever has an extension 44 adapted to engage a plunger 45 of a limit switch 46 depression of which plunger closes the switch to energise the loom motor, the switch being self-opening.

Immediately below the quadrant is a holding catch and release mechanism for the starting lever. The catch 47 is bell-cranked having a head 48 and is secured to one end of a spindle 49 mounted in a bracket 50 on end of the loom. To the other end of the spindle 49 is attached a depending arm 51, behind the lower end of which is a small compression spring 52. The head 48 of the catch is shaped like a saw tooth and is adapted to engage behind the starting lever immediately below the quadrant when such starting lever has been moved to its furthest position away from the fell, so as to hold such handle in that position after moving back to allow the lever to pass. The handle is formed with a notch 53 to provide a face normal to the head of the catch the horizontal arm 47a, of the catch, extending outwardly from the end frame is connected by a link 54, to an armature 55 of an electric solenoid 56. The electric solenoid is adapted to be connected to the usual stop motions of the loom so as to be energised when any of such mechanisms comes into operation. Such mechanisms are not shown, as they form no part of this invention.

In operation, with the loom at rest both starting handles are in a substantially upright position, the right hand one being centrally in the slot of the quadrant, and the brake lever 33 as shown in Fig. 1 is fully loaded to the "on" position by its spring 42. In such position, in order that full braking power will be available, the brake lever is just clear of full engagement with the cam formations 36, 37 of the double-ended lever 35, that is to say, the starting handle, by reason of the weight of the connecting link 30 and the arms 31 and 11a extending towards the fell, will be weighted to move towards the fell so that the cam formation 36 of the double ended lever which is furthest from the fell will be contacting the under side of the brake lever and the other cam formation 37 will be just clear. The spring load aforesaid on the brake lever prevents any further upward movement of such cam formation 36. The extension 44 of the double-ended lever is clear of the plunger 45 of the limit switch 46 which is therefore in the "off" position.

To start the loom, the operator pulls either

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starting handle 10 away from the fell, both handles moving together. As the right hand handle approaches the front end of the slot it engages the head 48 of the catch and pushes it back until, on reaching the end of the slot the head moves back to engage in the notch 53 behind the right-hand handle so as to hold it in the "on" position. In making such movement, the arm 11a of the starting handle pulls up the connecting link 30 and rocks the double ended lever 35 so that its fell end 37 lifts the brake lever 33 against the resistance of its loading spring 42 and thereby releases the brake, while the extension 44 at the other end of the double-ended lever engages the switch plunger 45 to depress the same and close the switch to start the motor for the loom.

If the weaver wishes to stop the loom, the weaver can "knock off" by pressing either starting handle to the left on Fig. 2 away from the catch head 48 whereupon the handles will yield each by pivoting about its pivot 14 against the spring 24 until the right hand handle is free of the catch and the brake spring will then operate through the cam formation 37, arm 31, link 30 and arm 11a, to pull the handles to the central "off" position and at the same time to apply the brake. If any of the stop mechanisms come into action, the solenoid is energised and withdraws the catch allowing the brake spring similarly to pull off the handle and apply the brake. In both these events the handles return to their midway position with the right hand handle centrally in the quadrant slot, as shown in full lines in Fig. 1. Should the weaver wish to release the brake without starting the loom, the starting handles can be moved further towards the fell into their third position where the right hand handle will be held by the notch, such movement rocking the double-ended lever 35 the other way and causing the other cam formation 36, to raise the brake lever. The right hand starting handle can be disengaged by pressure urging, either to the left on Fig. 2 bringing the right hand handle out of the notch when the brake spring 42 will again return the starting handles to their central position and apply the brake. The two other positions above described are indicated in Fig. 1 by chain line.

In order to save the weaver the extra operation of releasing or disengaging the drive to the take-up roller 57 the tube 15 carrying the main and duplicate starting handles is as already described provided with the cam 20 which is arranged to effect such release or disengagement while the starting handle is in either the midway or the third position.

As shown in Fig. 4 the take-up motion comprises a horizontal countershaft 58, driven from the bottom shaft (not shown) through chain and sprocket 59. On said countershaft is mounted a bevel wheel 60 which meshes with larger bevel wheel 61, slidably keyed to a vertical shaft 62 extending upwardly and adapted through gearing (not shown) of the take-up motion, including the usual change wheel, to drive the take up roller 57. The slidable bevel wheel 61 is arranged to be raised and lowered by the cam 20 aforesaid through the lever 63, rod 64, and lever 65, engaging the cam, so as to disconnect the drive to the take-up gearing when the starting handles are in the central and third positions, thereby enabling the operative when the handles are in such positions to adjust the take-up motion and when in the rearmost position, to ma-

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nipulate or "turn-over" the loom manually without taking up.

What I claim is:

1. Control mechanism for a loom comprising a single handle, braking and driving mechanisms for the loom, and coupling means connecting said handle to said braking and driving mechanisms for the loom, said coupling means providing three alternative handle positions in which in one position of the handle the drive is "on" and the brake is "off," in another position the brake is "on" and the drive is "off," and a third or neutral position wherein both drive and brake are off, and wherein the handle can be moved from the driving position to the loom stopped position without passing through the neutral position.

2. Control mechanism for a loom according to claim 1 characterised by a single handle at each end of the loom, a tubular member connecting the two handles for simultaneous pivotal movement about the axis of the said tubular member, pivot means providing pivotal movement of each handle in a further direction at right angles to said axis and a coupling member between the handles located within the tube constraining the handles to move simultaneously in such further direction, whereby movement of the control handle can be effected at either end of the loom.

3. Control mechanism for a loom comprising a single handle, braking and driving mechanisms for the looms, and coupling means connecting said handle to said braking and driving mechanisms for the loom, said coupling means providing three alternative handle positions in which in one position of the handle the drive is "on" and the brake is "off," and in the second position the brake is "on" and the drive is "off," and a third position in which both the drive and the brake are "off," a take-up mechanism for the loom, control means for coupling and uncoupling the drive to the take-up mechanism of the loom, and further coupling means between said handle and said take-up control means to disconnect said drive to the take-up when the handle is in the second or third position.

4. Control mechanism for a loom comprising, a single handle, braking and driving mechanisms for the loom, and coupling means connecting said handle to the braking and driving mechanisms for the loom, said coupling means providing three alternative handle positions in which in one position of the handle the drive is on and the brake is off, in another position the brake is on and the drive is off, and a third or neutral position wherein both the drive and brake are off, characterized in that the third position of the lever is relatively beyond and along the path of movement of the handle between the other two positions.

5. Control mechanism for a loom according to claim 4 characterized by a brake and brake lever loaded to the on position, and a double-ended lever both ends of which are operably associated with the brake lever to move the latter to the off position when the double-ended lever is rocked in either direction by the handle, while permitting the brake to move to its "on" position when the double-ended lever is in a mid-way position.

6. Control mechanism for a loom according to claim 5 further characterized by a control electric switch for the loom drive and in that the one end of the double-ended lever is adapted to engage and operate to the "on" position the control electric switch for the loom drive.

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7. Control mechanism for a loom according to claim 6, further characterized by means for holding the handle in the said third position.

8. Control apparatus for a loom, comprising, in combination, a brake for the loom; a brake operating member mounted on the loom for movement between a braking position, where the brake of the loom is engaged to stop the loom, and a release position, where the brake of the loom is released; and moving means engaging said brake operating member to locate the same at said positions thereof, said moving means being mounted on the loom for movement in opposite directions from an intermediate position, where said moving means locates said brake operating member in said braking position thereof, to two positions, respectively, where said moving means locates said brake operating member in said release position thereof.

9. Control apparatus for a loom, comprising, in combination, a brake for the loom; a brake operating member mounted on the loom for movement between a braking position, where the brake of the loom is engaged to stop the loom, and a release position, where the brake of the loom is released; spring means operatively connected to said brake operating member for urging the same into said braking position thereof; and moving means engaging said brake operating member to locate the same at said positions thereof, said moving means being mounted on the loom for movement in opposite directions from an intermediate position, where said moving means locates said brake operating member in said braking position thereof, to two positions, respectively, where said moving means moves said brake operating member against the action of said spring means to locate said brake operating member in said release position thereof.

10. Control apparatus for a loom, comprising, in combination, a brake for the loom; a brake operating member mounted on the loom for movement between a braking position, where the brake of the loom is engaged to stop the loom, and a release position, where the brake of the loom is released; spring means operatively connected to said brake operating member for urging the same into said braking position thereof; moving means engaging said brake operating member to locate the same at said positions thereof, said moving means being mounted on the loom for movement in opposite directions from an intermediate position, where said moving means locates said brake operating member in said braking position thereof, to two positions, respectively, where said moving means moves said brake operating member against the action of said spring means to locate said brake operating member in said release position thereof; a starting switch located on the loom adjacent to said moving means; and a switch operating member connected to said moving means for movement therewith and engaging said switch to close the same and start the loom only when said moving means is in one of said two positions thereof so that said switch is open when said moving means is in said intermediate position and the other of said two positions thereof.

11. Control apparatus for a loom comprising, in combination, a brake for the loom; an elongated brake operating member mounted on the loom for movement between a braking position, where the brake of the loom is engaged to stop the loom, and a release position, where the brake of the loom is released; an elongated cam mem-

ber turnably mounted intermediate its end on the loom and having on opposite sides of the turning axis thereof a pair of cam portions located next to said brake operating member on a side thereof when said cam member is in an intermediate position thereof and said brake operating member is in said braking position thereof, so that when said cam member is turned in opposite directions from said intermediate position thereof said cam portions respectively engage said brake operating member to move the same to said release position thereof; spring means operatively connected to said brake operating member to urge the same to said braking position thereof and to thereby urge said brake operating member to engage one of said cam portions to move said cam member to said intermediate position thereof; an extension fixed to said cam operating member adjacent one of said cam portions thereof; and a loom starting switch located in the path of movement of said extension to be closed by engagement with said extension when said cam member turns in one of said opposite directions.

12. Control apparatus for a loom comprising, in combination, a brake for the loom; an elongated brake operating member mounted on the loom for movement between a braking position, where the brake of the loom is engaged to stop the loom, and a release position, where the brake of the loom is released; an elongated cam member turnably mounted intermediate its ends on the loom and having on opposite sides of the turning axis thereof, a pair of cam portions located next to said brake operating member on a side thereof when said cam member is in an intermediate position thereof and said brake operating member is in said braking position thereof, so that when said cam member is turned in opposite directions from said intermediate position thereof said cam portions respectively engage said brake operating member to move the same to said release position thereof; spring means operatively connected to said brake operating member to urge the same to said braking position thereof and to thereby urge said brake operating member to engage one of said cam portions to move said cam member to said intermediate position thereof; an extension fixed to said cam operating member adjacent one of said cam portions thereof; a loom starting switch located in the path of movement of said extension to be closed by engagement with said extension when said cam member turns in one of said opposite directions; and manually operable moving means operatively connected to said cam member for turning the same in said opposite directions from said intermediate position thereof.

13. Control apparatus for a loom comprising, in combination, a brake for the loom, an elongated brake operating member mounted on the loom for movement between a braking position, where the brake of the loom is engaged to stop the loom, and a release position, where the brake of the loom is released; an elongated cam member turnably mounted intermediate its ends on the loom and having on opposite sides of the turning axis thereof a pair of cam portions located next to said brake operating member on a side thereof when said cam member is in an intermediate position thereof and said brake operating member is in said braking position thereof; so that when said cam member is turned in opposite directions from said intermediate position thereof said cam portions respectively engage said brake operating member to move the same to said release position thereof; spring means operatively connected to said brake operating member to urge the same to said braking position thereof and to thereby urge said brake operating member to engage one of said cam portions to move said cam member to said intermediate position thereof; an extension fixed to said cam operating member adjacent one of said cam portions thereof; a loom starting switch located in the path of movement of said extension to be closed by engagement with said extension when said cam member turns in one of said opposite directions; manually operable moving means operatively connected to said cam member for turning the same in said opposite directions from said intermediate position thereof; and releasable catch means operatively connected to said moving means for releasably holding the latter in two extreme positions where said cam member is out of said intermediate position thereof, so that upon release of said catch means said moving means may be moved from one of said extreme positions immediately to an intermediate position where said cam member is located in said intermediate position thereof and said brake operating member is in said braking position thereof.

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