May 19, 1953 T. HINDLE 2,638,941

LOOM FOR WEAVING

Filed Sept. 7, 1950 4 Sheets-Sheet 1

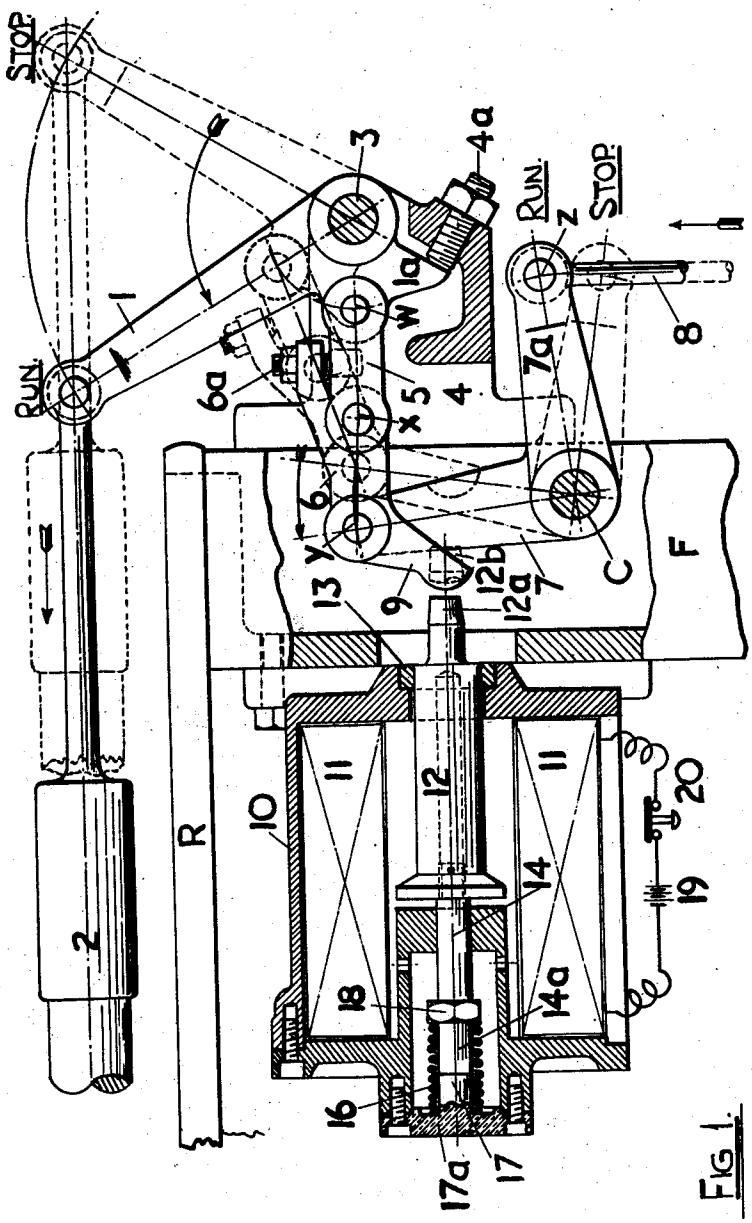


Fig 1.

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LOOM FOR WEAVING

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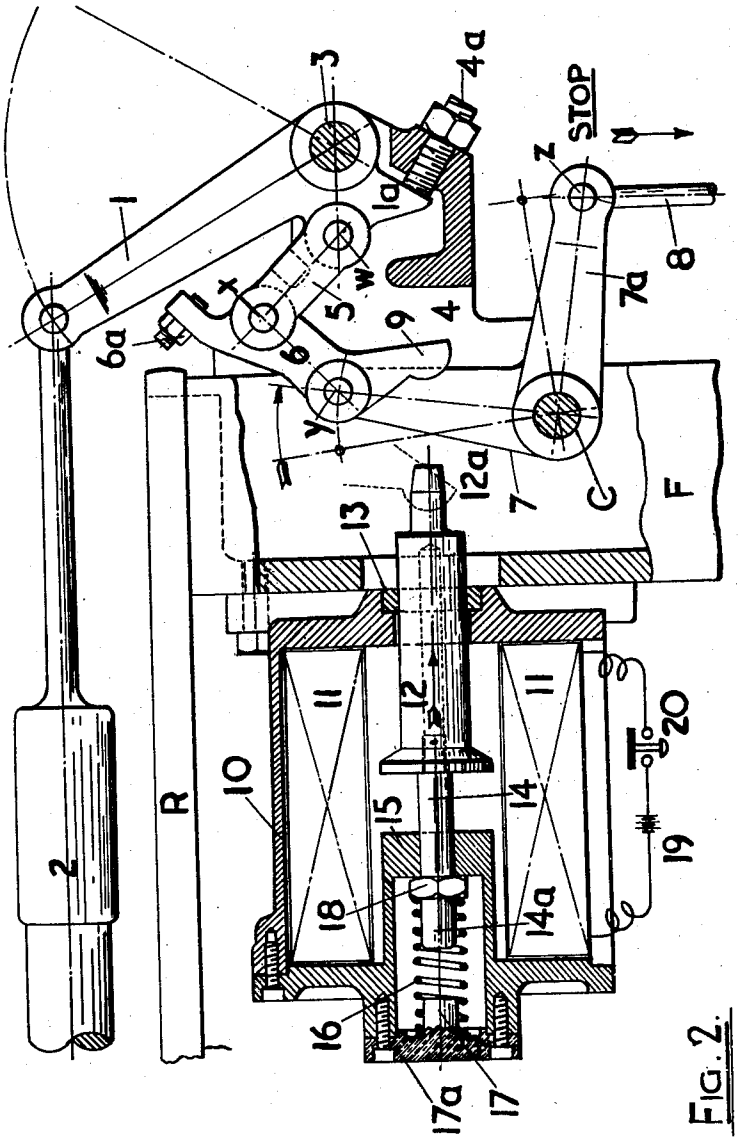


FIG. 2.

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LOOM FOR WEAVING

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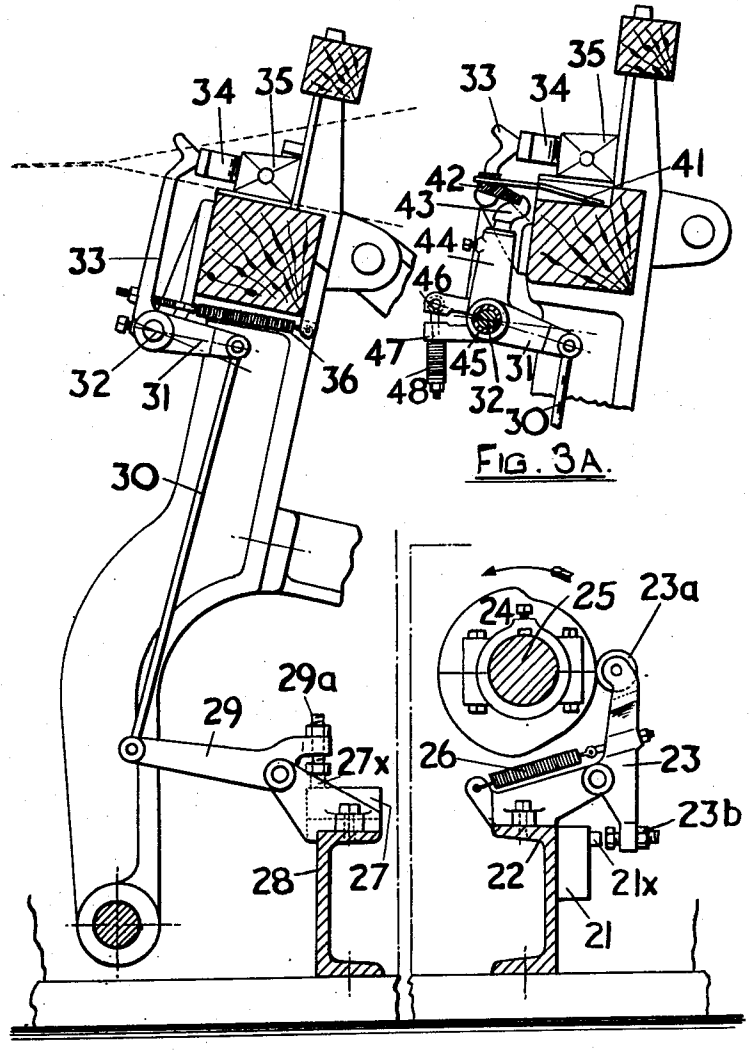


FIG. 3A.

FIG. 3.

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LOOM FOR WEAVING

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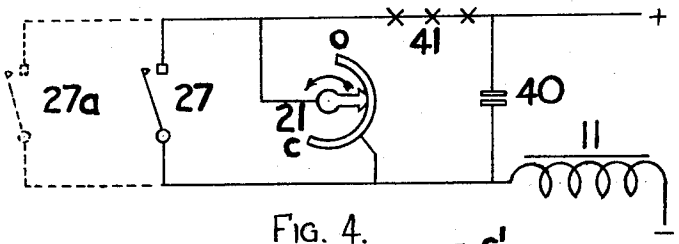


FIG. 4.

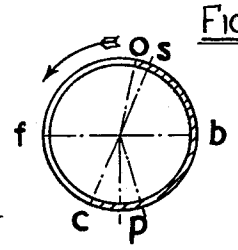


FIG. 4A.

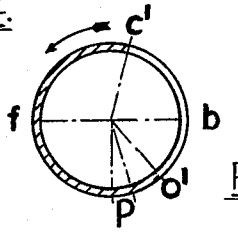


FIG. 5A.

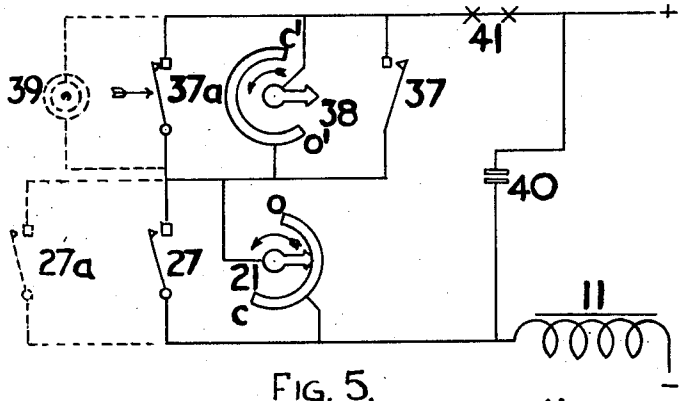


FIG. 5.

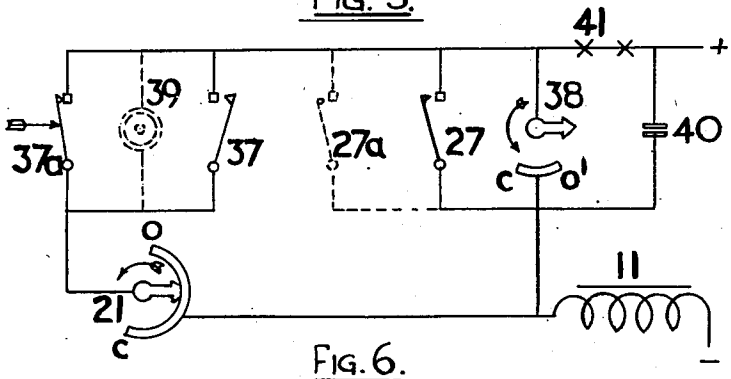


FIG. 6.

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Patented May 19, 1953 2,638,941

UNITED STATES PATENT OFFICE

2,638,941

LOOM FOR WEAVING

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Application September 7, 1950, Serial No. 183,541

In Great Britain September 24, 1949

6 Claims. (Cl. 139—345)

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This invention relates to looms for weaving and more particularly to improvements in loom stop motions.

The specification of application Serial No. 30,791, filed June 3, 1948, now Patent No. 2,551,492, granted May 1, 1951, describes improved means for driving, stopping and in certain circumstances reversing a loom, wherein a primary toggle serves to retain the starting handle when this is pulled into its "run" position to start the loom, and a secondary toggle is adapted to be tripped by automatic means, this secondary toggle then collapsing in an upward direction under the action of a powerful spring acting to disconnect the driving means and apply a friction-brake whereby the loom is stopped with exceptional promptness, the starting handle and attached control rod remaining stationary during such tripping action, thereby avoiding the delay which their inertia would otherwise cause.

The aforesaid patent also describes certain purely mechanical means whereby the said secondary toggle may be tripped automatically so as to stop the loom in the above manner should the shuttle fail to enter the box in the normal manner, or should the weft fail during the shuttle's flight across the loom, or in the case of a drop-box loom, should a shuttle-box jam during its changing movement.

The specification of my application Serial No. 185,990, filed September 21, 1950, describes a weft detector which is sensitive to the tension of the weft during the latter and major part of the shuttle's passage across the loom, and which acts, when subject to the pull of the weft, to close an electric switch. This weft-controlled switch is preferably employed to maintain an electric circuit which would otherwise be interrupted.

The principal object of the present invention is to provide improved means for tripping and controlling the tripping of the secondary toggle described in the aforesaid patent whereby the time lag between the detection of any initiating fault and the resultant stoppage of the loom is appreciably diminished in comparison with the mechanical tripping means described in that specification, and whereby the secondary toggle may be tripped in immediate response to an initiating fault at any time in the slay crankshaft's revolution irrespective of the position or movement of the slay at that time.

While the invention is particularly applicable to and is herein described in connection with the double-toggle starting handle mechanism described in the aforesaid patent, it may readily

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be adapted to effect automatic tripping of any form of holding-on device fitted to loom starting handles, such as a catch, a latch, a notch or a simple toggle or cam lock.

According to the present invention, an electric solenoid or electro-magnet, hereinafter referred to as the trip-solenoid co-acts with the loom's starting and stopping controlling means in such manner that the energising circuit of the trip-solenoid must first be completed to enable the loom to be started, and must be maintained uninterrupted all the time the loom is running, and if for any reason the circuit is not so maintained but is interrupted by one or more controlling switches in consequence of abnormal conditions arising either in the loom or any of its parts, or in the weft and/or warp yarn and/or woven cloth, or if the energising current supply fails, then the trip-solenoid is de-energised and as a result the loom is stopped automatically.

When the trip-solenoid is energised by completion of its circuit, the resultant magnetic pull draws in the solenoid plunger and loads up one or more springs, thereby providing a store of energy which, when released by automatically controlled interruption of the energising circuit, is amply powerful enough to trip the starting-handle's holding-on device.

The invention is illustrated in and will be described with reference to the accompanying drawings in which:

Fig. 1 is a front elevation, partly in section, showing the trip-solenoid adapted to control the secondary toggle of the double-toggle starting handle-linkage described in the aforesaid patent, the solenoid plunger being shown retracted in its normal energised position, and the starting-handle linkage in its normal running position;

Fig. 2 corresponds with Fig. 1, but shows the position of the various parts immediately following de-energisation of the trip-solenoid, and consequent automatic stoppage of the loom;

Fig. 3 is a cross-section through parts of a loom showing the mechanical actuation of the switches employed to control the trip-solenoid;

Fig. 3A corresponds with part of Fig. 3, but shows the mechanical weft fork described in the aforesaid patent adapted to control the shuttle-switch 27 shown in Figs. 3 and 4;

Fig. 4 is an electric circuit diagram providing shuttle protection;

Fig. 4A is a timing diagram relating to Figs. 4 and 5;

Fig. 5 is an electric circuit diagram providing

shuttle protection and loom stoppage consequent upon weft failure;

Fig. 5A is a timing diagram relating to Fig. 5;

Fig. 6 is an electric circuit diagram which is a modification of Fig. 5.

In the form of the invention illustrated in Figs. 1 and 2, the trip solenoid 10, with its axis horizontal, is mounted on the inside face of the loom end-frame F, in close proximity to the starting-handle linkage which is mounted outside the end-frame. The starting-handle linkage illustrated is identical with that described in specification of application Serial No. 30,791, and comprises a starting-handle or lever 1, with its top end linked to the starting-rod 2, which extends the full width of the front-rest R. The starting-lever 1 is pivoted on the pin 3 carried in the bracket 4 bolted to the outside of end-frame F, and is provided with a short arm or lug drilled for the linkage pin *w*, and also with a toe 1*a*, which latter finally abuts against an adjustable stop-screw 4*a*, as the starting-lever is swung over into its "run" position, shown in solid lines in Fig. 1.

The starting-lever 1 is connected by the compound compression links 5 and 6, pivotally connected by linkage pins *w*, *x* and *y*, to the top end of the vertical arm 7 of a bell-crank lever pivoted at C on the end-frame F. The setting of the secondary toggle links 5 and 6 is finely adjustable by means of a stop-screw 6*a*, and due to their own weight, these links tend to assume the locked or approximately straight-line position shown by both full and dotted lines in Fig. 1.

During normal manual operation of the starting-lever, the secondary toggle links 5 and 6 act as a rigid compression link, which in combination with the short radius arm carrying the pin *w*, constitutes a primary toggle serving to lock the starting-lever 1 in its "run" position, as defined by the toe 1*a* bearing against stop-screw 4*a*.

The horizontal arm 7*a* of the bell-crank lever is connected by a pin *z* to the vertical tension link 8, by which the movement of the bell-crank lever is transmitted to control the loom driving means, such as a friction-clutch, in combination with the loom stopping means, which is a powerful friction-brake. This brake is applied by a spring, and the effect of raising the pin *z* and link 8 is to release the brake and then engage the clutch, all against the increasing force exerted by the said brake spring, in the manner generally as described in specification of application Serial No. 30,791, the continuous action of the brake spring tending to disengage the clutch and apply the brake being resisted by the double toggle lock, so long as the loom continues weaving in a normal manner.

The trip-solenoid, which is part of the present invention, may be of any suitable construction, such as that shown in Figs. 1 and 2, in which an iron casing 19 encloses the energising coil 11. The soft iron plunger 12 is slidably supported in a non-magnetic bush 13 and by the non-magnetic stud 14, which slides in the iron pole-piece 15. A compression spring 16 located between the end-cap 17*a* and the collar 18 on a stud 14 acts to propel the plunger 12 to the right, as shown in Fig. 2, when the coil 11 is de-energised, such outward movement being limited by the collar 18 then bearing against the inner face of the pole-piece 15. The spring 16 forcibly retains the plunger 12 in such position so long as the coil 11 is not energised.

When the coil 11 is energised, however, as shown in Fig. 1, the plunger 12 is electro-magnetically retracted to the left, at the same time further compressing the spring 16, the plunger movement being limited by the end 14*a* of the stud 14 finally abutting against the fixed stop 17, in such manner as to leave an appreciable air-gap between the inner end of the plunger and the pole-piece 15. In such energised condition, the hammer 12*a* of the retracted plunger presents no obstruction to the movement of the arm 9, which is an extension of the secondary toggle link 6. When the trip-solenoid is energised, therefore, the starting-rod 2 and the starting-lever 1 may be moved in a normal manner from the "stop" position, indicated by dotted lines, to the "run" position shown by solid lines, thereby starting the loom. The corresponding positions of the primary and secondary toggle links, also of the bell-crank lever and link 8, are similarly indicated in Fig. 1. During such starting-lever movement, the arm 9 closely approaches the hammer 12*a* of the retracted plunger 12, as shown in Fig. 1.

In order to illustrate the action, an electric battery 19 and a simple switch 20 are depicted in Figs. 1 and 2 for controlling the solenoid. If the switch 20 is closed, as shown in Fig. 1, the solenoid is energised and the plunger retracted, thereby further compressing spring 16. If now the switch is opened to interrupt the solenoid circuit, the magnetic flux collapses, and the spring 16 propels the plunger 12 to the right at a suitable velocity so that it strikes a hammer blow on the arm 9, with the result, as shown in Fig. 2, that the secondary toggle, comprising the links 5 and 6, is tripped and instantly collapses in an upward direction under the compressive force continuously exerted by the aforesaid brake-spring.

As the secondary toggle is tripped in the above manner, the brake-spring acts to disengage the clutch and apply the brake, thereby effecting very prompt stoppage of the loom as described in the aforesaid patent.

During such tripping action, the starting-rod 2 and starting-lever 1 both remain stationary in their "run" positions, thereby avoiding the time-lag which their appreciable inertia would otherwise cause.

After the secondary toggle has been tripped by the trip-solenoid in the above manner, the toggle may be re-set by the simple manual return of the starting-rod 2 and lever 1 to their "stop" positions (shown in dotted lines in Fig. 1) in readiness for re-starting the loom.

If the fault which initiated the automatic stoppage has been duly remedied, so that the solenoid is again energised, and its plunger consequently retracted to the left, the starting-lever may be moved to its "run" position to re-start the loom in the normal manner. On the other hand, if for any reason the solenoid is not so re-energised, the spring 16 forcibly retains the plunger 12 in its tripping position, in which case its hammer end, shown in dotted lines at 12*b* in Fig. 1, obstructs the arm 9, with the result that the secondary toggle is again tripped before the starting-lever 1 and link 8 have been moved sufficiently to engage the friction-clutch, or other driving means, thus preventing the loom from being re-started until the trip-solenoid has been re-energised.

In applying the trip-solenoid to effect automatic stoppage of a loom in the event of the shuttle failing to enter the opposite box within the allotted time, customarily known as shuttle-protection, the trip-solenoid is placed under the joint control of two switches, hereinafter referred

to, respectively, as the shuttle try-switch and the shuttle-switch.

The shuttle try-switch is actuated from any convenient moving part of the loom, but preferably by means of a cam revolving at slay crankshaft speed, the profile of the cam being arranged to close the shuttle try-switch shortly before the shuttle is picked and to open it just after the time when the shuttle is normally due to arrive in the opposite box.

The shuttle-switch may be actuated by mechanical linkage from the slay stop-rod, in such manner that the shuttle-switch is closed by a shuttle entering into or remaining in the box at either side of the loom, but is open when both boxes are empty, as occurs while the shuttle is in flight across the loom, also when the weaver withdraws the shuttle from a box with the loom stopped.

Referring to Fig. 3, which merely shows those parts of a loom necessary to illustrate suitable mechanical actuation of the electric switches employed to control the trip-solenoid, the shuttle try-switch **21** is mounted on the back-rail **22**, and is actuated by follower-lever **23**, provided with adjustable screw **23***b* to engage the switch plunger **21***x*. A spring **26** holds a follower-bowl **23***a* mounted on the follower-lever **23** against the profile of a cam **24**, which revolves with the slay crankshaft **25**. The shuttle try-switch **21** is self-opening by reason of its own spring (not shown), and is closed by screw **23***b* as the cam revolves and displaces bowl **23***a* to the right.

The shuttle-switch **27** is mounted on the front-rail **28** of the loom and is actuated by a lever **29**, which is provided with an adjustable screw **29***a* to engage the switch plunger **27***x*. The lever **29** is connected by a link **30** to a lever **31** secured to the slay stop-rod **32**, which is a simple rocker-shaft, completely devoid of dagger-blades or the like, and is provided, at each end, with a finger lever **33** adapted to bear on the box-swell **34**, controlled by the shuttle **35** in the usual manner.

The stop-rod spring is indicated at **36**, but may be duplicated and applied in any convenient manner. The shuttle-switch **27** is self-opening by reason of its own spring (not shown) and is closed by a shuttle entering or remaining in the box at either side of the loom. When both boxes are empty, the shuttle-switch is open.

As shown in Fig. 4, the shuttle try-switch **21** is connected in parallel with the shuttle-switch **27**, and then in series with the energising coil **11** of the trip-solenoid. An electric condenser **40** is connected in parallel with the switches in order to quench the inductive spark when the solenoid circuit is interrupted. Any number of auxiliary switches **41** may be included in the solenoid circuit. These switches are normally closed, but are adapted to be opened as a direct consequence of abnormal conditions arising either in the loom or any of its parts, or in the weft or warp yarn or in the woven cloth, the actuation and opening of any one of these auxiliary switches serving to interrupt the trip-solenoid circuit, and consequently to effect prompt stoppage of the loom.

In Fig. 4A, which is a timing diagram based on one revolution of the loom crankshaft, the assumed direction of rotation being as shown by the arrow, *f* represents the front-centre and *b* the back-centre, the pick occurs at about *p*, and the shuttle normally enters the opposite box at *s*. Both boxes therefore, are empty for the period *p* to *s*, during which period the shuttle-switch **27** is open. The shuttle try-switch **21** closes at about *c*, shortly before the pick, and remains closed until it opens at *o*, just after the shuttle is normally due to arrive in the opposite box and close shuttle-switch **27**.

If the shuttle arrives in the box within the allotted time, that is, before the shuttle try-switch opens at *o*, the circuit of the trip-solenoid is maintained throughout the cycle, first by the shuttle try-switch and then by the shuttle-switch, with overlap as one switch takes over from the other, so that the loom continues weaving.

If, however, due to mischance, the shuttle has not arrived in the box and closed the shuttle-switch **27** when the shuttle try-switch **21** opens at *o*, then the circuit of the trip-solenoid is immediately interrupted, and the loom is stopped very promptly with slay about half-way in its forward swing, so avoiding all possibility of damage due to a trapped shuttle.

After such automatic stoppage, the act of manually inserting the shuttle into the box closes the shuttle-switch **27**, and re-energises the trip-solenoid, thereby enabling the loom to be re-started.

Referring to Figs. 3, 4 and 4*a*, the cam **24**, shown only in Fig. 3, which actuates the shuttle-try-switch **21**, may be readily adjusted around shaft **25** to set the opening point *o* so as to provide for a reasonable margin of delay in the shuttle's arrival in the box, combined with very adequate shuttle protection.

The stop-rod **32**, shown in Fig. 3, extending along the slay between the boxes at each end and may be omitted and substituted by two relatively short shafts each having secured to it one feeler lever **33** and one lever **31**. In this modification, the shuttle-switch **27** is duplicated, there then being one such switch for each box. These duplicate shuttle-switches, **27** and **27***a* are connected in parallel as indicated by dotted lines in Fig. 4. The operation is otherwise unchanged, as the shuttle's normal arrival closes either the shuttle-switch **27** or the shuttle-switch **27***a*, according to which end the shuttle is travelling, and thereby maintains the solenoid circuit when the shuttle try-switch **21** opens at *o*.

In a further modification, the duplicate shuttle-switches **27** and **27***a* may be mounted on the slay at each end and actuated directly by their respective box-swells. In a still further modification the shuttle switches may be mounted on the shuttle-boxes and actuated more or less directly by the shuttle, as is particularly convenient in the case of a loom fitted with pneumatic picking, which necessitates enclosed shuttle-boxes.

The aforesaid patent describes a mechanically actuated centre weft-fork by means of which, in the absence of weft in the shed during the latter part of the shuttle's passage, a pawl is lowered into the path of a vertical lever secured to a sleeve fitted loosely on the slay stop-rod, so preventing the sleeve from rocking along with the stop-rod when this rocks due to the shuttle's normal entry into the box. When the sleeve is locked and held stationary in this manner, an escapement spring, which normally causes the sleeve to rock with the stop-rod, acts to prevent damage to the parts. Such weft-fork mechanism may be readily adapted to operate in combination with the trip-solenoid and controlling switches hereinbefore described, so as to cause the loom to "stop on pick" if the weft fails during the shuttle's passage.

Referring to Fig. 3A, which shows the position of the relevant parts at the instant of the shuttle's normal arrival in the box, the weft having run out or broken during the shuttle's passage, the weft-fork 41, in the absence of weft support, has fallen into the usual groove in the slay, and has lowered the pawl 42 into position to engage and obstruct the movement of the top end 43 of a vertical lever 44 which is secured to the sleeve 45 fitted loosely on the stop-rod 32.

The escapement spring 48 normally holds the arm 46, also secured to the sleeve 45, in contact with the arm 47, which is secured to the stop-rod 32. In this arrangement, the lever 31, which in the arrangement shown in Fig. 3, is secured directly to the stop-rod, is instead secured to the spring-driven sleeve 45, so that the closure of the shuttle-switch 27 by the shuttle entering the box and rocking the stop-rod is made further conditional upon the weft-supporting the weft-fork and thereby permitting sleeve 45 to rock with the stop-rod.

The operation is as follows: If the weft-fork 41 receives the necessary support from the weft, the pawl 42 is thereby supported above and clear of the path of the vertical lever 44. If and as the shuttle enters the box in the normal manner and rocks the stop-rod, the sleeve also rocks, and the lever 31 acts through the link 30 to close the shuttle-switch 27, before the shuttle try-switch 21 opens at *o*, shown in Fig. 4A, so that the loom continues weaving. If, however, as is shown by Fig. 3A, the weft fails, the weft-fork 41 falls and lowers its pawl 42 to obstruct the top end 43 of the vertical lever 44, together with the sleeve 45 and attached arm 46, and also the lever 31. Even though the shuttle enters the box in the normal manner and rocks the stop-rod, the sleeve is prevented from rocking, and consequently the shuttle-switch 27 is not closed by the shuttle's normal arrival and when the shuttle try-switch 21 opens at the appointed time, the trip-solenoid is interrupted thereby stopping the loom, for weft repair, with the slay about halfway in its forward swing. When the stop-rod rocks within the stationary sleeve in this manner, the arms 46 and 47 separate as shown, thereby further compressing spring 48.

The weft detectors, or weft-controlled switches, described in application Serial No. 185,990 may be employed to control the circuit of the trip-solenoid hereinbefore described, so as to effect prompt stoppage of the loom if the weft fails while the shuttle is in flight across the loom. Two such weft detectors, hereinafter referred to as the weft-switches, are employed, one for each direction of picking, in combination with a cam-actuated weft try-switch, all three switches being connected in parallel and then in series with the basic shuttle protection circuit shown in Fig. 4. The weft try-switch 38 is preferably mounted and operated exactly as the shuttle try-switch 21 in Fig. 3, the cam profile being modified to suit the working requirements.

This combination is shown by the electric circuit diagram, Fig. 5, in which the trip-solenoid coil 11, the shuttle try-switch 21, the shuttle switches 27 and 27*a*, the condenser 40 and the optional auxiliary switches 41 all correspond with Fig. 4. The right and left-hand weft-switches, 37 and 37*a*, are connected in parallel with the weft try-switch 38. As shown by the timing diagram, Fig. 5A, the weft try-switch 38 opens at c^1 shortly after the shuttle has entered the shed, by which time the weft has normally looped round the adjacent weft detector pin of the aforesaid application Serial No. 185,990 and closed its weft-switch, and closes again at about o^1, as or just after the shuttle normally enters the opposite box. During the interval from o^1 to c^1, while the weft try-switch is open, the weft-switch at the picking side has the duty of maintaining the trip-solenoid circuit, as is indicated in Fig. 5, by the arrow holding the weft-switch 37*a* closed.

If the weft runs out or breaks, or for any reason does not close the appropriate weft-switch and keep it closed, then the trip-solenoid circuit is interrupted and the loom "stops on pick."

Referring to Fig. 5, when the loom stops automatically due to weft failure, the shuttle will generally arrive in its box after the slay has stopped, with the shed more or less fully open. The weaver will usually replace the empty or faulty shuttle with a full one, which he will pass through the stationary shed and insert into the box after withdrawing therefrom the faulty shuttle. In order to re-energise the trip-solenoid preparatory to re-starting the loom, the weaver must hold or arrange the weft thread extending through the shed so that is closes the weft-switch at that side from which the faulty shuttle was picked. In practice, this requirement is objectionable, particularly in the case of a wide loom, hence it is often preferred to adapt the control circuit to permit the loom, after a weft stoppage, to be re-started without the necessity for one of the weft-switches to be held closed during the first forward swing of the slay. While this throws upon the weaver responsibility for the weft being complete in the shed before restarting the loom after a weft stoppage, it is a practical convenience.

One such modification is shown in Fig. 6, wherein the two weft-switches 37 and 37*a* are connected in parallel and then in series with the shuttle try-switch 21. This leg of the circuit is connected in parallel with the shuttle-switches 27 and 27*a* and the weft try-switch 38. These parallel legs are in turn connected in series with the trip-solenoid coil 11. The condenser 40 is connected as before to quench the inductive spark when the solenoid circuit is interrupted.

In this modification, after a weft stoppage and the weaver taking the necessary action to make good the faulty weft in the open shed, the act of inserting the new shuttle into the box closes the shuttle-switch (27 or 27*a*) which energises the trip-solenoid although both weft-switches are open, thereby permitting the loom to be re-started. After the first forward swing of the slay, of course, the weft stop-motion renews its function.

Under normal running conditions when the slay is about its back-centre position, as is indicated by the diagrammatically depicted shuttle try-switch 21 and weft- try-switch 38 in Fig. 6, the shuttle is in flight across the loom, and the trip-solenoid is then normally maintained by one of the weft-switches held closed by the weft being laid in the shed by the moving shuttle, as is indicated by the arrow holding weft-switch 37*a* closed.

With the control circuits shown in Figs. 5 and 6, the complete absence of weft in the moving shuttle is instantly detected when the weft try-switch 38 opens very shortly after the pick, in which case the loom stops with the slay at or about its back-centre position and with the empty shed fully open. Weft failure may occur, however, and be instantly detected at any time during the period commencing with the

opening of the weft try-switch and ending with the shuttle's normal arrival in the opposite box. At the latest, therefore, the loom is stopped due to weft failure with the slay only about halfway in its forward swing, which coincides with the stoppage position resulting from non-arrival of the shuttle.

Referring to Figs. 5 and 6, the weft stop-motion feature may be put out of action, if so desired, by simple closure of a parallel hand-switch **39**, without impairing the shuttle protection.

Still referring to Figs. 5 and 6, any number of auxiliary switches **41** may be included in the solenoid circuit, such switches being normally closed but adapted to be opened as a direct consequence of abnormal conditions arising either in the loom or any of its parts, or in the warp yarn or in the woven cloth, the opening of any one of these auxiliary switches serving to interrupt the solenoid circuit and thereby to effect prompt stoppage of the loom. As an example of the use of the auxiliary switches **41**, the displacement due to overload of a safety-escapement device fitted to the linkage operating the shuttle boxes on a drop-box loom may readily be adapted to open an auxiliary switch, such as indicated at **41** in Figs. 4, 5, and 6, for the purpose of stopping the loom promptly and well before the next picking impulse, in the event of the moving boxes being jammed by a misplaced shuttle or picker.

The trip-solenoid **11** is preferably designed to have a final air-gap between the plunger **12** and pole-piece **15** equal in length to from one-sixth to one-quarter of the effective plunger stroke, which provision limits the final magnetic flux and ensures very rapid release of the plunger, under the propelling force of its spring, when the solenoid circuit is interrupted.

I claim:

1. In a stop motion for a loom having a starting rod, and a member for actuation by said rod to control the starting and stopping of the loom, a device for holding said member in running position and trippable to release said member for movement to stopping position, a solenoid active when deenergized to trip said holding device, a circuit for energizing said solenoid, a switch for closing said circuit to render said solenoid inactive relatively to said holding device and thereby condition said member for movement into starting position and for holding said circuit closed and said solenoid energized for continued running of the loom, and a controlling switch in said circuit operative in response to an abnormal condition in a part of the loom to open said circuit and de-energize said solenoid and thereby condition said solenoid to trip said holding device.

2. In a stop motion for a loom as defined in claim 1, wherein said holding device for said member comprises a toggle which when straightened provides an operating connection between said member and starting rod and operative, while said solenoid is energized to transmit motion from said member to said rod but when flexed renders said connection inoperative while said solenoid is de-energized.

3. In a stop motion for a loom as defined in claim 1, including a plunger which is retracted when said solenoid is energized, and a spring in which energy is stored by the retraction of the plunger and is operative to move the plunger into tripping engagement with said holding device to release said member.

4. In a stop motion for a loom as defined in claim 1, including a plunger which is retracted from said holding device while said solenoid is energized to condition said member to start the loom and for normal running of the loom, and a spring which is compressed when said plunger is retracted and which is operative to impart a hammer blow to said holding device to trip it and thereby release said member to stop the loom when said solenoid is de-energized.

5. In a stop motion for a loom as defined in claim 1, wherein said holding device comprises a toggle between said member and starting rod for conditioning said member for operation by the starting rod to start and stop the loom while said solenoid is energized and for rendering said member inactive to start the loom while said solenoid is de-energized.

6. In a stop motion for a loom having a starting rod and a member for actuating said rod, the combination of a holding device for said member, a solenoid for tripping said holding device, an energizing circuit for said solenoid, controlling switches in said circuit, a try-switch in said circuit in parallel with the controlling switches, and a cam for operating the try-switch and rotating at slay crank shaft speed, the profile of said cam being such as to maintain the try-switch closed during a predetermined period of the loom cycle, and each controlling switch being operated to close before opening of the try-switch in the absence of an abnormal condition in any part of the loom to influence a controlling switch to maintain it open.

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