

July 26, 1932.

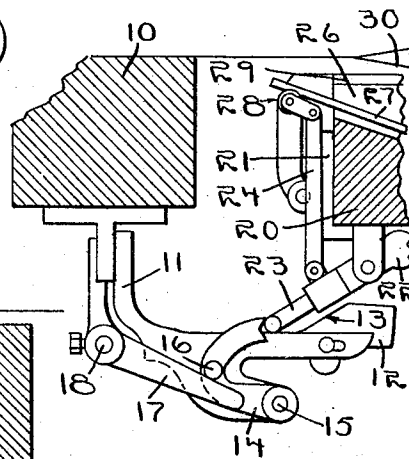
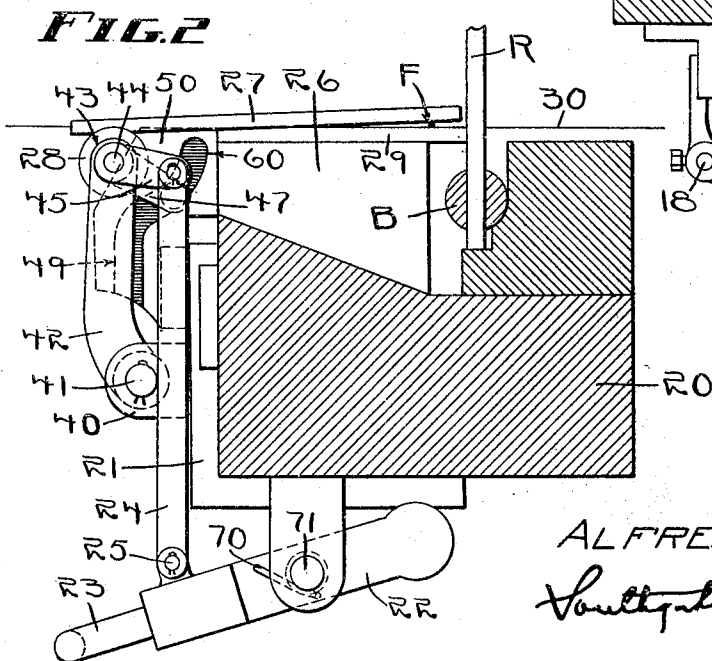
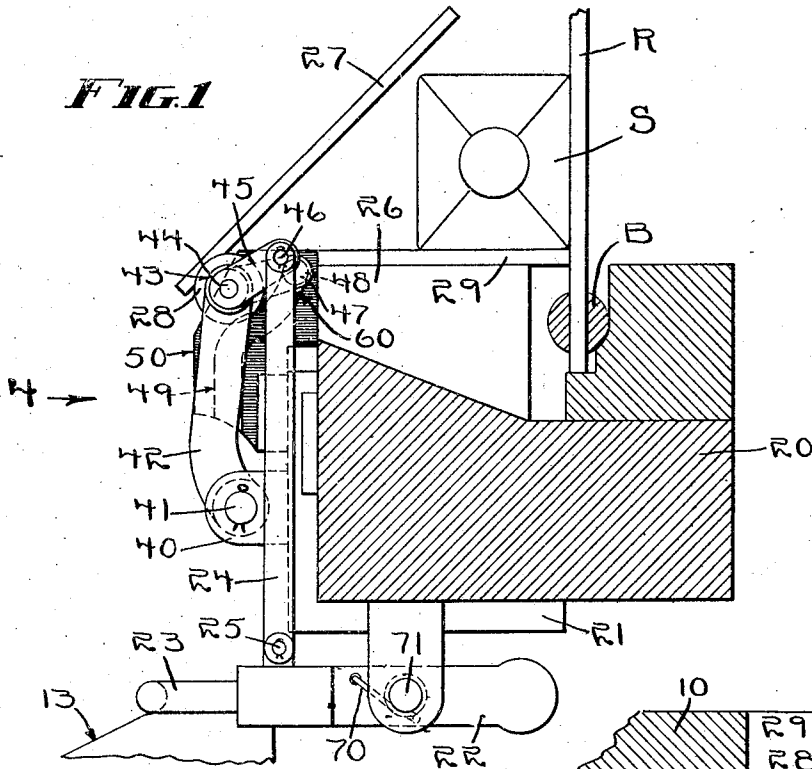
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1,868,716

FILLING STOP MOTION

Filed Nov. 14, 1930

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

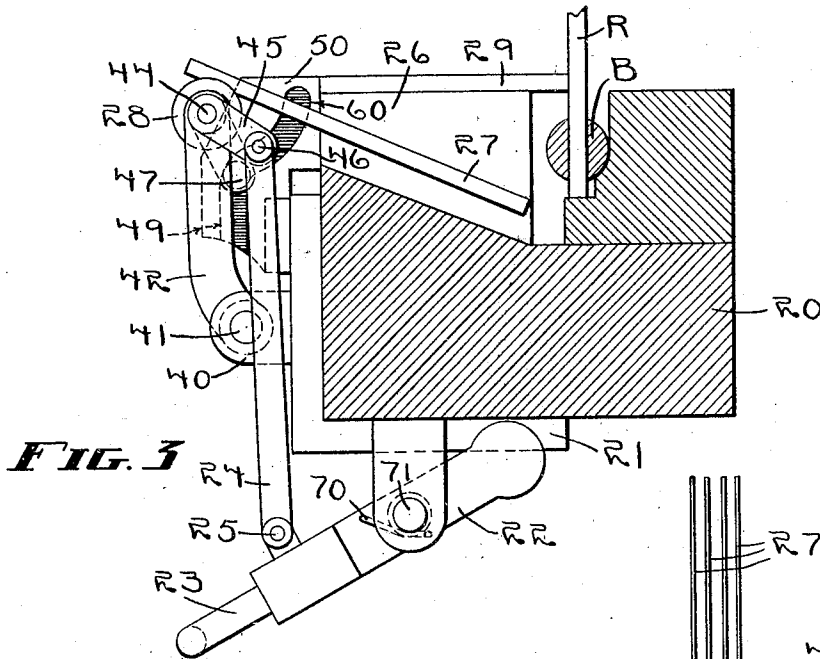


FIG. 3

FIG. 4

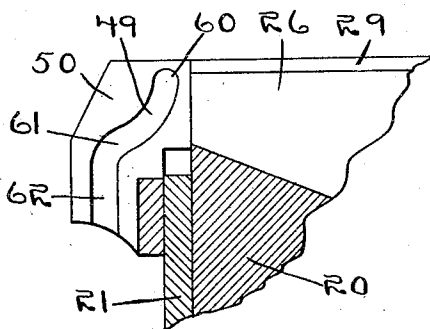
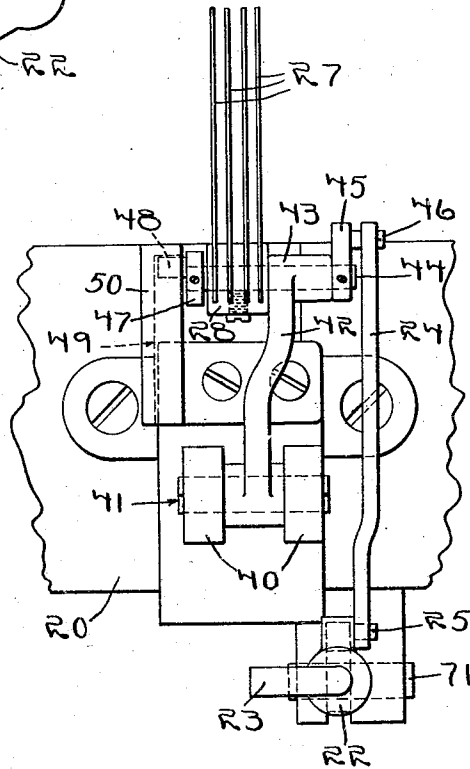


FIG. 5

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ALFRED F. MORRELL, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

FILLING STOP MOTION

Application filed November 14, 1930. Serial No. 495,710.

This invention relates to improvements in filling stop motions and it is the general object of the invention to provide means for giving the weft fork its usual downward movement but to act on it so as to require a forward movement after the detecting stroke has been practically completed for the purpose of clearing the lower bar of the reed.

In the weaving of certain goods there is employed a type of reed which has a relatively large lower rail or bar located a short distance below the shuttle race and extending forwardly from the reed line. When a center filling fork is used in such a loom the rear ends of the tines are likely to strike the lower bar of the reed to prevent the fork from having sufficient movement to insure a positive knock-off of the loom. It is an important object of my present invention to provide a mounting for the tines of the fork which will permit them to have their usual down motion to detect for the presence or absence of weft on the lower shed, but to act thereafter as the tines of the fork move in the well in the lay to advance them so their rear ends will miss the reed rail and be permitted to descend to the bottom of the well.

It is a further object of my present invention to mount the filling fork on an arm which is pivoted to and supported by the lay and acted upon during the forward movement of the lay to cause the tines to have a forward movement relatively to the lay. In this connection it is a detailed object of my invention to provide a cam to guide a part co-acting with the fork to give the latter its forward movement.

With these and other objects in view which will appear as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawings, where a convenient embodiment of my invention is set forth,

Fig. 1 is a vertical transverse section through a lay showing my improved center stop motion applied thereto with the tines in raised non-detecting position correspond-

ing to a relatively rearward position of the lay, with the shuttle in flight,

Fig. 2 is a view similar to Fig. 1 but with the lay advanced toward its forward position and with the tines of the fork moved to detecting position substantially level with the lower shed,

Fig. 3 is a view similar to Fig. 1 but with the tines moved into the well on the lay, indicating absence of weft,

Fig. 4 is a front elevation taken in the direction of arrow 4, Fig. 1,

Fig. 5 is a detail of the stand having the slot therein which effects the relative forward movement of the fork with respect to the lay, and

Fig. 6 is a vertical section through the upper portion of a loom showing the relation of the knocking-off parts of the stop motion, together with the breast beam and lay.

Referring to the drawings, particularly Fig. 6, I have shown a breast beam 10 having a bracket 11 extending rearwardly to support a normally fixed cam plate 12. The latter has a downwardly and forwardly inclined face 13 which may be varied as to position with respect to the breast beam. A knock-off lever 14 is pivoted as at 15 to the bracket and has a laterally extending lug 16 which projects over a finger 17 secured to a rocker shaft 18. The latter has connections through devices not shown to stop the loom when rocked in a right hand direction as viewed in Fig. 6. Such a rocking will be caused by lowering of the lug 16 to cause depression of the arm 17.

The lay 20 carries a bracket 21 to the lower part of which is pivoted a knock-off lever 22 into the forward end of which is extended a bunter 23. The latter is adapted to slide over the cam face 13 and is determined as to position by a force transmitted through the upright link 24. The latter has pivotal connection as at 25 to the knock-off lever 22.

The lay has a well 26 to receive the fork or tines 27 which are secured in any approved manner to a carrier 28. The lay has a race plate 29 along which the shuttle S travels and the lower shed 30 of the warp threads

is designed to support the weft or filling F when the latter is present in the shed.

The matter thus far described is of common construction and except as indicated hereinafter is substantially the same as the stop motion which has been used in the past on certain classes of looms, such as those weaving worsted cloth.

The type of loom to which my invention is particularly applicable employs a reed R having a lower bar B lying under a portion of the race plate 29 or at least is so disposed as to interfere with the free downward movement of the fork 27 if the latter should move in a truly circular path about its support. In carrying my invention into effect I provide the bracket 21 with ears 40 to support a pin 41 affording pivotal connection for an upwardly extending arm 42. The upper end of the latter has a relatively long bearing 43 through which extends a pin 44. As viewed in Fig. 4 the right hand end of this pin has secured thereto a small arm 45 pivotally connected by means of stud 46 to the upper end of the link 24. The left hand end of pin 44 has secured thereto a second arm 47 having a laterally projecting lug 48 which lies within a curved slot 49 in a small stand 50 secured to the bracket 21. The carrier 28 is secured to the pin 44 and lies between the bearing 43 and the arm 47.

The upper part 60 of the slot 49 may be substantially if not actually concentric with the axis of stud 44 when the fork is in raised position as shown in Fig. 1. The lower portions of the slot, however, are formed as shown more particularly in Fig. 5 and extend forwardly to have a portion 61 which is eccentric with the axis of the pin 44 as shown in Fig. 1. The remainder of the slot may be a straight vertical portion 62.

In describing the operation the lay 20 may be assumed to be in its rearmost position and the bunter 23 supported on the top of plate 12. When in this position the knock-off lever 22 will have its left hand end as viewed in Fig. 1 raised to lift the link 24, the effect of which is to elevate arm 45, thus holding the pin 44 so that the fork 27 will be in its uppermost or non-detecting position. The lug 48 will also be in the upper part 60 of the slot 49, as shown in Fig. 1. As the lay moves forwardly the bunter will descend along the inclined surface 13 and link 24 will move downwardly, causing the lowering of fork 27. During this time the lug 48 moves in the upper portion 60 of the slot 49 and the pin 44 is held in a position substantially fixed with respect to the lay. A slight amount of movement on the part of the pin is not objectionable, although it is desirable to keep the fork in such a position that its rear end will lie immediately in front of the reed R so as to catch the filling F, as shown in Fig. 2.

As the lay continues its movement for-

wardly from the position shown in Fig. 2, the position of the bunter will be determined by the condition of the weft F. If the latter be present the parts will move forwardly and maintain their same relative positions as shown in Fig. 2, a condition corresponding to continued loom operation. If weft be absent, however, so that the tines are not supported, forward movement of the lay from the position shown in Fig. 2 will permit the bunter 23 to slide down along surface 13 and the fork will move into the well 26. Under these conditions the bunter will engage a portion of the lever 14 to effect loom stoppage in the well-known manner.

During the downward movement of the fork from the position shown in Fig. 2 to that shown in Fig. 3 the lug 48 moves along that part of the cam slot 29 designated at 61 in Fig. 5, and this portion of the slot is so shaped as to move arm 47 and consequently pin 44 forwardly. This in turn will move the carrier for the fork, and it will be given a forward movement relatively to the lay so that its rear end will clear the front portion of the reed bar B. This action on the part of the fork is due to the fact that the supporting arm 42 is so mounted that its upper end is free to move in response to forces derived from the guide cam 49 and transmitted through the lug 48, and further to the fact that the cam is so designed as to require the forward movement of the fork relatively to the lay while the tines are moving in the well. In other words, the action of the fork in detecting for presence of weft is substantially the same as that found in ordinary motions of this type, and the advance movement of the fork does not come until after the detecting stroke is completed. Inasmuch as the weft is present during the greater part of the operation of the loom, the cam 49 and lug 48 will not move and wear while the loom is running normally. A torsion spring 70 surrounding stud 71 on which lever 22 is mounted is so connected to the lever and stand 21 as to hold the bunter down in the cam surface 13, and acts to lower the link 24 and fork 27.

From the foregoing it will be seen that I have provided a simple means for controlling the downward movement of the fork of a filling stop motion, the fork having the usual downward movement during the detecting part of the stroke, but having the modified movement when entering the well; whereby it is moved forwardly to clear any obstruction, such as the bar of the reed, which may project into the well. It will be seen that the cam is effective by positive action to control the movement of the fork so that even though the later drop either by gravity or by spring pressure it is required to undergo a forward movement with respect to the lay when entering the well. Further-

more, the parts do not function to move the fork forwardly except on those picks when weft is absent.

Having thus described my invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a filling stop motion for a loom having a lay, a filling fork supported by the lay, and movable from detecting position to indicating position to initiate loom stoppage if weft is absent, means to move the fork from a non-detecting to detecting position as the lay advances, and means dependent upon continued movement of the fork from detecting to indicating position and operative during the continued forward movement of the lay to move the fork forwardly relatively to the lay.

2. In a filling stop motion for a loom having a lay and a reed thereon, a filling fork movable from a raised non-detecting position and capable of a further movement to indicating position when weft is absent to a lowered detecting position, a carrier for the fork supported by the lay and movable relatively thereto in a direction toward and from the reed, and means effective during that part only of the fork movement from detecting to indicating position to move the carrier away from the reed.

3. In a filling stop motion for a loom having a lay with a well therein and a reed having a part adjacent the well, a filling fork movable from raised non-detecting position down to detecting position and thereafter into the well if weft be absent, a carrier for the fork, and means controlled by and operative during the forward movement of the lay to move the carrier forwardly as the fork moves in the well to move the fork away from said part of the reed.

4. In a filling stop motion for a loom having a lay with a well therein and a reed having a part adjacent the well, a filling fork movable from raised non-detecting position down to detecting position and thereafter into the well if weft be absent, a member pivoted to the lay, a carrier rotatably mounted in the member and supporting the fork, and means operative by and during the forward movement of the lay and dependent upon movement of the fork into the well to cause the carrier to move the fork away from the reed as the fork moves in the well to move the fork away from said part of the reed.

5. In a filling stop motion for a loom having a reed and a lay with a well into which a portion of the reed projects, a filling fork movable pivotally from a non-detecting raised position to a detecting position immediately above the well and movable thereafter into the well if weft be absent, a carrier for

the fork supported by and moving with and movable relatively to the lay in a direction toward and away from the reed, a cam carried by the lay and having a portion which is other than concentric with the axis of the fork when the latter is in non-detecting position, and means including an element to co-act with the cam and said portion effective to move the carrier and fork away from the reed as the fork moves in the well to cause said fork to avoid striking the reed.

6. In a filling stop motion for a loom having a reed and a lay with a well into which a portion of the reed projects, a filling fork movable pivotally from a non-detecting raised position to a detecting position immediately above the well and movable thereafter into the well if weft be absent, a fixed guide cam, a carrier for the fork, connections between the guide cam and carrier to cause the latter to have angular movement to give the fork its aforesaid motions, and means rendered effective by the lay and acting on said connections to move the carrier and fork away from the reed as the fork moves in the well.

7. In a filling stop motion for a loom having a reed and a lay with a well into which a portion of the reed projects, a filling fork movable pivotally from a non-detecting raised position to a detecting position immediately above the well and movable thereafter into the well if weft be absent, a fixed guide cam, a carrier for the fork, connections between the guide cam and carrier to cause the latter to have angular movement to give the fork its aforesaid motions, and means carried by the lay acting on said connections to move the carrier and fork away from the reed as the fork moves in the well.

8. In a filling stop motion for a loom having a reed and a lay with a well into which a portion of the reed projects, a filling fork movable pivotally from a non-detecting raised position to a detecting position immediately above the well and movable thereafter into the well if weft be absent, a member pivoted to the lay, a carrier rotatably mounted in the member and supporting the fork, and means dependent upon movement of the fork into the well operative by a force derived from the lay as the latter advances to move said member away from the reed, thereby moving the fork to a position where it will avoid striking that portion of the reed which projects into the well when the fork moves in the well.

9. In a filling stop motion for a loom having a lay and a reed thereon, the lay having a well into which a portion of the reed projects, a filling fork movable from a non-detecting raised position to a detecting position immediately above the well and movable thereafter in the well if weft be absent, an arm pivoted to the lay, a carrier rotatably

mounted on the arm, an actuating cam mounted on the lay, a connection between the cam and the arm, and means to actuate said connection as the lay advances to cause said arm and carrier to move away from the reed as the fork moves in the well to cause the fork to clear the reed.

10. In a filling stop motion for a loom having a lay and a reed thereon, the lay having a well into which a portion of the reed projects, a filling fork movable from a non-detecting raised position to a detecting position immediately above the well and movable thereafter in the well if weft be absent, a knock-off lever pivoted to the lay, a fixed cam to cooperate with said lever, an arm pivoted to the lay, a carrier rotatably mounted on the arm and supporting the fork, an actuator cam carried by the lay, a follower for the actuator cam operatively connected to the arm and movable about the axis of the carrier, and connections between the knock-off lever and the follower to cause the latter to move over the actuating cam as the knock-off lever moves, said actuator cam being so formed as to require the carrier and fork to move away from the reed as the fork moves in the well.

11. In a filling stop motion for a loom having a lay and a reed thereon, the lay having a well into which a portion of the reed projects, a filling fork movable from a non-detecting raised position to a detecting position immediately above the well and movable thereafter in the well if weft be absent, a support for the fork movable toward and from the reed, mechanism to move the support, said mechanism being substantially quiescent as the fork moves from non-detecting to detecting position, and means dependent upon movement of the fork into the well to render said mechanism effective to move the support to cause the fork to move away from the reed as the fork moves beyond the detecting position and in the well when weft is absent, to cause the fork to clear the reed.

In testimony whereof I have hereunto affixed my signature.

ALFRED F. MORRELL.

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