No. 649,203. Patented May 8, 1900.

T. FINN & W. S. BRODIE.

TAKE-UP STOP MOTION FOR LOOMS.

(Application filed July 1, 1899.)

(No Model.)

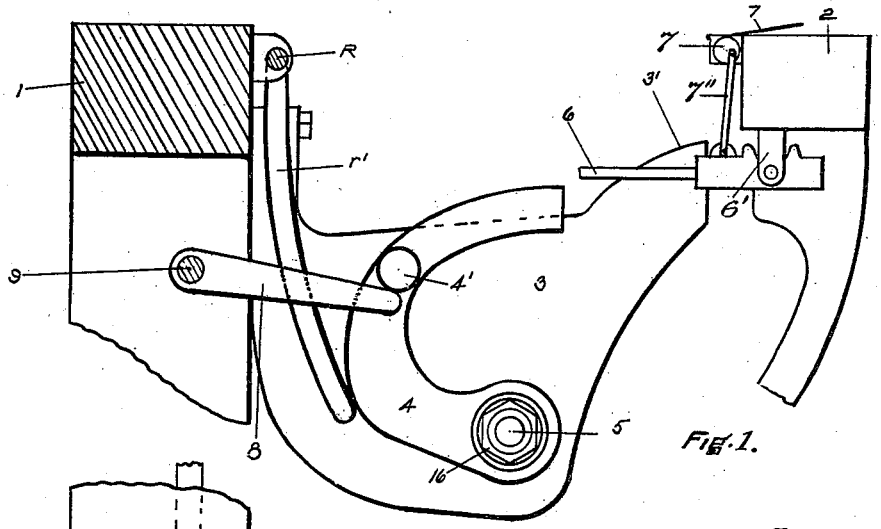

Fig. 1.

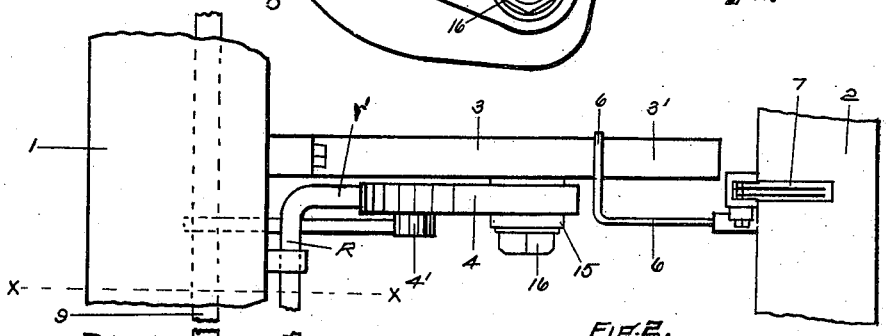

Fig. 2.

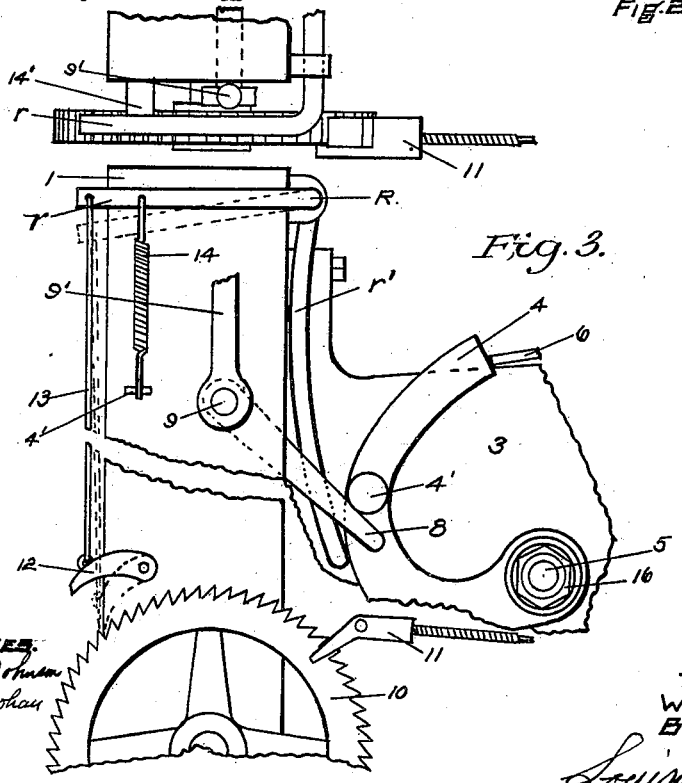

Fig. 3.

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THOMAS FINN AND WILLIAM S. BRODIE, OF NORTH ANDOVER, MASSACHUSETTS.

TAKE-UP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 649,203, dated May 8, 1900.

Application filed July 1, 1899. Serial No. 722,601. (No model.)

To all whom it may concern:

Be it known that we, THOMAS FINN and WILLIAM S. BRODIE, citizens of the United States, and residents of North Andover, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Take-Up Stop-Motions for Looms, of which the following is a specification.

This invention relates to an improved stop-motion device for the take-up of looms which when used will prevent the take-up roll from taking up the warps after the filling breaks or runs out.

This invention is particularly designed to be applied to that class of woolen-looms in which the knock-off stop-motion is arranged in the middle of the lay.

It will be understood that when the filling breaks or runs out and the stop-motion knock-off throws the shipper-lever to stop the loom the momentum of the parts will be sufficient to advance the take-up two or three picks without any filling before the lay comes to rest. The result will be that if the take-up roll is not let back there will be a thin place in the fabric, which is particularly noticeable on light-weight goods. It is extremely difficult for the weaver to let off the take-up roll just the right amount to bring it back to the position in which it was when the loom was knocked off, for if it is let off too much the result will be a thick place across the strip, and if it is not let off enough a thin place will appear. If the take-up is not let off the right amount and the loom is started up, it is often necessary for the weaver to pick out two or three weft-threads and adjust the take-up again, with the probable result of not getting it right even then. This all consumes considerable time, with the chance of poor results. Certain devices have been designed to stop the take-up before the lay comes to rest; but so far as we are aware these devices have not been applied to looms in which the knock-off stop-motion is in the middle of the lay and are not of such a nature that they may be readily applied to existing looms.

The object of our invention is to provide a simple and inexpensive device which may be readily applied to the ordinary loom which has the stop-motion knock-off in the middle of the lay without the necessity of changing or adapting any of the parts thereof to accommodate it, which will always stop the take-up on the pick in which the filling breaks or runs out and which when used will enable the weaver to produce much more and more perfectly woven cloth than would be possible without our attachment.

For a more complete understanding of our invention attention is called to the accompanying drawings, in which we have illustrated only such parts of the old machine as necessarily coöperate with our device, and in which—

Figure 1 is a section on the line X X of Fig. 2. showing a common form of stop-motion knock-off in its normal position. Fig. 2 is a plan view of a portion of the loom. Fig. 3 is an end elevation showing the parts in the knocked-off position.

In the drawings, 1 indicates the breast-beam, and 2 the lay. 3 indicates a bracket, which has the inclined top or cam-arm 3′. The knock-off 4 is pivoted on the shaft 5 to bracket 3. The dagger 6 is pivoted on a bracket 6′, carried by the lay. The weft-forks 7 are carried by the shaft 7′ at the front side of the lay. A link 7″ is eccentrically connected to said shaft at one end and to the dagger, in front of the point at which the latter is pivoted, at the other end, so that when the forks swing down the dagger will be lowered and when the latter is lifted as it rides up the cam-arm the forks will be swung up. The shipper-arm 8 is secured to and extends at right angles from the shipper-rod 9, which latter extends from end to end of the breast-beam and is operated by hand-levers 9″ at each end thereof. When the loom is running, the arm 8 will be thrown up against the projection 4′ on the side of the knock-off, as shown in Fig. 1, and it will also remain in engagement with projection 4′ during the entire backward movement of the knock-off to its abnormal position. (Shown in Fig. 3.) The take-up ratchet-wheel 10 is provided with the usual driving-pawl 11 and holding-pawl 12. All of the parts above described are well known in the art.

Journaled on the back side of the breast-beam is a rod R, which extends from a point opposite the knock-off to the end of the breast-beam and is then bent at right angles around the end of the breast-beam and over the take-up ratchet-wheel, forming an arm r. This arm r is connected by a wire 13 to the holding-pawl 12. A coiled spring 14, which is secured to the end of the breast-beam and to the arm r, constantly tends to draw down the latter. The opposite end of the rod R is provided with a slightly-curved depending arm r', which engages the back side of the knock-off, it being constantly drawn into engagement therewith by the spring 14. A friction-washer 15 is provided on the shaft 5, on which the knock-off is pivoted, and the nut 16, which clamps thereon, makes the necessary friction between the knock-off and the nut or shaft. This friction must be sufficient to overcome the tension of the spring 14.

The operation is as follows: As long as the filling remains unbroken the lay swings back and forth and the dagger will be held up by the feeler-wires, which come down on the filling as the lay moves toward the breast-beam. When the filling breaks or runs out, the feeler-wires drop into the notch in the lay, permitting the dagger to drop, so that it engages the end of the knock-off and forces the same back to the position shown in Fig. 3. As the knock-off is moved back the projection 4′ thereon will press down the shipper-arm, rotating the shipper-shaft, so as to stop the loom. As the knock-off is moved back the back side thereof will also force back the arm r' of the rod R to the position shown in Fig. 3, lifting the arm r to the position shown in full lines in Fig. 3 from the dotted position indicated in the same figure. This action will lift the holding-pawl from the position shown in dotted lines to the position shown in full lines in Fig. 3, so that it is wholly out of engagement with the ratchet-wheel of the take-up. As the lay will not immediately come to rest, as previously explained, the driving-pawl will force forward the ratchet-wheel; but as the holding-pawl is drawn out of engagement with the ratchet-wheel when the driving-pawl recedes the tension on the warp will rotate the take-up rod and its ratchet-wheel back with the driving-pawl, so that no matter how many times the working pawl may be forced forward it will not advance the take-up roll beyond the point at which it was at the time the filling broke. It will be understood that as the lay advances the driving-pawl will be rotating the take-up forward, so that the holding-pawl will be loose when the shipper is knocked off and may be readily lifted by the rod R. It will thus be seen that the take-up will be stopped on the same pick as that on which the filling breaks, as the holding-pawl will be lifted before the lay and also the driving-pawl reach the end of their forward strokes. When the knock-off is at the side of the loom, it often happens that the filling breaks beyond the fork, so that the loom will not be knocked off until the next pick; but with the knock-off in the middle the shipper will usually be knocked off on the same pick as that on which the thread breaks.

As previously stated, the friction at the pivot of the knock-off is sufficient to overcome the tension of the spring 14—that is, the tension of spring 14 is not sufficient to overcome the friction at the pivot and move the knock-off unassisted. For this reason after the knock-off has been forced back by the dagger the spring will not return the knock-off to its normal position as the lay recedes, carrying the dagger away from the end of the knock-off; but the knock-off and rod R will remain in the abnormal or knocked-off position, as shown in Fig. 3, sustaining the holding-pawl out of engagement with the ratchet-wheel until the loom is again started by rotating the shipper-rod. When the lever 9′ is pulled back, so as to rotate the shipper-rod and throw up the shipper-arm 8, the knock-off will be forced by the latter back to its normal position, and the spring 14 being no longer resisted by the friction on the knock-off will draw down the arm r and rotate rod R and throw the arm r', so that it will remain in engagement with the knock-off as the latter is moved back to its normal position and will constantly be held in engagement therewith. The lowering of arm r will permit the holding-pawl to drop down into engagement with the ratchet-wheel, so that all three parts will return to the position shown in Fig. 1.

If it is desired to stop or start the loom and the shipper is thrown to accomplish this, it will not move the rod R, which will remain in the same position as before. The only way in which the rod will be moved and the holding-pawl lifted is when the knock-off is forced back by the dagger, because there is no filling or weft-thread to sustain the fork. The lifting of the holding-pawl is not at all dependent on the position of the shipper-rod, so that it will be immaterial whether the shipper is thrown and the loom stopped when it is knocked off or not. The whole attachment is practically independent of the knock-off stop-motion and does not in any way interfere with the action of the latter.

From the above description it will be apparent that we have provided a device which will prevent the take-up roll from winding in the warp after the dagger has begun to move back the knock-off, which is also simple and effective and may be applied to any loom having the knock-off stop-motion in the middle and by using which the production of a loom may be considerably increased.

Having described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is as follows:

1. In a loom, a knock-off lever, means for forcing said knock-off back when the filling breaks, a shipper-arm arranged to be engaged by said knock-off, a take-up ratchet-wheel,

holding and driving pawls which are adapted to engage therewith, a rod journaled adjacent to said knock-off having two arms, one of said arms being adapted to be swung by said knock-off as the latter is moved back, and the other of said arms being adapted to simultaneously lift one of said pawls out of engagement with said ratchet-wheel, a spring which is adapted to force the arm first mentioned against said knock-off at all times, a frictional resistance which is adjusted to prevent said spring from moving said knock-off but which will permit said spring to hold said arm in engagement with said knock-off as the latter is moved to its normal position by the shipper-arm.

2. In a loom, a knock-off lever, a bracket to which said knock-off is pivoted, means for varying the friction between said knock-off and said bracket, means for forcing said knock-off back when the filling breaks, a shipper-arm arranged to be engaged by said knock-off, a take-up ratchet-wheel, holding and driving pawls which are adapted to engage therewith, a rod journaled adjacent to said knock-off having an arm at each end thereof, one of said arms being arranged in the path of motion of said knock-off and the other of said arms being connected to said holding-pawl, a spring which is adapted to constantly force said first-named arm into engagement with said knock-off, the tension of said spring being insufficient to overcome the friction between said bracket and said knock-off and move the latter; said parts being so arranged that when the knock-off is forced back, the holding-pawl will be lifted out of engagement with said ratchet-wheel and said parts will remain in the knock-off position until the shipper-arm is moved to start the loom.

3. In a loom, a bracket, a shaft projecting therefrom, a knock-off lever pivoted thereon, a friction-washer on said shaft, a nut for pressing said washer against said knock-off, means for forcing said knock-off back when the filling breaks or runs out, a shipper-arm which is arranged to be engaged by said knock-off, a take-up ratchet-wheel, driving and holding pawls therefor, a rod journaled adjacent said knock-off having an arm which is adapted to be swung by the knock-off as it is forced back, a second arm extending from said rod which is connected to said holding-pawl, a spring acting on said rod so as to hold said first-named arm constantly in engagement with said knock-off, said parts being arranged so that upon the breaking of the weft-thread said holding-pawl will be lifted and will not be permitted to fall into engagement with the ratchet-wheel until the shipper-arm is thrown to start the loom.

In testimony whereof we have affixed our signatures in presence of two witnesses.

THOMAS FINN.
WILLIAM S. BRODIE.

Witnesses:
LOUIS H. HARRIMAN,
M. C. JAQUITH.