E. HOLLINGWORTH.

PICK FINDER MECHANISM EMPLOYED IN LOOMS FOR WEAVING.

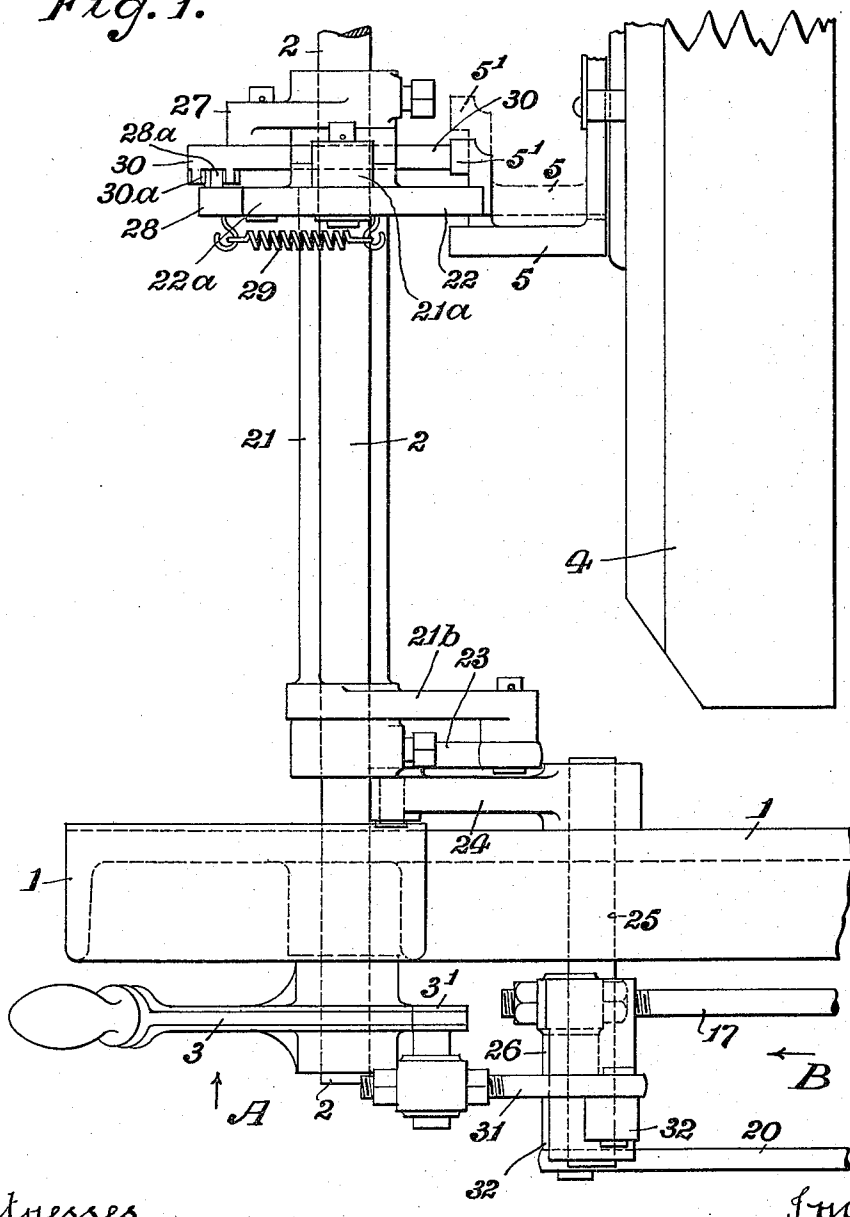
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4 SHEETS—SHEET 1.

Fig. 1.



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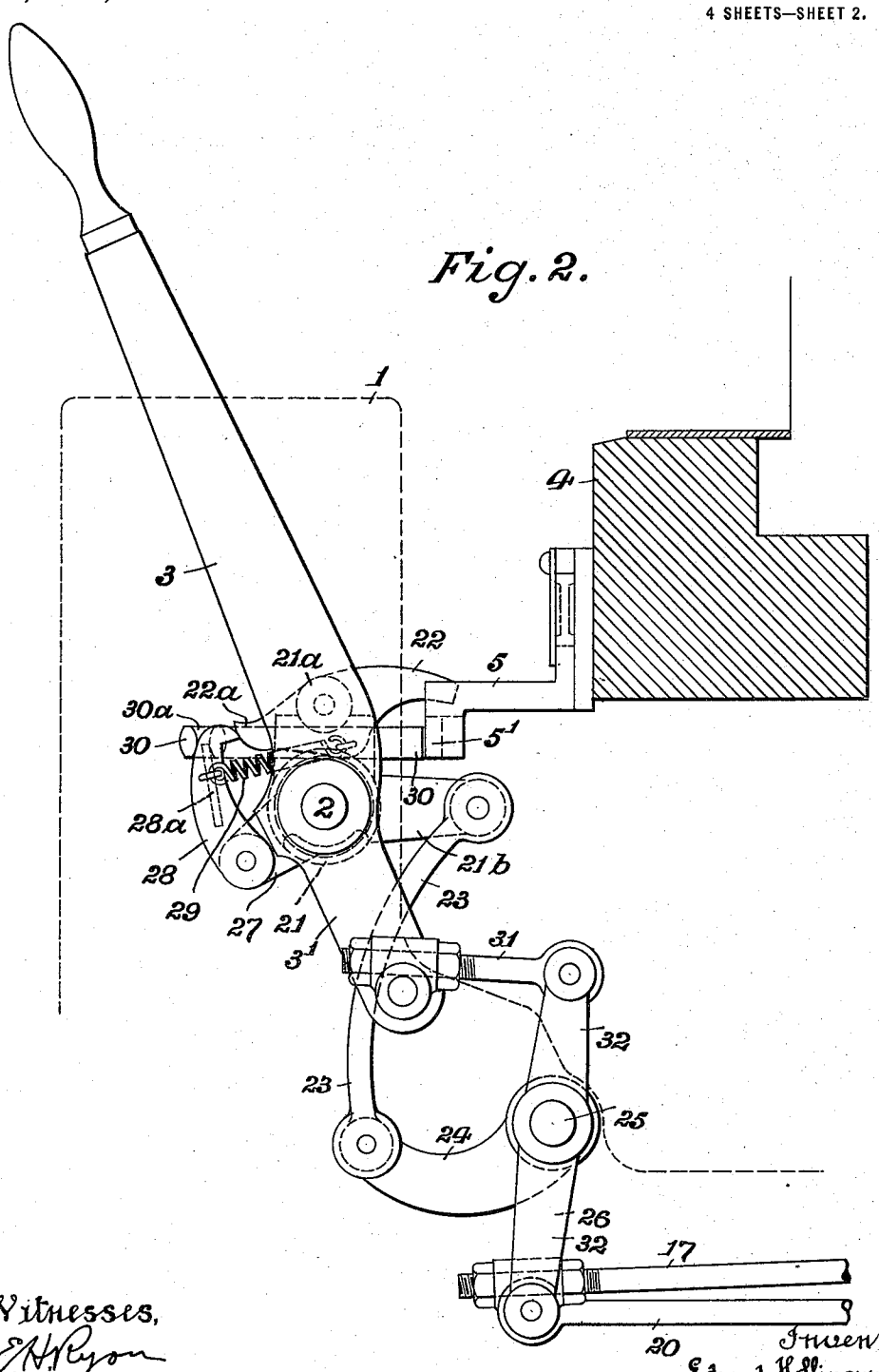
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 4.

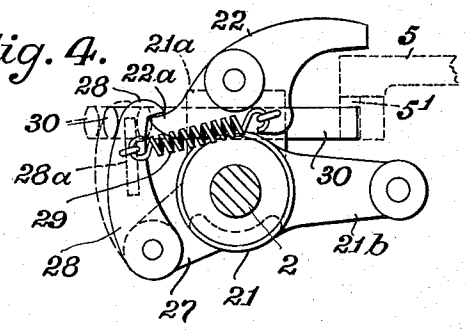
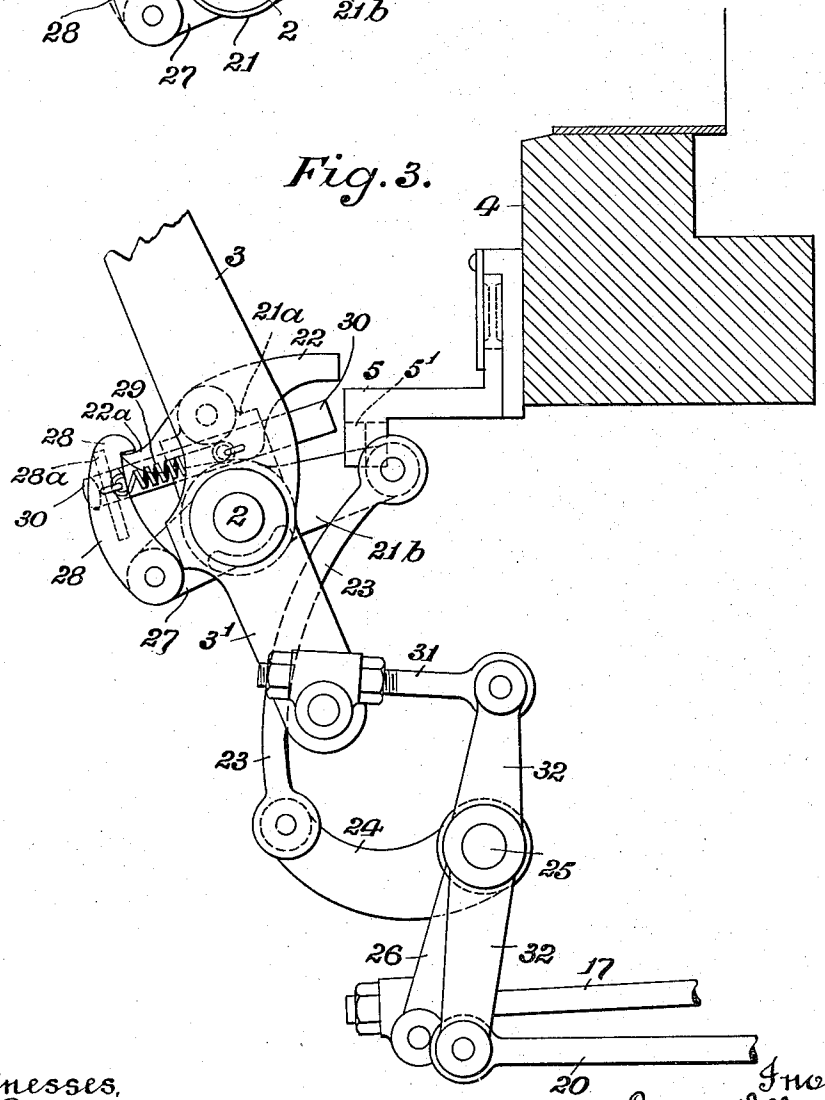


Fig. 3.



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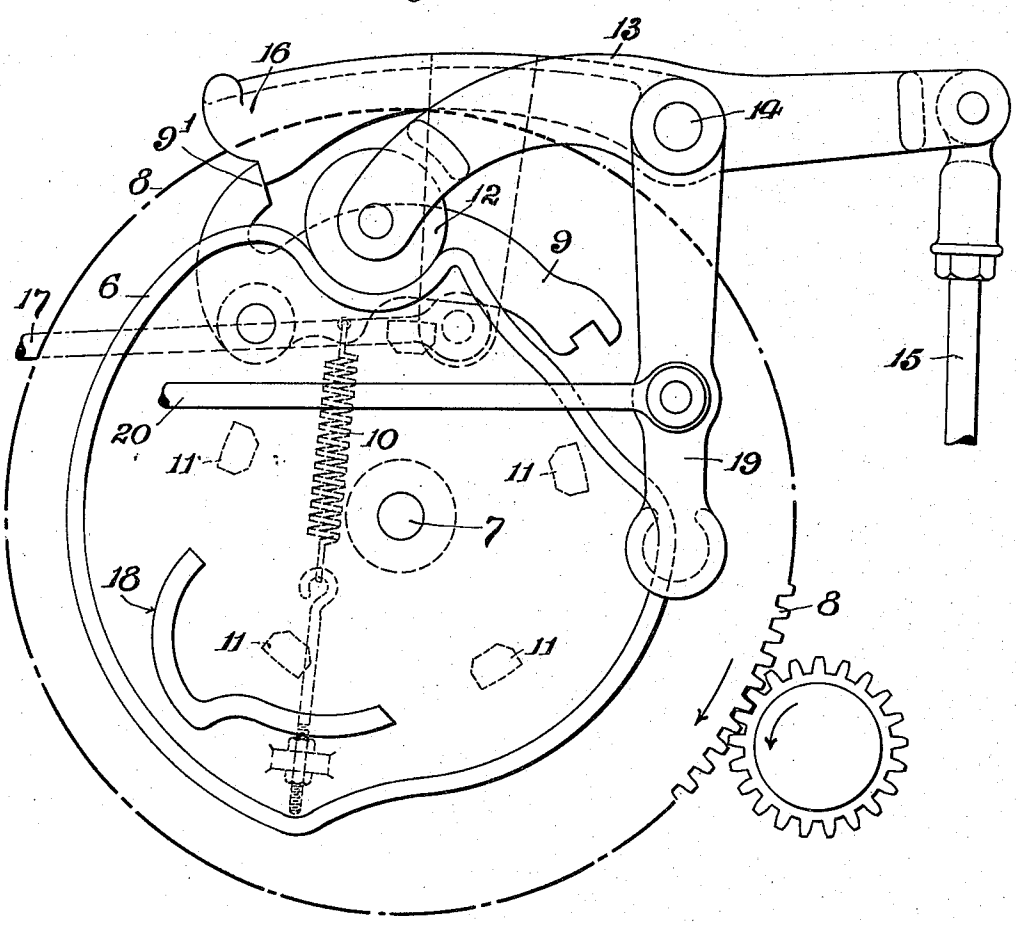
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4 SHEETS—SHEET 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

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PICK FINDER MECHANISM EMPLOYED IN LOOMS FOR WEAVING.

1,156,007. Specification of Letters Patent. Patented Oct. 5, 1915.

Application filed July 29, 1914. Serial No. 853,917.

To all whom it may concern:

Be it known that I, EDWARD HOLLINGWORTH, a subject of King George V of Great Britain, residing at Dobcross, in the county of York, England, have invented certain new and useful Improvements Connected with Pick Finder Mechanism Employed in Looms for Weaving, of which the following is specification.

This invention relates to loom stop motion or pick finder mechanism which, on detection of weft absence or breakage by the usual weft detector mechanism, causes the picking mechanism to be disengaged, the pattern mechanism reversed and the loom brought to rest, and particularly to the type of stop motion or pick finder mechanism acting automatically to arrest the operations of the loom and start other operations to effect readjustment of the loom to bring the warp threads and shuttle boxes into their proper relative positions for the restarting of the weaving operations before the loom itself is brought to rest. These operations are effected without attention on the part of the weaver who can start up the loom immediately the broken or absent pick has been attended to.

My invention has for its object to provide improved means whereby on the pick finder mechanism being actuated, the bunter will be held or locked in inoperative position until after the first beat up of the lay on the restarting of the loom, said means acting automatically and thus rendering the whole of the pick finder mechanism automatic in action from the time it is set in motion on detection of weft absence until the loom has been restarted again and the normal conditions resumed.

My invention therefore consists broadly in applying in conjunction with the bunter, a device for engaging said bunter when moved forward by the engagement therewith of the dagger on the lay on operation of the weft detector mechanism and to hold the rearward end of the said bunter in a position removed from the path of the dagger when in operative position until the lay makes its first forward movement on the restarting of the loom, and then release the bunter to allow it to resume its normal operative position.

In the accompanying drawings:—Figure 1 is a plan view of one form of mechanism embodying my invention, and showing the parts in normal or running position; Fig. 2 is an end view, looking in the direction of the arrow A, Fig. 1; Fig. 3 is a view similar to Fig. 2, but shows the position of the parts at the moment when the bunter has caused the pick finder mechanism to be set in motion and has been locked in inoperative position; Fig. 4 is an end view of the bunter and some of the coöperating parts, showing the position when the loom is ready for starting up, and Fig. 5 is an end elevation of one form of pick finder mechanism with which my improved mechanism coöperates.

Referring to the drawings, 1 represents the loom side frame, 2 the shipper shaft controlling the usual loom stop mechanism, and 3 the shipper handle fast thereon; 4 is the lay and 5 the dagger supported on the lay and adapted to be adjusted in position by connections from the weft detector mechanism of the loom in the ordinary and well known manner. Such connections are shown in United States patent to McMichael, No. 581,515, issued April 27, 1897.

The pick finder mechanism shown at Fig. 5 comprises a cam 6 loosely mounted on a stud 7 and adapted to be rotatively connected at the desired time to a driven gear 8, also mounted loosely on the stud 7, by means of a clutch lever 9 pivoted on the cam and adapted to be drawn by a spring 10 into the path of projections 11 on the face of the said gear 8. When thus positioned, one of the projections 11 will engage a lug 9^a upon the rear face of the lever 9, while the projection 11 next in advance of the engaged projection will contact with the extreme end of the lever 9, thus preventing the cam from being displaced forwardly relatively to the gear 8. A cam roll 12 carried by one arm of a lever 13 pivoted on a stud 14 is adapted to ride on the periphery of the cam 6. The other arm of said lever 13 is connected by a rod 15 to any suitable devices for controlling the picking mechanism and for reversing the pattern mechanism and shuttle box shifting mechanism. Such devices in one form are shown in the United States patent to McGuinness, No. 913,301, issued February 23, 1909. A catch 16 pivotally mounted on the stud 14 normally engages a part 9′ of the clutch lever 9 and holds the same in inoperative position.

A rod 17 is pivotally connected at one end to a depending arm on the catch 16, the

other end of the rod 17 being connected for actuation by the weft detector mechanism, as will be hereinafter described. So long as the loom is running normally, the parts remain in the position shown in Fig. 5. On weft breakage or failure occuring, the weft detector mechanism, through connections including the rod 17, acts to raise the catch 16 clear of the clutch lever which is therefore drawn down by the spring 10 to operative position and causes the cam 6 to be clutched to the gear 8 and therefore to be driven.

The rotation of the cam, acting on the lever 13 through the roll 12, causes the rod 15 to effect the disengagement of the picking mechanism and the reversal of the pattern mechanism and shuttle box shifting mechanism. The loom then continues to run, in this instance for two picks, with the picking mechanism disengaged and the pattern and shuttle box mechanisms reversed, after which the cam 6 permits the lever 13 to return part way toward its original position, this movement being sufficient to return the pattern and shuttle box mechanisms to their normal or forward running positions. The loom then runs another pick by which time a supplementary cam 18 on the face of the cam 6 contacts with and swings a lever arm 19 loosely mounted on the stud 14 and this movement of the arm 19 through a rod 20 (and other connections to be described) operates the usual shipper shaft and loom stop mechanism. By the time the loom stops the catch 16 has reëngaged the part 9′ of the clutch lever and raised the said lever to inoperative position and all the parts have resumed the position shown in Fig. 5, the return of the lever 13 to normal position reëngaging the picking mechanism. Since the loom ran with the pattern and shuttle box mechanisms reversed for two picks and then with these mechanisms running forward for one pick, before being stopped, it follows, as will be understood that on the loom being started up, the same shed will be presented as that in which the failure or breakage occurred.

The means above set forth form no part of my invention, but the brief description given will enable the bearing of my improvements to be understood.

I will now describe my improvements as shown in Figs. 1 to 4. On the shipper shaft 2 I provide a sleeve 21, loosely mounted on said shaft, and having at one end thereof a bracket or arm 21^a extending upwardly and having pivotally mounted thereon a bunter 22 located in such a position as to be opposite the dagger 5 when the latter is moved to operative position on actuation of the weft detector mechanism. The opposite end of the sleeve 21 is formed or provided with a lever or arm 21^b which is pivotally connected at its free end to one end of a link 23. The opposite end of the link 23 (Fig. 2) is pivotally connected to the free end of an arm 24 fast on a shaft or spindle 25. An arm 26 also fast on said shaft 25 is pivotally connected at its free end to the end of the rod or connector 17, whose other end is connected to the pick finder mechanism as shown at Fig. 5 so that a movement of the said rod 17 in the direction of the arrow B, Fig. 1, will cause the pick finder mechanism to be set in operation. Pivotally mounted on the free end of an arm 27 fast on the shaft 2, is a catch 28 connected by a spring 29 with the bunter 22. When the parts are in operative position, the front end 22^a of the bunter rests against the upper end of the catch, as shown in Fig. 2, being held in engagement therewith by the spring 29. Passing through and slidable in an opening in the bracket 21^a of the sleeve 21 is a bar or slide 30 whose front end has a lateral fork or notch 30^a into which enters a rib or projection 28^a on the catch 28. The shipper handle 3 has an extension 3′ below the shaft 2, and pivotally connected to this extension is one end of a link 31 whose opposite end is connected to one arm of a lever 32 loosely mounted on the shaft or spindle 25, the other arm of said lever 32 being connected to one end of the rod 20 leading to that part of the pick finder mechanism which controls the stopping of the loom.

The action of the mechanism above set forth is as follows:—So long as the loom is running normally the bunter 22 rests against the catch 28, as shown in Fig. 2, and the dagger 5 occupies such a position relatively to the bunter that it does not engage therewith as the lay comes forward, as will be understood from Fig. 1 where the lay is shown at front center. On breakage or failure of the weft occurring, the weft detector mechanism causes the dagger to be moved into the path of the bunter as shown in dotted lines in Fig. 1, so that as the lay beats up the dagger engages the bunter and forces same forward. The forcing forward of the bunter causes the sleeve 21 to be rocked and this movement of the sleeve, through the arm 21^b, link 23, arm 24, shaft 25, arm 26, and rod 17 causes the pick finder mechanism to be set into operation. As the bunter moves forward, the catch 28 is rocked on its pivot, and the forward end of the bunter slips under and is engaged by the catch, which is drawn back through the action of the spring 29 (see Fig. 3). As the sleeve 21 returns to its normal position, therefore, the rear end of the bunter is maintained in a raised position as shown at Fig. 4, and as the lay beats up during whatever number of revolutions the crank may make while the pick finder mechanism is operating and before the loom comes to rest, the

dagger 5 (which owing to weft absence remains in operative position) does not strike the bunter, as will be understood. The movement of the catch 28 to engage the forward end of the bunter as above described, causes the bar or slide 30 to be moved rearwardly, by reason of the engagement of the rib 28^a in the fork or notch 30^a so that on the return of the sleeve 21 to normal position, the rear end of said bar or slide projects rearwardly a distance beyond the normal. On the loom being started up, the presence of weft at the first or a subsequent beat-up causes the dagger to be moved back to normal or inoperative position, as shown in full line in Fig. 1, and at the first or a subsequent beat-up of the lay, a lateral extension 5′ of the dagger 5 strikes the end of the bar 30 and forces it forwardly, causing the catch 28 to be freed from its engagement with the front end of the bunter, and allowing the spring 29 to pull down the rear end of the bunter to operative position (Fig. 2) ready to be struck by the dagger on the next indication of weft breakage or failure.

Although I have only described and shown one embodiment of mechanism for effecting the object of my invention, other methods of effecting the locking of the bunter in inoperative position and the release or returning of same to operative position on restarting of the loom, will suggest themselves to those skilled in the art of loom construction, and I would therefore have it understood that I do not limit myself to the details of construction and arrangement shown and set forth.

Having thus described my invention, that I claim as new and desire to secure by Letters Patent is:—

1. In a loom, in combination, controlling means for pick finding mechanism, an actuating device carried by the lay, and movable by weft detecting mechanism into operative and inoperative positions, connections operable by said device when in operative position to release said controlling means, and means to render said connections thereafter inoperative until after said actuating device is returned to inoperative position.

2. In a loom, in combination, controlling means for pick finding mechanism, an actuating device carried by the lay, and movable by weft detecting mechanism into operative and inoperative positions, connections operable by said device when in operative position to release said controlling means, and means to render said connections thereafter inoperative until after said actuating device is returned to inoperative position, said connections including a bunter positioned for engagement by said actuating device, and said latter means including a catch effective to lock said bunter out of the path of said actuating device.

3. In a loom in combination, controlling means for pick finding mechanism, an actuating device carried by the lay, and movable by weft detecting mechanism into operative and inoperative positions, connections operable by said device when in operative position to release said controlling means, and means to render said connections thereafter inoperative until after said actuating device is returned to inoperative position, said connections including a bunter positioned for engagement by said actuating device, and said latter means including a catch effective to lock said bunter out of the path of said actuating device, and a member operable by said actuating device, when the latter is in inoperative position, to disengage said catch.

4. In a loom, in combination, a frame, a lay, controlling means for pick finding mechanism, a dagger mounted on said lay, and movable into operative and inoperative positions, a bunter supported on the frame and also movable into operative and inoperative positions, connections whereby movement of said bunter by said dagger will cause operation of said controlling means, means to thereafter lock said bunter in inoperative position, and means operable to release said bunter after the return of the dagger to inoperative position.

5. In a loom, in combination, a frame, a lay, controlling means for pick finding mechanism, a dagger mounted on said lay, and movable into operative and inoperative positions, a bunter supported on the frame and also movable into operative and inoperative positions, connections whereby movement of said bunter by said dagger will cause operation of said controlling means, means to thereafter lock said bunter in inoperative position, and means to release said bunter, said releasing means comprising a movable member engaging said locking means and positioned for actuation by a portion of said dagger when the latter is in inoperative position.

In testimony whereof I affix my signature in the presence of two witnesses.

EDWARD HOLLINGWORTH.

Witnesses:
JOHN R. SAALAM,
THOMAS HENRY BARRON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."