July 12, 1938. P. BOND 2,123,561

SHUTTLE BOX POSITION SELECTOR OR INDICATOR

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Fig. 1.

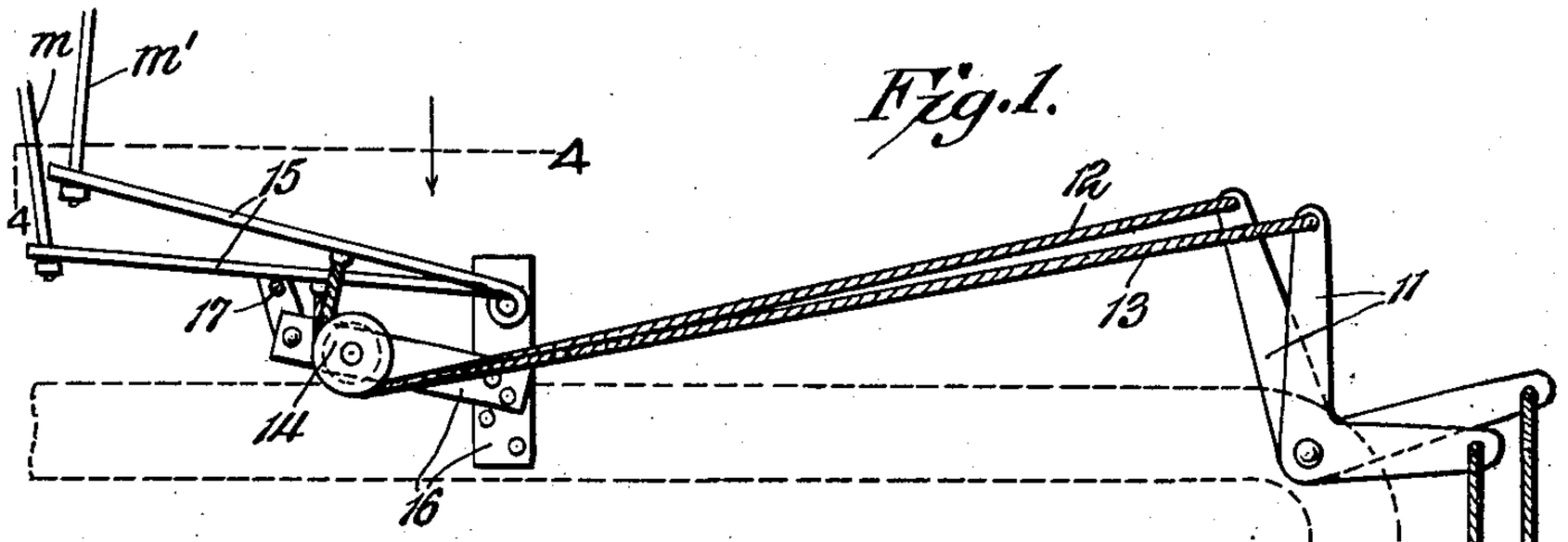
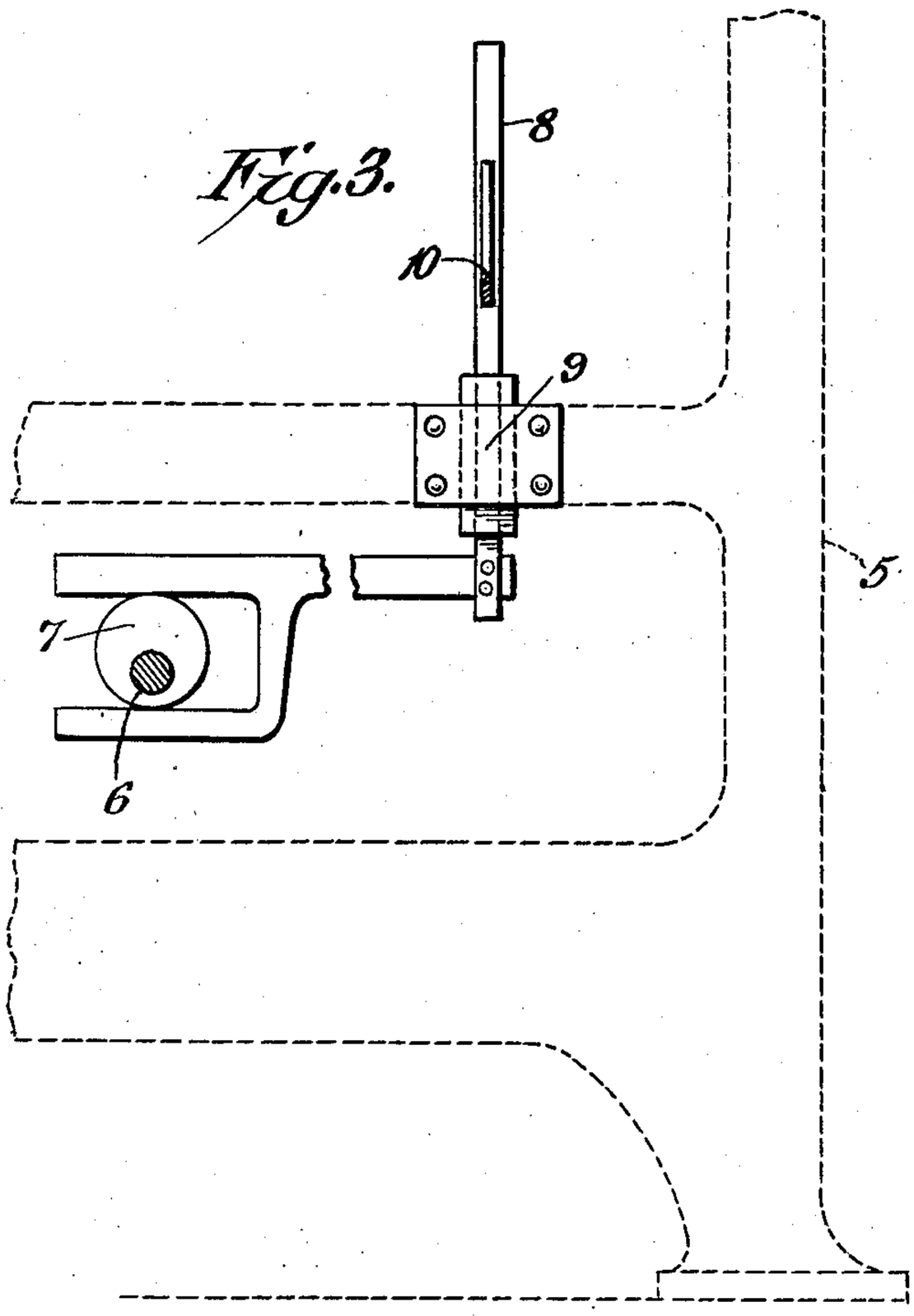


Fig. 3.



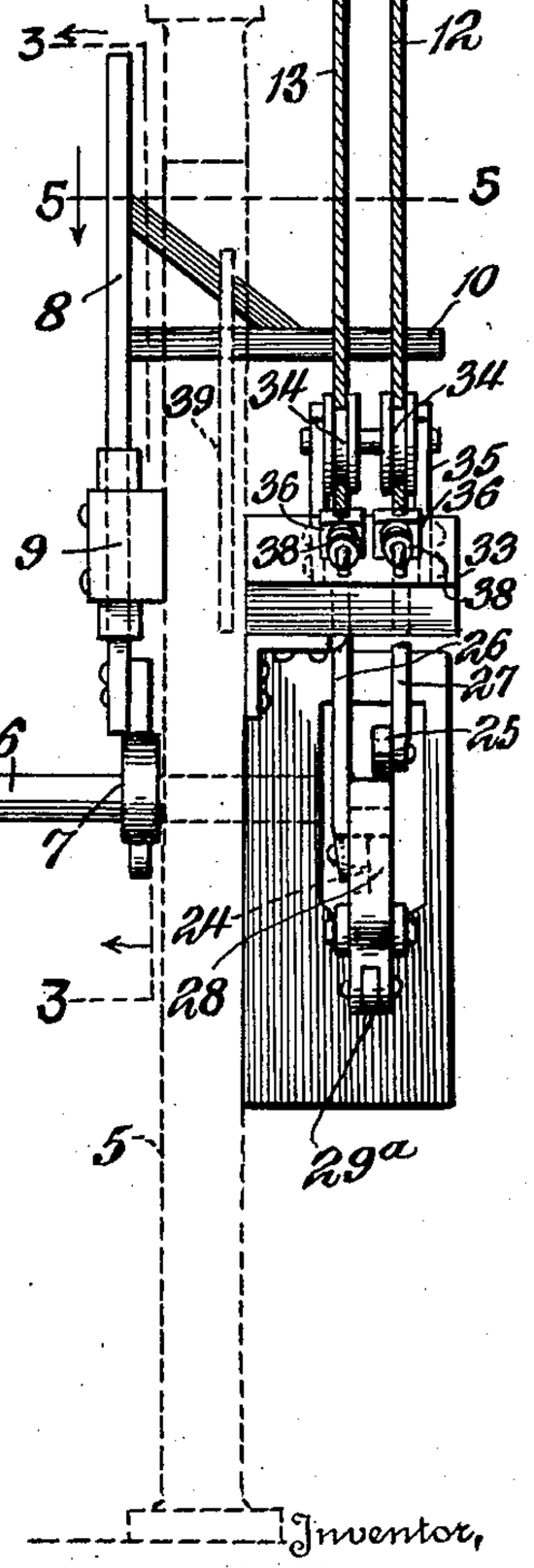


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Fig. 4.

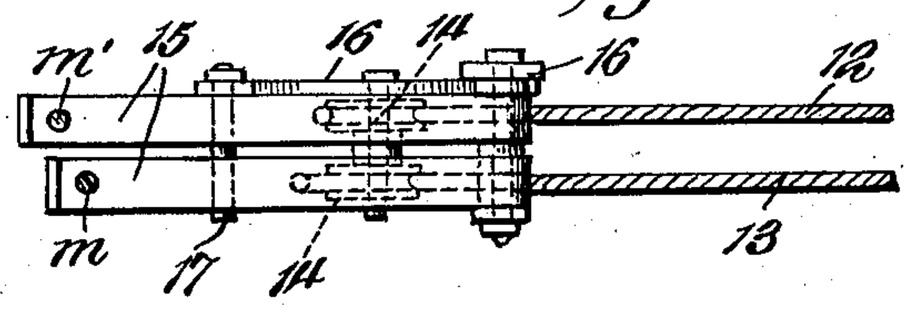


Fig. 2.

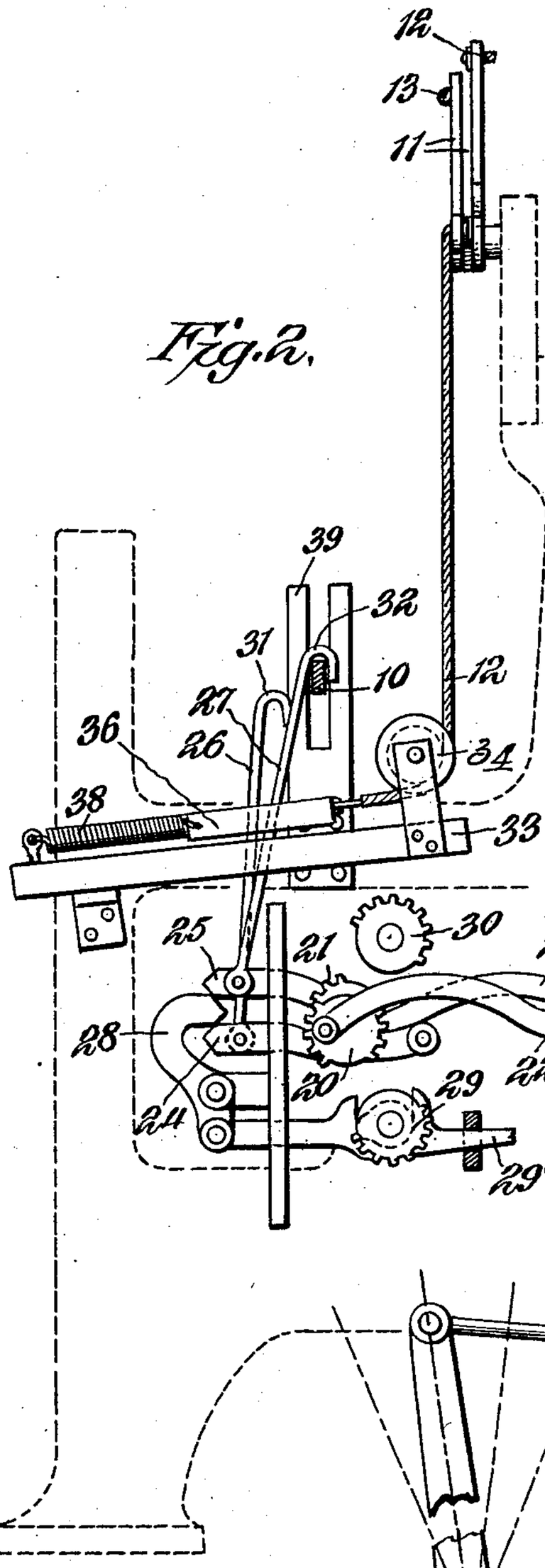
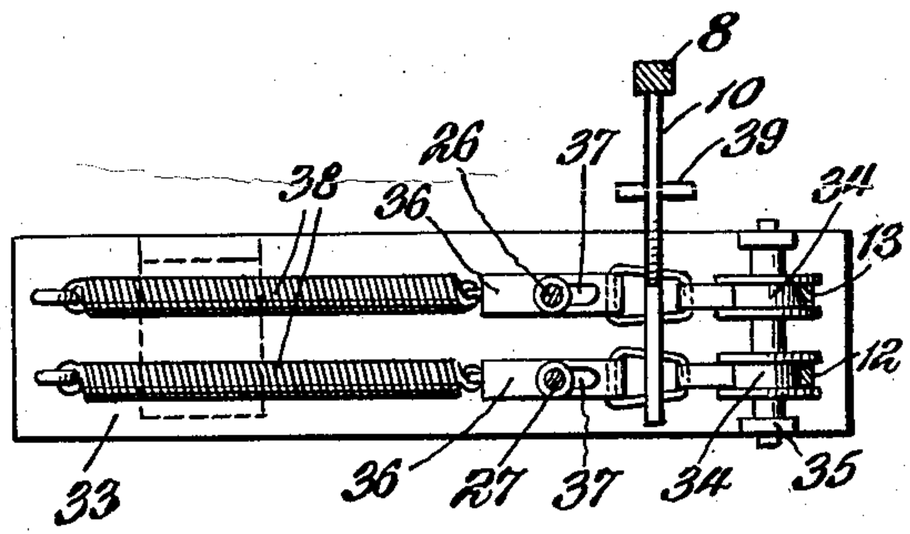
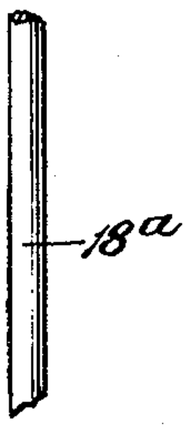


Fig. 5.





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Patented July 12, 1938

2,123,561

UNITED STATES PATENT OFFICE

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SHUTTLE-BOX POSITION SELECTOR OR INDICATOR

Paul Bond, Houston, Tex.

Application October 22, 1937, Serial No. 170,445

5 Claims. (Cl. 139—171)

The invention relates generally to Jacquard box looms or to looms of this general, pattern operated type in which are provided multi-compartment shuttle-boxes and box motion mechanisms for altering the positions of the boxes, and it primarily seeks to provide novel means controlled by the pattern equipment or jacquard head for indicating or selecting the desired effective box position and for actuating the box motion to attain that position.

An example of the type of loom generally referred to is disclosed in the patent to Lockwood No. 573,276, issued December 15, 1896. It has been the custom, in looms of this general type to impose upon the delicately constructed pattern or jacquard head mechanisms the loads incident to manipulation of the shuttle-box position shifting mechanisms, especially when the box-operating mechanism is of the type for shifting the shuttle-box bodily as shown in Figure 12 of the Lockwood patent and distinguished from the rotary type of box, and this imposition of operating load is objectionable.

The invention seeks to avoid the load imposition above referred to and resides in the provision of a prime mover constantly reciprocated from a power operated part of the loom, a plurality of individual, selective movement-transmitting elements constantly connected with the box-operating mechanism and movable individually or in groups for bringing about the desired shuttle-box positions, and means actuated from the pattern controlled devices or jacquard head for individually or collectively selecting and connecting said elements for movement with the prime mover.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a somewhat diagrammatic side elevation illustrating the invention, a known form of shuttle-box shifting mechanism being illustrated and the frame shown in dotted line phantom.

Figure 2 is an end elevation of the parts shown in Figure 1, parts of the actuator members being broken away.

Figure 3 is a fragmentary detail vertical section taken on the line 3—3 on Figure 1.

Figure 4 is a detail horizontal section taken on the line 4—4 on Figure 1.

Figure 5 is a detail horizontal section taken on the line 5—5 on Figure 1.

In the drawings I have illustrated fragments of known loom portions in combination with the novel elements comprising the invention. The loom frame is indicated at 5, and 6 designates a constantly rotated shaft forming a part of the loom mechanism.

An eccentric 7 rotatable with the shaft 6 engages an actuator member secured to the lower end of a rod 8 vertically slidable in a bearing 9 secured to a part of the loom frame as shown in Figures 1 and 3 of the drawings. An actuator bar 10 is secured to and extends laterally from the rod 8 and is constantly reciprocated in a vertical direction by reason of the constant rotation of the eccentric 7. The purpose of the constantly reciprocated actuator bar will become apparent as the description progresses.

Two bell crank members 11 are pivoted side by side on the loom frame and one has its respective ends connected in a pull cord or cable 12, and the other in a pull cord or cable 13. The portions of the cords 12, 13 connected with one adjacent set of bell crank arms are passed about individual pulleys 14 and attached to individual actuator levers 15, the pulleys 14 and levers 15 being suitably supported upon bracket members 16 secured to a portion of the loom frame. A stop member 17 may be provided for limiting movement of the levers 15.

It should be understood that the control levers 15 are moved under control of the pattern actuated devices or jacquard head of the loom. In the present illustration the levers are shown as movable upwardly for control purposes, but it is to be understood that they may be placed to move in any direction to accord with the direction of movement of the connected elements of the pattern actuated devices or jacquard head. In the Lockwood disclosure, No. 573,276, corresponding control elements are shown at *m* and *m'* and for the purpose of comparative illustration the same reference characters are applied to the lever movement effecting elements connected with the levers 15.

In this particular disclosure I have illustrated my improved box position indicator or selector operatively connected with a box motion mechanism of known form and adapted for moving the shuttle-box to one or another of four selective positions. This box motion mechanism is disclosed generally in the patent to Lockwood, No. 573,276, issued December 15, 1896, see Figure 12. It is to be understood, however, that my improved mechanism is adaptable to use in combination with box motion mechanisms other than the par-

ticular example of structure selected for the present disclosure.

In the illustrated box motion mechanism there are included differential levers **18** and **19**, operated by gear-cranks **20**, **21**, through rods or thrust arms **22**, **23**. My improved mechanism is designed to select and position the gear-cranks **20**, **21**, by movement of the levers **24**, **25**, upon which they are respectively mounted, and under control of the pattern controlled devices or jacquard head.

To each of the two levers **24**, **25**, I secure an actuator member. These members are respectively designated **26** and **27** and are selectively controlled, in a manner soon to be described, for individually or collectively connecting the levers **24** and **25** to move with the actuator bar or prime mover **10** so as to leave both levers **24**, **25** down, as when both members **26**, **27** are disengaged from the prime mover, to lift both levers **24**, **25**, as when both members **26** are engaged with the prime mover, or to lift one lever **24** or **25** while leaving the remaining lever **24** or **25** lowered, as when one or the other only of the members **26**, **27** is engaged with the prime mover. The levers **24**, **25** thus position the gear-cranks **20** and **21** so that by their retaining-lever **28** (to which reciprocatory motion is intermittently imparted by the cam surface on the toothed segment **29** through the medium of the connecting-rod **29a**) they may be put into gear with one or the other of the toothed segments **29** or **30**, by which they are operated to move the rod **18a**, (which is coupled to the shuttle-boxes in the well known manner) through the medium of the rod **18b** and the lever **18c**, their several and varied positions being indicated by dot and dash lines representing the center lines of the levers.

The selective actuator members **26**, **27** are provided at their upper ends with hook portions respectively designated **31**, **32** and which are adapted, when suitably positioned, to hook over and attach the members in operative connection with the prime mover, as indicated in Figure 2 of the drawings. I will now proceed to describe the elements by which the members **26** and **27** are shifted, individually or collectively and under pattern or jacquard head control, into or out of the path of the movement of the prime mover.

A plate or table member **33** is secured upon the frame and supports a pair of individual pulleys **34** mounted in a bracket **35**. The portions of the cords **12**, **13** connected with the remaining adjacent set of bell crank arms are passed about the pulleys **34** and secured to individual actuator member selecting and shifting blocks **36** apertured at **37** to permit passage of the actuator members **26**, **27** therethrough as shown in Figure 5 of the drawings. It will be obvious that a pull on one or both cords **12**, **13** will move a block or the blocks **36** to position one or both hooks **31**, **32** over the prime mover, and springs **38** anchored to the plate **33** serve to return one or both blocks **36** and member or members **26**, **27** to the inactive, prime mover disengaged position when one or both cables are allowed by the control devices to move in the pull relaxing direction.

The pattern or jacquard head devices impart movement to the levers **15** and through intermediate connections hereinbefore described to the blocks **36** for selecting and positioning the hooks **31**, **32** with respect to the prime mover **10**. The work of actually controlling the box motion mechanism is done by the power shaft **6** and prime mover **10** and hence the delicate pattern or jacquard head mechanisms are relieved of the loads incident to these operations. Either one or the other or both of the hooks **31**, **32** and actuator members **26**, **27** may be connected with or removed from the prime mover **10** for effecting the box motion mechanism adjustments hereinbefore described in detail.

What I claim is:

1. In a loom, the combination of a box motion mechanism including a pair only of elements movable individually or collectively in one direction or another for effecting a selected one of four shuttle-box positions, a power reciprocated prime mover, a pair only of actuator members pivotally connected one with each of said elements and selectively and swingably movable individually or collectively into and out of operative connection with the prime mover for at times connecting it in power transmitting relation with said elements, and pattern or jacquard head controlled means for moving said actuator members.

2. In a loom, the combination of a box motion mechanism including a pair of elements movable individually or collectively in one direction or another for effecting a selected one of four shuttle-box positions, a power reciprocated prime mover, a pair of actuator members pivotally connected one with each of said elements and selectively and swingably movable individually or collectively into and out of operative connection with the prime mover for at times connecting it in power transmitting relation with said elements, and pattern or jacquard head controlled means for moving said actuator members, said last named means including a shifter block for each actuator member and having provision for slidably receiving the member, a pull cord for moving each block in one direction, and spring means for moving each block in the reverse direction.

3. In a loom, the combination of a box motion mechanism including a pair of elements movable individually or collectively in one direction or another for effecting a selected one of four shuttle-box positions, a power actuated prime mover including a vertically reciprocating horizontal bar, a pair of actuator members pivotally connected one with each of said elements and terminating at their upper ends in hook portions and selectively and swingably movable individually or collectively into and out of hook-over relation or driving connection with said horizontal bar for at times connecting the bar in power transmitting connection with said elements, and pattern or jacquard head controlled means for moving said actuator members, said last named means including a shifter block for each actuator member and having provision for slidably receiving the member intermediate its pivot and its hook portion, a pull cord for moving each block in one direction, and spring means for moving each block in the reverse direction.

4. In a loom, the combination of a box motion mechanism including a pair of elements movable individually or collectively in one direction or another for effecting a selected one of four shuttle-box positions, a power reciprocated prime mover, a pair of actuator members pivotally connected one with each of said elements and selectively and swingably movable individually or collectively into and out of operative connection with the prime mover for at times connecting it in power transmitting relation with said elements, and pattern or jacquard head controlled

means for moving said actuator members, said last named means including a shifter block for each actuator member and having provision for slidably receiving the member intermediate its pivot and its hook portion, a pull cord for moving each block in one direction, spring means for moving each block in the reverse direction, and lever and stop devices for determining the prime mover disconnected positions of the actuator members.

5. In a loom, the combination of a box motion mechanism including a pair of elements movable individually or collectively in one direction or another for effecting a selected one of four shuttle-box positions, a power actuated prime mover including a vertically reciprocating horizontal bar, a pair of actuator members pivotally connected one with each of said elements and terminating at their upper ends in hook portions and selectively and swingably movable individually or collectively into and out of hook-over relation or driving connection with said horizontal bar for at times connecting the bar in power transmitting connection with said elements, and pattern or jacquard head controlled means for moving said actuator members, said last named means including a shifter block for each actuator member and having provision for slidably receiving the member intermediate its pivot and its hook portion, a pull cord for moving each block in one direction, spring means for moving each block in the reverse direction, and lever and stop devices for determining the prime mover disconnected positions of the actuator members.

PAUL BOND.