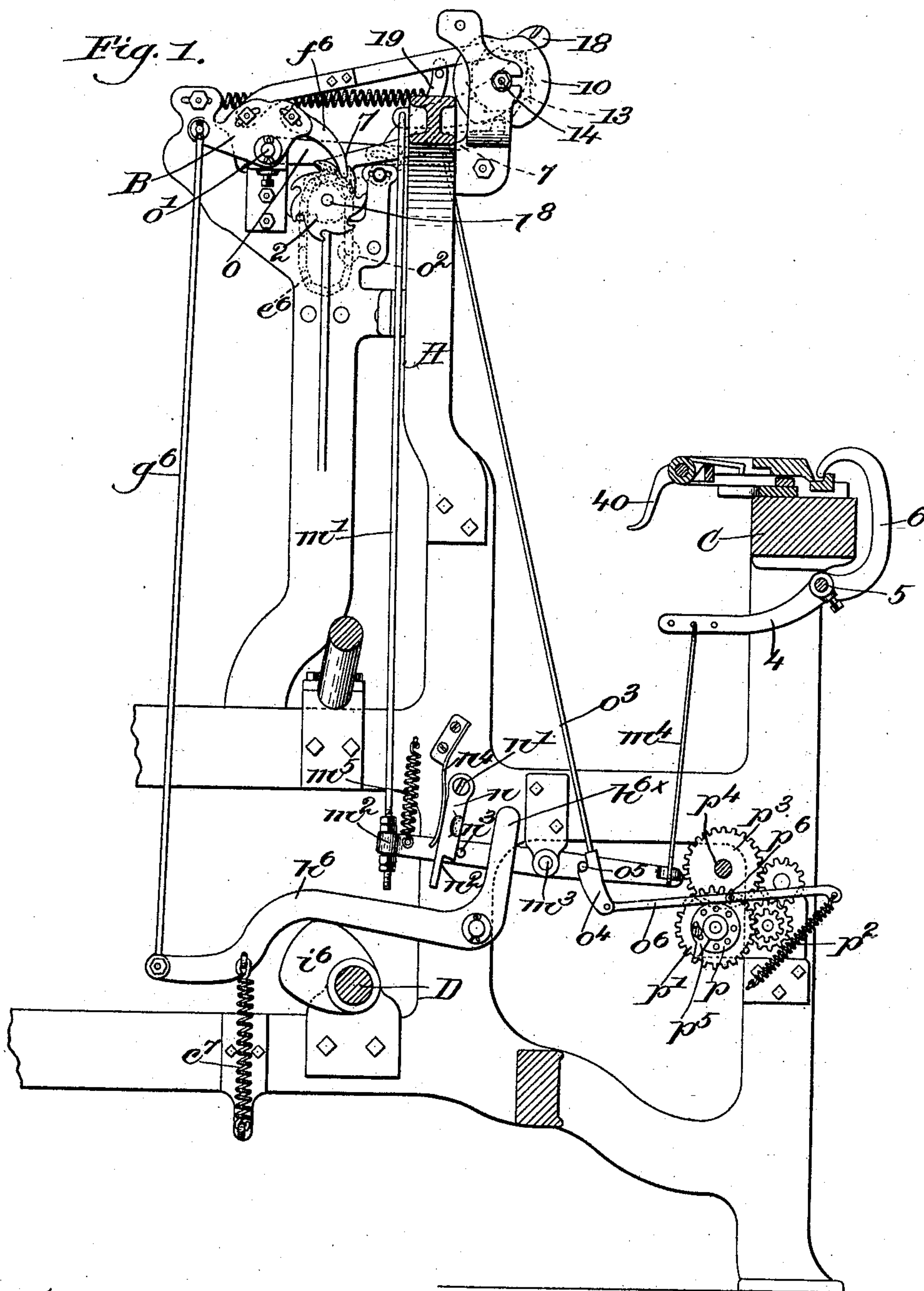


(No Model.)

2 Sheets—Sheet 1.

H. WYMAN.  
SHUTTLE BOX OPERATING MECHANISM FOR LOOMS.  
No. 603,522. Patented May 3, 1898.



Witnesses:  
Edward F. Allen.

Thomas J. Drummond.

Inventor:

Horace Wyman.

by Crosby Gregory, attys.

(No Model.)

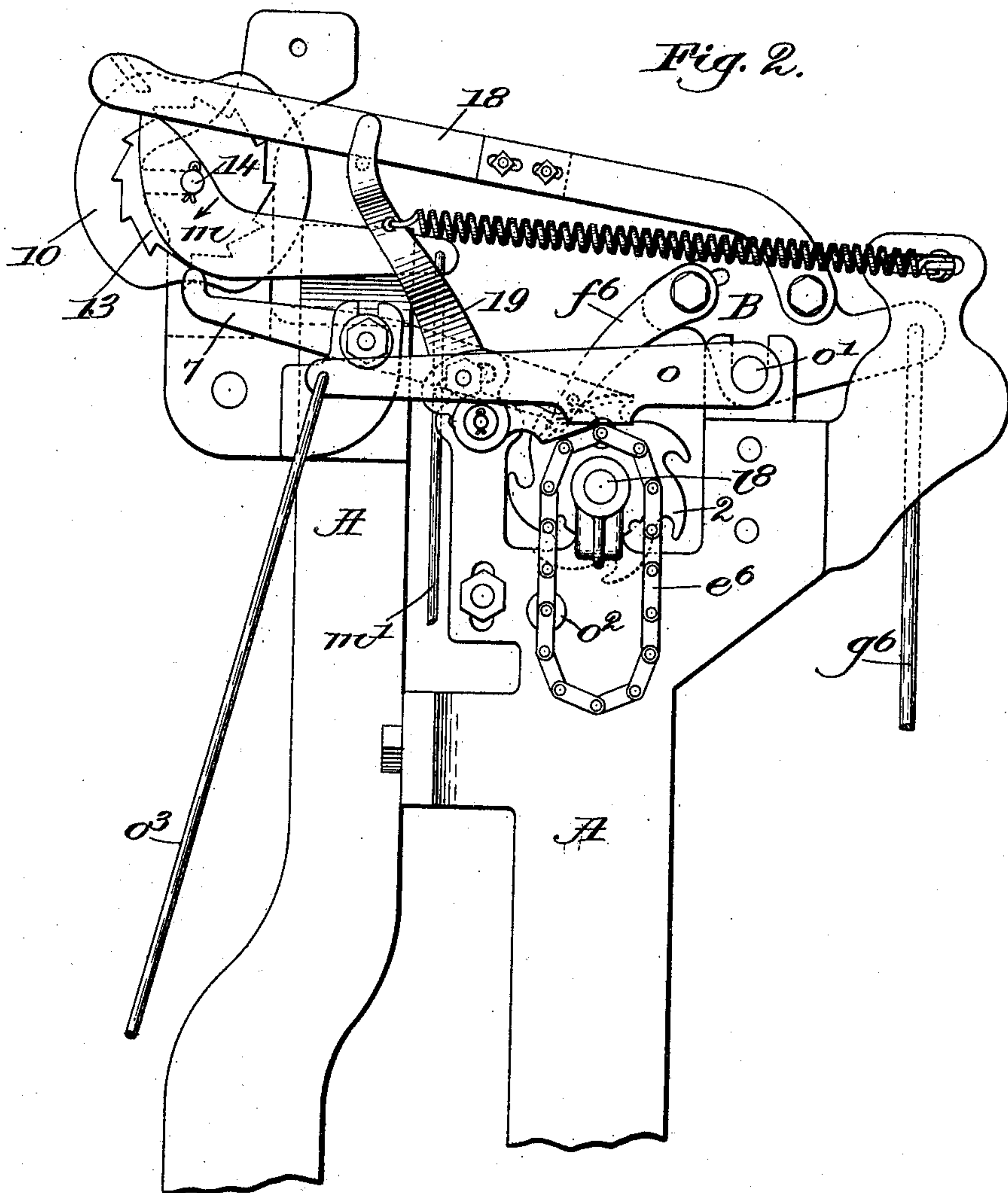
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# UNITED STATES PATENT OFFICE.

HORACE WYMAN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

## SHUTTLE-BOX-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 603,522, dated May 3, 1898.

Application filed February 20, 1896. Serial No. 580,060. (No model.)

*To all whom it may concern:*

Be it known that I, HORACE WYMAN, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Shuttle-Box-Operating Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention in shuttle-box mechanism for looms has for its object to provide suitable means for automatically throwing out of operation the pattern-surface feed and the multiplier-feed on breakage of a weft or filling thread or when for any reason it is desired to operate the loom for a considerable period of time with the same weft or shuttle, as when weaving the body of a blanket or other equivalent large body of fabric.

20 My invention is particularly adapted for use in connection with box mechanisms wherein the pattern-surface and multiplier feeds are actuated alternately—as, for instance, when connected with a common actuator and facing in opposite directions—so that one feed will operate on movement of the actuator in one direction, the other being operated on the return movement of the actuator. In mechanisms where two feeds are thus alternately operated if when the loom is stopped one feed be thrown out of action and the other not thrown out of action the latter feed, when the loom is again started, will operate to impart a feeding movement to its mechanism before the first one can pick up or recover the feed which it lost when the loom was stopped, and therefore the said latter feed will overrun the first feed, and thereby throw the two out of proper timing one with relation to the other.

40 To obviate this, when either of the threads is thrown out of action the other should likewise be thrown out and held out of action until the first has picked up or recovered the feed which it lost in order that in the subsequent operation of the loom the two threads may follow each other in proper order as if no breakage had occurred.

50 One object of my present invention is to provide an improved mechanism for automatically throwing out of action both the pattern-surface and multiplier feeds on breakage or

slackening of a weft or filling thread and to hold one of the feeds out of action until the other, which first lost a feeding movement, shall have recovered the same.

My invention also comprehends suitable improved mechanism actuated from or controlled by the pattern mechanism to automatically throw out of action both the pattern and multiplier feeds when it is desired to operate the loom with a single shuttle or weft for a considerable period of time to thereby enable the pattern and multiplier surfaces to be shortened, the said feeds being again thrown into action by some moving part of the loom, as the take-up roll, at the end of a predetermined movement thereof.

In the drawings, Figure 1, in vertical section and partial elevation, shows a sufficient portion of a loom embodying my invention to enable the latter to be understood; and Fig. 2, an enlarged detail showing a rear side view of some of the parts in different positions.

In the present instance for a disclosure of my invention I have elected to describe the same as embodied in a shuttle-box-operating mechanism substantially such as shown in my Letters Patent of the United States No. 364,696, dated June 14, 1887, to which reference may be had, like letters and figures representing like parts; but I desire it to be understood that my invention is not limited in its application or use to the particular box mechanism shown in said patent, for my invention is not limited in this respect.

Referring to the drawings, the frame A, the breast-beam C, the cam-shaft D, the weft-fork 40 and its slide, the hooked finger 6, the stop-rod 5, its arm 4, the pattern-surface  $e^6$ , the shaft  $l^8$ , on which the pattern-surface is mounted, the ratchet 2, its feed-pawl  $f^6$ , which in the present instance constitutes the feeding device for the pattern-surface, the multiplier cam or surface 10, its ratchet 13, mounted on a stud 14 and actuated by the pawl 18, which in the present instance constitutes the multiplier feed device, and with the pattern-surface feed device  $f^6$  are secured to and alternately moved to operate their respective feed mechanisms or surfaces by the common actuator B, and the pawl-lifters 7 and 19 are and may be of suitable construction—such;



for instance, as fully shown and described in my said Patent No. 364,696—and since the construction and operation of this type of box mechanism are well understood by those conversant with the art it is considered unnecessary to here enter into a detailed description of the same, except to state generally that the movable lifter 19 is in the mechanism shown controlled by the pattern-surface  $e^6$ , which also controls the box mechanism, and the pattern-feed lifter 7 is controlled by the multiplier-surface 10, the pattern and multiplier feeds being arranged to operate in opposite directions and alternately by the vibrations of the actuator B, the latter, instead of being actuated precisely as in my earlier patent referred to, being herein actuated by an equivalent construction—viz., the rod  $g^6$ , connected to a lever  $h^6$ , held in contact with a cam  $i^6$  on the cam-shaft by a suitable spring, as  $c^7$ .

In the present embodiment of my invention (see Fig. 2) I have loosely mounted upon the stud 14, carrying the multiplier pattern-surface, a disengaging device  $m$ , of such shape and construction, for instance, as shown, that when moved from its full-line position, Fig. 2, it will act to separate the multiplier feed device 18 and the pattern-feed lifter 7 to move the one from possible engagement with the teeth of its ratchet 13 and move the other to remove the pattern-feed device  $f^6$  from engagement with the teeth of its ratchet 2. This disengaging device is shown as provided with a radially-extended arm, which is connected at its end by a rod  $m'$  with a lever  $m^2$ , (see Fig. 1,) fulcrumed on the frame at  $m^3$  and connected at the opposite side its fulcrum by a link  $m^4$  with the arm 4 of the stop-rod 5 of the automatic weft stop-motion for the loom.

When during the operation of the loom the weft-slide carrying the weft-fork 40 is moved to the right, Fig. 1, to stop the loom in well-known manner because of the breakage or undue slackening of a weft-thread, the hooked finger 6 will be moved to rotate the stop-rod 5 and raise its arm 4 to thereby operate through the link  $m^4$  the lever  $m^2$  and rod  $m'$  to depress the arm referred to and the disengaging device  $m$  and turn the latter in the direction of the arrow, Fig. 2, to throw out of action both feed devices in the manner described.

I have herein provided suitable means to hold the feed devices disengaged or out of action until such time as they can be again put into action in the same order in which they were operating when stopped, such means being herein shown in the form of a holding device, as a dog  $n$ , pivoted to the frame at  $n'$  and notched at  $n^2$  to cooperate with a pin  $n^3$  on the lever  $m^2$ , referred to, a spring  $n^4$  acting to press said dog toward the pin.

When the lever  $m^2$  is moved, as described, to throw out of action the multiplier and pattern feeds, the pin  $n^3$  is carried below the notch  $n^2$ , permitting the spring  $n^4$  to move

the dog over the pin to hold the lever  $m^2$  in its new position with the feed devices out of action, the parts remaining thus held out of action until the proper time, usually the second pick after that at which the loom was stopped, when in suitable manner the dog  $n$  will be disengaged to permit the lever  $m^2$  under the action of its spring  $m^5$  to move again introduce the feed devices into action.

In the present embodiment of my invention for the release of the dog  $n$ , referred to, I have provided the lever  $h^6$  with an upwardly-extended arm  $h^{6x}$ , which, as the cam  $i^6$  drops said lever, will engage the dog  $n$  and move it to release the lever  $m^2$ , as described, and at this time if the lever 6 and weft fork and stick have been restored to their normal position for the usual operation of the loom the lever  $m^2$  will by means of spring  $m^5$  assume its normal position.

For throwing out of action both the pattern and multiplier feeds for considerable periods of time when it is desired to weave large bodies of fabric without change of shuttles I have herein provided a lever  $o$ , (see Fig. 2,) fulcrumed upon the frame at  $o'$  and adapted to be raised at the proper time by a roller or rollers  $o^2$  or other suitable change in or on the pattern-surface  $e^6$ , said lever being shown as provided with a depending rod  $o^3$ , carrying at its lower end a notched or hooked head  $o^4$ , adapted to lie normally beneath a pin  $o^5$  on the lever  $m^2$ , referred to.

The roller  $o^2$  is introduced into the pattern-surface at such point that when in the weaving of the fabric the body portion is reached it will pass under and lift the lever  $o$ , and thereby through its hooked head  $o^4$  and the pin  $o^5$  turn the lever  $m^2$  into its position described for throwing out of action both the multiplier and pattern feeds, said lever being at once locked in this new position by the dog  $n$ , referred to. To release the lever  $m^2$  when thus held by the hooked head  $o^4$  at the proper time, I have connected with said head a bar  $o^6$ , adapted to rest upon and to be held in contact with a cylindrical shoulder  $p$  on and rotatable with a toothed wheel  $p'$ , (see Fig. 1,) a spring  $p^2$  being preferably employed to hold the bar  $o^6$  in operative contact with the said shoulder.

The wheel  $p'$  is connected, through suitable gearing or otherwise, with a gear  $p^3$  in and rotatable with the take-up roller or shaft  $p^4$ , said wheel  $p'$  being also provided, preferably adjustably, with a finger  $p^5$ , adapted to engage a roller or other stud  $p^6$  on the bar  $o^6$ , so that at the proper time in the rotation of the wheel  $p'$ , which time is determined by the gearing between it and the take-up roller, the said finger  $p^5$  will engage the stud  $p^6$  and move the bar  $o^6$  and the hooked head  $o^4$  to the right, Fig. 1, to release the pin  $o^5$  and the lever  $m^2$  and permit the latter immediately thereafter to be released, as heretofore described, by the lever  $h^6$  to throw into action both feeds for the finishing of the fabric.



My invention is not limited to the particular embodiment or construction herein shown, for it is evident the same may be varied without departing from the spirit and scope of my invention.

Having described my invention, and without limiting myself as to details, what I claim as new, and desire to secure by Letters Patent, is—

10 1. In a loom, the combination with a pattern-surface and its feed device, a multiplier and its feed device and a disengaging device, of an automatic stop mechanism, connections  
15 between said stop mechanism and said disengaging device and operating through the latter to throw both the said feed devices out of action on automatic stopping of the loom by the said stop mechanism, and means to retain said feed devices out of action after re-  
20 lease of the same by said automatic stop mechanism, substantially as described.

2. In a loom, the combination with a pattern-surface and its feed device and a multiplier and its feed device, of an automatic  
25 stop mechanism, connections between said stop mechanism and said pattern and multiplier feed devices for throwing both the latter out of action on automatic stopping of the loom by the former, a holding device and  
30 means to operate it to retain the said feed devices out of action for one or more picks of the loom after starting the latter, substantially as described.

3. In a loom, the combination with pattern and multiplier mechanisms and feed devices therefor, and actuating means to alternately operate the said feed devices, of an  
35 automatic stop mechanism for said loom, a disengaging device and connections between the same and said stop mechanism whereby the former is automatically moved to disengage said feed devices on automatic stopping  
40 of the loom by the latter, and means operable independent of said actuating means to retain said alternately-acting feed devices out  
45 of action through one or more picks of the loom, substantially as described.

4. In a loom, the combination with the pattern and multiplier ratchets, feed-pawls therefor, and means to actuate the latter, of an  
50 automatic stop mechanism and connections between the same and said feed-pawls for automatically disengaging the latter from their respective ratchets on automatic stopping of  
55 the loom by the former, and means to retain said feed-pawls in their disengaged positions through one or more picks of the loom, substantially as described.

5. In a loom, the combination with the pattern and multiplier mechanisms, and the feed  
60 devices therefor, of a single disengaging device operable independent of but cooperating with both said mechanisms to move the said feed devices out of action, an automatic stop  
65 mechanism and connections between the same and said disengaging device to move the latter by or from the former.

6. In a loom, the combination with the pattern and multiplier mechanisms, feed-wheels therefor, the oppositely-acting feed-pawls co-  
70 operating therewith, and a common actuator for the said feed-pawls, of an automatic stop mechanism, means actuated thereby for lifting said feed-pawls out of engagement with  
75 their respective feed-wheels on automatic stopping of the loom, and means to retain said feed-pawls in their lifted disengaged positions, through one or more picks of the loom, substantially as described.

7. In a loom, the combination with the pattern and multiplier mechanisms; ratchet-  
80 wheels therefor; the feed-pawls; the common actuator for the same; and the lifters for the respective pawls, of the disengaging device for simultaneously disengaging both pawls; the  
85 lever to which said disengaging device is connected; the automatic stop mechanism for operating said lever; the holding device for said lever and means to release it, substantially as described.

8. In a loom, the combination of the pattern and multiplier mechanisms, the feed-  
90 wheels and feed-pawls therefor, automatic stop mechanism, and connections between the latter and said feed-pawls for automatically disengaging the latter and their feed-wheels  
95 on stopping of the loom by the former, means controlled by the said pattern mechanism automatically to throw out of action the said feed-pawls at the end of a predetermined  
100 movement of said pattern mechanism, a take-up roller, and means controlled thereby automatically to put said feed-pawls again into action at the end of a predetermined movement of the said take-up roller.

9. In a loom, the combination of the pattern and multiplier mechanisms; the feed  
105 devices therefor; a common actuator for said feed devices; a feed-disengaging device for throwing said feed devices out of action, a lever to which said disengaging device is connected, a holding device for said lever; the  
110 automatic stop mechanism, means controlled by said pattern mechanism to throw said feed devices out of action; a take-up roller, and means governed thereby to put said feed  
115 devices again into action.

10. In a loom, the combination of the pattern and multiplier mechanisms, the feed  
120 devices therefor, the actuator for said feed devices, a feed-disengaging device for throwing said feed devices out of action, a lever for operating said disengaging device, the automatic stop mechanism connected with and to  
125 move said lever, the lever-holding device, means controlled by the pattern-surface automatically to move said lever to disengage said feed devices, the take-up roller, and means controlled thereby to move said lever-  
130 holding device to release said lever for re-engagement of the feed devices.

11. In a loom, the pattern and multiplier mechanisms, the feed-ratchets and cooperating feed-pawls therefor, the common actua-



tor for said feed-pawls, a feed-disengaging device to disengage said feed-pawls and their ratchets, a lever for actuating said disengaging device, the lever-holding device and means 5 to release it, the automatic stop mechanism to move said lever, a lever moved by the pattern-surface, a rod connecting said last-mentioned lever with and to move the lever for operating said disengaging device, the take-up roller, and means operated thereby to re- 10 leasesaid rod from engagement with said last-mentioned lever.

12. In a loom, the combination with the pattern and multiplier mechanisms, and the 15 feed ratchets and pawls therefor, of means controlled by the pattern mechanism automatically to move said pawls out of engagement with said ratchets, a take-up roller, and means operated thereby automatically to 20 move said pawls again into engagement with said ratchets.

13. In a box mechanism for looms, two alternately-acting feed devices and parts fed by the same, and means for disengaging the 25 active feed device from the part fed thereby while insuring retention of the inactive feed device out of engagement with the part fed thereby.

14. In a loom containing a box mechanism, 30 two alternately-acting box-mechanism feed devices and parts fed thereby, an automatic stop mechanism for the loom, and means controlled thereby for disengaging the active feed device from the part fed by it while in- 35 suring retention of the inactive feed device out of engagement with the part fed by it.

15. In a loom, containing a box mechanism, a plurality of box-mechanism feed devices, means to throw said feed devices temporarily 40 out of action on stopping of the loom, and means to hold said feed devices out of action after the starting of the loom until such time as they can be again set in operation in the same order or sequence as when stopped, sub- 45 stantially as described.

16. In a loom, the combination with the pattern and multiplier mechanisms and the respective feed devices therefor, of means 50 controlled by the pattern mechanism automatically to cause disengagement of both said feed devices from their respective mechanisms, a take-up roller and connections auto- 55 matically to cause reengagement of said feed devices with their respective mechanisms at the end of a predetermined length of move- 55 ment of said take-up roller, substantially as described.

17. In a loom, the combination of the pattern and multiplier mechanisms, feed devices 60 therefor, disengaging means to cause said feed devices to be simultaneously disengaged from their respective mechanisms, and means con- 65 trolled by the pattern-surface automatically to operate said disengaging means, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE WYMAN.

Witnesses:

JUSTIN A. WARE,  
SAMUEL B. SCHOFIELD.