No. 824,200. PATENTED JUNE 26, 1906.

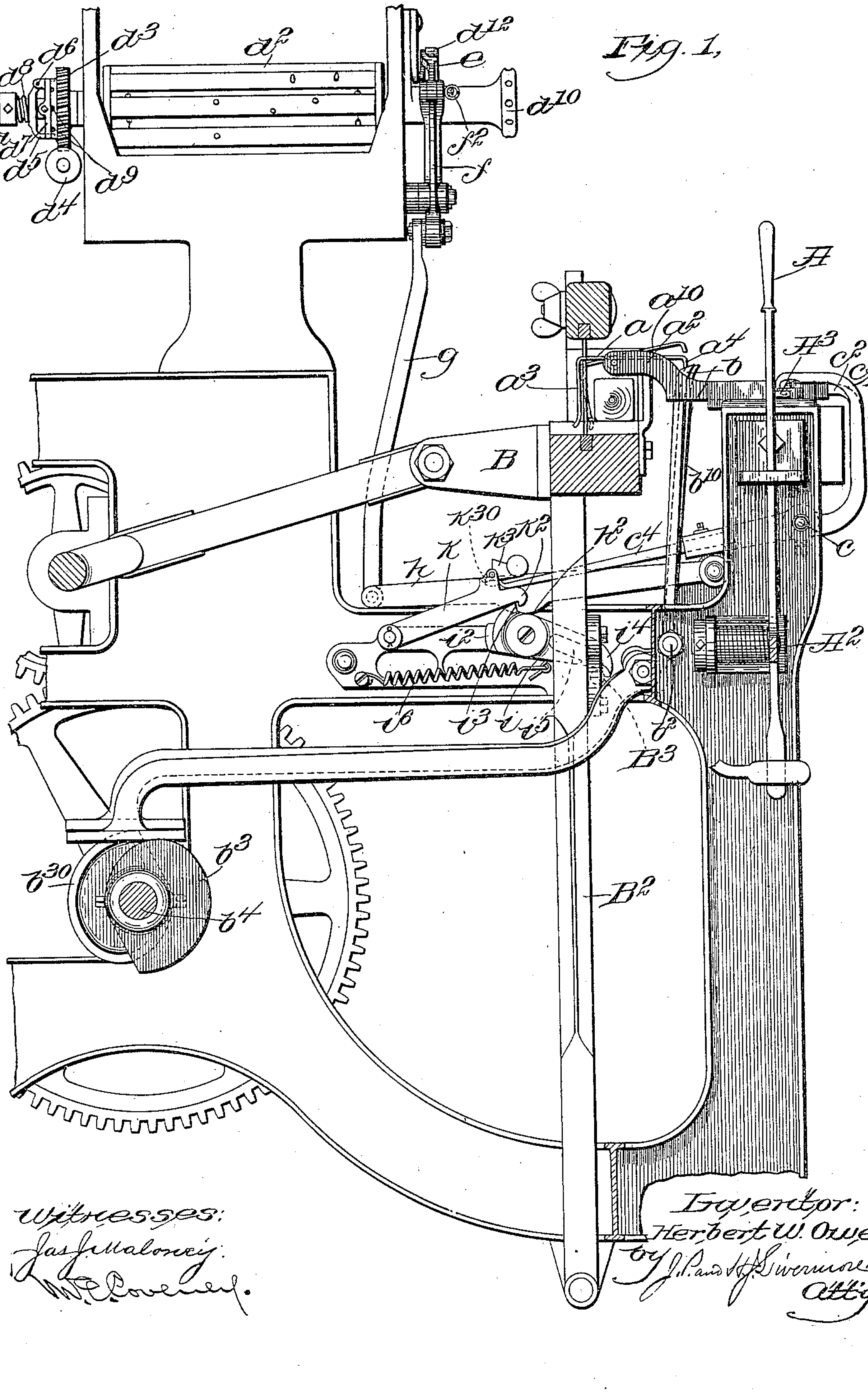
H. W. OWEN.

PATTERN RESETTING MECHANISM FOR LOOMS.

APPLICATION FILED NOV. 27, 1903.

3 SHEETS—SHEET 1.

Fig. 1,



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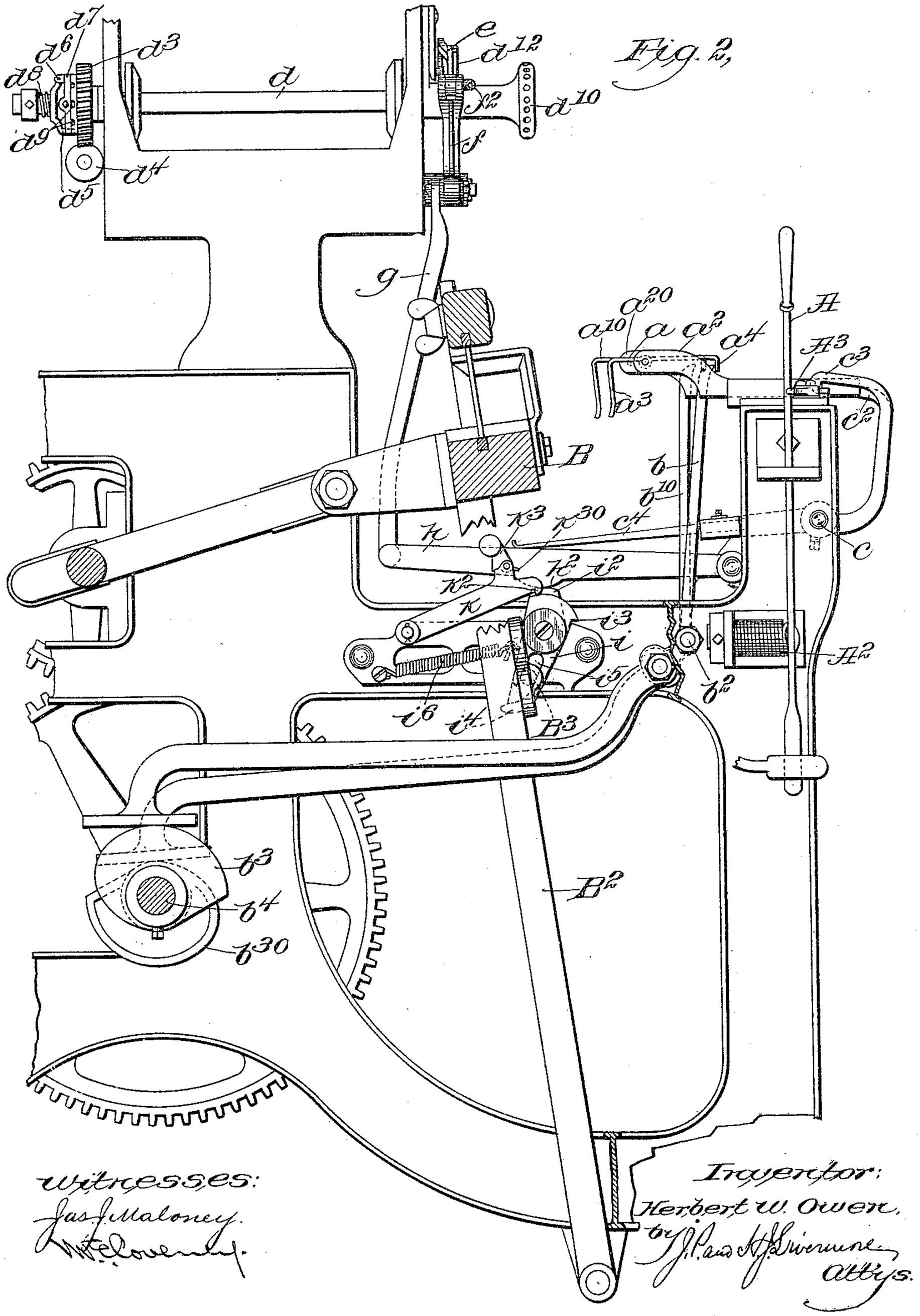
3 SHEETS—SHEET 2.

Fig. 2.



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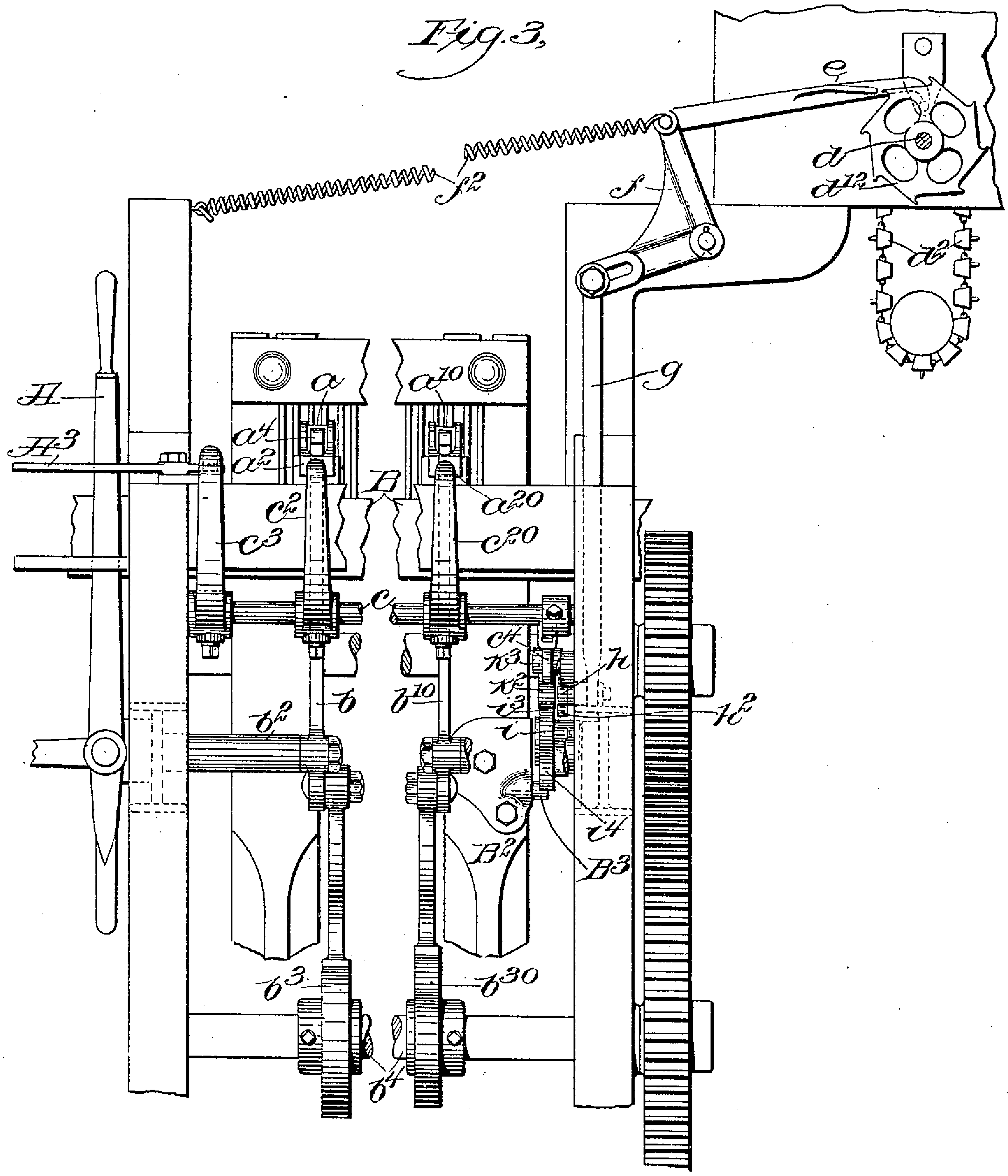
3 SHEETS—SHEET 3.

Fig. 3,



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UNITED STATES PATENT OFFICE.

HERBERT W. OWEN, OF DOVER, NEW HAMPSHIRE, ASSIGNOR OF ONE-HALF TO CHARLES H. FISH, OF DOVER, NEW HAMPSHIRE.

PATTERN-RESETTING MECHANISM FOR LOOMS.

No. 824,200. Specification of Letters Patent. Patented June 26, 1906.

Application filed November 27, 1903. Serial No. 182,841.

To all whom it may concern:

Be it known that I, HERBERT W. OWEN, of Dover, county of Strafford, and State of New Hampshire, have invented an Improvement in Pattern-Resetting Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a stop-motion for looms, and is embodied in mechanism employed in connection with the stop-motion for the filling, the purpose being to reset the pattern-chain automatically while the loom is being stopped in response to the breaking or running out of the filling.

In the stop-motion now commonly employed the shipper is operated when a filling-thread breaks; but the loom will not stop until it has made an idle pick, the result being that the pattern-chain has been fed a certain distance while no filling-thread has been woven in, and it is therefore necessary prior to starting the loom to set the pattern mechanism back in order that the pattern may not be broken in the fabric as woven. In connection with the stop-motion now commonly employed the pattern mechanism is provided with means for resetting it by hand, an operation which may be overlooked or which may be wrongly performed by the operator; and the object of the present invention is to provide the stop-motion with devices for automatically restoring the pattern-chain to an extent equivalent to the amount it has traveled during the idle pick or after the filling has become exhausted or broken.

To these ends the invention is embodied in a novel construction and arrangement, whereby a resetting device for the pattern-carrier is combined with a stop-motion which may be of the kind commonly employed, the resetting device being actuated in response to the operation of the said stop-motion when a thread breaks or the supply of thread gives out.

In accordance with the invention the pattern-resetting mechanism is directly operated by the lay, there being intermediate devices whereby the stop-motion causes the lay to become temporarily connected with operating mechanism for the resetting device, so that the more delicate mechanism directly controlled by the threads is not called upon to supply the power necessary to reset the pattern mechanism.

Figure 1 is a longitudinal vertical section of a portion of a loom embodying the invention, shown partly in side elevation. Fig. 2 is a similar view showing the parts in a different position; and Fig. 3 is a front view of the same, parts being broken away.

The invention is herein shown as applied to a loom having the ordinary filling-thread stop-motion which comprises a shipper-lever A, held in position when the loom is running by a shoulder or notch against the stress of a spring A^2, so that when it is thrown out of engagement with the notch the spring operates to shift the belt from the fast to the loose pulley, a brake being commonly employed in connection with the shipper mechanism to stop the loom as soon as possible. The brake, however, is not herein shown, since it is a well-known expedient and forms no part of the present invention. The shipper-lever is arranged to be pushed out of the notch by means of a lever A^3. The said lever A^3 is operated through the agency of a feeler a, pivotally mounted upon a slide or stop-motion actuating member a^2, the said feeler having a downwardly-projecting finger a^3 to be engaged by the filling-thread when the lay beats the said filling-thread up, the said feeler or "filling-fork," as it will be hereinafter termed, having a hook a^4 at the opposite end, which is adapted to be engaged by a lever b when no filling is present to tip up the fork. The said lever b is pivoted at b^2 and acted upon by a cam b^3 on a continuously-rotating shaft b^4, so that the lever b is moved back and forth at the end of alternate picks. If the shuttle-thread is present, therefore, it will engage the finger a^3 and tip the filling-fork a so that the hook portion a^4 is not engaged by the lever b. If, on the contrary, the filling-thread is exhausted or broken, the filling-fork a will not be tipped up, and the hook portion a^4 will be caught by the lever b, producing a movement of the slide a^2, which operates to trip the shipper-lever A.

In accordance with the present invention the loom is provided with a pattern-resetting mechanism, which is also arranged to be initially operated through the agency of the filling-fork a and the lever b, the slide a^2 for

this purpose being arranged to coöperate through an arm c^2 with a rock-shaft c, the said rock-shaft also being provided with a tripping member c^3, which acts upon the lever A^3 to release the shipping-lever A and stop the loom. Furthermore, in order that the loom may be stopped promptly when the thread gives out at either end of the lay B the loom is provided with a duplicate slide a^{20} at the opposite end of the lay, arranged to coöperate through an arm c^{20} with the rock-shaft c, and with a duplicate filling-fork a^{10} and duplicate lever b^{10}, which is acted upon by a cam b^{30}, the cams b^3 and b^{30} being set opposite each other, so that the levers b b^{10}, controlled thereby, act alternately for a purpose to be hereinafter described. Furthermore, as best indicated in Fig. 1, the cams are so shaped that one of the levers will dwell in its forward position until the other lever has been moved to such forward position, so that if the filling is absent the filling-fork at one end of the lay will be engaged prior to the disengagement of the other, thus preventing the return movement of the stop-motion-actuating member so long as both forks are in position to be engaged by their respective levers. The rock-shaft c is thus oscillated if a filling-thread gives out or breaks at either end of the lay and not only trips the shipping-lever to stop the loom, but also serves to set in operation a pattern-resetting device which may be described as follows.

The pattern-carrier, which is controlled by the resetting mechanism, may be of any suitable or usual construction, being herein shown as a shaft d, which carries the pattern-chain d^2, and said shaft is rotated through the agency of a worm-gear d^3 and a worm d^4, the said gear being loose on the shaft d, but arranged to rotate the same through the agency of a retaining-catch d^5, pivotally supported at d^6 upon a collar d^7, which is keyed or otherwise fastened to the shaft, the said retaining-catch d^5 being held in engagement by means of a spring d^8 with beveled notches d^9, formed on the flange carried by the worm-gear. Thus while the worm-gear d^3 will rotate the shaft d it is practicable to turn the shaft with relation to said worm-gear in either direction, since the retaining-stop d^5 will be pushed out by the beveled surfaces of the notches. In order to reset the shaft in the ordinary way, it is shown as provided with a knob or handle d^{10}, which may be turned by the operator. In accordance with the present invention, however, the shaft is further provided with automatic resetting mechanism, one element of which is shown as a ratchet-wheel d^{12}, which is arranged to be acted upon by a pawl e, connected with a bell-crank lever f, which is arranged to be rocked on its pivot against the stress of a spring f^2, Fig. 3, by means of a link g, connected with a lever h, which lever is arranged to be moved on its fulcrum through the agency of the devices controlled by the rock-shaft c. In the construction shown, however, while the rock-shaft c, controlled by the slide, is initially depended upon for the operation of the resetting mechanism the said rock-shaft does not directly operate the lever, since it would be undesirable to put any undue strain upon the light filling-forks a a^{10}, by which the slides a^2 a^{20} are pulled to operate said rock-shaft, the said filling-forks of necessity being light and delicate, since they are tilted by the filling-thread. For this reason the lever h is arranged to be directly operated through the agency of the lay B, there being an actuating device i, which is arranged to be brought into coöperation with the lay-sword B^2 through the agency of the slides a^2 a^{20} and rock-shaft c, the operation requiring but little power.

As herein shown, the actuating member i consists of an arm pivotally supported and provided with a cam i^2, which is arranged when the said arm is moved on its pivotal support to engage a cam projection h^2 on the lever h, and the said member i is normally prevented from coöperation with the lay by means of a retaining-catch k, which is under the control of the slides a^2. The said retaining-catch k is provided with a hooked end k^2, which hooks over or engages a corresponding hook portion i^3 of the member i, and the said member k is arranged to be lifted, so as to disengage the hook i^3 through the agency of a lever c^4, connected with the rock-shaft c, so as to be lifted when said shaft is oscillated.

In order that the catch k may be restored to its normal position without a corresponding movement of the lever c^4, the said lever instead of acting directly upon the catch k is shown as engaging a weighted projection k^3, which is pivoted to the catch k, the lever c^4 normally engaging the said weighted member k^3 at a point close to the pivotal connection thereof, whereby the leverage, aided by the weight, will prevent the member from turning on its pivot at first, so that the catch k will be lifted. As the arcs of movement of said catch k and said lever c^4 are divergent, the end of the lever c^4 will slide toward the weighted end of the member k^3, thus increasing the leverage, so that the weighted end is lifted, as shown in Fig. 2, thus permitting the catch k to drop back to its normal position ready to engage the member i when restored. The said member k^3 is also provided with a tail or projection k^{30} to be hit by the lever c^4 when the latter moves back to normal position, thereby restoring the said member k^3 to the normal position over the end of the lever, as shown in Fig. 1. While this construction is simple and practicable, it is obvious that the same result may be obtained in various ways.

The end i^4 of the member i when the hook

portion i^3 is released will be pressed down upon a projection B^3, connected with the lay-sword B^2, and the under part of the member i is provided with a recess i^5, into which the projection B^3 will travel as the lay moves back, finally engaging the throat and under surface of the said recess and positively swinging the member i on its pivot, so as to force the cam i^2 under the cam projection h^2 and lift the lever h and throw back the pattern-chain through the action of the ratchet-wheel d^{12}, as shown in Fig. 2.

As the lay beats up the member i will be turned to its normal position and will latch in behind the catch k, which, as stated, then stands in its normal position.

In order to throw the member i downward toward the projection B^3, a spring i^6 is connected with said member, and said spring causes the shoulder i^3 to bear against the hook portion of the latch k with considerable force. In order to relieve the frictional pressure, so that the latch k will lift easily, the tail i^4 of the member i projects just below the path of the projection B^3, which engages it each time the lay beats up, (see Fig. 1,) slightly rocking the member i against the stress of the spring. It is at this period that the latch k is lifted, if at all, and in lifting it nothing has to be overcome except the weight of the latch itself. When the latch is up, the spring i^6 causes the member i to turn on its pivot as the lay travels back, the tail i^4 hugging the projection B^3 until the latter engages in the recess i^5 and positively continues the movement of the member i.

The duplicating of the cams and the slides operated by them and the setting of the cams opposite to each other prevents the latch k from being raised or partly raised a second time in response to a second movement of the slide which has been operated first. By having the cams operate alternately the other slide is pushed back before the lever c^4 drops far enough to restore the weighted member k^3 to its normal position, the consequence being that the subsequent lifting of the lever c^4 does not raise the latch a second time. Furthermore, the shipper-lever A is acted upon when the thread gives out at either end of the lay, the said lever, as previously stated, being tripped in response to the movement of either of the slides. If, therefore, the loom is arranged to be stopped as nearly as possible at the end of one backward and forward movement of the lay after the detection of weft failure, there will be only two idle or false picks, and the pattern mechanism will be correspondingly set back without regard to the box the shuttle may be in when the thread gives out.

While the construction hereinbefore described constitutes a practical embodiment of the invention, it is obvious that modifications may be made in the specific construction and arrangement and that the invention is not limited to the structure chosen as an illustration.

I claim—

1. In a loom provided with a stop-motion controlled by the filling-thread, and a pattern-carrier, the combination with the lay; of resetting mechanism for the pattern-carrier; and means actuated by the stop-motion for connecting the lay with said resetting mechanism to operate the same.

2. In a loom, a filling-fork; pattern mechanism; a resetting device for said pattern mechanism; the lay; and means coöperating with the said filling-fork for causing the lay to operate said resetting device.

3. In a loom, the combination with a lay; of two filling-forks, one located adjacent to each end of the lay; separate devices for engaging said filling-forks; a stop-motion; a device under the control of either filling-fork for operating such stop-motion; and means whereby the device for operating one fork engages the same prior to the disengagement of the other fork by the other device.

4. In a loom having a lay, a stop-motion; a filling-fork opposite each end of the lay; a device coöperating with either filling-fork to operate said stop-motion; and a pattern-resetting mechanism operated in response to the operation of the stop-motion.

5. In a loom provided with a stop-motion controlled by the filling-thread, and a pattern-carrier, the combination with the stop-motion-actuating member; of a retaining-latch operated in response to the operation of said member; an actuating device normally held by said latch in a position in which it will not operate; a pattern-resetting device controlled by said member when operated; and means for operating said member when released by the latch, as set forth.

6. In a loom, the combination with a pattern-carrier; of a ratchet mounted on said pattern-carrier; a pawl to operate said ratchet; the lay; actuating mechanism for said pawl operated by the lay; a stop-motion-actuating member; and means operated by said member for connecting the lay and the actuating mechanism for said pawl.

7. In a loom, the combination with a pattern-carrier; of a ratchet mounted on said pattern-carrier; a pawl to operate said ratchet; a lever to operate said pawl; the lay-sword; an actuating device for said lever to be operated by said lay-sword; a retaining-latch normally holding said actuating device in a position in which it will not be operated by said lay-sword; a stop-motion-actuating member; and means operated in response to the operation of said stop-motion-actuating member for releasing said latch, substantially as described.

8. The combination with the lay-sword provided with an engaging projection; of an

actuating-cam to be operated by the engagement therewith of said projection; a pattern-resetting device operated by said cam; a pivotally-supported latch coöperating with said cam to hold the same normally out of the path of the projection on the lay-sword; an engaging member pivotally connected with said latch; a pivotally-supported lever to engage said engaging member, the arcs of movement of said member and said pivotally-supported lever being divergent; a stop-motion; and means operated in response to the operation of said stop-motion for operating said pivotally-supported lever, substantially as described.

9. In a loom, the combination with a pattern-resetting device; of an actuator therefor; an operating device for said actuator, movable with the lay; a filling-fork; and means operated by said filling-fork for causing the coöperation of said operating device and said actuator.

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

HERBERT W. OWEN.

Witnesses:
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