No. 677,608. Patented July 2, 1901.

E. S. STIMPSON.

WEFT REPLENISHING LOOM.

(Application filed Apr. 5, 1901.)

(No Model.) 2 Sheets—Sheet 1.

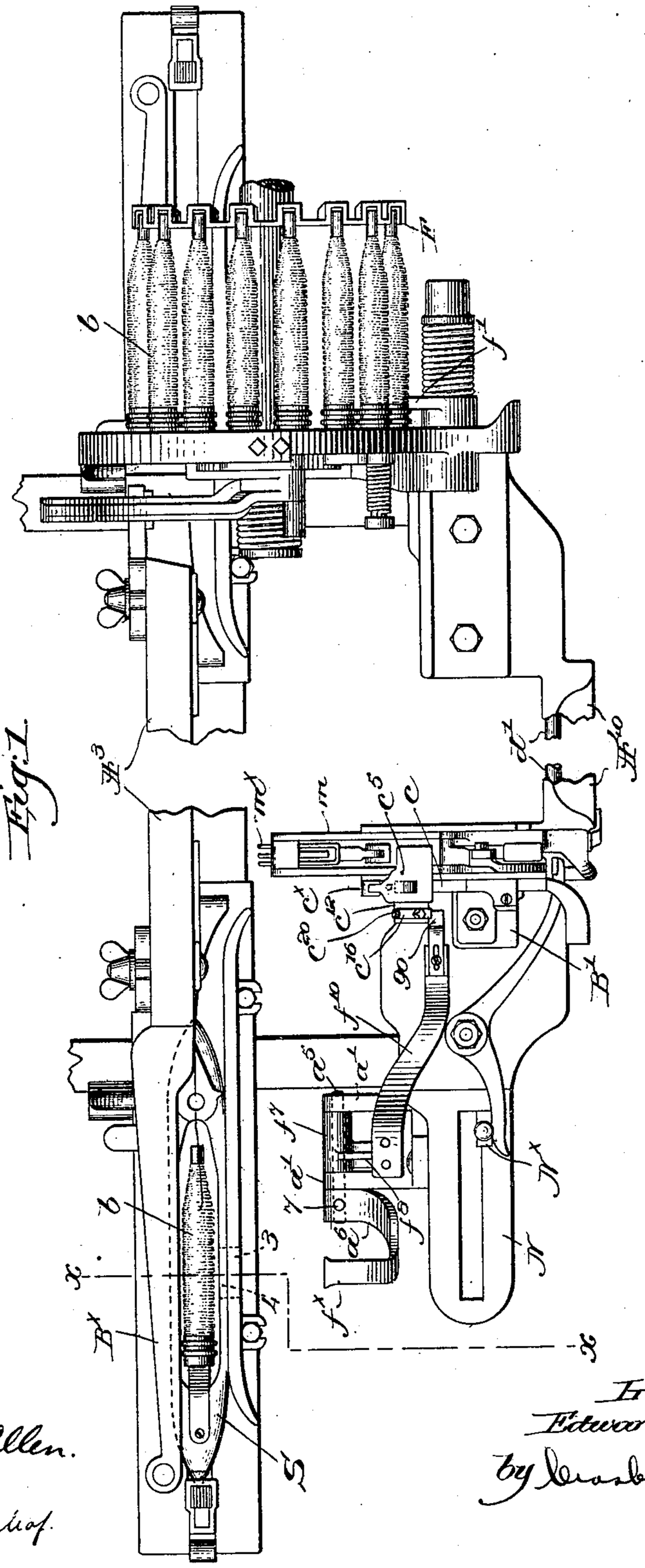

Fig. 1.

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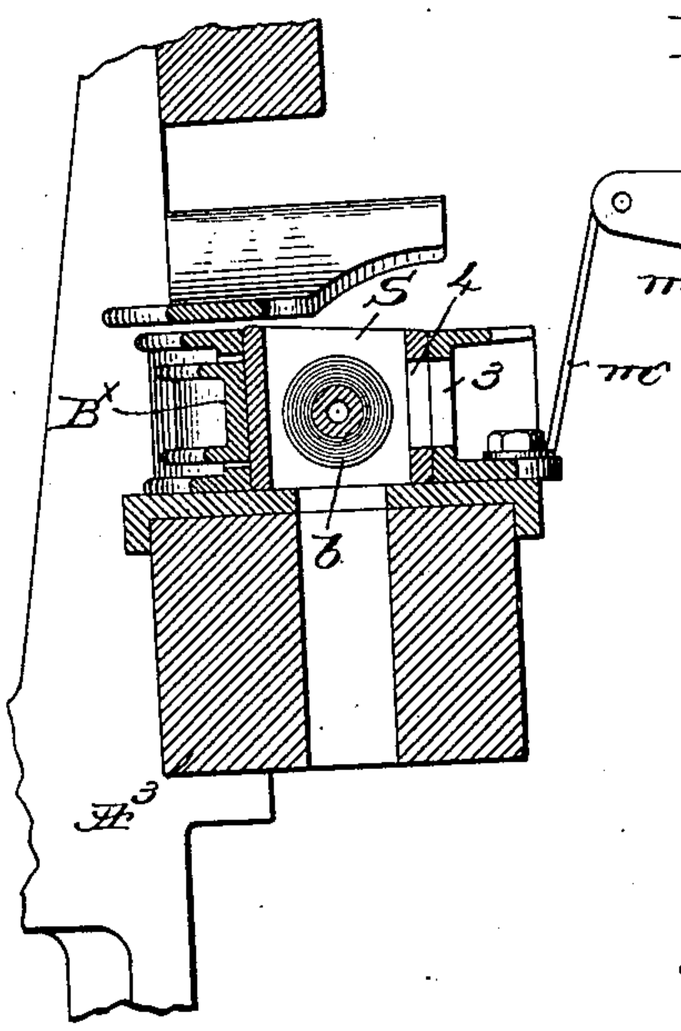


Fig: 2.

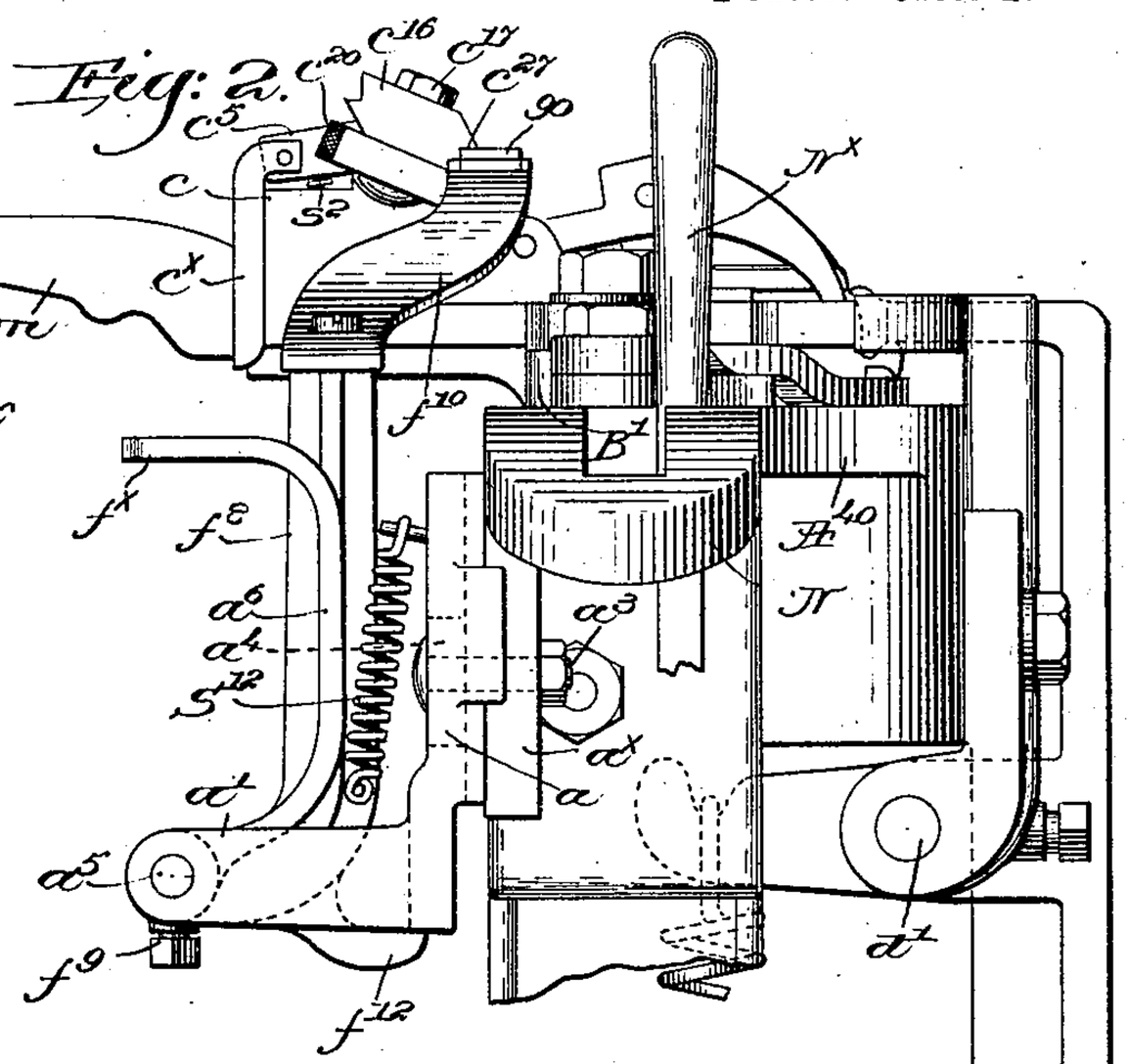


Fig: 3.

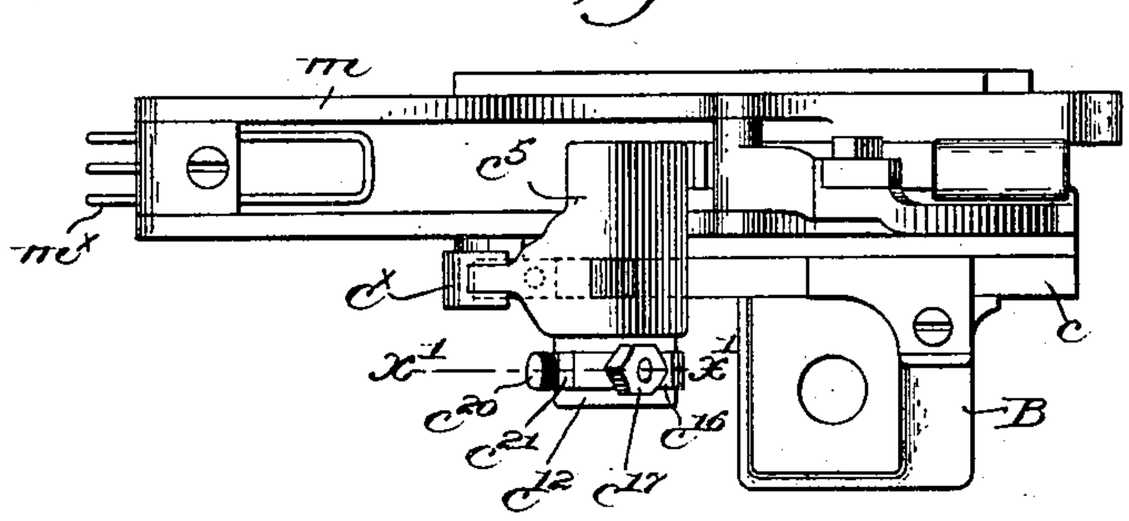


Fig: 4.

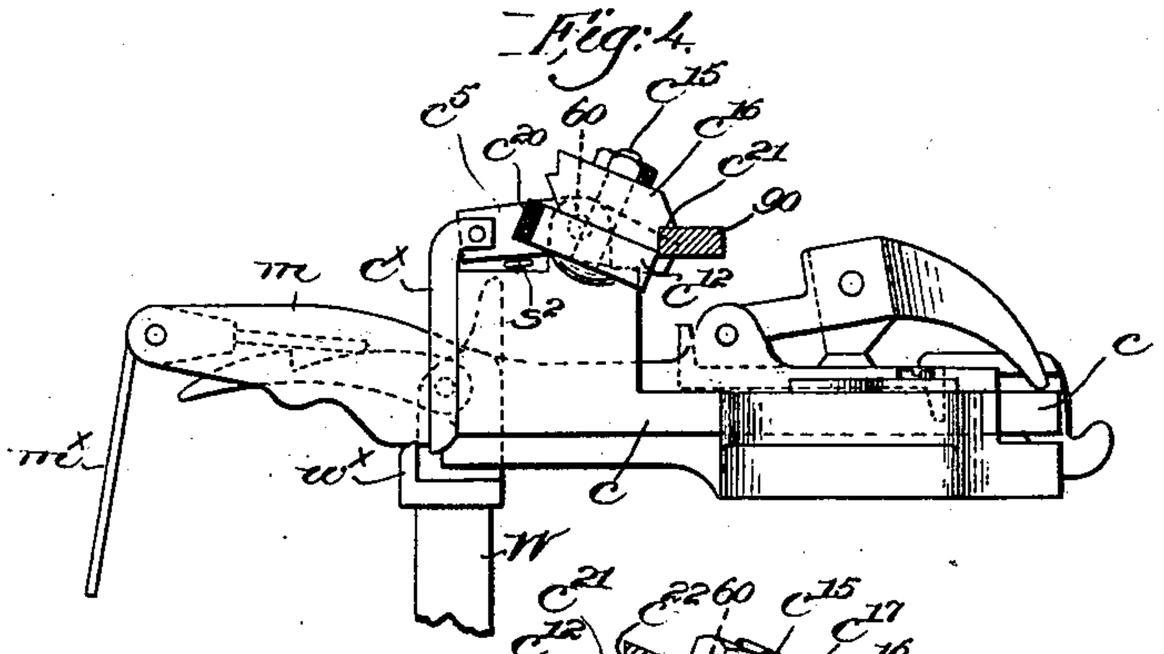
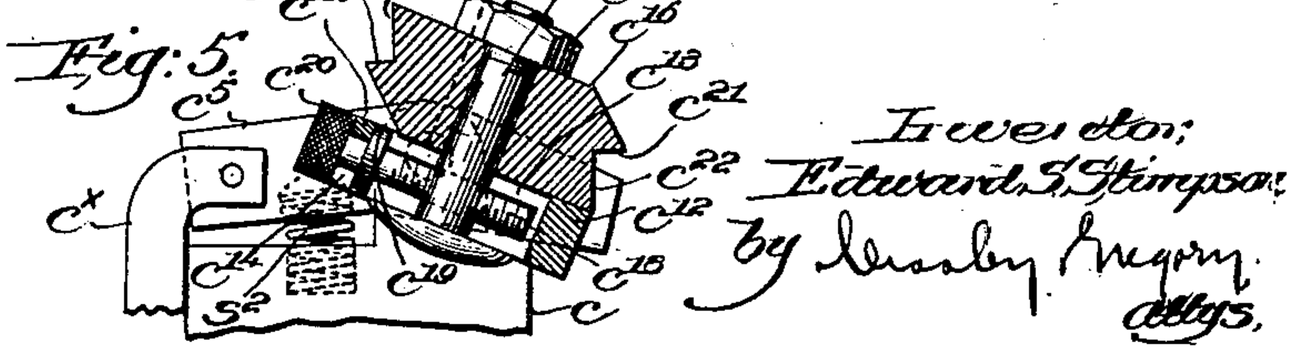


Fig: 5.



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UNITED STATES PATENT OFFICE.

EDWARD S. STIMPSON, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF SAME PLACE.

WEFT-REPLENISHING LOOM.

SPECIFICATION forming part of Letters Patent No. 677,608, dated July 2, 1901.

Application filed April 5, 1901. Serial No. 54,438. (No model.)

To all whom it may concern:

Be it known that I, EDWARD S. STIMPSON, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Weft-Replenishing Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My present invention relates to looms provided with automatic filling-replenishing mechanism the time of operation whereof is controlled by the quantity of filling in the shuttle, it being desirous to effect a change of filling prior to complete exhaustion of the shuttle-filling.

A feeler which intermittingly engages and is moved by the filling in the shuttle is made effective to cause the operation of the filling-replenishing mechanism at the proper time; and one of the objects of this invention is the production of a novel feeler mechanism operating in such a way as to practically avoid rubbing contact between the filling and the feeler.

I have also provided novel means for adjusting the feeler mechanism so that the operation of the filling-replenishing mechanism can be made to correspond very accurately with the desired extent of exhaustion of the shuttle-filling.

Figure 1 is a top or plan view, centrally broken out, of a loom provided with automatic filling-replenishing mechanism and having one embodiment of my invention applied thereto. Fig. 2 is a transverse sectional view on the line $x\,x$, Fig. 1, looking toward the right and omitting the filling-replenishing mechanism shown in Fig. 1. Fig. 3 is an enlarged plan view of the usual filling-fork and coöperating parts, with certain novel elements of the controlling means, to be described. Fig. 4 is a side elevation thereof, the detent, to be described, being shown in section; and Fig. 5 is an enlarged sectional detail on the line $x'\,x'$, Fig. 3, of the setting means mounted on the latch-carrier.

The major portion of the loom illustrated in Fig. 1 forms the subject-matter of United States Patent No. 662,320, dated November 20, 1900, and the breast-beam A^{40}, holding plate N for the shipper $N^{\times}$, the filling-feeder F for the filling-carriers b, the transferrer f', controlling-shaft d', the lay A^3, having one of its shuttle-boxes $B^{\times}$ apertured at 3, the shuttle S, having a slot 4 in its side wall for the entrance of the feeler, and the vibrating actuator or weft-hammer W, provided with a projection $w^{\times}$, may be and are all substantially as in said patent. The filling-fork $m^{\times}$, its slide m, mounted to be moved in a guideway in the stand B', the slide-bar c, latch-carrier c^5, pivoted thereon at 60 and having fulcrumed upon it at its inner end a depending latch $c^{\times}$ to coöperate at times with the weft-hammer projection $w^{\times}$, and the spring s^2, tending to lift the latch into inoperative position, are also substantially as in said patent and operate as therein set forth.

Referring more particularly to Fig. 2, an L-shaped stand a, having its base bifurcated to form the ears a', is secured to a depending bracket $a^{\times}$ on the plate N, a clamping-bolt a^3, passing through a vertical slot a^4 in the upright part of the stand into the bracket to permit vertical adjustment of the stand. A horizontal rock-shaft a^5 is mounted in the ears a', which form bearings therefor below the lay-path, and to this shaft is rigidly secured, as by a pin 7, Fig. 1, an upturned arm a^6, bent rearwardly at its upper end to constitute a filling-feeler $f^{\times}$, the arm a^6 being so shaped as to bring the feeler opposite the apertures 3 4 as the lay beats up, as will be seen from inspection of Figs. 1 and 2. On every alternate beat-up of the lay the feeler will engage the filling in the shuttle, entering the latter through the apertures 3 4 in well-known manner, and such engagement operates to swing or rock the feeler in a vertical plane about its fulcrum a^5; but owing to the long radius the path of movement of the feeler will be so slightly curved that rubbing of the filling, which tends to abrade it, is substantially obviated. The greatest filling-induced movement of the feeler occurs when the maximum amount of filling is in the shuttle, and as the filling is drawn off during weaving the amplitude of movement of the feeler decreases, and when only a predetermined small quantity of filling remains

the minimum effective movement is reached, and by means to be described and not broadly novel the filling-replenishing mechanism is caused to operate.

As in said Patent No. 662,320 the latch $c^{\times}$ will coöperate with the weft-hammer or actuator, if it is not moved into inoperative position, to cause a change of filling, and periodical movement of the latch into inoperative position is effected by or through filling-induced movements of the feeler until the desired exhaustion of the shuttle-filling is reached.

I have herein shown the latch-carrier as provided with an offset inclined shelf or ledge c^{12}, having a slot c^{13} therein, and at the under side of the shelf at its inner end a recess c^{14} is made. (See Fig. 5.) A headed retaining-bolt c^{15} is passed up through the slot c^{13} and through a block c^{16}, slidable on the shelf c^{12}, but adapted to be clamped securely thereupon by a suitable nut c^{17} on the end of the bolt c^{15}. An adjusting-screw c^{18} is screwed into a hole in the bolt, the screw having an annular collar c^{19} thereon and a milled head or thumb-nut c^{20}, the part of the screw-shank between them entering the recesss c^{14}, so that the screw will be held from longitudinal movement in the shelf-slot c^{13}, while it can be rotated in one direction or the other to thereby move the bolt c^{15} and the block c^{16} toward or away from the lay. I have herein shown the upper and lower faces of the block c^{16} parallel, and the ends thereof are provided with oppositely-faced seats c^{21}, each seat being located adjacent a stop portion c^{22}, substantially at right angles to the seat, so that the block is reversible to compensate for wear upon the seats, the seat in use overhanging the detent, to be described.

The hub f^7 of an upright arm f^8 is held securely on the feeler rock-shaft a^5 by a suitable set-screw f^9, Fig. 2, the upper end of the arm having secured thereto (or forming a part of it) a laterally-offset portion f^{10}, extended over nearly to the latch-carrier, and this extension has mounted upon it the detent, shown as a block 90, preferably of hardened steel. This detent projects beneath the overhanging seat c^{21} when the feeler is at rest, it being observed that the angle between the feeler-arm a^6 and the detent-arm can be varied to provide for adjustment of the parts for different filling-carriers, shuttles, &c., the final fine adjustment being effected by movement of the block c^{16}. A projecting toe f^{12} on the arm f^8 is adapted to engage the bottom of the stand a to limit movement of said arm toward the lay, and such movement of both the feeler and the detent toward the lay is effected herein by a spring S^{10}, Fig. 2, attached at one end to the detent-arm and at its other end to a lug on the stand a. Now if the parts are in the position shown in the drawings the detent 90 will act upon the seat c^{21} to depress the latch $c^{\times}$ into the path of the part $w^{\times}$ of the actuator W; but at each alternate beat-up of the lay the feeler will be swung back and the detent will be withdrawn from beneath the seat. The spring s^2 thereupon tilts the latch-carrier and moves the latch into inoperative position until the actuator has moved beyond it, and this withdrawal of the detent occurs periodically—that is, at each filling-induced movement of the feeler which is of sufficient amplitude to move the detent completely away from the seat.

Owing to the different radii of the feeler and detent, a very slight movement of the former is sufficient to withdraw the detent.

When there is insufficient filling in the shuttle to move the feeler, and thereby the detent, far enough to withdraw the latter from the seat, the latch will coöperate with the actuator and a change of filling will be effected.

The nearer the seat is moved toward the lay the less filling will remain on the filling-carrier at the time of filling change, and it follows that movement of the seat away from the lay will leave more filling in the shuttle when the change takes place. This adjustment is capable of great accuracy and fineness, yet is readily effected by the operator.

The upright wall c^{22} serves as a stop for the detent on its return movement, and the latch-carrier is automatically reset or tilted to permit the detent to move back beneath the seat c^{21} after each withdrawal, but by well-known means forming no part of my invention.

Should the filling break, the filling-fork $m^{\times}$ acts through intervening means to effect operation of the filling-replenishing mechanism in a well-known manner.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a loom, automatic filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including an upturned feeler intermittingly rocked in a vertical plane by engagement with the filling in the shuttle until exhausted to a predetermined extent, a fulcrum for the feeler located below the lay-path, and a member moved into inoperative position by filling-induced movements of the feeler, the actuator coöperating with said member when the movement of the feeler is insufficient to render the member inoperative.

2. In a loom, automatic filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including an upturned, elongated arm bent rearwardly at its upper end to constitute a feeler to intermittingly engage the filling in the shuttle and rock the arm until the filling is exhausted to a predetermined extent, a horizontal fulcrum for the arm, located below the lay-path, and a member normally adapted to coöperate with the actuator but moved into inoperative position by filling-induced movement of the feeler, the long

radius of the feeler effecting movement of the latter in an arc of slight curvature.

3. In a loom provided with filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including an upturned feeler, a fixed fulcrum therefor located below the lay-path, the feeler intermittingly engaging and being moved by the filling in the shuttle until exhausted to a predetermined extent, an upturned, laterally-offset arm fulcrumed coaxially with the feeler and operatively connected therewith, and a member moved into inoperative position by or through change of position of the arm due to filling-induced movement of the feeler.

4. In a loom, automatic filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including an upturned feeler intermittingly rocked in a vertical plane by engagement with the filling in the shuttle until exhausted to a predetermined extent, a fulcrum for the feeler located below the lay-path, a member normally in position to cooperate with the actuator, a detent to retain said member in such position, and connections between the feeler and the detent to withdraw the detent at each filling-induced movement of the feeler and thereby effect inoperative positioning of the said member.

5. In a loom, automatic filling-replenishing mechanism, means to control the time of its operation, and an actuator, for said means, the latter including an upturned feeler intermittingly rocked in a vertical plane by engagement with the filling in the shuttle until exhausted to a predetermined extent, a fulcrum for the feeler located below the lay-path, a member normally in position to coöperate with the actuator, a detent to retain said member in such position, connections between the feeler and the detent, to withdraw the latter at each filling-induced movement of the feeler, and thereby effect inoperative positioning of the said member, and means to adjust the said connections.

6. In a loom, automatic filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including an upturned feeler intermittingly rocked in a vertical plane by engagement with the filling in the shuttle until exhausted to a predetermined extent, a fulcrum for the feeler located below the lay-path, a detent, an arm on which it is mounted, fulcrumed coaxially with the feeler, connections between said arm, and the feeler, to effect simultaneous rocking movement thereof, and a member maintained in operative position by the detent, filling-induced movements of the feeler periodically withdrawing the detent to thereby effect movement of the said member into inoperative position.

7. In a loom, automatic filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including an upturned feeler intermittingly rocked in a vertical plane by engagement with the filling in the shuttle until exhausted to a predetermined extent, a fulcrum for the feeler located below the lay-path, a detent, an arm on which it is mounted, fulcrumed coaxially with the feeler, connections between said arm and the feeler, to effect simultaneous rocking movement thereof, means to vary the angle between the feeler and the detent-arm, and a member maintained in operative position by the detent, filling-induced movements of the feeler periodically withdrawing the detent to thereby effect movement of the said member into inoperative position.

8. In a loom, automatic filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including an upturned swinging arm rearwardly bent at its upper end to constitute a feeler to intermittingly engage the filling in the shuttle, a horizontal rock-shaft to which the arm is secured at its lower end, vertically-adjustable bearings for the rock-shaft, located below the lay-path, a second upturned and laterally-offset arm adjustably mounted on the rock-shaft and of greater length than the feeler-arm, a detent on the offset arm, a member normally held by the detent in position to coöperate with the actuator, filling-induced movements of the feeler withdrawing the detent periodically, and effecting inoperative positioning of said member, until the filling in the shuttle is exhausted to a predetermined extent.

9. In a loom, automatic filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including a latch, a latch-carrier, an adjustable seat thereon, a detent which cooperates with the seat to maintain the latch in the path of the actuator, a feeler intermittingly rocked in a vertical plane by engagement with the filling in the shuttle until exhausted to a predetermined extent, a detent-carrying arm connected to rock with the feeler, and a common fulcrum for the feeler and arm, located below the lay-path, adjustment of the seat determining the amount of filling to be withdrawn from the shuttle before operation of the replenishing mechanism.

10. In a loom provided with filling-replenishing mechanism, means to control the time of its operation, and an actuator for said means, the latter including a latch normally in the path of the actuator, a pivotally-mounted latch-carrier, a reversible block movably mounted on the latch-carrier, and provided with two detent-seats, a clamp to hold the block in adjusted position on the latch-carrier, an adjusting device to move the block and adjust the position of the operative seat, a detent, a rocker-arm on which it is mounted, and a feeler fulcrumed below the lay-path and rocked in a vertical plane by intermitting engagement with the filling in the shuttle un-

til exhausted to a predetermined extent, failure of filling-induced movement of the feeler to withdraw the detent from the seat operating to maintain the latch in position to be engaged by the actuator, to effect actuation of the filling-replenishing mechanism.

11. In a loom, filling-replenishing mechanism, an upturned arm bent rearwardly at its upper end to form a filling-feeler, a horizontal fulcrum for said arm, located below the lay-path, the feeler intermittingly engaging the filling in the shuttle and being rocked thereby in a vertical plane, means to effect return movement of the feeler, and connections between the filling-replenishing mechanism and the feeler to effect the operation of the former when, by exhaustion of the filling in the shuttle to a predetermined extent, the filling-induced movements of the feeler attain their minimum effective amplitude.

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

EDWARD S. STIMPSON.

Witnesses:
GEORGE OTIS DRAPER,
ERNEST W. WOOD.