

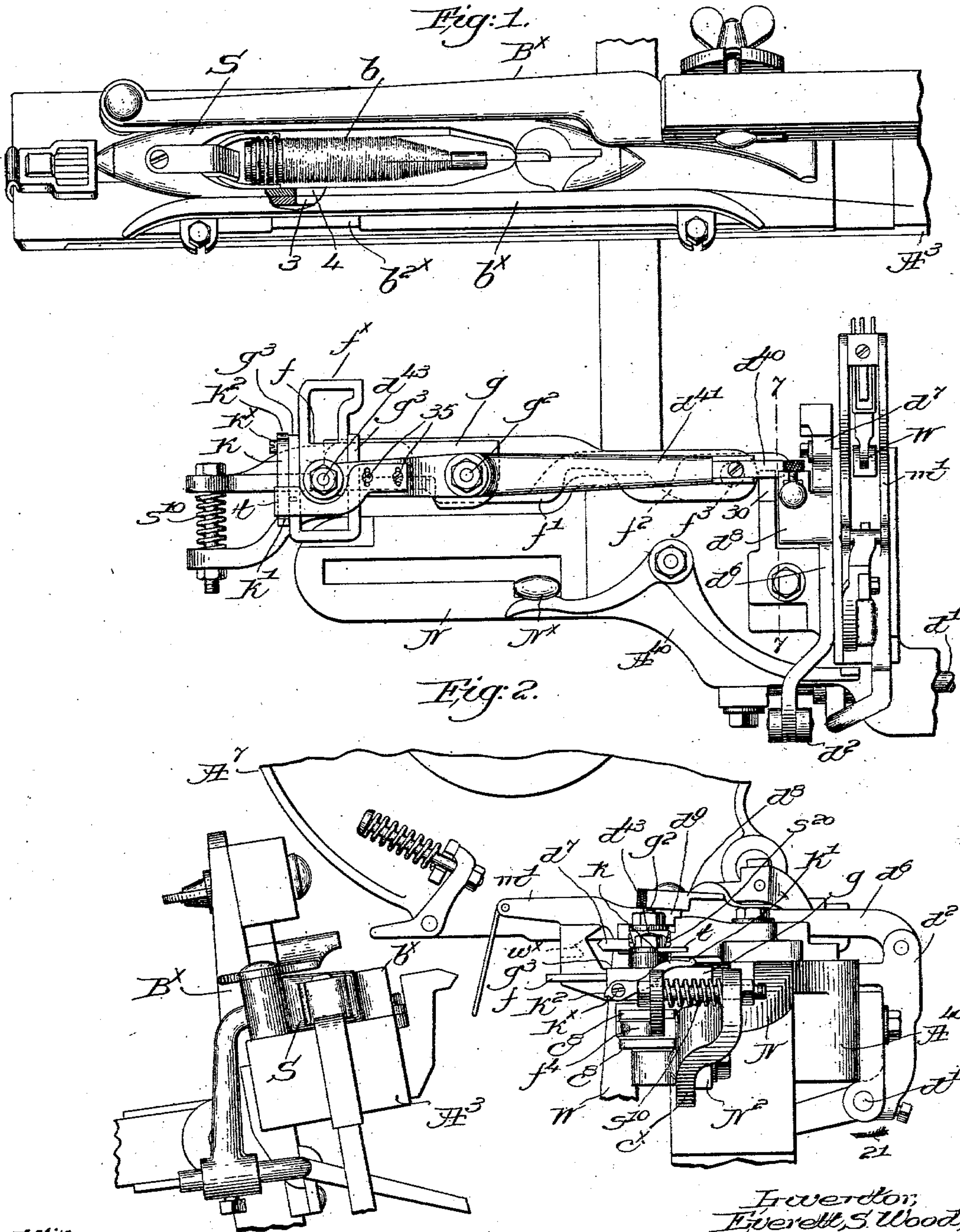
No. 745,408.

PATENTED DEC. 1, 1903.

E. S. WOOD.
FILLING REPLENISHING LOOM.
APPLICATION FILED SEPT. 19, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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Edward F. Allen.
J. W. Lutton.

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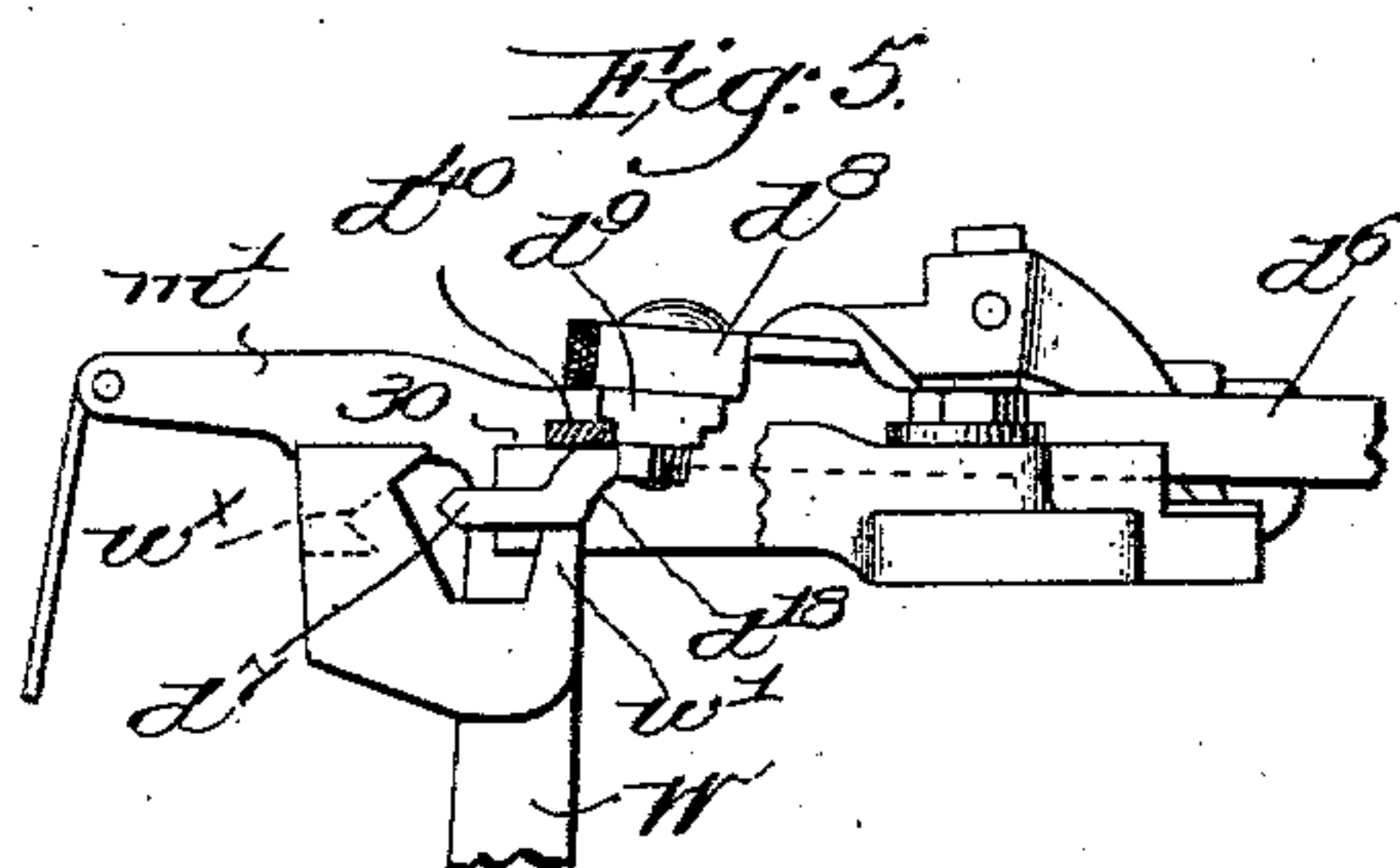
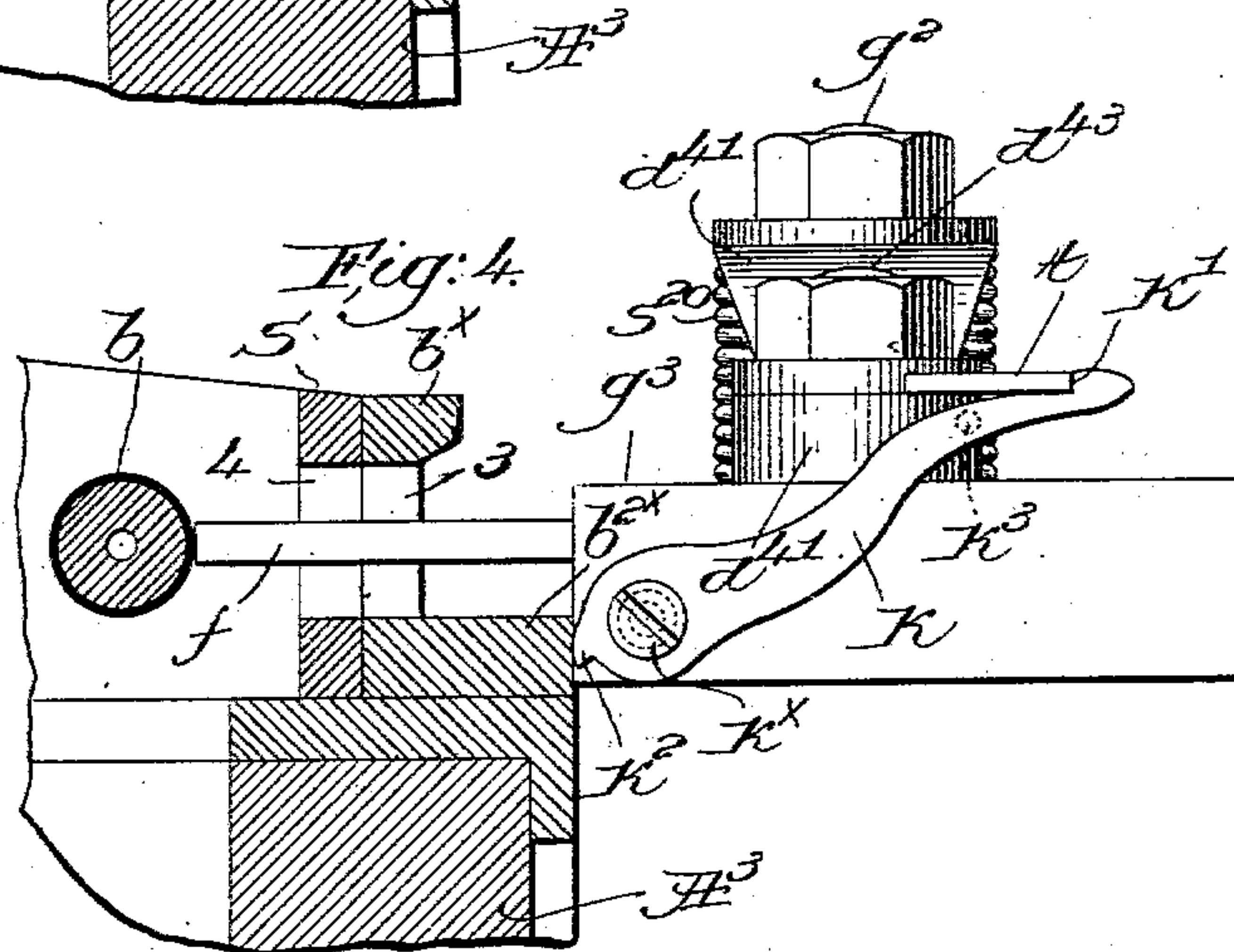
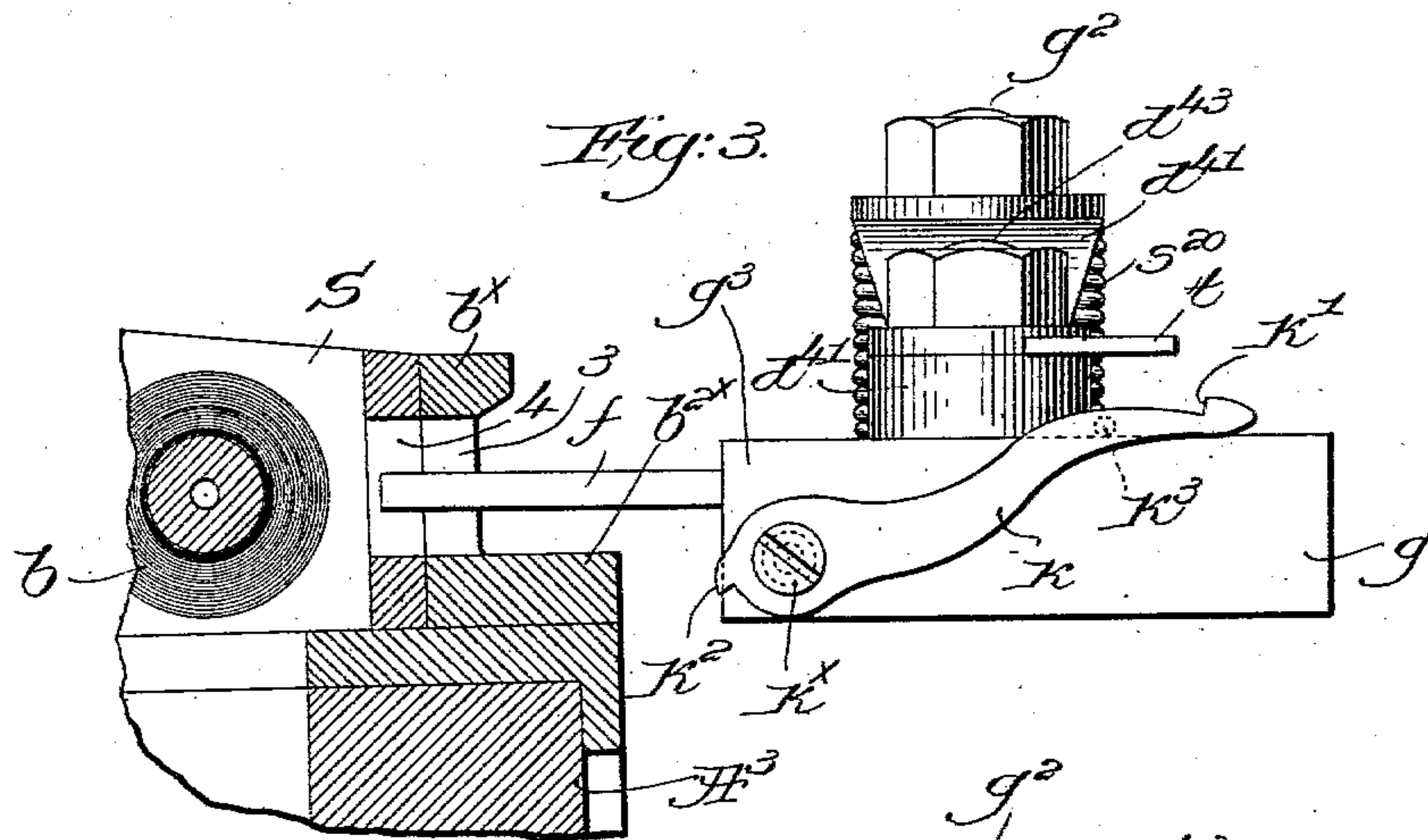
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2 SHEETS—SHEET 2.



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Inventors,
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UNITED STATES PATENT OFFICE.

EVERETT S. WOOD, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

FILLING-REPLENISHING LOOM.

SPECIFICATION forming part of Letters Patent No. 745,408, dated December 1, 1903.

Application filed September 19, 1903. Serial No. 173,811. (No model.)

To all whom it may concern:

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

This invention relates more particularly to looms the operation whereof is controlled by or through a feeler in accordance with the condition of the filling in the shuttle, a change in the operation of the loom, such as a replenishment of filling or stoppage of the loom, being effected automatically upon substantial exhaustion of the filling in the running or working shuttle. As is well known to those skilled in the art, the feeler intermittently engages and is moved or vibrated by the filling in the shuttle on alternate beats of the lay, the filling-induced movement of the feeler gradually decreasing in amplitude as the filling weaves off until only so much remains in the shuttle as will cross the lay a few times. When this point of substantial exhaustion of the filling is reached, a stoppage of the loom or a replenishment of the filling is effected by suitable means, the feeler at such time having no filling-induced movement at all or so slight a movement as will serve to effect the desired change in the operation of the loom. The means which control the operation of the loom are normally quiescent; but at the proper time the operation of such means is effected by an actuator, usually the weft-hammer or a similar device, which actuator engages a latch, and through such co-operation of actuator and latch the change in the operation of the loom is effected. So long as the filling-induced movement of the feeler continues the latch is maintained inoperative; but when the filling-induced movement of the feeler ceases or is reduced to a minimum the latch is rendered operative and co-operation with the actuator follows.

In the practical embodiment of my present invention herein illustrated the latch is maintained in its operative position by a dog, and through a suitable connection between

the latter and the feeler the dog is withdrawn and permits the latch to move into inoperative position at each filling-induced movement of the feeler. When substantial exhaustion of the filling in the shuttle is attained, the movement of the feeler is insufficient to withdraw the dog from the latch, and the latter is thereby held in its operative position. In a rapidly-running loom there is of course very considerable vibration, and in actual practice it sometimes happens that such vibration or shaking of the various parts of the loom will withdraw the dog from the latch, so that the latter becomes inoperative at a time when substantial exhaustion of shuttle-filling has been attained and the latch should be maintained in its operative position. So, too, it sometimes will happen that on the forward beat of the lay on a detecting-pick the momentum of the moving parts will tend to act upon and improperly move the feeler to retract the dog when the latter should remain in position to hold the latch operative.

My present invention has for its object the production of simple and effective means to prevent improper movement of the feeler when the shuttle-filling is substantially exhausted, to thereby insure the operation of the controlling means for the loom at such time.

I have herein shown my invention as applied to a feeler-loom provided with automatic filling-replenishing mechanism and which forms the subject-matter of United States Patent No. 725,229, dated April 14, 1903, the feeler being so mounted that it is properly positioned for its feeling action on the forward beat of the lay.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a top or plan view of a portion of the left-hand side of a loom with the lay back and with one embodiment of my present invention applied thereto. Fig. 2 is a left-hand side elevation of the parts shown in Fig. 1, the means for preventing improper movement of the feeler being shown in normal condition when the lay is back. Fig. 3 is a much-

enlarged detail of the locking means to be described in the position shown in Fig. 2. Fig. 4 is a similar view, also enlarged, but showing the manner in which the locking device operates when substantial exhaustion of the filling in the shuttle is attained; and Fig. 5 is a side elevation of the latch and its actuator on the line 7 7, Fig. 1, looking toward the right.

10 The breast-beam A^{40} , lay A^3 , having a shuttle-box B^x thereon, (see Fig. 1,) the adjustable front wall b^x of the shuttle-box having an aperture 3 therein for the reception of the feeler, the stand A^7 , Fig. 2, on which is mounted the filling feeder or hopper, the notched holding-plate N for the shipper N^x , the automatically-self-threading shuttle S , adapted to contain a supply of filling, such as a filling carrier or bobbin b , Fig. 1, and the hole 4 in the front wall of the shuttle-box are all of well-known construction and substantially as in the patent referred to.

The filling-replenishing mechanism is of the Northrop type and practically such as shown in United States Patent No. 648,986, a rock-shaft d' controlling the operation of the loom, as, for instance, to effect a change of filling, the rock-shaft having secured to it an up-turned arm d^2 , with a pivotally-connected latch d^6 , the latch extending across and beyond the breast-beam and having a reduced end d^7 , Figs. 1, 2, and 5, and a beveled or cam face d^{18} on its under edge, as shown in Fig. 5.

The notched bunter w^x on the head of the weft hammer or actuator W to at times engage the end d^7 of the latch and move it outwardly to rock the arm d^2 and turn the rock-shaft d' in the direction of the arrow 21, the projection w' on the head of the actuator traveling beneath the end d^7 of the latch and at times coöperating with the cam-face d^{18} , are all as in Patent No. 725,229, and so, too, are the lateral enlargement d^8 on the latch and the notched block d^9 , adjustably mounted on the under side thereof to be engaged by a dog, to be hereinafter referred to, to hold the latch lifted with its end d^7 in the path of the bunter w^x as the weft-hammer moves forward. When the dog is withdrawn by or through filling-induced movement of the feeler, the latch drops, so that its end d^7 is below the bunter, the latch then being inoperative, and the projection w' has passed from beneath the part d^7 before the bunter has moved forward sufficiently to engage it. When the weft-hammer swings back, the projection w' coöperates with the cam-face d^{18} and lifts the latch, so that the dog can pass beneath the block d^9 , as before.

60 The bracket N^2 , bolted to the holding-plate N , sustains a stand c^x , on which the lateral swinging feeler-support is mounted, the stand being herein shown as in Patent No. 725,229 and provided with parallel rearwardly-extended ears c^8 , constituting a guide and support for the outer free end of the feeler-support, the latter comprising a body portion f' , hav-

ing an extension f^2 at one end provided with a fulcrum-pin f^3 (see dotted lines, Fig. 1) to enter a socket in the inner end of the stand, the other end of the feeler-support having a dropped extension f^4 , freely entering between the ears c^8 of the stand. As in said patent, a feeler-guide g is mounted on the feeler-support overhanging the ears c^8 , said guides being provided with transverse parallel ribs g^3 on its upper face, (see Fig. 1,) the feeler f being slidably mounted between them and having an elongated feeling-face f^x , as in the patent referred to, the feeler passing through the opening 3 of the front shuttle-box wall b^x when the lay beats up, and when the shuttle is boxed the feeler enters the shuttle through the hole 4 to engage the filling. The thickened portion b^{2x} of the base of the box-wall b^x engages the outer end of the feeler-guide below the feeler when the lay beats up and swings the feeler-support outward on its fulcrum f^3 against the action of the spring s^{10} , so that the feeler-guide will always maintain a certain fixed position relative to the longitudinal axis of the shuttle when the lay is on front center, and the feeler will be properly positioned for feeling action whenever the shuttle is in the box B^x .

The dog, hereinbefore referred to, is shown as a plate d^{40} , preferably of hardened steel, mounted on the end of a carrier (shown as an arm d^{41}) fulcrumed at g^2 on the feeler-support, the inner end of the dog-carrier overhanging the fulcrum f^3 of the feeler-support, while the dog swings on the face 30 of a part of the guide for the filling-fork slide m' . The outer end of the carrier is loosely and pivotally connected with the feeler by a finger d^{43} , as in Patent No. 725,229. As the inner lever-arm of the dog-carrier is the longer, the movement of the dog is greater than the stroke of the feeler, filling-induced movement of the latter being resisted by the spring s^{20} , Figs. 2, 3, and 4, the spring tending to maintain the dog in engagement with the notched block d^9 . This spring effects the return movement of the feeler and brings the dog back to coöperate with the latch in well-known manner, and it will be obvious that when filling-induced movement of the feeler is too slight to withdraw the dog the latch will be engaged by its actuator and moved to effect a change in the operation of the loom. If at such time the vibration of the loom or any other cause should rock the dog-carrier, it would tend to withdraw the dog and release the latch, so that it could not coöperate with the actuator. To prevent this improper retraction of the dog, I have in the present embodiment of my invention mounted a locking-finger k on a suitable stud k^x on the outer end of the feeler-guide g , as most clearly shown in Figs. 3 and 4, the upper and forward end of the finger having a notch or shoulder k' , while at its lower end adjacent its fulcrum the finger is provided with an eccentric projection or lug k^2 , which projects

rearwardly slightly beyond the rear face of the feeler-guide when the finger is in inoperative position. (Shown in Fig. 3.) A stop pin or lug k^3 , projecting from the inner face of the finger, at such time rests on the top of the adjacent guide-rib g^3 and limits downward movement of the finger.

The dog-carrier d^{41} has secured to its outer end an upwardly-yielding or resilient plate or catch t , secured to the arm in a suitable manner, as by screws 35, Fig. 1, and shaped to clear the pivot connection d^{43} between the carrier and the feeler, the outer end of the catch t projecting across the vertical path of movement of the locking-finger k . When the lay beats up, the feeler will engage the filling in the shuttle, and the forward movement of the feeler will swing the outer end of the dog-carrier toward the front of the loom before some part of the lay—as, for instance, the face or flange of the front box-wall b^x —can engage the lug or projection k^2 of the locking-finger. Consequently when the locking-finger is swung upward its shouldered end will rise beneath the plate or catch t , and the latter will yield or give sufficiently to permit the full rise of the locking-finger. When, however, the filling in the shuttle is substantially exhausted, as is shown in Fig. 4, the projection k^2 of the locking-finger will be engaged and said finger will be moved into its operative position with its shoulder k' in front of the front edge of the catch t , and thereby the dog-carrier and the feeler will be locked from movement relative to the feeler-support. Should the feeler then have any movement, due to vibration of the loom or otherwise, the dog-carrier would not move or swing on its fulcrum g^2 , but all of the parts would have a swinging movement on the fulcrum f^3 of the feeler-support, and such fulcrum is so closely adjacent to the dog that a very considerable movement of the feeler or of the outer end of the dog-carrier might take place without moving the dog enough to retract it from the block d^9 on the latch. Consequently the latch is maintained in its operative position to cooperate with the actuator, and the change in the operation of the loom will be effected by the controlling means at the proper time. The forward movement of the actuator W takes place before the backward stroke of the lay can release the locking-finger, and thereby permit disengagement of said finger and catch t , so that when the locking device is in its operative condition the actuator is timed to cooperate with the latch.

It will be obvious that if the operation of the loom is not changed at the time it should be changed objectionable results may follow, as a delay in the operation of the filling-replenishing mechanism, for instance, would tend to permit the filling to run out before the insertion of the fresh supply, thereby doing away with the very object of the feeler device—viz., to change filling before complete exhaustion of the supply in the running or

working shuttle. Any such delay in changing the operation of the loom cannot occur in a loom provided with my present invention.

My invention is not restricted to the precise construction and arrangement herein shown and described, nor is it restricted in its application to the particular form of feeler mechanism in connection with which it is herein illustrated, and various changes or modifications in details of construction and arrangement may be made by those skilled in the art without departing from the spirit and scope of my invention.

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

1. In a loom, a shuttle to contain a supply of filling, means to control the operation of the loom, including a feeler to intermittently engage and be moved by the filling in the shuttle until substantial exhaustion thereof, cessation of filling-induced movement of the feeler acting therethrough to render said means operative, and automatically-operating means to prevent improper movement of the feeler when the shuttle-filling is substantially exhausted.

2. In a loom, a shuttle to contain a supply of filling, means to control the operation of the loom, including a feeler to intermittently engage and be moved by the filling in the shuttle until substantial exhaustion thereof, cessation of filling-induced movement of the feeler acting therethrough to render said means operative, a movable feeler-support to properly position the feeler for its feeling stroke, and means acting automatically upon substantial exhaustion of the filling to prevent movement of the feeler relatively to its support and thereby insure the operation of the controlling means.

3. In a loom, a shuttle to contain a supply of filling, means, including a feeler, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, a feeler-support moved independently of the shuttle, to properly position the feeler for its feeling action, and means acting automatically upon such substantial filling exhaustion to lock the feeler from improper movement until operation of the controlling means has been instituted.

4. In a loom, a shuttle to contain a supply of filling, means, including a feeler, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, and means operated by or through the lay to prevent improper movement of the feeler when the shuttle-filling is substantially exhausted and insure the operation of the controlling means.

5. In a loom, a shuttle to contain a supply of filling, means, including a feeler, to control the operation of the loom, substantial ex-

haustion of the filling in the shuttle acting through the feeler to render said means operative, a feeler-support moved by a part of the lay on each pick, to properly position the feeler for its feeling action, and means rendered operative by or through the lay upon substantial exhaustion of the shuttle-filling to insure the operation of the controlling means at such time.

6. In a loom, a shuttle to contain a supply of filling, means, including a feeler, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to render said means operative, a feeler-support moved independently of the shuttle on each forward beat of the lay, to properly position the feeler for its feeling action, and means automatically operative upon substantial exhaustion of the shuttle-filling to lock the feeler from movement relative to its support, to thereby insure the operation of the controlling means.

7. In a loom, means to control its operation, the lay, a shuttle adapted to contain a supply of filling, an actuator for said means, the latter including a feeler, a latch maintained inoperative by the presence and rendered operative by the substantial exhaustion of filling in the shuttle, acting by or through the feeler, said actuator coöperating with the latch when operative to effect a change in the operation of the loom, and means operating automatically on the forward beat of the lay and acting through the feeler, to insure coöperation of the latch and actuator upon substantial exhaustion of the filling.

8. In a loom, means to control its operation, the lay, a shuttle adapted to contain a supply of filling, an actuator for said means, the latter including a feeler, a latch maintained inoperative by the presence and rendered operative by the substantial exhaustion of filling in the shuttle, acting by or through the feeler, said actuator coöperating with the latch when operative to effect a change in the operation of the loom, a feeler-support to properly position the feeler for feeling action, and means mounted on the feeler-support and actuated by a part of the lay upon substantial exhaustion of the filling to lock the feeler from improper movement and thereby insure coöperation of the latch and actuator.

9. In a loom, means, including a feeler to intermittently engage the filling in the shuttle, to control the operation of the loom, an actuator for said means, a latch, a coöperating dog governed by or through the feeler to maintain the latch inoperative by the presence and render it operative by the substantial exhaustion of filling in the shuttle, the actuator coöperating with the latch when operative to effect a change in the operation of the loom, and means operative upon substantial exhaustion of the shuttle-filling to insure retention of the latch in operative condition by said dog until the operation of the controlling means has been instituted.

10. In a loom, a lay, a shuttle-box thereon, means, including a feeler, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to effect the actuation of said means, a device moved by engagement with the wall of the shuttle-box on the forward beat of the lay, to properly position the feeler for its feeling action, and an independently-actuated device to act through the feeler and insure the operation of the controlling means upon substantial exhaustion of the shuttle-filling.

11. In a loom provided with filling-replenishing mechanism, a lay having a shuttle-box thereon, a shuttle to contain a supply of filling, means to control the operation of said mechanism and including a feeler, and a movable feeler-support upon which the feeler is yieldingly sustained, the front wall of the shuttle-box moving the feeler-support on the forward beat of the lay to present the feeler properly to intermittently engage and feel the filling in the shuttle, and a device to prevent movement of the feeler on its support when the filling in the shuttle is substantially exhausted, to thereby insure the operation of the controlling means.

12. In a loom, filling-replenishing mechanism, means to control its operation, including a feeler to intermittently engage the filling in the shuttle and be moved thereby until substantial exhaustion of such filling, an actuator for said means, a latch, a dog, connections between it and the feeler to prevent coöperation of the actuator and latch until substantial exhaustion of the filling in the shuttle, and a locking device automatically operative at such time to engage said connections and cause the dog to positively maintain the latch in position to coöperate with the actuator.

13. In a loom, filling-replenishing mechanism, means to control its operation, including a feeler to intermittently engage the filling in the shuttle and be moved thereby until substantial exhaustion of such filling, an actuator for said means, a latch, a dog, a carrier therefor operatively connected with the feeler, to prevent coöperation of the actuator and latch until substantial exhaustion of the filling in the shuttle, a support on which the carrier is movably mounted, and a locking device on said support and moved automatically into position to engage the carrier upon substantial exhaustion of the filling and cause the dog to positively maintain the latch in position to coöperate with the actuator.

14. In a loom, a lay having a shuttle-box thereon, means to control the operation of the loom, and an actuator for said means, the latter including a feeler to intermittently engage and be moved by the filling in the shuttle until substantial exhaustion of such filling, a latch, a dog to maintain it operative, a swinging carrier for the dog, operatively connected with the feeler, a movable feeler-support on which the carrier is fulcrumed, the

front wall of the shuttle-box engaging the feeler-support on the forward beat of the lay and moving it to properly position the feeler, filling-induced movement of the latter swinging the carrier and through the dog rendering the latch inoperative, substantial exhaustion of the filling in the shuttle permitting the dog to retain the latch in position to be engaged by the actuator, to effect thereby the operation of the controlling means for the loom, and a locking-finger moved by engagement with a part of the lay into position to engage and hold the carrier from movement upon substantial exhaustion of the filling, to insure retention of the latch in operative position by said dog.

15. In a loom, a lay, means to control the operation of the loom, and an actuator for said means, the latter including a feeler to intermittingly engage and be moved by the filling in the shuttle until substantial exhaustion thereof, a latch, a dog to maintain it operative, a swinging carrier for the dog, operatively connected with the feeler, a yielding catch mounted on the carrier, and a locking-finger to at times cooperate with said catch and hold the carrier from movement, filling-induced movement of the feeler swinging the carrier to withdraw the dog and render the latch inoperative, the lay then acting to lift

the locking-finger against the under side of the catch, substantial exhaustion of the filling in the shuttle permitting the dog to retain the latch in position to be engaged by the actuator, and effect the operation of the controlling means for the loom, the lay at such time moving the locking-finger into position to engage the edge of the catch and prevent movement of the carrier tending to withdraw the dog from the latch.

16. In a loom, a shuttle to contain a supply of filling, means, including a feeler, a latch governed thereby, and an actuator, to control the operation of the loom, substantial exhaustion of the filling in the shuttle acting through the feeler to cause cooperation of the latch and actuator and thereby render said means operative, and a normally inoperative device to automatically and positively insure cooperation of the latch and actuator when substantial exhaustion of the filling in the shuttle has been detected by said feeler.

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

EVERETT S. WOOD.

Witnesses:

GEORGE OTIS DRAPER,
ERNEST W. WOOD.