No. 755,715. PATENTED MAR. 29, 1904.

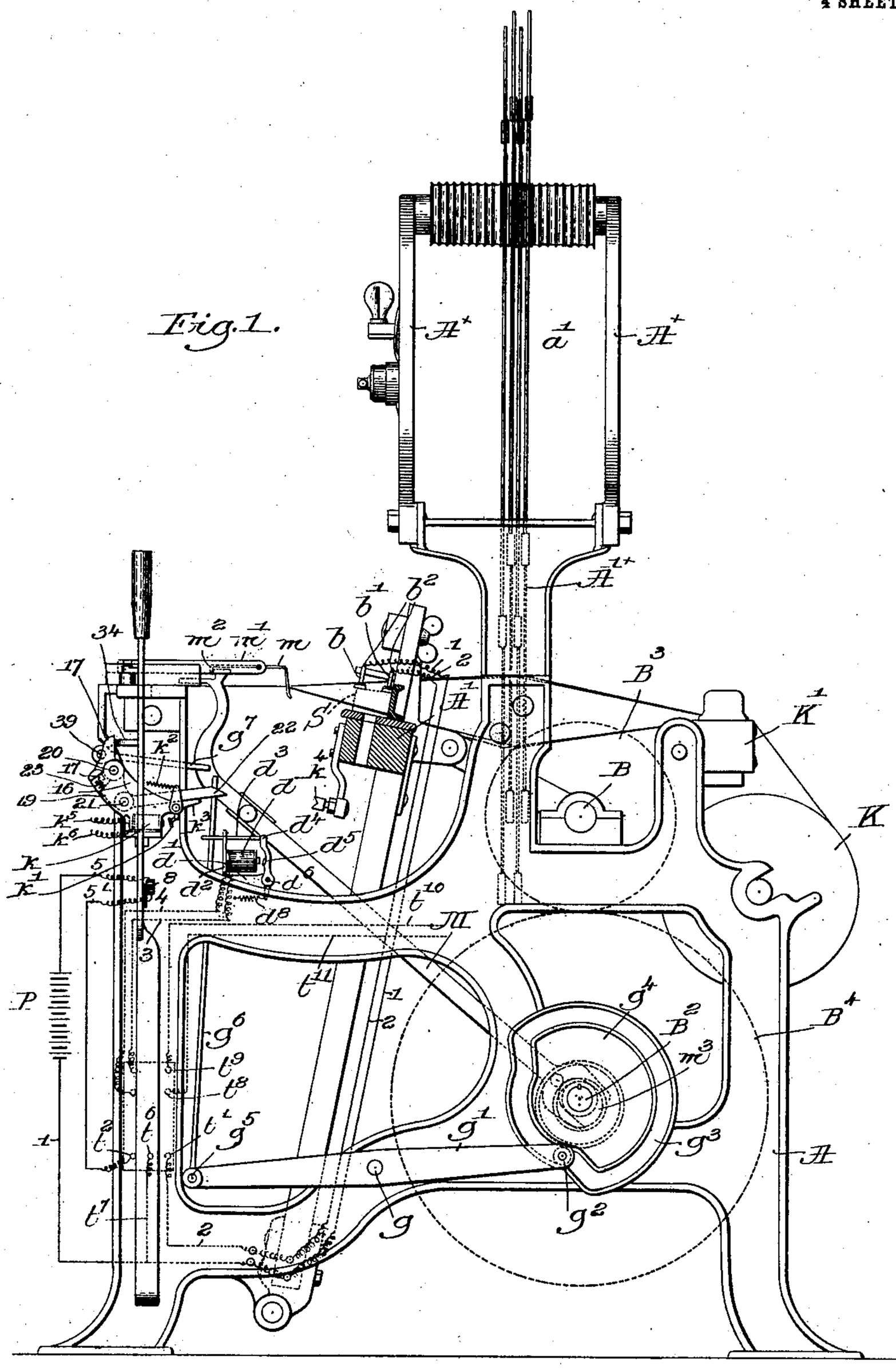
H. W. SMITH.

LOOM.

APPLICATION FILED NOV. 10, 1900.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Fred L. Gunthaf.
John M. Gerigill

Inventor:
Harry W. Smith.
By Lemon & Gregory
Attys.

No. 755,715. PATENTED MAR. 29, 1904.

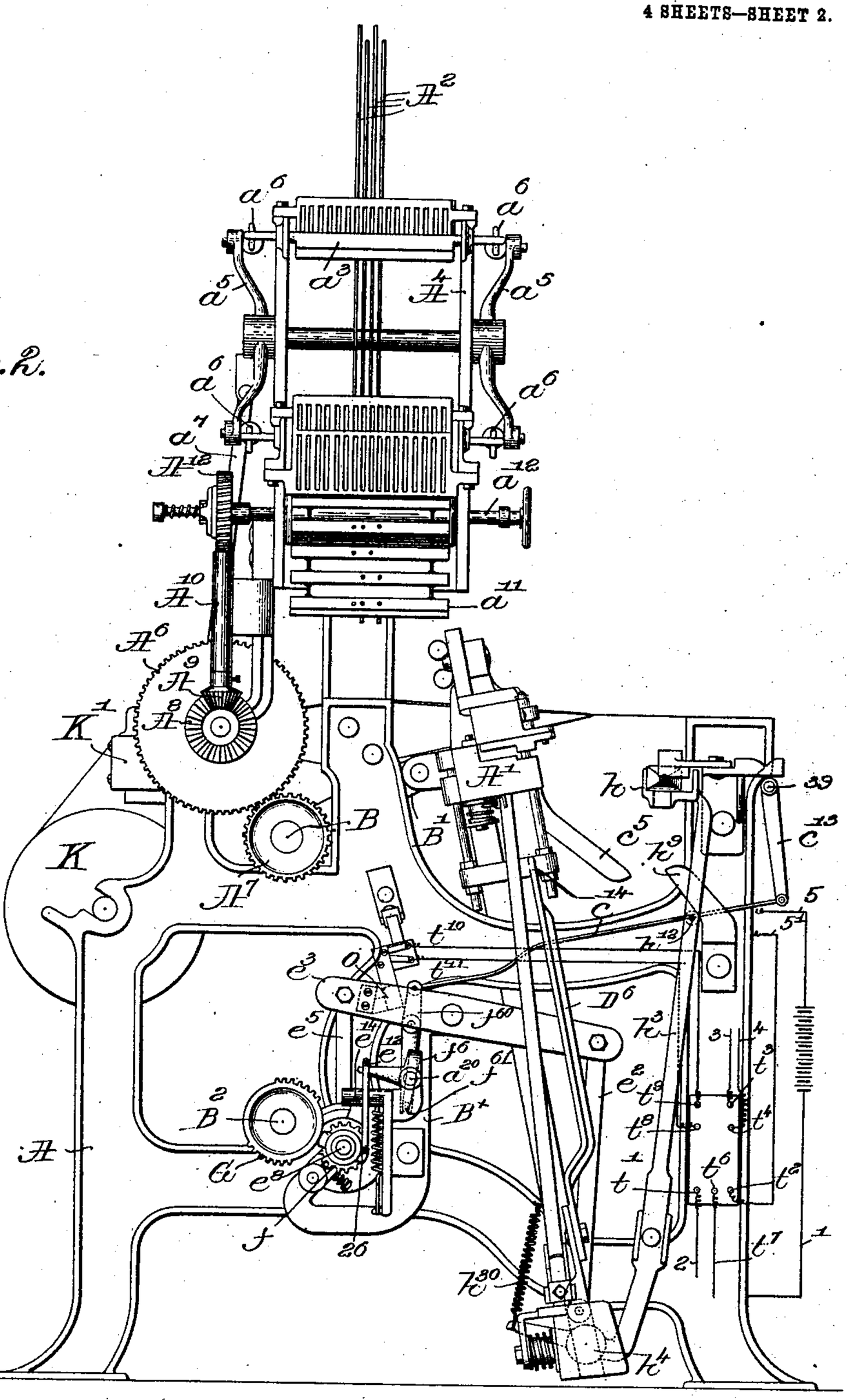
H. W. SMITH.

LOOM.

APPLICATION FILED NOV. 10, 1900.

NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
Fred S. Grundy.
John J. McGarequill

Inventor:
Harry W. Smith.
By Lemsby & Gregory
Attys.

No. 755,715. PATENTED MAR. 29, 1904.

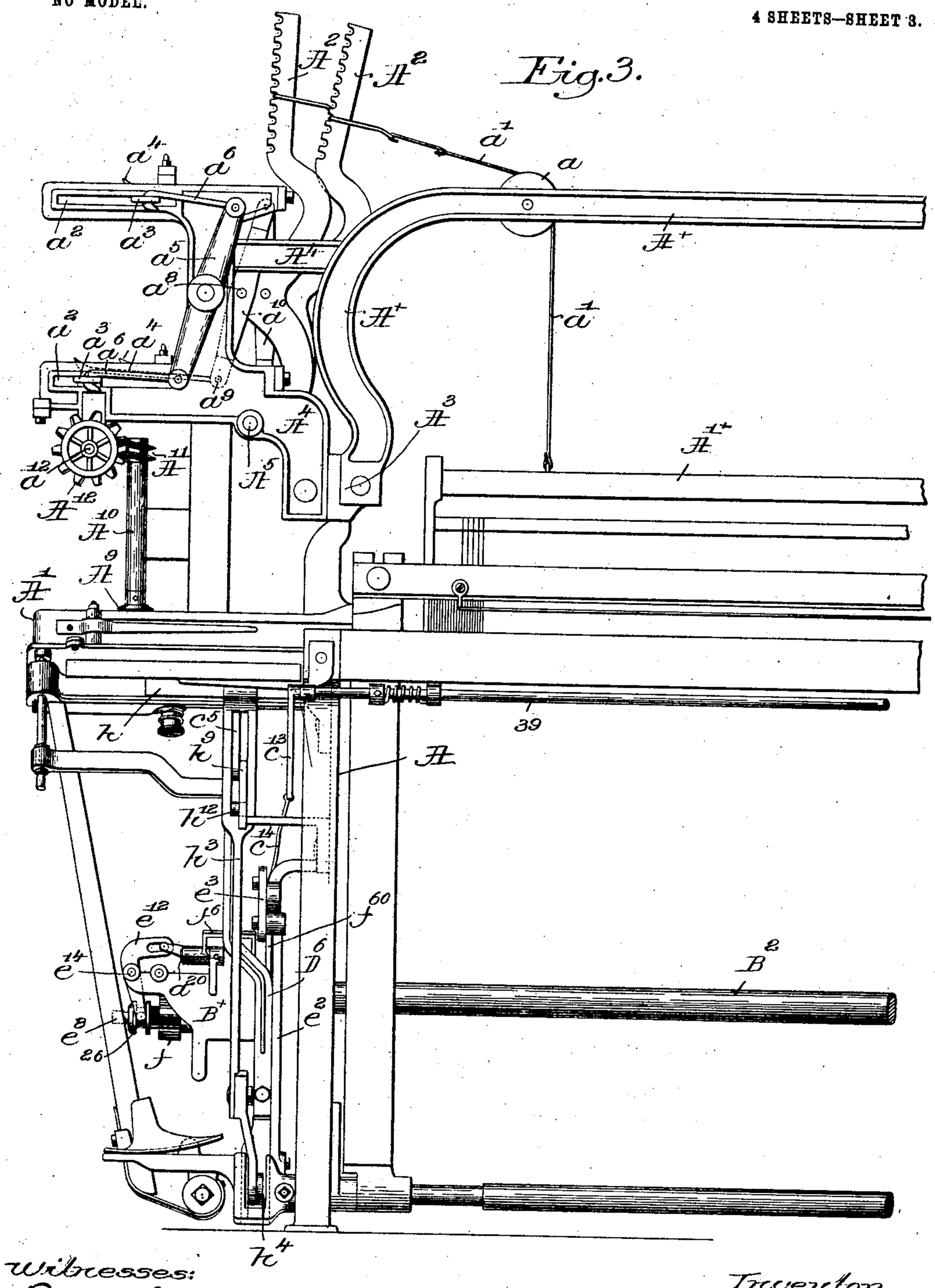
H. W. SMITH.

LOOM.

APPLICATION FILED NOV. 10, 1900.

NO MODEL. 4 SHEETS—SHEET 3.

Fig. 3.



Witnesses:
Fred S. Grinnell.
John J. McGarrell

Inventor:
Harry W. Smith.
by Lemsby & Gregory
Attys.

No. 755,715. PATENTED MAR. 29, 1904.

H. W. SMITH.

LOOM.

APPLICATION FILED NOV. 10, 1900.

NO MODEL. 4 SHEETS—SHEET 4.

Fig. 4.

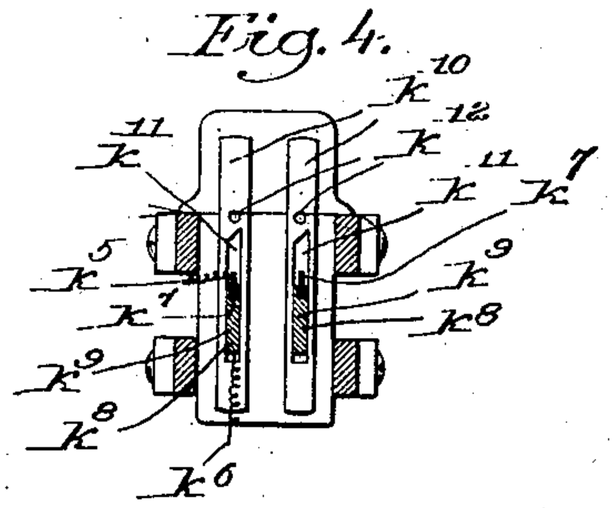


Fig. 5.

Fig. 6.

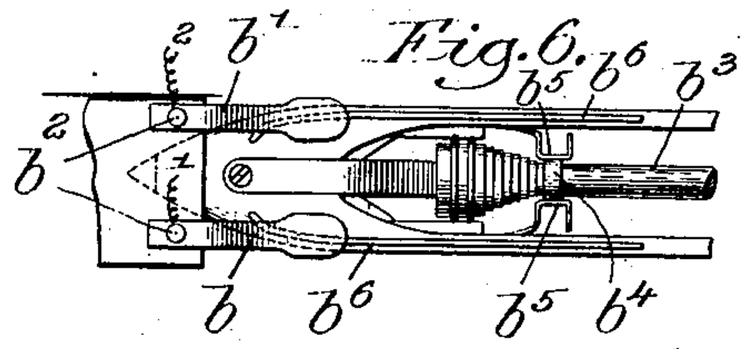


Fig. 7.

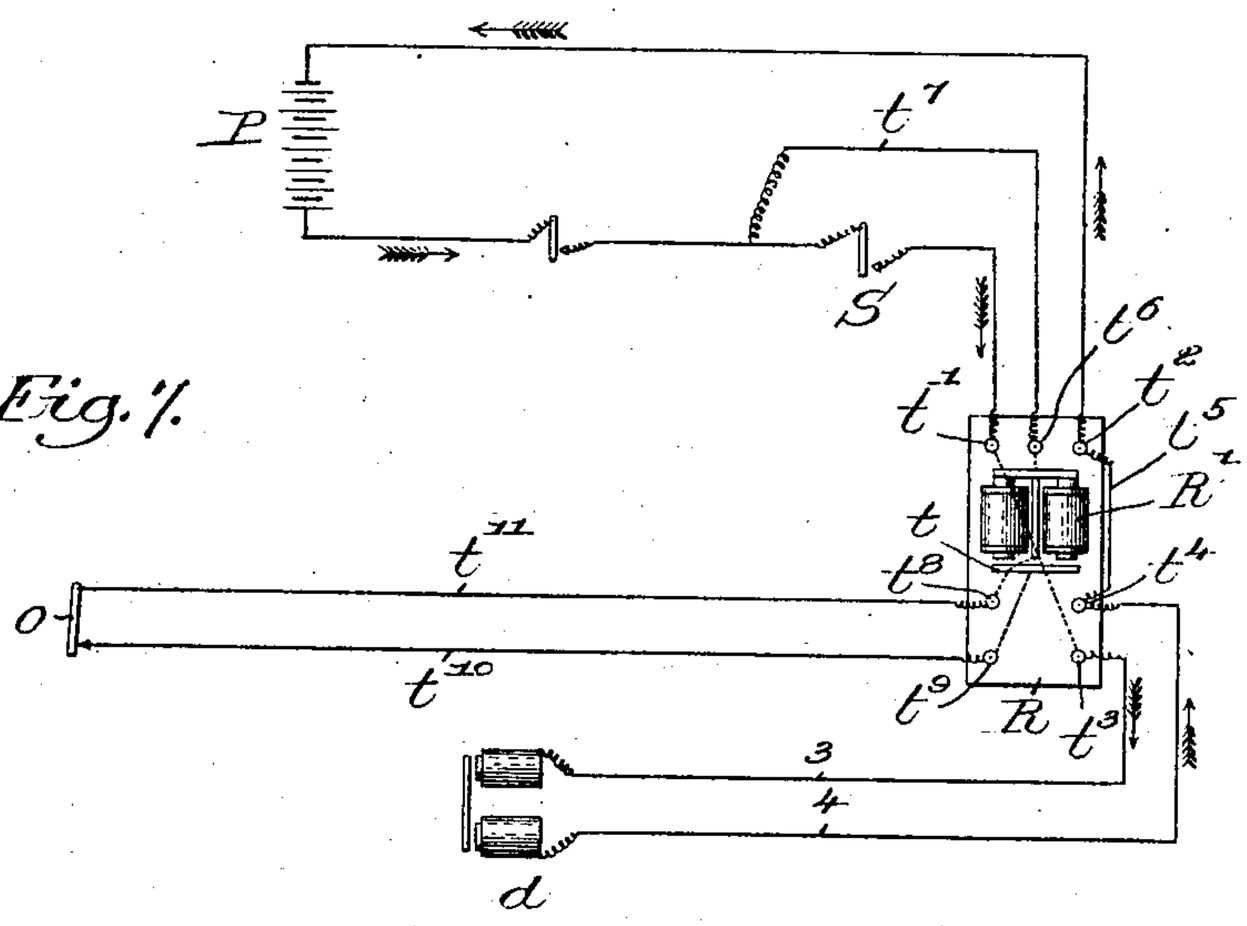
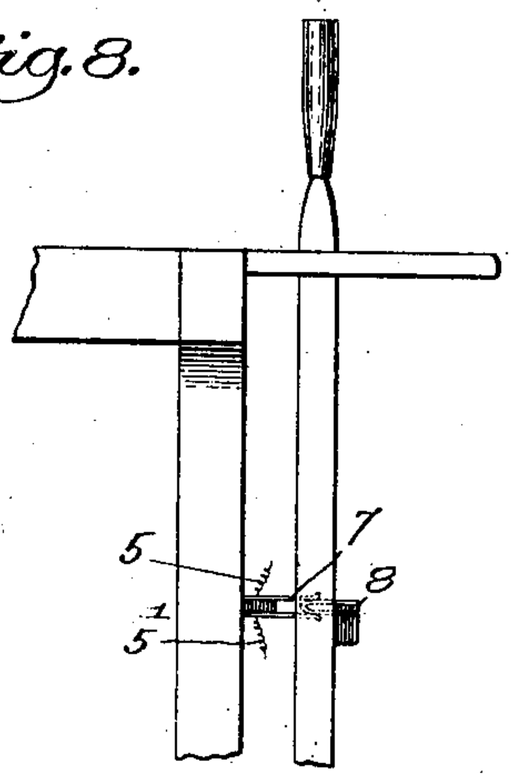


Fig. 8.



Witnesses:
Fred S. Grinnell.
John McGaregill

Inventor:
Harry W. Smith,
By Lemon & Gregory
Attys.

No. 755,715. Patented March 29, 1904.

UNITED STATES PATENT OFFICE.

HARRY W. SMITH, OF WORCESTER, MASSACHUSETTS.

LOOM.

SPECIFICATION forming part of Letters Patent No. 755,715, dated March 29, 1904.

Application filed November 10, 1900. Serial No. 36,118. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. SMITH, a citizen of the United States, and a resident of Worcester, county of Worcester, and State of Massachusetts, have invented an Improvement in Weft-Replenishing 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.

The invention to be hereinafter described relates to looms of that type wherein a pattern-controlled shedding mechanism determines the order in which the warps shall be manipulated to form the sheds.

In such type of loom should the filling in the shuttle break or become absent from any cause the mechanism of the loom is liable to continue in operation for several picks, during which time the shedding mechanism following the call of the pattern forms sheds, into which, however, no filling is laid, the result being that no cloth is woven from the time the filling becomes broken or exhausted until the loom is brought to a stop by the usual weft-fork mechanism or similar device, thus operating with several lost picks. Under these conditions in order to resume weaving at the proper point and to produce perfect cloth not only is it necessary to turn the warp and cloth beams to bring the fell into proper relation with the lay and to pick out any defective or incomplete picks that might have been laid, but the entire shedding mechanism of the loom has to be turned back by hand the exact number of picks the loom had run after the filling failed, the pattern-surface also requiring attention to see that a proper shedding of the warp-threads will result in the pick next to be made to continue the figure of the fabric.

In the plain-fabric loom—that is, one in which substantially one-half of the warp-threads are alternately raised and lowered to form the sheds—the difficulties above pointed out are not present, owing to the simple character of the shed and the alternate motions given the two sets of warps, so that on the breaking or exhaustion of filling in a plain loom turning back of the shedding-mechanism is not necessary. In such plain form of loom, however, it has been desirable to secure continuous running to produce increased amount of cloth, and to this end it has been proposed to equip such plain looms with a filling, changing, or replenishing mechanism made operative on the breaking or exhaustion of the filling in a shuttle to effect a fresh supply thereto.

The most frequent cause of weaving imperfect cloth on the fancy loom and the consequent delay in turning back the mechanism to the starting-point is the failure of filling due to its breaking or becoming exhausted from the shuttle or carrier.

It is therefore one of the objects of my present invention to provide in a loom equipped with pattern-controlled shedding mechanism means whereby the occurrence of a lost pick or lost picks due to failure of filling may be prevented and the delay of turning back be overcome. In order to further preserve the figure effect in the fabric produced and avoid the objectionable delay of turning back the shedding and pattern mechanism on the occurrence of a fault in the wrap, I have provided means to bring the loom to rest when a warp-thread breaks or becomes too slack.

As one embodiment of my present invention I have selected a form of filling changing or replenishing mechanism which shall be rendered operative to effect a fresh supply of filling when that in the shuttle approaches but prior to complete exhaustion, and while I deem this the preferred form of such filling changing or replenishing mechanism, yet it is to be understood that my invention is not limited in this respect, and the objects of the present invention would be attained by other forms of such mechanisms—as, for instance, where the filling is replenished upon complete exhaustion or breaking of that carried by a shuttle. Having selected for illustration of my invention a filling changing or replenishing mechanism operable to effect a fresh supply just prior to complete exhaustion of the filling in the shuttle, I have also illustrated and described in connection therewith a stopping mechanism for stopping the loom when a filling-thread breaks.

With the above general statement of my invention, which primarily consists of a pattern-controlled shedding mechanism of any usual or desired type and a filling changing or replenishing mechanism combined for the purposes generally outlined above, I will now proceed to describe in detail one form of mechanical embodiment of my invention selected for illustration.

In the drawings, Figure 1 is a side elevation of so much of a loom provided with a pattern-controlled shedding mechanism as is necessary to show my invention applied thereto. Fig. 2 is a like elevation on the opposite side of the loom from that shown by Fig. 1. Fig. 3 is a front elevation of one end of the loom, being the end shown by Fig. 2; and Fig. 4 is a detail of the warp stop-motion to be described. Figs. 5 and 6 are details of shuttle and contacts. Fig. 7 is a detached view of the relay and circuits. Fig. 8 is a detail of the shipper and switch for cutting out the circuit.

Rising from the loom-frame A are the top arches $A^{\times}$, to which is connected, as at A^3, the dobby or head-motion supporting bracket A^4, having pivoted thereto at A^5 the harness-levers A^2, provided with notched upper ends to which one end of a harness connection a' is secured, the said harness connection passing therefrom over suitable guide-rollers a on the top arches and being connected at the opposite end to the heddle-frames $A'^{\times}$, as usual in such form of shedding mechanism.

The dobby or head-motion supporting bracket is provided with guideways a^2, in which slide the knives a^3, driven from the vibrator-arm a^5 through the connection a^6, the said vibrator-arm, preferably one each side of the bracket, being reciprocated, as usual, by any suitable connection, as a^7, with a moving part of the loom, as the pinion a^6. Pivotally secured to the harness-levers at a^8 are the connectors a^{10}, carrying the hooked jacks a^4, jointed to them at a^9, the said jacks under the call of the pattern-chain a^{11}, carried by the shaft a^{12}, being adapted to engage the reciprocating knives a^3 a^3 to thereby raise and depress the heddle-frames $A'^{\times}$, all as usual in this class of dobby or head motions and which will be fully understood without further detail explanation.

Mounted in suitable bearings in the loom-frame is the pinion A^6, intermeshing with a pinion A^7 on the crank-shaft B, from which it receives motion. Secured to pinion A^6 is a bevel-gear A^8, having driving connection with the bevel-gear A^9 on the worm-shaft A^{10}, carrying a worm A^{11} near its upper end, which engages and drives a worm-wheel A^{12} on the shaft a^{12}, over which the pattern-chain a^{11} passes. From this it will be seen that the order of forming sheds is controlled from the pattern surface or chain a^{11}, the shedding mechanism being driven from the crank-shaft, and that the usual wide range of pattern or figured effects on the fabric being produced is secured, and it will likewise appear should any disarrangement occur in the operative relations or timing of the shedding mechanism and the other parts of the loom that at once the continuity of the figure or pattern being woven is destroyed, and a defect will exist in the cloth. This disarrangement may be brought about by a continuation of the weaving operation after the filling in the shuttle has run out or become exhausted, and it may also occur with more or less effect upon a breakage in the warp, for which reason I have provided a filling-detecting mechanism to detect the filling before complete exhaustion, a filling changing or replenishing mechanism which will be called into action to supply fresh filling prior to the complete exhaustion of the filling in the shuttle, and also a warp stop-motion to bring the loom to rest upon the breaking of a warp-thread.

In the present embodiment of my invention I have selected for illustration a form of filling changing or replenishing mechanism disclosed in Patent No. 614,369, wherein the shuttle previously in use is ejected from the shuttle-box and another shuttle carrying a supply of filling is substituted therefor when the filling is to be changed; but it is to be understood that my invention is not limited in this respect and that I regard as within the scope thereof any form of filling changing or replenishing mechanism, either where the shuttles are changed, as in the above patent, or where the filling-carrier is changed in the same shuttle.

The crank-shaft B, pitman B', the under or cam shaft B^2, gears B^3 and B^4, the mutilated gear G, shaft e^8, link e^5, lever e^3, link e^2, shuttle-box rod D^6, mutilated gear f, shaft 39, arm c^{13}, link c^{14}, joined to the elbow-lever f^6, pivoted at a^{20} on a stand $B^{\times}$, the elbow-lever e^{12}, mounted on a stud e^{14} and having a stud or roller 26, the shuttle-feeder h, mounted on a lever or bar h^3, pivoted on a stud h^4, spring h^{30}, inclined guides h^9 and c^5, roller h^{12}, are and may be all as set forth in said Letters Patent No. 614,369 and need not be further described except in the one particular that instead of connecting the link c^{14} direct to the elbow-lever f^6 I interpose a lever f^{60} between them and connect the lever f^{60} by a pin f^{61} to the lower extended end of the elbow-lever f^6 for ease of movement.

In the present form of my invention I have preferably placed the filling-changing mechanism at one end of the lay and the indicating-box at the opposite end, so that after an indication of practical exhaustion of the filling in an active shuttle the latter will make one, three, or more picks before the shuttle is brought into position to have the filling changed, and I have disposed the filling upon the bobbin or carrier to provide sufficient fill-

ing for this purpose after practical exhaustion has been indicated.

Mounted upon the indicating-box end of the lay A′ and projecting into the shuttle-box, so as to be engaged by the incoming shuttle S, are the detectors b b', comprising spring conducting-fingers connected, preferably, to the said box at the inner end thereof, as shown by Fig. 6, and to which the wires 1 and 2, having suitable connection with electric supply, as battery P or other source of electric energy, are joined by suitable binding-posts b^2.

The shuttle may be of any usual construction, and it carries a bobbin or filling-carrier b^3, upon which is mounted a conductor b^4, preferably in the form of a metallic ring, which when the bobbin or carrier has a practical working supply of filling thereon is covered by said filling; but when said filling has become practically exhausted the conductor or ring b^4 is uncovered. Connected to the shuttle and preferably spring-pressed toward the bobbin or filling-carrier are the contacts b^5 b^5 in electrical connection with the strips b^6 b^6, preferably located on the top of the shuttle in position to be engaged by the detectors b b' as the shuttle enters the box. The contacts b^5 b^5 are normally separated from electrical connection through the metallic ring b^4 by the filling on the carrier or bobbin; but when the filling has become practically exhausted and the ring b^4 uncovered the contacts b^5 b^5 are electrically joined, and the circuit is completed through the detectors b b' and wires 1 and 2, as will presently appear. While I have shown and described the above form of detectors, binding-posts, contacts, and ring as the preferred construction in this particular embodiment of my invention, it is to be understood that any form of filling-detector whereby as the filling nears complete exhaustion a change is ordered is within the scope of my invention.

Mounted on the loom-frame, preferably adjacent the indicating-box, is an electromagnet d, supported on a bracket d', having a guiding-arm d^2 for the support and guidance of the free end of a controller d^3, pivotally connected at d^4 to the armature d^5, itself pivoted at d^6 to the bracket d' and having its lowered end extended and engaged by a spring d^8, which normally tends to hold the armature away from the magnet.

Pivoted to the loom-frame at g is an actuating-lever g', having at one end a pin or roller g^2, which travels in the groove g^3 of a cam g^4, secured to the under or cam shaft B^2, and connected to the other end of the actuating-lever, preferably by the pivot g^5, is the actuator g^6, which midway of its length is embraced and guided by the end of the controller d^3. Secured to the shaft 39, which is connected to the filling-changing mechanism, is the operating-arm g^7, adapted to be contacted and moved by the actuator g^6 when during the reciprocation of the latter it is moved under the arm g^7 consequent upon the energization of the magnet d and movement of its armature due to the completion of the circuit by the practical exhaustion of the filling from the active shuttle.

The magnet d is in circuit with the detectors b and b' through the wires 1 and 2, 3 and 4, the electric energy being derived from any suitable source, as the battery P. From this construction it will be evident that upon a completion of the circuit through the detectors the electromagnet will be energized and at once attract the armature d^5 and move the actuator beneath the arm g^7; but immediately after having indicated a practical exhaustion of the filling and prior to the operation of the filling-changing mechanism the shuttle is driven from the indicating-box and the circuit is again broken, at which time the armature under the stress of spring d^8 would assume its original position and withdraw the actuator from beneath the arm g^7 to obviate which and to retain the magnet energized until the shuttle has reached the changing end of the lay and the filling has been changed I have provided in this circuit just described what I term a "retarding-relay" R, which consists of an electromagnet R′, placed in the circuit of the detectors and having an armature t, Fig. 7, which on establishment of the circuit through the detectors is moved to complete an auxiliary circuit through electromagnet d after the detecting-circuit has been interrupted by the shuttle leaving the box.

The construction and operation of the relay and the course of the currents will be best understood by reference to Fig. 7, in which R represents the relay, P the battery or source of electrical energy, S a switch corresponding to the filling-detectors, d the electromagnet for moving the actuator, and O the switch to be hereinafter described and operated by the movement of the filling-changing mechanism. On completion of the circuit by closing the switches S and O the current is caused to flow from the battery through the post t', part thereof passing to the frame of and around the electromagnet R′ and part to the magnet R′, energizing it, and back to the battery through the post t^2, and part passing through the post t^3 to energize the magnet d through the wires 3 and 4, thence back to post t^4 and by the conductor t^5 to post t^2 to battery. Thus the armature d^5 is moved to place the actuator beneath the arm g^7. To retain it in this position with the switch S open or the connection between the detectors interrupted by the shuttle leaving the box, I have connected to post t^6 the auxiliary circuit t^7, and this with the post t^8 and its connected circuit t^{11} t^{10}, to the other post t^9 of which is connected the armature t. From this it will be evident that when the circuit has been established through the detector-circut the armature t is by the energy of the electromagnet R′ moved to com-

plete the auxiliary circuit, which when the switch S or detectors are opened causes the current to flow from the battery P to circuit t^7, to post t^6, to t^8, to O, to t^9, to armature t, to the magnet-frame, to t^3, part passing through the electromagnet R′ to d, to t^4, to t^2, to battery, and to thus continue until the circuit is interrupted by movement of the filling-changing mechanism, which opens the switch O, releasing the armature t and interrupting the circuit through the electromagnet d, as will be evident.

In order that the auxiliary current may be broken as soon as the filling-changing mechanism has changed the filling, I secure one member of the switch, O, to the lever e^3 and the other adjacent thereto on the frame of the loom, as shown in Fig. 2, the connecting-wires t^{10} and t^{11} of which lead to the relay and form part of the auxiliary circuit, from which it will be clear that as soon as the filling-changing mechanism has operated the auxiliary circuit will be broken and the electromagnet R′ will release its armature t, thus cutting out the auxiliary circuit also at the relay, so that as the filling-changing mechanism closes the switch O after having supplied fresh filling the auxiliary circuit will not be completed until by the completion of the circuit through the filling-detectors on exhaustion of filling the armature t is again moved into completing position.

From the construction described it will be evident that on completion of the circuit by the practical exhaustion of the filling in an active shuttle the electromagnet d will be energized and will place the actuator in position to operate the arm g^7 on its upward movement. By the same current thus established the electromagnet R′ will be energized, as above explained, and through its armature will establish an auxiliary circuit through the wire t^7. On the interruption or breaking of the circuit from the filling-detectors as the shuttle leaves the box the current, which before passed through the detector-circuit, will now pass through the auxiliary circuit and retain the magnet d energized to hold the actuator in position beneath the arm g^7 until said actuator has moved said arm and caused a change of filling, thus interrupting the auxiliary circuit, as will be apparent, and the parts resume their original position.

While I have disclosed the above form of relay and connected circuits as the preferred embodiment of my invention, it is to be understood that my invention is not limited thereto, but includes any form of device which will serve to hold the actuator in operative position after the indication-shuttle has left the indicating-box.

In order to stop the loom when the filling breaks, I provide any usual form of stop-motion, that in the present form of the invention comprising the usual fork m, pivoted to the slide m' and adapted to have its hooked end m^2 engaged by the weft-hammer M, actuated from the cam or eccentric m^3 on the cam-shaft B^2, when the said fork is not tipped by contact with the filling as the lay beats up, movement of the slide m' being transmitted through any usual means to detach the belt-shipper from its holding-notch, as will be fully understood.

Should the loom continue to operate after a warp-thread has become broken or unduly slack, the pattern or figure in the resulting fabric would be imperfect and the objections heretofore pointed out of turning back the loom, together with the shedding mechanism and pattern-surface, to the point where defective weaving was commenced would be necessary, to obviate which I have combined in the present embodiment of my invention electrically-controlled devices, which upon the indication of a defect in the condition of a warp-thread will cause an electric circuit to be established to thereby put such devices into position to be struck by a moving part of the loom to thereby stop the same.

The side of the loom-frame, preferably at the end adjacent the shipper-handle, has applied to it a stand 16, to which is pivoted at 20 a dagger-carrier 19, having pivoted at its end 21 a dagger 22, a spring 23 being interposed between the end of the dagger-carrier 19 and a trip-toe 17 on said dagger-carrier, which bears against the knock-off lever 34 of any usual construction and bearing against the shipper-handle, as shown in Fig. 1.

Preferably below the dagger-carrier 19 and supported by the stand 16 is an electromagnet k, whose armature k' is normally held out of contact with the magnet by means of a spring k^2. Said armature carries a dagger-supporting arm k^3, which when the loom is in normal operating condition supports said dagger 22 above the path of movement of the bunter k^4, carried by the lay.

The electromagnet k is by means of the wires k^5 and k^6 in electric circuit with the two electrically-insulated portions k^7 k^8 of the guide-bars k^9, such guide-bars being preferably formed of a lower portion k^8, having a groove in its top into which the other portion, k^7, is secured by suitable insulating material electrically separating the two portions of the bars.

Freely sliding on the guide-bars k^9 are the drop devices k^{10}, preferably consisting of thin metal plates, each having an elongated slot k^{11}, through which a guide-bar k^9 passes and by which the drop device is guided in its rising-and-falling movement. Above the elongated slot each plate has an eye or perforation k^{12}, through which a warp-thread passes and by which the plates are normally held so that they do not contact with the upper portion k^7 of the guide-bar, as will be fully understood. From this construction it will be

evident should a warp-thread break or become unduly slack the drop device suspended thereby will fall and join the parts k^7 and k^8 of the guide-bars electrically, thereby completing the circuit through the magnet k and energizing the latter, whereupon the dagger-support is moved by the armature to allow the dagger to fall into the path of the bunter, to be struck thereby and stop the loom through the trip-toe 17 and knock-off lever 34.

Should a drop device fall and the circuit be completed, as above described, the current would continue to flow indefinitely or until the drop device was again raised, and to obviate this I have interposed a switch or cut-out in the circuit between the electromagnet or battery and portions k^7 and k^8 of the guide-bars, one portion of the switch being carried by the shipper, as at 8, Fig. 8, and the other portion having the terminal, as at 7, which when the shipper is in position to place the loom in operative connection with the driving means are electrically joined by the part 8; but on movement of the shipper to stop the loom the part 8 is withdrawn from between the terminals at 7, and the current is interrupted.

In the form of my invention as hereinbefore described I have specifically described in some detail particular means for detecting the filling before complete exhaustion and suitable means for changing the filling prior to complete exhaustion to thereby obviate the necessity of turning back the loom, the shedding mechanism, and pattern, and for the same purpose I have disclosed a particular form of warp stop-motion; but I do not wish to be understood as limiting my invention to such particular means employed, as I intend my invention to include any form of filling-detecting and any form of filling changing or replenishing mechanism and any form of warp stop-motion when combined with a pattern-controlled shedding mechanism of any usual or desired form, whereby the difficulties hereinbefore pointed out are overcome and a pattern in fabric or figure may be woven without a lost pick.

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

1. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism for manipulating the warp-threads in the production of a figure or pattern, a filling-changing mechanism, and means for operating said filling-changing mechanism to effect a fresh supply of filling.

2. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism to manipulate the warp-threads in the production of a figure or pattern, and a filling-changing mechanism operable to effect a fresh supply of filling prior to complete exhaustion of the filling in the shuttle, whereby fabrics may be woven in pattern or figure without a lost pick.

3. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism to manipulate the warp-threads in the production of a figure or pattern, a detecting mechanism, and a filling-changing mechanism operable to effect a fresh supply of filling prior to complete exhaustion of the filling in the running shuttle, whereby fabrics may be woven in pattern or figure without a lost pick.

4. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism for manipulating the warp-threads in the production of a figure or pattern, a detecting mechanism disposed at one side of the loom, and a filling-changing mechanism for effecting a fresh supply of filling disposed on the other side of the loom.

5. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism to manipulate the warp-threads in the production of a figure or pattern, a filling-changing mechanism, and electrically-controlled means for rendering the filling-changing mechanism operable to effect a change of filling in the running shuttle, whereby fabrics may be woven in pattern or figure without a lost pick.

6. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism to manipulate the warp-threads in the production of a figure or pattern, a warp stop-motion to bring the loom to rest upon the breaking of a warp-thread, and a filling-changing mechanism operable to effect a fresh supply of filling prior to complete exhaustion of the filling in the running shuttle, whereby fabrics may be woven in pattern or figure without a lost pick.

7. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism to manipulate the warp-threads in the production of a figure or pattern, an electrically-controlled warp stop-motion to bring the loom to rest upon the breaking of a warp-thread, a filling-changing mechanism, and means for rendering the filling-changing mechanism operable to effect a change of filling prior to complete exhaustion of the filling in the running shuttle, whereby fabrics may be woven in pattern or figure without a lost pick.

8. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism to manipulate the warp-threads in the production of a figured fabric, a filling-changing mechanism operable to effect a change of filling in the running shuttle and means to stop the loom when the filling breaks.

9. In a loom the following instrumentalities, viz: a pattern-controlled shedding mechanism to manipulate the warp-threads in the production of a figured fabric, a warp stop-motion to stop the loom when a warp-thread breaks, a filling-changing mechanism operable to ef-

fect a change of filling prior to complete exhaustion of the filling in the running shuttle and means to stop the loom when the filling breaks.

10. In a loom, the combination of a pattern-controlled shedding mechanism for manipulating the warp-threads in the production of a figured fabric, a filling-detecting mechanism, a filling-changing mechanism operable to effect a change of filling prior to complete exhaustion of the filling in a running shuttle, and means to stop the loom when the filling breaks.

11. In combination with weaving mechanism proper of a loom, an automatic mechanism for supplying weft or filling, a pattern-controlled shedding mechanism, and intermediate connections between such mechanisms.

12. In combination with the weaving mechanism of a power-loom, pattern-controlled shedding mechanism, a feeder for holding filling-carriers, mechanism for automatically delivering filling-carriers and ejecting an empty one, and connections between such mechanisms.

13. In a loom comprising weaving instrumentalities, the combination of a pattern-controlled shedding mechanism for manipulating the warp-threads, a feeder for containing filling-carriers, and a filling changing or replenishing mechanism for transferring a filling-carrier from the feeder to the weaving instrumentalities.

14. In a loom comprising weaving instrumentalities, the combination of pattern-controlled shedding mechanism for manipulating the warp-threads, a detecting mechanism, a feeder for holding filling-carriers, and a filling changing or replenishing mechanism for transferring a filling-carrier from the feeder to the weaving instrumentalities.

15. In combination with the weaving instrumentalities of a power-loom, pattern-controlled shedding mechanism for actuating the harness thereof, a feeder or magazine for containing filling-carriers, mechanism for automatically ejecting an empty carrier and delivering a filled one, and connections between said mechanism.

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

HARRY W. SMITH.

Witnesses:
CHAS. BAEDER,
F. K. COOK.