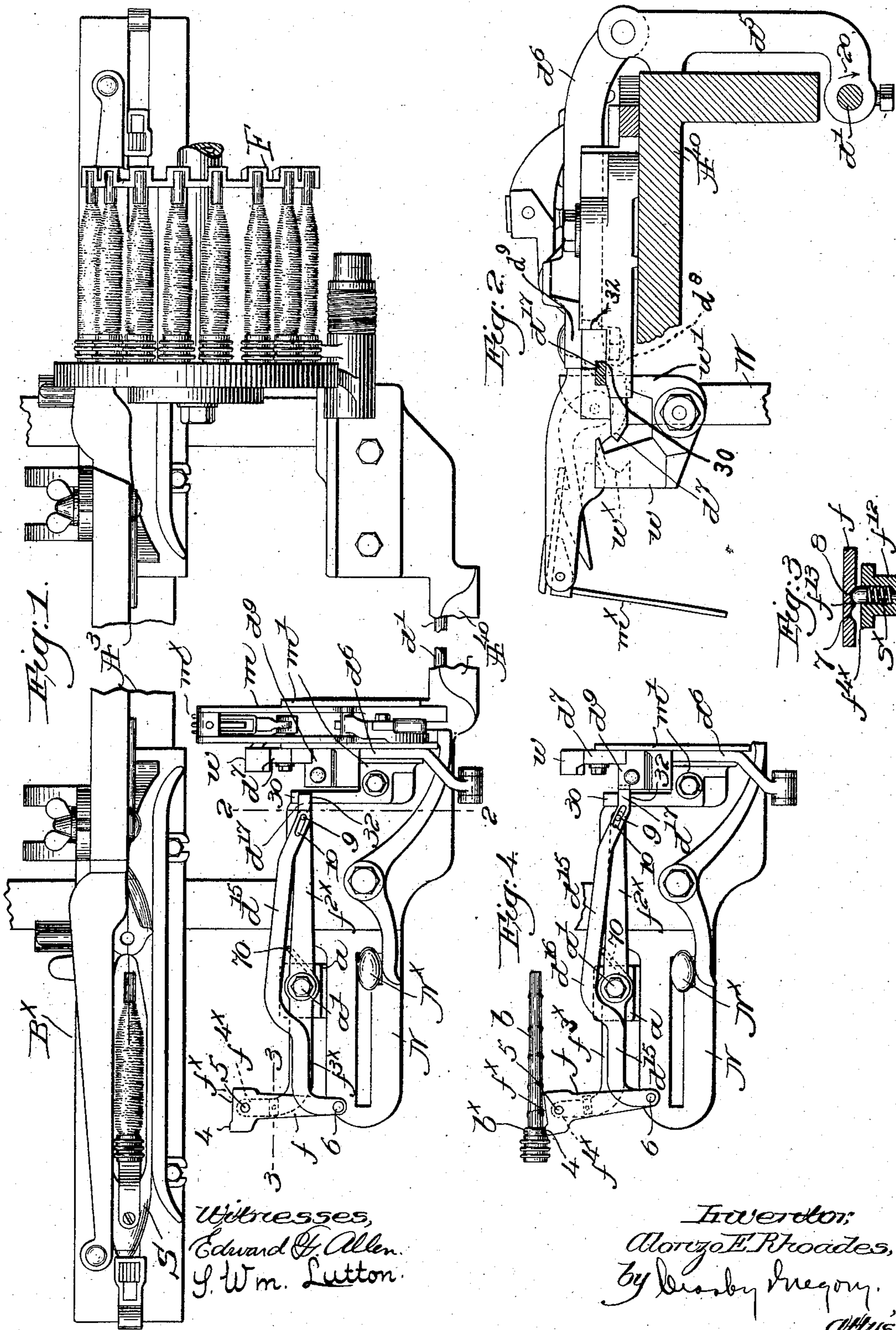


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FILLING REPLENISHING LOOM.

APPLICATION FILED MAY 18, 1903.

NO MODEL.



UNITED STATES PATENT OFFICE.

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FILLING-REPLENISHING LOOM.

SPECIFICATION forming part of Letters Patent No. 741,717, dated October 20, 1903.

Application filed May 18, 1903. Serial No. 157,596. (No model.)

To all whom it may concern:

Be it known that I, ALONZO E. RHOADES, a citizen of the United States, residing at Hope-
dale, county of Worcester, State of Massa-
chusetts, have invented an Improvement in
Automatic Filling-Replenishing Looms, of
which the following description, in connec-
tion with the accompanying drawings, is a
specification, like letters on the drawings rep-
resenting like parts.

This invention relates particularly to that
type of filling-replenishing looms usually
termed "feeler-looms," wherein a fresh sup-
ply of filling is provided by replenishing mech-
anism operated automatically upon substan-
tial exhaustion of the filling in the running
shuttle, such a loom being shown in United
States Patent No. 648,986. The means for
controlling the replenishing mechanism in-
cludes a member adapted to be engaged and
operated by a suitable actuator, such as the
weft-hammer, when through the instrumen-
tality of a filling-feeler the said member is
operatively positioned. In certain structures
of this general type a detent is withdrawn
from coöperation with the member referred
to by or through filling-induced movement
of the feeler at every other forward beat of
the lay until by substantial exhaustion of
the filling in the shuttle the filling-induced
movement of the feeler is insufficient to with-
draw the detent, and thereupon the actuator
engages the said member and effects the op-
eration of the controlling means and filling
replenishment is accomplished.

In my present invention I have devised a
feeler which has no movement relative to the
feeler-carrier until the filling in the shuttle
is substantially exhausted. At such time
and while there yet remains sufficient filling
in the shuttle to extend one or more times
across the lay the feeler has imparted to it a
movement relative to the feeler-carrier, and
such feeler movement causes a detent to co-
operate with and operatively position a mem-
ber of the controlling means to be engaged
and moved by the actuator, herein shown as
the weft-hammer. Until such relative move-
ment of the feeler the detent is not moved
into coöperative relation with the said mem-
ber of the controlling means, and I have so

constructed the apparatus that a very slight
movement of the feeler relative to its carrier
will cause a much greater movement of the
detent. A fine and accurate operation of the
feeler mechanism is thereby insured, so that
the amount of filling remaining in the shuttle
at the time of filling replenishment is reduced
to a minimum.

The entire apparatus is simple, compact,
and direct-acting and positive in its opera-
tion.

The various novel features of my invention
will be described hereinafter, and particu-
larly pointed out in the following claims:

Figure 1 is a plan view, centrally broken
out, of an automatic filling-replenishing loom
embodying one form of my invention, the
parts being shown in normal running posi-
tion. Fig. 2 is an enlarged sectional detail
on the line 2 2, Fig. 1, looking toward the
right. Fig. 3 is an enlarged section through
the feeler-carrier and feeler on the line 3 3,
Fig. 1, showing a device for preventing rela-
tive movement of the feeler and carrier from
accidental causes; and Fig. 4 is a detail view
in plan, showing the relative movement of
the feeler upon substantial exhaustion of the
filling, preparatory to effecting filling replen-
ishment.

The breast-beam A^{40} , lay A^3 , filling-feeder
F, controlling rock-shaft d' , the shipper N^x ,
its holding-plate N, and the feeler-carrier f^{2x}
 f^{3x} , fulcrumed at a' on a bracket a, mounted
on the holding-plate may be and are substan-
tially as in United States Patent No. 677,607
save that the outer end of the feeler-carrier
is extended rearwardly at f^{4x} , Figs. 1 and 4.
An upright stud 5 on the extension serves as
a fulcrum for the feeler f, having its feeling-
face broadened at f^x and with a projection 4
at its outer corner, and, referring to Fig. 3, the
under side of feeler is provided with two sock-
ets or depressions 7 and 8, placed side by side.
The extension f^{4x} has a depending boss f^{12}
socketed to receive an upwardly-movable
plunger having a rounded head f^{13} to enter
one of the sockets 7 or 8, a spring s^x press-
ing the plunger upward and into a socket, as
shown in Fig. 3. The front end of the feeler
extends beyond the arm f^{3x} of the feeler-car-
rier and is pivotally connected at 6 to a link

d^{15} , bent rearwardly at d^{16} to clear the fulcrum a' and then extended toward the center of the loom. At or near its free end the carrier-arm f^{2x} has an upright pin 9, which extends loosely through an elongated slot 10 in the link, said slot being diagonal to the length of the arm f^{2x} , and beyond the slot the link is extended to form a detent d^{17} , projecting above a shelf 30. Normally the plunger-head f^{13} is seated in the socket 8 and the pin 9 is at the right-hand end of the slot 10, as in Fig. 1, and when the feeler f intermittently passes through slots in the shuttle-box B^x and shuttle S , Fig. 1, the filling in the shuttle engages the feeler and moves it forward on the beat-up, the feeler-carrier rocking on its fulcrum a' against the spring 70. At first there is no relative movement of feeler and feeler-carrier; but when the filling wears off down to a preliminary bunch or winding b^x , Fig. 4, on the filling-carrier b such bunch engages the projection 4 before the end f^x of the feeler engages the filling-carrier, and thereby the feeler is swung on its fulcrum 5 relatively to the carrier, so that the plunger-head f^{13} slips out of the socket 8 and snaps into socket 7.

It will be seen that owing to the greater leverage between fulcrum 5 and the link connection 6 a very slight turning of the feeler will cause a very much greater longitudinal movement of the link to the right, and thereby the detent d^{17} will be moved across the shelf 30 and into operative position, the slot-and-pin connection 10 and 9 guiding the inner end of the link at such time. This condition of affairs is shown in Fig. 4, the lay being supposed to be at front center and the parts are in readiness to effect filling replenishment, as will now be described.

A member of the controlling means for the replenishing mechanism is shown as a latch d^6 , pivoted at its front end on an upturned arm d^5 , fast on the controlling rock-shaft d' , Fig. 2, the rear end of the latch extending beyond the breast-beam at d^7 , and a cam-face d^8 is formed on the under edge of the latch. (See dotted lines, Fig. 2.) At one side of the guide m' for the slide m of the weft-fork m^x an upturned head w is secured to the weft-hammer W , said head having a notched bunter w^x (shown in dotted lines in Fig. 2) to at times engage the end d^7 of the latch, as in United States Patent No. 720,209. The head w has an upturned projection w' to travel beneath the latch end d^7 and permit the latter to drop below the path of the bunter w^x on each forward stroke of the weft-hammer unless the latch is otherwise held up. The weft-hammer acts in usual manner upon detection of filling failure by the filling-fork m^x to release the shipper. The shelf 30 forms a part of the guide m' and has an upright shoulder 32, against which the spring 70 holds the detent d^{17} , except when the feeler-carrier is moved by filling-induced movement of the feeler. On each backward stroke of the weft-hammer the pro-

jection w' rides under the cam-face d^8 and lifts the end d^7 of the latch into the position shown in Fig. 2, and said latch is provided with a lateral shelf d^9 , which overhangs the detent d^{17} when the latter is operatively positioned, as shown in Fig. 4. So long as there is no relative movement of the feeler and feeler-carrier the latch end d^7 will drop below the path of the bunter w^x on each outward stroke of the weft-hammer, the latter moving on alternate beats of the lay as usual; but when the substantial exhaustion of the filling in the shuttle causes the feeler to turn on the carrier the detent d^{17} will be moved into the position shown in Fig. 4 beneath the overhanging shelf d^9 . Then when the weft-hammer moves forward the detent acts upon the shelf d^9 to hold the latch end d^7 up in the bunter-path, and the bunter engages it, moves the latch d^6 outward, and thereby rocks the arm d^5 and the rock-shaft d' in the direction of arrow 20, Fig. 2, effecting the actuation of the replenishing mechanism in well-known manner. When the fresh supply of filling is inserted in the shuttle, the first engagement thereof with the feeler turns the latter on its fulcrum 5 back into the position relative to the feeler-carrier shown in Fig. 1, withdrawing the detent d^{17} from beneath the latch-shoulder d^9 , and the loom runs normally until the fresh filling is woven down to substantial exhaustion. The spring-controlled plunger on the feeler-carrier keeps the feeler in proper position relative to the carrier and prevents premature movement of the feeler from accidental causes.

By the construction shown the detent is not called into action until necessary, and unnecessary movement and wear of the parts will be prevented, and at the same time a very close feeling action is effected.

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

1. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including an operating member, an actuator to engage and move said member when operatively positioned, a movable feeler-carrier, a filling-feeler movable with and relatively to said carrier, and a detent positively connected with the feeler and to effect operative positioning of the said member of the controlling means, presence of filling in the shuttle causing movement of the feeler and feeler-carrier in unison, and substantial exhaustion of the filling in the shuttle effecting a movement of the feeler relative to its carrier and thereby causing the detent to position the operating member to be engaged by the actuator.

2. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including an operating member, an actuator to engage and move said member when operatively positioned, a swinging feeler-carrier, a feeler pivotally mounted

thereon and moved in unison with the carrier by the presence and moved relatively thereto by the substantial exhaustion of filling in the shuttle, and a device connected with the
5 feeler and moved thereby to operatively position the operating member of the controlling means when the feeler is moved relatively to the feeler-carrier.

3. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including an operating member, an actuator to engage and move said member when operatively positioned, a swinging feeler-carrier, a feeler pivotally mounted
15 thereon and moved in unison with the carrier by the presence and moved relatively thereto by the substantial exhaustion of filling in the shuttle, a device to prevent accidental or premature relative movement of the feeler,
20 and a device actuated by relative movement of the latter to operatively position the operating member of the controlling means.

4. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including an operating member, an actuator to engage and move said member when operatively positioned, a swinging feeler-carrier, a feeler pivotally mounted
25 thereon and moved in unison with the carrier by the presence and moved relatively thereto by the substantial exhaustion of filling in the shuttle, a spring-controlled catch to prevent accidental or premature relative movement of the feeler, and a device actuated by such
30 relative movement of the feeler to operatively position the operating member of the controlling means.

5. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including a latch, a weft-hammer having a bunter to engage and move the latch when operatively positioned, a normally inactive detent, and a filling-feeler positively and permanently connected therewith, substantial exhaustion of the filling in the shuttle acting through the feeler to move the detent into coöperation with and thereby operatively position the latch.
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6. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including a latch, a weft-hammer having a bunter to engage and move the latch when operatively positioned, a swinging feeler-carrier, a feeler pivotally mounted
55 thereon and moved in unison therewith by intermitting engagement with the filling in the shuttle until substantial exhaustion of the filling, a detent, and a link connecting it and the feeler, movement of the feeler relatively to the feeler-carrier upon substantial exhaustion of the filling acting through the link to slide the detent into coöperative engagement with and to operatively position the latch.
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7. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including a latch, a weft-hammer having a bunter to engage and move the latch when operatively positioned, a swinging feeler-carrier, a feeler pivotally mounted
65 thereon and moved in unison therewith by intermitting engagement with the filling in the shuttle until substantial exhaustion of the filling, a spring-operated catch on the feeler-carrier to engage the feeler and prevent
70 premature movement thereof relative to the feeler-carrier, and a detent operatively connected with the feeler, substantial exhaustion of the filling effecting relative movement of the feeler and thereby causing the detent
75 to operatively position the latch. 80

8. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including a latch, a weft-hammer having a bunter to engage and move the latch
85 when operatively positioned, a swinging feeler-carrier, a feeler pivoted thereon and extended forward beyond its pivot, a device to prevent premature movement of the feeler relatively to the carrier, a link connected at
90 its outer end with the forward extension of the feeler and slidably connected at its inner end with the feeler-carrier, and a detent on the inner end of the link, presence of filling in the shuttle preventing and substantial ex-
95 haustion of the feeler causing relative movement of the feeler and the feeler-carrier, such relative movement of the feeler causing co-operation of the detent and latch and operatively positioning the latter. 100

9. In a loom provided with automatic filling-replenishing mechanism, controlling means therefor including a latch, a weft-hammer having a bunter to engage and move the latch when operatively positioned, a swinging
105 feeler-carrier, an elongated feeler pivoted nearer its rear end on the carrier, a link connected with the outer end of the feeler, and a detent attached to the link and slidably connected with the feeler-carrier, the contact
110 portion of the feeler being laterally broadened, intermitting engagement of the feeler with the filling in the shuttle causing the feeler and feeler-carrier to move in unison until substantial exhaustion of the filling
115 acts to turn the feeler on its pivot, the greater leverage between the outer end of the feeler and its pivot at such time multiplying the longitudinal movement of the link and causing coöperation of the detent with the latch to
120 operatively position the latter.

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

ALONZO E. RHOADES.

Witnesses:

GEORGE OTIS DRAPER,
ERNEST W. WOOD.