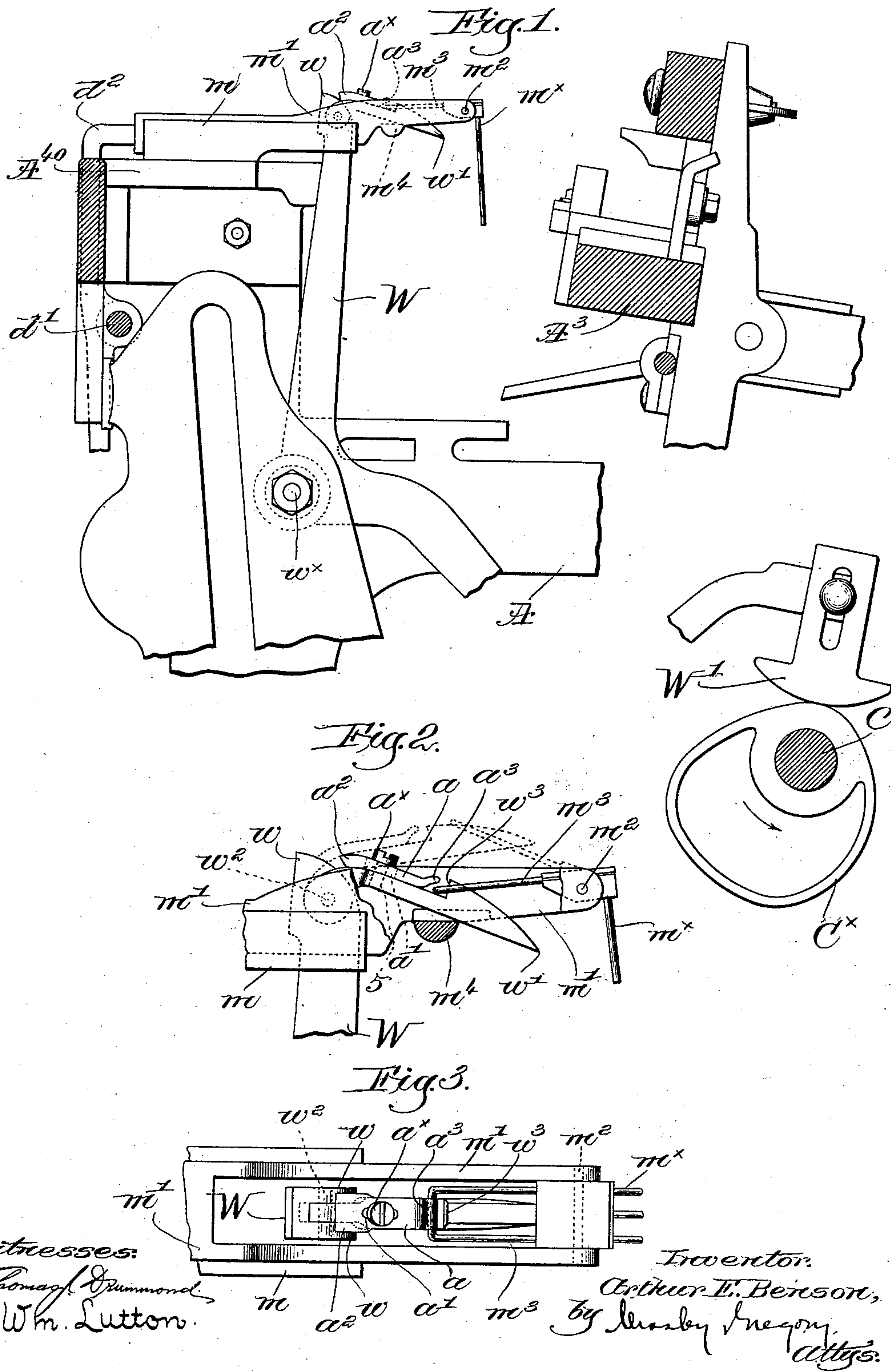


A. E. BENSON.  
FILLING DETECTING MECHANISM FOR LOOMS.

APPLICATION FILED JUNE 15, 1903.

NO MODEL.





# UNITED STATES PATENT OFFICE.

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## FILLING-DETECTING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 742,564, dated October 27, 1903.

Application filed June 15, 1903. Serial No. 161,424. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR E. BENSON, a citizen of the United States, and a resident of New Bedford, county of Bristol, State of Massachusetts, have invented an Improvement in Filling-Detecting Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to filling-detecting mechanism for looms, and more particularly to the hook of the weft-hammer or its equivalent which coöperates with the tail of the filling fork or detector when the latter detects failure of filling.

The object of my invention is twofold—viz., to prevent the hook from rising above, and hence out of coöperative relation with the tail of the filling-fork, and to steady the fork itself and prevent it from jumping improperly. When a loom is running, the hook will sometimes rise or be thrown up above and rest upon the loop-like tail of the fork, and manifestly when this occurs it is impossible for the latter to detect filling failure either for the purpose of stopping the loom or replenishing filling in an automatic loom. I have obviated such improper lifting of the hook by providing a stop, preferably adjustably mounted on the hook, to engage the head of the cam-follower or weft-hammer, and thereby limit the rising movement of the hook, so that it cannot swing up too far. After a fork is tilted by engagement with the filling as the lay beats up it returns to normal position, its tail dropping onto the hook, and often the tail will rebound when it strikes. Occasionally it will rebound to such an extent that the hook fails to catch when the fork should have detected, and of course the operation of the loom is impaired. This I have prevented by means of a device which steadies and catches the tail and prevents it from rebounding after it drops back of the shoulder of the hook as the vibrating hook-support—as, for instance, the weft-hammer—moves toward the back of the loom. When the weft-

hammer moves forward, the device is withdrawn from above the tail of the hook just as the latter is tilted if the filling be properly laid.

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

Figure 1 is a transverse sectional view of a portion of a loom with one embodiment of my present invention applied thereto, the section being taken inside of the fork-slide and its guide. Fig. 2 is an enlarged detail, in side elevation and partly broken out, of the fork, fork-slide, and hook, with my invention clearly shown in connection therewith; and Fig. 3 is a top or plan view of the parts shown in Fig. 2.

The lay  $A^3$ , breast-beam  $A^{40}$ , having a guide  $m$  mounted thereon for the longitudinally-open slide  $m'$  of the weft or filling-fork  $m^x$ , the latter being pivotally mounted at  $m^2$  on the slide and having a loop-like tail  $m^3$ , the vibrating actuator or weft-hammer  $W$ , fulcrumed at  $w^x$  on the loom side  $A$  and having its upper end or head bifurcated to present separated sides or cheeks  $w$  and provided with a follower  $W'$  to coöperate with the cam  $C^x$  on the cam-shaft  $C$  of the loom, and the hook  $w'$ , fulcrumed at  $w^2$  on the head of the actuator between the sides  $w$  thereof, are and may be of substantially well-known construction, the hook at its free rear end being slidably supported on a transverse bar  $m^4$  on the fork-slide. As is usual, the actuator makes one complete reciprocation for every two beats of the lay, the head thereof moving back and forth in the open fork-slide, and when the fork is not tilted, as by failure of the filling on the beat up of the lay, the hook engages the tail and moves the slide forward to act upon an upturned arm  $d^2$ , fast on the rock-shaft  $d'$ , and rock the latter to effect stoppage of the loom or a replenishment of filling in well-known manner. Replenishment of filling by or through rocking of such a rock-shaft  $d'$  is shown in United States Patent No. 529,940, and the rocking of such a shaft to effect stoppage is of such wide application and



knowledge that illustration thereof is unnecessary. When in coöperative relation with the tail of the fork, the hook  $w'$  is below the tail and slides back and forth on the support  $m^1$  as the actuator vibrates; but in actual practice the hook sometimes jumps or rises up and rests upon the tail of the fork, and manifestly when this occurs it is impossible for the fork to detect the presence or absence of filling and upon failure there would be no operation of the rock-shaft  $d'$  either to stop the loom or replenish filling, as the case might be. In order to prevent such improper lifting of the hook while permitting all proper freedom of movement thereof, I have provided a stop, and herein the stop is mounted on the hook to coöperate with the head of the actuator W. As best shown in Figs. 2 and 3, this stop is an elongated block  $a$ , preferably of metal, shaped on its under side to seat firmly on the hook and having a longitudinal slot  $a'$  to receive the shank of a headed screw  $a^x$ , the latter being screwed into a threaded hole 5 (see dotted lines, Fig. 2) in the hook. The end of the stop nearer the fulcrum of the hook is widened, as at  $a^2$ , to extend in front of the upright rear edges of the sides  $w$  of the actuator-head, as clearly shown in Fig. 3. When the hook jumps or lifts, as in dotted-line position, Fig. 2, the stop engages the sides  $w$ , and thus limits such lifting movement, so that there is no possibility of the hook getting over the tail of the fork. By loosening the screw  $a^x$  the stop can be adjusted to permit greater or less lifting movement of the hook, and when it is necessary the stop can be removed entirely, as when removing the fork-slide.

After a fork is tilted by engagement with the filling and its tail is lifted it returns to normal position, and often the loop rebounds after striking the hook or when it drops off the top of the hook-shoulder  $w^3$  onto the lower part of the hook as the actuator moves toward the back of the loom. Occasionally the rebound will be to such an extent that the hook fails to catch when the fork should have fulfilled its function of detecting filling failure or absence. I have provided herein means to prevent such improper rebound of the fork-tail.

The rear end of the stop-block  $a$  is upturned and extended toward the hook-shoulder at  $a^3$ , leaving sufficient clearance therebetween for the tail to drop in front of the shoulder. When, however, the tail drops off the latter onto the lower part of the hook, the latter then moving toward the back of the loom, the lip or overhanging portion  $a^3$  will be moved to project over the tail when the hook stops in its rearward movement. This is shown very clearly in Fig. 2, and it will be seen that the tail cannot then rise above the lip  $a^3$ . Now on the detecting pick the forward movement of the actuator W and the hook begins

just as the tail is lifted, supposing the filling to be present, so that the lip  $a^3$  will be moved out of the path of the tail. Of course if the filling is absent the fork will not be tilted and the hook will engage the tail  $m^3$  and move the slide  $m'$  outward, as usual.

My invention is not restricted to the precise construction and arrangement herein shown and described, as the same may be modified or rearranged in various details 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 pivotally-mounted filling-fork having a loop-like tail, a vibrating actuator, a hook pivotally connected therewith and adapted to coöperate with the tail upon failure of the filling, and adjustable means mounted independently of the slide to limit lifting movement of the hook.

2. In a loom, a vibrating actuator, a hook pivotally mounted thereon, an adjustable stop on one to engage the other and prevent improper lifting of the hook, and a pivotally-mounted filling-fork having a tail to be engaged by said hook upon detection of filling failure.

3. In a loom, a vibrating actuator having a bifurcated head, a hook pivotally mounted between the separate sides of the head, a stop detachably secured to the hook and adapted to engage the sides of the head when the hook lifts and limit such lifting, and a filling-fork having a tail to coöperate with the hook upon detection of filling failure.

4. In a loom, a weft-hammer, a hook pivotally mounted on the head thereof, an adjustable stop detachably secured on the hook to engage the head and limit lifting movement of the hook, and a filling-fork having a tail to at times coöperate with the hook.

5. In a loom, a vibrating actuator, a hook pivotally mounted thereon and having a transverse shoulder, a tiltable filling-fork having a tail to be engaged by the hook upon detection of filling failure, and a device adjustably mounted on the top of the hook beyond its shoulder to extend over and prevent rebound of the tail of the hook.

6. In a loom, a vibrating actuator, a hook pivotally mounted thereon, a tiltable filling-fork having a loop-like tail to coöperate with the hook upon detection of filling failure, and a member detachably mounted on the top of the fork and having one end upturned and adapted to extend over and prevent rebound of the tail, the other end of said member acting as a stop to engage the actuator and limit lifting movement of the hook.

7. In a loom, a vibrating actuator, a hook pivotally mounted thereon, a tiltable filling-fork having a loop-like tail to coöperate with the hook upon detection of filling failure, and

a member adjustably mounted on the top of the fork and having one end upturned and adapted to extend over and prevent rebound of the tail, the other end of said member acting as a stop to engage the actuator and limit lifting movement of the hook.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

ARTHUR E. BENSON.

Witnesses:

L. W. JENNEY,  
GEO. H. POTTER.