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A. M. MARCOUX.

THREAD TENSIONING DEVICE FOR REPLENISHING LOOMS.

APPLICATION FILED JUNE 8, 1906.

Fig: 1.

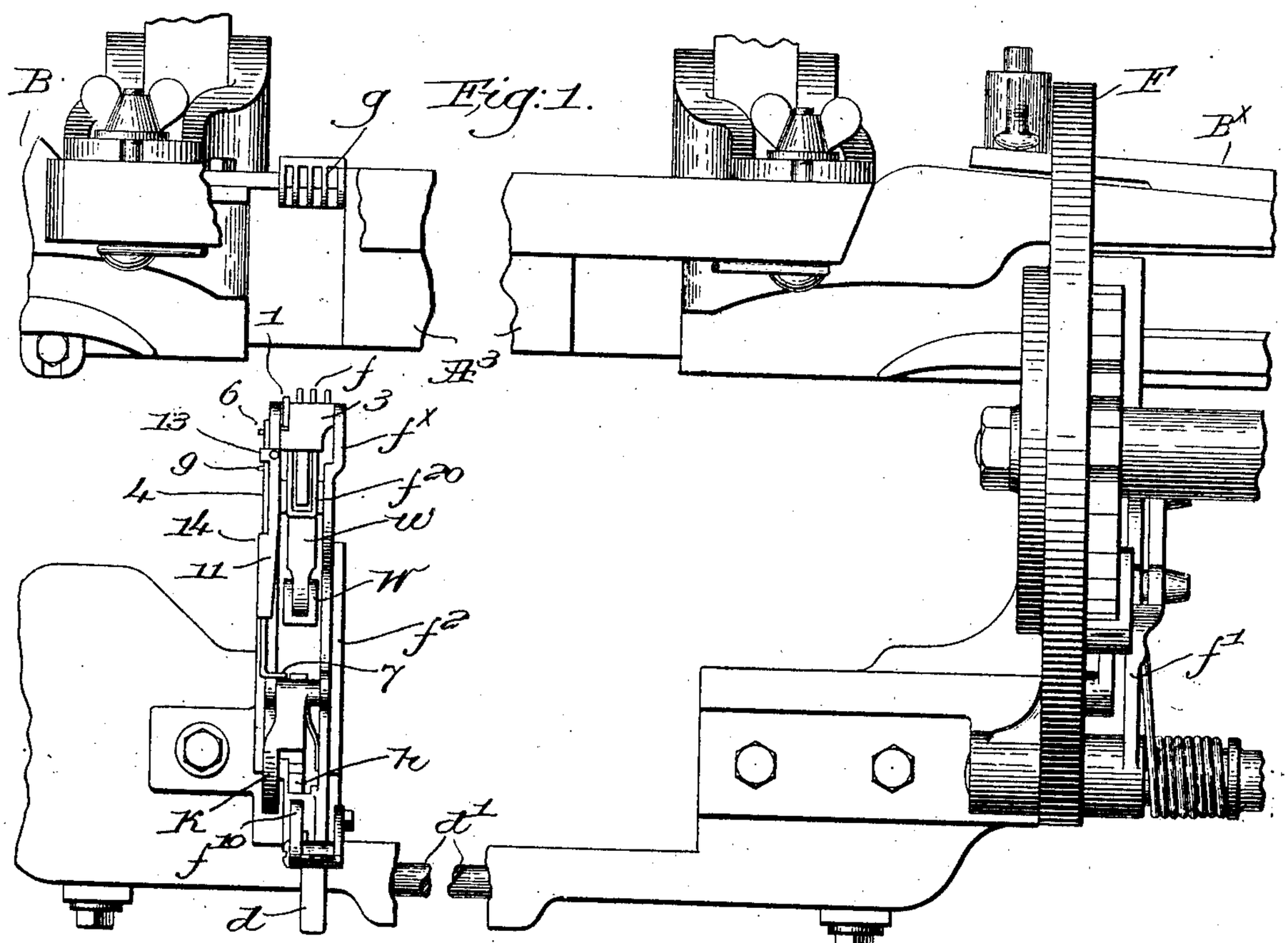


Fig: 2.

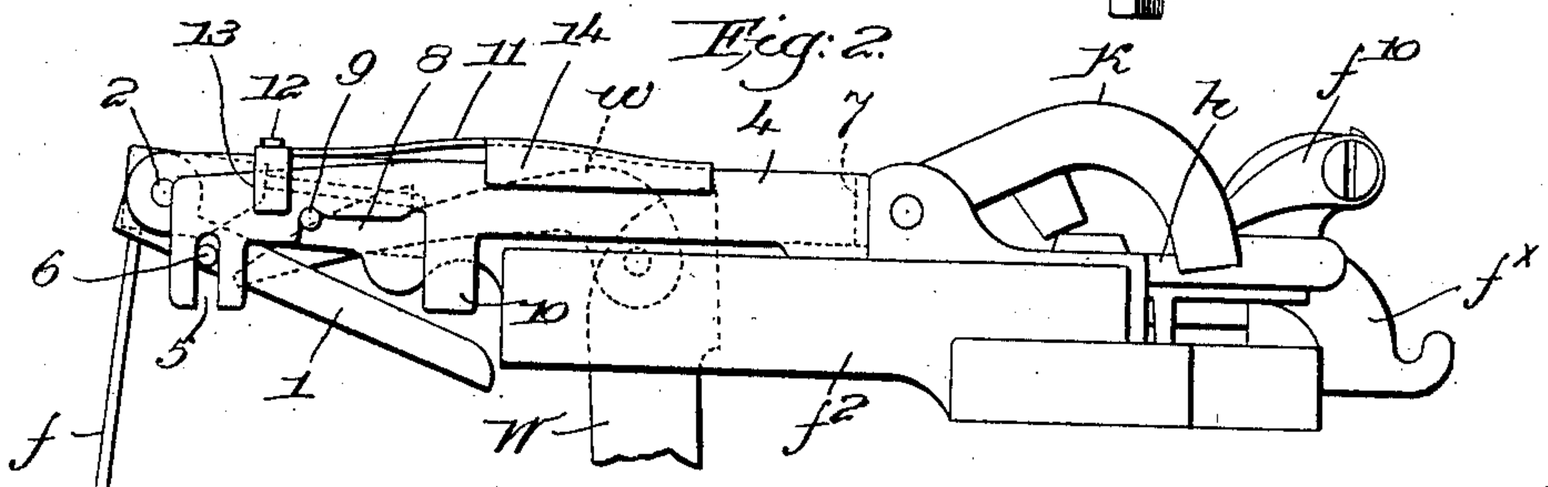


Fig: 3.

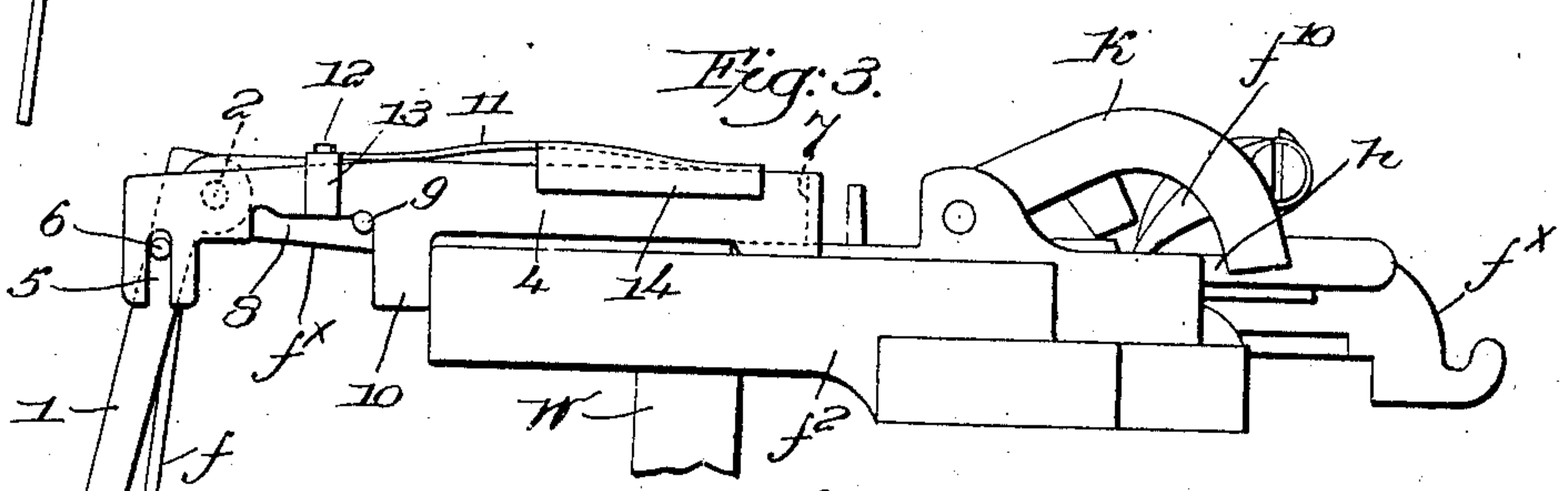
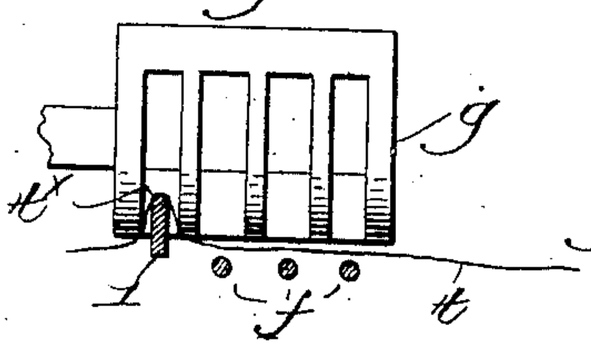


Fig: 4.



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UNITED STATES PATENT OFFICE.

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THREAD-TENSIONING DEVICE FOR REPLENISHING-LOOMS.

No. 837,862. Specification of Letters Patent. Patented Dec. 4, 1906.

Application filed June 8, 1906. Serial No. 320,732.

To all whom it may concern:

Be it known that I, ALIDA M. MARCOUX, a citizen of the United States, residing at Hopedale, county of Worcester, and State of Massachusetts, have invented an Improvement in Thread-Tensioning Devices for Filling-Replenishing Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

When the running filling is automatically replenished in the "Northrop" type of loom, an example of which is found in United States Patent No. 529,940, granted to J. H. Northrop, the fresh supply of filling is inserted in the shuttle at the replenishing side of the loom, and the end of the fresh filling is held when the shuttle is picked across the loom. On such pick the filling usually is drawn into the threading device on the shuttle, to be directed thereby to the delivery-eye of the shuttle, the threading being completed on the next pick to the replenishing side, and when the filling is drawn into the threading device on such first pick after replenishment there is generally sufficient tension on the filling to properly tilt the fork at the non-replenishing side. Sometimes, however, on the first pick after replenishment the filling will not be controlled at all by the threading device and is subjected to so little tension that when the lay beats up and the fork engages the slack filling the latter will give instead of resisting and the fork is not tilted. The fork-slide is then moved outward in usual manner, calling for another operation of the replenishing mechanism, and take-up will be arrested notwithstanding the fact that the filling has been laid properly and is intact. A thick place will be made in the cloth because of such arrest of take-up, and if the shuttle should thread properly on the return pick the second replenishing action would be wholly unnecessary.

My present invention has for its object the production of means to insure tilting of the filling-fork on the first pick after filling replenishinent if the filling has been laid and is intact at the instant of detection, so that the unnecessary arrest of take-up is prevented. If the new filling breaks on such first pick, the fork will indicate the failure without hindrance from the novel means for insuring tilting when the filling is present. As will appear hereinafter, such means is inactive during the normal operation of the loom and is brought into operative position automatically every time the replenishing mechanism operates.

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 plan view, centrally broken out, of a sufficient portion of an automatic filling-replenishing loom to be understood with one embodiment of my present invention applied thereto. Fig. 2 is an enlarged left-hand side elevation of the filling-detecting mechanism with my present invention applied thereto and in normal inactive position. Fig. 3 is a similar view, but showing the change in the relative position of the parts effected by or through detection of filling failure, so that on the first pick after replenishment the tilting of the fork is insured if the new filling is intact. Fig. 4 is a top plan view of the grid, enlarged, with the fork-tines and the tension-producing member in section to illustrate the manner in which my invention operates.

Referring to Fig. 1, the lay A^3, having shuttle-boxes B $B^\times$ thereon, the replenishing mechanism comprising, essentially, a filling-feeder F, (only partly shown at the right, Fig. 1, to contain a plurality of filling-carriers or bobbins as a reserve supply,) and a transferrer f' to transfer the filling-carriers one by one to the running shuttle when required, the controlling rock-shaft d', having an attached arm d to be moved outward by the fork-slide $f^\times$ upon detection of filling failure by the filling detector or fork f, mounted on the slide, the stand or guide f^2, in which the slide is movable, and the vibrator or weft-hammer W, having a hook w to engage the fork-tail f^{20} when the fork is not tilted, may be and are all of substantially well-known construction and operate in usual manner.

When the fork detects failure of filling when the shuttle is in the box B, Fig. 1, on the forward beat of the lay, the slide $f^\times$ is moved outward, rocking the arm d and turning the shaft d' to effect filling replenish-

ment on the next pick, when the shuttle is in the box B× at the replenishing side of the loom.

Near the mouth of the box B the lay is provided with a grid or grating *g* of usual construction, to support the filling on the detecting-pick.

In looms of this type the end of the fresh filling is held at the replenishing side of the loom when the shuttle is picked from box B× after filling replenishment, and on such pick the filling will usually be drawn into such cooperation with the threading device of the shuttle that proper tension will be provided to hold the filling taut when engaged by the fork in order that the latter may be tilted. Sometimes, however, the filling will not be drawn into such coöperative relation to the threading device, but will lie loosely along the top or side of the shuttle when boxed at B, Fig. 1, and there is then so little tension on the filling that it will give when engaged by the fork, failing to tilt the latter. Consequently the slide $f^{\times}$ is moved outward, and a second replenishment of filling will be called for; but as such movement of the slide is generally arranged to also arrest take-up, as is familiar to those skilled in the art, it will be manifest that while the fresh filling has been properly laid and is intact the take-up will be arrested just as if the filling had failed. A thick place will be made in the cloth as a result of such action.

I have provided means to act upon the filling after replenishment and hold it taut if it be intact, so that the fork will be tilted properly, thereby obviating arrest of take-up and a second replenishment of filling will be prevented unless the filling fails to thread in the shuttle on the next pick. In accordance with my present invention I provide a filling-engaging member or deflector 1, shown as a flat blade-like piece loosely fulcrumed on the fork-pivot 2 between the adjacent side of the fork-head 3 and the bifurcated end of the slide $f^{\times}$, the deflector being long enough to engage the filling when the deflector is operatively positioned. The deflector is so placed herein that as the lay beats up on the detecting-pick said detector will pass between two of the bars of the grid *g*, as in Fig. 4.

In order to control the position of the deflector, I mount a controller 4 on the fork-slide, the rear end of such controller being downturned and slotted at 5 to loosely receive a lateral pin 6 on the deflector, the front end of the controller being bent laterally at 7 across the top of the slide and into the path of the vibrator W. (See Fig. 1.) A longitudinal notch 8 is formed in the lower edge of the controller to receive a supporting and stop pin 9 on the slide, and a lug 10 depends from the controller to at times engage the rear end of the stand f^2. A leaf-spring 11, fastened at 12 on the slide, bears upon the upper edge of the controller and holds it in place while acting frictionally thereon, the spring being overturned at 14 and 13, Figs. 2 and 3, to prevent lateral displacement of the controller.

Referring first to Figs. 1 and 2, wherein the parts are shown in normal position, the controller is shown with the pin 9 at the rear end of the notch 8, and the deflector 1 is swung forward and upward into inactive position and the lug 10 is a short distance beyond the end of the stand f^2. While the filling is intact no change takes place in the parts referred to; but if the filling fails its absence is detected by fork *f*, and the vibrator W moves the slide $f^{\times}$ forward, the controller, moving with it until the lug 10 hits the end of the stand. This stops the controller; but the slide continues to move, and the slot-and-pin connection 5 6 with the deflector 1 swings the latter on its fulcrum 2 into the position shown in Fig. 3, a little in advance of the fork-tines. This positioning has taken place during the retraction of the lay and while the shuttle has been picked to the box B×, and the fresh supply of filling will be inserted on the forward beat of the lay with the shuttle in box B× in well-known manner. Now the lay goes back and the shuttle is picked to the box B, laying the filling *t*, Fig. 4, across the grid *g* and in front of the fork *f*, and the latter detects on this pick. As the lay beats up, however, the deflector 1 first engages the filling between the shuttle and the cloth and pushes a portion thereof between two of the bars of the grid, as at $t^{\times}$, Fig. 4, such deflection of the filling drawing the same properly taut across the grid to insure tilting of the fork, it being supposed that the filling is intact. When the fork-slide moves back to normal position, it carries with it the controller without any relative change from the position shown in Fig. 3, and on the next forward movement of the weft-hammer, the fork being tilted, the weft-hammer hits the lateral extension 7 and moves the controller 4 forward along the slide to the normal position, (shown in Fig. 2,) and thereby the deflector 1 is returned to the inactive position therein shown. The tensioning device is thus brought into active or operative position only when filling failure is detected and replenishment is called for, and after such device has performed its office it is returned to inoperative position to remain quiescent until another filling failure is detected. Should the filling break when the deflector is operatively positioned, the hook *w* will engage the fork-tail and the slide will be again moved outward, but no change will be made in the relative position of either deflector or controller, and the deflector will thereby be in position to act when the next fresh filling is laid in front of the fork. A predetermined number of outward movements of

the slide in succession may be made effective to effect automatically stoppage of the loom—as, for instance, in United States Patent to Stafford, No. 727,014, dated May 5, 1903—the trip *h*, latch-finger *k* controlled thereby, and the detent f^{10} being herein shown all substantially as in said patent. So, too, the take-up control through movement of the fork-slide may readily be effected herein as provided for in said patent.

My invention is not restricted to the precise construction and arrangement herein shown and described, as the same may be varied or modified in different particulars without departing from the spirit and scope of the invention.

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

1. In a loom, a lay provided with a shuttle-box, a filling-detector at the side of the loom, a normally inoperative device to act upon the filling and draw it taut in front of the detector when the shuttle is in said box, and means to render operative said device by or through detection of filling failure by said detector on the next preceding detecting-pick.

2. In a loom, a lay provided with a shuttle-box, a grid near the mouth of the box, a filling-fork, a normally inoperative device to act upon the filling between the shuttle and the cloth and draw it taut across the grid in front of the fork on the detecting-beat of the lay, and means to render said device operative whenever the fork detects filling failure.

3. In a loom, a filling-fork, its slide, a normally inoperative device adapted to at times act upon the filling and hold it taut in front of the fork, and means governed by movement of the slide upon detection of filling failure to operatively position said device in readiness to act on the next detecting-pick.

4. In a loom, filling-replenishing mechanism, a filling-fork to effect actuation thereof upon detection of filling failure, a device to act upon the fresh filling on the detecting-pick following replenishment and hold the filling taut in front of the fork, and means to operatively position said device only when filling replenishment is effected.

5. In a loom provided with filling-replenishing mechanism, a lay having a shuttle-box and a grid near the mouth thereof, a filling-detector adapted to effect the actuation of said mechanism by or through detection of filling failure, a deflector to deflect the filling between the shuttle and the cloth and draw such filling taut across the grid on a detecting-beat of the lay, means to operatively position the deflector whenever filling replenishment is effected, and a device to thereafter render said deflector inoperative.

6. In a loom provided with filling-replenishing mechanism, a filling-fork to effect the actuation thereof upon detection of filling failure, a fork-slide, a vibrator to move the slide outward upon detection of filling failure, a device adapted to engage and hold the filling taut in front of the fork after filling replenishment, and means to operatively position said device by outward movement of the slide, the device being returned to normal, inoperative position by or through said vibrator when the fork detects presence of filling.

7. In a loom provided with filling-replenishing mechanism, a filling-fork to effect the actuation thereof upon detection of filling failure, and means operatively positioned upon each actuation of said mechanism to coöperate with the fresh filling when intact and insure proper tension thereon to tilt the fork on the first detecting-pick after replenishment.

8. In a loom provided with filling-replenishing mechanism, a filling-fork to effect the actuation thereof upon detection of filling failure, a fork-slide, a vibrator to move the slide outward upon detection of filling failure, a deflector fulcrumed on the slide, to engage and hold properly taut the filling in front of the fork after filling replenishment, a controlling device longitudinally movable on the slide, to move the deflector into and out of operative position, and a stop to hold the controller stationary on outward movement of the slide, to operatively position the deflector, the vibrator engaging the controller and resetting the same to return the deflector to inoperative position when the fork again detects presence of filling.

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

ALIDA M. MARCOUX.

Witnesses:
GEORGE OTIS DRAPER,
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