No. 808,146. PATENTED DEC. 26, 1905.

# W. F. DRAPER & J. NORTHROP.

## TRAILING FILLING END CLEARER FOR LOOMS.

APPLICATION FILED MAY 11, 1905.

2 SHEETS—SHEET 1.

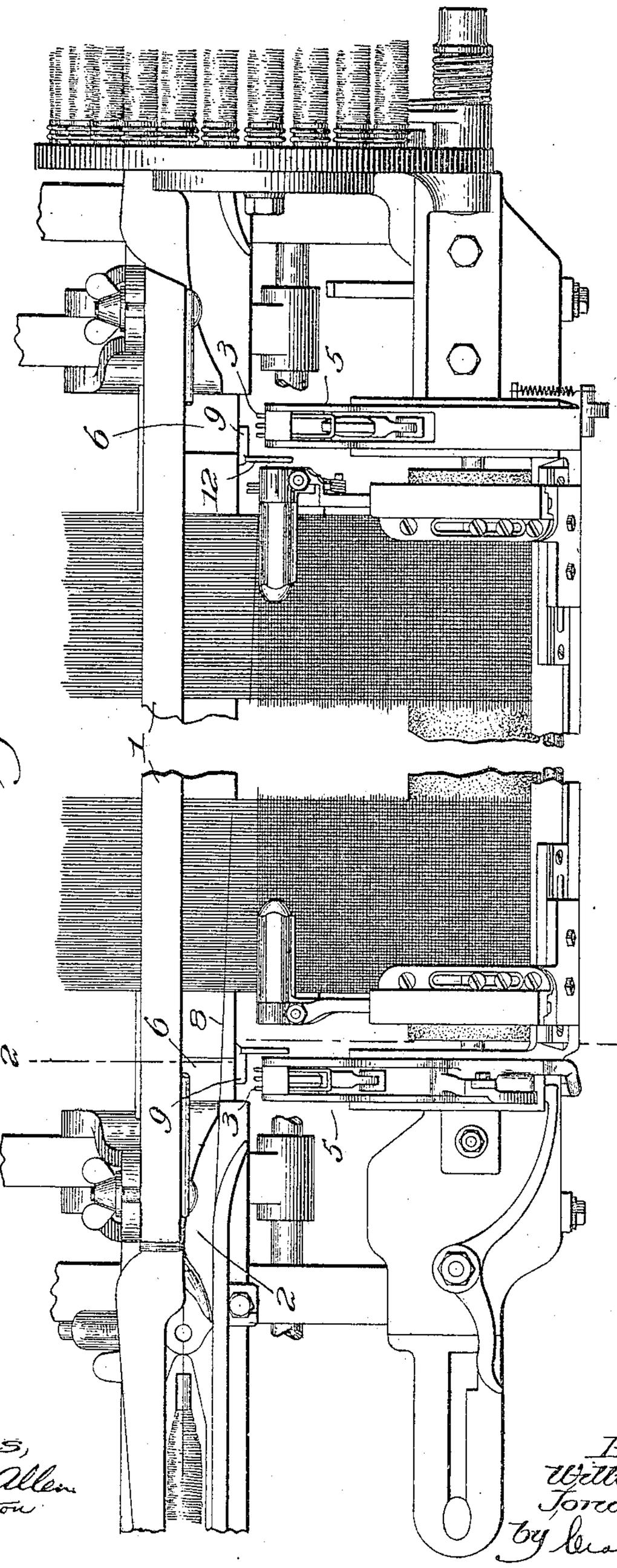


Fig. 1.

Witnesses,
Edward F. Allen
S. William Sutton

Inventors,
William F. Draper,
James Northrop,
by Bradley Gregory.
Attys.

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2 SHEETS—SHEET 2.

Fig: 2.

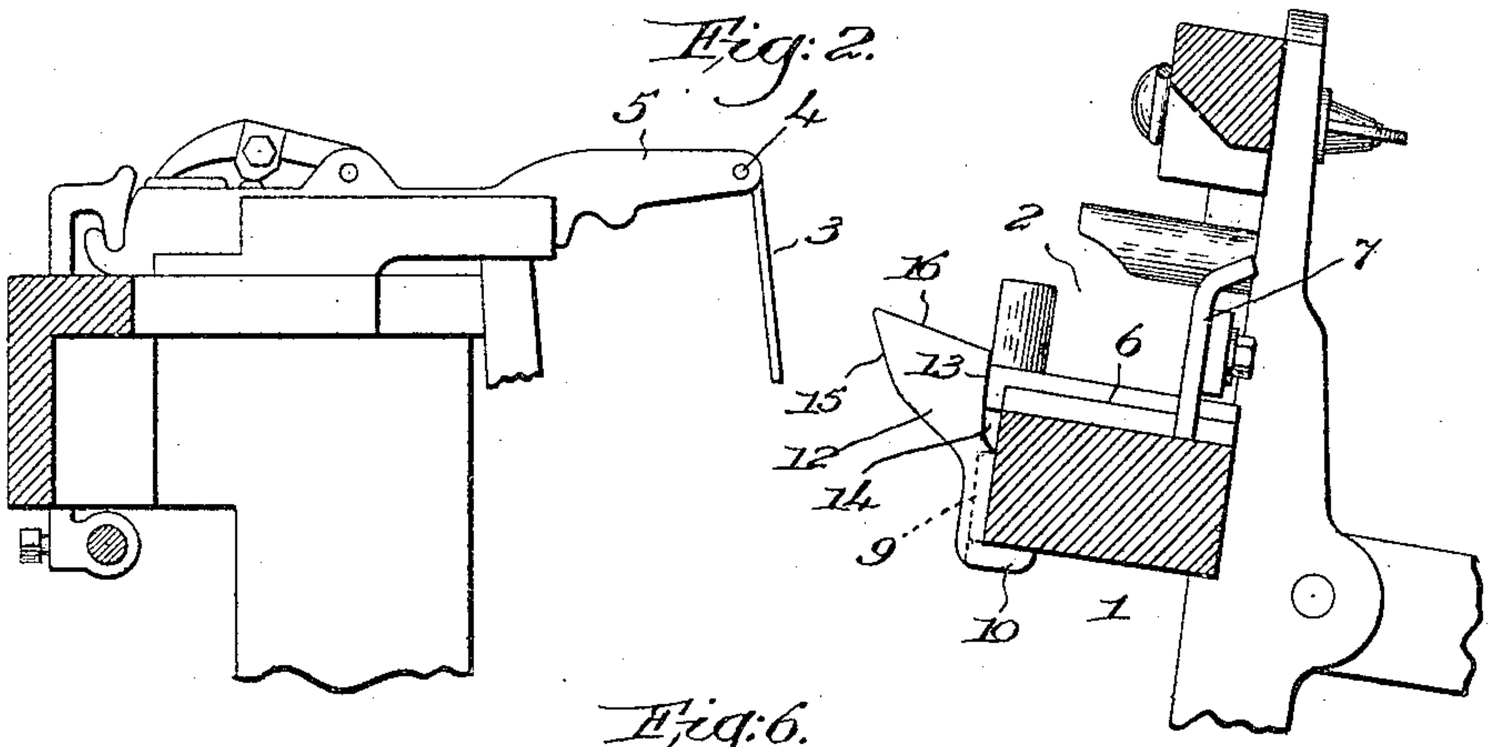



Fig: 6.

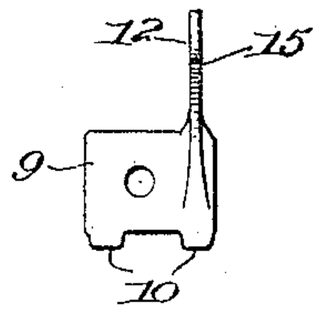



Fig: 4.

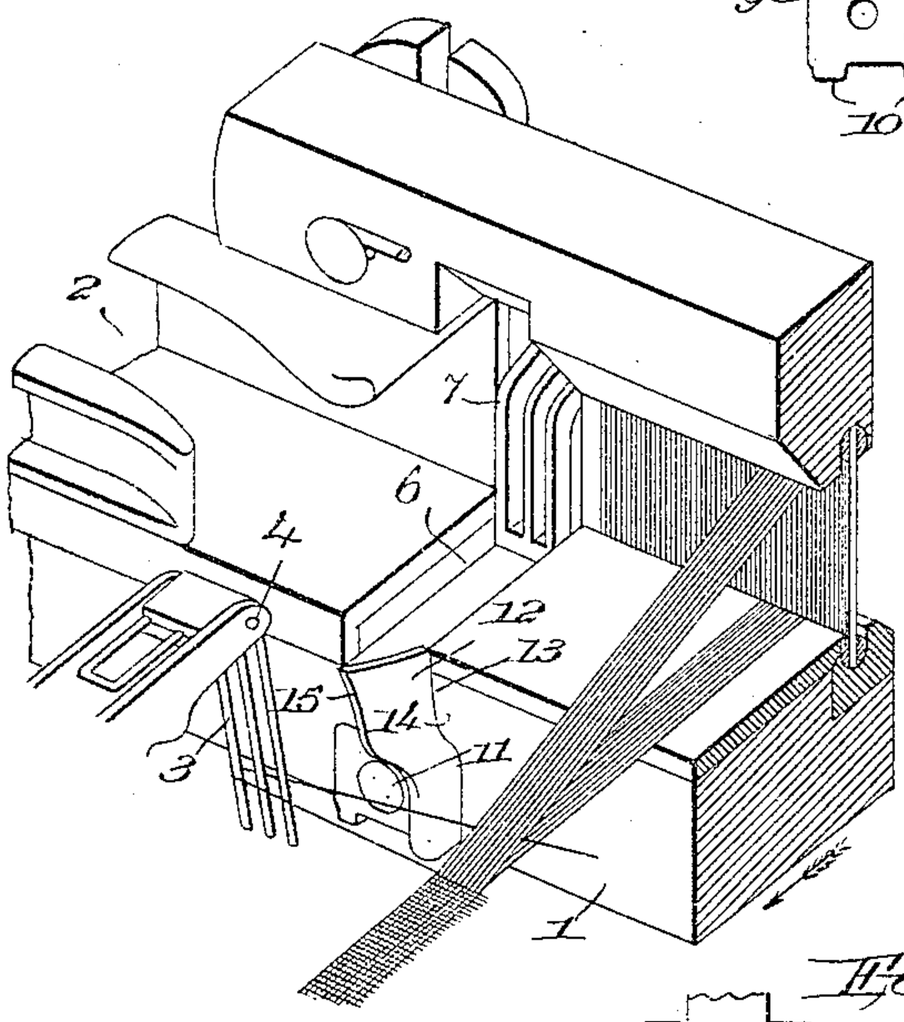



Fig: 3.

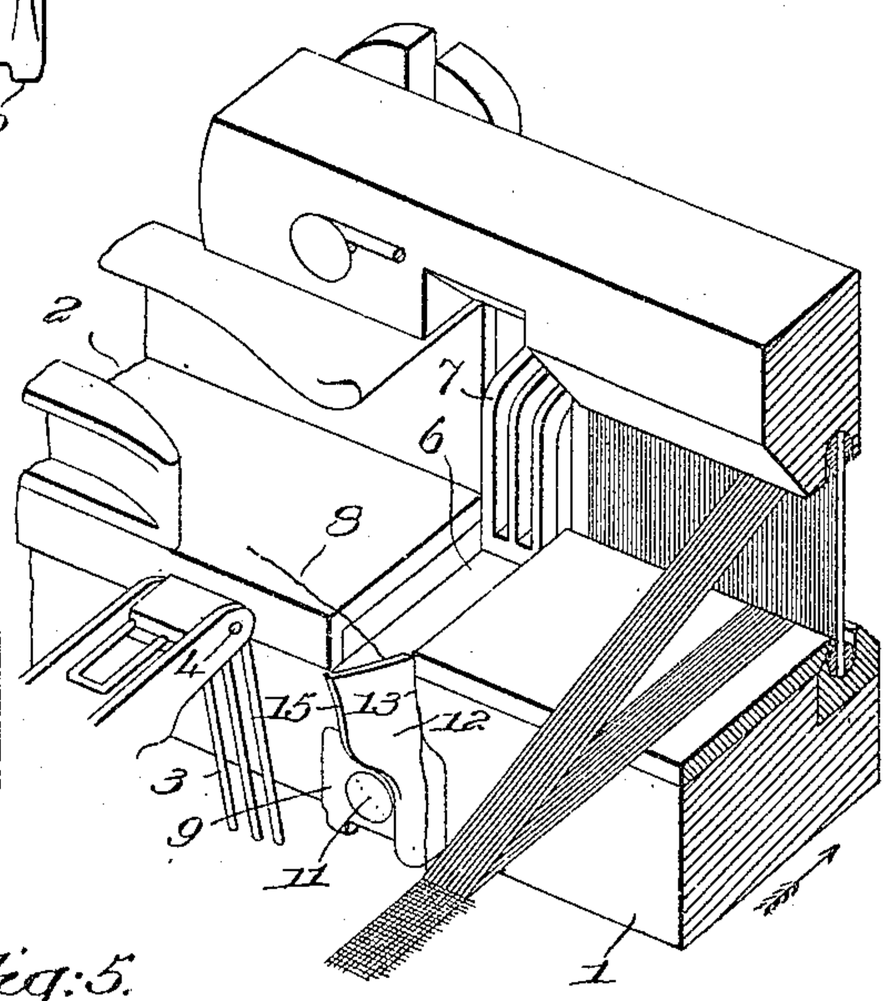
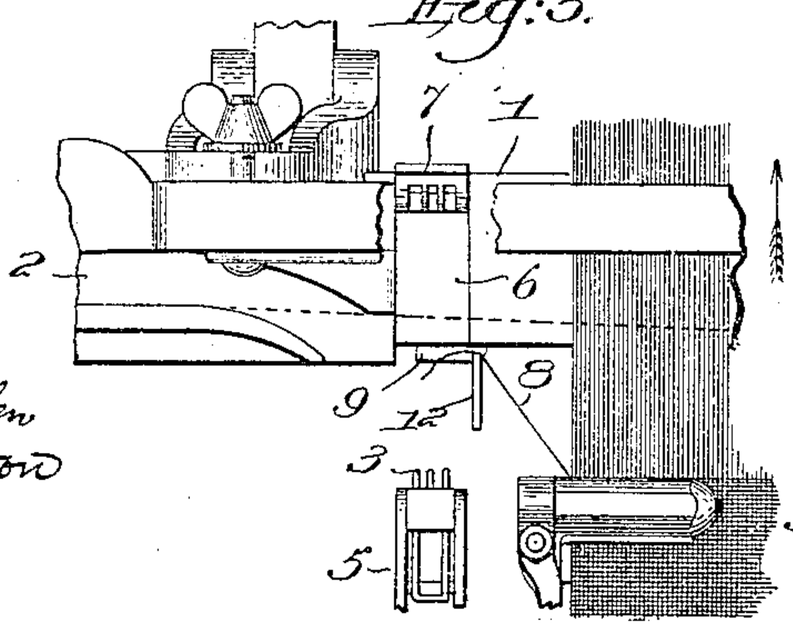



Fig: 5.




Witnesses,
Edward G. Allen
S. William Litton

Inventors,
William F. Draper;
Jonas Northrop,
by Wesley Gregory.
Attys.

# UNITED STATES PATENT OFFICE.

WILLIAM F. DRAPER AND JONAS NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNORS TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

## TRAILING FILLING-END CLEARER FOR LOOMS.

No. 808,146. Specification of Letters Patent. Patented Dec. 26, 1905.

Application filed May 11, 1905. Serial No. 259,945.

*To all whom it may concern:*

Be it known that we, WILLIAM F. DRAPER and JONAS NORTHROP, citizens of the United States, and residents of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Trailing Filling-End Clearers for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like figures on the drawings representing like parts.

When in the ordinary operation of a loom the running filling fails—*i. e.*, breaks or is exhausted—the failure may occur in the cloth between the edges thereof or outside of the cloth between its edge and the point in the shuttle-box to which the filling may happen to run prior to the instant of failure. The usual detector to detect the presence or absence of filling, such as the well-known filling-fork, is so located as to detect at a point in the filling-path between the edge of the cloth and the shuttle-box, and filling laid in front of the fork tilts the same, whereas upon absence of filling the fork does not tilt, and through suitable mechanism a change is effected automatically in the operation of the loom. In case the filling fails outside the cloth the trailing end frequently remains extended from the edge of the cloth in front of the filling-fork, and the loom will continue to run without filling, the trailing filling end acting to lift or tilt the fork and the take-up mechanism continuing to operate until the trailing end is worn off or becomes detached. Manifestly such continued operation of the loom without filling causes a thin place in the cloth, in some cases an inch or more in width before it is discovered, spoiling the cut of cloth and objectionable in any case. The great importance of perfect freedom of action for the filling fork or detector and the performance of its proper functions unimpeded or hampered will be obvious, the freedom from thin places in the cloth being absolutely dependent upon the accuracy and certainty of operation of the filling-detector.

Our present invention has for its object the production of simple and efficient means for clearing or removing with certainty from a position in which it could affect the operation of the filling-detector such a trailing filling end as has been just referred to, whether the trailing end be in position to coöperate with the detector after the manner of intact filling or in position to prevent detecting action by reason of fouling the detector.

In accordance with our invention we have provided means operated by or through the lay to engage a trailing filling end extended from the cloth and either push it when the lay beats up or pull it when the lay goes back out of position where the action of the filling-detector can be affected or break it if it has caught on any of the adjacent parts.

The various novel features of our 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 a loom to be understood with our present invention applied thereto. Fig. 2 is a transverse sectional detail, enlarged, on the line 2 2, Fig. 1, looking toward the left, with the lay back. Fig. 3 is a perspective detail showing the mode of operation of our invention when the trailing filling end extends from the cloth in front of the filling-fork, the lay moving back. Fig. 4 is a similar view showing the operation of the clearer on the forward beat of the lay and also assuming that the filling has looped around the tines of the fork. Fig. 5 is a detail in plan to illustrate the mode of operation of the clearer; and Fig. 6 is a front elevation, enlarged, of the device for effecting the clearance or removal of the trailing filling end.

We have herein shown our invention as applied to a loom of well-known construction. The lay 1, shuttle-box 2, the filling-detector, herein shown as a fork 3, pivotally mounted to tilt on a fulcrum 4 on the fork-slide 5, and the transverse recess 6 in the raceway of the lay, with the grid or grating 7, may be and are all of substantially usual construction and operate in a manner well known to those skilled in the art.

When filling is laid along the lay-raceway in front of the fork, the latter is lifted or tilted and the normal operation of the loom continues. If, however, the filling fails, either by exhaustion or breakage, the detection thereof depends upon the proper action of the fork, perfect freedom of the latter being requisite in order that it may remain untilted as it sweeps across the lay, so that a change in the operation of the loom will be effected—such,

for instance, as a replenishment of the running filling or stoppage of the loom, as the case may be. If the filling fails outside the cloth, between its edge and the adjacent shuttle-box, the trailing end of filling extended from the edge of the cloth will frequently assume such a position as will affect the operation of the fork. For instance, it may extend from the edge of the cloth into the shuttle-box across the recess 6, as shown at 8, Fig. 1, so that such trailing filling end 8 will to all intents assume the position of properly-laid and intact filling, and as the lay beats up the fork will engage the trailing end and will be tilted, precisely as if the filling were intact. This operation will be repeated on each detecting-pick for a longer or shorter period and the take-up will continue to operate normally as the loom continues to run, though no filling is laid and a thin place is made in the cloth. To obviate this most objectionable result, we have herein shown a clearing device, in the present embodiment of our invention mounted on the lay at the front thereof, to engage a trailing filling end and remove it from a position where it can affect the action of the fork.

Herein the clearer is shown as a metallic piece comprising a base portion 9, adapted to rest against the front face of the lay and provided with positioning-lugs 10, which project under the lay, a bolt 11 securing the clearer rigidly in position. The clearer proper is shown as upturned from the base and integral therewith, said clearer being made as a rather thin, flat, or blade-like portion 12, lying in a plane transverse to the lay and having its rear upright edge 13 set forward to leave a space or clearance 14 between it and the front face of the lay. (See Fig. 2.) The front upright edge 15 of the clearer is shown as inclined upward and forward and the top edge 16 is upwardly inclined from back to front, the clearer being located between the fork-recess 6 and the adjacent edge of the cloth, and hence moving in a path at one side of the fork.

Referring to Fig. 1, at the left-hand side thereof let it be supposed that the lay is beating up and that the trailing filling end 8 is in the position shown, then as the lay advances the broken filling is beaten in and the fork will be tilted on that pick by the trailing end. The lay now swings back, and as it does so the rear upright acting edge 13 of the clearer engages the trailing end, and such end is pulled out of the way of the fork, as shown in Fig. 5, where the lay has nearly attained its extreme backward position—that is, as one end of the trailing end is held at the edge of the cloth and the other end is free the trailing end will draw around the rear edge of the clearer as the lay goes back and the trailing end drops down into the clearance 14 below the point at which it can affect the action of the fork on the next forward beat of the lay. If the trailing end is short, it will frequently be drawn entirely away from in front of the fork and out of engagement with the clearer, or if long it will be drawn part way out by the clearer and then will drop by its weight into the clearance-space 14 into a perfectly harmless position. In Fig. 3 the lay is moving back and the trailing end 8 is shown as it draws across the rear edge of the clearer and out of the way of the fork. From an inspection of the drawings it will be seen that this clearing of the trailing filling end from a position in which it can affect the action of the fork takes place on the backward beat of the lay immediately succeeding the forward beat on which the failure of filling occurred, so that on the subsequent detecting-beat the fork is perfectly free and unhampered by the trailing filling end and will not be tilted, as it then detects the absence of filling.

In Fig. 5 the dotted line indicates the position of the trailing filling end at the time the filling fails, it then being in position to tilt the fork. If the fork jumps over the filling and the end is carried back into the cloth, as shown in Fig. 4, looping the filling around the fork and holding it in tilted position, the clearer would act to release or clear the fork by engaging the filling between the fork and the cloth as the lay beats up and the front edge 15 of the clearer breaks the filling, releasing the fork.

The rear edge of the clearer is carried above the raceway high enough to with certainty operate when occasion requires on the backward beat of the lay, and the front edge 15 is carried up somewhat higher to compensate for the curved path in which the lay moves and also to absolutely insure engagement with the filling end on the forward beat when necessary.

No interference can occur between the trailing end clearer and the running filling, as the clearer is located wholly outside the path of the running filling or the shuttle.

The clearer can be applied to looms now in operation by the addition of a single bolt, as the clearer interferes with nothing else on the loom. While its action is at once certain, prompt, and effective, its simplicity of structure and operation is of importance, as there are no relatively moving parts or portions liable to become worn.

The invention is equally effective and valuable whether applied to a single or a double fork loom, as will be manifest, and in Fig. 1 we have shown a loom of the latter type with a clearer at each side, one for each fork.

Our invention is not restricted to the precise construction herein shown and described, for the same may be modified or varied in different particulars by those skilled in the art without departing from the spirit and scope of our invention.

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

1. In a loom, a lay, a filling-fork, and means fixedly mounted on the lay, and moving in a path at one side of the fork, to prevent a trailing filling end extended from the cloth from affecting the action of the fork.

2. In a loom, a lay, a detector to detect absence of filling, and means fixedly mounted on the lay and moving in a path at one side of the fork, to free the detector from control by a trailing filling end extending from the cloth.

3. In a loom, a lay, a detector to coöperate with a running filling-thread laid in front thereof, and means fixedly mounted on the lay in a plane transverse thereto to relieve the detector from coöperation with a trailing filling end extended from the cloth.

4. In a loom, a lay, a shuttle reciprocable thereupon to lay the filling, a filling-fork to coöperate with the filling laid in front thereof, and an upturned clearer fixedly mounted on the lay in a plane transverse thereto and moving in a path at one side of the fork, to automatically relieve the fork from coöperation with a trailing filling end extending from the cloth and in front of the fork.

5. In a loom, a lay having a transverse fork-recess, a filling-fork adapted to be tilted by intermittent engagement with the running filling, and means fixedly mounted on the lay between the cloth and the fork-recess to clear the fork from coöperation with a trailing filling end extended from the cloth and in position to engage and tilt the fork.

6. In a loom, a lay, a filling-fork to coöperate with and be tilted by running filling laid in front thereof, and an upright clearer fixedly mounted on the front of the lay and moving in a path between the fork and the edge of the cloth to act upon a trailing filling end so laid and extending from the cloth and free the fork from the influence of such trailing end.

7. In a loom, a lay, a filling-fork, and a filling-end clearer mounted on the lay and having an upright, thin and flat portion fixedly extended in front of and at right angles to the lay, to engage a trailing filling end extended from the cloth and clear the same from a position affecting the action of the fork.

8. In a loom, a lay, a filling-fork, and a blade-like filling-end clearer fixedly mounted on the front of the lay and set out therefrom and extended above the raceway, to engage a trailing filling end extended from the cloth and clear the same from a position affecting the action of the fork, the space between the lay and the rear edge of the clearer permitting a trailing filling end to drop thereinto below the fork-path across the lay-raceway.

9. In a loom, a lay, a filling-fork, and a filling-end clearer fixedly mounted on the lay at the front thereof in a plane transverse to the lay, and having front and rear upright acting edges, to engage a trailing filling end extended from the cloth and clear the same from a position affecting the fork action, the front and rear acting edges of the clearer operating on the forward and backward strokes, respectively, of the lay, to push or pull the filling end into harmless position.

10. As a new article of manufacture, a filling-end clearer for looms, comprising a base adapted to be secured to the front of a loom-lay and a rigidly-attached upright, blade-like portion adapted to lie in a plane transverse to the lay and to engage a trailing filling end when the clearer is in use.

11. In a loom, a lay, a filling-fork, and means fixedly mounted on the lay in a plane transverse thereto to free the fork from control by a trailing filling end on the forward stroke of the lay.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM F. DRAPER.
JONAS NORTHROP.

Wittnesses:
OLIVER H. LANE,
ARTHUR W. BEARDSELL.