

J. NORTHROP.
THIN PLACE PREVENTER FOR LOOMS.
APPLICATION FILED SEPT. 9, 1909.

973,129.

Patented Oct. 18, 1910.

2 SHEETS—SHEET 1.

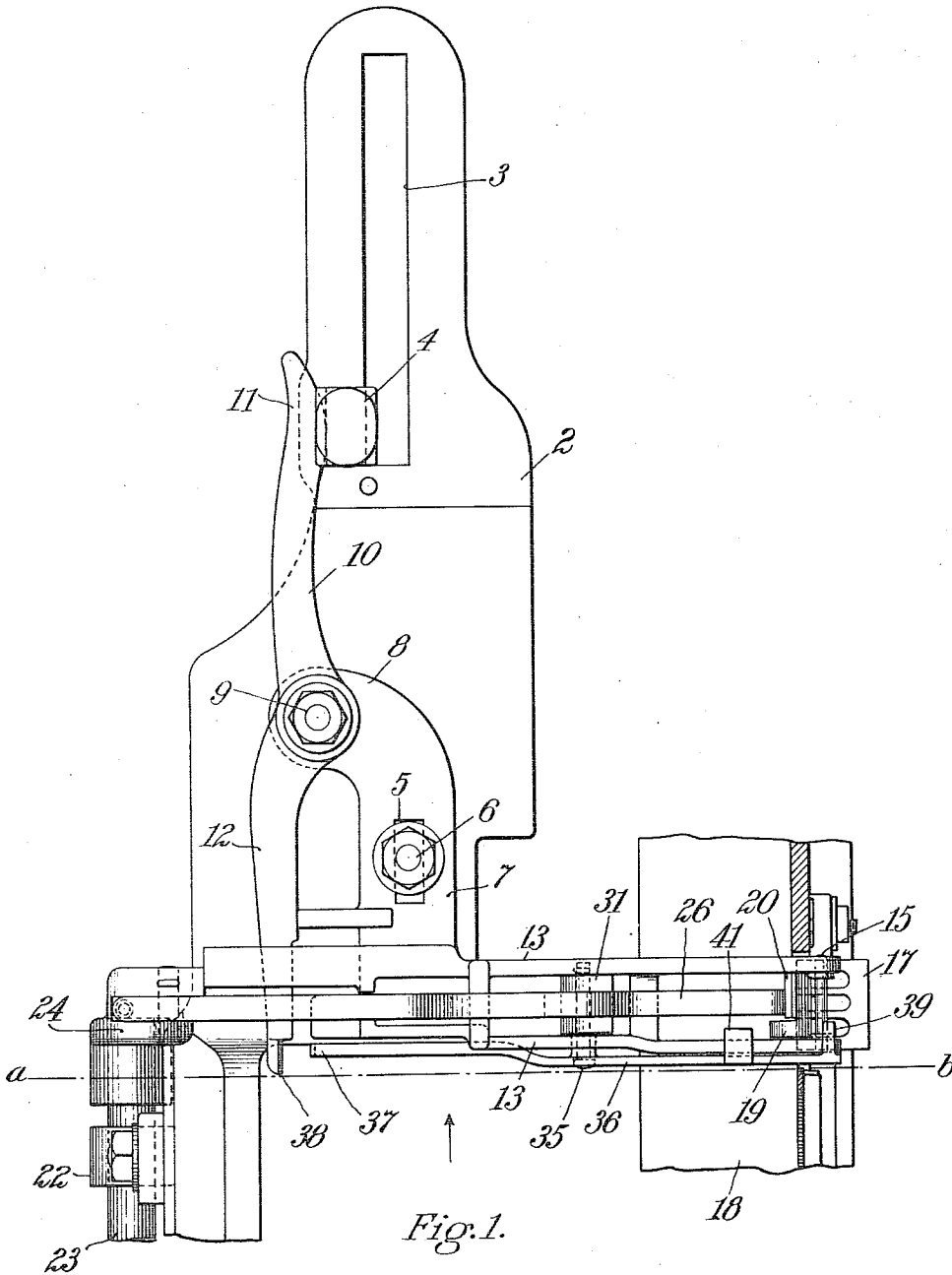


Fig. 1.

Witnesses:
Liquid Lubity.
Marion D. Kimball

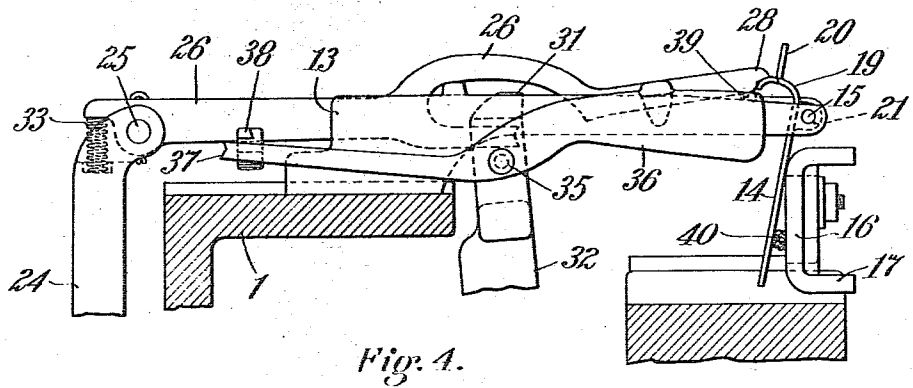
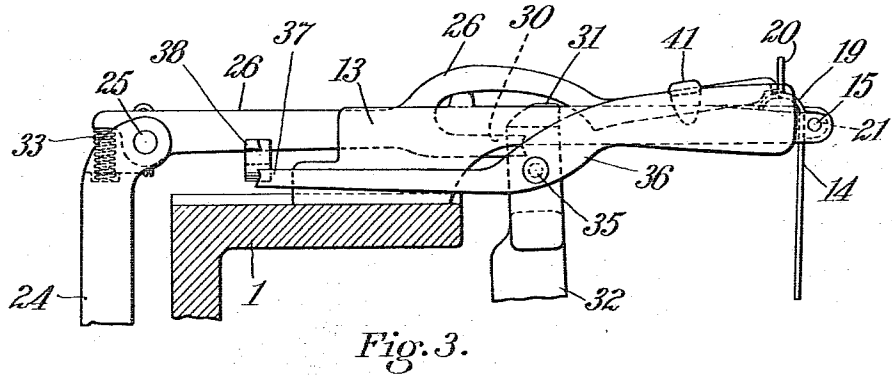
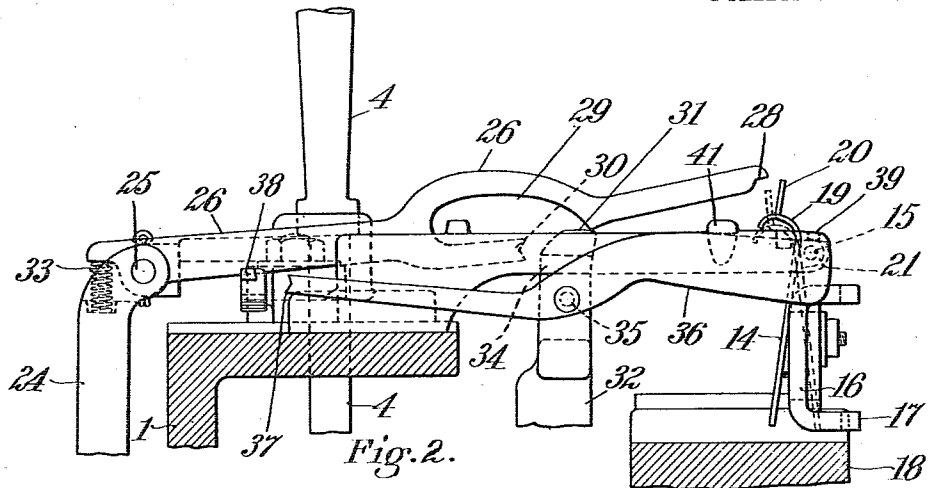
Inventor:
Jonas Northrop.
by *Robt. P. Harris*
Atty.

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2 SHEETS-SHEET 2.



Witnesses:
Signed Luby
Marion F. Kentball

Inventor:
Jonas Northrop
by Robt. A. Haas
Atty.

UNITED STATES PATENT OFFICE.

JONAS NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO WILLIAM F. DRAPER, OF HOPEDALE, MASSACHUSETTS; CLARE H. DRAPER AND OLIVER H. LANE EXECUTORS OF SAID WILLIAM F. DRAPER, DECEASED.

THIN-PLACE PREVENTER FOR LOOMS.

973,129.

Specification of Letters Patent.

Patented Oct. 18, 1910.

Application filed September 9, 1909. Serial No. 516,849.

To all whom it may concern:

Be it known that I, JONAS NORTHROP, a citizen of the United States, and a resident of Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in Thin-Place Preventers for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The invention to be hereinafter described relates to looms, and more particularly to means for preventing the formation of thin places in the cloth being woven.

As well known by those skilled in the art, a weft fork is ordinarily employed to detect the presence or absence of weft or filling in the shed, and to cause the loom to stop or a train of mechanism to be put in operative condition to effect a new supply of weft or filling when an absence of weft or filling is detected. In either case it is the failure of the weft fork to be tilted that determines whether either of the above results shall be reached. It happens at times that lint accumulates on the lay opposite the weft fork, or that the weft fork or one of its tines becomes bent, or other contingency arises, so that even though no weft or filling be laid in the shed by the shuttle, the weft fork may continue to be tilted as the lay beats up and the loom continue to operate even though the weft or filling has become broken or exhausted and remains so. The result is the production of thin places in the cloth being woven, as will be clearly apparent to those familiar with the art.

The aims and purposes of the present invention are to overcome this defective action and provide means whereby, should the weft fork be tilted for reasons other than the presence of weft or filling in the shed, the loom will be stopped, all as will herein more fully appear in connection with the following description of one form of means for carrying the invention into practical effect, it being understood that the invention may be embodied in various forms of means other than that shown and described, as it is not restricted thereto.

In the drawings Figure 1 is a plan view representing sufficient of one side of a loom containing the present invention; Fig. 2 is

a section on the line *a—b*, Fig. 1, looking in the direction of the arrow, and with some of the parts omitted in the interest of clearness, the weft or filling being shown as being present in front of the weft fork; Fig. 3 is a view similar to that of Fig. 1, with the parts in another position, and some features being omitted to afford better illustration of others; and Fig. 4 is a sectional view showing the weft fork as improperly tilted by a bunch of lint even though the weft or filling is not present in the shed.

The loom frame may be of any usual or desired character and is provided with the breast beam 1 from which projects a bracket 2 having the slot 3 and usual holding notch for a shipper 4 which controls the operative and inoperative condition of the loom, as well understood by those skilled in the art.

Secured to the breast beam by suitable means, as by slot 5 and bolt 6, is a bracket 7, one portion 8 of which may conveniently provide a support for the pivot 9 of the knock-off lever 10, the end 11 of which is disposed in such position that movement of the lever 10 clockwise, viewing Fig. 1, will cause the shipper to be detached from its holding notch and the loom to stop, as usual. The other portion 12 of the knock-off lever is extended into such position that upon improper tilting of the weft fork for any reason, it will be moved to free the shipper from the holding notch and effect loom stoppage, as will more fully appear.

Extending from the bracket 7 are the fixed supporting arms 13, 13 carrying the weft fork 14 at their outer ends, said weft fork being pivoted thereto at 15 and having the downwardly extending tines, which, unless prevented, are adapted to pass between the upright bars 16 of the usual grid 17 secured to the lay beam 18, as the lay beats up.

The weft fork is provided with a cam or or arched portion 19 adjacent one of the fixed supporting arms 13 and preferably disposed between said arms for a purpose that will presently appear, and has the upwardly extending finger 20. In the present illustration the weft fork is conveniently formed of sheet metal and has the side ears 21 by which it is pivotally supported, although, as will be obvious, this is not es-

sential and various changes may be made in these respects within the true scope of the present invention.

The invention is herein shown and described as associated with a filling replenishing loom, but it is to be understood that this is for exploitation purposes only, the invention being adapted for association with any character of loom.

10 Mounted in brackets or bearings 22, Fig. 1, is the usual transverse shaft 23 of a filling replenishing loom, said shaft having an arm 24 rising therefrom to which is pivoted at 25 the actuator 26, the end of which has a shoulder 28 adapted to coact with the finger 20 of the weft fork. The actuator 26, as described in application filed August 30, 1909, Ser. No. 515,152, may have a curved or recessed portion 29, and a portion 30 adapted 20 to coact with the slotted head 31 of a weft hammer 32, the construction being such that when weft or filling is properly laid in the shed in front of the weft fork, and the lay beats up, the weft fork will be tilted 25 and the finger 20 be moved from under the portion 28 of the actuator so that it may drop under the influence of gravity, assisted, if desired, by the spring 33 disposed between the front end of the actuator and the arm 30 24, and permit the portion 30 thereof to pass into the slot 34 of the weft hammer without being moved by the latter as it makes its forward stroke; but should the filling improperly fail to be laid in the shed in front 35 of the weft fork, and the weft fork be not tilted as the lay beats up, the shoulder 28 of the actuator will meet and be supported by the finger 20 of the weft fork, so that the weft hammer will, on its forward movement, move the actuator and set in action a train of mechanism which may either cause filling replenishment, as in the construction illustrated, or loom stoppage.

In the embodiment of the invention 45 shown, the weft fork mechanism is at the side of the loom opposite or remote from the filling replenishing mechanism, and, as usual, the weft hammer makes one excursion and return to each two beat up movements of the lay, the consequence is that weft or filling detection, as above indicated, will occur when the shuttle is in the box at the side of the loom remote from the filling replenishing mechanism, and the weft hammer will move forward the actuator when 50 the shuttle is on the filling replenishing side, although this relation and action of parts are not essential to the true scope of the invention, as will be readily understood.

60 It sometimes happens that a bunch of lint may accumulate in front of the grid 17, or a tine of the weft fork may become bent, or other condition arise, which, notwithstanding the fact that weft or filling may not be 35 laid in the shed, will cause the weft fork to

be improperly tilted on the beat up movement of the lay. Under these conditions the loom will continue to run without filling and thin places be formed in the cloth, as will be readily understood. The present 70 invention contemplates means for preventing the formation of such thin places, one form of which means will now be described, it being understood that the invention is generic in this respect, and that other means 75 than the means shown and described may be employed to this end.

Pivottally mounted on the weft hammer 32 at 35 is a tilting member or lever 36, the front end 37 of which, when in raised position, is adapted to meet the end 38 of the knock-off lever on the frontward movement of the weft hammer and release the shipper, thus causing the loom to stop; but which front end, when in lowered position, 85 as will presently appear, is adapted to move beneath the end 38 of the knock-off lever without moving it. The tilting member or lever 36 has a lug or projection 39 at its end portion adjacent the weft fork, which, 90 as the weft hammer moves back and forth in usual manner, is adapted to cooperate with the cam or arched portion 19 of the weft fork, the construction and relation of the parts being such that when the weft 95 hammer is in its back position, as in Fig. 2, said lug or projection 39 will be in rear or back of the cam or arched portion 19, and when the weft hammer is in its front position the lug or projection 39 will be in 100 front of or on the opposite side of said cam or arched portion, as indicated in Fig. 4.

From the construction described it will be clear to those skilled in the art that so long as the loom is working under normal conditions, that is without the accumulation of lint in front of the grid, as at 40, Fig. 4, and in the absence of other condition that would cause the weft fork to improperly tilt, the lug or projection 39 will travel back and forth over the cam or arched portion 19 of the weft fork and act to position it for its next indication of weft or filling absence or presence; and if, under these normal conditions, the filling fails, the weft fork will 115 act, as usual, to cause filling replenishment or stoppage, as the case may be in the particular loom. Should a condition arise which would cause the weft fork to improperly tilt during the absence of weft or 120 filling on the detecting pick, the lug or projection 39, on the frontward movement of the weft hammer, would again ride over the cam or arched portion 19 of the weft fork, and on its return or rearward movement 125 would find the weft fork in tilted position, as in Fig. 4, so that the projection or lug 39 would pass beneath the cam or arched portion 19 of the weft fork, thus failing to depress the end 37 of the member or lever 130

36, which, on the return frontward movement, would engage the end 38 of the knock-off lever and cause the loom to stop in a manner well understood, whereupon the defect causing stoppage may be corrected.

If desired the tilting member or lever 36 may have a lug 41 to normally support the fork end of the lever by engaging and sliding on one of the fixed supporting arms 13, when the lug or projection 39 is not riding over the cam or arched portion 19 of the weft fork, said end of the lever being preferably made heavier than the outer end 37. Obviously various changes may be made in the form, character, and general relation of the parts, and means other than the means shown may be employed within the true scope of the present invention, which is definitely pointed out by the claims.

What is claimed is:

1. In a loom, the combination of a lay, loom stopping means, a weft fork, means controlled by the weft fork to actuate the stopping means, and actuating devices for causing said controlled means to stop the loom when the weft fork is tilted on the non-detecting beat of the lay with reference to said weft fork.

2. In a loom, the combination of a lay, stopping means for the loom, a weft fork, means operatively related to the stopping means, and mechanism for moving said operatively related means to cause the loom to stop when the weft fork indicates presence of filling on the non-detecting beat of the lay with respect to said weft fork.

3. In a loom, the combination of a lay, stopping means for the loom, a weft fork, an arm operatively related to the stopping means and controlled as to its position by the weft fork, and means to cause said arm to actuate the stopping means when the weft fork controlled position of said arm improperly indicates presence of filling on the non-detecting beat of the lay.

4. In a loom, the combination of a lay, loom stopping means, means to indicate the presence of filling, and means operative on improper indication by said indicating means to actuate the stopping means.

5. In a loom, the combination of a lay, loom stopping means, means to indicate the presence of filling, and a stop arm operative on improper indication by said indicating means during the non-detecting beat of the lay to actuate the stopping means.

6. In a loom, the combination of a lay, loom stopping means including a knock-off element, means to indicate the presence of filling, and means operative on improper indication by said indicating means at the time of non-detecting lay movement to actuate the knock-off element.

7. In a loom, the combination of a lay,

loom stopping means, a weft hammer, means to indicate the presence of filling, and means actuated by the weft hammer to operate the stopping means when the indicating means improperly indicates the presence of filling on the non-detecting beat of the lay.

8. In a loom, the combination of a lay, loom stopping means, a filling detector operative as the lay beats up to detect the presence of filling, means operatively positioned to actuate the stopping means on improper indication of presence of filling by the indicating means, and actuating mechanism for said operatively positioned means.

9. In a loom, the combination of a lay, loom stopping means, a weft fork, a stop arm coöperating with said loom stopping means and adapted to be maintained in inoperative position under normal operative condition of the loom and to move into operative position when the weft fork indicates an abnormal condition on the non-detecting beat of the lay, and means to cause the stop arm to actuate the stopping means when the stop arm is in operative position.

10. In a loom, the combination of a lay, means to indicate the presence or absence of filling, a transverse shaft, loom stopping means, and means to actuate the transverse shaft when the indicating means properly indicates the absence of filling and to actuate the stopping means and stop the loom when the indicating means indicates presence of filling on the non-detecting beat of the lay.

11. In a loom, the combination of a lay, a weft fork to detect the presence or absence of filling, a transverse shaft, loom stopping means, and means to actuate the transverse shaft when the weft fork properly detects the absence of filling and to cause the loom to stop when the weft fork indicates the presence of filling on the non-detecting movement of the lay.

12. In a loom, the combination of a lay, a weft fork to detect the presence or absence of filling, and means acting positively to move the weft fork to detecting position after it has been moved by the filling and to prevent vibration thereof.

13. In a loom, the combination of a lay, a weft fork to detect the presence or absence of filling in the shed, a weft hammer, and means moved by said hammer and acting positively to return the weft fork to detecting position after it has been moved by a filling and to prevent vibration thereof.

14. In a loom, the combination of a lay, a weft fork having a cam portion, a weft hammer, and a member movable to engage said cam portion and return the weft fork to detecting position after it has been moved by a filling.

15. In a loom, the combination of a lay, a weft fork having a cam portion, a weft ham-

mer, a tilting member adapted to be tilted by said cam portion when the weft fork is in normal position and fail to be tilted by said cam portion when the weft fork is improperly out of normal position on the non-detecting movement of the lay, and stopping means controlled by said tilting member.

16. In a loom, the combination of a lay, a weft fork, a weft hammer, a tilting member under control of the weft fork, and means to cause the tilting member to move independent of the weft fork to stop the loom when the weft fork improperly indicates the presence of filling on the non-detecting movement of the lay.

17. In a filling replenishing loom, the combination of the lay, a weft fork, stopping mechanism for the loom, filling replenishing actuating means and means for operating said actuating means when the weft fork properly indicates an absence of filling, and means for actuating the stopping mechanism when the weft fork indicates presence of filling on the non-detecting movement of the lay.

18. In a loom, the combination of a lay, a weft fork having a cam portion, a weft hammer, and a member movable to engage and ride over said cam portion to return the weft fork to detecting position after it has been moved by a filling and to pass under said cam portion when the weft fork is tilted on the non-detecting beat of the lay.

19. In a loom, the combination of a lay, a weft fork, loom stopping mechanism, means adapted to be tilted by the weft fork following the detecting beat up movement of the lay and failing to be tilted by the weft fork on the non-detecting beat up movement of the lay when the weft fork is tilted on such non-detecting lay movement, and actuating devices for said means to operate the stopping mechanism when the said means fails to be tilted.

20. In a loom, the combination of the lay,

a weft fork, fixed supports for pivotally sustaining the weft fork, and means to move and temporarily hold the weft fork in initial position to prevent vibration thereof after being tilted by the filling.

21. In a loom, the combination of a lay and its shuttle boxes, a weft fork disposed at one side of the loom, stopping mechanism, and means controlled by the weft fork for actuating the stopping mechanism if the weft fork is tilted when the shuttle is in the box at that side of the loom more remote from the weft fork.

22. In a loom, the combination of a lay and its shuttle boxes, loom stopping mechanism, indicating means disposed at one side of the loom to indicate the presence of filling, and means rendered operative to actuate the stopping mechanism and stop the loom if the indicating means indicates presence of filling when the shuttle is in the box at the side of the loom remote from the indicating means.

23. In a loom, the combination of a lay, a filling detector to detect the presence of filling, loom stopping means, means controlled by the filling detector to actuate the stopping means when the filling detector is improperly operated, and actuating devices for said controlled means.

24. In a loom, the combination of a lay, loom stopping means, a weft fork, means controlled by the weft fork for actuating the stopping means, and means for actuating the controlled means to stop the loom when the weft fork is improperly tilted by other than the filling as the lay beats up.

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

JONAS NORTHROP.

Witnesses:

SHELBY X. VINCENT,
E. S. WOOD.