

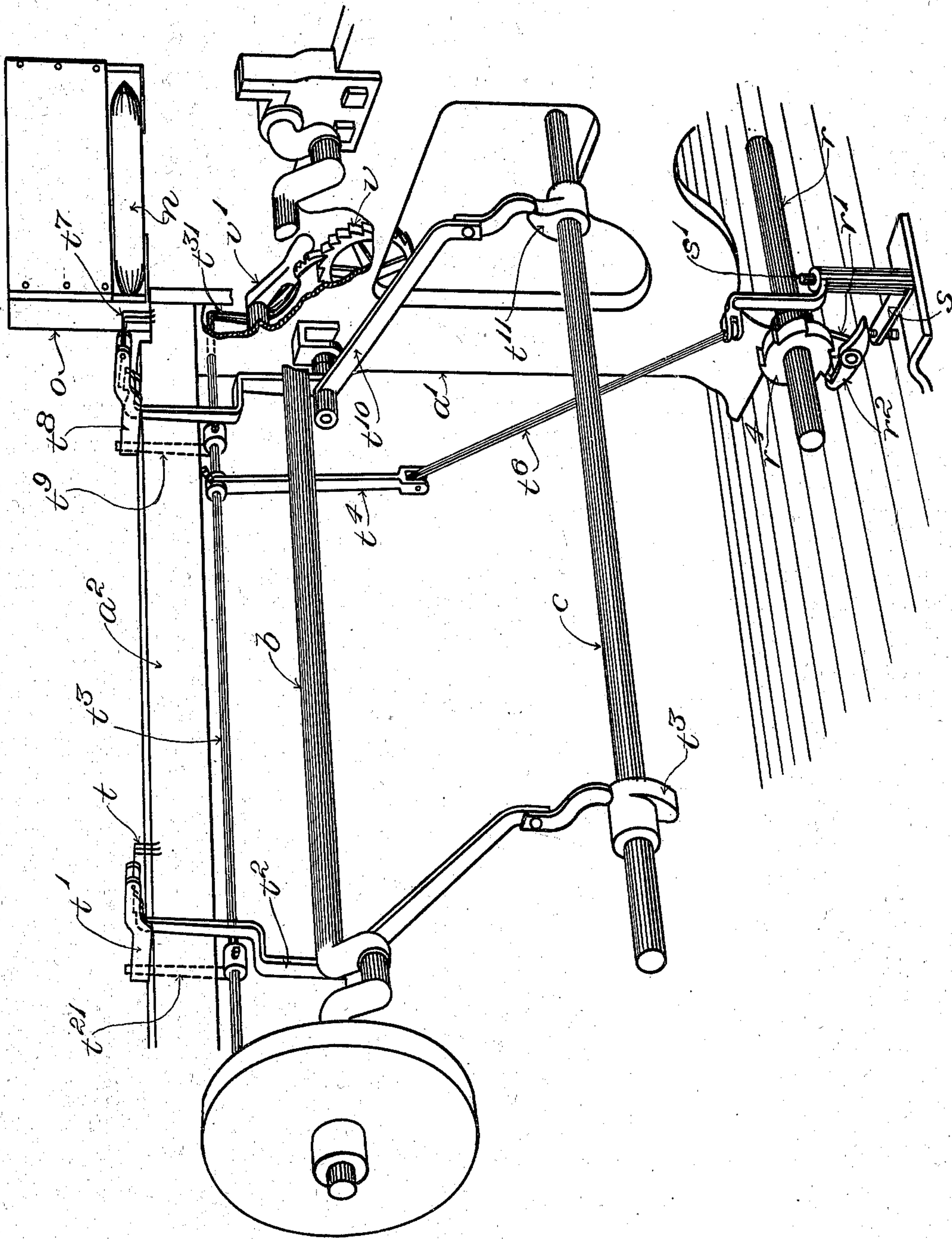
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Patented Sept. 16, 1902.

H. I. HARRIMAN.
WEFT REPLENISHING LOOM.

(Application filed Apr. 18, 1902.)

(No Model.)



Witnesses:

Oscar F. Hill
Edith J. Anderson.

Inventor:
Henry I. Harriman
by Maceo Balvers Randall
his Attorney.

UNITED STATES PATENT OFFICE.

HENRY I. HARRIMAN, OF NEW YORK, N. Y.

WEFT-REPLENISHING LOOM.

SPECIFICATION forming part of Letters Patent No. 709,440, dated September 16, 1902.

Application filed April 18, 1902. Serial No. 103,510. (No model.)

To all whom it may concern:

Be it known that I, HENRY I. HARRIMAN, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented a certain new and useful Improvement in Weft-Replenishing Looms, of which the following is a specification, reference being had therein to the accompanying drawing.

Looms are commonly provided with thin-place-preventing devices operating in well-known manner in connection with the take-up mechanism and brought into action by means of the weft-fork mechanism when the latter detects absence of the weft or filling, with the object in view of preventing the production in the cloth that is being woven of thin places due to taking up the cloth for one or more picks after breakage or exhaustion of the weft or filling. Various arrangements of thin-place-preventing devices are known, and the mode of operation varies somewhat in different arrangements. These different arrangements may all be comprehended for the purposes of this case under the general term "take-up-arresting devices." In practice a weft-fork is employed at one end of the loom only. In looms in which replenishment of the working weft-supply is effected automatically when the weft or filling breaks or runs out the weft-fork is located usually at the end of the loom opposite that at which the weft-replenishing instrumentalities are located. When breakage or failure of the weft occurs at the time of the flight of the shuttle toward the weft-fork side of the loom, the weft-fork will detect such occurrence immediately after the said pick and will act accordingly to arrest the taking up of the cloth and bring about the operation of the weft-replenishing instrumentalities; but should the breakage or failure of weft present itself during the flight of the shuttle in the opposite direction the said fact will not be detected until after the next succeeding pick toward the weft-fork side, involving thus a delay or loss of one pick before the taking up of the cloth is arrested and the action of the weft-replenishing instrumentalities is instituted. Inasmuch as the devices which are employed in connection with the take-up are arranged to produce a suspension of the taking up of

the cloth corresponding with a fixed number of picks of weft and are not adapted to provide for a variable number of picks, it results that when the weft breaks or is absent during the flight of the shuttle from the weft-fork side of the loom to the opposite side a thin place corresponding with the aforesaid difference of one pick of weft is produced in the cloth. It has been essayed to provide means for preventing the loss of a pick and the formation of a thin place in the cloth in whichever direction the shuttle may be moving when the weft breaks or runs out. The arrangements which have been devised for the purpose, however, have not to my knowledge come into use.

The object of my invention is to produce an improved combination of parts of simple and practical character for attaining the desired result.

My invention is susceptible of embodiment in somewhat-varying forms without involving departure from the invention in its broader aspects, and with regard to these last it is not limited to the specific construction that is shown in the accompanying drawing, and specifically described in this specification.

The drawing shows in perspective portion of a loom having the preferred embodiment of the invention applied thereto. The loom which is partly shown in the drawing is supposed to be of the general character of that which is presented in United States Letters Patent No. 652,105, granted to me June 19, 1900, to which reference may be had. Only such parts of the loom are shown as are essential to an understanding of the invention and of the manner of applying the same to a loom.

Having reference to the drawing, the end frame at the change end of the loom is shown in part at a' , the breast-beam at a^2 , the crank-shaft at b , and the cam-shaft at c . A magazine such as is employed for containing the reserve weft-supply at the weft-replenishing end of the loom is shown at o , a reserve-shuttle being indicated at n in position in said magazine adjacent the mouth of the latter. At t is represented a weft-fork occupying the position customarily occupied by the weft-fork of a weft-replenishing loom—namely, at

the end of the loom opposite to that at which the weft-replenishing instrumentalities are located—and t' being the slide carrying the said weft-fork, it being mounted upon the breast-beam a^2 , as usual, in manner permitting it to move from front to rear crosswise of the breast-beam. The gooseneck or weft-hammer coöperating with the said weft-fork t is shown at t^2 , and the operating-cam for the gooseneck is shown at t^3 , mounted upon the cam-shaft c . At r is represented portion of the change-shaft, the latter being in operative control of the weft-replenishing instrumentalities through the agency of cams and intermediate connections, as in the Letters Patent aforesaid. The arm r' , fast upon the said change-shaft, the pawl or dog r^2 , pivoted upon the said arm, and the independently-driven ratchet-wheel r^4 , turning independently of the change-shaft, all may be essentially as in the patent. The controller for the said pawl or dog r^2 is indicated at s , the vertical pivot on which said controller turns being designated s' , and t^6 being the rod or connection through which motion is transmitted to the said controller. In the present instance the said rod or connection t^6 is joined at its forward extremity to the arm t^4 , depending from the rod t^3 and fast therewith. The said rod t^3 extends across the loom immediately below the breast-beam a^2 and is mounted in bearings in connection with the two end frames. An arm t^{21} , fast upon the said rod t^3 , extends upward adjacent the slide t' of the weft-fork. At v is represented the ratchet of the take-up mechanism, and at v' the compensating pawl, which coöperates with the said ratchet. The said compensating pawl is of well-known construction and mode of operation, and these being familiar to those who are skilled in the art I will not describe the same specifically. The rod t^3 is provided with an arm t^{31} , which is in operative engagement with the compensating pawl v' .

The action of the parts which have thus far been referred to will be obvious. The controller s stands normally in the position in which it is represented in the drawing, holding the engaging portion of the pawl or dog r^2 out of the path of rotation of the teeth of the ratchet-wheel r^4 . When no weft is carried against the weft-fork t by the advance of the lay following the flight of the shuttle toward the side of the loom at which weft-fork t is located, the engagement of the gooseneck or weft-hammer t^2 with the tail of the weft-fork then permitted to take place will cause the slide t' to be advanced through the action of the gooseneck or weft-hammer, the said slide acting through the arm t^{21} to rock the rod t^3 and the arm t^4 of the said rod serving to transmit movement through the connection t^6 to the controller s , so as to disengage the said controller from the pawl or dog r^2 and permit the engaging portion of the latter to swing into the path of rotation of the teeth

of the ratchet-wheel r^4 . The rocking of the rod t^3 also serves, through its arm t^{31} , to disengage the compensating pawl v' of the take-up ratchet v , thereby arresting the taking-up action. The dog or pawl r^2 having been permitted to assume its engaging position through the disengagement of the controller therefrom, the next tooth of the ratchet-wheel r^4 that comes around to the engaging portion of the dog or pawl will take hold of the same, which will clutch the ratchet-wheel and change-shaft together and cause the latter to rotate in unison with the former. Thereby the weft-replenishing instrumentalities will be made to operate.

In carrying the invention into effect I employ a second weft-fork, as t' , at the side of the loom opposite to that at which the weft-fork t is located, the same being operatively combined with the thin-place-preventing devices for the purpose of arresting the taking up of the cloth whenever it detects the absence of weft after the flight of the shuttle toward the change end of the loom. The said second weft-fork t' is also in operative control of the weft-replenishing instrumentalities. Thus the slide t^8 , disposed in customary manner upon the breast-beam a^2 and upon which the weft-fork t' is mounted, is arranged to engage with an arm t^9 , similar to the arm t^{21} and also made fast upon the rod t^3 , extending across the loom. A weft-hammer or gooseneck t^{10} is provided in connection with the said weft-fork t' , an operating cam, as t^{11} , being provided therefor upon the cam-shaft c . The second weft-fork t' acts to detect absence or breakage of the weft occurring during the pick of the shuttle toward the change end of the loom, and when the same occurs the engagement of the gooseneck or weft-hammer t^{10} therewith brings about an immediate disengagement of the compensating pawl v' by causing the slide t^8 as it is advanced across the breast-beam a^2 to bear the arm t^9 forwardly and rock the rod t^3 , raising the arm t^{31} so as to operate the compensating pawl v' . The rocking of the rod t^3 thus brought about occasions the disengagement of the controller s from the pawl or dog r^2 in the manner which has already been explained in describing the results of the action of the weft-fork t and connected devices when the weft-fork t detects the absence of weft or filling. This release of the dog or pawl r^2 is operative to institute the action of the weft-replenishing instrumentalities—that is to say, the dog or pawl having thus been released, as soon as the next tooth of the ratchet-wheel r^4 comes around to the engaging portion of the dog or pawl the said tooth will take hold of the said engaging portion so as to clutch the ratchet-wheel and change-shaft together and set the change-shaft to rotating. It will be understood that the timing of the teeth of the ratchet-wheel r^4 determines the timing of the replenishing operations. Consequently whichever weft-fork acts to detect the absence

of weft or filling the weft-replenishing operations are begun with the same timing in the general working of the loom, although the taking up of the cloth is arrested immediately upon detection of the absence of weft or filling by either of the weft-forks.

I claim as my invention—

1. In a weft-replenishing loom, in combination, weft-replenishing instrumentalities arranged to effect the replenishment of the working weft-supply, a take-up, weft-forks at opposite ends of the loom, a rod, as t^3 , extending across the loom and having in connection therewith means operated thereby to arrest the taking up and occasion the action of the weft-replenishing instrumentalities, and means operatively connecting said rod with both of said weft-forks whereby said rod is operated when either weft-fork detects the absence of weft or filling.

2. In a weft-replenishing loom, in combination, the change-shaft, clutch devices for driving the same, a controller for the said clutch devices, weft-detectors at opposite ends of the loom in operative control of said controller, and thin-place-preventing devices under operative control of both of the said weft-detectors and actuated to arrest the taking up of the cloth when either weft-detector detects the absence of weft or filling.

3. In a weft-replenishing loom, in combination, weft-replenishing instrumentalities, a controller, as s , in connection therewith, a take-up, weft-forks at opposite ends of the loom, a rod, as t^3 , extending across the loom

and having in connection therewith means operated thereby to arrest the taking up, said rod also having operative connection with said controller, and means operatively connecting said rod with both of said weft-forks, whereby said rod is operated when either weft-fork detects the absence of weft.

4. In a weft-replenishing loom, in combination, the change-shaft, the toothed wheel and dog or pawl for driving the change-shaft, the controller in connection therewith, weft-detectors at opposite ends of said loom in operative control of said controller, a take-up, and thin-place-preventing devices under operative control of both of the said weft-detectors and actuated to arrest the taking up of the cloth when either weft-detector detects the absence of weft or filling.

5. In a weft-replenishing loom, in combination, the change-shaft, the toothed wheel and dog, a controller, a take-up, weft-detectors at opposite ends of said loom, a rod, as t^3 , extending across the loom and having in connection therewith a thin-place-preventing device, said rod also having operative connection with said controller and both of said weft-forks, whereby said rod is operated when either weft-fork detects the absence of weft.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY I. HARRIMAN.

Witnesses:

CHAS F. RANDALL,
WILLIAM A. COPELAND.

It is hereby certified that in Letters Patent No. 709,440, granted September 16, 1902, upon the application of Henry I. Harriman, of New York, N. Y., for an improvement in "Weft-Replenishing Looms," an error appears in the printed specification requiring correction, as follows: Page 3, line 62, the compound word "weft-works" should read *weft-forks*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of September, A. D., 1902.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.