C. E. BLAIR.

WARP REPLENISHING MECHANISM.

APPLICATION FILED OCT. 2, 1911.

1,304,846

Patented May 27, 1919.

2 SHEETS—SHEET 1.

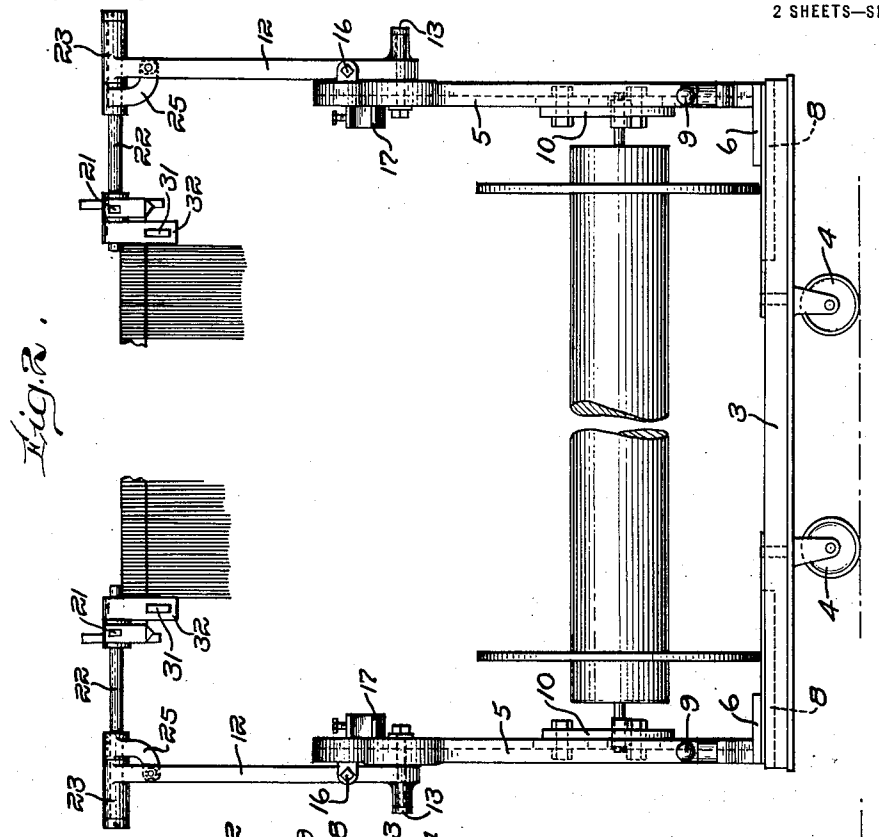


Fig. 2.

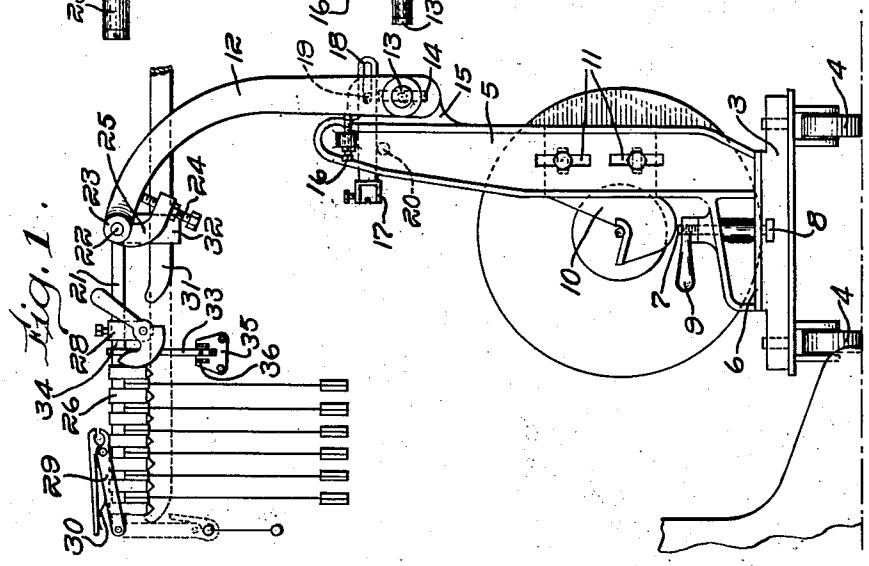


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

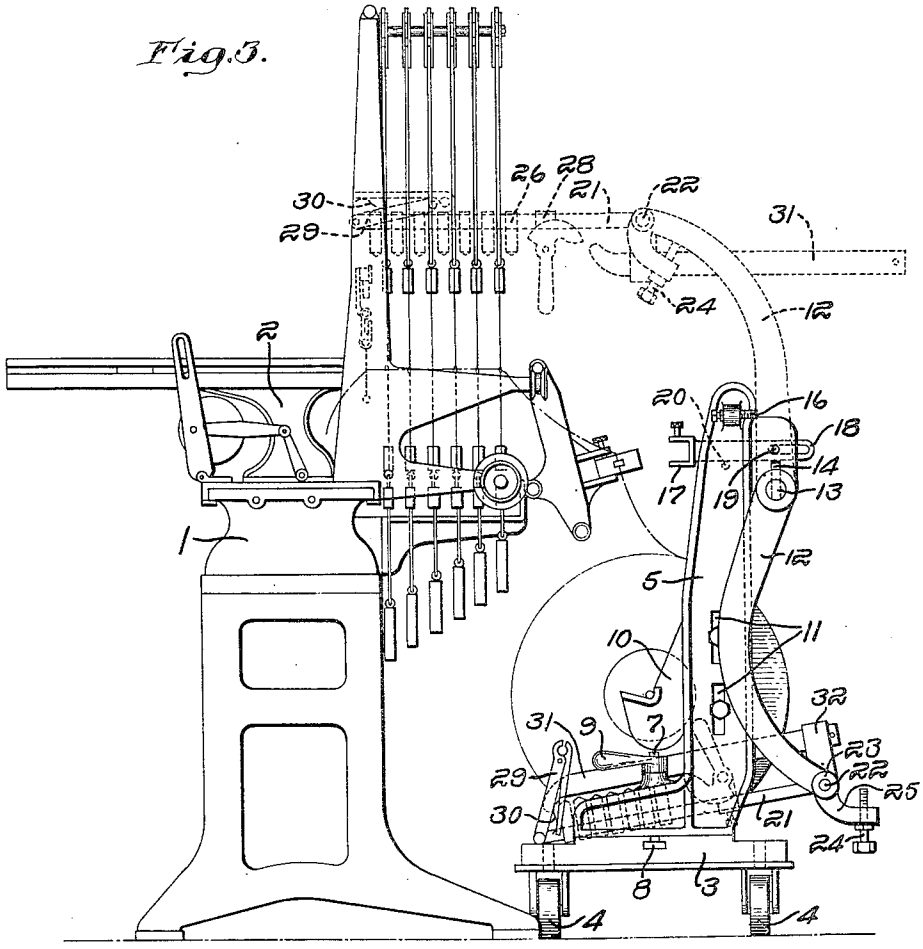


Fig. 4.

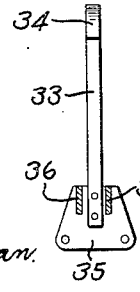
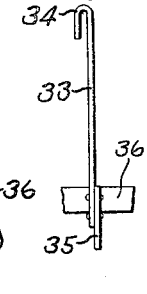


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES E. BLAIR, OF DORCHESTER, MASSACHUSETTS, ASSIGNOR TO AMERICAN WARP DRAWING MACHINE COMPANY, A CORPORATION OF MAINE.

WARP-REPLENISHING MECHANISM.

1,304,846. Specification of Letters Patent. Patented May 27, 1919.

Application filed October 2, 1911. Serial No. 652,261.

To all whom it may concern:

Be it known that I, CHARLES E. BLAIR, a citizen of the United States and a resident of Dorchester, county of Suffolk, State of Massachusetts (whose post-office address is 195 Freeport street, Dorchester, Massachusetts), have invented an Improvement in Warp-Replenishing Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to improvements in warp replenishing machines, and has particular reference to apparatus for facilitating the preparation of warps for installation in the loom.

Preferably the apparatus is in the form of a transfer device for use in conjunction with warp drawing-in machines, such device being adapted to load or unload the machine with the warp, harnesses or other loom elements employed, and being of such a nature as to increase the capacity and output of such machines, and facilitate the work of drawing-in the warps thereon.

The invention will be best understood by reference to the following description when taken in connection with the accompanying illustration of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a side elevation partly broken away showing a transfer device with the warp beam, harnesses and reed in position for installation in a warp drawing machine;

Fig. 2 is a front elevation of the transfer device shown in Fig. 1;

Fig. 3 is a side elevation of the same device showing its relation to a warp drawing machine;

Fig. 4 is a front elevation of a drop wire hanger adapted to be used in connection with a transfer device; and

Fig. 5 is an end elevation of the same.

Referring to the drawings and to the embodiment of the invention by which I have therein illustrated the same, there is shown one form of transfer device coöperatively associated by way of example with a well known type of drawing-in machine 1, the latter being of the same general construction as that shown in U. S. Patents Nos. 755,861, to Field, 871,860 to Field *et al.*, 862,474 to Hathaway and 980,086 to Field, Lanning, Hathaway & Blanchard. Such machine is herein shown for the sake of illustration, it being obvious that the transfer device described with suitable modification may be usefully employed with warp drawing and other machines of widely different construction.

In the illustrated form of machine, as is well known to those skilled in the art, the loom elements, that is to say, the warp threads and those elements such as the harnesses, reed and drop wires, which accompany and are associated with the drawn in warp for the control thereof in the loom, are supported in a generally parallel arrangement lengthwise the machine while an appropriate needle or other thread placing device carried by the traveling carriage 2 of the machine is caused to traverse the extent of the reed and harnesses and place successive warp threads through the desired heddle eyes and the selected reed dents, these being appropriately positioned for that purpose in the needle path by suitable selecting and positioning mechanisms.

In this, or in any other type of drawing-in machine, much time is usually expended in installing the loom elements in the machine preparatory to the drawing-in operation, and much time is apt to be expended in disconnecting and removing the drawing-in warp and other loom elements from the machine after the drawing-in operation, as well as in checking up errors in the placing of the threads and correcting such errors when they are found to have occurred. In the described form of drawing-in machine two selecting and positioning devices in the form of worm or screw shafts are employed for the harnesses which must be carefully applied to the harnesses when the latter are installed in the machine, and are carefully removed therefrom when the harnesses are withdrawn.

To reduce the period of idleness or inaction thus forced upon the machine, I have provided for use coöperatively with the drawing-in machine of a movable transfer device which is adapted to present the loom elements for installation in the drawing-in machine in substantially the same general relation they are to occupy therein, so that they may be conveyed to the machine, installed therein, and thereafter withdrawn

from the machine after the drawing-in operation has been completed. Through the provision of two or more of such transfer devices it is possible during the drawing-in of one warp to correct and check simultaneously the previously drawn-in warp while the latter is sustained upon one of these handling and conveying devices and to make such other preparations for the installation of the warp harness or reed in the loom as have been heretofore made while those elements remain supported in and consuming the productive time of the drawing-in machine. At the same time a warp may be made ready for installation in the machine as soon as the warp then in the machine is drawn in, this being accomplished by arranging the loom elements upon another loading device in the relation they are to occupy in the machine and applying to the harnesses those portions of the separating and positioning mechanisms which are detachable from the drawing-in machine. In this manner the drawing-in machine can be kept in substantially continuous operation without those prolonged interruptions which have heretofore been necessary in installing the undrawn warp in the machine and taking the drawn-in warp therefrom.

Referring to the particular type of transfer device illustrated, the same comprises a frame or platform 3 mounted upon the swiveled trucks 4 so that it may be rolled along the floor from place to place. At each end of the truck there is provided an upright support or standard 5 the latter having a foot 6 which can be adjustably clamped in different positions along the truck to accommodate different widths of warp beams and harnesses. For the adjustment of the standards the latter are each provided with a clamping screw 7 having a head working in a longitudinal T-slot 8 in the upper face of the truck platform, the threaded end of the screw being engaged by a nut having the handle 9 whereby the standard may be clamped in any desired position lengthwise the T-slot 8.

To support the warp beam the latter is journaled at each end in the holding bracket 10 clamped to the inner face of the adjacent standard 5 by means of bolts which pass through vertical slots 11 in the standard so that the brackets and therefore the warp beam may be adjusted vertically to different heights.

To support the reed, harnesses and drop bars a pair of upright arms 12 are provided pivoted each upon a stud 13, the latter adjustably fixed in a vertical slot 14 formed in a lug or projection 15 from the upper rear of the standard 5 so that the position of the stud may be adjustably raised or lowered as required. Each arm 12 can be freely swung about the stud 13 as indicated in Fig. 3 but when swung to an upright or operative position, as shown in Fig. 1, it is held against an adjustable stop screw 16 by the weight of its supported parts, such screw also serving to adjust the normal position of the arm and the height of the supported harnesses.

To provide means for holding the warp clamp, or a portion of the clamp, a U-shaped bracket 17 is provided at each end of the transfer device being secured to a horizontal slide arm 18. The latter is slotted to receive the stud 19 fixed on the inside of the projection 15 on the standard 5 and rests on the pin 20. The clamp holder may thus carry the warp clamp to the drawing-in machine and when the warp is installed and the clamp applied the arm 18 may be slid back out of the way.

The immediate supports for the harnesses are embodied in a pair of horizontal arms 21 secured each to a rock shaft 22, the latter journaled in a hub 23 carried by the end of the upright arm 12. The rock shafts 22 project inwardly and the supporting arms 21 project laterally therefrom over the truck, being held each in a harness supporting position by the adjustable stop screw 24, which latter is threaded in a lug 25 fixed on the shaft 22 and engages the curved under side of the arm 12 and definitely fixes the position of the horizontal arm 21.

The arms 21 are designed to be positioned just above the level of the upper harness shafts in the drawing-in machine and are provided with a series of clamping blocks 26 slidably mounted on the arm so that with the harness shafts located between the blocks the latter may be compressed to hold the harnesses fast as indicated in Fig. 1 by means of the cam member 27 pivoted on the adjustably fixed block 28.

To support the reed any suitable means may be provided such, for example, as a pair of holding clamps pivoted one at the end of each harness supporting arm 21, each holder comprising a pair of pivoted jaws 29 normally pressed together by the spring 30 but adapted to be opened at will. When the reed holding clamps are used to hold the reed they are thrown down to hang in the dotted line position shown in Fig. 1, the jaws gripping the upper shaft of the reed. When the jaws are not in use they can be turned back out of the way about their pivot as represented in full lines in Fig. 1.

Preferably in coöperation with the horizontal arms 21 I employ the arms 31 which herein are slidably mounted in the hanger blocks 32 fixed each to the end of one of the shafts 22 the arms 31 providing harness supports located at such a height that, when moved to the dotted line position shown in Fig. 1 they pass under and serve to support the ends of the harness shafts as best rep-

resented in Figs. 1 and 2. Either the arms 21 with their gripping or holding devices on the one hand or the arms 31 on the other hand may be used alone to support the harnesses but preferably they are used jointly in the loading or unloading of the loom elements.

Since the horizontal harness supporting arms are pivoted upon the upright arms 12 and the latter upon the standards 5, the entire supporting mechanism for the harnesses may be folded up or collapsed into the relation represented in full lines in Fig. 3 where it will be seen that the side supports are turned back and down upon the truck presenting no greater obstruction than would be presented by a warp beam truck alone. Furthermore, by this arrangement the supports are wholly at the side, leaving a clear unobstructed space between them when the harnesses are removed so that the operator has ready access to the machine or the warp beam whether the side supports are in their upright or collapsed position.

To support the drop wires when the latter are to be employed in the drawing-in machine, I have provided a pair of drop wire hangers one of which is shown in Figs. 4 and 5, and which can be attached to or removed from the horizontal arm 21 at will. When in position as shown in Fig. 1, it supports the drop wires immediately at the rear of the harnesses in the position in which they are intended to be held in the drawing-in machine.

Referring to Figs. 4 and 5, each hanger consists of the strap 33 having the hook-shaped end 34 by which it may be hung upon the arm 21 and carrying at the lower end the plate 35 having notches in which the stringer bars 36 for the drop wires may be placed.

To install the loom elements in the drawing-in machines the warp beam is placed in the holding brackets 10, the reed in the reed clamps 29 and the harnesses gripped by the gripping members 26 on the arms 21, or if desired, the harnesses may be supported alone upon the horizontal arms 31. These are substantially as shown in Fig. 1. If drop wires are to be used the hangers 33 are placed in position and the stringer bars 36 for the drop wires placed therein. The outer half of the warp clamp may be placed in the clamp brackets 17.

The transfer device with the loom elements thus arranged is then removed to the rear of the drawing-in machine as represented in Fig. 3, the reed fastened in the reed carrier of the machine and released from the reed clamps of the transfer device and the harnesses fastened to the harness hooks or supports of the drawing-in machine and released from the clamping blocks 26. The clamped ends of the warp threads being then installed in the machine, the half clamp is transferred from the bracket 17 of the transfer device to the clamp holder on the machine. The side supports may then be collapsed or folded back from the dotted line position shown in Fig. 3 to the full line position shown therein and the drawing-in operation proceeded with, the warp beam still remaining on the truck as shown in Fig. 3.

After the drawing-in operation has been performed the loom elements, namely the reed, harnesses and drop wires, if the latter are used, are restored to their original position in the transfer device, the side supports being swung up into the dotted line position shown and the lower horizontal arms 31 projected below the upper harness shafts to support the harnesses when the latter are freed from their hooks. With the reed secured to its clamps and the harness shafts gripped by the harness clamps 26 the transfer device can be moved back out of the way to permit a second transfer device with a fresh set of loom elements to be moved up to the machine for installation therein. While the fresh warp is being drawn in, the previously drawn in warp can then be moved away and conveyed to another part of the room or mill where the checking and correcting operation is to be carried on and where the harnesses are to be prepared for the loom. The installation of the new warp to be drawn in can therefore immediately follow the withdrawal of the drawn in warp so that the interval between successive drawing-in operations on the machine is reduced to a minimum. The several supporting devices on the transfer apparatus are so located that the harnesses, the reed and drop wires occupy the same general relation each to the other and the warp threads as they are designed to occupy in the drawing-in machine. This permits the errors to be as readily checked up with the drawn in warp on the transfer device as if the checking were performed on the drawing-in machine.

The invention is capable of use either as an unloading device exclusively or loading device exclusively, although the same is herein described as performing both functions.

While I have herein shown and described for purposes of illustration one specific form of the invention, it is to be understood that extensive deviations may be made from the details of construction as well as the arrangement of parts and various other applications may be made of the invention without departing from the spirit thereof.

Claims:

1. In a transfer device for transferring the work with relation to a drawing-in machine the combination with a transfer truck, of upright warp beam supports thereon and

pivoted collapsible harness transfer supports carried thereby.

2. The combination with a warp drawing machine of a transfer device for transferring the work with relation thereto, said transfer device comprising a truck adapted to be moved to or away from said machine and having upright end supports thereon and harness supports carried by said end supports, leaving a central, intermediate space unobstructed thereby, whereby harnesses may be added to said warp drawing machine from the back of said transfer device.

3. In a transfer device for a warp drawing machine the combination with a truck, upright standards thereon, arms pivoted on said standards and harness supporting arms mounted on said last named arms and means for fixing said supporting arms in substantially horizontal position.

4. In a transfer device, the combination with a truck, a warp beam holder thereon, upright standards, arms pivotally mounted thereon but adapted to be moved to an upright position, means for adjustably fixing the same in said upright position, horizontal arms pivotally mounted on said upright arms, means for adjustably fixing said horizontal arms in position, and harness supporting means on said horizontal arms, said upright and horizontal arms being collapsible about their pivots.

5. In a transfer device, the combination with a truck, of harness supporting means comprising a pair of arms, means supporting said arms for swinging movement upon the truck to permit their withdrawal from the drawing-in machine, and slidably mounted arms adapted to be moved to a position on a lower lever from said first named arms but having the same swinging movement.

6. The combination with a drawing-in machine of a transfer device having arms for supporting the under side of the harness shafts, supporting arms adapted to be presented above the harness shafts, clamping means on said upper set of arms and means for supporting said upper and lower arms.

7. The combination with a warp drawing machine of a transfer device for transferring the work with relation thereto, said transfer device comprising a transfer truck, upright warp beam supports thereon, harness supports carried by said warp beam supports, and means for adjusting said warp beam supports and said harness supports toward or from each other on the truck.

8. The combination with a warp drawing machine of a transfer device for transferring the work with relation thereto, the same comprising a portable transfer means for supporting the warp beam, harnesses and reed in the same general relation they occupy in the machine, and movable drop wire supporting means therefor for supporting the stringer bars of a series of drop wires.

9. The combination with a warp drawing machine of a portable transfer device for transferring the work with relation thereto, said device having harness supporting transfer arms and a drop wire hanger bar comprising means for holding the drop wire stringer bars thereon.

10. In a transfer device for transferring the work with relation to a warp drawing machine, the combination with a transfer frame for holding the warp and harness of a pivoted reed clamp thereon for holding the reed in the same general relation to the warp and harness which it occupies in the warp drawing machine.

11. In a transfer device for transferring the work with relation to a warp drawing machine, the combination with a truck of upright supports thereon for holding the warp and harnesses, horizontal supporting arms and pairs of pivoted reed clamping jaws on said arms for holding the reed in the same general relation to the warp and harnesses which it occupies in the machine.

12. In a transfer device for transferring the work with relation to a warp-drawing machine, the combination with means for holding the warp beam and harnesses whereby the latter may be transferred to or from the machine, of an adjustable warp-clamp supporting member carried by the transfer device.

13. In a transfer device for transferring the work with relation to a warp drawing machine, the combination with means for holding the warp beam and harnesses whereby the latter may be transferred to or from the machine of a slidable warp clamp member.

14. In a transfer device for transferring the work with relation to a warp drawing-in machine, the combination with a truck of warp beam holding means carried by said truck, upright supports at the ends of said truck adjacent one side of said beam, and harness supports projecting inwardly and horizontally from said upright supports.

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

CHARLES E. BLAIR.

Witnesses:

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EVERETT S. EMERY.