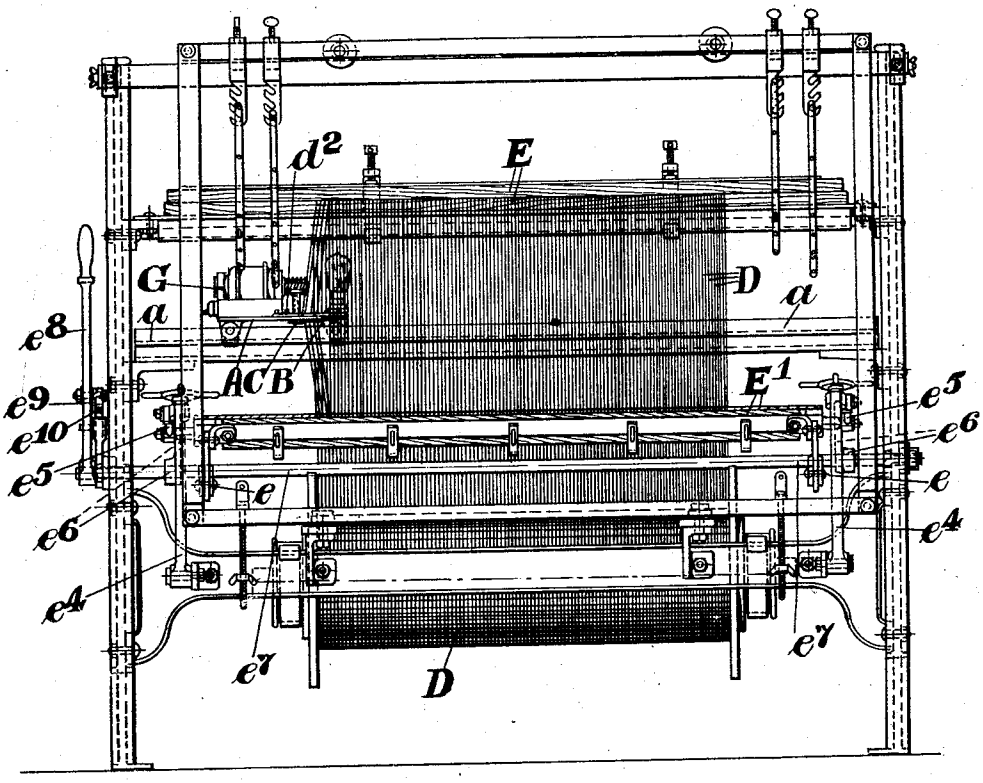
Dec. 13, 1927. 1,652,316

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APPARATUS FOR SELECTING AND SEPARATING WARP THREADS

Filed Feb. 26, 1925 . 2 Sheets-Sheet 1

FIG. 1.



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FIG. 3.

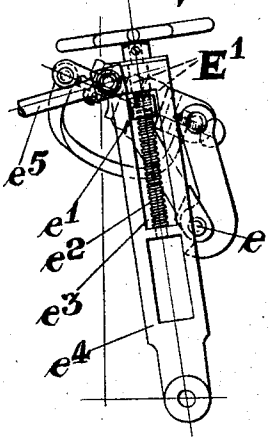


FIG. 2.

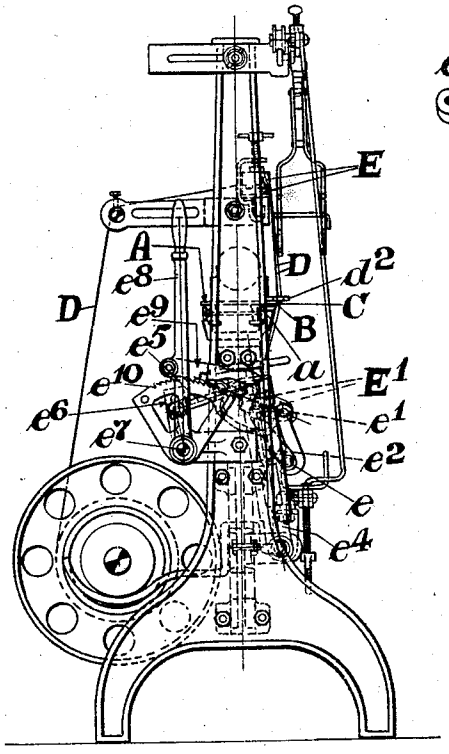


FIG. 4.

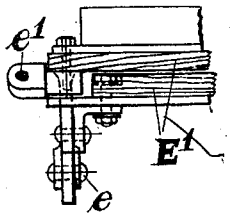


FIG. 5.

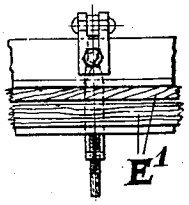
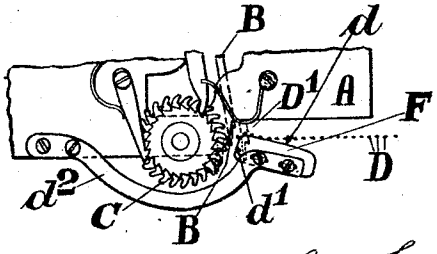


FIG. 6.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR SELECTING AND SEPARATING WARP THREADS.

Application filed February 26, 1925, Serial No. 11,828, and in Great Britain February 27, 1924.

This invention relates to apparatus for selecting and separating warp threads in the preparation of the warp for looms for weaving, and to that type of apparatus in which a carriage having a selector with a hook device at one side is caused to travel past the warp threads while the latter are suspended in a state of tension between top and bottom clamping members, the selector as it approaches each warp thread engaging same with a forward movement and transferring it with a diagonal movement on to a separator along which the selected threads are spaced in a position for enabling them to be drawn through the healds and reed by the operator.

In machines of this class it is possible for the selector to miss transferring a thread on to the separator and for such thread to slip off the selector and take up a position behind the first few unselected warp threads with the result that if the fault is undetected quite a number of threads may be selected, transferred on to the separator, taken off the latter and drawn through the healds and reed before the missed thread is caught by the selector and transferred to the separator. This causes the missed thread to occupy a crossed position in the warp and it is liable to produce faulty weaving. The present invention has for its chief object to overcome this objection, to render the action of the selector more certain and to introduce a simple and efficient form of mechanism by means of which the tension on the warp threads can be easily and accurately adjusted.

According to this invention means are provided whereby any thread that the selector fails to transfer to the separator is prevented from getting behind any of the remaining threads so that it will again be operated upon by the selector during the next operative movement of the latter. The movement of the selector in relation to that of the separator is so timed that the selector transfers a thread on to the separator whilst the latter is making its forward or spacing movement and commences its return stroke before such forward movement is completed. The bottom clamping members previously referred to are mounted in such manner that they can be moved towards and away from a frame in such manner as to deflect the warp threads over the edge of such frame and so increase their tension or move them entirely clear from the frame. A separate adjustment is also provided whereby each end of the lower clamping members can be raised or lowered for effecting an independent adjustment.

In order that the said invention may be clearly understood and readily carried into effect, the same is described more fully with reference to the accompanying drawings, in which:—

Fig. 1 is a front elevation, and Fig. 2 an end elevation of a machine of the kind specified with the improvements applied thereto.

Fig. 3 is an end view of a portion of the warp tensioning apparatus drawn to a larger scale.

Fig. 4 is a plan of one end of the bottom clamping members.

Fig. 5 is a plan of a portion of the bottom clamping members illustrating one of the clamps.

Fig. 6 is a plan of a portion of the carriage fitted with a deflecting plate for preventing a missed thread from getting behind any of the remaining threads.

A indicates the carriage, B the selector, C the separator, D the warp threads, E E^1 the top and bottom clamping members.

In the example shown the means for preventing a missed thread from getting behind any of the remaining threads comprises a deflecting plate F (Fig. 6) that is mounted on the carriage A in such a position that it will deflect, or push back the foremost unselected warp threads D^1 as the carriage travels past them. For this purpose the forward end of the plate is preferably rounded or inclined at d so that it will gradually deflect the threads as it comes in contact with them and the rear end d^1 of the plate occupies a position slightly in advance of the first unselected thread D^1 so that if such thread slips off the selector B as the latter is transferring it to the separator C it will spring back against the rear end of the plate and either remain there in the path of the selector, or return to its original position. In applying the invention to a machine such as that which is described in the prior United States patent specification No. 1,259,546 the deflecting plate may be formed on or adjustably attached to an arm d^2 that is adapted to be screwed or otherwise fixed to the carriage A. This arm is curved or otherwise shaped to clear the separator C. The

latter is actuated by a cam which is adjustably mounted on a shaft G through which motion is transmitted to the selector and carriage, adjustment of the position of such cam enabling the selector and separator to move in any desired order in relation to one another. The bottom clamping members E^1 previously referred to comprise two bars hinged together at e and provided at each end with a nut e^1 which engages a screw e^2 rotatably mounted in a slot e^3 in an arm e^4. Each of these arms is pivotally mounted and is connected by a link e^5 to a crank arm e^6 on a shaft e^7 which extends from one end frame of the machine to the other and can be turned in one direction or the other by a lever e^8 and catch e^9 operating in conjunction with a toothed quadrant e^{10}. When the lever is moved in one direction it moves the bottom clamping member E^1 towards a frame a which in the example shown is the one on which the carriage A runs, thereby deflecting the warp threads against the edge of such frame and tightening them; the lever e^8 being retained in the position to which it has been moved by its catch e^9 engaging one or other of the teeth in the toothed quadrant e^{10}. To move the lever e^8 in the opposite direction the catch e^9 is first lifted out of engagement with the quadrant teeth, and the lever then moved to slacken the warp threads D, and if desired to move them out of contact with the edge of the frame a. If it is desired to effect an independent adjustment of the lower clamping member it can be raised or lowered at one or both ends by turning one or both of the adjusting screws e^2 carried by the pivotally mounted arms e^4.

What I claim as my invention and desire to secure by Letters Patent in the United States, is:—

1. In apparatus for selecting and separating warp threads in which a power driven carriage containing warp selecting and separating mechanism is adapted to be driven past warp threads which are maintained in a state of tension between two pairs of clamping members, the combination with a thread selector and a thread separator of means stationary on the carriage for preventing any thread that the selector fails to transfer to the separator from springing past in front of any of the remaining threads so that it will again be operated upon by the selector during the next operative movement of the latter.

2. In apparatus for selecting and separating warp threads in which a power driven carriage containing warp selecting and separating mechanism is adapted to be driven past warp threads which are maintained in a state of tension between two pairs of clamping members, the combination with a thread selector and a thread separator of a thread deflecting plate stationary mounted on the carriage and arranged to retain the first unselected thread in the path of the selector.

3. In apparatus for selecting and separating warp threads in which a power driven carriage containing warp selecting and separating mechanism is adapted to be driven past warp threads which are maintained in a state of tension between two pairs of clamping members, the combination with a thread selector and a thread separator of a rail extending across the warp threads and means for moving one pair of clamping members to a variable extent towards and away from the rail to deflect the warp threads over the edge thereof and regulate their tension, or move them entirely clear of the rail, and means for securing the clamping members in any adjusted position.

4. In apparatus for selecting and separating warp threads in which a power driven carriage containing warp selecting and separating mechanism is adapted to be driven past warp threads which are maintained in a state of tension between two pairs of clamping members, the combination with a thread selector and a thread separator of a rail extending across the warp threads, means for moving one pair of clamping members to a variable extent towards and away from the rail to deflect the warp threads over the edge thereof and regulate their tension, or move them entirely clear of the rail, means for securing the clamping members in any adjusted position, and screw actuated adjusting mechanism for moving either end of the said pair of clamping members independently.

5. In apparatus for selecting and separating warp threads comprising means for maintaining warp threads stretched in approximate parallelism, and a carriage power driven across the series of warp threads, the combination with a thread selector mounted on said carriage, and means for operating the same to take off said warp threads successively, of a deflector mounted on the carriage to travel therewith in advance of the selector having a projection protruding across the plane in which the warp threads are held and terminating in an arresting surface adjacent to but in advance of said selector.

6. In apparatus for selecting and separating warp threads comprising means for maintaining warp threads stretched in approximate parallelism, and a carriage power driven across the series of warp threads, the combination with a thread selector mounted on the carriage in position to take off such warp threads successively, of a deflector plate carried by the carriage in advance of the selector, arranged to deflect the warp threads transversely to the plane in which they normally lie, and having a receding formation adapted to come adjacent to the first un-

selected thread when the apparatus is in normal operation.

7. In apparatus for selecting and separating warp threads comprising means for maintaining warp threads stretched in approximate parallelism, and a carriage power driven across the series of warp threads, the combination with a thread selector mounted on the carriage in position to take off such warp threads successively, of a deflector plate mounted in a stationary manner on the carriage in advance of the selector, having its forward end inclined to deflect the warp threads as it comes in contact with them, and its rear end adapted to occupy a position slightly in advance of the first unselected warp thread, when in operating relation with a sheet of warp threads.

In testimony whereof I have signed my name to this specification.

JOHN ERNEST MOORE.