B. ELMENDORF & J. GABLER.

AUTOMATIC WEFT REPLENISHING MECHANISM FOR LOOMS.

APPLICATION FILED JAN. 11, 1912.

1,060,831.

Patented May 6, 1913.

4 SHEETS—SHEET 1.

Fig. 2.

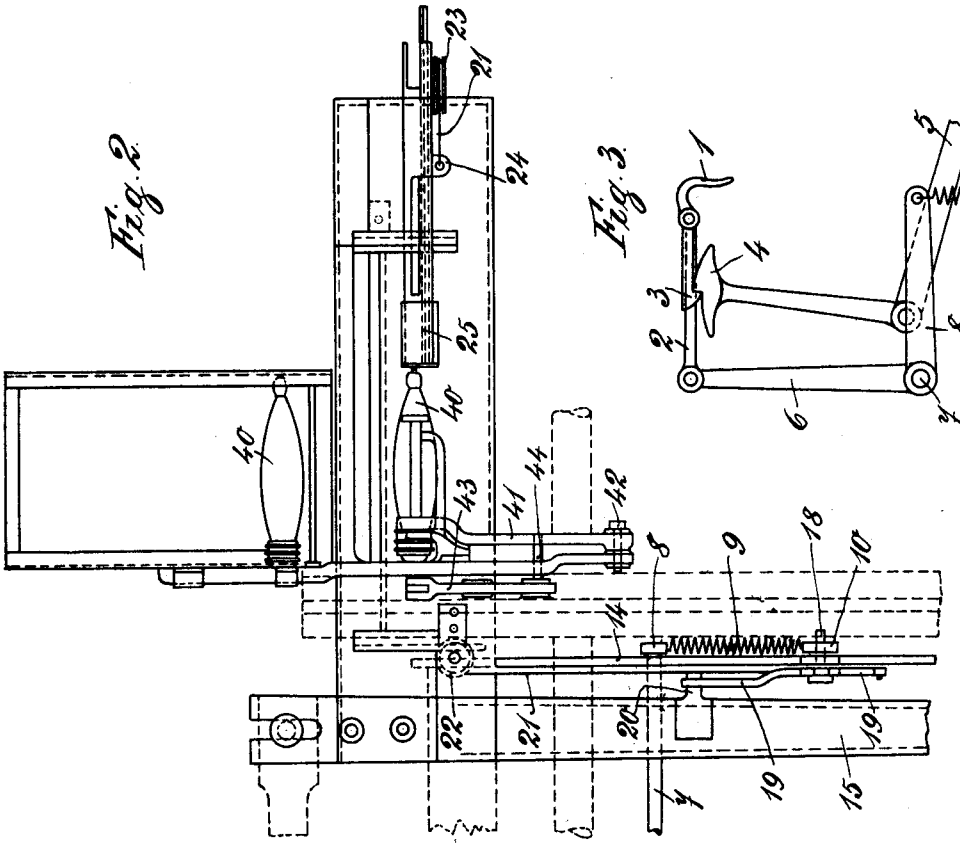
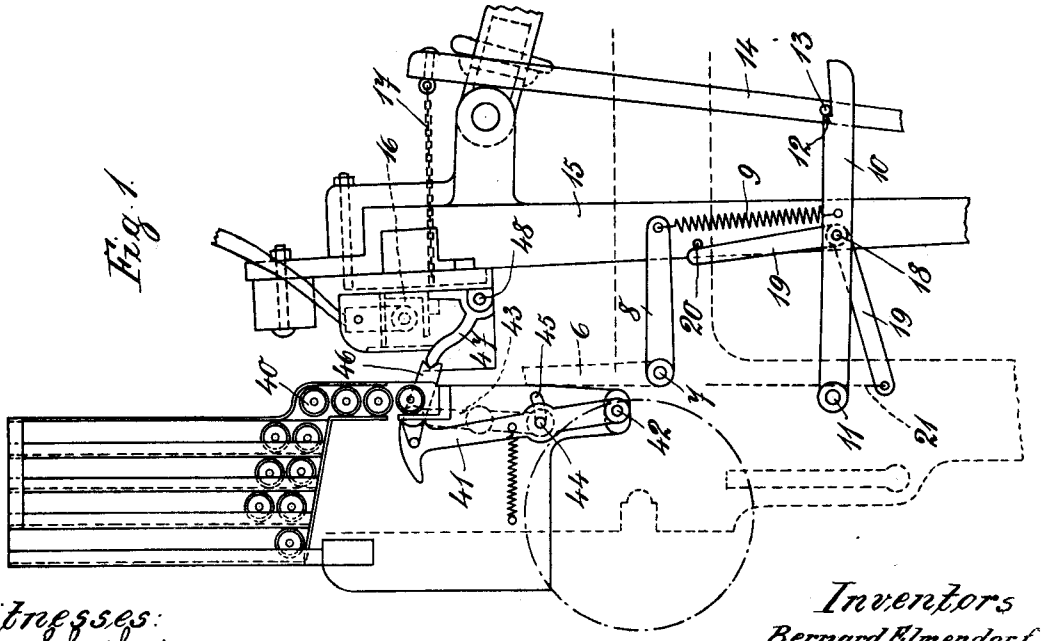


Fig. 3.

Fig. 1.



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4 SHEETS—SHEET 2

Fig 4

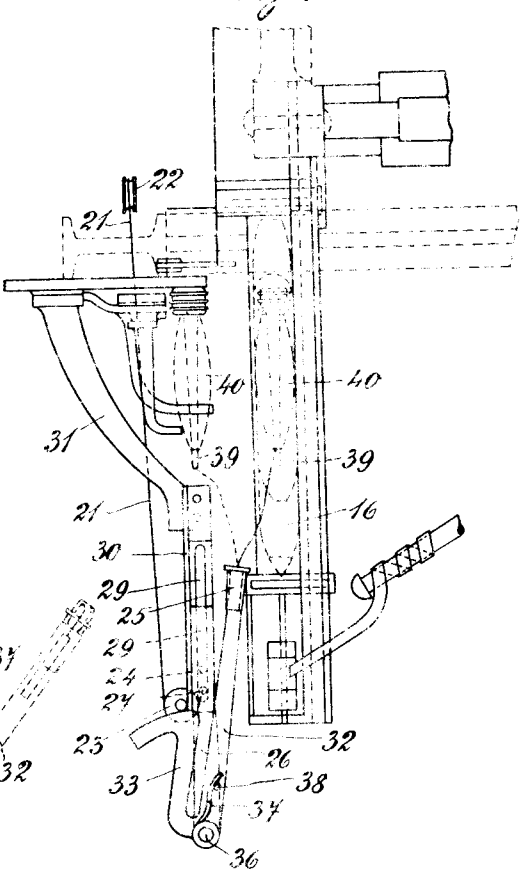


Fig 6

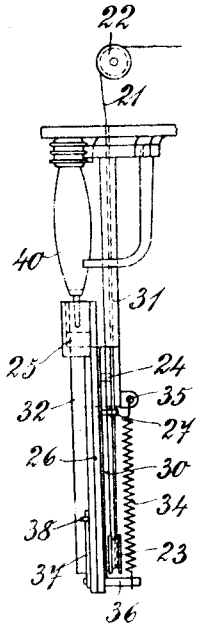


Fig 5

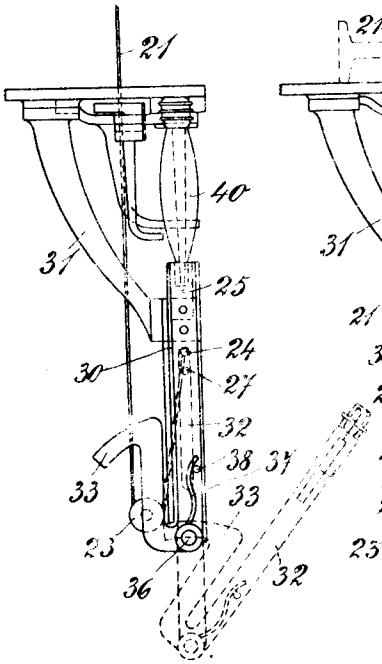


Fig 7

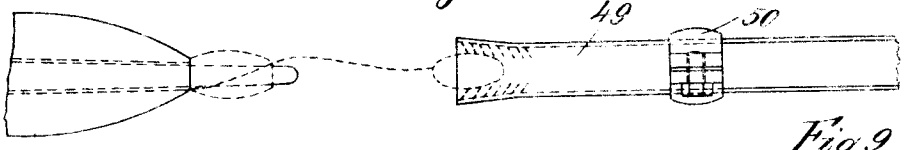


Fig 9

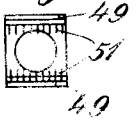
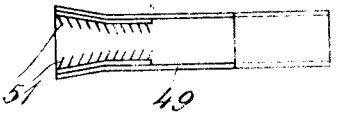


Fig 8



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4 SHEETS—SHEET 3.

Fig. 10.

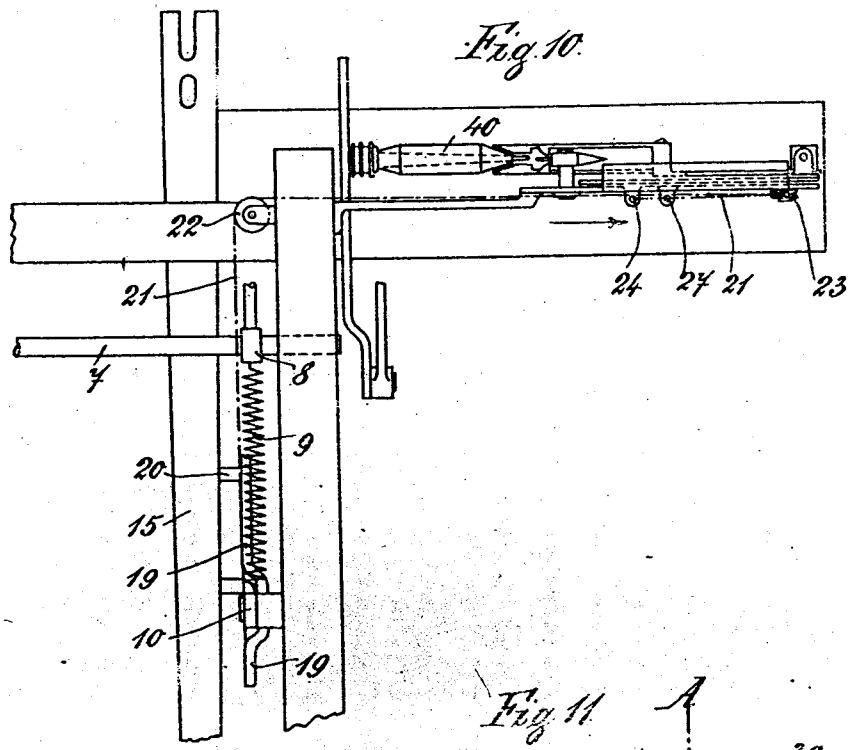


Fig. 11.

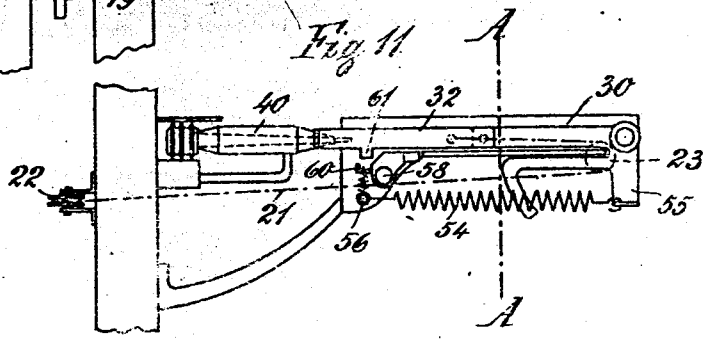
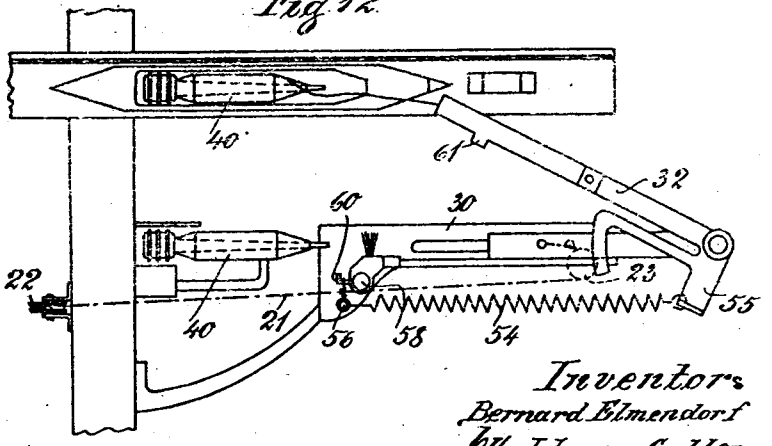


Fig. 12.



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4 SHEETS—SHEET 4.

Fig. 13.

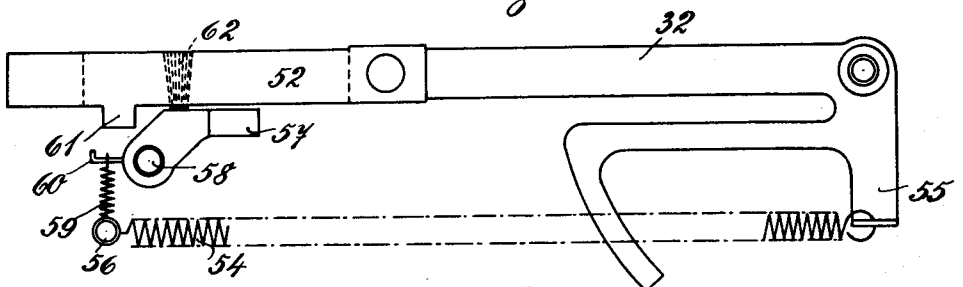


Fig. 14.

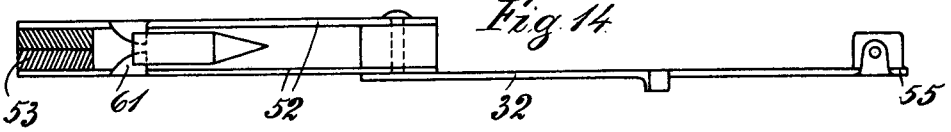


Fig. 15.

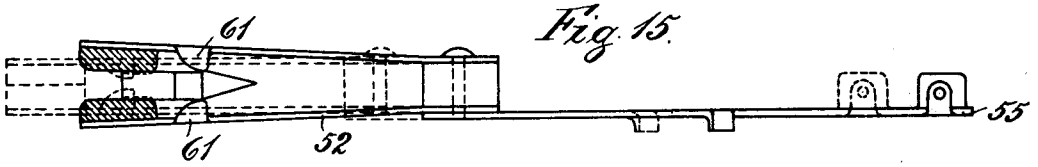


Fig. 16.

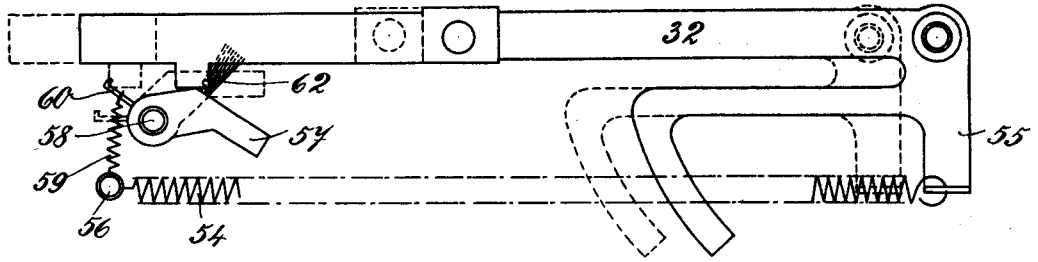
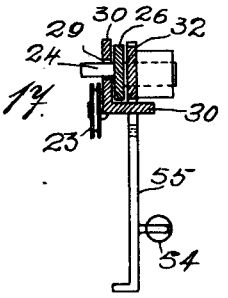


Fig. 17.



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UNITED STATES PATENT OFFICE.

BERNHARD ELMENDORF AND JOHANNES GABLER, OF ISSELHORST, GERMANY.

AUTOMATIC WEFT-REPLENISHING MECHANISM FOR LOOMS.

1,060,831. Specification of Letters Patent. Patented May 6, 1913.

Continuation in part of application filed December 19, 1910, Serial No. 598,055. This application filed January 11, 1912. Serial No. 670,612.

To all whom it may concern:

Be it known that we, BERNHARD ELMENDORF and JOHANNES GABLER, subjects of the King of Prussia, both residents of Isselhorst, Westphalia, in the German Empire, have invented certain new and useful Improvements in Automatic Weft-Replenishing Mechanism for Looms, of which the following is a specification.

This invention relates to improvements in connection with automatic weft replenishing mechanism for looms and more particularly to improved mechanism for detaching the end of the weft thread from the weft carrier and holding it in position during the weft replenishing operation and threading of the shuttle and until the next pick of the weft has been effected.

The object of the present invention is to simplify the construction of such mechanism, to insure the threading of the shuttle being effected with certainty, and to enable the same to be employed in conjunction with either overpick or underpick looms.

According to the present invention a single weft-end detacher or drawing-off device is provided for the whole of the weft carriers and is actuated on the breakage or failure of the weft from the weft fork or the tappet shaft of the loom, so that sufficient time is allowed for this operation before the actual weft replenishing action is performed. The detacher comprises a gripper which preferably draws off the end of the weft-thread directly from the weft carrier although, if desired, the end of the weft thread may be previously wound upon a cap or the like fitted on the spindle of the weft carrier, the gripper being so constructed as to imitate manual detachment of the weft thread in that a plurality of spring members carrying bristles, rubber strips, hooks or the like at their outer ends freely move over the end of the weft carrier until the latter is gripped thereby, and then detach and hold the weft end on their return movement. The detached weft end is then moved toward the slay on its backward movement and held in this position until the next pick of the shuttle, the thread being carried along by the shuttle and the end thereof being cut off at the selvage in known manner, after which the detacher is returned to its normal position. Means may also be provided for removing the remaining end of thread held by the detacher on its return movement.

In order that the invention may be more clearly understood, reference is made to the accompanying drawings showing various methods of carrying out the invention by way of example.

Figure 1 is a side view of the weft replenishing mechanism of a loom, the loom frame being shown in dotted lines. Fig. 2 is a front view of the mechanism shown in Fig. 1. Fig. 3 is a detail view of the weft fork and its connections. Fig. 4 is a plan view of the mechanism, showing the position of the parts immediately after the weft replenishing action, the weft carrier magazine being omitted. Fig. 5 is a plan view of the detacher in its normal position while the position it may assume is shown in dotted lines. Fig. 6 is a side view of Fig. 5. Fig. 7 is a detail plan view, Fig. 8 a side view and Fig. 9 an end view of a modified form of detacher. Fig. 10 is a front view of a further modified form of detacher. Fig. 11 is a plan view of Fig. 10, and Fig. 12 is a similar view showing the detacher in operation. Fig. 13 is an enlarged plan view of the detacher alone. Figs. 14 and 15 are side views of the detacher alone showing it in closed and open position respectively. Fig. 16 is a plan view of the detacher alone showing the same in two positions in full and dotted lines respectively. Fig. 17 is a transverse section on the line A—A of Fig. 11.

Referring to Figs. 1–6 of the drawings which disclose subject matter divided out from our prior patent application Ser. No. 598,055 filed Dec. 19, 1910. The weft fork 1 is balanced in the usual manner on the rod 2 and carries at its rear end a hook 3 which rests upon a shouldered hammer 4 which receives an oscillating motion from a lever 5 operated from the tappet shaft. The rod 2 is articulated to a lever 6 mounted upon a rotatable shaft 7 upon which is also fixed a lever 8. The lever 8 is connected by means of a spring 9 to a lever 10 pivoted at 11 to the loom frame, the lever 10 having a shoulder 12 at its free end adapted to engage a pin 13 on a floating lever 14, carried by the slay 15. On the failure of the weft, the catch 3 on weft fork 1 engages the shoulder of the weft hammer 4 which on its

backward movement oscillates the levers 6 and 8 and thus raises the lever 10 into position to engage the pin 13 of the floating lever 14 on the forward movement of the slay 15. The arresting movement of the floating lever 14 rotates the shuttle box 16 in the known manner through the medium of the chain 17, and thus brings the shuttle into position for the weft replenishing operation. Pivotally mounted at 18 on the pivoted lever 10 is a bell-crank lever 19, one arm of which is adapted to engage a stop 20 on the slay 15 while the other arm is connected to a chain 21 passing over pulleys 22 and 23 and connected to a projecting lug 24 on the detacher 25. The detacher 25 shown more clearly in Figs. 4, 5 and 6, is pivotally carried by a slide bar 26 guided in its sliding movement by means of a lug 24 and a lug 27 slidable in a slot 29 in an angle plate 30 which is supported by the bracket 31 on the loom frame, the angle plate 30 being located in a position parallel to the shuttle race. The detacher 25 is mounted at one end of a lever 32 by which it is pivoted to the slide 26 and integral with the lever 32 is a hook-shaped arm 33, the detacher 25 and the parts integral therewith being normally held out of operation by means of a spring 34, connected at one end to a lug 35 on the angle plate 30 and at its other end to the pivot pin 36 of the lever 32.

On the operation of the weft fork due to the failure of the weft in the manner hereinbefore described, tension is put upon the cord or chain 21 and under the action thereof, the slide 26 together with the detacher 25 is moved outwardly and away from the weft carrier 40 supported in the magazine taking with it the end of the weft thread in the manner hereinafter described. On reaching the extremity of its outward movement the detaching lever 32 and detacher 25 are rotated about the pivot pin 36 toward the slay under the action of a spring 37 secured at one end to the pivot pin 36 and bearing at its other end against a pin 38 on the lever 32. In order to prevent return movement of the gripper 25 on attaining this position, the hooked shaped arm 33 is adapted to engage the end of the angular plate 30. until the weft replenishing operation has been completed and the next forward movement of the slay performed, which forward movement forces back the detacher 25 until the hooked arm 33 is clear of the angle plate 30 whereupon the detacher 25 is returned to normal position under the action of the spring 34.

The end of the weft is preferably wound in the form of a small ball fitted on the end of the spindle 39 of the weft carrier 40, this ball of weft being grasped by the hollow detacher 25 and withdrawn from the spindle 39 of the weft carrier on the outward movement of the detacher 25. The weft replenishing mechanism may be of any suitable type that shown on the drawing comprising a hammer 41 pivoted at 42 to the loom frame and actuated by means of a double-armed lever 43 pivoted to the hammer 41 at 44 and which pivot works in a slot 45, the double armed lever 43 being oscillated by means of a nose 46 on its other end adapted to be engaged by a catch 47 pivoted at 48 and brought into actuating position on the rotation of the shuttle box. It will thus be seen, that the end of the weft is detached from the weft carrier and brought into position for threading the shuttle box of the loom before the weft replenishing hammer 41 enters into operation and is effected during the interval of time between the breakage of the weft and the actual weft replenishing action and that on the completion of the weft replenishing action, the detacher 25 moves backwardly together with the slay 15 and holds the end of the weft thread in position until the next pick of the shuttle has been effected, thus insuring the threading of the shuttle.

The actual form of the detacher 25 may be considerably varied without departing from the spirit of the invention.

Figs. 7–9 show one type of detacher which comprises a plurality of blade springs 49 capable of adjustment by means of a clamp 50 and in which the blade springs are provided with internal brushes or teeth 51 adapted to grasp the end of weft on the weft carrier.

Figs. 10–17 show a further modification of the detacher. In this case the detacher comprises two spring arms 52 mounted on the lever 32 and carrying at their free ends bristles, teeth, rubber strips or the like, 53, adapted to grasp the thread on the weft carrier as shown in Fig. 10. In this case the outward movement of the detacher is effected by means of a spring 54 connected at one end to an extension 55 on the lever 32 and at its other end to a pin 56 on an extension of the angle plate 30, and this spring 54 also serves to return the detacher to its normal position in alinement with the weft carrier 40 on the detacher being pushed back with the slay during the forward movement of the latter next succeeding the weft replenishing action. On returning the lever 32 and spring arms 52 into normal position the latter are adapted to be opened as shown in Fig. 15, this being effected by means of a wedge 57, pivoted at 58 to an extension of the angle plate 30 and normally held in operating position by means of a spring 59 connected at one end to the fixed pivot 56 and its other end to a hook 60 on the wedge 57. This wedge is adapted to engage lugs or projections 61 carried by the spring arms 52 so that before the spring

arms complete their return movement to normal position they are opened by the wedge 57 and the thread end remaining therein and between the gripping pieces 53 is removed by means of a brush or the like 62 projecting from the wedge 57. This opening movement of the spring arms 52 also enables the gripping pieces 53 to grasp the end of the weft on the weft carrier, the gripping pieces closing thereon on the detacher attaining its normal position by the projections 61 moving clear of the wedge 57. On the next weft replenishing action, the spring arms 52 on their movement from normal position depress the wedge 57 as shown in Fig. 16 under the action of the projections 61 and against the action of the spring 58 so that the spring arms 52 remain closed and hold the end of the weft thread between the gripping pieces 53.

It will of course be understood that, if desired, the end of the weft thread may be mounted upon caps or plugs fitted on the end of the spindle of the weft carrier in the usual manner.

We claim:—

1. In combination with the weft replenishing mechanism of a loom, a single slidable and pivoted weft-end detacher for the whole of the weft carriers, means actuated by the weft replenishing mechanism previous to the actual weft replenishing action to slide said detacher away from and in alinement with the weft carrier, means for rotating said detacher on its pivot to bring it into contact with the lay and to hold it in contact therewith during the backward movement of the lay and means for returning the detacher to normal position.

2. In combination with the weft replenishing mechanism of a loom, a single slidable and pivoted weft-end detacher for the whole of the weft carriers, said detacher comprising a plurality of spring arms and gripping elements carried at one end thereof, means actuated by the weft replenishing mechanism previous to the actual weft replenishing action to slide said detacher away from and in alinement with the weft carrier, means for rotating said detacher on its pivot to bring it into contact with the lay and to hold it in contact therewith during the backward movement of the lay and means for returning the detacher to normal position.

3. In combination with the weft replenishing mechanism of a loom, a single slidable and pivoted weft-end detacher for the whole of the weft carriers, said detacher comprising a plurality of spring arms and resilient gripping pieces carried at one end thereof, means actuated by the weft replenishing mechanism previous to the actual weft replenishing action to slide said detacher away from and in alinement with the weft carrier, means for rotating said detacher on its pivot to bring it into contact with the lay and to hold it in contact therewith during the backward movement of the lay and means for returning the detacher to normal position.

4. In combination with the weft replenishing mechanism of a loom, a single slidable and pivoted weft-end detacher for the whole of the weft carriers, means actuated by the weft replenishing mechanism previous to the actual weft replenishing action to slide said detacher away from and in alinement with the weft carrier, means for rotating said detacher on its pivot to bring it into contact with the lay and to hold it in contact therewith during the backward movement of the lay, means for returning the detacher to normal position, and means for removing the remaining weft end on the return movement of said detacher.

5. In combination with the weft replenishing mechanism of a loom, a weft-end detacher comprising a plurality of spring arms secured together at one end and carrying gripping elements at their other ends, a lever carrying said arms, a slide piece to which said lever is pivoted, a guide for said slide piece in alinement with the weft carrier, a spring coacting with said guide to normally hold said arms in alinement with and so as to grasp the weft end of said weft carrier, and means actuated by the weft replenishing mechanism for sliding said slide-piece, said spring thereupon turning said lever about its pivot to bring said arms into contact with the lay and hold same in contact therewith during the backward movement of the lay and said spring returning said arms to normal position on the next forward movement of the lay.

6. In combination with the weft replenishing mechanism of a loom, a weft-end detacher comprising a plurality of spring arms secured together at one end and carrying gripping elements at their other ends, said arms having projections thereon, a lever carrying said arms, a slide piece to which said lever is pivoted, a guide for said slide-piece in alinement with the weft carrier, a spring coacting with said guide to normally hold said arms in alinement with and so as to grasp the weft end of said weft carrier, means actuated by the weft replenishing mechanism for sliding said slide-piece, said spring thereupon turning said lever about its pivot to bring said arms into contact with the lay and hold same in contact therewith during the backward movement of the lay and said spring returning said arms to normal position on the next forward movement of the lay, and a pivoted spring-controlled wedge adapted to co-act with the projections on said arms on their return movement to open the same.

7. In combination with the weft replenishing mechanism of a loom, a weft-end detacher comprising a plurality of spring arms secured together at one end and carrying gripping elements at their other ends, said arms having projections thereon, a lever carrying said arms, a slide-piece to which said lever is pivoted, a guide for said slide piece in alinement with the weft-carrier, a spring coacting with said guide to normally hold said arms in alinement with and so as to grasp the weft end of said weft carrier, means actuated by the weft replenishing mechanism for sliding said slide-piece, said spring thereupon turning said lever about its pivot to bring said arms into contact with the lay and hold same in contact therewith during the backward movement of the lay and said spring returning said arms to normal position on the next forward movement of the lay, a pivoted spring-controlled wedge adapted to co-act with the projections on said arms on their return movement to open the same and a brush carried by said wedge and adapted to clean the gripping elements on said arms when the latter are open.

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