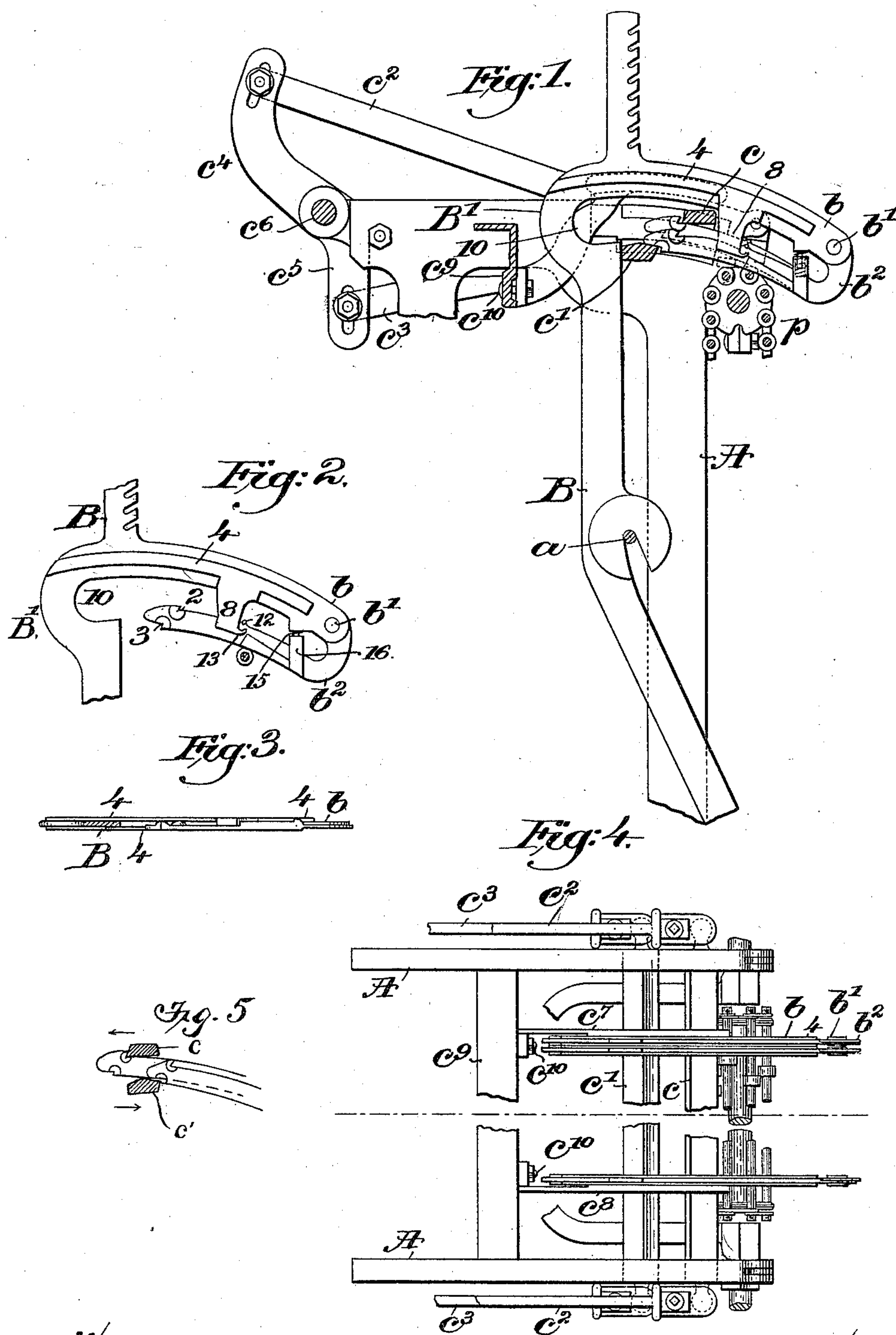


(No Model.)

H. WYMAN.  
LOOM.

No. 561,466.

Patented June 2, 1896.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

HORACE WYMAN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE  
CROMPTON LOOM WORKS, OF SAME PLACE.

## LOOM.

SPECIFICATION forming part of Letters Patent No. 561,466, dated June 2, 1896.

Application filed April 13, 1894. Serial No. 507,358. (No model.)

*To all whom it may concern:*

Be it known that I, HORACE WYMAN, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention in looms relates more especially to that class of lever which has jointed to it a hooked or notched jack, the series of jacks being distributed by or through a pattern-surface to be engaged by a suitable mover, such as an elevator or depressor, by which to move the lever in one or the other direction, and by suitable cording between it and a harness-lever or a shuttle-box in the desired direction, said lever being commonly designated as a "harness-lever."

I have shown my invention as embodied upon a lever of the class shown in United States Patent No. 480,684, dated August 9, 1892, but my invention to be herein described is applicable to any kind of lever having a jack-supporting arm extended therefrom, whether said lever is straight or crooked, nor is this invention limited to the particular location of the notches for connecting the lever with the harness-frame or device to be moved by it. Referring to the said patent, the lever has a laterally-extended arm, on which is pivoted a notched jack, said jack being long enough to cross the lever, one notch of the jack being at one side and the other notch at the other side of said lever, and consequently the depressor and elevator are located at opposite edges of said lever, and one edge of both the depressor and elevator act directly against opposite edges of the series of levers to even them or to even the shed.

In the class of looms referred to it is very desirable to make the lever and its jack as light in weight as possible and yet have them sufficiently stiff or rigid to stand the strain required, and it is also very desirable that the jack should not require a wide space in which to work than the space occupied by the lever.

In my invention I employ a harness-lever having a laterally-extended arm, to the end of which the notched jack is movably connected, with notches of the jack both at the same side of said lever as the point of connection of the jack with said arm.

My invention also comprehends the arrangement of the jack-moving knife or knives, sometimes known, respectively, as "lifter" and "depressor," at the same side of said lever as the point of connection of said jack with its carrying-arm, with evening-surfaces on the lever and arm, respectively, to cooperate with the knives or lifter and depressor to even the levers.

Prior to this invention the jacks have been provided with guiding-surfaces located remote from their fulcrum-points, usually more remote from the said fulcrum-points than the knives or one of them, and in practice I have encountered much difficulty by reason of the sticking of the jacks in contact with the said guiding-surfaces, so that the jacks do not move easily and quickly nor with certainty, thus greatly interfering with the proper and rapid operation of the loom. To obviate this difficulty, my present invention comprehends the arrangement of the knives or either of them at the same side of the lever as the point of connection of the jack with the laterally-extended jack-supporting arm and the arrangement of the guiding-surfaces on the said laterally-extended arm and between the fulcrum of the arm and the nearest knife which moves said jack, thereby bringing the said guiding-surface so close to the fulcrum of the jack that the weight of the jack or the light springs which assist in moving the same are always amply sufficient to overcome any possible sticking or hindrance, thereby insuring positive and proper rapid operation of the loom.

My present invention comprehends also the arrangement of both knives at the same side of the lever as the point of connection of the jack with the laterally-extended jack-supporting arm on the said lever, the knives cooperating with said jack in such manner as to permit ready removal of the jack from said knives without necessary removal of the knives, thereby enabling any lever, its arm, and the attached jack to be readily removed from the loom with practically no difficulty whatsoever.

The above with other features will be hereinafter described, and pointed out in the claims.

Figure 1, in section, shows a sufficient portion of a loom having my improvements added



to enable my invention to be understood. Fig. 2 shows part of a lever and its jack as resting on a projection of the pattern-chain. Fig. 3 is an under side view of the parts shown in Fig. 2. Fig. 4 is a top or plan view of the parts shown in Fig. 1. Fig. 5 is a diagram showing some of the parts of Fig. 1 in a different position.

In the embodiment of my invention illustrated in the drawings the loom-frame A, of usual or suitable shape, has a rod *a*, on which are mounted the slotted hubs of the levers B, in practice notched as shown at the top in Fig. 1, or otherwise adapted in usual manner to receive the cording going to the tops and bottoms of usual harness-frames, (not shown,) to thus move them.

The lever B has a laterally-extended arm *b*, which receives the pivot *b'* for a notched jack *b*<sup>2</sup>, having at its upper edge a notch 2 (see Fig. 2) to be engaged by a depressor or knife *c* and at its under side a notch 3 to be engaged by an elevator or knife *c'*, said depressor and elevator being each made as bars, to the ends of which may be connected, respectively, sets of links *c*<sup>2</sup> *c*<sup>3</sup>, attached in turn in an adjustable manner to arms *c*<sup>4</sup> *c*<sup>5</sup> of a rock-shaft *c*<sup>6</sup>. The rock-shaft may in practice receive motion as provided for in said patent. The arms *b* of the levers have each a guide-surface (shown as on a lug 8) which is arranged intermediate the elevator and depressor and the fulcrum of the jack, and is of sufficient length to overlap the jack *b*<sup>2</sup> and act as a lateral guide therefor to prevent twisting or lateral movement of the jack out of place, the edge of said lug also serving the purpose of an evening-surface, it being acted upon by the outer edge of the depressor *c*, the inner edge of the elevator, by the action of its edge against one edge of the lever B, serving as the second guiding-surface to effect the evening of the levers and of the shed, Fig. 1 showing the said depressor and elevator acting as eveners.

In order that the lever with the depressor arranged above the jack and the elevator below the jack at the same edge of the lever may have sufficient range of movement, said lever is shown as having an offset B' to thus provide a recess 10, in which the depressor may stand when the shed is open.

The top of the elevator *c'* (shown in Fig. 1) is made of such shape as to come in contact with the under side of such jacks as are engaged with the depressor *c*, such contact aiding in keeping the hooks of the jacks in engagement with the edge of the depressor during the movement of the depressor and while the elevator is being moved outwardly, and at the same time said lifter, by slightly lifting the jacks engaged by the depressor, causes them to bear more lightly on the rolls or protuberances of the usual pattern-surface, and consequently the wear of the jacks and of the pattern-surface is lessened.

In this my invention the jack is made much

shorter than in the patent referred to, and the shorter the jack the less its weight, said jack preferably terminating short of the lever.

The lug 8, carried by one arm *b*, acts not only on one side of the hooked jack pivoted upon it, but also against one side of the jack of the lever next to it.

I have shown each of the notched jacks as provided (see Fig. 2) with a stop pin or projection 12, which engages a toe 13 of the lug 8, said pin preventing the jack from dropping down horizontally when not held up by the pattern chain or surface *p*, of usual or suitable construction and operated in usual ways or as provided for in said patent.

The pin 12 and toe 13 aid in keeping the jack in place on the lever when it is removed from the loom.

The arm *b* has, as shown, at its under side a small pin or projection which acts as a guide for a spiral spring 15, one edge of which acts against a seat 16 on the jack *b*<sup>2</sup>, said spring acting normally to keep the jack pressed toward the pattern-surface.

I have shown the arms *b* of the upright levers as provided at each end with wearing-surfaces 4, which contact the surface of one arm with the corresponding surface of an adjacent arm, all the arms being kept pressed together by bars *c*<sup>7</sup> *c*<sup>8</sup>, adjustably attached to a part of the loom-frame by suitable bolts *c*<sup>10</sup>.

By reference to Fig. 1 it will be seen that the jacks may be readily withdrawn from engagement with both the depressor and elevator and the harness-lever removed from the loom, for since both the elevator and depressor are arranged at the same side of the lever and since they are not confined to the jacks by reason of traveling in slots in the jacks or otherwise, but so engage the jacks that the latter may be readily disconnected from the same by moving said elevator and depressor into close proximity one with the other, the lever may have a lateral movement sufficient to withdraw the end of a jack from between and from engagement with the elevator and depressor and the entire lever and its attached jack thereafter lifted bodily from position without necessary removal of either the elevator or depressor. To facilitate this removal, the jack may be sprung to one side far enough to disengage its stop-shoulder from the hook on the lug 8, which will thereby permit the jack to drop down into a vertical position.

In the present and preferred embodiment of my invention it will be noticed that the depressor *c* has a travel to the left, Fig. 1, beyond the middle line of the elevator *c'*, the recess 10 permitting in the present instance this movement of the depressor past the elevator, and when the depressor is thus moved to the left past the middle line of the elevator the end of the jack terminating, as it does, at the middle line of the elevator when in the position shown in Fig. 1 will then clear the depressor and will permit the lever, its arm, and the attached jack to be lifted bodily with-



out even a side movement to clear the jack of either the elevator or depressor, so that by means of my invention any lever and its jack may be most conveniently removed at any time without in any wise disturbing the rest of the mechanism.

In the particular construction shown the elevator and depressor are both arranged at the same side of the lever, and the end of the jack, when in one position, terminates short of the lever by a distance sufficient to enable said jack to be raised past the elevator or depressor, whichever is above the same, when the said elevator and depressor are between the end of the jack and said lever.

In looms wherein the jacks pass from one to the other side of their carrying-levers with the lifter on one side of the lever and the depressor on the other side thereof either the lifter or the depressor prevents movement of the lever toward it a sufficient distance to disengage the jack from the other at the opposite side of said lever.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a loom, a lever having an arm projected therefrom and provided with a jack-guiding lug, combined with a notched jack pivoted at one end to the outer end of said arm, the free end of the jack terminating short of the upright part of said lever, substantially as described.

2. A harness-lever having a substantially upright end and provided with a jack-supporting arm extended laterally therefrom, and a notched jack pivoted on said arm, the free end of the jack terminating short of the edge of the upright part of the said lever, combined with an elevator and depressor located both at one side of said lever and under said arm, substantially as described.

3. A harness-lever having a substantially upright end and provided with a jack-supporting arm extended laterally therefrom, and having a depressor-receiving recess at one edge of said lever under said arm, a notched jack pivoted on said arm, the free end of the jack terminating short of the edge of the upright part of said lever, and an elevator and a depressor located both at one side of said lever and under said arm, and one below and the other above said notched jack, the latter lying wholly at one side of the said lever, the combination being and operating, substantially as described.

4. A harness-lever having an upright end, and an attached jack-supporting arm extended laterally therefrom provided with an evening-lug, an elevator and depressor located both at one side of said lever and with evening-surfaces thereon to act on the evening-lug and on the edge of the harness-levers to aline said harness-levers in central position, substantially as described.

5. The series of levers having laterally-projecting arms *b*, a series of notched jacks piv-

oted thereto and having their free ends terminating short of the edges of the upright portions of said levers, a pattern-surface, a depressor located above said jacks, and an elevator located below said jacks, both said depressor and said elevator being located at the same edge of said series of levers, the top of the elevator being shaped to contact with the under side of the jacks engaged by said depressor and keep the hook of the jack and said depressor connected during the formation of the shed, substantially as described.

6. A lever having an arm provided with a lug having a toe, combined with the jack *b*<sup>2</sup>, and its projecting pin to cooperate with said toe, substantially as described.

7. The herein-described jack-hook, comprising a bar adapted to be pivoted at one end and having two hooks at or near its opposite end, one of said hooks being at its upper and the other at its lower edge, said jack being provided with a supporting or stop surface located between its ends, and with a seat for a spring, substantially as shown and described.

8. In a loom, a lever, having an arm projected laterally therefrom, combined with a notched jack movably connected at one end to the outer end of said arm with its notches at the same side of said lever as the connection of the jack with said arm, and a jack-guiding surface on said arm and intermediate the notches or either of them and the fulcrum of said jack, substantially as described.

9. In a loom, a lever having an arm projected laterally therefrom, combined with a jack movably connected at one end to the outer end of said arm, and provided with notches both located at the same side of said lever as the point of connection of the jack with said arm, and a lifter and depressor also at the same side of said lever as said notches, and to cooperate therewith, said jack being free to be withdrawn from the said lifter and depressor, whereby said harness-lever and its jack may be readily removed without necessary removal of said lifter and depressor or either of them, substantially as described.

10. In a loom, a lever having an arm projected laterally therefrom, combined with a notched jack movably connected at one end to the outer end of said arm with its notches at the same side of said lever as the point of connection of the jack with said arm, a lifter and depressor also arranged at the same side of said lever as said notches, and to cooperate therewith, and evening-surfaces on said lever and its laterally-extended arm respectively, to cooperate with said lifter and depressor, substantially as described.

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

HORACE WYMAN.

Witnesses:

JUSTIN A. WARE,

SAMUEL B. SCHOFIELD.