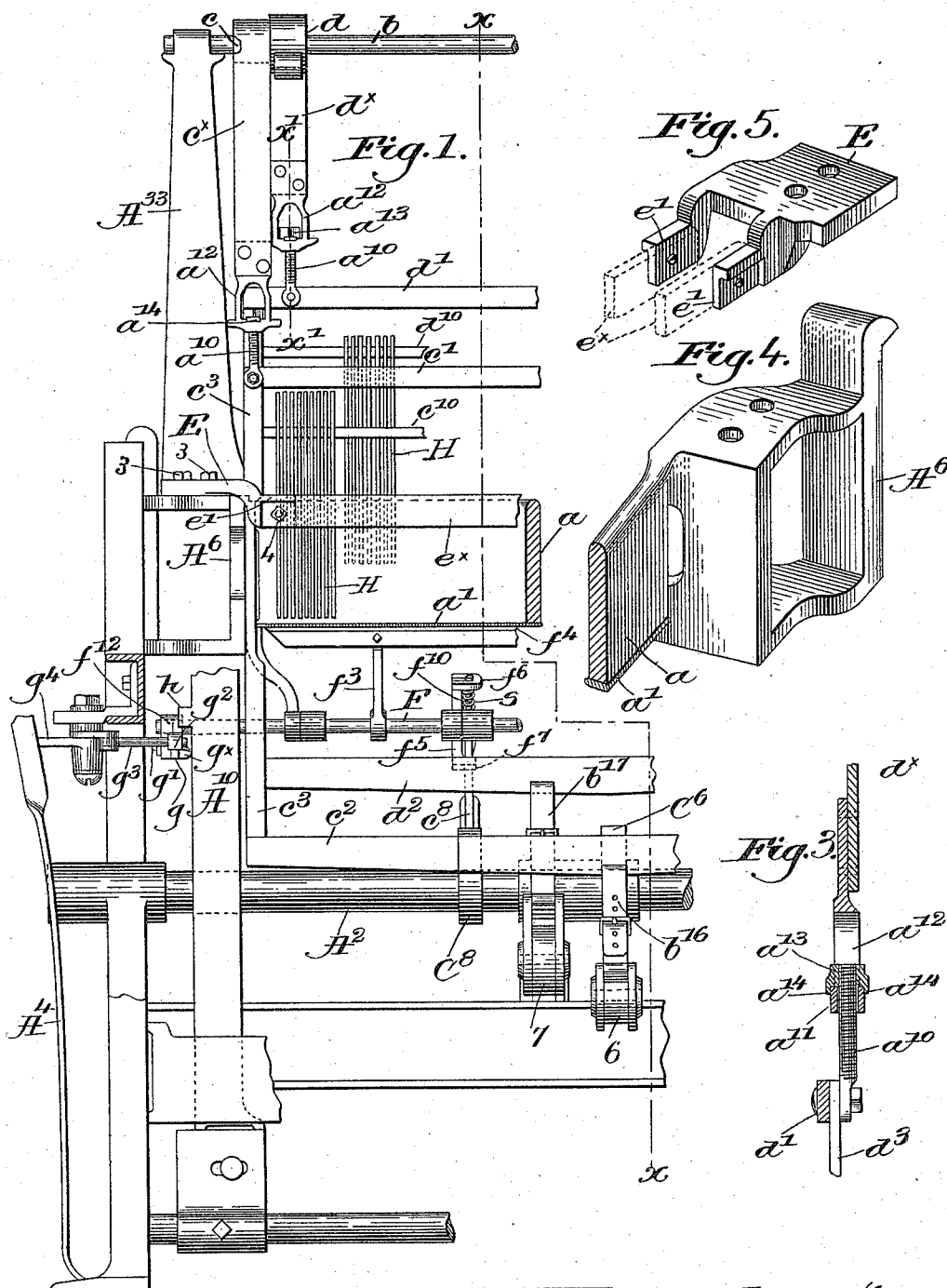


G. O. DRAPER & J. H. NORTHROP.
SHEDDING MECHANISM FOR LOOMS.

No. 576,506.

Patented Feb. 2, 1897.



Witnesses:

A. C. Harmon,
Edward F. Allen.

Inventors:

George O. Draper,
James H. Northrop.
by Wesley Sugor. attys.

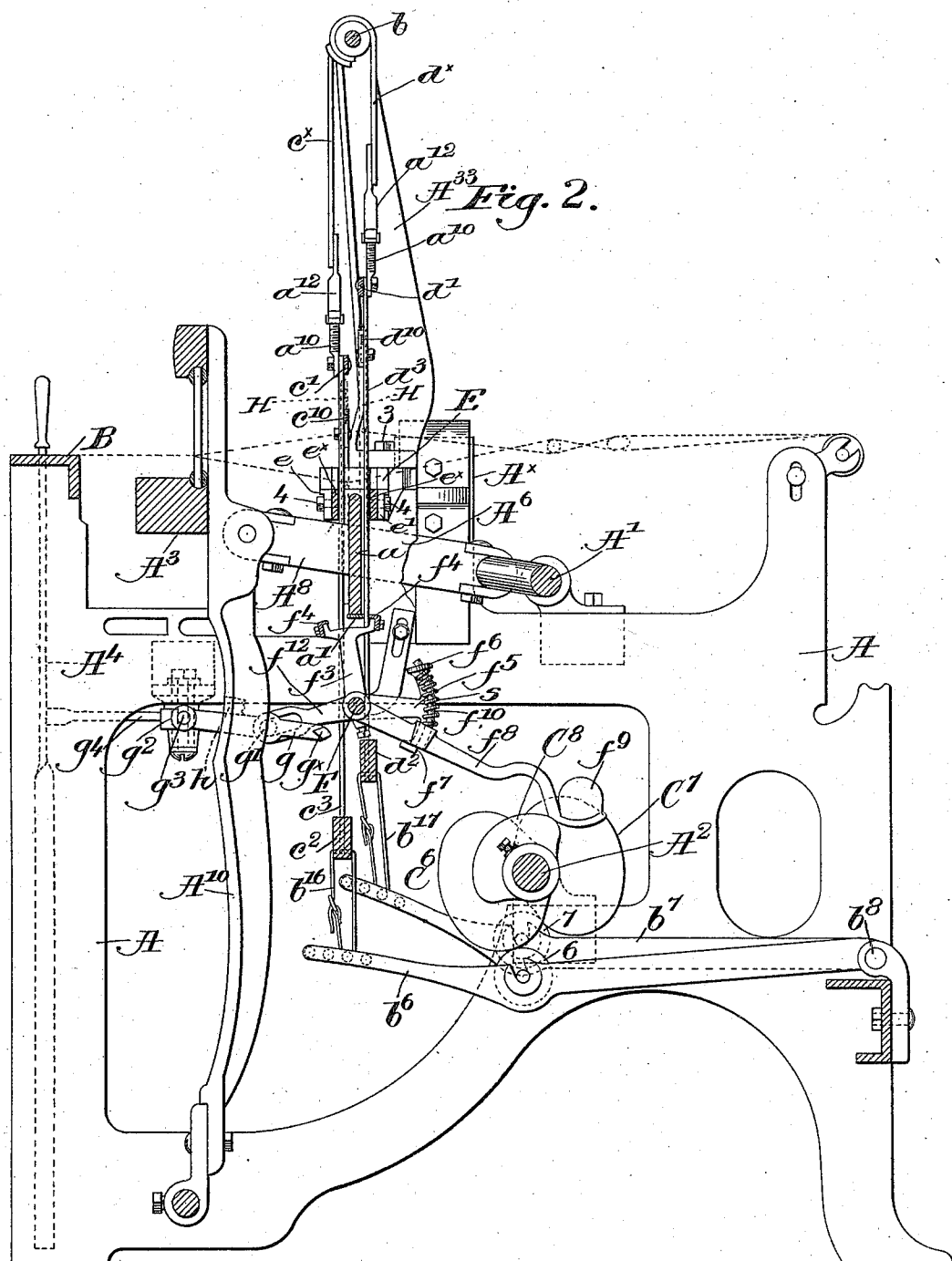
(No Model.)

2 Sheets—Sheet 2.

G. O. DRAPER & J. H. NORTHROP.
SHEDDING MECHANISM FOR LOOMS.

No. 576,506.

Patented Feb. 2, 1897.



Witnesses:
A. C. Harmon,
Edward F. Allen.

Inventors:
George O. Draper,
James H. Northrop.
by Crosby Gregory attys.

UNITED STATES PATENT OFFICE.

GEORGE O. DRAPER AND JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNORS TO THE NORTHROP LOOM COMPANY, OF SAME PLACE AND SACO, MAINE.

SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 576,506, dated February 2, 1897.

Application filed September 19, 1896. Serial No. 606,321. (No model.)

To all whom it may concern:

Be it known that we, GEORGE O. DRAPER and JAMES H. NORTHROP, of Hopedale, county of Worcester, State of Massachusetts, have
5 invented an Improvement in Shedding Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like
10 parts.

This invention relates to that class of looms wherein the harness-frames are provided with heddles composed of thin metallic strips having holes for the reception of the warp-threads, said devices being made effective in
15 stopping the loom when a warp-thread breaks or unduly slackens.

In another application, Serial No. 592,571, filed by one of us the harness-frames were
20 positively held in absolute alinement by the rigid side bars of the frames moving in fixed vertical bearings and with no connection between the different frames.

In this present invention the harness-frames are freely suspended from connections
25 at the top and bottom thereof, and said frames are not positively guided at the sides and prevented from having some lateral movement, but they are loose and are free to have some lateral movement, which at times is demanded
30 by the differing tension of the warps. The construction of the loom is thus simplified and wear is decreased. Means are also provided herein whereby the attendant can
35 readily adjust the harness without the use of tools in a rapid and easy manner.

The warp stop-motion herein shown is not claimed nor described in detail, as the same forms the subject-matter of the pending application, Serial No. 592,571, referred to.

Figure 1 is a front elevation of the left-hand end of a loom embodying our invention, the breast-beam and lay being omitted for the sake of clearness. Fig. 2 is a vertical
40 transverse sectional view of the loom shown in Fig. 1, taken on the line $x\ x$, looking to the left. Fig. 3 is an enlarged vertical sectional view of one of the adjusting devices, taken on the line $x'\ x'$, Fig. 1; and Figs. 4 and

5 are enlarged perspective views of one of the stands or boxes and the heddle-guide support.

The loom-frame A, crank-shaft A¹, the cross or cam shaft A², the lay A³, breast-beam B, and the shipper-handle A⁴, held by the usual
notched plate when the loom is running properly, are and may be all as common in looms.
55 To uprights A^x at each side of the frame are attached open stands or boxes A⁶, (see Fig. 4,) through which the crank-arms A⁸ are extended, each stand having secured thereto or
60 forming part of it a cross-girt a , extended across the loom from side to side and forming a separator for two adjacent series of heddles, as in the application referred to. A
flat plate a' is shown as secured to the bottom
65 of the cross-girt and preferably having milled or finely-notched edges to engage the vertical edge of a dropped heddle to assist in preventing it from twisting.

A heddle-guide support E, Fig. 5, is secured
70 by suitable bolts 3 to the top of each stand or box A⁶, said support having depending feet e' , which straddle the cross-girt a when in position, said feet having secured to their
inner faces heddle-guides e^x by suitable fastenings, as bolts 4, the guides extending from
75 one to the other side of the loom to receive the two series of heddles and guide them at their upper ends, the separator a being interposed between the two series.
80

The rocker-shaft F, having arms f^3 rigidly secured thereto and forked at their outer ends, carrying the feelers f^4 , preferably notched or
toothed on their inner edge to engage the edge
85 of a dropped heddle of one or other of the series, said feelers being vibrated toward and from the foot or plate a' by oscillation of the shaft F, is as shown and described in the
application referred to, the parts herein being correspondingly lettered. As in said ap-
90 plication, the rock-shaft F has fast thereon an arm f^5 , provided with a slotted ear f^6 , and a lug f^7 , extended laterally beneath an arm f^8 , loose on the shaft F and weighted at f^9 to rest against an actuating-cam C⁸ on shaft A².
95 A curved rod f^{10} on arm f^8 extends through the slotted ear f^6 and is surrounded by a spring s , the strength of which is sufficient to nor-

mally hold the lug f^7 against the under side of the arm f^8 , so that normally rocking of arm f^8 by its cam will, through the spring, cause rocking of the shaft F. When a heddle drops, however, the feeler f^1 engaging it would prevent vibration of the feeler, and the rock-shaft would be stopped without interfering with the movement of the arm f^8 . At such time the slotted arm f^{12} , fast on the rock-shaft F, acts, through a stud g' , on the dagger g , pivoted at g^2 on an elbow-lever $g^3 g^4$, one arm of which normally rests against the shipper-handle A^1 and fails to move the lip g^x out of the path of a notched lug h , shown as mounted on one of the lay-supports A^{10} . As the lay continues its backward movement the dagger is moved in the direction of its length, turning the lever $g^3 g^4$ to press the shipper-handle A^1 out of its usual holding-notch, so that the released handle may operate to shift the driving-belt from the fast to the loose pulley, as usual, to stop the loom.

When the loom is running properly, the oscillation of the rock-shaft F acts to swing the dagger g out of the path of the lug h , so that the shipper-releasing mechanism will normally remain inoperative.

At each side of the loom upright arms A^{33} are provided, having bearings at their upper ends for a cross-shaft b , having secured thereto sheaves $c d$, to which are secured, respectively, flexible straps or supports $c^x d^x$ for the heddle-frames.

The heddle-frames are herein shown as composed of top bars $c' d'$ and bottom bars $c^2 d^2$, respectively, rigidly connected by upright side bars $c^3 d^3$. To each heddle-frame at its top is secured an upturned threaded link a^{10} , extended loosely through a hole in the bottom a^{11} of a stirrup a^{12} , attached in suitable manner to each of the supporting-straps $c^x d^x$. A nut a^{13} is screwed onto the end of the link a^{10} , projecting into the stirrup, said nuts having locking-ears a^{14} (see Fig. 3) to embrace the sides of the stirrup-base a^{11} and prevent accidental rotation of said nuts. These nuts are made to turn easily on the links, so that by lifting the link until the locking projections a^{14} are disengaged from the stirrup the attendant can turn the nut up or down with his fingers to secure the desired adjustment quickly and accurately without the use of tools.

Levers $b^6 b^7$, pivoted on a cross-girt b^8 of the loom-frame, are connected by adjustable straps or links $b^{16} b^{17}$ to the bottom bars $c^2 d^2$ of the respective heddle-frames, said levers carrying rolls 6 7, acted upon by the peripheries of actuating-cams $C^6 C^7$, to operate the heddle-frames, the depression of one frame acting, by the overhead connection described, to lift the other frame.

It will be seen that the frames are not posi-

tively guided at their sides, but that they are free to move laterally for a limited distance between the two heddle-guide supports E, according to the demands made by the differing tension of the warps as the harnesses are hung or sustained in suspension between their upper and lower supports.

Cross-bars $C^{10} D^{10}$ are extended through longitudinal slots in the heddles, said bars being suitably secured to the heddle-frames, and to avoid confusion in Fig. 2 the heddles H are shown in dotted lines.

The side bars of the heddle-frames move between the cross-girt or separator a and the feet e' , supporting the heddle-guides e^x .

The construction herein shown is simple and strong, and while the action is positive there is no undue rigidity of parts.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a loom, a pair of reciprocating heddle-frames, and a series of heddles on each frame to act as warp-detectors, combined with a fixed separator to separate the lower ends of the heddles of one series from the lower ends of the heddles of the other series, a stationary guide into which the lower ends of the heddles enter, stands having depending, separated feet for the heddle-guide and between which the side bars of the heddle-frames are free to move laterally, means connected to the bottoms of the heddle-frames, to reciprocate them, and upper connections between the tops of the frames, substantially as described.

2. In a loom, a heddle-frame having upturned threaded links attached to its top, an overhead rotatable shaft, depending straps secured thereto each having a stirrup through which one of said links is loosely extended, and a combined adjusting and retaining nut on each link to rest on the stirrup and provided with a locking-ear to prevent accidental rotation of the nut, substantially as described.

3. In a loom, a heddle-frame, an overhead rotatable shaft, connections between it and the top of the heddle-frame, including stirrups and cooperating threaded links extended loosely therethrough, and adjusting-nuts on said links, provided with locking-ears to straddle the stirrup-bases and prevent accidental rotation of the nuts, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE O. DRAPER.
JAMES H. NORTHROP.

Witnesses:

WM. W. KNIGHT,
C. D. BANCROFT.