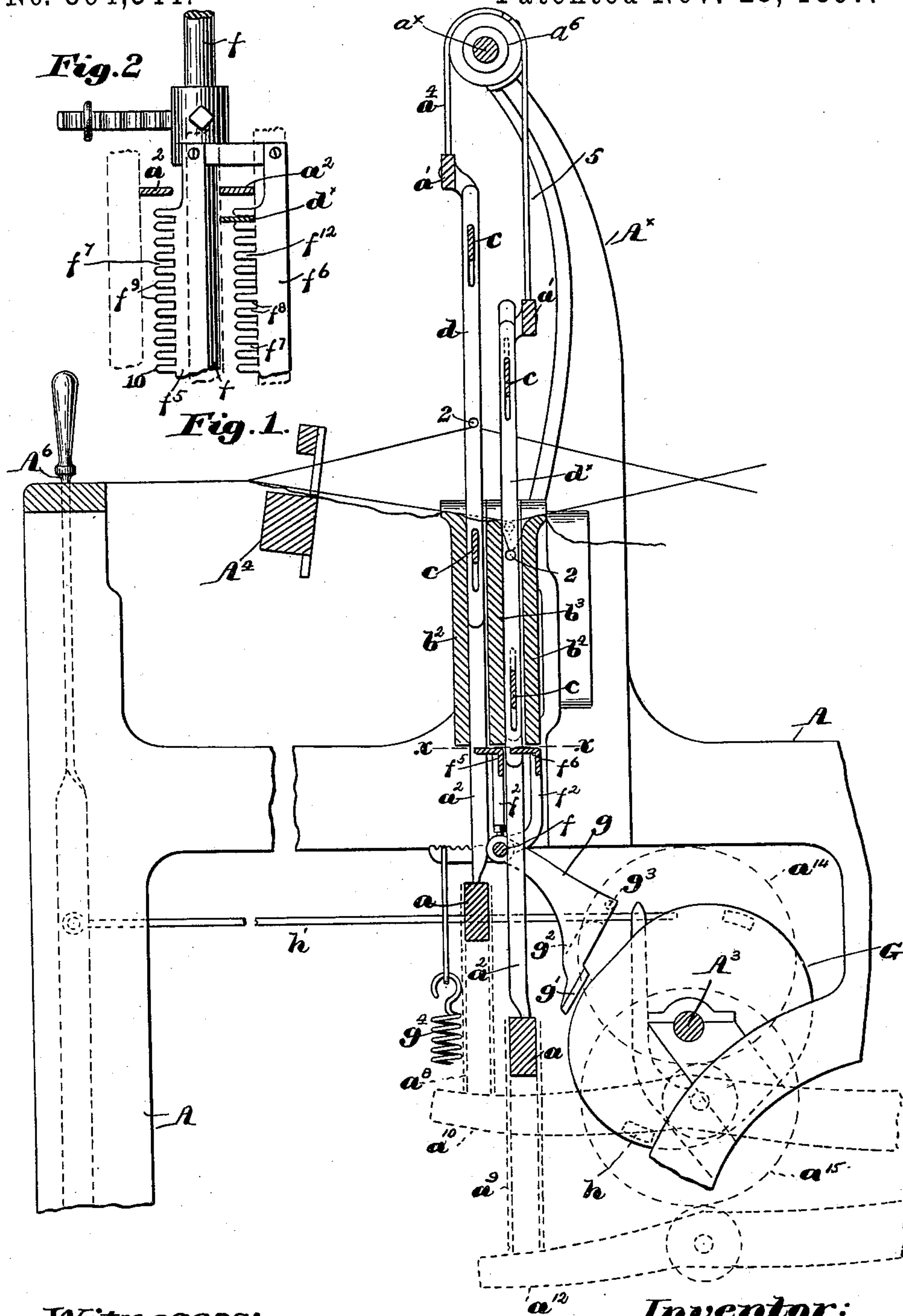


(No Model.)

W. F. DRAPER.
WARP STOP MOTION FOR LOOMS.

No. 594,344.

Patented Nov. 23, 1897.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM F. DRAPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE
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WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 594,344, dated November 23, 1897.

Application filed February 26, 1897. Serial No. 625,232. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. DRAPER, of Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in Warp Stop-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates more particularly to that class of looms wherein warp-stop-motion-actuating detectors are made operative through a cooperating vibrator to effect the automatic stoppage of the loom upon break-
15 age or undue slackening of a warp-thread, the affected detector at such time assuming an abnormal operative position. In various forms of construction looms have been provided with such warp-stop-motion-actuating
20 detectors, either in the nature of detectors pure and simple or when also serving as heddles, and in practice it has been found that the detectors, usually made as thin flat strips of metal, have shown a tendency to twist or
25 bend when engaged by the vibrator. To overcome this tendency, the acting face of the vibrator has been serrated or finely toothed, and the fixed bar or support for the opposite longitudinal edge of an engaged detector has also
30 been serrated, the object of the opposed serrated members being to prevent lateral movement of the detector when engaged. However, the detectors are in such construction
35 often caught in a slanting manner, tending to bend them and prevent the operation of the stopping mechanism of the loom.

This present invention has for its object the production of means for completely overcoming the objectionable features hereinbefore
40 stated in a simple and effective manner, my invention being applicable to all forms of stop-motion mechanism, including actuating-detectors and a cooperating vibrator, my invention relating particularly to the construction
45 of the latter.

Various novel features of my invention will be hereinafter described, and particularly pointed out in the claims.

50 Figure 1 is a longitudinal sectional view of a sufficient portion of a loom to be understood with my invention applied thereto; and Fig.

2 is an enlarged horizontal sectional detail on the line $x x$, Fig. 1, looking down.

It is immaterial what form of stop-motion mechanism be employed, and I have illus- 55
trated my invention in connection with the loom forming the subject-matter of United States Patent No. 536,969, dated April 2, 1895, to which reference may be had.

The loom-frame A, cam-shaft A³, the lay A⁴, 60
carrying a reed, and the shipper-handle A⁶, held in place while the loom is running properly by the usual notched plate, (not shown,) are and may be all as common in looms.

The uprights A^x provide bearings for a 65
cross-shaft a^x, having pulleys a⁶, to which are connected straps a⁴ a⁵, attached to the upper bars a' of the heddle-frames, the lower bars a of said frames being connected by the straps a⁸ a⁹ with the levers a¹⁰ a¹², each having, pref- 70
erably, a roll to be acted upon by the cams a¹⁴ a¹⁵, carried by the shaft A³, as in said Patent No. 536,969.

The top and bottom bars of the frames are connected by rigid side bars a², and cross- 75
bars c carry the detectors d, herein serving also as heddles, said detectors being shown as thin flat metallic strips, each having a warp-receiving eye 2 and slotted to receive the carrying-bars c. Three parallel plates 80
or bars b² b³ b⁴ receive the lower ends of and act as guides for the detectors, the tops of said bars serving to support the warp-threads when in the lower plane of the shed, and the plane rear surfaces of the bars b² b³ support a 85
dropped detector when engaged and pressed against such bar by the vibrator.

A rock-shaft f is supported in the loom-frame, and the connected controller-lever g, having a toe g', heel g², and projection g³, the 90
spring g⁴, and the cam G, fast on the shaft A³ and provided with pins or projections h to at times cooperate with the connecting-rod h', attached to the shipper-handle A⁶, said rod being controlled as to its position by the con- 95
troller-lever g, are and may be as shown in said patent referred to and operate as therein described. The rock-shaft f has attached thereto upturned arms f², to which are attached the like vibrators f⁵ f⁶, one to cooper- 100
ate with each series of detectors. The acting portion of each vibrator is provided with a

series of deep notches f^7 in the direction of the length of the warp, the sides of the notches being parallel for the greater part of their length, as at f^8 , Fig. 2, said sides being flared or outwardly beveled at the entrance of each notch at f^9 to facilitate the entrance of the dropped detector thereinto. The notches are of such depth that preferably a detector will be embraced for about one-half its width, effectually preventing twisting or bending thereof and obviating any serration or notching of the back bar against which the detector is pressed by the vibrator.

Referring to Fig. 2, it will be seen that the flaring entrances of adjacent notches are so located that the oppositely-beveled sides intersect, as at 10, so that a detector will be guided into one or other of the notches at opposite sides of the dividing-wall. The vibrator is thus in effect a comb-like member, the tines f^{12} of which have pointed or beveled ends and parallel sides.

While I have herein shown the stop-motion-actuating detectors also serving as heddles, it will be obvious that the detectors and heddles may be entirely independent, the vibrator cooperating with the detecting member in either case.

A separately-actuated vibrator may cooperate with each series of detectors, or the vibrators may be arranged in groups, as herein shown, and any other suitable form of mechanism for giving the vibrator its normal movement may be employed instead of that herein shown.

In the drawings a detector d^x is shown as in abnormal position, due to breakage of its warp-thread, and engaged by the vibrator, stopping the latter, to thereby effect the stoppage of the loom automatically.

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

1. In a loom the following instrumentalities, in combination, viz: a series of flat vertically-reciprocating warp-stop-motion-actuating detectors movable into abnormal operative position upon breakage or undue slackening of a warp-thread, a cooperating vibrator having parallel-sided notches to be entered by a detector in abnormal position, and means to normally move said vibrator back and forth in the direction of the length of

the warp-stopping means, and connections therefrom to the vibrator, substantially as described.

2. In a loom the following instrumentalities in combination, viz: a series of flat vertically-reciprocating warp-stop-motion-actuating detectors, movable into abnormal operative position upon breakage or undue slackening of a warp thread, a cooperating vibrator having parallel-sided notches and flaring entrances to be entered by a dropped detector, and means to normally move the vibrator in the direction of the length of the warp-stopping means, and connections therefrom to the vibrator, substantially as described.

3. In a loom the following instrumentalities in combination, viz: a series of flat vertically-reciprocating warp-stop-motion-actuating detectors, a cooperating vibrator having notches with parallel sides of a depth equal to substantially one-half the width of and to be entered by a detector in abnormal position, and means to normally move the vibrator in the direction of the length of the warp-stopping means, and connections therefrom to the vibrator, substantially as described.

4. In a loom the following instrumentalities, viz: a series of flat vertically-reciprocating warp-stop-motion-actuating detectors movable into abnormal operative position upon breakage or undue slackening of a warp-thread, a cooperating vibrator, slotted to form tines presenting parallel sides and pointed outer ends, said slots being entered by a detector in abnormal position, and means to normally move said vibrator back and forth in the direction of the length of the warp-stopping means, and connections therefrom to the vibrator, substantially as described.

5. As an article of manufacture, a comb-like vibrator for warp-stop-motion mechanisms, presenting a series of tines having parallel sides and pointed outer ends, substantially as described.

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

WILLIAM F. DRAPER.

Witnesses:

GEO. OTIS DRAPER,
HERBERT S. MANLEY.