No. 696,083. Patented Mar. 25, 1902.

C. F. ROPER.

WARP STOP MOTION MECHANISM.

(Application filed Aug. 26, 1901.)

(No Model.)

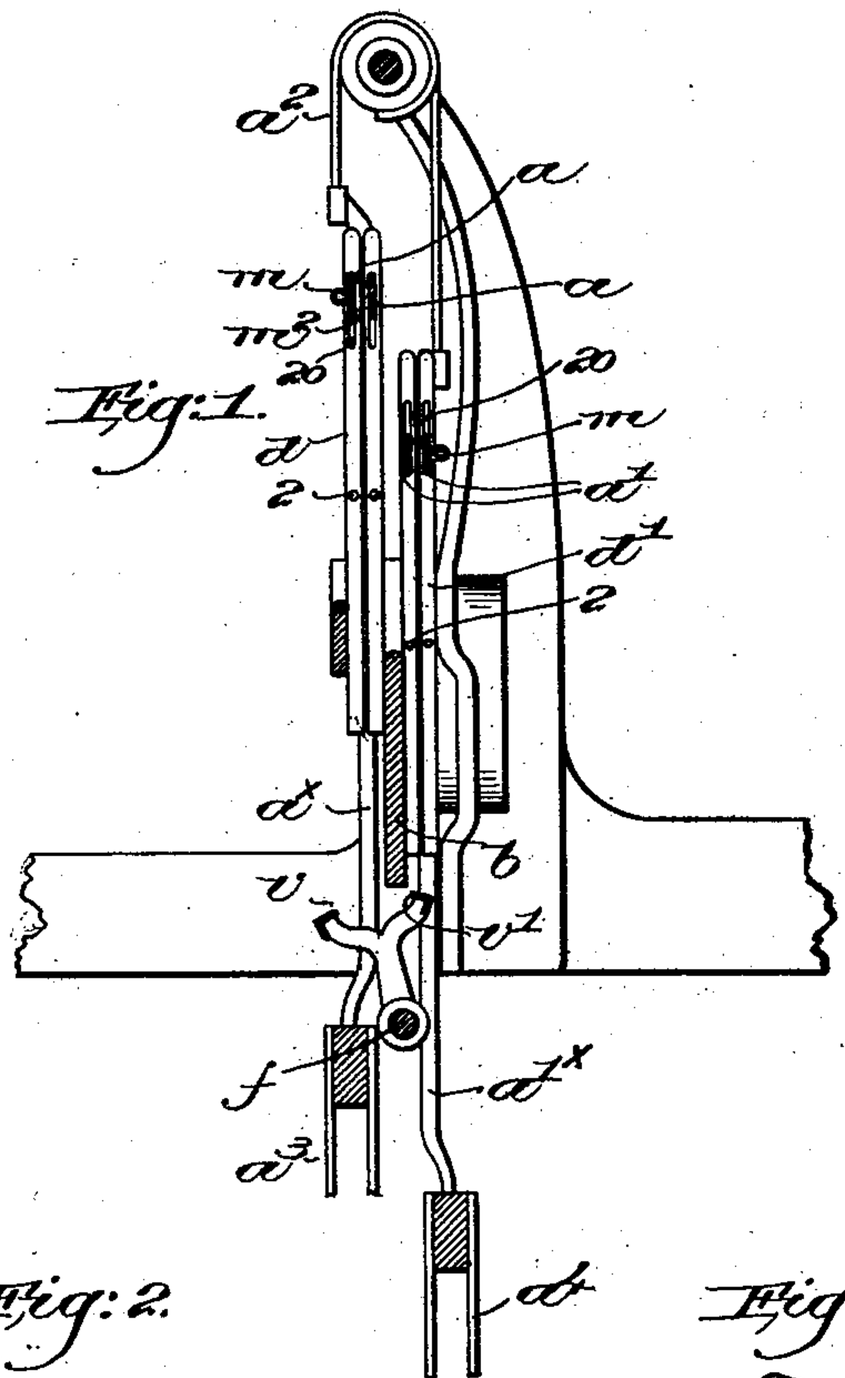

Fig: 1.

Fig: 2.

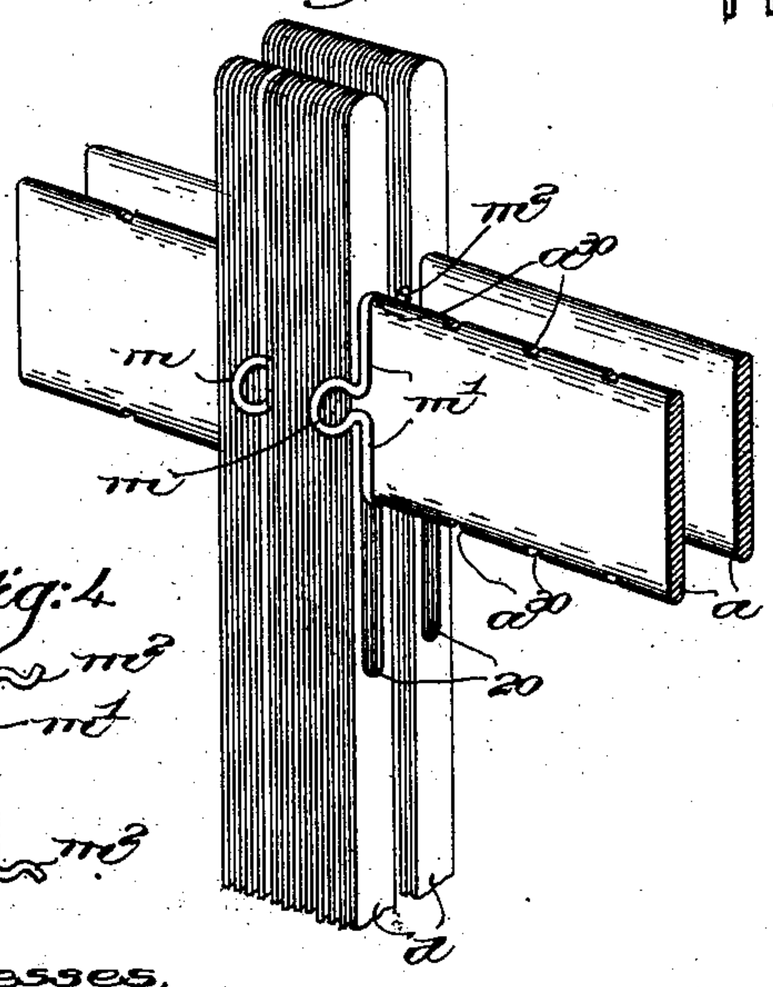

Fig: 3.

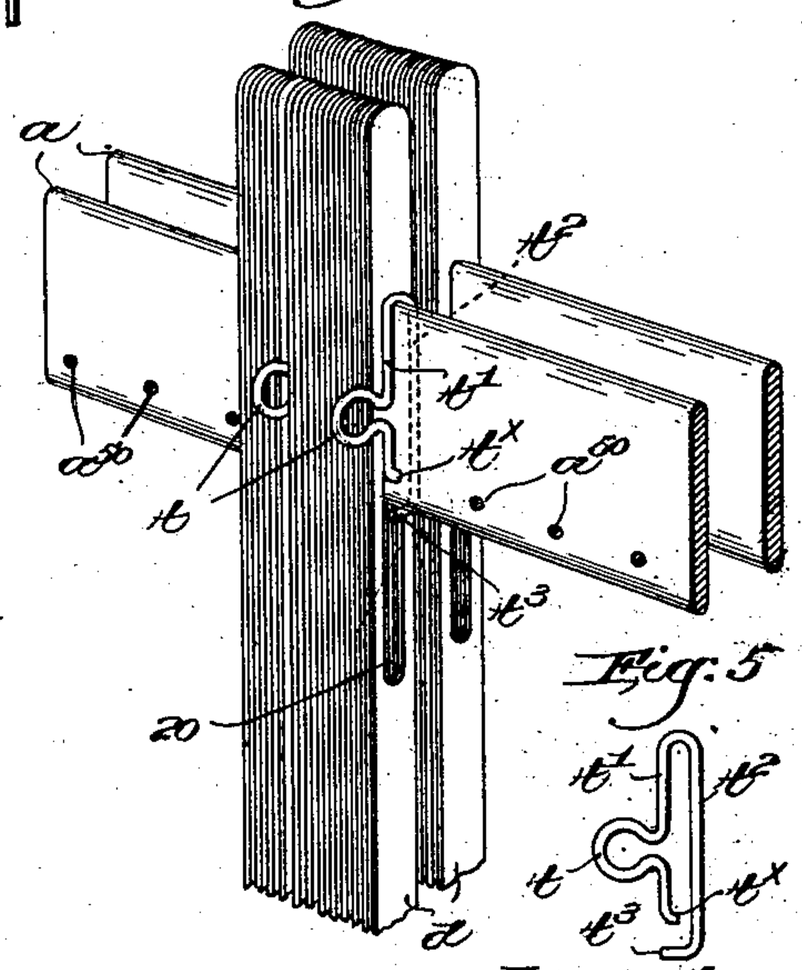

Fig: 4.

Fig: 5.

Witnesses,
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UNITED STATES PATENT OFFICE.

CHARLES F. ROPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF PORTLAND, MAINE, AND HOPEDALE, MASSACHUSETTS.

WARP-STOP-MOTION MECHANISM.

SPECIFICATION forming part of Letters Patent No. 696,083, dated March 25, 1902.

Application filed August 26, 1901. Serial No. 73,387. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. ROPER, a citizen of the United States, residing at Hopedale, in the county of Worcester and State of Massachusetts, have invented an Improvement in Warp-Stop-Motion Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object the production of means for preventing lateral swaying of the controlling-detectors of warp-stop-motion mechanism by dividing the detectors of a bank or series into groups.

The movement of the warp-threads in the formation of the shed in a loom causes a very marked and objectionable swaying of the detectors, which are governed by the warp-threads, and when the detectors serve also as heddles the swaying is particularly noticeable.

By dividing the detectors of a bank or series into relatively small groups through the agency of suitable separators the swaying is prevented, and herein a detachable separator is shown and described, the separators being readily attached to the detector-supports to include any desired number of detectors in a group, according to circumstances.

The invention is illustrated in connection with warp-stop-motion mechanism, wherein the detectors also serve as heddles.

Figure 1 is a transverse sectional view of a portion of a warp-stop-motion mechanism applied to a loom with one form of my invention embodied therein. Fig. 2 is an enlarged perspective detail showing two detector-supports, detectors on each, and separators on the supports. Fig. 3 is a similar view showing a modified form of separator and the means for preventing lateral displacement thereof. Fig. 4 is a side elevation of one of the separators shown in Figs. 1 and 2, and Fig. 5 is a similar view of the modified separator shown in Fig. 3.

In Fig. 1 the front and back banks of detectors d d', which also serve as heddles and are made as flat thin metal strips, are each provided with a warp-eye 2 and a longitudinal slot 20 at their upper ends, as in United States Patent No. 590,551, dated September 21, 1897, the detectors being arranged in double series and having extended through their slots cross-bars a a', forming parts of vertically-reciprocated frames $a^{\times}$ $a'^{\times}$, as in said patent. The overhead flexible connections a^2 between the frames, the straps a^3 a^4, which connect the lower ends of the frames with usual cam-actuated treadles, (not shown,) the vertically-arranged and transversely-extended plate b between the lower ends of the front and back banks of detectors, the normally oscillated rock-shaft f, and the feelers v v' thereon to coöperate with a released detector in the front or rear bank, respectively, may be and are all substantially as in the patent referred to.

The supports a or a' are shown as thin flat bars set on edge and of less depth than the length of the slots 20 in the detectors to permit limited vertical movement of the detectors relatively to the support, as in the said patent.

In the structure herein shown the detectors are arranged in double banks or series, and it has been found necessary to apply separators to only one of the supports of a pair, as the series of detectors divided into relatively small groups by the separators will be kept by the latter from swaying laterally, and they in turn will prevent swaying of the adjacent series.

The separators herein shown each comprise a body portion to project substantially at right angles to the support, and a resilient or spring clip, by which the separator is held onto the support.

The separator is preferably made of a piece of stout spring-wire, and, referring to Fig. 4, it is shown as bent between its ends to form a loop-like body m, the free ends of the wire at the base thereof being oppositely extended, as at m', and bent over at their extremities at m^2 to form opposed and substantially **S**-shaped ends, forming a spring-clip for the separator. These ends are adapted to be sprung over and embrace the upper and lower edges of the detector-support, as very clearly shown in Fig. 2, the body m projecting from

the upright face of the support to form a separating-partition between two adjacent groups of the detectors.

It will be manifest that the separators may be made to include any desired small number of detectors in a group and that one group may have a greater or less number of detectors than are included in other groups, the separators being readily and instantaneously applied to or detached from the supporting-bars.

I have provided means for preventing lateral displacement of the separators, and, referring to Fig. 2, the upper and lower edges of the supporting-bar are provided with a series of recesses, shown as notches a^{30}, into which the ends of the separators are sprung, the separators being thus restrained from lateral movement on the support.

A modified form of separator is shown in Figs. 3 and 5, it being also made of stout spring-wire bent near one end to form a loop-like body t, the shorter end being bent to form a prong $t^{\times}$, while the longer end is oppositely extended at t' and bent back upon itself at t^2, the long leg t^2 being carried beyond the prong $t^{\times}$ and oppositely turned at its extremity, as at t^3. The portion t' t^2 t^3 forms the spring-clip to be snapped upon the detector-support into the position shown in Fig. 3, with the body t projecting from the face of the support, and the prong $t^{\times}$ in this structure springs into one of a series of recesses or holes a^{50} in the support near its lower edge to prevent lateral displacement of the separators.

My invention is not restricted to the precise construction and arrangement herein shown, as it will be manifest that the same may be modified or changed in details without departing from the spirit and scope of my invention.

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

1. In a loom, a series of warp-stop-motion-controlling detectors, a support upon which they are mounted, separators detachably connected with the support, to divide the detectors thereon into small groups, and means to prevent lateral displacement of the separators.

2. In a loom, a series of warp-stop-motion-controlling detectors, a support upon which they are mounted, separators each having a spring-clip for detachable connection with the support, to divide the detectors thereon into small groups, and means to prevent lateral movement of the separators on the support.

3. In a loom, a series of warp-stop-motion-controlling detectors, a support upon which they are mounted, and a series of separators detachably connected with the support to divide the detectors thereon into small groups, each separator comprising a body, and a spring-clip to engage the detector-support.

4. In a loom, a series of longitudinally-slotted warp-stop-motion-controlling detectors, a transverse support for and extended through the slots of the detectors, a series of recesses in the support, and a plurality of separators detachably connected with the support and in engagement with the recesses therein, to divide the detectors into groups, the recesses preventing lateral displacement of the separators.

5. In a loom, a series of longitudinally-slotted warp-stop-motion-controlling detectors, a flat supporting-bar of less depth than the length of the slots and extended therethrough, a series of recesses in the bar, and detachable separators having resilient attaching means to engage the upper and lower edges of the bar, to divide the detectors into groups, a separator engaging one of the recesses in the bar, to thereby be held from lateral displacement.

6. In a loom, a series of stop-motion detectors longitudinally movable into operative position by breakage of the warp-threads, a transverse support for and relatively to which the detectors have a limited independent vertical movement, detachable separators mounted on the support and each having a body portion to extend at right angles from the support, to divide the detectors into groups, and means to position the separators on the support and prevent their lateral displacement.

7. A separator for attachment to detector-supports in warp-stop-motion apparatus, consisting of a spring-wire bent between its ends to form a loop-like body, the wire being bent at opposite sides of the body to form a spring-clip.

8. A harness-frame having a cross-bar, in combination with heddles suspended from said cross-bar, each heddle having a warp-eye below said bar, and separators which divide said heddles into small groups or sections, said separators being mounted on the cross-bar and located above the warp-eyes, whereby lateral movement of said heddles is restricted.

9. A harness-frame having a cross-bar, in combination with heddles constituting warp-detectors suspended from said cross-bar and having a limited vertical movement thereon, each heddle having a warp-eye below said bar, said heddles being supported by the warp-threads when occupying the lower plane of the shed, and detachable separators which divide said heddles into small groups or sections, said separators being mounted on the said cross-bar and located above the warp-eyes, whereby lateral movement of said heddles is restricted.

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

CHARLES F. ROPER.

Witnesses:
GEORGE OTIS DRAPER,
ERNEST W. WOOD.