

E. S. STIMPSON.
WARP STOP MOTION FOR LOOMS.
APPLICATION FILED AUG. 13, 1907.

937,888.

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Fig. 1.

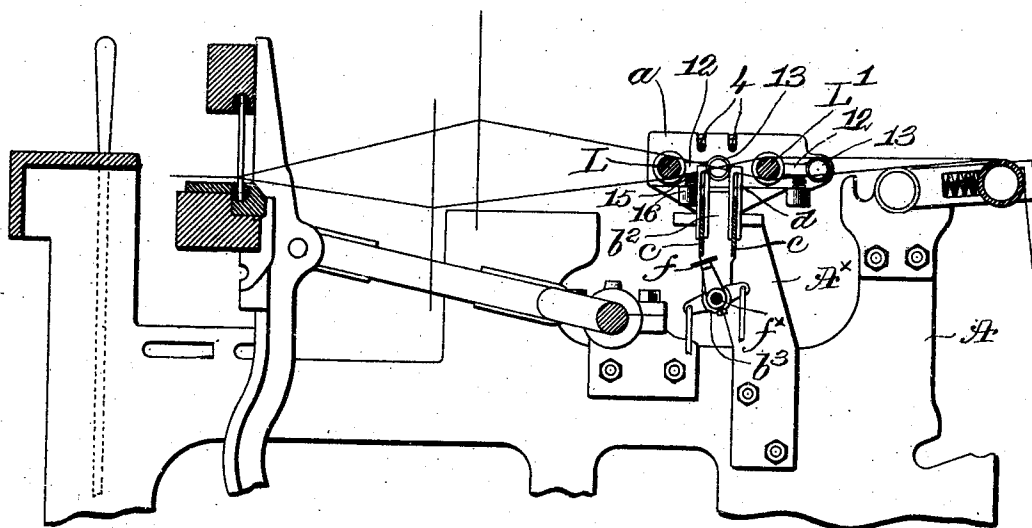


Fig. 3.

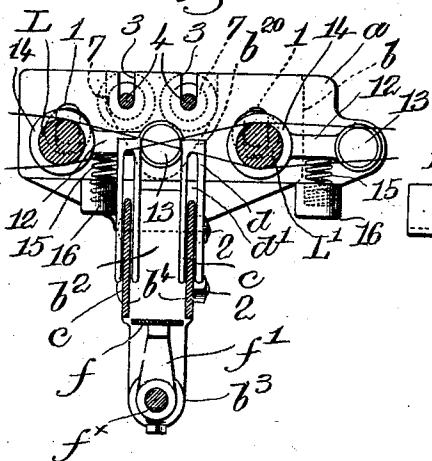


Fig. 2.

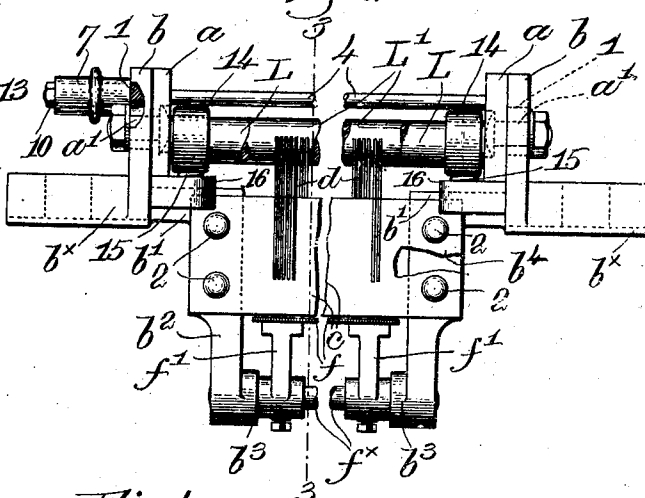


Fig. 4.

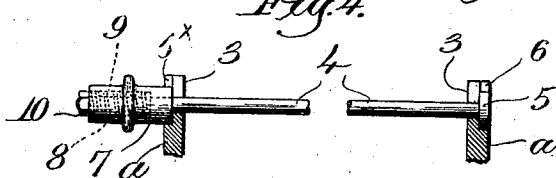
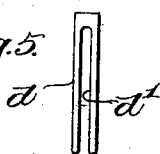


Fig. 5.



Witnesses.
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Edward S. Stimpson,
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UNITED STATES PATENT OFFICE.

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WARP STOP-MOTION FOR LOOMS.

937,888.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed August 13, 1907. Serial No. 388,317.

To all whom it may concern:

Be it known that I, EDWARD S. STIMPSON, a citizen of the United States, and resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Warp Stop-Motions for Looms, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to warp stop-motions for looms wherein the controlling detectors are sustained by intact warp threads under normal conditions, release of a detector by failure of its thread causing the arrest of a normally vibrating feeler to effect the stoppage of the loom.

In the present embodiment of my invention the detectors are provided with longitudinal slots open at their lower ends, so that the detectors can be dropped on the warp threads, said detectors being arranged in banks or series so located with relation to the lease-rods that the detectors cooperate with the threads between the lease-rods, and herein each detector is controlled by a single thread.

Transverse supports extend through the detector slots to guide the detectors in their vertical movement, the lower end of each support extending close to the feeler path so that when the feeler engages a released detector the latter will be sustained by the support as a back-stop adjacent the point of engagement with the feeler. This reduces the bending strain on the detector, enabling it to be made light in weight, and it also simplifies the construction, as the support itself also serves at the proper time as a back-stop.

I have provided means to limit upward movement of the detectors, to thereby guard against accidental disengagement with the warp threads, for as the detector slots are open at their lower ends any quick jerk or pull on the warp tends to jump the detectors up.

When the weaver is picking out the movement of the warps will often cause one or more of the detectors to jump, and if not limited such upward movement is sufficient to throw the detector clear of its thread.

The limiting means is made readily removable so that the weaver may have full and free access to the warp and to the detectors when necessary, and a simple and

effective retaining device holds the said limiting means in operative position.

I have also provided novel means for supporting and controlling the movements of the lease-rods, so that heavy and rigid rods may be used without detriment, the rigidity of the rods preventing bending or bowing thereof when subjected to considerable warp strain, such bending being an objection frequently occurring in practice, particularly when weaving with heavy or woolen warp.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a transverse sectional view of a sufficient part of a loom, with one embodiment of my present invention applied thereto; Fig. 2 is a front elevation, enlarged and centrally broken out, of the principal parts of the warp-stop-motion mechanism; Fig. 3 is a transverse section thereof on the line 3-3, Fig. 2, looking toward the left; Fig. 4 is a detail partly in section and elevation showing the means for retaining in operative position the stop-rod, to be referred to; Fig. 5 is a side elevation of one of the detectors.

Each loom side A, Fig. 1, has fixedly secured to it a rigid arm A^x , to the tops of which are bolted horizontal, outwardly, extended feet b^x , each foot forming an integral part of a stand made as a casting, each stand at its upper end being shaped to present a wide-upright head b .

The heads of the two stands are located opposite each other, one at each side of the loom, and each one of said heads is provided with vertical slots 1, see dotted lines Fig. 3. Each stand has an inturned portion b' from which depends an extension b^2 terminating in a sleeve-like bearing b^3 .

Vertical seats b^4 are made in the front and rear faces of the extensions b^2 , see Fig. 3, on which are bolted at 2 transverse flat metal plates c , set upright and parallel to each other, and forming supports for the vertically movable stop-motion controlling detectors d , one of said detectors being shown separately in Fig. 5.

Each detector d , conveniently made of thin, flat sheet metal, is longitudinally slotted at d' , the lower end being open, so that it can be dropped on to a warp thread, as shown in Figs. 1 and 3, the detectors being arranged in two banks or series herein, one

of the supports *c* passing loosely through the slots of the detectors forming a bank or series.

Normally the detectors are maintained elevated by intact warp threads, one for each detector, in a well known manner, as shown clearly in full lines Fig. 3, with the lower end thereof well above the bottom of the support *c*. Herein, however, the support extends almost to the path of a vibrating feeler *f* mounted on arms *f'* secured to a rock-shaft *f** mounted in the bearings *b*³, so that as the feeler is vibrated by any suitable means it will just clear the lower edge of the support.

The means for normally vibrating the feeler and the loom stopping mechanism made effective by or through the arrest of the feeler form no part of my invention and may be any one of several devices now in common use.

When a detector is released by failure of its warp thread it drops on the support *c* and its bifurcated lower end extends below the bottom of the support, in the path of and arresting the feeler, in well known manner. The feeler path is so close to the bottom of the support, however, that the latter acts as a back-stop for the detector adjacent the point at which the latter is engaged by the feeler, greatly reducing the tendency of the detector to bend or twist. By this construction the same member which supports the detectors and guides them in their vertical movements serves as a back stop to resist feeler strain when the feeler engages a released detector, simplifying and improving the construction and increasing the efficiency, and presenting a small number of parts upon which lint can collect.

As the lower ends of the detectors are open, permitting them to jump up and off the warp threads if the latter are suddenly or jerkily moved I provide means to limit such movement and prevent accidental disengagement of the detectors from their threads.

A plate *a* is clamped against the inner face of each head *b* by suitable bolts *a'* extended through the vertical slots 1, so that the plates may be vertically adjusted in order to vary the height of the lease-rods, to be referred to hereinafter, the central portion of each head *b* having a substantially V-shaped opening *b*²⁰, see dotted lines Fig. 3, for a purpose to be described. Each plate *a* has upright slots or notches 3, two being herein shown, directly above the supports *c*, and forming open bearings for stop-rods 4, each rod having at one end a rigid head 5, Fig. 4, which fits into a recess 6 on the outer face of one of the plates *a*.

At its other end the rod carries a slidable sleeve-like head 7, counterbored at 8 to receive a coiled spring 9, retained in place by

a nut 10 on the extremity of the stop-rod, as clearly shown in Fig. 4, the head fitting in a recess 6^x in the outer face of the plate *a* at that side of the loom.

The expansion of the spring draws the heads 5 and 7 toward each other, and they in turn acting against the outer faces of the plates *a* frictionally maintain the stop-rod 4 in the seats 3, the openings *b*²⁰ in the heads *b* permitting the rods to be inserted in and removed from their seats. The stop-rods are thus held in position directly above the series of detectors, as clearly shown in Figs. 1 and 3, and at such a distance above them as will prevent the detectors from jumping off the threads, while at the same time permitting sufficient freedom of upward movement.

When the weaver wishes to manipulate a detector in either series he draws outward the head 7 against its spring and lifts the corresponding stop-rod 4 from its seats, and after correcting any fault replaces the rod, its removal and replacement being effected easily and quickly.

Herein I have shown the detectors arranged in two parallel series, between the lease-rods *L*, *L'* and in front of and behind, respectively, the crossing point of the warp threads, and I have improved the leasing means in a manner now to be described.

The lease-rods are made of wood or metal, preferably the latter on account of its greater rigidity when subjected to strain, and thereby I overcome the bending or bowing of the lease-rods which frequently occurs in weaving with heavy or woollen warps, such distortion having a bad effect on the warp and also interfering with the proper action of detectors when located between the lease-rods.

I support each lease-rod on rocker-arms 12, arranged in pairs at opposite sides of the loom and fulcrumed on fixed studs 13 on the inner faces of the plates *a*.

At its free end each rocker-arm is provided with an intumed seat or socket 14, made tubular in the present instance, to receive the adjacent end of a lease-rod, the latter having a free vertical movement about the fulcrum studs 13 but being rigidly held by the arms 12 from any fore and aft movement in the direction of warp travel. This arrangement maintains the rigid or unbending feature of the lease-rod while permitting all requisite vertical vibratory movement with the warp.

Metallic lease-rods, preferred by me as before stated, are quite heavy and in order to relieve the warp of undue weight I yieldingly support or cushion the rods, to counterbalance a sufficient portion of their weight. To this end coiled springs 15 are seated in pockets 16 on the plates *a*, the upper end of each spring engaging and sus-

taining a rocker-arm 12, as best shown in Figs. 1 and 3, the springs being stiff enough to relieve the warp of the major part of the weight of the lease-rods. These springs also serve to cushion the vibratory movements of the lease-rods, taking up and absorbing any shock or jerk.

From the foregoing description, taken in connection with the drawings, it will be seen that the two stands at opposite sides of the loom are rigidly connected by the detector-supports *c, c*, and that said stands adjustably support the leasing means, the feeler of the stop-motion also being supported by said stands.

Vertical adjustment of the lease-rods is secured by loosening the clamping bolts *a'* and raising or lowering the plates *a* on the heads *b* of the two stands.

Different effects in the cloth are obtained by raising or lowering the lease-rods, and such changes are conveniently and easily effected by the vertical adjustment shown and described herein.

While vertical adjustment of the plates *a* will vary the distance between the stop-rods 4 and the tops of the series of detectors such adjustment is never great enough to prevent the rods from acting as described to overcome any tendency of a detector to jump off its warp-thread.

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

1. In a warp-stop-motion, a fixed support,

a series of longitudinally slotted detectors open at their lower ends, vertically movable on the support, and adapted to hang upon intact warp threads, a stop-rod located above and to limit upward movement of the detectors, open bearings in which the stop-rod is seated, and a spring-controlled head on the stop-rod to normally retain it in place in the bearings.

2. In a warp-stop-motion, a fixed support, a series of longitudinally slotted detectors open at their lower ends, vertically movable on the support and adapted to hang upon intact warp threads, a stop-rod located above and to limit upward movement of the detectors, open bearings in which the stop-rod is seated, a rigid head on one end of the rod, and a spring-controlled head on the other end, the heads frictionally engaging the outer faces of the bearings and retaining the stop-rod therein.

3. In a loom, pairs of rocker arms fulcrumed at opposite sides thereof, a lease rod fixedly secured to the free ends of each pair of rocker-arms, and yielding means to support the weight of each of the lease-rods and relieve the warp therefrom, each lease-rod being supported independently of its fellow.

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

EDWARD S. STIMPSON.

Witnesses:

FRANK J. DUTCHER,
J. L. REMINGTON, Jr.