

(No Model.)

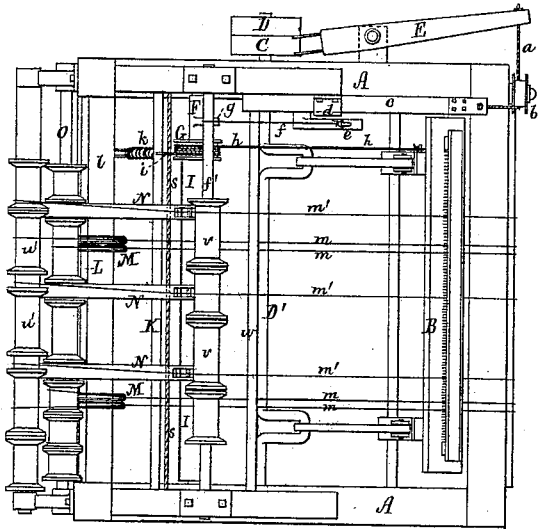
J. J. SWITZER.

WARP STOP MOTION FOR LOOMS.

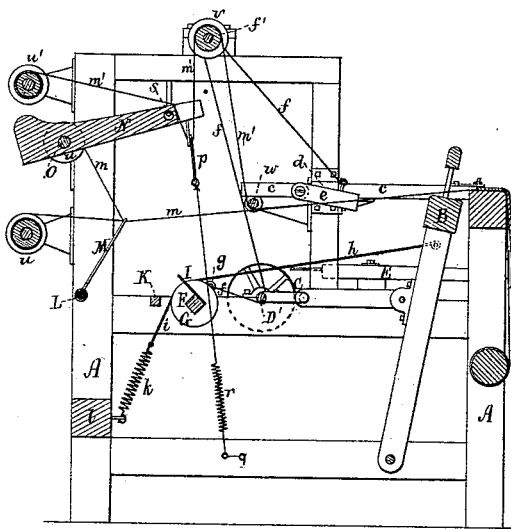
No. 348,174.

Patented Aug. 24, 1886.

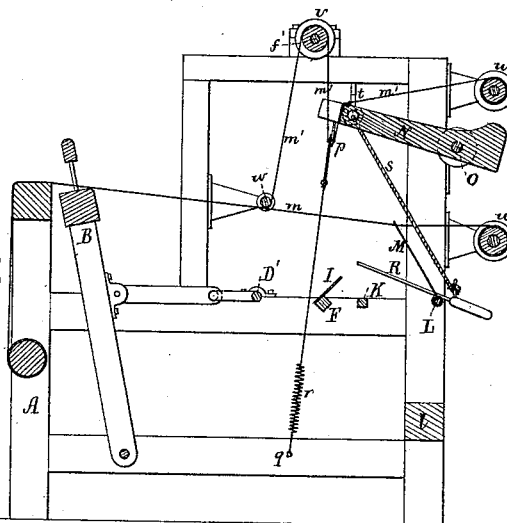
Fig. 1.



*Fig. 2.*



*Fig. 3.*



Witnesses.

S. N. Piper.

B.B. Frey

Inventor,

John J. Switzer.

by RH Eddy atty.

# UNITED STATES PATENT OFFICE.

JOHN JACOB SWITZER, OF CHELSEA, ASSIGNOR, BY MESNE ASSIGNMENTS,  
TO HIMSELF, WILLIS TUXBURY, OF BOSTON, AND ARTHUR F. COWLES,  
OF AMHERST, MASSACHUSETTS.

## WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 348,174, dated August 24, 1886.

Application filed February 8, 1886. Serial No. 191,122. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN JACOB SWITZER, of Chelsea, in the county of Suffolk, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Warp Stop-Motions for Looms for Weaving; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, and Figs. 2 and 3 are vertical, median, and longitudinal sections of a loom-frame and lay with my invention applied thereto. One section shows the mechanism to the right, and the other that to the left, of the plane of section.

The nature of my invention is defined in the claims hereinafter presented, the purpose of such invention being to effect a stoppage of the loom in case of either the breakage or the "running out" of a warp yarn or thread taking place.

The improvement is applicable to most looms, although specially so to those used in weaving suspender-webbing, tapes, and other like goods.

In the drawings, A represents the loom-frame, and B the lay thereof.

C is the fast pulley, and D the loose pulley, of the lay-shaft D'.

E is the belt-shipper lever, it having attached to its longer arm a rope, *a*, which goes partly around a guide-pulley, *b*, and is fastened to a bar, *c*, adapted to slide lengthwise in a guide, *d*, projecting from one side of the loom-frame. To this bar *c* a pawl, *e*, is pivoted. A rope, *f*, attached to such pawl, extends upward partly around a horizontal shaft, *f'*, and thence downward under the lay-shaft D', and is fastened to a short arm, *g*, projecting from a rocker-shaft, F, extending across the loom-frame in advance of the shaft D'. To one of the "swords" of the lay, and to the periphery of a pulley, G, fixed on the shaft F, a rope, *h*, is attached, such rope being wound about the pulley. Furthermore, to the said periphery another rope, *i*, is affixed, and is wound about it in the opposite direction to that of the rope *h*, and is extended from a

spring, *k*, fastened to the lower front girt, *l*, of the loom-frame. There is attached to and projected forward from the shaft F a plate, I. On the lay being reciprocated the rocker-shaft will be partially revolved, so as to first move the plate upward and next downward, relatively to a stationary bar, K, arranged just in the rear of the plate I.

Upon a horizontal rod, L, extending across the loom-frame, at a short distance from and parallel to the bar K, there is pivoted a series of looped arms, M, each of which, when resting on the bar K, being long enough to project somewhat in front thereof, in order that, during a downward movement of the plate I, the latter, by being carried into contact with or down upon the arm, shall be stopped thereby from descending farther.

If now we suppose each of the warp-yarns *m* to pass from its spool or beam *n* into and through one of the looped arms M, and thence to and across the race-beam of the lay, and also to and across the breast-beam, as usual in looms, such warp-yarn, while intact, will hold its looped arm upward, off, and above the bar K, in which case the rocker-shaft will be free to reciprocate. During these movements of the rocker-shaft the pawl *e* will be held up so that the lay in each advance will pass under without coming into contact with the said pawl; but should a warp-yarn become broken or run out, its looped arm, while the plate I is up, will fall down and rest upon the bar K, so that on the plate I descending it will go down upon and be stopped by the arm. On this stopping of the plate, and of course of the rocker-shaft, the pawl will be in a position for its rear end to be met by the lay in its rearward movement, in which case the lay in moving rearward will impinge against the pawl and press it and its slide-bar rearward, and thereby cause the shipper-lever to be moved so as to force the driving-belt of the loom from the fast to and upon the loose pulley, the loom thereby being stopped in action.

In the place of the series of looped arms, as described, or with such, when it may be desirable, as it often will be, I employ a series of furcated arms, N, pivoted on a shaft, O, ar-

ranged in the upper part of the loom-frame. Each of these arms N has below it a loop, *p*, there being attached to such loop, and a rope, *q*, going across the loom-frame at the lower part thereof, a spring or elastic cord, *r*, such cord or spring serving to pull downward the loop. A rope, *s*, fastened at one end to the loom-frame, extends loosely through holes in the several arms N, and thence through a stationary guide, *t*, at the opposite end of the frame, and downward, and is fastened to the shorter arm of a lever, R, pivoted on the rod L, the said shorter arm being weighted to over-balance the longer arm of such lever. This latter arm is to be long enough for it when down upon the bar K to project a short distance in rear thereof.

Now, if a warp-yarn, as shown at *m'*, be carried from its beam or spool *u'* down between the prongs of one of the furcated arms N, thence through the loop depending from such arm, thence upward and partially around a guide-spool, *v*, thence downward to and under a stationary horizontal rod, *w*, and thence across the race and breast beams, we shall find that such warp-yarn, while it may remain intact, will be drawn sufficiently tight to raise its loop *p* up to the arm N and elevate the latter to an altitude that will allow the weight of the lever R to keep the longer arm of such lever raised high enough to be wholly out of the way of the plate I while such plate may be vibrating. Should, however, the warp-yarn become broken or run out, the spring below its loop *p* will be free to act and draw downward the loop away from the arm N, which in descending will by its weight so act upon the rope *s* as to cause such rope to tilt the lever R down upon the bar K, in which case such lever and bar will stop the plate I in its descent, a consequent stoppage of the loom following, as hereinbefore explained.

From the above it will be seen that the series of furcated arms, their loops, springs, rope, and weighted lever, are a mechanical equivalent for the series of looped arms as used with the bar K and the vibrating plate I. Such

plate I and its rocker-shaft may be termed the "vibrator," it being vibrated, or having imparted to it transversely of it a reciprocating rotary movement, by the lay, ropes, a pulley and spring, adapted to operate, as explained. By its connection with the pawl *e* the latter is held up out of the path of the lay while the warp-yarns are intact, but on one of them becoming broken or run out the vibrator will be arrested in its motion, and as a consequence the pawl will fall into the said path and be acted on by the lay in its rearward movement, so as to force the slide-bar *c* rearward, and thereby effect a stoppage of the loom.

I claim—

1. In a loom, the warp stop-motion or combination, substantially as specified, consisting of the stationary bar K, vibrator, (or plate I and rocker-shaft F,) lay B, spring *k*, series of looped arms M, pawl *e*, slide *c*, shipper E, and the lines *a*, *h*, *i*, and *f*, such slide *c* being connected with the said shipper by the line *a*, and such vibrator being connected with the lay and the spring *k* by the lines *h* and *i*, and with the pawl by the line *f*, and all being arranged and to operate essentially in manner and for the purpose as set forth.

2. The combination of the series of furcated arms N, the loops *p*, springs *r*, rope *s*, and weighted lever R, arranged in the loom-frame, as described, with the stationary bar K, vibrator, (or plate I and rocker-shaft F,) lay B, spring *k*, series of looped arms M, pawl *e*, slide *c*, shipper E, and the lines *a*, *h*, *i*, and *f*, such slide *c* being connected with the said shipper by the line *a*, and such vibrator being connected with the lay and the spring *k* by the lines *h* and *i*, and with the pawl by the line *f*, and all being arranged and to operate essentially in manner and for the purpose as set forth.

JOHN JACOB SWITZER.

Witnesses:

R. H. EDDY,  
R. B. TORREY.