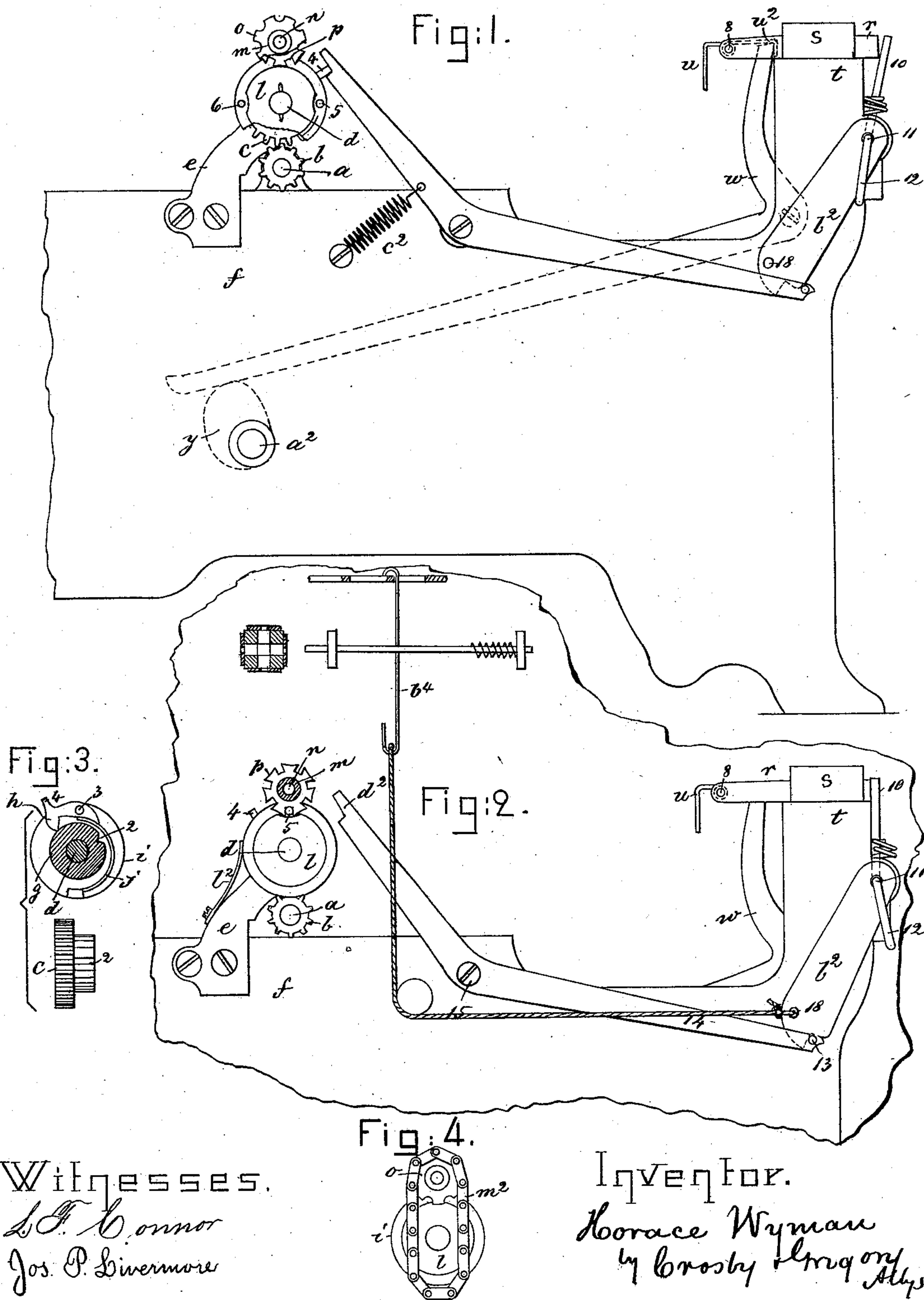


(Model.)

H. WYMAN.  
Loom.

**No. 235,975.**

**Patented Dec. 28, 1880.**



N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.



# UNITED STATES PATENT OFFICE.

HORACE WYMAN, OF WORCESTER, MASSACHUSETTS.

## LOOM.

SPECIFICATION forming part of Letters Patent No. 235,975, dated December 28, 1880.

Application filed March 5, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, HORACE WYMAN, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Looms, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to looms, and has special reference to an improvement whereby the shaft or drum that supports and moves the shuttle-box pattern-cylinder surface or chain will be automatically and instantly stopped whenever the weft or filling is broken, such contrivance acting to stop the motion of the shuttle-box pattern-surface sooner than could be done when the said pattern-surface is stopped only as the crank-shaft is stopped, for by this latter and common plan the momentum of the loom, after the shipper operates to stop the loom, is usually sufficient to run the loom for one or two picks.

My invention consists, essentially, in the combination, with any usual weft-feeling devices and the sleeve or shaft carrying the shuttle-box pattern-surface, of rotating clutching mechanism having a pinion engaged and driven by a pinion on the crank or other suitable rotating shaft of the loom, and intermediate devices between the weft-feeling devices and the said clutch to automatically operate the clutch to release the said shaft that moves the shuttle-box pattern-surface from the control of the running parts of the loom upon the breaking or absence of the weft, or when the weft becomes too slack.

Figure 1 represents, in side elevation, a sufficient portion of a loom to illustrate my improvement; Fig. 2, a partial side elevation and section, showing the parts in a different position; Fig. 3, details of one form of clutching mechanism for placing the shuttle-box pattern-surface under or releasing it from the control of the crank or other positively-driven shaft of the loom; and Fig. 4 a detail with the pattern-chain added.

In the drawings, *a* is the usual crank-shaft, and *b* a pinion thereon. This crank-shaft *a* is intended to be like, and to be actuated in the same manner as, the crank-shaft in United States Patent No. 142,441. This pinion engages and drives a toothed gear, *c*, placed loosely on a stud, *d*, held in a suitable bracket

or stand, *e*, at the loom side *f*. At the side of this toothed gear is a collar, *g*, having in it a notch, 2, which, when the loom is in regular operation and the filling is being properly laid by the usual shuttles, is engaged by the clutching-pawl *h*, pivoted at 3 on the disk *i*, loose on the stud *d*, a spring, *j*, acting to keep the said pawl in the said notch. This notched collar *g*, pawl *h*, disk *i*, and spring *j* form what I herein denominate the "clutch" or "clutching mechanism" for the shuttle-box pattern-surface; but, instead of the particular devices shown, it will be understood that any other well-known suitable clutch mechanism which will operate in the same manner may be employed. I have placed at the side of the said disk *i* a pin-wheel contrivance, *l*, and one or more pins, 5, according as it is desired to turn the pattern-surface one or more picks to each revolution of the cam-shaft, one pin being herein used to insure a movement of the said pattern-surface for every two picks, for the pin-wheel is so timed as to make one while the crank-shaft makes two revolutions; but with two pins, one directly opposite the one 5, in the position indicated by the circle 6, Fig. 1, the pattern-cylinder would move one step at each semi-revolution of the pin-wheel, and consequently at each rotation of the crank-shaft.

The pattern-surface which I prefer to employ will be the chain *m*<sup>2</sup>, (shown in Fig. 4,) it being carried by the shaft or hollow sleeve or cylinder *m*, placed on the stud *n*, the sleeve having the usual notched disks *o*, which receive the bars of the pattern-chain. Upon this sleeve, at one end, is the star-wheel *p*, notched to form teeth which at their outer ends are concaved, the notches to be entered by the pin 5 and the concaves to act in succession upon the disk *l* after the said pin passes from each of the said notches, to thus prevent further rotation of the pattern-surface with the said disk and crank-shaft.

The bar *r*, fitted to slide in the stand *b* of the breast-beam *t*, has pivoted upon it at 8 the usual tilting fork *u*, which, as the lay is moved forward to beat in the filling, causes the weft, if present on the usual grid, to act upon and tilt the said fork, elevating its hooked rear end above the path of movement of the vibrating lever *w*, (see dotted lines, Fig. 1,) which, in



practice, will be moved once during each rotation of the cam-shaft by a cam, as indicated by dotted lines  $y$ , on a suitable cross or cam shaft,  $a^2$ .

5 At the rear of the slide-bar  $r$  is an arm, 10, of a rock-shaft, 11, having another arm, 12, which, at or near its lower end, has a projection to act upon and lift the lever-holder  $b^2$ , which, as herein shown, is loosely mounted upon the  
10 shaft 11, the lower end of the said lever-holder being suitably notched to engage a pin or projection, 13, on the stopping-lever 14, pivoted at 15. The rear end of this lever 14, near the clutch mechanism for the shuttle-box pattern-  
15 surface, is notched, and at the proper time strikes the head 4 of the pawl and lifts it from the notch 2 in the collar  $g$ , leaving the pin-wheel loose and the shaft or sleeve that carries the pattern-surface at rest, notwithstanding movement of the crank-shaft after such  
20 disengagement.

The devices  $r$ ,  $u$ , 10, and 12 constitute what I shall hereinafter call the "weft-feeling" mechanism; but instead of the special devices  
25 shown I may employ any usual weft-feeling devices.

When the weft is being properly laid and the fork is tilted at every other forward movement or beat-up of the lay, all in the usual  
30 manner, the lever-holder  $b^2$  acts to hold the stopping-lever 14 lifted, as in Fig. 2. When the weft fails and the fork is not tilted the lever  $w$  strikes the rear end,  $w^2$ , of the fork, (shown in dotted lines, Fig. 1,) carries back the  
35 slide  $r$ , turns the rock-shaft 11, and lifts the holder  $b^2$ , when the spring  $c^2$  (shown in Fig. 1) turns the said lever so that its notched end  $d^2$  is placed in position to strike the top 4 of the pawl  $h$ , disengage it quickly from the gear  
40  $c$  and collar, then, being driven by the crank-shaft, instantly leaving the disk, pin-wheel, and pattern-surface at rest, and completely stopping the rotation of the same, notwithstanding the lay may, from its momentum,  
45 move sufficiently to produce one or two picks. As soon as the end 4 of the pawl strikes the end  $d^2$  of the lever 14, said end being preferably inclined, as shown, the end  $d^2$  of the said lever is lifted far enough to permit the loosely-mounted  
50 holding-arm  $b^2$  to drop by its own weight over the pin 13 and hold the lever 14, as in Fig. 2. Now, when the loom is again started the pawl will drop into the notch 2 as soon as the said notch, in the rotation of the hub  $g$ , arrives under it, which instantly permits the pin-wheel  
55 to start up and the pattern-surface to be again actuated automatically.

The lever-holder  $b^2$  may, if desired, be provided with a hole, 18, in which will be attached  
60 a cord,  $b^3$ , or wire, joined, as shown in Fig. 2, with a Jacquard lifting-wire,  $b^4$ , of usual construction, thus placing the said lever-holder under the control of a Jacquard, to thereby move the holder to release the lever 14 at suitable intervals, according to the pattern of the  
65 cloth being woven.

The holder may be operated by hand, should it be desired to do so.

The pawl  $h$  can only be connected or disconnected at the position shown in the drawings, 70 while the lever-holder  $b^2$  can be operated upon by either the filling stop-motion or by an auxiliary pattern-surface at any point of the revolution, as may suit the convenience of the operation of such stop-motion or pattern-surface; 75 or it may be operated by hand, and when the pawl arrives at the point shown in the drawings the connecting or disconnecting takes place.

The pin-wheel  $l$ , in practice, may be kept in 80 place by a slight spring,  $l^2$ , bearing on its surface.

I am aware that it is not new to connect the shuttle-box pattern-surface with and so as to be stopped by the absence of the weft; but in 85 all such cases, so far as I am aware, the shuttle-box pattern-surface has been moved by a reciprocating pawl and ratchet-wheel, the said pawl being operated by a cam or eccentric on a running shaft of the loom, and being lifted 90 at its free end from the said ratchet when the filling-fork carrier was moved backward. With a pawl of this kind, if the loom is turned backward part of a revolution, or more, as is frequently necessary to be done by the opera- 95 tor when the loom is stopped and the filling unbroken, as when preparing the shed to mend a warp-thread, the said pawl may engage a tooth of the said ratchet and turn the shuttle-box pattern forward when it should be turned 100 backward, consequently disarranging the pattern.

In this my apparatus one part of the clutch mechanism always turns in unison with the crank-shaft, and the other part of the clutch 105 mechanism turns in unison with the said crank-shaft when the pawl of the clutch operates to hold the two parts of the clutch in engagement. Consequently, when the loom is turned backward, as hereinbefore stated as necessary at 110 times, the pattern-surface for the shuttle-box is moved backward according to the extent of backward movement of the crank-shaft, thus keeping the said pattern-surface in correct time. 115

I do not claim releasing the cams that operate the harness to stop the movement of the harness-frames when a weft is not laid in place between the warps, as such a contrivance is described in United States Patent No. 79,923. 120

I have not considered it necessary to herein show a shuttle-box mechanism, as any usual shuttle-box mechanism may be employed—such, for instance, as in the patent referred to. 125 Fingers such as therein shown may be employed in connection with the devices herein shown, the said fingers being extended over the cylinder  $m$  and chain  $m^2$  thereon, the said fingers being connected by wires with pawls to actuate the shuttle-box-lever moving cam, all 130 as in the said patent.

I claim—



1. In a loom, the weft-feeling mechanism and shuttle-box pattern-surface-moving shaft, the shaft *a*, and means to connect the said two shafts and rotating clutch mechanism, combined with means intermediate between the weft-feeling mechanism and the clutching mechanism to instantly release the shuttle-box pattern-surface from the control of the shaft *a*, whereby the shuttle-box pattern-surface is compelled to remain at rest until the loom is stopped and weft supplied, thus insuring the proper succession in the fabric being woven of the different colors of weft, all in accordance with the requirements of the shuttle-box pattern-surface, all substantially as and for the purpose described.

2. The combination, in a loom, of the following instrumentalities, viz: the shuttle-box pattern-surface-moving sleeve or shaft and shaft *a*, the rotary clutching mechanism for

connecting the same with or disconnecting it from the control of the shaft *a*, means intermediate between the said pattern-surface-moving sleeve or shaft and clutching mechanism to move the said shuttle-box pattern-surface, a stop-lever to act upon and release one part of the clutching mechanism to thereby check the movement of the pattern mechanism at a definite point in its own rotation, as described; and a lever-holder by which to operate the said stop-lever at any desired time, all being adapted to operate substantially as and for the purpose described.

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

HORACE WYMAN.

Witnesses:

J. B. SYME,  
J. A. WARE.