F. O. TUCKER.

Stop-Motion for Looms.

No. 226,810. Patented April 20, 1880.

FIG. 1.

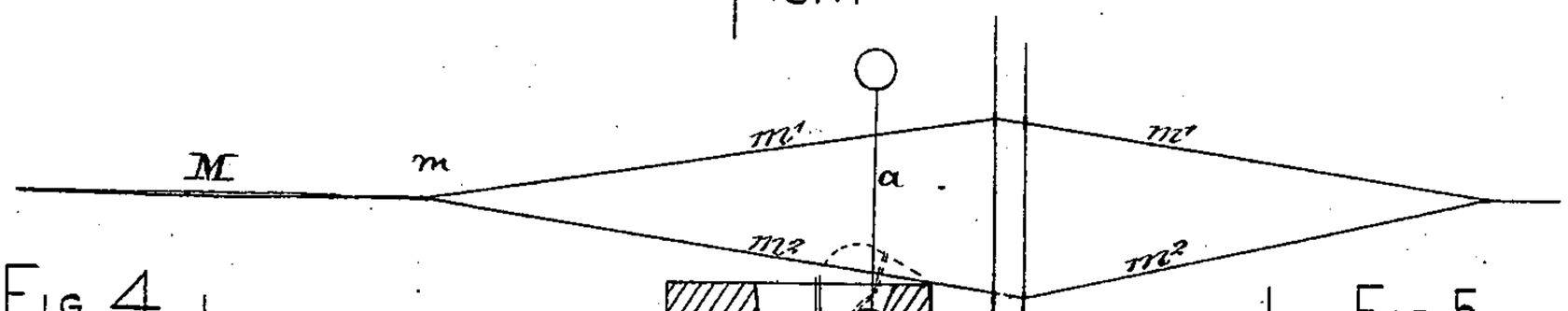


FIG. 4.

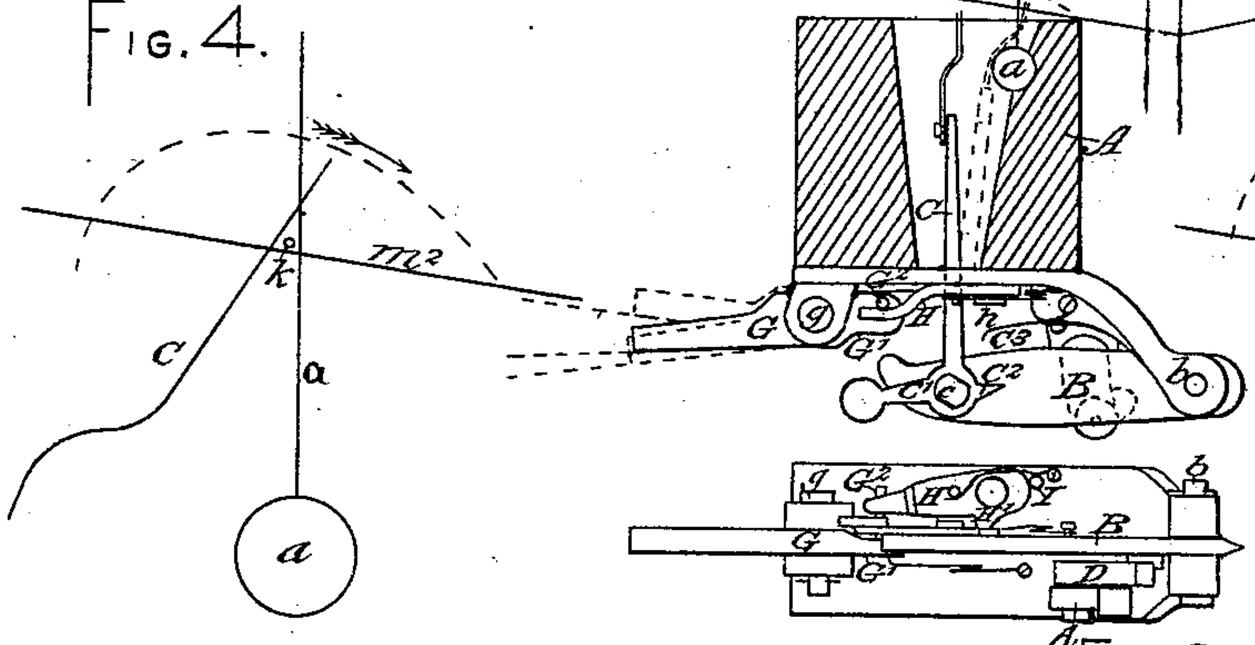


FIG. 2.

FIG. 5.

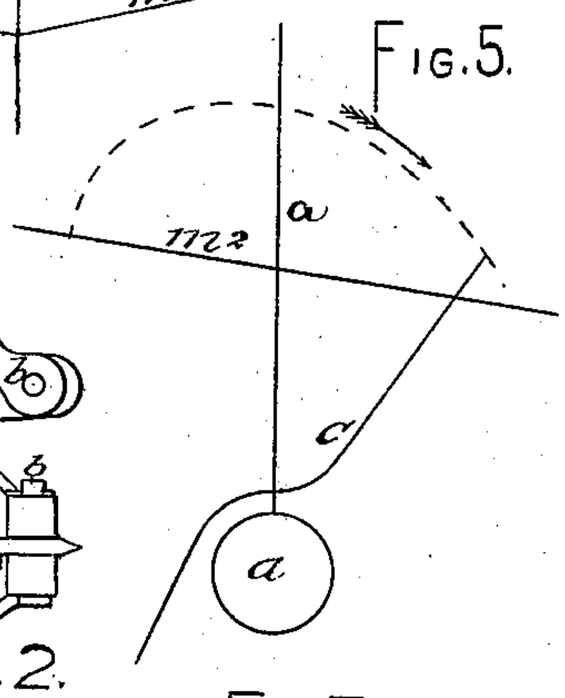


FIG. 6.

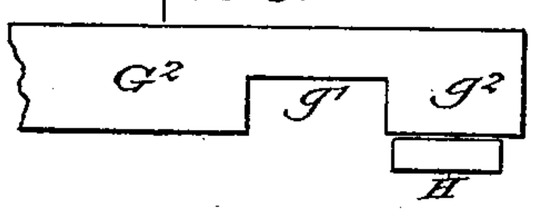
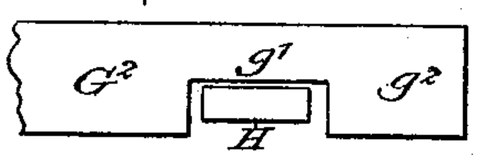


FIG. 7.



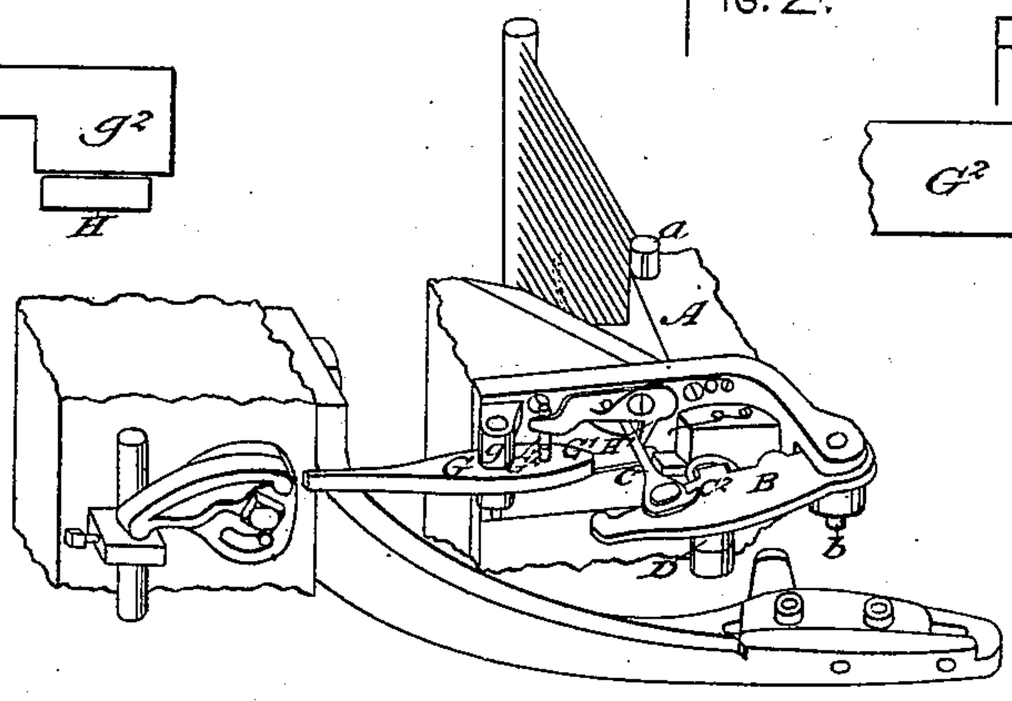


FIG. 3.

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FREDERICK O. TUCKER, OF HARTFORD, CONNECTICUT.

STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 226,810, dated April 20, 1880.

Application filed September 11, 1879.

To all whom it may concern:

Be it known that I, FREDERICK O. TUCKER, of Hartford, in the State of Connecticut, have invented certain new and useful Improvements in Stop-Motions for Looms, of which the following is a specification.

The improvement relates to the weft stop-motion, by which I mean the mechanism which, by the aid of a delicate feeler, ascertains, after each passage of the shuttle across the warps, whether it has properly left a yarn extended across in the shed, and, if it has not done so through any cause, instantly stops the loom.

Hitherto there has been a difficulty in effecting this with absolute reliability, due to the uncertainty of the position of the light weft-yarn. It is liable to be left in various positions by the rapidly-traversing shuttle, or to be pushed more or less from its position in one direction or another by even the most delicate feeler. Means have been adopted to support the weft-yarn against the pressure of the feeler; but there has always been a liability of the yarn moving one way or another, so as to allow the feeler to move a little beyond its ordinary stopping-point, or to arrest it a little short thereof.

I provide for supporting the yarn in the V-shaped pocket at the rear and base of the shed, resting against the reed at the rear and the bottom warps at the front and base. I introduce the feeler in the usual form of a fork or comb, causing it to be protruded up through the lower warps in front of the weft-yarn, and to be moved delicately backward against the said yarn with a tendency to move through spaces in the reed, which when the yarn is not present it will do. When the weft-yarn is present it will arrest the feeler after its points have passed through the reed and just at the moment that it is endeavoring to pass the angle where the reed crosses the lower warps. If the weft has not already moved back to that position, the feeler will have to move it there; but I avoid any such chance by causing the feeler to act so late that the reed has previously advanced against the weft-yarn and thus received it already in the angle referred to before the feeler moves back against it.

I prefer to mount the feeler at or near the middle of the width of the goods. The acting end may be, in theory, only a simple fork, or even a single wire; but in practice I prefer a comb of three or four teeth.

There may be various provisions for communicating the indications of the feeler to the parts for stopping the loom. I prefer the general plan set forth in the patent to me dated March 31, 1876, No. 174,928, Reissue No. 8,632, and will so describe it.

The following is a description of what I consider the best means of carrying out the present invention.

The accompanying drawings form a part of this specification.

Figure 1 is a vertical section through the lay and the attached parts. It shows the feeler just in the act of rising through the lower warps preparatory to its rapid movement back against the weft-yarn. In this condition it is held forward by gravity; but when a little higher it will be thrown gently but quickly backward by the slender spring, which will be struck by its rear projection. Fig. 2 is a plan view from below. It shows the parts in the same condition. Fig. 3 is a perspective view from below. It shows the same parts with some additional parts. In this figure the parts are still in the same condition. Figs. 4 and 5 are diagrams showing the relative position and mode of operation of parts of the device. Fig. 4 is a diagram representing the parts in the condition adapted to allow the loom to continue its motion. Fig. 5 is a corresponding diagram, showing the parts in the condition which results when the weft is missing and the feeler moves moves backward farther so as to change the parts and stop the loom. Fig. 6 shows the rear end of the dagger held up for the loom to continue. Fig. 7 shows the same let down, as results from the condition of the feeler (shown in Fig. 5) to stop the loom.

Similar letters of reference indicate like parts in all the figures.

The drawings represent the novel parts with only so much of the ordinary parts as appears necessary to show their relations thereto.

M is the woven goods; m', the upper warps; m^2, the lower warps, and m what is sometimes termed the "weaving-line," where each successive yarn is forced by the beats of the lay and worked into the closely-woven fabric M.

A is the lay, and *a* the reed, in the usual form, carried thereon. B is a stout lever turning on a center, *b*, carried under the lay, and lifted and lowered at certain points in the forward movement of the lay by the action of a dog or bell-crank lever, D, which turns on a center, *d*, mounted under the lay and turned therewith.

All this is as shown in my aforesaid patent of 1876, as is or may be also the dagger G G′, which turns on center *g* carried by the lay, so that when the front end, G, is in its highest position it will strike the knock-off lever, also like the corresponding part in my said patent, and stop the loom.

H H′ is an easily-worked cross-lever of bell-crank form, turning in a horizontal plane on the center *h*, carried by the lay. It is acted on by a spring, I, and by a feeler, which latter is peculiarly formed, and operated to serve as above explained.

The main arm of the feeler is marked C. It extends up through a sufficient opening in the lay to allow the required motion, and is forked into as many thin branches as is deemed expedient, adapted to strike through the spaces between the lower warps in the rising motion and to move also through the same and through the spaces in the reed in the backward movement which immediately follows. It is again drawn downward entirely out of both before the reed strikes the weft home. It is pivoted on the lever B at the point *c*. The gravity of a lightly-loaded arm, C′, as also the inertia thereof and of the whole feeler, tends to keep it erect in the rising motion of the lever B until, near the close of such motion, the arm C^2—a light arm extending rearward from C—is brought in contact with and presses upward against a gentle spring, c^3. This spring then throws the feeler around backward, turning on its movable center *c*. If the weft-yarn *k* is in its place in the shed, the comb at the top of the feeler will be arrested by it at the moment it reaches the junction or crossing of the reed and lower warps. In such case it will have no effect on the lever H. But if the weft-yarn *k* is not in place, due to a breakage thereof or other cause, the feeler will be thrown farther around by the comb at the top of arm C being allowed to move farther backward. In such case the arm C will strike the arm H′ of cross-lever, and will turn it slightly, sufficient to throw the other arm, H, of the cross-lever into a new position and effect an important result.

A projection, G^2, on the side of the rear end, G′, of the dagger is at each pick raised and lowered over the long arm, H, of the cross-lever. It is formed with a bearing surface, g^2, and a notch, *g*′. So long as the weft-yarn *k* continues to arrest the backward movement of the comb C and prevent the contact of C against the arm H′ the cross-lever will not turn, but will remain with its arm H in the path of the bearing-surface g^2, and will receive such bearing-surface and hold the front end G of the dagger against rising. But the moment the weft-yarn *k* disappears and fails to arrest the backward movement of the comb, the lever C strikes the arm H′, and the lever being then easily turned turns it a little on its center *h*, so that its front arm, H, is turned out of the path of the bearing-surface g^2 and into the path of the notch *g*′. In this latter position it is of no effect. It no longer holds up the rear end, G′, of the dagger, but at the next sinking of the lever B allows the dagger to assume the position to stop the loom which, as the lay continues to move forward, immediately results from the striking of the elevated front end, G, against the knock-off lever and its connections, arranged in any ordinary or suitable manner on the front part of the loom.

Any of the approved motions may be adopted for any of the parts. My invention allows the use therewith of all or nearly all the modifications and improvements used on plain or fancy looms. I propose especially to use ordinary or any suitable detecters to arrest the loom if the shuttle fails to be at the proper time in its proper box.

My invention, by always holding the weft-yarn in a definite place at the base of the reeds or a little above the line where the reed meets and crosses the lower warps, and by strongly supporting it there by the plane face of the reed, allows the stop-motion to be constructed and adjusted to act with great certainty.

I claim as my invention in stop-motions for looms—

The feeler C, provided with weight C′, and the arm C^2, in combination with the lever B, spring *h*′, dagger G G′, and mechanism, as described, to connect the lever and dagger, the said feeler being adapted to pass rearward through the reed of a loom, for the purposes specified.

In testimony whereof I have hereunto set my hand this 4th day of September, 1879, in the presence of two subscribing witnesses.

FREDERICK O. TUCKER.

Witnesses:
THOMAS D. STETSON,
CHARLES C. STETSON.