(No Model.)

J. PATERSON & T. BROOK.

WEFT STOP MECHANISM FOR LOOMS.

No. 407,236. Patented July 16, 1889.

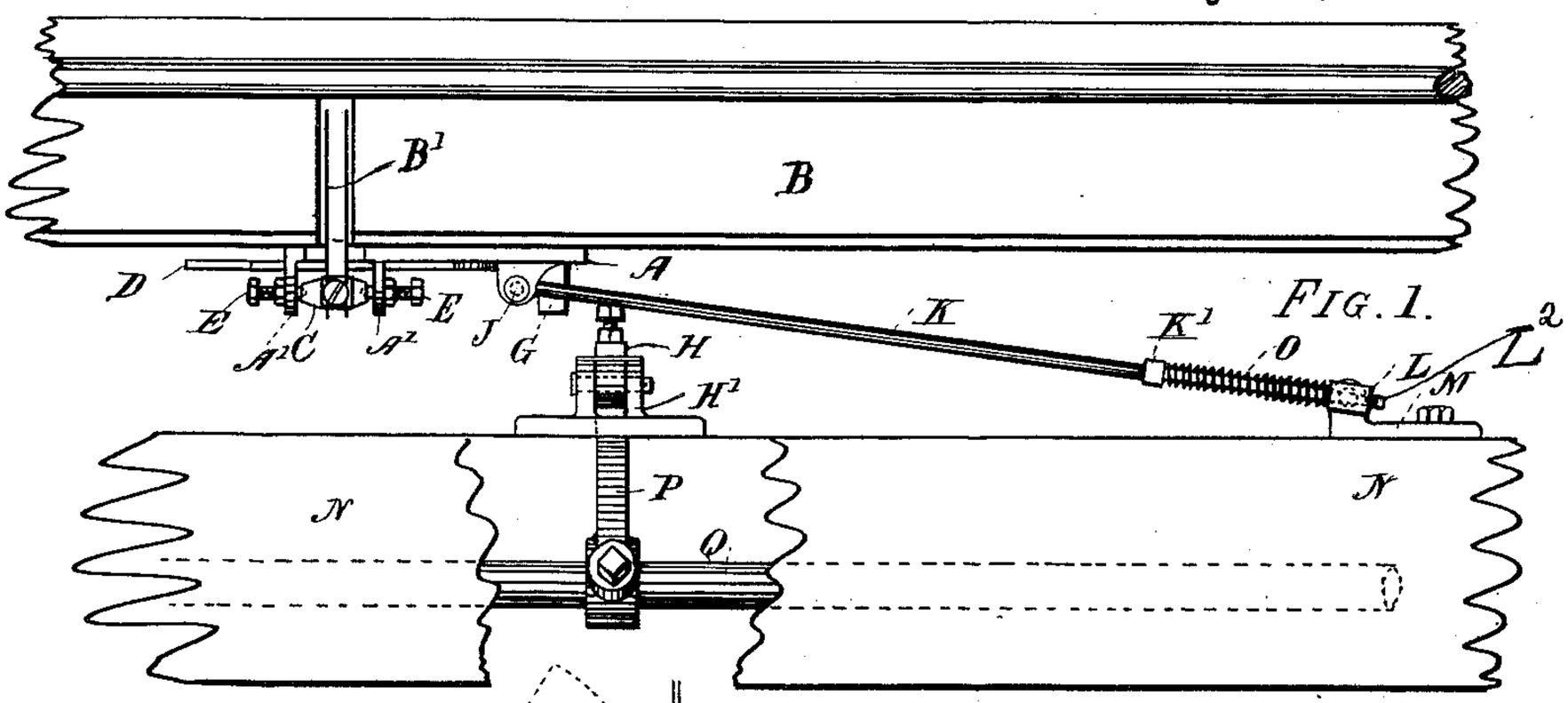

FIG. 1.

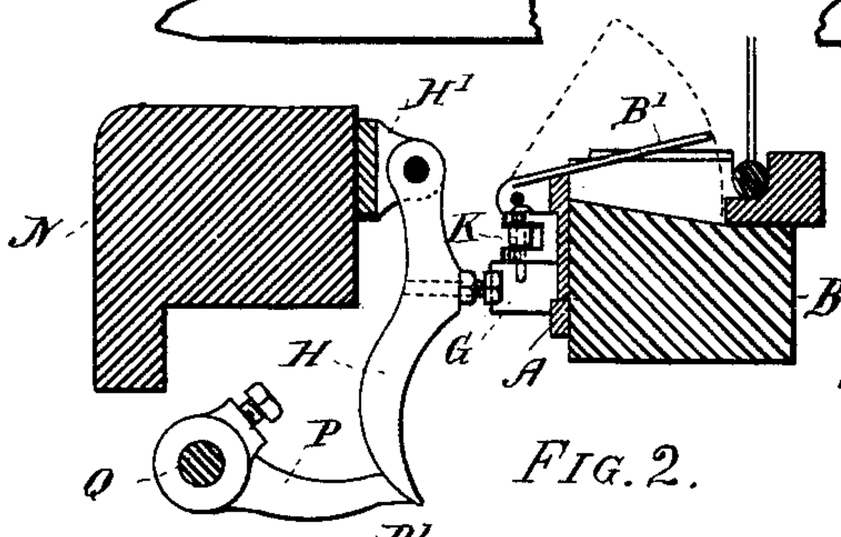

FIG. 2.

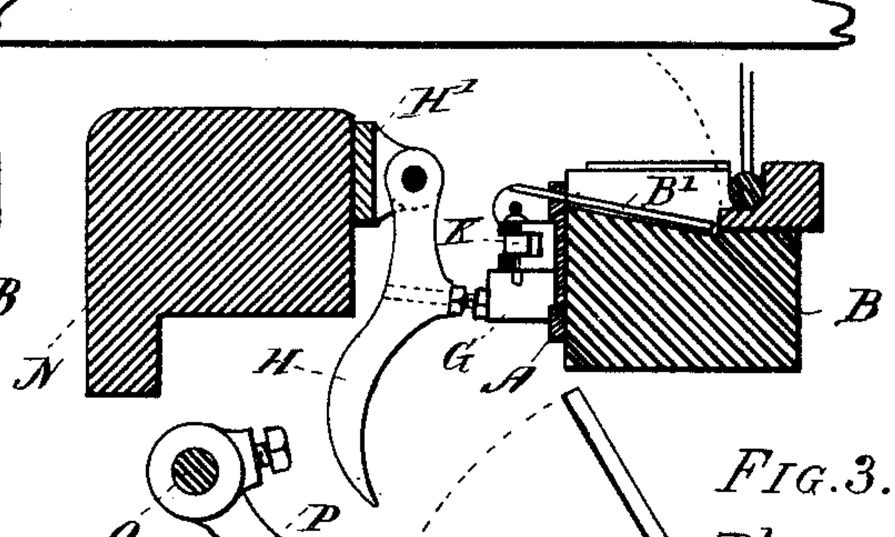

FIG. 3.

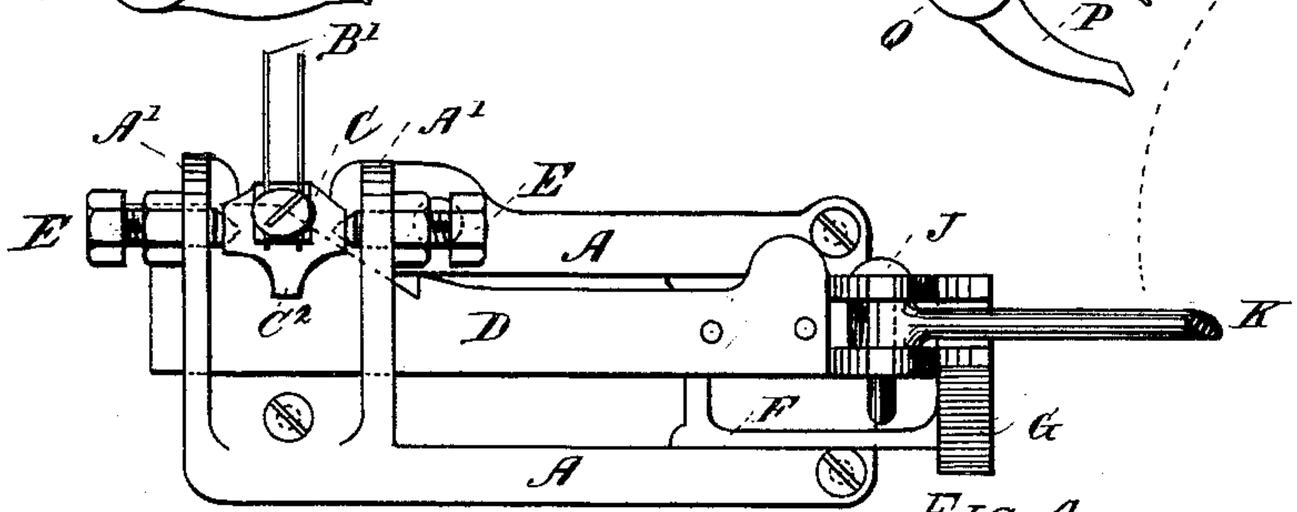

FIG. 4.

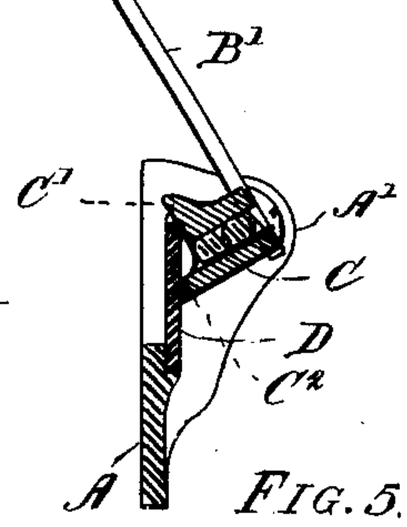

FIG. 5.

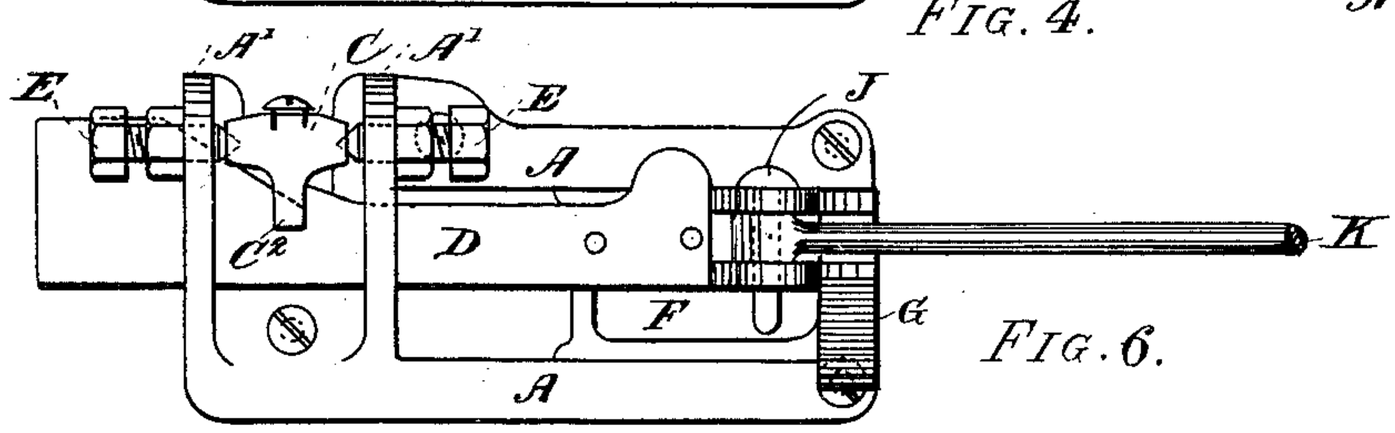

FIG. 6.

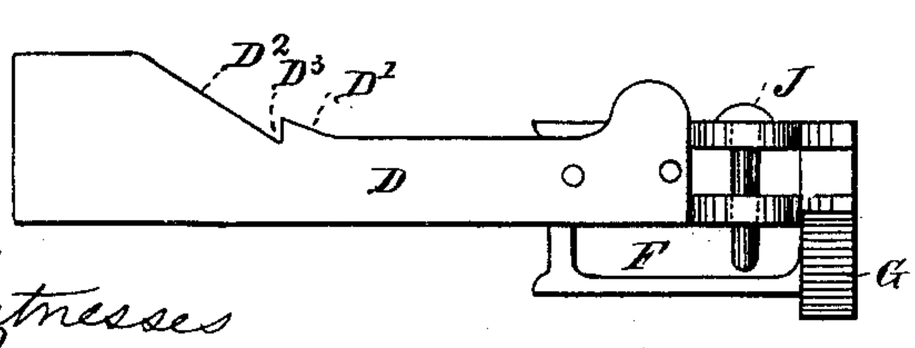

FIG. 7.

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JAMES PATERSON AND TOM BROOK, OF HUDDERSFIELD, COUNTY OF YORK, ENGLAND.

WEFT STOP MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 407,236, dated July 16, 1889.

Application filed August 6, 1887. Serial No. 246,340. (No model.) Patented in England November 17, 1886, No. 14,941, and in Belgium December 18, 1888, No. 84,346.

To all whom it may concern:

Be it known that we, JAMES PATERSON and TOM BROOK, subjects of the Queen of Great Britain and Ireland, both residing at Huddersfield, in the county of York, Kingdom of Great Britain and Ireland, have invented new and useful Improvements in Weft Stop Mechanism for Looms, of which the following is a specification.

This invention forms the subject of the following patents heretofore granted us, viz: Patent dated November 17, 1886, No. 14,941, for Great Britain and Ireland, and Belgian patent dated December 18, 1888, No. 84,346.

This invention relates to mechanism for automatically stopping power-looms when the weft fails to pass through the warps, or, for instance, when the weft breaks or runs off the shuttle or becomes foul.

Referring to the accompanying sheet of drawings, (which show sufficient of the breast-beam and sley-board to clearly illustrate our invention,) Figure 1 is a plan or top view showing the mechanism attached to the sley-board and breast-beam of a loom. Fig. 2 is an end section showing the levers and weft-fork in position when the loom is running. Fig. 3 is a similar view with the weft-fork down, the levers released, and the loom stopped. Fig. 4 is an enlarged view showing the sliding cam or lifting-bar drawn out its full length of stroke and the weft-fork up ready for the shuttle and weft to pass through the warps. Fig. 5 is an end elevation showing the weft-fork up. Fig. 6 is a similar view to Fig. 4, only the weft is supposed to be broken and the sliding cam or lifting-bar caught before making its full stroke. Fig. 7 is a detached view showing a separate view of the sliding cam or lifting-bar and the attached slide-block.

A suitable frame A is secured to the front of the sley-board B, at or about the middle of the loom, forming a carrier for an ordinary weft-fork B′, composed of one or two steel prongs or fingers secured to a small cross-head or axis C, having a projection or short arm C′, for sliding on the upper edge of a sliding lifting-bar D. The said cross-head is also provided with another arm or stop C^2, Fig. 5, so as to prevent it being overturned. The weft-fork is mounted so as to partially rotate on centers or pointed set-screws E E, screwed into brackets A′ A′ on the frame A, and provided with locking-nuts, as shown in Figs. 1, 4, and 6.

The upper edge of the sliding cam or lifting-bar D is shaped as clearly shown in detached view, Fig. 7. There are two cams or inclined portions D′ and D^2 on the edge, the lesser D′ forming a detent or projection, as shown at D^3. The arrangement is such that by sliding the bar D along the face of the sley-board B the arm C′, Fig. 5, which bears on its upper edge, is thereby raised or lowered, thus causing the weft-fork B′ to partially rotate, so as to allow the shuttle and weft to pass.

The cam or lifting-bar D is made of a thin steel plate, and is guided and retained at one end in an upright position by passing through guide-slots formed in the brackets A′ A′, Figs. 4, 5, and 6, while its other end is attached to a suitable guide or slide F, working in a slide on the frame A, as shown. This guide or slide F is formed with a projecting portion or stop G, which, under certain conditions, hereinafter explained, comes in contact with a regulating set-screw secured in a knocking-off lever H, Figs. 1, 2, and 3. To this guide or slide F one end of the connecting-rod K is attached by a pin-joint J, as shown in Figs 1, 4, and 6. The other end of the connecting-rod K slides through a bearing formed by an eyebolt L, Fig. 1, which is carried by a socket in a bracket M, securely fixed to the inside of the breast-beam N, as shown in Fig. 1, thus forming a double joint to allow the sley-board B to move to and fro when the loom is running. Near one end of the connecting-rod K a collar K′ is provided, while between it and the bearing L an encircling spiral spring O is inserted, and a stop-pin L^2 at the extreme end of the rod is provided to prevent the rod leaving the bearing L.

The spring O is of sufficient strength to push the lifting-bar D along while the weft is intact and the weft-fork held up, and retains the pin at the extreme end of the connecting-rod K against the bearing L.

When the sley-board B is in its back posi-

tion ready for the shuttle to pass between the warps, the connecting-rod K will have drawn the lifting-bar D into the position shown in Fig. 4, and the weft-fork B′ will be raised, as shown in Fig. 5, while in the return-stroke of the lifting-bar D, if the weft be intact, the weft-fork B′ will drop onto and be held up by the thread, as shown in end view, Fig. 2, thereby allowing the lifting-bar D to travel the full length of stroke; but should the weft be broken or not pass through the warps the weft-fork B′ will drop into the recess cut in the sley-board B, and cause the arm or projection C′ on the weft-fork axis to catch against the notch D′ on the lifting-bar D, (shown in Fig. 6,) thereby preventing the said bar from traveling any farther. The remaining portion of the stroke or travel that will be given to the lifting-bar D is taken up in the connecting-rod by compressing the spiral spring O.

The knocking-off lever H is pivoted to a bracket H′, secured to the inside of the breast-beam N, as shown in Figs. 1, 2, and 3. It is in such a position that the before-mentioned stop or projection G shall be in a line and come into contact with it as the sley-board B advances toward the breast-beam N—that is, when the weft-fork B′ has caught in the notch D′, as shown in Fig. 3, then the lifting-bar D will be retained in the position shown in Fig. 6. The arrangement is such that as the sley-board advances toward the breast-beam N the projection G will travel past clear of the knocking-off lever H, while the weft-fork is supported by the weft, and that as soon as the weft fails to support the weft-fork the projection G will be retained in the position shown in Figs. 3 and 6, and as the sley-board B advances toward the breast-beam N the knocking-off lever H will be moved, thereby forcing the lever P on starting-shaft Q out of the way, as shown in Fig. 3, thus automatically stopping the loom.

The length of the connecting-rod may vary according to the stroke of the sley-board. Thus with a long stroke the connecting-rod will require to be somewhat longer; but for a loom having an ordinary length of stroke—say about eight inches, for example—we should arrange the connecting-rod to be about twenty inches long.

With some classes of looms we find it advantageous to employ two weft stop-motions. In that case we use only one connecting-rod K, and attach the two lifting-bars together by a rod or link, so that should a weft break or fail after passing one weft-fork the second one would come into action and cause the loom to stop. As the shipping-lever and its connections with the connecting-rod are substantially the same as are shown in well-known power-looms—such, for instance, as in that illustrated in United States Patent of Bigelow, No. 2,744, of 1842—a further description of such connection is deemed unnecessary. Thus it will be understood by employing mechanism of the kind referred to no complicated fitting is required, while the weft stop-motion is easily fixed and requires little or no attention and is more certain in action than other weft stop-motions where cams, bent levers, or the like are employed for raising and lowering the weft-fork.

The manner of mounting the weft-fork, as shown and above described, is important, as thus pivoted on pointed supports it is held balanced with the least frictional resistance and the wear of the supports can be taken up by the set-screws. Especially is this manner of supporting the fork and setting the same when supported advantageous when employed in connection with the form of lifting-bar described. The combination can be used in slow or quick moving looms and with various kinds of fabrics to be woven, either with heavy cloth having thick warp and weft or with light or fine fabrics, without the necessity of resetting—a necessity that exists in many well-known stop mechanisms.

We do not lay any general claim to a weft stop mechanism answering the same purpose as before described, as we are aware that such have been worked by means of bent levers, wedges, or other mechanism requiring careful adjustment on the loom.

What we claim is—

1. A cross-head C, having weft-feeding fingers secured thereto, and stop-arms C′ C², the pointed pivotal set-screw supports E, on which the weft-fork is mounted, the bracket for said supports, the locking-nuts for the supports, the lifting-bar, and the connecting-rod and sliding guide-plate for actuating said bar and the lay, substantially as described.

2. In an automatic weft stop mechanism, the combination of a sliding cam or lifting-bar D, slide F, with projection G, connecting rod or link K, spiral spring O, and brackets L and M, substantially as described, for the purpose specified.

3. An automatic weft stop mechanism comprising, in combination, the weft-fork and its supports, the sliding lifting-bar D, the slide F, the projecting stop G, the knocking-off lever H, provided with a regulating set-screw, with which the said stop G is adapted to come in contact, the bracket to which said lever is pivoted, the breast-beam for supporting said bracket, the lever P and starting-shaft Q, the spring-actuated connecting-rod K, and the bearing on said breast-beam through which said rod slides, substantially as and for the purpose described.

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