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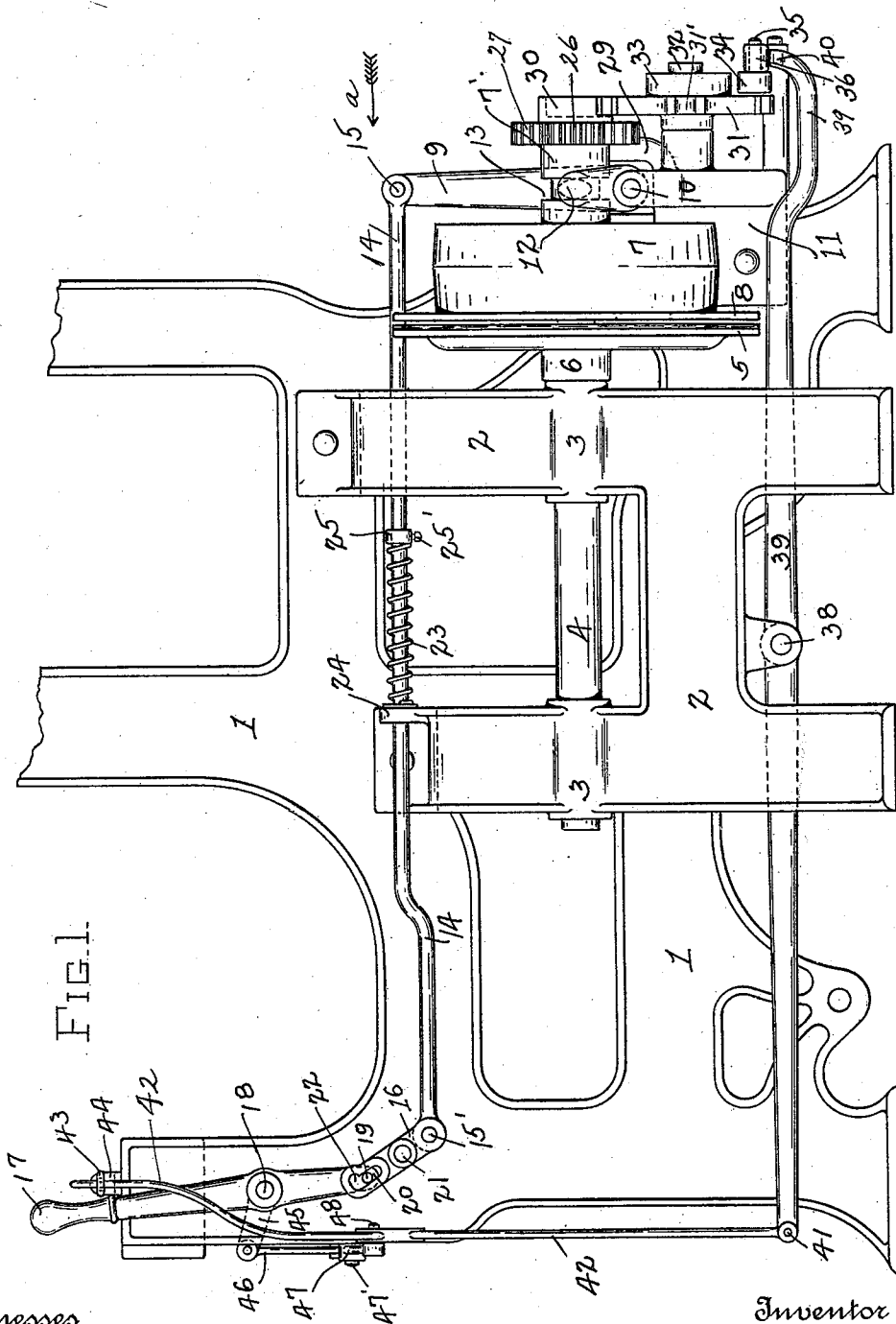
2 Sheets—Sheet 1.

G. F. HUTCHINS.

AUTOMATIC STOPPING AND RESTARTING MECHANISM FOR LOOMS.

No. 466,525.

Patented Jan. 5, 1892.



Witnesses

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Chas. T. Fletcher

Inventor

George F. Hutchins

By

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att'y

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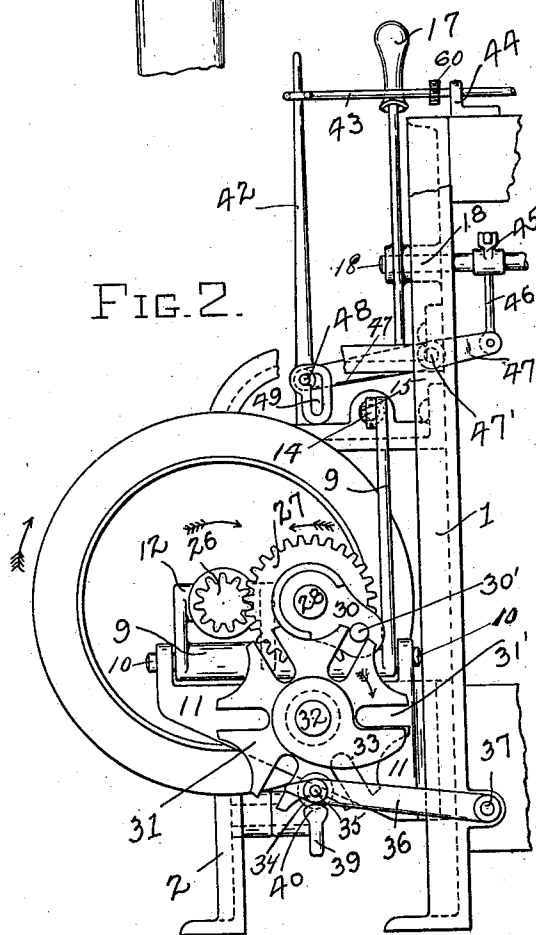
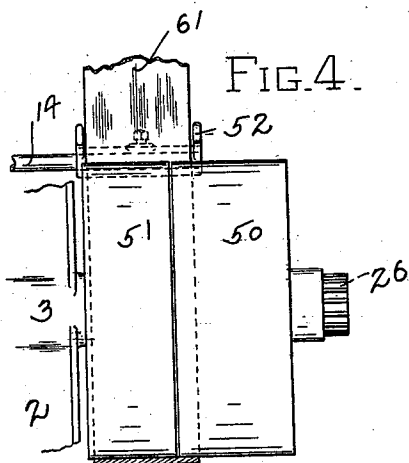
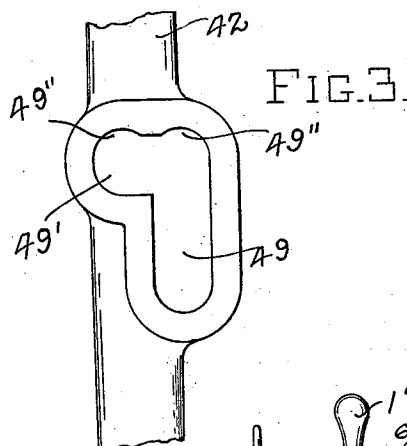
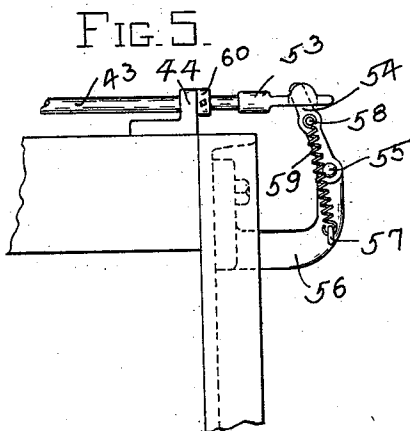
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UNITED STATES PATENT OFFICE.

GEORGE F. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
KNOWLES LOOM WORKS, OF SAME PLACE.

AUTOMATIC STOPPING AND RESTARTING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 466,525, dated January 5, 1892.

Application filed March 16, 1891. Serial No. 385,195. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. HUTCHINS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Automatic Stopping and Restarting Mechanism for Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to improvements in looms for weaving textile fabrics, and more particularly to a supplemental attachment adapted to be applied to a loom of ordinary construction and operation for the purpose of automatically restarting the loom after the same has been stopped by an automatic stop mechanism of the description set forth in my patent, No. 437,894.

The object of my invention is to provide a suitable and convenient mechanism adapted to be combined with a loom of ordinary construction, to be used more particularly on looms which are required to be stopped at regular intervals and remain at rest for a short time and then be restarted, my mechanism being adapted to restart the loom automatically.

By means of my invention, combined with a loom of ordinary construction provided with any well-known automatic stop mechanism, the operations of stopping and restarting a loom with a uniform rest between the same are rendered entirely automatic.

My invention consists in certain novel features of construction and operation of the mechanism for automatically restarting a loom, as will be hereinafter fully described, and the nature thereof indicated by the claims.

Referring to the drawings, Figure 1 is an end view of a portion of a loom with my improvement applied thereto, sufficient to show the construction and operation thereof. Fig. 2 is an end view of the parts shown in Fig. 1, looking in the direction of arrow *a*, same fig-

ure. Fig. 3 is a detail view, on an enlarged scale, of the upright lever. Fig. 4 illustrates a modification of the driving-pulleys, and Fig. 5 is a detail of the locking mechanism for the breast-beam shipper-rod to be herein- after described.

In the accompanying drawings, 1 is the loom side, 2 the pulley-shaft frame bolted to the loom side and having bearings 3 thereon in which the pulley-shaft 4 revolves, from which, by gearing (not shown) the loom is driven in the ordinary way. On the end of the shaft 4 is fast the hub 6 of the friction-flange 5. The belt-pulley 7, provided with a corresponding friction-flange 8, is loose on the shaft 4 and is adapted to slide thereon and is held in driving contact with the flange 5 by means of the forked shipper-lever 9, pivoted at 10 on a stand 11, bolted to the loom side (see Figs. 1 and 2) and provided with lugs 12 at the points of the fork, which engage the grooves 13 in the hub 7' of the pulley 7.

The shipper-lever 9 is operated by the rod 14, jointed to lever 9 at 15 and to shipper lock-lever 16 at its opposite end 15', the said lever 16 being moved by means of the shipper-handle 17, which is pivoted on shipper-shaft 18, journaled in the loom side and provided at its lower end with a pin 19, which works in a slot 20 in the lock-lever 16, pivoted at 21.

When the handle 17 is pulled forward, the lock-lever 16 swings on its pivot 21 until the pin 19 drops into the recess 22 in the lock-lever slot, where it is held by the strain of pulley-flange 18 against its driving-flange 5, assisted by the force of the coil-spring 23 on the rod 14, confined between the ear 24 and the collar 25, adjustably fastened on said rod 14 by a set-screw 25'. When the handle 17 is pushed backward, the pin 19 is released from the recess 22, and the spring 23 acts on rod 14 to move the same and operate the lever 9 and disengage the friction-face 8 of the belt-pulley 7 from the friction-face 5.

The shipper locking mechanism shown in the drawings and herein described is more fully set forth in United States Patent No. 197,641.

I will now describe my improvements. On

the end of the hub 7' of pulley 7 in this instance is fast a pinion 26, (see Fig. 2,) which meshes with gear 27, mounted on a stud 28, fast in the upper end of an arm 29 of stand 11. (See Fig. 1.) On the face of the gear-wheel 27 is fast a pin-wheel 30, having a pin 30' extending out therefrom, which engages the slots 31' in the star-wheel 31, loose on a stud 32 in the stand 11. Secured upon the face of the star-wheel 31 is a cam 33, which acts on a roll 34, loose on a stud 35, fast in the end of a lever 36, which is pivoted at 37 on the loom-frame. (See Figs. 1 and 2.) A lever 39 is pivoted at 38 on the frame 2 and has a rounded point 40 at its rear end, which rests under the free end of the lever 36. The front end of said lever 39 is jointed at 41 to an upright resetting-bar 42, the top end of which is fitted to slide freely in a loop on the end of rod 43, which extends the length of the breast-beam and is fitted to slide freely in stands 44. (See Figs. 2 and 5.)

Fast on the shipper-shaft 18 inside of the loom-frame is an arm 45, to the outer end of which is jointed a connector 46. The lower end of said connector 46 is jointed to one end of the lever 47, pivoted at 47' on the loom side. The other end of the lever 47 has a pin 48 fast therein, which engages a slot 49, formed in the upright resetting-bar 42. (See Fig. 2.)

The slot 49 (shown enlarged in Fig. 3) is cut out horizontally on one side at its top end to form a recess 49' to receive the pin 48. The horizontal part of the slot 49 has at each end slight depressions 49'' on its upper part, which serve to hold the upright resetting-bar 42 through its weight, so that the pin 48 may be either directly in line with the vertical part of the slot 49 or in the recess 49', as shown in Fig. 2.

When the resetting-bar 42 is in the position shown in Fig. 2, the effect of the action of cam 33 on its roll 34 is to depress the back end of lever 39, which pushes up the resetting-bar 42 and, through lever 47, connector 46, and arm 45, turns the shipper-shaft 18 in the same direction as pulling forward on the handle 17 would do, thereby starting the loom.

If the resetting-bar 42 be pushed over so that the pin 48 comes in line with the vertical part of the slot 49, the action of cam 33 simply lifts the resetting-bar 42 without operating the shipper. This enables the operator, in case he is not ready to have the loom start, to throw the shipping mechanism out of engagement by means of rod 43, extending along the breast-beam.

To give warning of the starting of the loom, I shape the cam 33 so as to engage its roll 34 and take the backlash out of the connections and give a slight impulse to the upright resetting-bar 42 on the movement of the star-wheel next prior to that which makes the full action of the cam 33.

I have shown the pin-wheel 30 driven by gearing on the end of the pulley-hub 7'. This enables me to use a longer and easier swing

in the action of the cam 33 than I could get if the pin-wheel were placed directly on the pulley-hub 7'. Said pin-wheel might be placed on said pulley-hub, the only condition being that the proportion between the gearing of the pulley-shaft 4, the loom, and the star-wheel be such that one complete revolution of the star-wheel be made in the time desired to be occupied by a complete cycle of the operation and dwell of the loom.

The pin-wheel and star-wheel motion is employed as a convenient method of gearing back in the proper proportion and of shaping the cam to give the operator warning of the starting; but the cam could of course be shaped to operate just as effectively if it were given a continuous rotary motion by properly proportioned gearing.

In Fig. 4 I have shown a slight modification necessary to adapt my invention to tight and loose pulley driving instead of the face friction-pulley shown in Figs. 1 and 2. In said Fig. 4 the loose pulley 50 is made wider than usual in proportion to the tight pulley 51, and the belt 61 is wide enough to lap on the loose pulley and drive the pin-wheel when it is shipped on the driving-pulley. The shipper-rod 14 is fitted to the belt-fork 52, instead of being jointed to shipper-lever 9, as shown in Fig. 1.

Fig. 5 represents a locking mechanism for the breast-beam shipper-rod 43, (shown in Fig. 2,) which renders the whole mechanism more secure against accidental movement of the upright resetting-bar 42 from its proper position in the recesses 49'' in slot portion 49. Said locking mechanism for the rod 43 is not absolutely essential to the operation of my invention.

Referring to said Fig. 5, 53 is a tip fast on the end of the breast-beam rod 43 on the opposite side of the loom from the back-lever shipping mechanism. (Shown in Figs. 1 and 2.) Passing loosely through a slot in the end of tip 53 is a lock-lever 54, pivoted at 55 on a stand 56, which is bolted to the loom side. Attached to an ear 57 on stand 56 and to a pin 58 on lock-lever 54 is a coil-spring 59, which pulls the lock-lever over and holds it on the side of its throw of a line passing through the center of the pivot-stud 55 and ear 57.

Collars 60 are fastened by set-screws to rod 43, (see Figs. 2 and 5,) forming stops for said rod 43 and for the pull of spring 59.

The operation of my mechanism for automatically restarting a loom after the same has been stopped will be readily understood by those skilled in the art from the above description, in connection with the drawings, and is as follows: A belt (not shown) passing around the loose pulley 7 drives said pulley, and when said pulley, having the friction-flange 8 thereon, is moved along on the shaft 4 to engage the flange 5, fast thereon, by the hand-lever 17, through intervening mechanism, the loom is started in the ordinary way. At the proper time the loom is stopped auto-

15 matically by means of a stop mechanism (not shown) of the description above referred to, with which the loom is provided. The loom remains at rest for a fixed period of time, according to the shape of the cam and the time of its revolution, and then said cam, operated as above described, operates the shipper-shaft by means of the connections between said cam and said shipper-shaft and restarts the
 10 loom automatically. The loom will then continue to run until it is again stopped by the stop mechanism and the operation of my mechanism for automatically restarting the loom will be repeated.

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

1. The combination, with a shipper, of mechanism for automatically moving the same to the position assumed thereby in starting a loom, such mechanism comprising a resetting-bar, means actuated from the driving power of the loom for automatically reciprocating the same, and intervening connections between said resetting-bar and the shipper, through which connections the shipper may be moved, as stated, substantially as described.

2. In a loom, mechanism for automatically restarting the loom after the same has been stopped, said mechanism consisting of a cam, means for operating the same, a resetting-bar, operating connections intermediate said bar and cam, whereby the bar is operated at regular intervals by the cam, a shipper, and devices intermediate the bar and shipper whereby the shipper is moved into position to start the loom, substantially as described.

3. In a loom, the combination, with mechanism for automatically restarting the loom, such mechanism consisting of a cam, means for operating the same, a resetting-bar, connections whereby the said bar is operated from the said cam, the shipper, and devices inter-

mediate the bar and shipper whereby the shipper is moved into position to start the loom, of a breast-beam shipper-rod connected with said resetting-bar to move the latter and prevent it from operating to move the shipper to start the loom, substantially as described.

4. In a loom, the combination, with the driving mechanism and the shipping mechanism, of a pin-wheel and star-wheel mechanism, a cam driven therefrom, cam-levers operated by said cam, a resetting-bar, and connections therefrom to the shipping mechanism, substantially as set forth.

5. In a loom, the combination, with the loose pulley of the driving mechanism, a pinion fast on the hub thereof, a gear carrying a pin-wheel, a star-wheel, a cam moving therewith, an intermediate lever, and an intermediate cam-lever, of an upright resetting-bar, an intermediate shipper-lever connected to an arm on the shipper-shaft, said arm and shipper-shaft, shipper-handle, lock-lever connected to forked shipper-lever, and said forked shipper-lever connected with the hub of the loose pulley for the purpose stated, substantially as set forth.

6. In a loom, the combination, with the loose pulley of the driving mechanism, a pinion fast on the hub thereof, a gear carrying a pin-wheel, a star-wheel, a cam moving therewith, a cam-lever, and an intermediate lever, of an upright resetting-bar, a breast-beam shipper-rod connected therewith, an intermediate shipper-lever connected to an arm on shipper-shaft, said arm and shipper-shaft, shipper-handle, lock-lever connected to forked shipper-lever, and said forked shipper-lever connected with the hub of the loose pulley for the purpose stated, substantially as set forth.

GEORGE F. HUTCHINS.

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CHAS. S. SHORT, Jr.