(No Model.)

G. F. HUTCHINS.

MECHANISM FOR DEPRESSING LOOM HARNESSES.

No. 346,408. Patented July 27, 1886.

Fig. 2

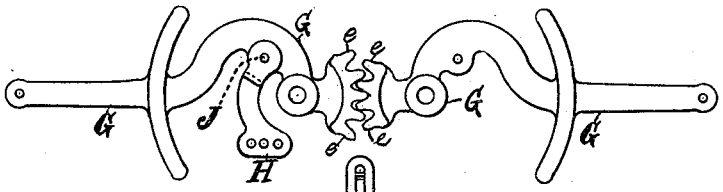
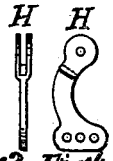


Fig. 3. Fig. 4.



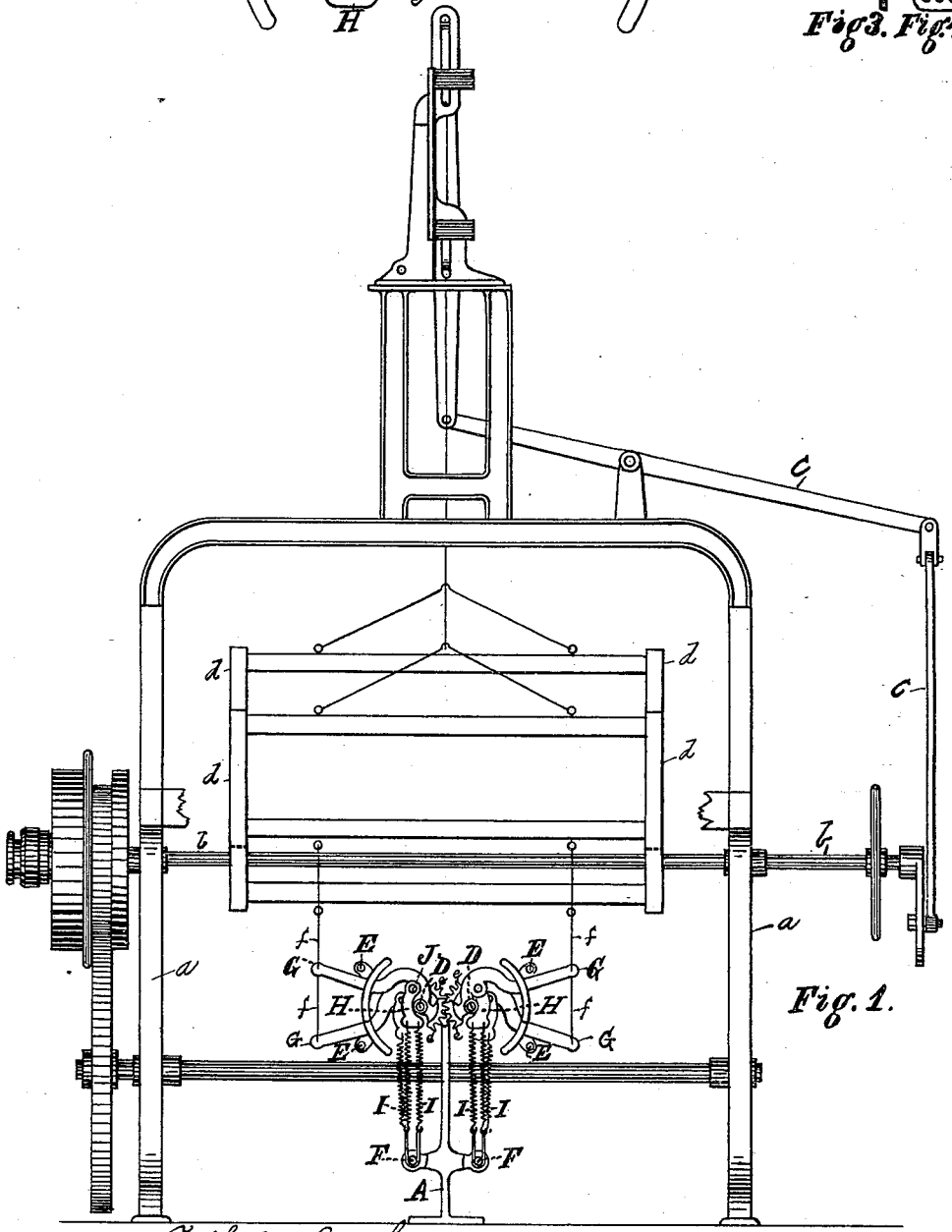


Fig. 1.

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Inventor George F. Hutchins. By his Attorney, John C. Dewey.

UNITED STATES PATENT OFFICE.

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

MECHANISM FOR DEPRESSING LOOM-HARNESSES.

SPECIFICATION forming part of Letters Patent No. 346,403, dated July 27, 1886.

Application filed January 15, 1886. Serial No. 188,625. (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 a certain new and useful Improvement in Mechanisms for Depressing Loom-Harnesses; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings forming 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 mechanisms for operating harnesses in looms known as "dobby" looms, in which the harnesses are raised by the mechanism called the "dobby," and are pulled down by the tension of springs operating on levers with which the harnesses are connected.

The object of my invention is to connect the springs with the levers in such a manner as to cause the springs when the harnesses are raised to lose a part of the force with which they tend to pull the harnesses down. I attain this object by the mechanism illustrated in the accompanying drawings in the manner to be hereinafter fully described.

Referring to the drawings, Figure 1 is a front elevation of parts of a dobby loom of the usual and well-known construction, showing my improved mechanism applied thereto. Fig. 2 shows, on an enlarged scale, a pair of harness-levers of my improved construction detached from the loom and from connection with the springs. Figs. 3 and 4 show an edge and side view respectively of a detached link for connecting the levers with the springs.

As my invention relates only to the mechanism for drawing down the harnesses after they have been raised, and has no reference to any of the other parts of a loom, it will not be necessary to describe the other parts of the loom shown in the drawings. I will simply state that the part marked *a* is the frame of a dobby loom. *b* is the main shaft for operating, through the connecting-arms and levers *c*, the dobby to raise the harnesses *d* in the usual and well-known manner.

The mechanism for drawing down the harnesses *d* after they have been raised, and to which my invention relates, is located under the harnesses in the usual way; and it consists of a front frame-piece or standard, A, and a corresponding back frame-piece or standard. (Not shown in the drawings.) Said standards support the rods D D in their upper parts, upon which the levers G are suspended in the usual manner. They also support the rods E E, against which the levers G strike, to prevent them from swinging too far in either direction as the harnesses *d* are raised and lowered. In the lower part of the standards rods F F are supported, to which the lower ends of the springs I I are attached in any usual and well-known manner. The levers G are provided at one end with gear-teeth *e*, which mesh together, as shown in the drawings, so that when one lever of a pair of levers thus meshing together is raised or lowered, being suspended on the rods D, as before stated, the other lever of the pair receives a corresponding motion, and is also raised or lowered. A connecting-link, H, of substantially the shape shown, is attached to one lever of each pair, as clearly shown in Fig. 2. I prefer to attach the links H alternately to levers on opposite sides, so that a link will be attached to every alternate lever on the same side. The upper ends of the springs I are attached to the lower part of the links H, there being one or more of the springs I for each pair of levers G, said springs serving to pull down the levers, and through them the harnesses *d*, the harnesses being connected with said levers by means of cords or wires *f*, attached to the outer ends thereof in the usual manner. A pair of levers, G, is provided for each and every harness *d*, and both levers of a pair are connected with the same harness, as shown in Fig. 1. The link H is attached to the lever G at a point above the center line of the lever, as clearly shown in Fig. 2. It will be seen from Fig. 1 that when a harness is raised to its highest point the pin J, which connects the link H with the lever G, is moved to a point nearly vertically over the rod D, on which the lever G is suspended, so that the springs I, owing to the decreased leverage with which they pull downward on the lever G, lose a large part of the force tending

to pull down the lever G, this force being received instead on the rod D or fulcrum of said lever when the lever G is raised to its highest point.

The value of my invention will be readily understood and appreciated by those skilled in the art. When a harness is at its lowest point, causing the yarn which it controls to form the under side of the shed, the pull or tension exerted by the spring or springs which operate said harness must be sufficient to hold said harness down in its place in spite of the strain on the yarn tending to pull said harness up, and it is at this lowest point of the harness that it is desirable to exert the greatest tension of the springs. When the springs are attached to the levers in the usual and well-known manner, the tension of the spring is increased as the harness is raised. This increased tension adds greatly to the strain on the mechanism for raising the harness, and requires greater power to operate said mechanism; but by my improved manner of attaching the springs to the levers this objection is overcome. It will of course be understood that the link H must be attached to the lever G in such a manner that the pin J will not come directly over the rod D, upon which the lever G is suspended, when the lever is raised to its highest point, for this is a neuter point, and the spring would fail to exert any tension to draw down the harness at the proper time.

By means of my improved mechanism, without changing the springs or other parts of the mechanism, I can vary the tension with which the springs pull down the harnesses with which they are connected, making this tension greater or less, as desired, on certain harnesses by adjusting the length of the connections *f*, by which the harnesses are attached to the levers. If I desire to increase the tension of the springs pulling down a certain harness, I lengthen the connections *f* of said harness. By so doing the point of connection of the link H with its lever is pulled downward by the springs, and the line of action of the springs is then more nearly at right angles to a line passing through the fulcrum of the lever, and the point of action of the springs on the lever than was the case before I lengthened the connections of the harness with its levers, thus increasing the force with which the springs act on the harness. A contrary effect is produced by shortening the connections of a harness with its levers.

It will be understood by those skilled in the art that it is not necessary for the levers G to be drawn up to the highest point shown in the drawings, nor down to the lowest point, to have the harnesses operate properly; but the levers may stop at intermediate points, varying with different harnesses, thus allowing for the shortening and lengthening of the connections *f*, as above described, and for the purpose stated.

Having thus described my improvements in mechanisms for operating loom-harnesses, what I claim therein as my invention, and desire to secure by Letters Patent, is—

The combination, with the supporting-frame, rods D and F, and check-rods E, of geared levers G, links H, hinged at one end to one of each pair of said levers and movable at the other end, and vertical spiral springs I, secured to the movable ends of the links H and to the rods F, for depressing the harnesses, substantially as set forth.

GEORGE F. HUTCHINS.

Witnesses:
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