Sheet 1-2 Sheets.

J. Phillips.

Let-Off for Looms.

No. 50,156. Patented Sep. 26, 1865.

Fig: 1

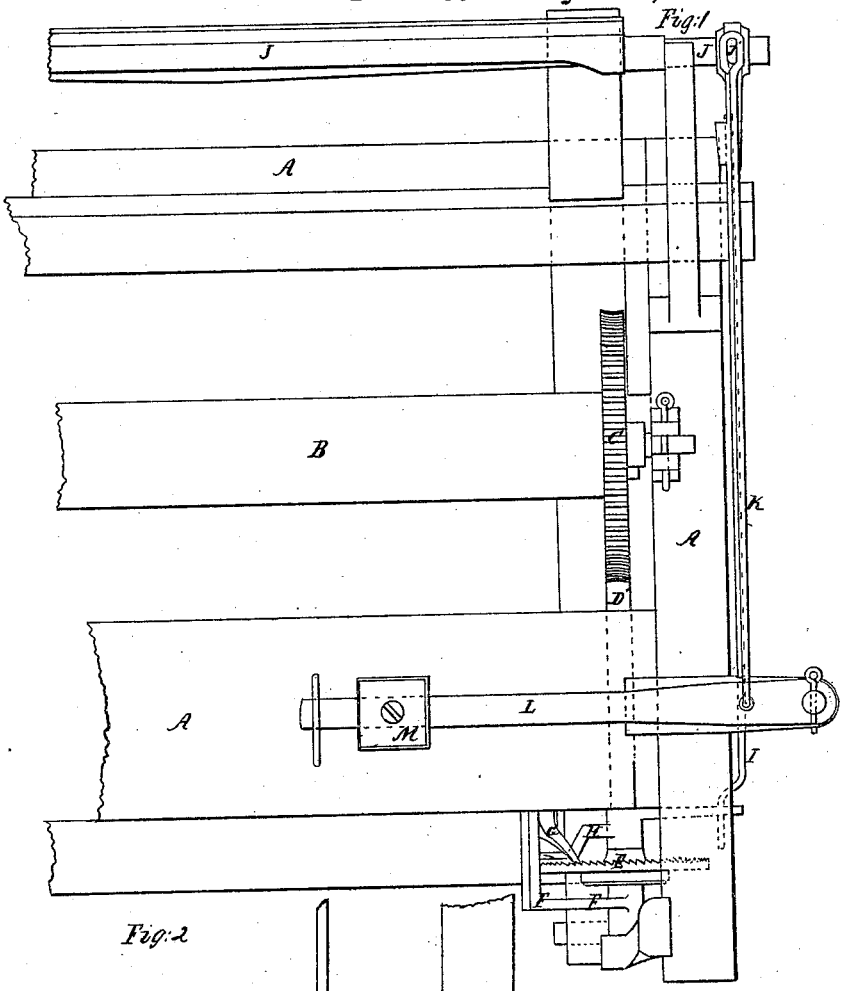
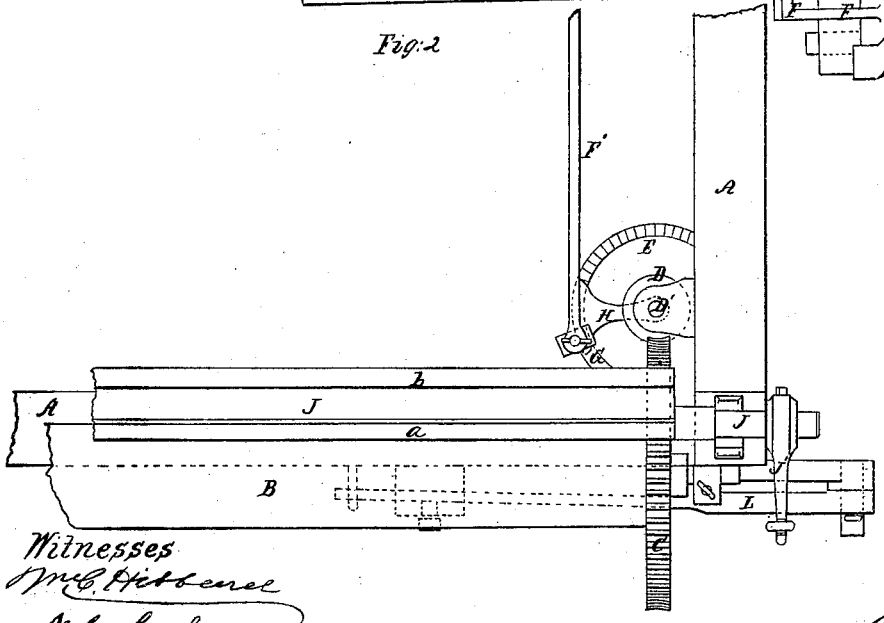


Fig: 2



Witnesses
Wm. C. Hibbard
N. C. Lombard

Inventor
Jol Phillips

Sheet 2 - 2 Sheets.

J. Phillips.

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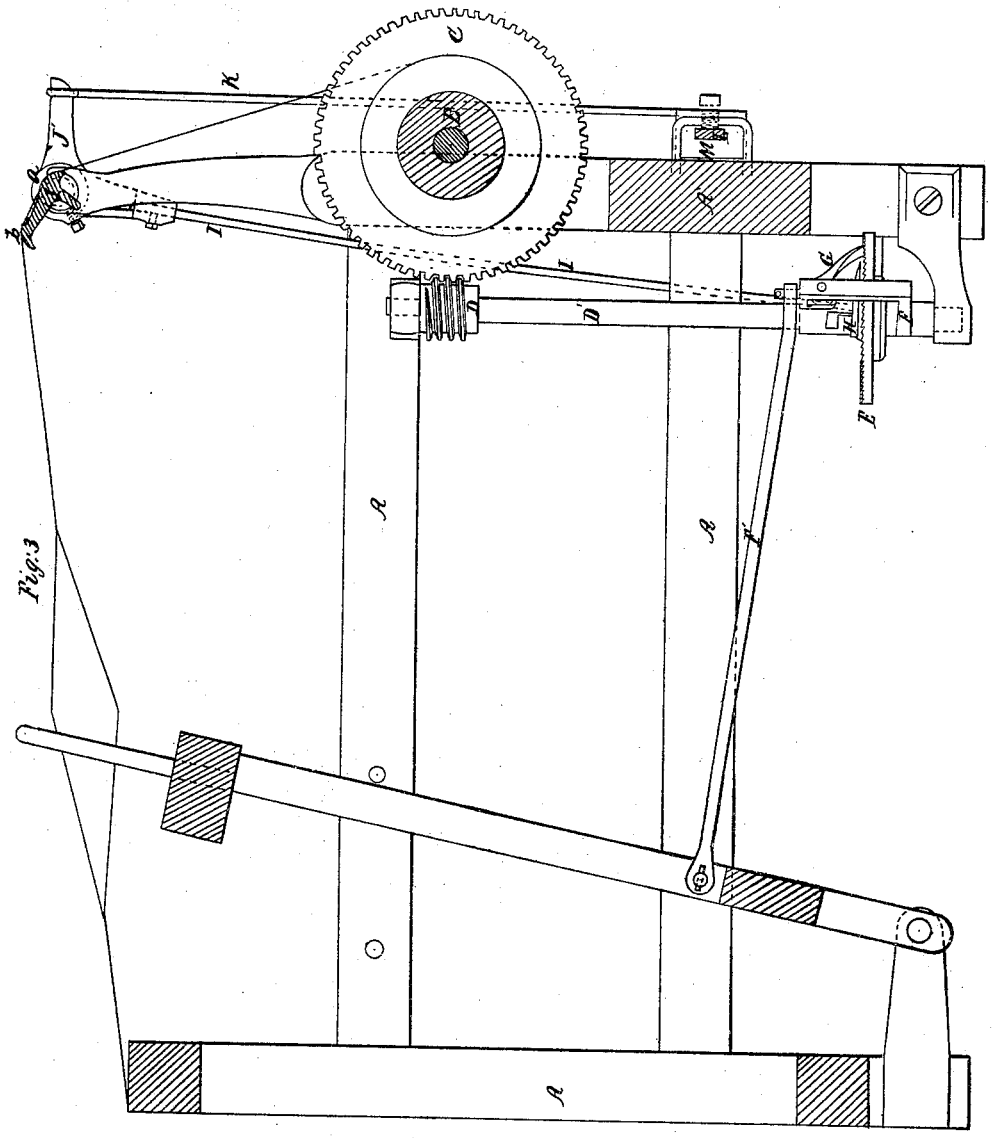

Witnesses

Wm. C. Hibbard

N. C. Lombard

Inventor

Job Phillips

UNITED STATES PATENT OFFICE.

JOB PHILLIPS, OF PAWTUCKET, RHODE ISLAND.

IMPROVEMENT IN LET-OFFS FOR LOOMS.

Specification forming part of Letters Patent No. **50,156,** dated September 26, 1865.

To all whom it may concern:

Be it known that I, JOB PHILLIPS, of Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Looms; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation thereof, taken in connection with the accompanying drawings, making a part of this specification, in which—

Figure 1 is an elevation of a portion of the back side of a loom with my improvement applied thereto. Fig. 2 is a plan of the same; and Fig. 3 is a transverse longitudinal section of the same parts, looking outward.

The subject-matter of my invention relates to the mechanism for letting off the warp from the yarn-beam as it is woven, and is an improvement in that class of "let-off motions," so called, in which the delivery of the warp is controlled by the shortening of its length between the yarn-beam and the point where the cloth is made, which shortening of the warp causes the mechanism that unwinds the same from the yarn-beam to be put in operation in such a manner that the required length of warp is preserved.

In this class of let-off motions a usual mode of construction is to have the horizontal part of the warp supported at the back side of the loom upon a movable "whip-roll," so called, or some other equivalent support, the movement of which by the shortening of the warp controls the action of the letting-off mechanism by sliding a shoe or shield, which is interposed between the ratchet-wheel which moves the yarn-beam and its pawl, so as to cause it to take a greater or less number of teeth of the ratchet, and thus cause a greater or less delivery of the warp at each pick, according to the amount required by the weaving.

My improvement consists in combining with a vibrating bar, used as a support for the warps at the back side of the loom, a long arm rigidly attached thereto, which extends downward, and the lower end of which engages directly with the shield upon the ratchet without any intermediate mechanism, so that a very small movement of the vibrating bar will produce a great movement of the shield. By this means the control of the delivery is much more delicate than is possible where intermediate levers and other parts are interposed between the whip-roll and the shield, as has been heretofore done.

In the drawings the letters refer to the same parts in all the figures.

A is the frame of the loom; B, the yarn-beam; C, a worm-gear upon it; D, a worm upon the vertical shaft D′, which engages with the gear C. E is a ratchet upon the same shaft by which it is turned. F is a rocker-arm working loosely upon the shaft D′, which receives a reciprocating motion from the lay by means of the rod F′, and carries the pawl G, which works in the ratchet E. H is a shield or shoe, of the form shown, which is also mounted loosely on the shaft D′, and is interposed between the ratchet and pawl, and by its position determines the number of teeth of the ratchet that the pawl shall take. All these parts are constructed substantially in the usual manner.

At the opposite side of the fulcrum of the shoe there is an arm extending outward, which engages with the lower end of the pendent arm I, which is rigidly attached to the axis of the vibrating bar J, which takes the place of a whip-roll. This vibrating bar J is of the form shown, and upon it the warp rests at two points, *a* and *b*. The point *a* is near the center of motion, and the point *b* extended with an upward inclination toward the lay. The warp is led over them, as shown by the red lines. By this arrangement it will be seen that a very small change in the length of the warp causes a great movement of the shield H, and a great change corresponding thereto in the rate of delivery of the warp. The proper tension of the warp is preserved by means of the weight M, acting through the arm J′, rod K, and lever L in a perfectly-obvious manner.

In all the let-off motions of this general character heretofore constructed of which I have any knowledge there has been interposed between the whip-roll or its equivalent and the shield H a series of rods and levers or other moving parts jointed together, the friction of which joints would oppose considerable resistance to movement, and the looseness of which would deprive the mechanism of that precision of movement which is desirable in all cases, and which in this case, where great sen-

sitiveness and nicety of regulation are designed to be obtained, are indispensable, because, from the great leverage that the shield has in proportion to that of the vibrating bar, and from the elasticity of the warp, any considerable obstacle to the free movement of the parts would prevent its successful operation.

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

Combining the vibrating bar J with the shield H by means of the arm I, rigidly attached to the bar, all constructed and arranged as described.

Executed at Boston, July 15, A. D. 1865.

JOB PHILLIPS.

Witnesses:
WM. C. HIBBARD,
N. C. LOMBARD.