G. HETHERINGTON.

PROTECTION RODS FOR LOOMS.

No. 177,244. Patented May 9, 1876.

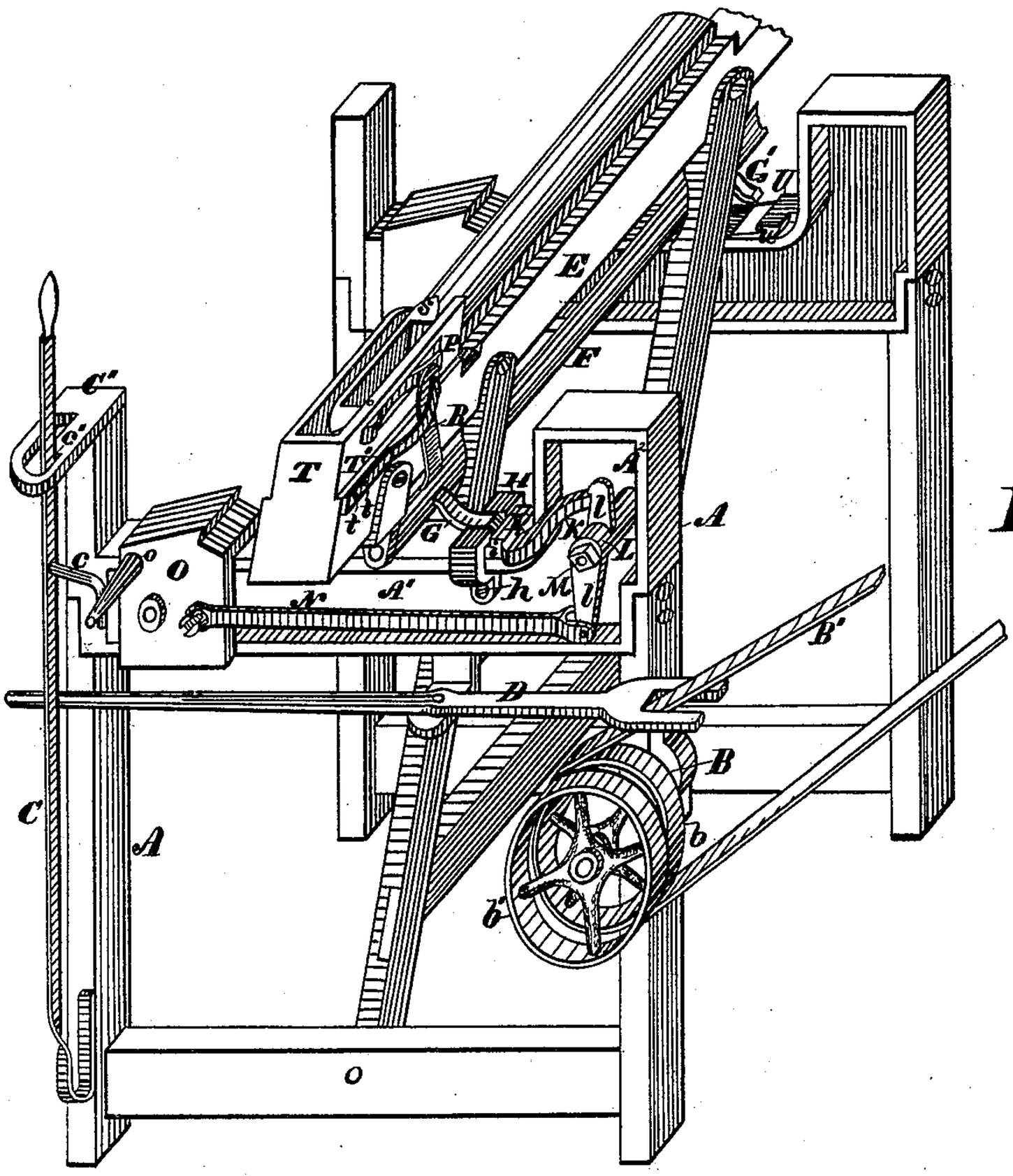

Fig. 1

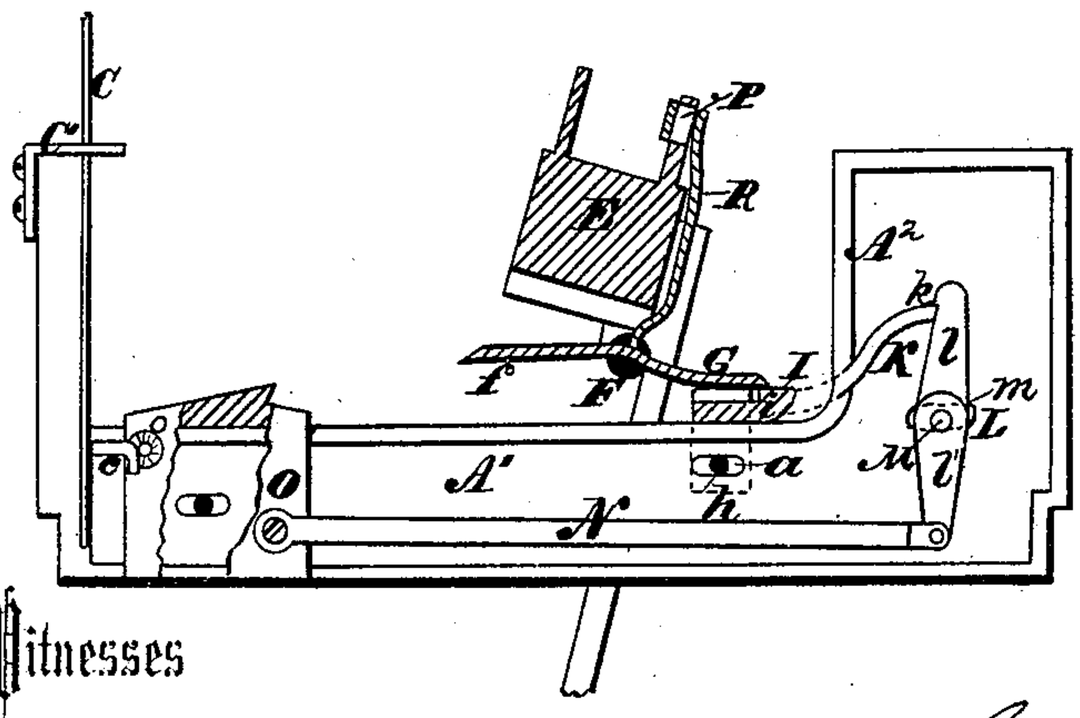

Fig. 2

Witnesses

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GEORGE HETHERINGTON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PROTECTION-RODS FOR LOOMS.

Specification forming part of Letters Patent No. **177,244**, dated May 9, 1876; application filed January 7, 1876.

To all whom it may concern:

Be it known that I, GEORGE HETHERINGTON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Protection-Rod for Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a perspective of my invention. Fig. 2 is a broken side elevation, partly in section.

My improvement is designed to totally prevent "smashes" in the warp when any breaking or displacing of parts of the loom occurs, a smash being the breaking of a large number of threads by the shuttle's being in the shed when the lay comes up to the cloth. The circumstances under which a smash will ordinarily occur are, first, the breaking of the picking-strap; second, the breaking of the picking-stick; third, the displacing of the picking-boll; fourth, the rising or dropping of the drop-box at the wrong time; fifth, the putting in by the weaver, through ignorance or forgetfulness, of too many shuttles.

My improvement consists in the provision of two striking-fingers, projecting from the back of the protection-rod toward the rear of the loom, and the combination, with the rod thus provided, of apparatus whereby, when the lay is moving backwardly, the loom will be stopped, if the shuttle is not out of the box on either side, when the crank-arms are within an inch, more or less, of the back center.

Referring to the accompanying drawing, A A designate the frame of the loom; B, the shaft to which the power is applied, having fast and loose pulleys *b* and *b'*, respectively; C, the shifting-lever, operating upon the belt B' through the medium of the pivoted rod D, and E the lay, these several parts being of the usual or any suitable construction. F is the protection-rod, having the usual forwardly-projecting finger *f*. G G are the fingers on this rod, (one at each end,) projecting toward the back of the loom. H H are clamps fastened to the framing-piece A' by a bolt, *h*, passing through an elongated opening, *a*; and I is a slide, having a motion between the front and back of the loom beneath said clamps. A curved stud, K, projects backwardly from the slide I, its point *k* impinging against the notched end of one of the arms *l* of the hollow shaft L, which turns on a spindle or bolt, M, adjustably secured in an elongated slot, *m*, in the frame-piece A^1. N is a bar connecting the other arm *l'* of the shaft L with the sliding clamp O on the forward part of the frame-piece; and *o* is a stud on said clamp, against which the shifting-lever C, or a pin or hook, *c*, attached thereto, impinges when said lever is in the notch *c'* in the keeper C'—the position said lever occupies when the band is on the fast pulley, and the loom is running. P is a "swell-finger" on the back of the box T, and R an arm attached to the protection-rod, and kept in contact with the swell-finger by means of a spring, T', fastened to said box by a pin or pins *t t*, or by equivalent screws.

When a loom provided with the aforesaid devices is running, if the picking motion be set right the shuttle S will be clear of the box T, and on its way across the lay E, when the crank (not shown in the drawing) is about an inch and a half from its back center, thereby allowing the swell-finger P to come close to the box T, and the striking-finger G to rise above and pass over the shoulder *i* of the slide I. The loom continues running until one of the aforesaid accidental circumstances occurs, when, the shuttle being in the box after the proper distance has been passed, the finger G strikes the shoulder *i*, said finger being then depressed, moving the slide I backwardly. The backward movement of the slide I has the effect of moving the slide O forward, and thus throwing the shifting-lever or "stop-bar" C out of the notch *c'* through the medium of the stud K, shaft L, arms *l l'*, bar N, and stud *o*. The belt is thus shifted to the loose pulley. After the finger G has moved backward far enough to throw the shifting-lever C out of the notch *c'* the slide I is stopped by coming in contact with the upright part A^2 of the loom at the same time that the finger G' on the other end of the rod F strikes a block, U, firmly fastened to the frame A, and having a shoulder, *u*, thereby effectually preventing the

cranks from going over the back center. On restoring the shifting-lever C to its proper position for starting the loom the slide O is pushed back by the impact of the pin *c* against the stud *o*, thus bringing the slide I back to its normal place through the medium of the parts connecting said slides.

What I claim as my invention is—

1. In combination with the lay and shipping mechanism, a loom-protection rod, operated by the swell-finger of the box, having a forwardly-projecting finger to prevent smashes while the shuttle is out of the box, and a rearwardly-projecting finger to prevent smashes while the shuttle is in the box, substantially as shown and described.

2. The combination of the box T, having a swell-finger, P, the protection-rod F, having arm R and finger G, the slide I, stud K, shaft L, having arms *l l'*, bar N, slide O, and shifting-lever C, the several parts being constructed and operating substantially as described, to stop the loom and prevent smashes, as set forth.

3. In combination with the protection-rod F and fingers G G', the block U, for preventing the cranks from passing the dead center, as described.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of January, 1876.

GEORGE HETHERINGTON.

Witnesses:

M. DANL. CONNOLLY,

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