

(No Model.)

C. F. PERHAM.

HARNESS OPERATING MECHANISM FOR LOOMS.

No. 562,655.

Patented June 23, 1896.

Fig. 2.

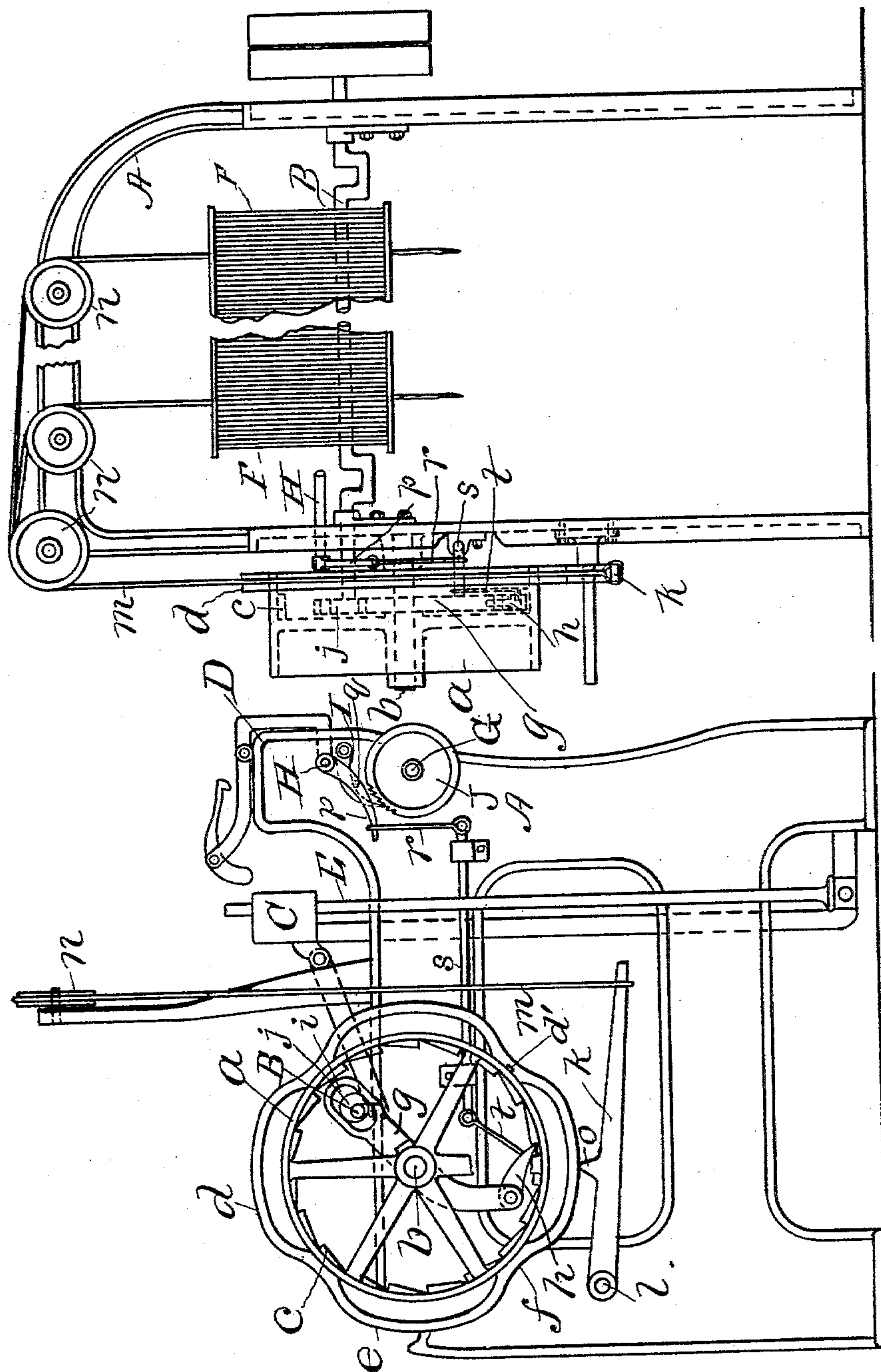


Fig. 1.

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HARNESS-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 562,655, dated June 23, 1896.

Application filed June 8, 1895. Serial No. 552,132. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FOSTER PERHAM, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Harness-Operating Mechanism for Looms, of which the following is a specification.

This invention has reference to the mechanism which controls the movement of the harness or leashes which govern the decussation of the warps in a loom to form a shed or raceway for the weft-carrying shuttle, which mechanism is commonly termed the "harness-motion" or "shed mechanism."

It is the object of the invention to provide such improvements in the mechanism referred to as will enable the same to be operated directly from the crank-shaft which actuates the lay, and which improvements, when employed in connection with an improvement in picker-operating mechanism for looms described in an application filed of even date herewith, Serial No. 552,131, will obviate the necessity of a cam-shaft, simplify and cheapen the cost of construction, and render the machine easier of operation and more ready of starting and stopping.

It is also the object of the invention to provide such improvements in the means mentioned as will enable it to be more readily and quickly adjusted by the operative to conform to the desired pick, and in a similar manner to be adjusted in any order required for a particular pattern.

It is also the object of the invention to provide other improvements of greater or less importance, as will appear to those skilled in the art from the following description.

To these ends mentioned the invention consists of a shedding or harness-controlling mechanism directly connected with and operated from the lay-operating crank-shaft, all as I will now proceed to describe in detail, and subsequently point out with particularity in the appended claims.

Reference is to be had to the annexed drawings, and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is an end view of my improvements represented as operatively

connected with a loom, only so much of the latter and its equipments being shown as it is necessary to represent in order to explain the invention. Fig. 2 is a front view of the same, a part of the central portion being shown as broken out.

In the drawings, A designates the loom-frame. B is the crank-shaft, by which the lay C is operated through suitable connections. D is the breast-beam. E designates the picker-sticks; F, the harness; G, the cloth-roll; H, a rod extending parallel with the breast-beam and connected with the stopping mechanism, and I a holding-pawl coöperating with a ratchet-wheel J on the cloth-roll to prevent the latter from turning backward. These parts may be of the form and arrangement shown, or of any other known or suitable construction, and their functions are so well understood by those skilled in the art to which this invention appertains as not to need further description herein.

a designates a broad-rim wheel or pulley, arranged to turn on a stud or shaft b, secured to the loom-frame and provided on the interior of its rim with a circle of ratchet-teeth c, which may be an integral part of the rim, or be formed on a ring detachably connected with the rim.

Upon the outer surface or periphery of the rim-wheel a are detachably and adjustably secured a series of cam-rings d. But one such cam-ring is, for the sake of clearness of illustration, shown in the drawings. The cam-rings may be adjustably and removably held by means of an ordinary key (not shown) or by means of a spline d' (see Fig. 1) or in any other suitable way. The said cam-rings are provided on their peripheries with a plurality of rises e and falls f, according, with the number of ratchet-teeth c, to the pattern to be woven.

The means for detachably and adjustably securing the cam-rings upon the rim-wheel is not shown, as any suitable devices may be employed for this purpose.

Upon the stub b is fulcrumed a lever g, to the end of one arm of which is pivoted a pawl h, adapted to take into the teeth of the ratchet-ring described. The other end of the said lever g is provided with an elongated slot i, in which an eccentric j on the crank-

shaft operates, so that at each rotation of the crank-shaft the lever *g* and its attached pawl *h* will be actuated so as to engage the ratchet-teeth *d* and move the rim-wheel *a* to the extent of the distance between two of the said ratchet-teeth.

k designates a lever, of which there may be as many as there are sets of harness to be operated, (but one lever being shown in the drawings,) which lever is fulcrumed at its rear end, as at *l*, and has a cord *m* attached to its other end, which cord extends over suitable pulleys *n*, and is connected at its other end with the harness *F* to be raised. On the lever *k* there is a projection *o*, which rests upon the periphery of the cam-ring *d*, so that in the rotation of the rim-wheel with the said rings secured thereto, the rises and falls of the said rings will act upon the levers *k* and through their connections with the harness raise the latter and allow them to be depressed, it being understood that a rise *e* on a cam-ring *d* will operate to raise a heddle, under the arrangement shown, and that a fall *f* will allow the heddle to be lowered, through any of the common and known means employed in the art for the purpose, such as springs, weights, or connections with other heddles which operate to depress one set of heddles when another set is raised.

The finger *p*, usually employed on the rod *II* of the common stopping mechanism, which is provided with a pin *q*, extending under the holding-pawl *I*, I elongate, as shown in Fig. 1, and attach thereto one end of a cord *r*, the other end of which is connected to one of the angular ends of a rock-rod *s*, the other angular end of the said rock-rod being connected, by means of a cord *t*, with the pawl *h*, so that as the rod *II* is rocked and the pin *q* on the finger *p* operates to raise the pawl *I*, the said finger will also, through the medium of its connections, operate to raise the pawl *h*, and so arrest the movement of the rim-wheel *a* and its adjuncts.

It is obvious that the levers *k* might be arranged above the rim-wheel and the cam-rings *d* thereon, and the connections of the harness with the lever be made from the lower part of the latter and operate to depress the same.

With this invention it will be seen that I am enabled to operate the harness-controlling mechanism directly from the lay-operating crank-shaft, and greatly simplify and cheapen the cost of construction, making the machine easier of operation and of stopping and starting, and providing more room for the cloth-roll and warp-beam than in looms as now most commonly organized. Besides this, the improvements provide a construction which is most ready of examination and manipulation by the weaver in case of need of turning the mechanism back or otherwise moving it without moving other parts of the loom to correspond with the required pick; and, moreover,

the mechanism is such as to materially lessen the momentum of the moving parts, so that the loom can be stopped quicker than heretofore without undue shock or jar.

As has already been intimated, the cam-rings *e* and their adjuncts may be increased and adjusted to any order, so as to suit any desired pattern, making the improvement, to all intents and purposes, a most efficient, simple, and easily-adjusted dobby.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. A loom, comprising in its construction, a lay-operating crank-shaft, harness for forming the shed, a rim-wheel having a circle of internal ratchet-teeth, cam-rings on the rim-wheel, and levers connected with the harness and arranged to be acted upon said cam-rings in combination with a lever operated by the crank-shaft, and having a pawl adapted to engage said internal teeth.

2. A loom, comprising in its construction, a lay-operating crank-shaft, harness for forming the shed, a second shaft, a rim-wheel thereon provided with external cam-rings and an internal ring of ratchet-teeth, a lever pivoted on second shaft and operatively connected with the crank-shaft, a pawl on the free end of said lever adapted to engage the ratchet-teeth, and a lever adapted to be actuated and controlled by the cam-rings and operatively connected with the harness.

3. A loom, comprising in its construction, a rotary rim-wheel *a*, provided on its periphery with a plurality of cam-rings *d*, and on its interior with a ring of ratchet-teeth, *c*, a harness, and means operatively connecting the same with the said cam-rings, in combination with a shaft, an eccentric thereon, a lever actuated by the said eccentric and provided with a pawl to engage the said ratchet-teeth to impart a step-by-step movement to the rim-wheel.

4. The combination with the rim-wheel provided on its periphery with a plurality of cam-rings, and on its interior with a ring of ratchet-teeth, of the cam-shaft, an eccentric thereon, a lever actuated by the said eccentric and provided with a pawl to engage the said ratchet-teeth to impart a step-by-step movement to the rim-wheel, a rock-rod adapted to engage the said pawl to raise it, stopping devices and operative connections between the said rod and stopping devices, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 2d day of March, A. D. 1895.

CHARLES FOSTER PERHAM.

Witnesses:

ARTHUR W. CROSSLEY,
C. C. STECHER.