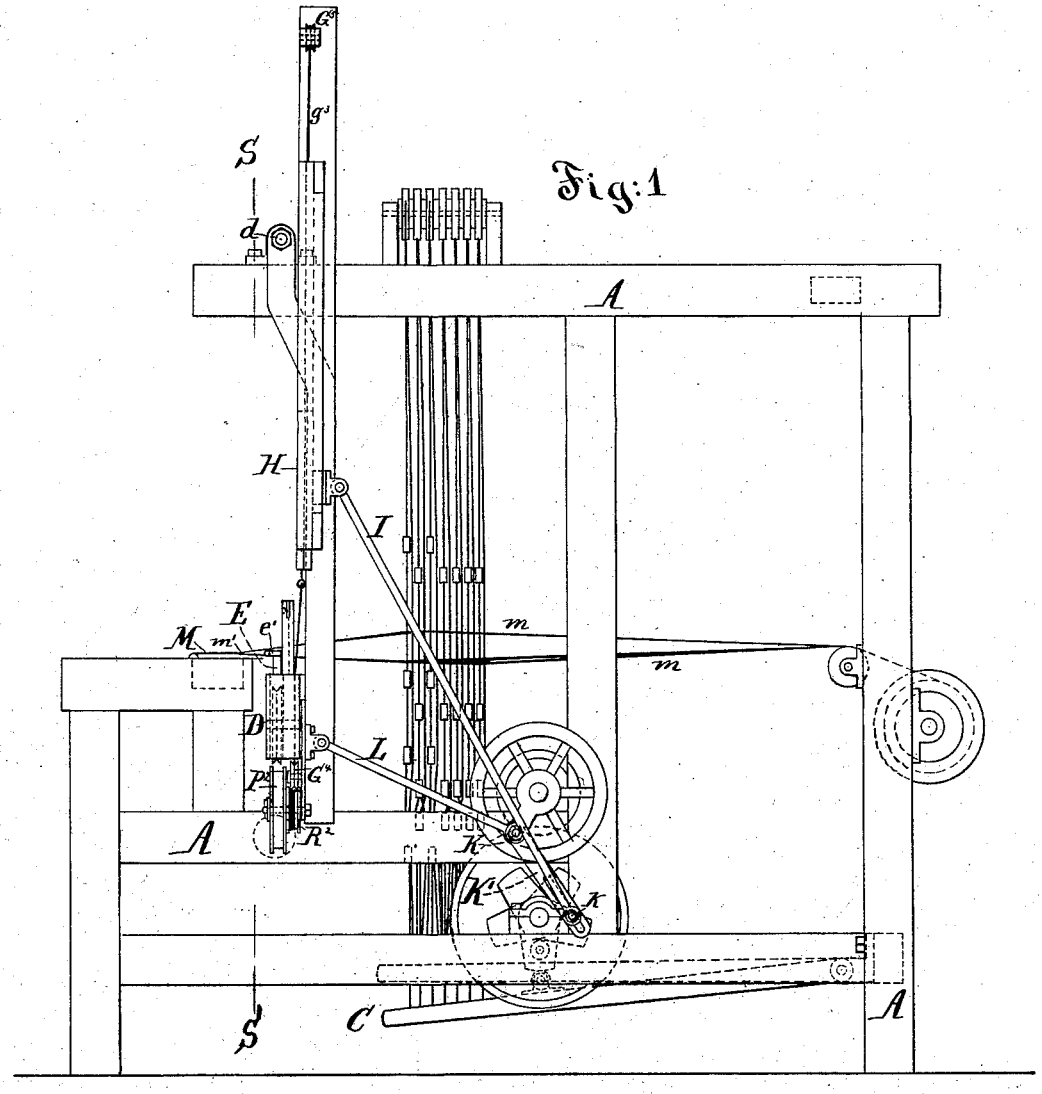
2 Sheets—Sheet 1.

W. J. PORTER.

LOOMS FOR WEAVING HAIR-CLOTH.

No. 192,006. Patented June 12, 1877.

Fig: 1



Witnesses:

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M. A. Learfless

Inventor:

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New York

2 Sheets—Sheet 2.

W. J. PORTER.

LOOMS FOR WEAVING HAIR-CLOTH.

No. 192,006. Patented June 12, 1877.

Fig: 2.

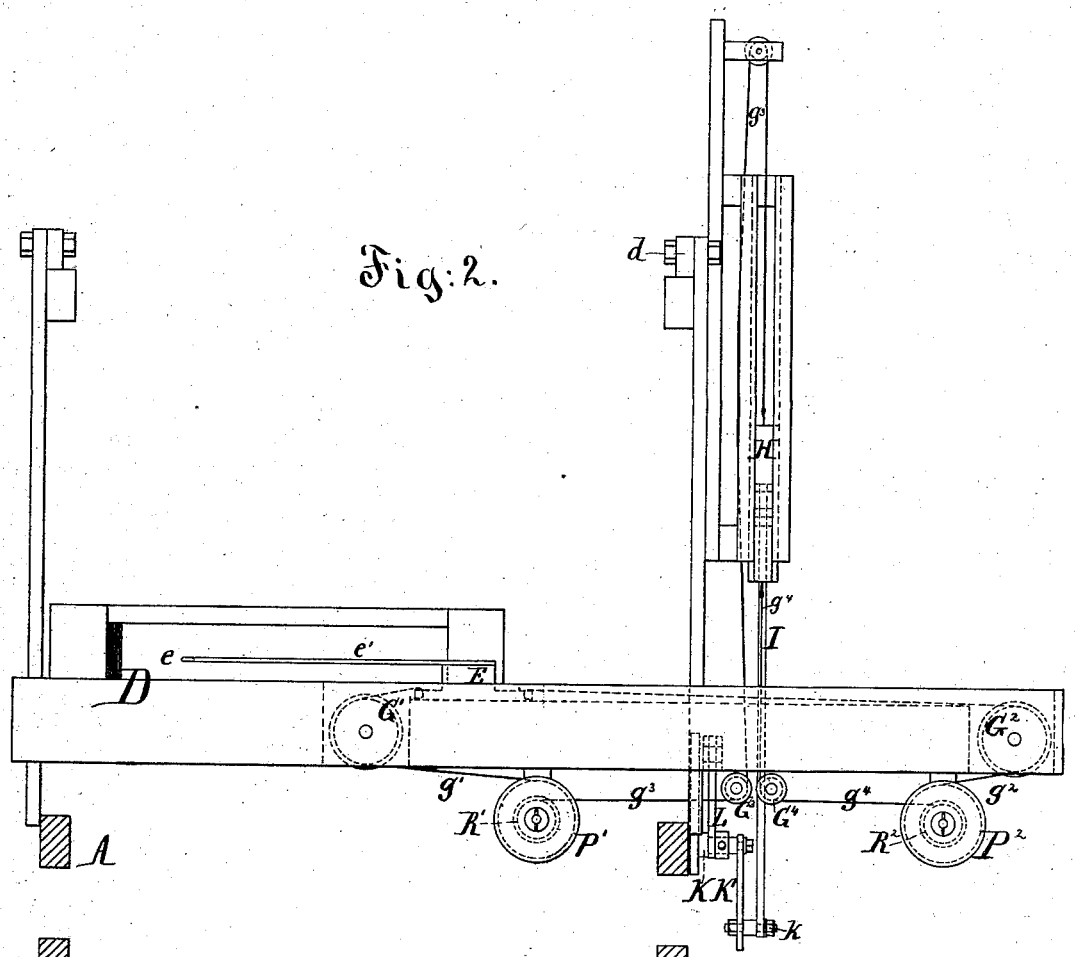
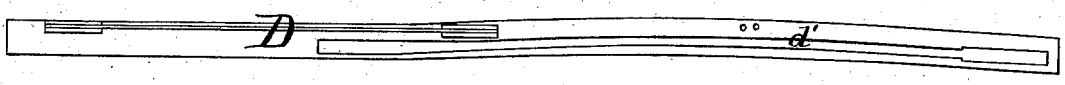


Fig: 3.



Witnesses:

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UNITED STATES PATENT OFFICE

WILLIAM J. PORTER, OF NEW YORK, N. Y.

IMPROVEMENT IN LOOMS FOR WEAVING HAIR-CLOTH.

Specification forming part of Letters Patent No. **192,006**, dated June 12, 1877; application filed October 13, 1876.

To all whom it may concern:

Be it known that I, WILLIAM J. PORTER, of New York city, in the State of New York, have invented certain new and useful Improvements relating to Looms for Weaving Hair-Cloth, of which the following is a specification:

I believe that my invention may be used with any of the automatic selectors; but in my experiments I have selected and applied the hairs to the hook by hand.

The invention relates to the means for operating the hook. I support the hook and its operating-staff in a carriage or slide, which is carried in a curved groove on the lay. The curvature gives a motion to the hook, which compensates for the fact that it is carried on the lay. The hook traverses in a path practically at right angles to the warp of the fabric in both directions. I operate the hook by a crank-motion with no greater delay at either end of its path than is involved by the gradual starting and stopping due to such motion. I secure a long enough total absence of the hook and its rod from the shed by making the traverse sufficiently long after it emerges from the goods. The delay at the other end need not be longer than a crank-motion affords. My crank-motion avoids the jar and concussion due to the ordinary cam mechanism for this purpose.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a general side elevation, showing the principal parts of the entire loom. Fig. 2 is a cross-section on the line S S. Fig. 3 is a plan view of the lay with the hook removed.

Similar letters of reference indicate like parts in all the figures.

A is the fixed frame-work; M, the fabric; and *m* the warp-yarns extending backward therefrom, in which the sheds are opened and closed by the motion of the harness B, controlled by the treadles C, worked by cams or by the feet of the attendant, as will be understood. D is the lay, turning on a center, *d*, and is of sufficient length and width to allow the curved groove *d'*, in which may reciprocate the carriage or slide E, to which is rigidly connected the hook-rod *e'*, provided at its inner end with a hook, *e*. The hook and its connections enter the shed while the lay is moving back. It is drawn out while the lay is moving forward. The curvature of its guiding-groove *d'* compensates for the forward and backward motion, and causes the hook *e* to traverse across and back at always about the same distance from the weaving-line *m'*. Being thus laid parallel to the weaving-line, or "fell," as it is sometimes termed, the beating of the lay leaves it straight. If, on the contrary, it lay as it would be laid by a hook which traversed obliquely across, it would be crinkled or even looped. Crinkling or looping each hair would render the goods imperfect, for obvious reasons, one of which is the inability of such goods to endure a strain crosswise without becoming extended by the straightening of the weft.

I reciprocate the slide E in the groove *d'* by means of two cords, g^1 g^2, which extend from the slide E to the right and left, and pass first over pulleys G^1 G^2, and thence are wound on large light wheels P^1 P^2, mounted on pivots or short shafts carried on the lay. Fast thereto are similar wheels R^1 R^2, which receive cords g^3 g^4, wound thereon in the opposite direction. The cords g^3 g^4 pass, respectively, over pulleys G^3 G^4, and thence upward through guides in the lay to operating mechanism above. That operating mechanism consists in a slide, H, carried in vertical ways on the lay-frame. One cord, g^3, passes up over a pulley, G^5, above the center of motion of the lay, and thence down, and is attached to the slide H. The other cord, g^4, is attached directly to the slide H. The winding and unwinding of the operating-cords upon the wheels P^1 P^2 R^1 R^2 has the effect to increase the extent of the movement, so that a small movement of the slide H, and consequently of the cords g^3 g^4, induces a large movement of the cords g^1 g^2, and consequently the proper large and rapid movement of the hook. The slide H is moved up and down at the right time by a connection, I, hinged thereto, which leads from an eye in the back to a crank-pin, *k*, rigidly fixed, by a suitable arm, K', to the crank-pin K, which latter gives motion to the lay by an ordinary connection, L.

The extent of the motion of the slide H, as also the time of its motion, may be varied at will within considerable limits by changing the position of the crank-pin *k* in the arm K′, and by changing the position of the latter arm on the main crank-pin K.

The oblique position of the connection I, due to the fact that the crank-pins *k* traverses around a center considerably behind the lay, induces a motion of the hook more rapid in one direction than the other. This I esteem an advantage rather than the reverse. The curvature of the slot *d′* should be such that the path of the hook will be most strictly parallel with the weaving-line in its withdrawing motion.

Many modifications may be made in many of the details without sacrificing the advantages of the invention, or even with some improvement, though I know of none sufficiently important to compensate for the increased expense or other disadvantages. Thus the carriage E may be equipped with anti-friction rollers. The lay may be made with an iron frame of less size.

For narrow goods, the wheels P^1 P^2 R^1 R^2 may be dispensed with, and a sufficient motion given directly to the cords g^1 g^2 by a sufficient movement of the vertical slide H.

I claim as my invention—

1. The lay D, having a curved way or guide, *d*, in combination with the carriage E and attached hook *e*, as and for the purposes herein set forth.

2. The combination of the primary crank-pin K, secondary crank-pin *k*, arm K′, rod I, hook *e*, and connecting mechanism, adapted to serve as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand this 9th day of October, 1876, in the presence of two subscribing witnesses.

WILLIAM J. PORTER.

Witnesses:

A. HENRY GENTNER,

CHAS. C. STETSON.