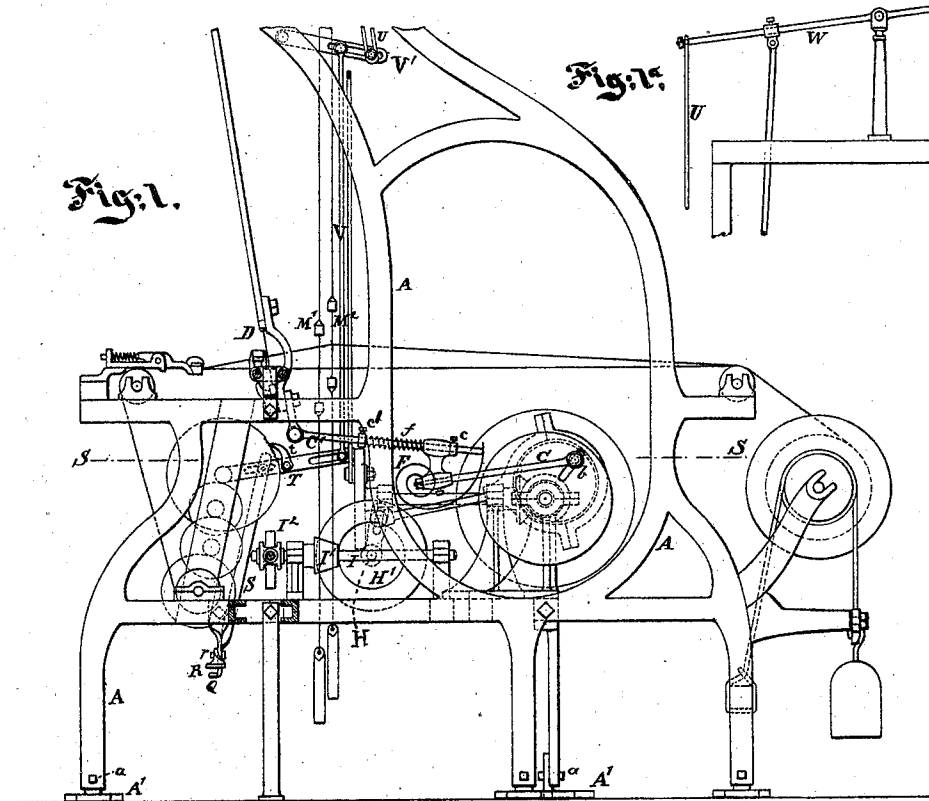


J. TURPIE.
Looms for Weaving Hair-Cloth.
 No. 139,981. Patented June 17, 1873.



Witnesses: *Arnold Horwath.*
Wm C. Daly

Inventor: *J. Turpie*
 by his attorney *J. S. Stetson*

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Fig. 3.

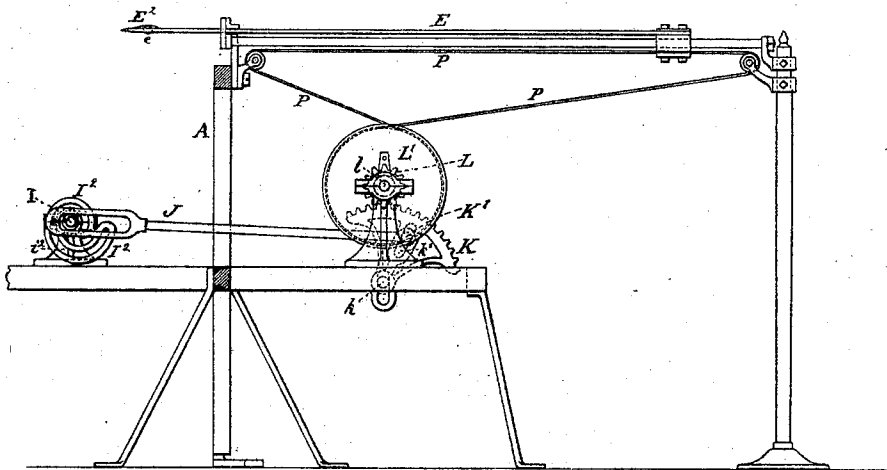


Fig. 4.

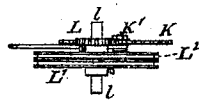
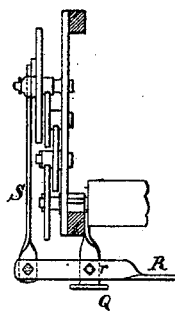


Fig. 5.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

JOHN TURPIE, OF NEW YORK, N. Y., ASSIGNOR TO EDWARD H. FAULKNER,
OF SAME PLACE.

IMPROVEMENT IN LOOMS FOR WEAVING HAIR-CLOTH.

Specification forming part of Letters Patent No. 139,981, dated June 17, 1873; application filed
December 9, 1872.

To all whom it may concern:

Be it known that I, JOHN TURPIE, of New York city, in the State of New York, have invented certain Improvements relating to Looms for Weaving Hair-Cloth, of which the following is a specification:

The invention relates to looms for weaving hair-cloth. My improved loom is provided with a small hook and roller on the end of a slender rod, which is thrust through the shed from the right side, and on the presentation of the hook on the left side of the goods a hair is introduced into it, which, by the drawing of the rod and its attached hook back again through the shed, extends the hair properly through the warps. I have devised improved mechanism for operating the hook-rod.

To operate the harness I employ a Jacquard mechanism only sufficiently complex to make the twills and simple figures usually required in this class of goods, and provide convenient means for stopping the take-up until the Jacquard can complete its round in case a hair is missed.

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 side elevation. Fig. 2 is a horizontal section on the line S S in Fig. 1. Fig. 1^a is a view of a portion of the work at the top of the loom, and is a front elevation of the Jacquard-lever and some of its connections. Fig. 3 is a portion of a cross-section of the loom. It gives a front view of some of the details for operating the hook. These devices are on or near the right-hand side of the loom. Fig. 4 is a plan view of a small portion thereof. Fig. 5 is a portion of a cross-section of the loom with a front view of some of the treadle and its connections for stopping the take-up mechanism at will. The parts shown in this figure are on or near the left-hand side of the loom.

The drawings show the novel parts with so much of the ordinary parts as is necessary to indicate their relation thereto.

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

A is a rigid framing of cast-iron. It is

mounted on adjustable feet A¹, which are secured to the legs of the main frame by bolts *a*, which are adjustable in slots up and down. I have provided means for allowing the lay to yield. The connecting-rod is provided with an adjustable spring, by regulating which the force with which the several hairs are beaten up may be modified. I have provided two springs as a preferable mode of construction, one assisting the other, and only one being adjustable. B is the main driving-shaft, receiving power through a belt, not represented, from a steam-engine or other suitable motor. A crank-pin, *b*, turned by the main shaft B gives motion through my spring connection to the lay or batten D. The rigid portion of the connection is in two parts, one sliding on or within the other. The part C is connected directly to the crank-pin *b*, and has a rigid arm extending up at its front, and with a hole therein. The part C' slides through the hole in the connection C, as will be understood. A stout spring, F, bent as represented, is firmly mounted on the part C, and bears against the end of the sliding piece C'. A collar, *c*, adjusts the extent to which the sliding piece C' may move in one direction, and the spring F in conjunction with another spring *f* tends to urge the slide C' constantly outward, and hold the collar *c* firmly against its bearing. The spring *f* is a stout spring or helical wire abutting firmly against the upper part of the arm on the connection C at one end and the adjustable collar *c'* at the other. The latter may be moved on the part C' and set in various positions by means of a pinching-screw, thus graduating the force of the spring *f*. The springs F and *f* can yield whenever the resistance requires it, and the joint force of the two may be graduated by adjusting the spring *f* alone. The rod E, carrying a hook-roller, *e*, plays forward and backward through the shed to draw through several hairs. It enters from the right with a rapid motion, and returns, after a short pause, at the left extreme of its motion. During the period while it is entirely withdrawn from the goods, the shed closes and opens again, and the lay or batten operates to strike up the hair just deposited. I have devised mechanism which gives the

proper motion with this long period of rest by very simple, durable, and noiseless means, and which admits of adjustment within wide limits, to allow for the weaving of wide and narrow goods. G is a rod connecting from an eccentric B² on the main shaft B to an arm H² on a rocking shaft H. A bevel gear-wheel, H¹, mounted on an overhanging end of the shaft H, meshes into a smaller bevel-gear wheel, I¹, on the shaft I, and the sizes of these wheels are such that the shaft I revolves alternately about a complete revolution in one direction and the other. I² is a cam, clearly shown in Fig. 3, mounted on the overhanging end of the shaft I, which gives a positive motion in both directions to a forked rod, J, which stands astride of the shaft I, and is connected to the adjustable pin K' in a slot, k', in the geared sector K, which turns on the fulcrum k and meshes into the pinion L on the shaft l, which carries the two pulleys L¹ L², and thus gives motion to the strap P, wound thereon, as shown. When it is desired to weave wide goods, the connection of J to K is lowered by moving the pin K' downward in the slot k', and the pinion L and strap P have a proportionably greater motion, thus giving a correspondingly longer motion to the rod E and its hook and roller for seizing the hairs. A portion of the slot in the cam I² is made concentric with the shaft I, thereby giving a period of rest to the rod J and its connected sector K and hook-rod E during about half of a complete revolution of the shaft I and back again; and at this time the sheds are being closed and opened and the batten is acting. This period of rest is succeeded by a rapid movement of the rod J and its connections by the action of the portion i² of the slot. In other words, during the other half of the rotation of the shaft I, the rod J, and its connected hook-rod E is moved sufficiently to dart the hook E² through the shed. During the period of rest of the rod E the hook receives the hair, and on the return motion of the rod E it draws the hair properly into the shed. The hair may be introduced to the hook by hand or by suitable mechanism, as will be understood. Both the pulleys L¹ and L² are adjustable on the shaft l, being held by pinching-screws, as indicated. This allows any slack in the strap P to be taken up by turning one or both of the pulleys L¹ L² around on the shaft l and confining in new positions. Both pulleys are grooved to better receive and guide the strap P as it is alternately wound and unwound thereon. It sometimes happens that a hair is missed. In

such case the attendant must stop the take-up of the loom and allow the loom to work idly until the Jacquard has revolved again into the same position. To effect this conveniently, I provide a treadle, R, turning on a pivot, r, and having a rigid rod, S, extending upward from its heaviest end and connected adjustably to a pawl-lever, T, which has a loose connection through the rod V, and an intermediate lever, V', having adjustable pivots, and the link U to the tilting-lever W of the Jacquard, not shown. When the loom is properly working, the rocking of the lever W of the Jacquard correspondingly raises and lowers the lever T at each movement, and this lever, by the pawl t and suitable connections, works the take-up. But when it is desired to stop the take-up, the attendant acts with her foot on the treadle R and raises the heavy end thereof and thereby the lever T. There is a stop, Q, which limits the motion of the treadle in both directions. When the treadle is depressed by the foot, the rocking of the lever W of the Jacquard continues without inducing any motion of the take-up, so long as is required.

The harnesses are marked M¹ M², and are connected by cords or wires to the Jacquard mechanism above, and are operated thereby.

What I claim as my invention, is—

1. In combination with the pulleys L¹ L², strap P, and hair-seizing device, the rock-shaft H, the multiplying-gearing, the shaft I carrying the cam I², connection J, and geared-sector K, all arranged for joint operation, as and for the purpose specified.

2. In combination with the hair-seizing device the pulleys L¹ L², one being adjustable on its shaft so as to take up the slack of the strap P, substantially as herein specified.

3. In combination with the batten and the crank b, the yielding connection consisting of an adjustable spring, f, the sliding connection C', the adjustable collar c', the connection C, and the spring F, substantially as shown.

4. The tilting treadle R, rigid connection S, lever T, pawl t, connection V, and loose connection U, all arranged relatively to the lever W of the Jacquard and to the take-up mechanism of the loom, substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand this 25th day of November, 1872, in the presence of two subscribing witnesses.

JOHN TURPIE.

Witnesses:

WM. C. DEY,
ALF. WESTBROOK.