J. Welsh.
Hand Loom.

No. 49,814. Patented Sept. 5, 1865.

Fig. 1.

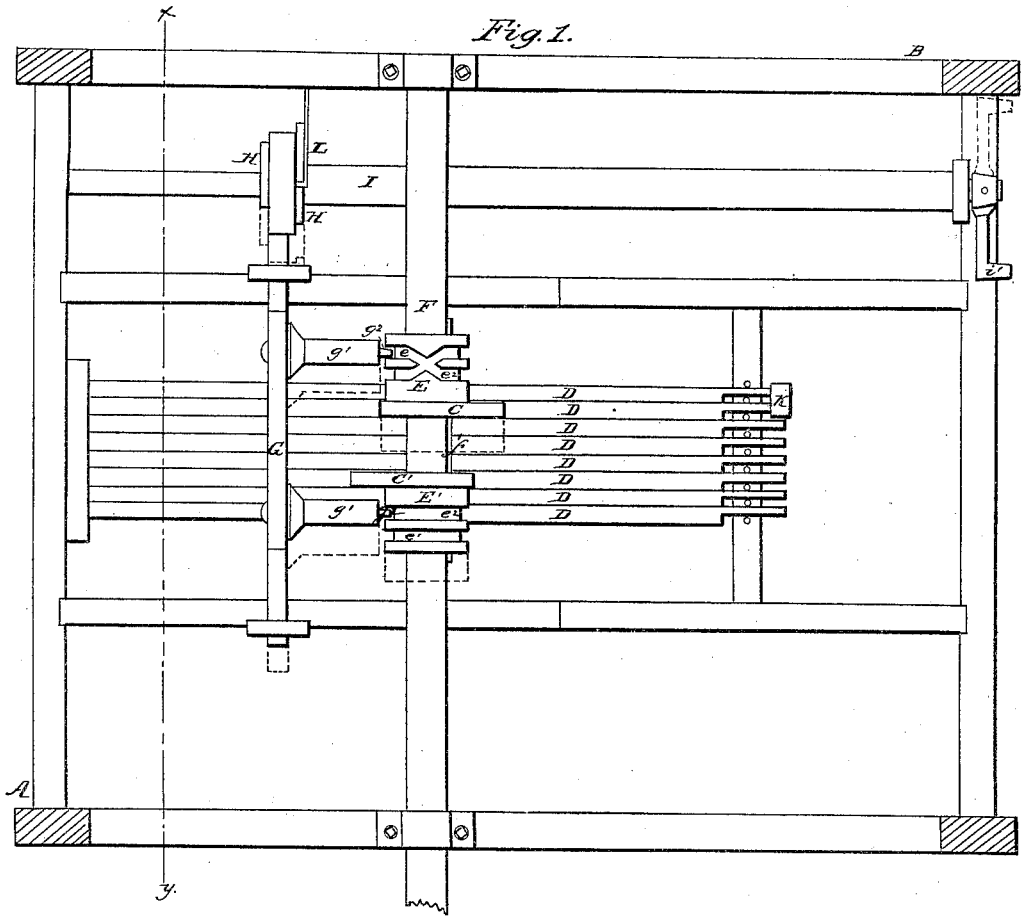
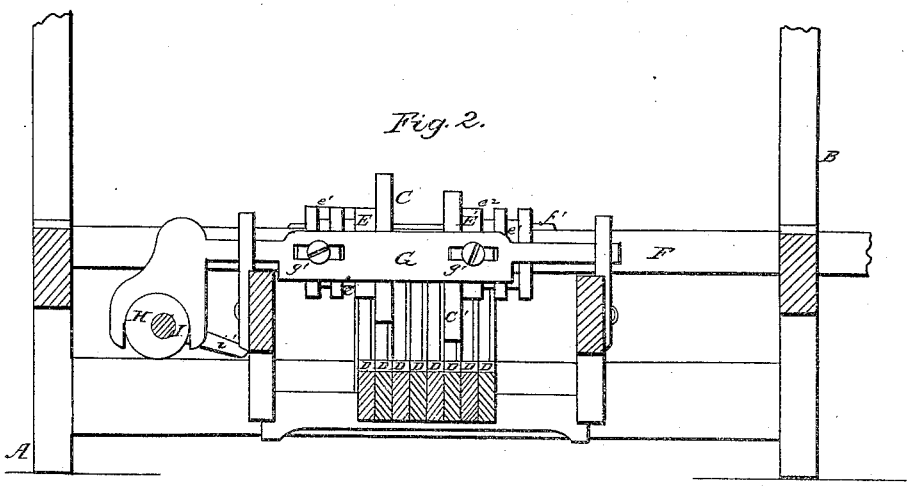


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOSEPH WELSH, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. **49,814**, dated September 5, 1865.

To all whom it may concern:

Be it known that I, JOSEPH WELSH, of the city of Philadelphia, in the State of Pennsylvania, 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 of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a sectional plan view of the lower portion of a power-loom having my improvement applied thereto; and Fig. 2, a vertical transverse section of Fig. 1, on the dotted line *x y* of the latter, like letters of reference indicating the same parts when in both figures.

The object of my invention is to enable the attendant at will to vary the character or nature of the cloth which is being produced in a common power-loom—as, for instance, from plain to twilled or covered fabrics, and vice versa—in a few moments.

It consists, substantially as hereinafter described, in the application and arrangement of devices whereby the relative positions of the cams and treadles of a power-loom can be changed, as occasion may require, in a few moments, simply by moving an attached lever, crank, or slide by hand.

In the drawings, A B is the frame of the loom, C and C′ the treadle-cams, and D D the treadles.

The cams C and C′ are each rigidly fixed to a cylinder, E E′, which is provided with two guiding-grooves, e' e^2, crossing each other on one side of the same. Each of the said combined cams and cylinders is made to slide separately and easily on the cam-shaft F, being also prevented from turning around on the latter by means of a long fin or feather, *f*, fixed on the shaft and operating in the usual well-known manner.

G is a sliding piece, to which is adjustably attached two arms, g' g', provided each with a swiveling block, g^2, that traverses the crossing guide-grooves e' e^2 of the respective cylinders E E′ in the usual manner.

The slide G is arranged parallel to the cam-shaft F, and is moved longitudinally right or left, as may be desired, by means of an eccentric, H, which is fixed on another shaft, I, that is arranged at right angles to the shaft F and extends to the front of the loom-frame, and is provided thereat with a crank-handle, i', whereby it can be easily turned by hand half-way round in either direction, so as to operate the slide G′, and consequently move the two cams C C′ of the shaft F.

The treadles D D are arranged beneath and at right angles to the cam-shaft F in the usual well-known manner.

K is one of several like removable clamping cups or bands, which may be used, if desired, to couple the free ends of any two adjoining treadles together, so that a cam bearing on one will also operate the other at the same time; and L is a spring-catch which enters either of three notches cut in the eccentric H, so as to hold the shaft I sufficiently steady in either of the three required positions hereinafter mentioned.

In the operation of my invention it will be readily seen that the cams C and C′ will be slipped along freely on the shaft F in whichever direction the sliding piece G′ is moved, and that as the shaft I, which is connected therewith by the eccentric H, can be turned either a quarter or half around by the attendant's hand applied to the crank-handle i', the said cams C and C′ can be brought to bear alternately upon either of two distinct sets of two pairs or sections of the treadles D D by turning the said shaft I half around in either direction, and also that by turning the said shaft quarter round in either direction each of the said cams will be caused to bear alternately upon two distinct sets of four treadles, the cams in either case being controlled by the swivel-blocks g^2 g^2 traversing the two crossing-grooves e' e^2 in the respective cylinders E and E′.

As the cams will each bear simultaneously upon two treadles, or with half its face upon each, when the shaft I is turned a quarter round, there will necessarily be inequality in its wearing away the face of the treadles; but this objection will be obviated by coupling together the two treadles operated on by means of the clamping-cup K and turning the shaft I so as to bring the cam to bear only upon either one of the two said treadles.

The changing of the relative positions of the cams and treadles for the purpose specified may be effected by different devices—as, for instance, instead of moving the cams the treadles alone may be moved together laterally so as to bring them alternately under the cams fixed

immovably on the cam-shaft—to produce the same described varied effects upon the web of cloth in the loom; and so, also, for the same purpose the cam-shaft having the cams fixed thereon may be made to slide in its bearings so as to cause the cams to operate alternately each upon two distinct sections of the treadles.

In the common sliding-cam loom the cams in all cases press down only one treadle at a time, but by my invention each of the cams can be caused in a moment or two to operate on either one or two simultaneously, at the will of the attendant, so as to produce quite different results in the web of cloth, either by shifting the cams or by coupling two treadles together by means of the cup K, as described.

The device is simple of construction and can be readily applied to any of the common power-looms in use, and thus adapt them, at small cost, to produce a varied or irregular kind of fabric which could not be produced by them before.

I am aware that in the English patent of Whitesmith and Stephens, 1860, there is shown applied to a loom an automatically-acting arrangement which produces changes in the fabric in weaving—as from twilled to plain, or from plain to twilled—in a regular order of succession, and accordingly the said changes must always take place on every completion of the number of "shots" determined on in the previous arrangement of the mechanism whereby they are effected. Consequently where there is any irregularity in the thickness of the filling-thread used the spaces woven between each change, either twilled or plain, will not in all cases be of the same length or size in the web. For instance, suppose the change takes place at every fortieth "shot" of the filling-thread. If the thread be thick, it will produce, say, one inch space of cloth, but if at other times the thread be finer, the space in the same web will accordingly be shorter, and therefore, in all cross-striped cloth woven on the said English loom, when the two edges of parts of the cloth are required to be sewed together they will not match. Exact regularity in the sizes of the stripes is often of the greatest importance—as, for instance, in the weaving of a lady's Balmoral skirt, wherein there are generally required to be four breadths of the cloth sewed together, and to be perfect the cross-stripes must match exactly. My invention not being self-acting or automatic, but entirely subject to the will of the operator, guided by the usual "tape-measure," which has the different lengths of the desired spaces marked on it; the said spaces may be dwelt upon or added to until they are complete, whether the filling-thread of the part be fine or coarse, to any desired extent between the changes; but this cannot be done by the automatically-acting device referred to.

I wish it to be understood that I do not intend to confine myself to any particular device for effecting the changes in the relative positions of the treadles and cams; but,

Having described the nature and object of my invention and pointed out what I believe to be the best device for effecting the said changes by hand, what I claim as new, and desire to secure by Letters Patent, is—

Producing the herein-described changes in a loom by means of any suitable device to be operated by hand at the will of the attendant, substantially as and for the purpose described.

JOSEPH WELSH.

Witnesses:

BENJ. MORISON,

B. F. SHATTUCK.