2 Sheets—Sheet 1.

L. J. KNOWLES.

LOOM.

No. 186,350. Patented Jan. 16, 1877.

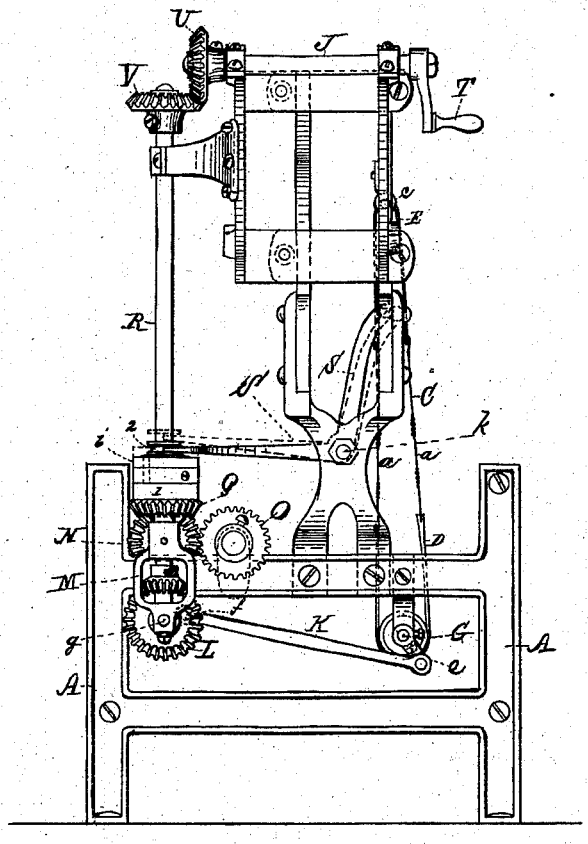

Fig. 1.

WITNESSES;

Thos. H. Dodge
Edwin E. Moore.

INVENTOR;

Lucius J. Knowles.

2 Sheets—Sheet 2.

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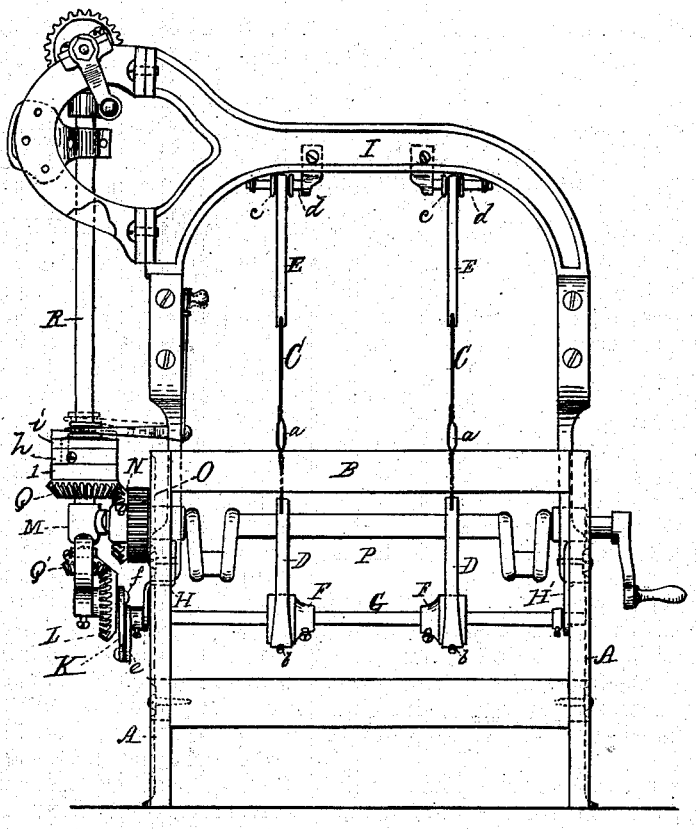

Fig. 2.

WITNESSES;

Thos. G. Dodge

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INVENTOR;

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UNITED STATES PATENT OFFICE.

LUCIUS J. KNOWLES, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. **186,350**, dated January 16, 1877; application filed June 19, 1876.

To all whom it may concern:

Be it known that I, LUCIUS J. KNOWLES, of the city and county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Looms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents an end view of so much of a loom as is necessary to illustrate my present invention, and Fig. 2 represents a front view of the parts shown in Fig. 1.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

My present invention has reference to looms in which the heddles, which receive and shed the selvage-threads, are operated by independent and separate mechanism from that which operates the harnesses or heddles, which shed the warp-threads which form the body of the web.

The nature of my invention consists in the combination, with independent mechanism for operating the heddles, which receive and shed the selvage-threads, as above stated, of mechanism for detaching the selvage-heddle-operating mechanism from the running part of the loom.

In the drawings, the part marked A represents the loom-frame, and B the breast-beam thereof. C C represent the heddle-wires, through the eyes *a* of which the selvage-threads are drawn. Said selvage heddle wires C are secured at their lower and upper ends to straps D and E respectively. The straps D are secured at their middles *b* to hubs or wheels F F securely fastened to shaft G, which is fitted to turn in suitable bearings H H′ depending from the main frame. The straps E E, to which the upper ends of the heddle-wires C are secured, pass over pulleys *c* upon shafts *d*, which are free to rock in bearings attached to the front piece I of the elevated frame which supports the pattern-chain, the latter being operated by shaft J.

Shaft G has a rocking motion imparted to it to give the necessary and proper motion to the selvage heddle wires C C by means of the connection K, one end of which connection is attached to a crank, *e*, on the outer end of shaft G, while the other end of said connection is pivoted at *f* to the side of gear L, which turns on a stud, *g*, in the lower end of frame-piece M supported by a stem, which passes through a combined bevel and spur gear, N, and is rigidly fastened to a bearing-piece on the main frame A. The spur part of gear N takes into, and is driven by, spur-gear O fast on the end of main crank-shaft P, while the bevel part of gear N takes into and drives bevel-gear Q, which is loose on the lower end of shaft R, which has a clutch-plate, *h*, fastened to it, and is also provided with a movable clutch-piece, *i*, whereby, when the bell-crank lever, pivoted at *k*, is in position, (shown in full lines in the drawings,) a pin in the movable clutch-piece *i* will pass down through piece *h* and enter a hole in the hub 1 of bevel-gear Q, thus locking shaft R to gear Q; and when the parts are in this position, motion will be communicated from the main crank-shaft P, through gears O and N and bevel-gears Q and Q′, to bevel-gear L; and as the latter gear revolves the necessary rocking motion will be imparted to shaft G, and the heddle-wires C will also be operated, those on the front sides—shaft G and pulleys *c*—going up, while those on the back sides of the same parts will move down, and vice versa. By making the crank-connections *e* and *f*, or either of them, adjustable, a greater or less throw, as desired, may be imparted to the eyes *a* of the heddle-wires C.

When bell-crank lever S is in the position shown in dotted lines in the drawings, its forked horizontal end, which enters groove 2 in the hub of clutch-piece *i*, lifts clutch-piece *i*, so as to disconnect gear Q from shaft R, and, consequently, the attendant, by means of crank T, shaft J, and gears U and V, can turn shaft R, and give a rocking motion to heddle-wires C while the main crank-shaft P is at rest; and those skilled in the art will readily understand and appreciate the advantages resulting from my said invention, since it enables the operator to move the independently-operated selvage-heddles in either direction, for the purpose of picking out selvage-

threads, which heretofore has been rendered very inconvenient in consequence of the want of improvement which I have now perfected.

It may be here stated that in that class of looms upon which my present invention is an improvement the body of the web is woven by harness mechanism under the control of a pattern-chain or surface, while the portion of the web known as the "selvages" is woven by a positive mechanism independent of the pattern-chain, and, consequently, when the filling-threads were to be picked out by reason of defective weaving, or for other cause, it was necessary to tear back the selvage portions of the web, or, in other words, break off the filling-threads at each edge, since only the body portion of the web could be operated by reversing the pattern-chain.

In such cases, however, after the tearing back of the selvages of the web, it was necessary for the operator of the loom to pick out the short pieces of the filling-threads from the selvages, and as such selvage-threads had no reversing mechanism the broken pieces of filling-threads had to be drawn out from between the locking-selvage threads, which were by such operation chaffed, rubbed, or abraded to such an extent as to render them very liable to break when the loom was started to renew the weaving operation, and, besides, if such selvage-threads did not break, the operation of picking out was such as to leave the selvage of the cloth very rough at such places. All of which objections are obviated by my present improvement.

Having described my improvements in looms, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

The combination, with the shedding mechanism of a loom, of the independently-operating selvage-heddle mechanism consisting of the rock-shaft G and connecting-straps D E, and detaching mechanism, substantially as and for the purposes set forth.

LUCIUS J. KNOWLES.

Witnesses:

THOS. H. DODGE,

EDWIN E. MOORE.