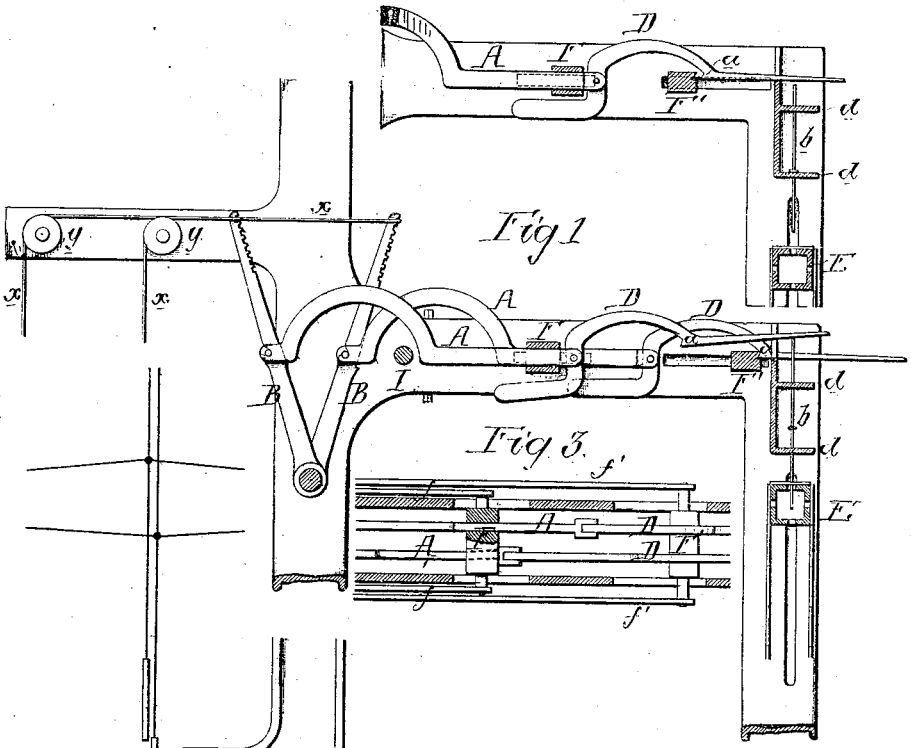
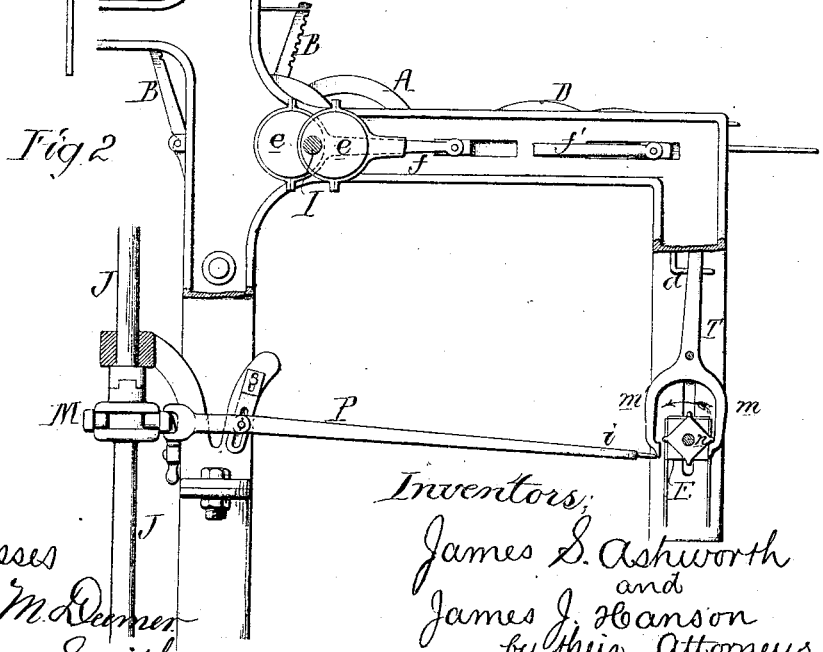
J. S. ASHWORTH & J. J. HANSON.

SHEDDING MECHANISM FOR LOOMS.

No. 191,296. Patented May 29, 1877.

Fig. 4.





Witnesses
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UNITED STATES PATENT OFFICE.

JAMES S. ASHWORTH AND JAMES J. HANSON, OF PHILADELPHIA, PA.

IMPROVEMENT IN SHEDDING MECHANISMS FOR LOOMS.

Specification forming part of Letters Patent No. **191,296**, dated May 29, 1877; application filed March 16, 1877.

To all whom it may concern:

Be it known that we, JAMES S. ASHWORTH and JAMES J. HANSON, both of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Looms, of which the following is a specification:

Our invention relates to certain improvements in "Crompton" looms, the object of our invention being to control the operation of the jacks by means of a card-cylinder, an object which we attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of that portion of the loom to which our invention relates; Fig. 2, a side view of the same, partly in section, and Fig. 3 a plan view of a portion of Fig. 1.

A A represent the jacks, of which as many are employed as there are leaves of heddles to be operated, two only being shown in the present instance as sufficient to illustrate our invention.

The jacks are connected at the inner ends to levers B, hung to the frame of the loom, and each attached to cords or wires *x*, which, after passing over pulleys *y*, are connected to the upper edges of the heddle-frame, with which their lever B corresponds, the heddle-frame being acted upon by a spring, which tends to constantly depress it.

To the front end of each jack is pivoted a counterbalanced lever, D, which has a projection, *a*, and extends at the outer end over one of a set of vertical bars or needles, *b*, guided in suitable ribs *d* on the frame, and under the control of cards carried by a cylinder, E, the latter having journals adapted to guides in the side frames of the loom, and being arranged to be elevated and depressed at suitable intervals by any appropriate mechanism, operating in unison with that which operates the jacks.

Adapted to guides in the upper portion of the loom-frame are two transverse bars, F and F′, arranged in the same horizontal plane as the jacks, which pass through and are guided by the inner bar, reciprocating movements from and toward each other being imparted to these bars by means of connecting-rods *f f′* and eccentrics *e e*, the latter being carried by the opposite ends of a shaft, I, extending transversely across the loom, and receiving its motion from the vertical driving-shaft J through the medium of any suitable system of gearing.

Each of the jacks A has at the front end a shoulder for bearing against the front edge of the bar F, as seen in Fig. 3, and the levers D are so constructed that when the bars F and F′ have approached each other to the fullest extent, as in Fig. 4, the projections *a* of the levers are immediately in advance of the front edge of the bar F′, so that the entire weight of the leaves of heddles transmitted through the levers B and jacks A is borne by the bar F.

It is when the parts are in this position that the card-cylinder operates, and, owing to the fact that the levers D are counterbalanced, and are subjected to no strain, the labor of operating them is so slight that the needles *b* and card-cylinder E may be made very light and inexpensive.

The upper portion of the driving-shaft J—that is, that portion which is geared to the shaft I—does not form part of the main or lower portion of the driving-shaft, but can be connected to or disconnected from said lower portion at pleasure by operating a clutch, M, the operating-arm of which is embraced by the forked short arm of a lever, P, hung to a stud on the frame, and so arranged that the outer end of its long arm *i* will be depressed when the clutch is in gear, and elevated when said clutch is out of gear.

Hung to one of the side frames of the loom is a lever, T, forked at the lower end, so as to form two arms, *m* and *m′*, hooked at the ends and operating in conjunction with the usual plate *n* on the end of the card-cylinder, so as to partially turn the latter as it moves downward past them, the direction of movement depending upon which of the arms *m m′* is in line with the projections on the plate *n*. Thus, while the arm *m* is in line with the projections, the cylinder is turned forward, or in the direction of the arrow, while, when the arm *m′* is in line with said projections, the cylinder is turned backward or in the reverse direction.

The throwing of these arms in and out of line is governed by the long arm *i* of the lever P, which, when the clutch M is in gear and the loom running, is depressed so as to allow

the arm *m* to act on the cylinder and turn the same forward, but which, as soon as the clutch is thrown out of gear, is elevated so as to throw the arm *m'* into line, and thus insure the proper turning backward of the card-cylinder as the jack motion of the loom is turned backward by hand, in order to discover the fault which causes its stoppage.

The operation of the loom will be understood on reference to Figs. 1 and 4, the latter view showing the position of the parts when all the warp-threads are in line preparatory to being separated to form the shed.

The first operation is the rise of the card-cylinder E, the card on which causes the needles *b* to lift the levers D, carried by those jacks which correspond with the heddles to be depressed, while they do not affect the position of the levers D of those jacks which correspond with the heddles to be raised. The arms F and F′ are now caused to recede from each other, as shown in Fig. 1, the former permitting the rearward movement of the jacks and fall of the heddles, which it controls, while the bar F′ causes a rise of the heddles and forward movement of the jacks, whose levers D are under its control, the warps thus separating to form the shed.

After the passage of the shuttle the parts return to the position shown in Fig. 4, and the card-cylinder, which had, in the meantime, descended and been turned so as to bring a fresh card into play, again rises and operates as before.

We claim as our invention—

1. The combination of the card-cylinder E and its needles *b* with the counterbalanced levers D, jacks A, for operating the heddles, and mechanism for reciprocating said jacks, as set forth.

2. The combination of the reciprocating bars F and F′, with the levers D and jacks A for operating the heddles, and passing through openings in said bar F, and provided with shoulders, as described.

3. The combination of the card-cylinder E, forked lever T, the driving-shaft J and its clutch M, with the lever P, arranged and operating as herein described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JAMES S. ASHWORTH.
JAMES J. HANSON.

Witnesses:
HERMANN MOESSNER,
HARRY SMITH.