

(No Model.)

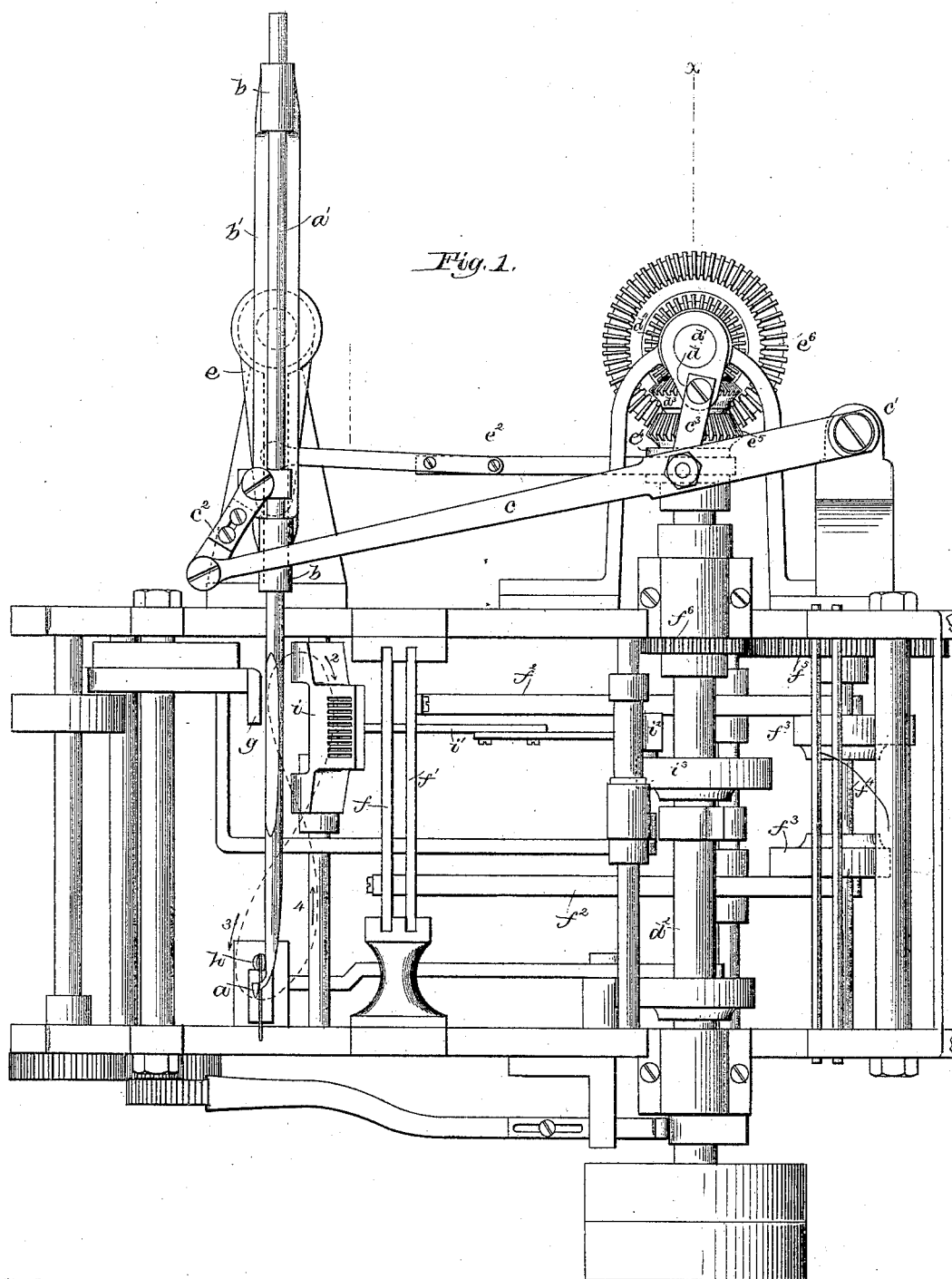
2 Sheets—Sheet 1.

O. ARNOLD & C. W. ARNOLD.

MECHANICAL MOVEMENT.

No. 342,060.

Patented May 18, 1886.



Witnesses
Allene
J. J. Maloney.

Inventors,
Oliver Arnold & Clarence W. Arnold,
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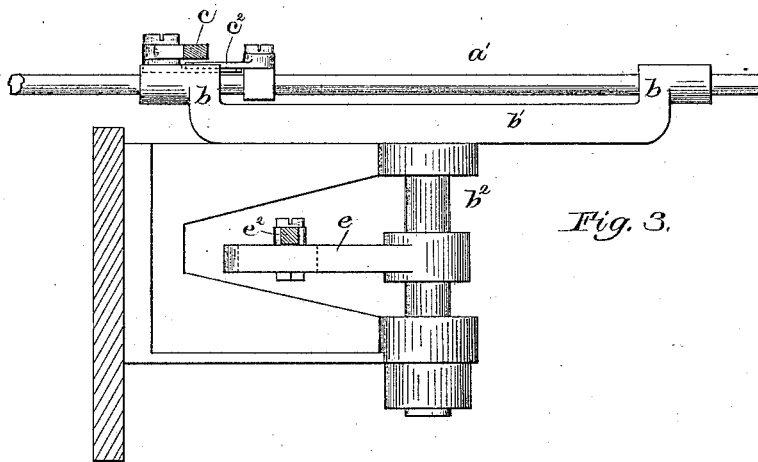


Fig. 3.

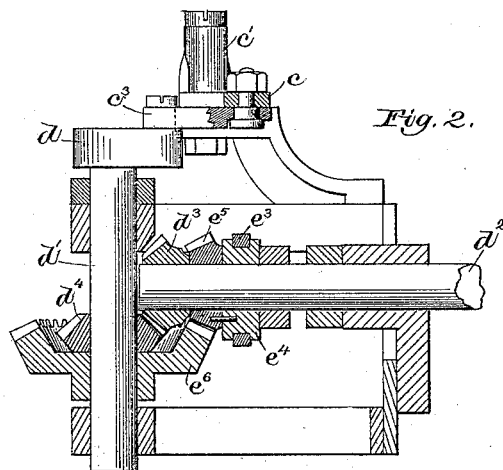


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

OLIVER ARNOLD AND CLARENCE W. ARNOLD, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO EDWIN BROWN, TRUSTEE, OF SAME PLACE.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 342,060, dated May 18, 1886.

Application filed October 22, 1885. Serial No. 180,589. (No model.)

To all whom it may concern:

Be it known that we, OLIVER ARNOLD and CLARENCE W. ARNOLD, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Mechanical Movements, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Our invention relates to a mechanical movement for producing a peculiar path of movement of a moving part, and is shown as employed for actuating the needle or weft-carrier of a needle-loom, being embodied in a loom such as shown and described in an application of Oliver Arnold, Serial No. 180,590, filed October 22, 1885.

The mechanical movement forming the subject of the present invention is adapted to give a device—such, for instance, as the end or eye of the needle of the loom—a movement in a path shaped substantially like the figure 8, so that in the loom the point of the needle carrying a loop of weft-thread passes into the shed formed by separating the warp-threads, in the usual manner, at some distance from the apex of the shed, and then having passed through the shed the point moves around, so as to carry the loop of weft-thread over a loop-holder or equivalent device, and in the return of the needle out from the shed the weft-thread is carried close to the apex of the shed, thus laying the thread in proper position to be beaten up by the usual reed or lay of the loom.

The parts constituting the mechanical movement or combination of devices forming the subject of the present invention consist of the needle or part to be moved in the peculiar path, a guide in which the said part or needle has an endwise reciprocating movement, the guide being itself pivoted to turn on an axis at an angle to the line of endwise movement of the needle, a crank or equivalent and connections between it and the reciprocating part, for giving the latter its reciprocating endwise movement, and an eccentric or equivalent having its speed of rotation in some definite relation to that of the crank, which produces the endwise movement of the needle—the eccentric, for instance, in the particular device

shown, having two rotations to each rotation of the crank, and the said eccentric being connected with the oscillating guide for the reciprocating part or needle, and producing any desired number (in this instance two) of oscillatory movements of the needle-guide and needle at each to-and-fro endwise movement of the needle, the resultant of which oscillatory and endwise movements taking place simultaneously is to move any desired point on the needle or other moving part in a peculiar curved path, which, in the particular form shown, where there are two oscillatory movements for each endwise movement, causes the desired point to move in a path closely resembling the figure 8; but it is obvious that the said point might move in a zigzag or undulatory path, forming any desired number of intersections or loops in each to-and-fro movement; and the invention may be applied to any machinery in which it is necessary or desirable to give a moving part such movement.

Figure 1 is a plan view of a mechanical movement or combination of devices embodying this invention, shown in connection with the main parts of a loom, in which such mechanical movement is applicable; Fig. 2, a vertical section of the main actuating parts on line *x*, Fig. 1, and Fig. 3 a side elevation of the reciprocating part or needle-shank and its oscillating guide.

The part to be moved in the peculiar path is shown in this instance as the end or point *a* of the rod or needle *a'*, having a longitudinal reciprocating movement in bearings *b* of a guide, *b'*, itself having an oscillating movement on a shaft, *b''*, at an angle to the axis of the reciprocating part *a'*.

The rod *a'* is actuated in its reciprocating endwise movement by a lever, *c*, pivoted at *c'*, and connected by a link, *c''*, with the rod *a'*, and also connected by a link, *c'''*, with a crank or wrist-pin, *d*, on a shaft, *d'*, rotated from a main shaft, *d''*, by beveled gears *d''' d''''*, (shown as of equal size,) and thus causing the shaft *d'* to rotate at the same speed as the shaft *d''*. The rod *a'* thus receives a single to-and-fro endwise movement at each rotation of the shafts *d'* and *d''*. The needle-guide *e'* is oscillated during the endwise movement of the rod *a'* by means of a crank, *e*, connected

with the rock-shaft d^2 of the said needle-guide, and connected by a rod or link, e^2 , with an eccentric-strap, e^3 , embracing an eccentric, e^4 , loose on the shaft d^2 , and actuated from the shaft d' by beveled gears e^5 e^6 , so proportioned as to give the eccentric e^3 any desired speed of rotation relative to that of the shafts d' and d^2 . As shown, in this instance the eccentric is caused to make two complete rotations at each rotation of the shaft d' so that the eccentric-rod e^2 makes two to-and-fro movements, and the guide b' and reciprocating part a' therein consequently make two oscillatory movements at each complete to-and-fro movement of the said reciprocating part a' , and as a resultant of the endwise and oscillatory movements the said end a of the reciprocating part moves in a path represented in dotted lines, Fig. 1, closely resembling the figure 8 in shape.

It is obvious that by varying the relative speed of the shaft d' and eccentric e^4 the path of movement of the end of the rod a might be greatly varied. The particular movement herein illustrated is especially adapted for the weft-carrying needle of a loom, for making fringed fabric, the other parts of which are shown in Fig. 1, and consist, mainly, of the heddle-frames f f' , actuated by levers f^2 and cams f^3 on a shaft, f^4 , connected by gears f^5 f^6 with the main shaft d^2 , the said heddle-frames controlling the position of the warp-threads and forming sheds therein in the usual manner. The fabric as fast as completed is held at the point where the last weft-thread is beaten up by a clamp, g , which forms the apex of the shed formed in the warp-thread, and when the shed is opened by the movement of the heddle-frames the end of the needle enters in the path shown in dotted lines near the point marked 2, at a considerable distance from the apex of the shed, where there is a wide opening in the warp-threads to receive it. The weft-thread extending from the pick last beaten up, and held within the clamp g through an

eye formed in the end a' of the needle and out through suitable guides to a spool or ball at the side of the loom, is carried by the eye across through the shed in the warp-threads and a considerable distance beyond, where, during the movement of the point of the needle near the place marked 3 in the path shown in dotted lines, a loop-holder, h , is projected up between the needle-shank and the loop of weft-thread extending from the last pick to the eye of the needle and in the curved movement of the needle a' . At this point the thread is carried around and engaged with the said loop-holder h , after which, in the return movement of the needle in the part of the path marked 4, the thread is drawn tightly around the said loop-holder and carried close to the apex of the shed at the clamp g in proper position to be readily beaten up by the lay i , operated by a bar, i' , arm i^2 , and cam i^3 on the main shaft d^2 .

We claim—

1. The combination of a reciprocating part and an oscillating guide therefor with actuating mechanism common to the said reciprocating part and its guide by which the guide receives any desired number of oscillating movements to each to-and-fro movement of the reciprocating part, substantially as described.

2. The combination of a reciprocating part and rotating shaft and crank for actuating the same, with an oscillating guide for the said reciprocating part and eccentric for actuating the same, and gearing between the crank-shaft and eccentric for rotating the latter at any desired speed relative to that of the former, substantially as described.

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

OLIVER ARNOLD.

CLARENCE W. ARNOLD.

Witnesses:

JOS. P. LIVERMORE,

EDWIN BROWN.