

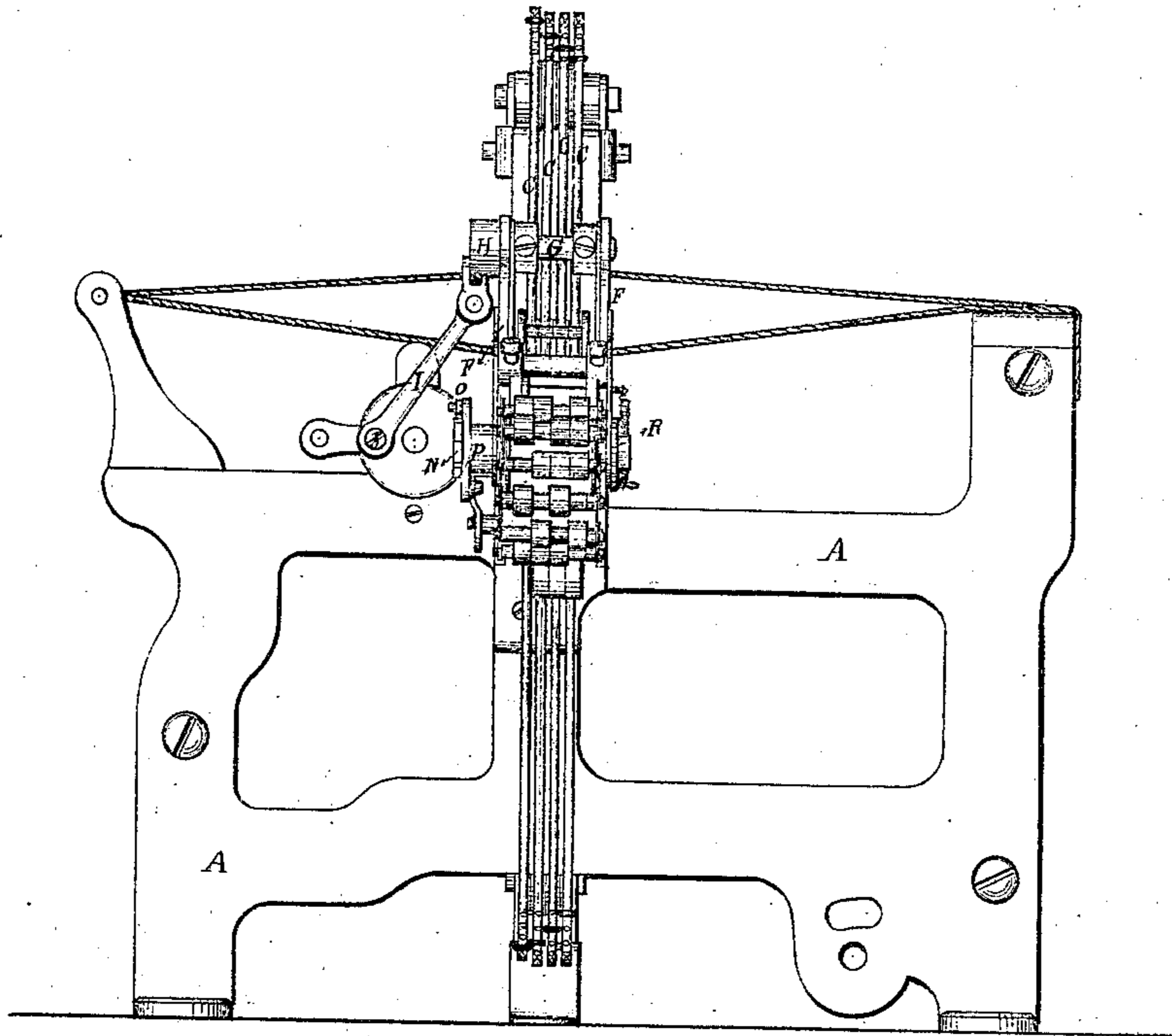
*J. Ashworth,*

*2. Sheets. Sheet 1.*

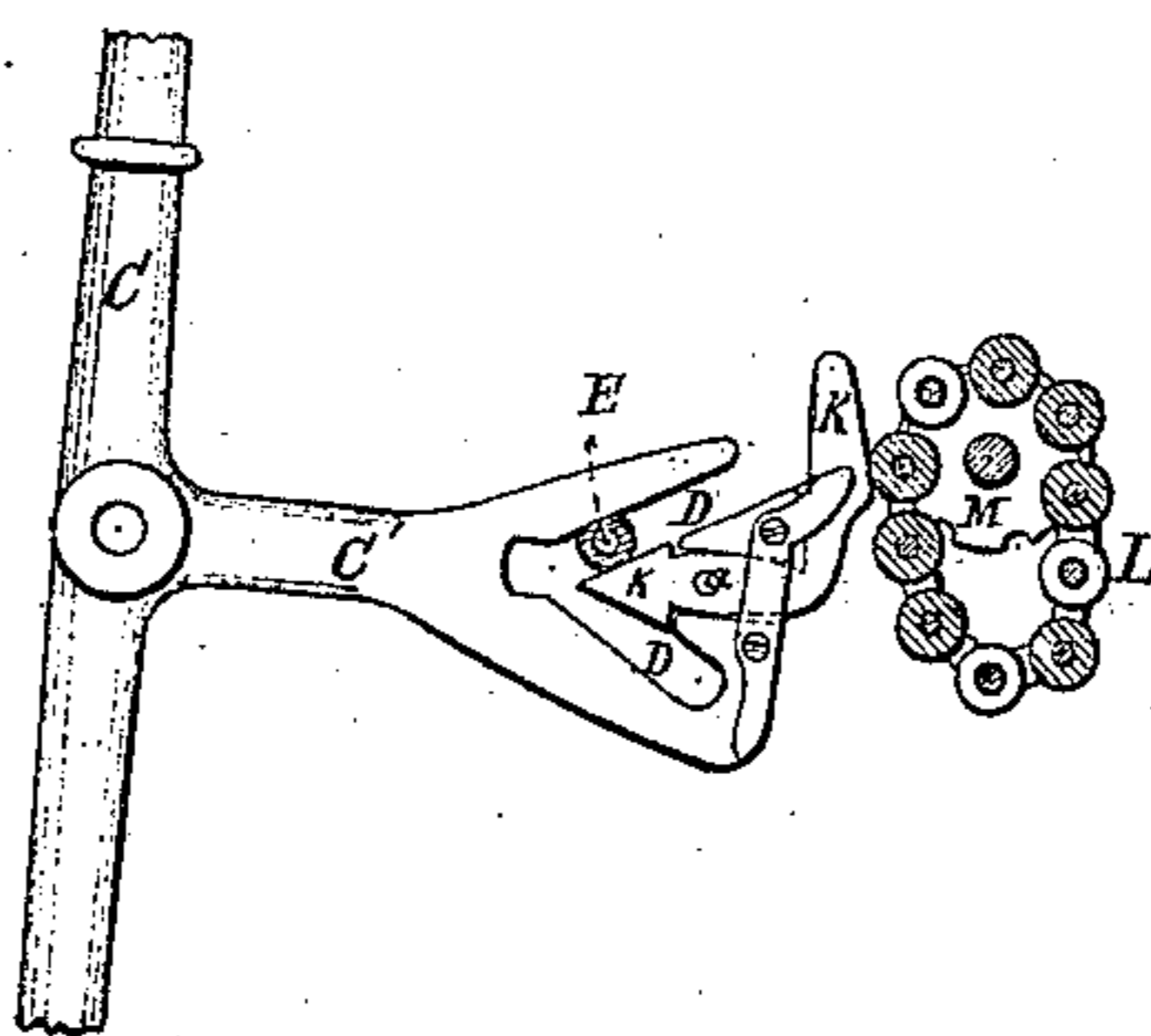
*Loom.*

*No. 106,300.*

*Patented Aug. 16. 1870.*



*Fig. 1.*



*Fig. 3.*

WITNESSES

*B. B. Whitney*  
*Wm. C. Hubbard*

INVENTOR

*John Ashworth*

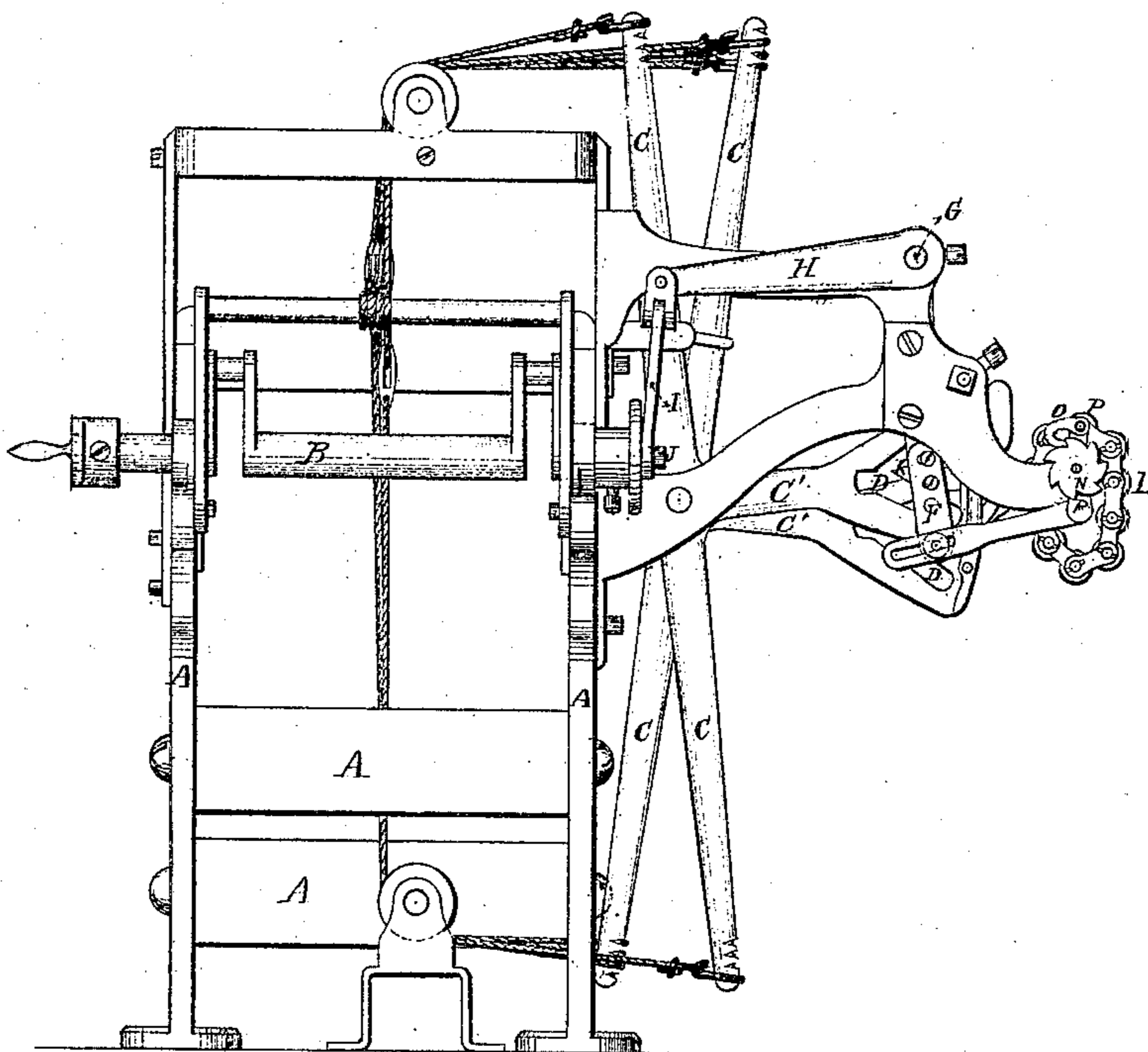
*J. Ashworth,*

*2. Sheets, Sheet, 2.*

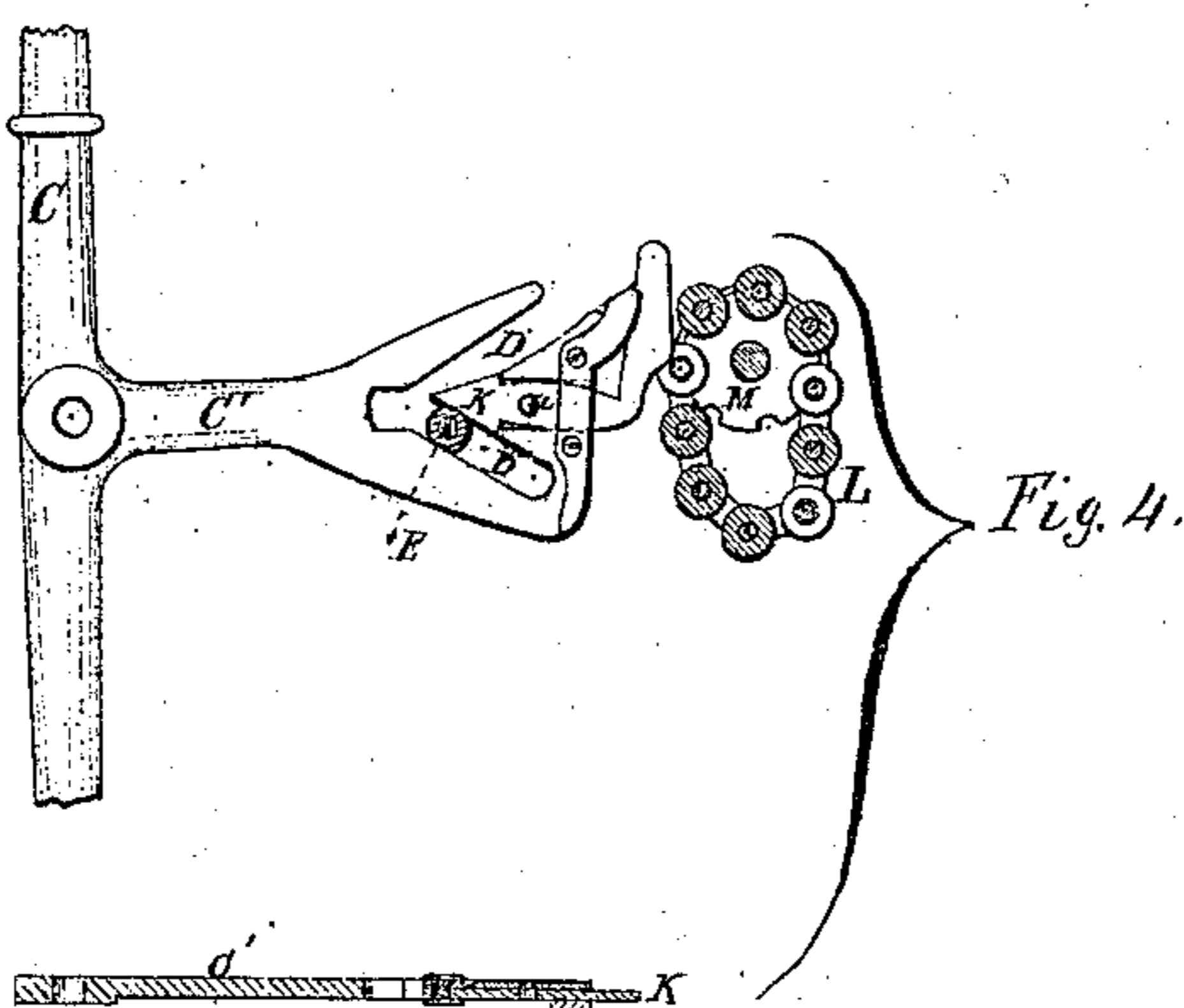
*Loom.*

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*Fig. 2.*



*Fig. 4.*

WITNESSES

*S. B. Whitney*  
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INVENTOR

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# United States Patent Office.

JOHN ASHWORTH, OF NORTH ANDOVER, MASSACHUSETTS.

*Letters Patent No. 106,306, dated August 16, 1870.*

## IMPROVEMENT IN HARNESS-OPERATING MECHANISM FOR LOOMS.

The Schedule referred to in these Letters Patent and making part of the same

I, JOHN ASHWORTH, of North Andover, in the county of Essex and State of Massachusetts, have invented certain Improvements in Looms, of which the following is a specification.

My invention relates to the construction of the mechanism for operating the heddles in a fancy loom, by which the same is much simplified; and consists in combining with each of the levers or jacks which work the heddles a projecting radial arm in which is formed a duplex cam or groove, the two parts of which are inclined to the radius of the lever in opposite directions, a vibrating bar or its equivalent, which moves in the direction of the radius of the said arm, and works in said cam-groove to vibrate the jack, and a shifting guide-piece that forms a part of said cam-groove and directs the said bar into one inclined part or the other of said cam-groove, according to the position in which it is placed by the pattern-chain, which thus determines in which direction the jack shall be vibrated, and, consequently, whether the leaf of heddles connected therewith shall be raised or depressed.

### *Description.*

In the accompanying drawing—

Figure 1 is an end elevation of so much of the loom as will show the nature and mode of application of my improvement.

Figure 2 is a side elevation of the same.

Figures 3 and 4 are detached views, showing the relations of the jack with its duplex cam-groove, the vibrating bar, the guide-piece, which directs the bar into the inclines of the groove, and the pattern-chain.

A is the frame of the loom;

B, the lay-shaft; and

C C, &c., the heddle-levers or jacks, arranged vertically at the side of the loom, and working the heddles in a well-known manner.

From the center of each lever C an arm, C', extends radially outward, of the form shown, in which the duplex-forked groove or slot D is made.

E is a vibrating bar, which extends transversely through all the grooves of the series of jacks, and is attached to the lower ends of the vibrating arms F upon the rocking-shaft G, which receives an oscillating motion of the requisite extent by means of the arm H upon the same, and the connecting rod I, from the crank J upon the lay-shaft B, in an obvious manner.

K is a guide-piece, which is placed at the angle formed by the two inclined parts of the groove D, and is made to vibrate upon a fulcrum, at *a*. The extent of its vibration is so limited that when at the extreme of its motion in one direction the opposite side of the same will form a part of the inclined groove, and will also so far close the other incline as to direct the bar E into the first.

The outer end of the guide-piece K extends beyond the jack, and is turned up, as shown, to form a face upon which the pattern-chain L acts.

The pattern-chain is of a well-known description, being composed of large and small bolls arranged upon pins which are linked together to form an endless chain, and rests upon sprocket-wheels M, which are turned by a ratchet, N, and pawl O, upon the rocking lever P, which is worked from one of the arms F, as is shown in the drawing, and is held by an index, R, and detent, S, in a manner well known.

As the pattern-chain revolves the large bolls come against the outer faces of the guide-pieces K and throw them inward, depressing the point of the guide-piece so that the bar E, as it moves outward, is guided into the upper incline and depresses the arm C' of the jack, as is shown in fig. 3; and, when the small boll of the pattern-chain comes opposite the outer face of the guide-piece K, the said piece falls outward by gravity or is forced out by a spring, so that the parts are put in the position shown in fig. 4, which directs the bar E into the lower incline and gives a motion to the jack in an opposite direction to that first mentioned.

Upon this bar is arranged a series of rollers, one to work in the groove of each jack, to avoid friction and prevent the wear of the groove.

What I claim as my invention is—

The combination, with the jack, of the projecting radial arm C', having the duplex inclined cams or groove, the vibrating bar to move the same, and the guide-piece, controlled by a pattern, substantially as described.

Executed May 11th, 1870.

JOHN ASHWORTH.

Witnesses:

G. E. WHITNEY,  
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