

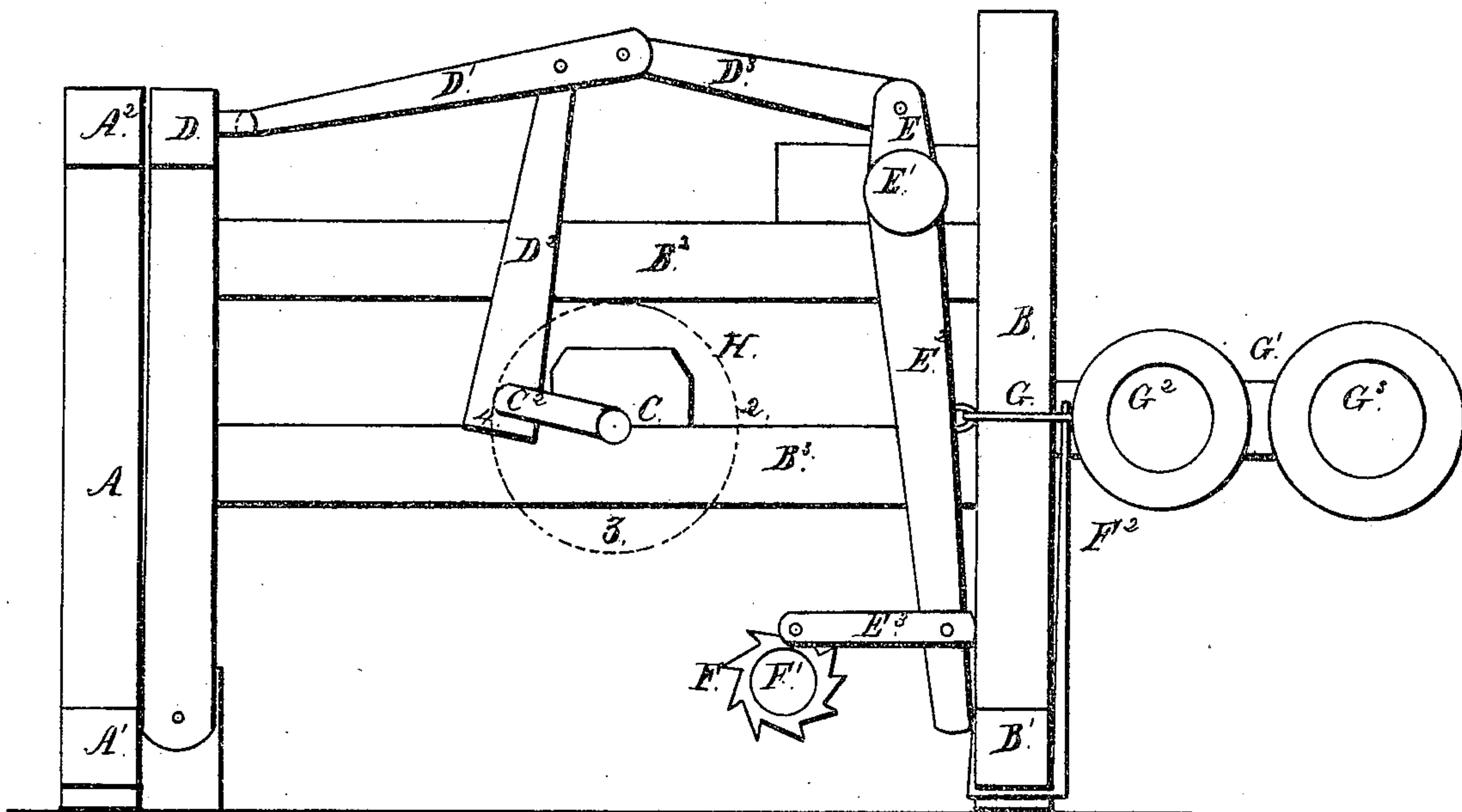
*J. Goulding.*  
*Hand Loom.*

*Hand Loom.*

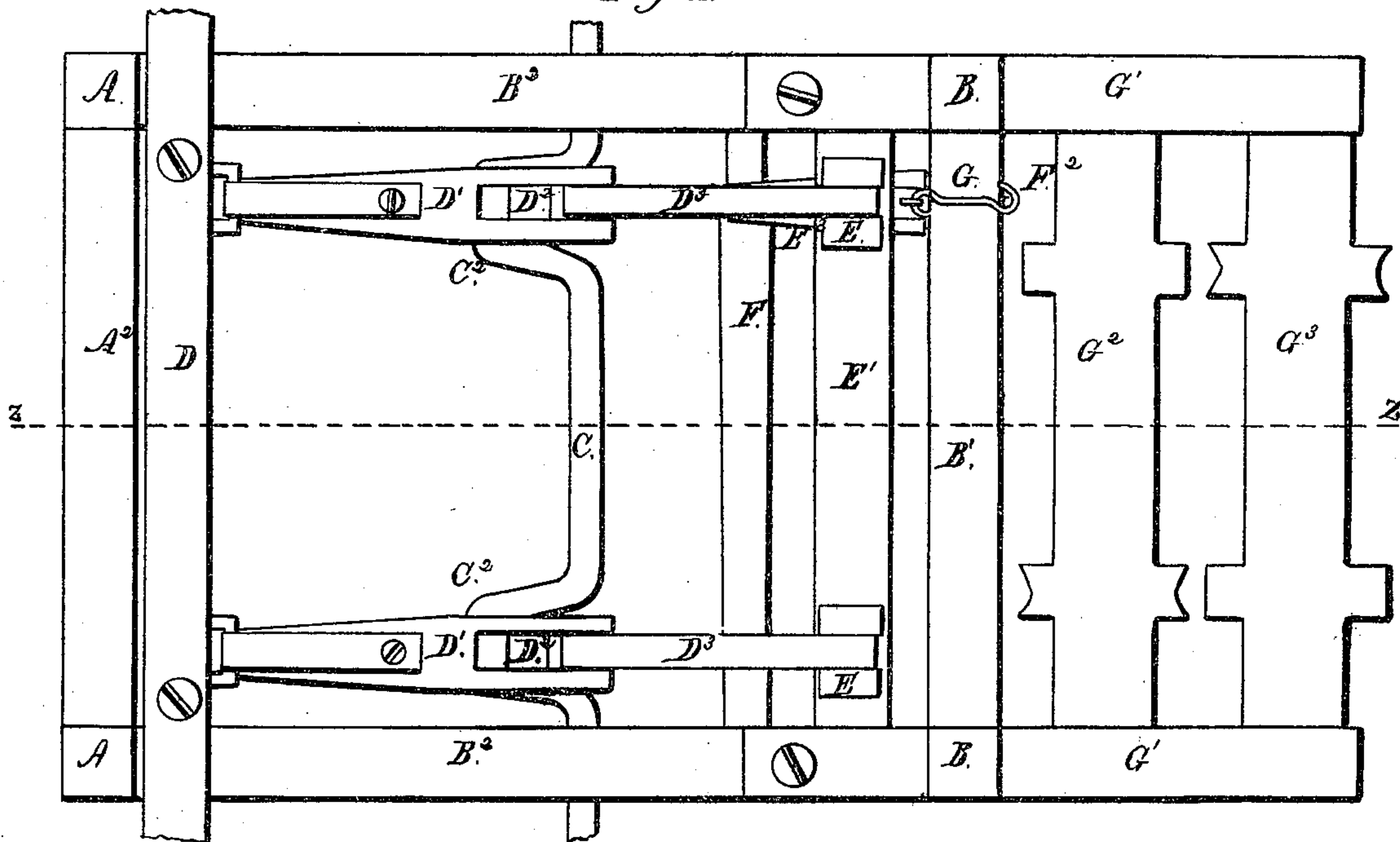
*N<sup>o</sup> 9.024.*

*Patented Jan. 15, 1852.*

Fig: 2.



*Fig: 1.*





# UNITED STATES PATENT OFFICE.

JOHN GOULDING, OF WORCESTER, MASSACHUSETTS.

## MOTION OF THE LAY IN LOOMS.

Specification of Letters Patent No. 9,024, dated June 15, 1852.

*To all whom it may concern:*

Be it known that I, JOHN GOULDING, of Worcester, in the county of Worcester and State of Massachusetts, have made certain  
5 new and useful Improvements in Looms; and I do hereby declare that the same is described and represented in the following specification and accompanying drawings.

10 In most of the looms which have been constructed heretofore, the lay has been vibrated by the direct action of a crank or cam, requiring a large amount of power in proportion to the force of the stroke.

15 The design and object of my first improvement is to save a part of the power heretofore required, and give a more efficient and powerful stroke, and repeat the stroke as many times as may be requisite upon the same thread of weft. To do this, I vibrate  
20 the lay of my loom by toggle joints, the ends of which are connected to the lay and to some part of the loom so as to operate the lay by vibrating the toggle joints with a sweep from a crank or some analogous  
25 device from a cam or otherwise, by means of which I am enabled to make the lay strike such a number of times upon each thread of weft as may be desirable, and only draw the lay a short distance from the weft  
30 for each stroke after the first upon the same thread of weft, thereby saving the warp from a large portion of the wear to which it is subjected by drawing the lay as far from the weft for each succeeding stroke as  
35 for the first, as has been practised in the looms heretofore constructed which have made more than one stroke upon the same thread of weft.

40 To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation, referring to the drawings abovementioned, in which the same references indicate like parts in each of the figures.

45 Figure 1 is a plan and Fig. 2 a sectional elevation through the line *z, z* of Fig. 1.

50 A, A are front posts connected by the girth A' and breast beam A<sup>2</sup>; B, B are back posts connected together by the girth B' and to the front posts A, A by the girths B<sup>2</sup>, B<sup>3</sup>. The main shaft C, to which the power is applied to drive the loom and which has the cranks C<sup>2</sup>, C<sup>2</sup> in it, turns in boxes fitted to the girths B<sup>3</sup>. A gear may be applied  
55 to this shaft to operate a cam shaft to traverse the heddles and throw the shut-

ties. The lay D may be constructed in the usual manner or otherwise and hung to stands fastened to the lower ends of the posts A; which lay is vibrated by the arms  
60 D', D' connected to it as represented. The opposite ends of the arms are made double with a space between the ends for the ends of the sweeps D<sup>2</sup>, D<sup>2</sup> connected to them and to the cranks C<sup>2</sup>, C<sup>2</sup>. The ends of the arms  
65 D<sup>3</sup>, D<sup>3</sup> are inserted into the space in the ends of the arms D' as represented in the drawing and connected to them and to the cheeks E, E upon the rock shaft E' forming  
70 toggle joints to vibrate the lay as they are operated by the crank and sweeps. The shaft E' turns in bearings fastened to the girths B<sup>2</sup> and has the arm E<sup>2</sup> fastened to it which vibrates the pawl E<sup>3</sup> to turn the  
75 ratchet wheel F fastened to the shaft F', which turns in stands fastened to the posts B and may be connected to the yarn beam so as to deliver the warp as it is required. The spring F<sup>2</sup> is fastened to the girth B'  
80 and connected to the arm E<sup>2</sup> by the link G so as to draw the arm back after it has been forced forward by the action of the arms D'.

There are two arms G', G' fastened to the posts B which are perforated for the pivots of the yarn beams G<sup>2</sup>, G<sup>3</sup> which turn in the  
85 same. The circle H (in dotted line) represents the circuit of the crank. If the crank is up or at 1, on the circle the lay is drawn from the cloth and the arms D' and D<sup>3</sup> stand at an angle; as the crank is turned to 2, the  
90 arms are straightened and the lay is driven to the cloth; as the crank goes to 3 it draws the arms D' and D<sup>3</sup> down so as to form an angle and draws the lay a short distance from the cloth and as the crank proceeds  
95 to 4 it straightens the arms D' and D<sup>3</sup> and forces the lay up against the cloth again; and as the crank passes on from 4 to 1 the arms make an angle and draw the lay from the cloth to the same position it was in at  
100 first; thus throwing the lay and striking the weft with the reed twice for each revolution of the crank without wearing the warp (by traversing the reed on it) so much as it would be worn if the lag was traversed  
105 back the usual distance, as is practiced in the double stroke looms heretofore used.

110 If it is desirable to have the lay strike once only instead of twice for each thread of weft the sweeps D<sup>2</sup> and crankshaft C may be removed and longer sweeps and a shaft with shorter cranks substituted so that when



the crank is at 3, or its lowest point, it will only bring the arms  $D'$  and  $D^3$  in a straight line.

5 In constructing complicated looms a cam grooved or otherwise may be used instead of a crank and the cams may be shaped so as to make the lay strike once, twice, or such a number of times as may be desirable for each thread of the weft.

10 In weaving Brussels or tufted carpets it is important to have both sheds of ground warp strained alike and it is common to spring the sheds a short distance below a straight line so that if both sheds of warp  
15 come from the same beam the top one will not be drawn so tight as the under one and hence the under one is subject to nearly all the strain from the stroke of the lay and consequently the warp is more often broken  
20 than it would be if the strain was more equally divided between them; thus causing frequent stopping and delay to mend the threads.

To obviate the abovementioned defect I  
25 put the ground warp upon two beams, that is, one shed upon  $G^2$  and the other upon  $G^3$ ; by taking one shed from each beam in

this way the strain is divided so equally between the two sheds, by the yielding of the several posts of the loom, that although 30 the warps are sprung below a straight line they break far less than when they are both taken from the same beam.

When fabrics are to be woven with two or more sheds of warp I contemplate using 35 a separate beam for one or two or more of the sheds, or otherwise

What I claim as my invention and desire to secure by Letters Patent, is:—

Giving the lay of a loom one or more 40 long beats for the shuttle to pass or to insert a wire into the web; and as many short beats as may be necessary or desirable to strike up each thread of weft and wire with a toggle joint operated by a sweep or some 45 other device connected to or operated by a crank cam or otherwise.

In testimony whereof, I have hereunto signed my name before two subscribing witnesses.

JOHN GOULDING.

Witnesses:

WM. DENNIS,  
JONATHAN DENNIS, Jr.