

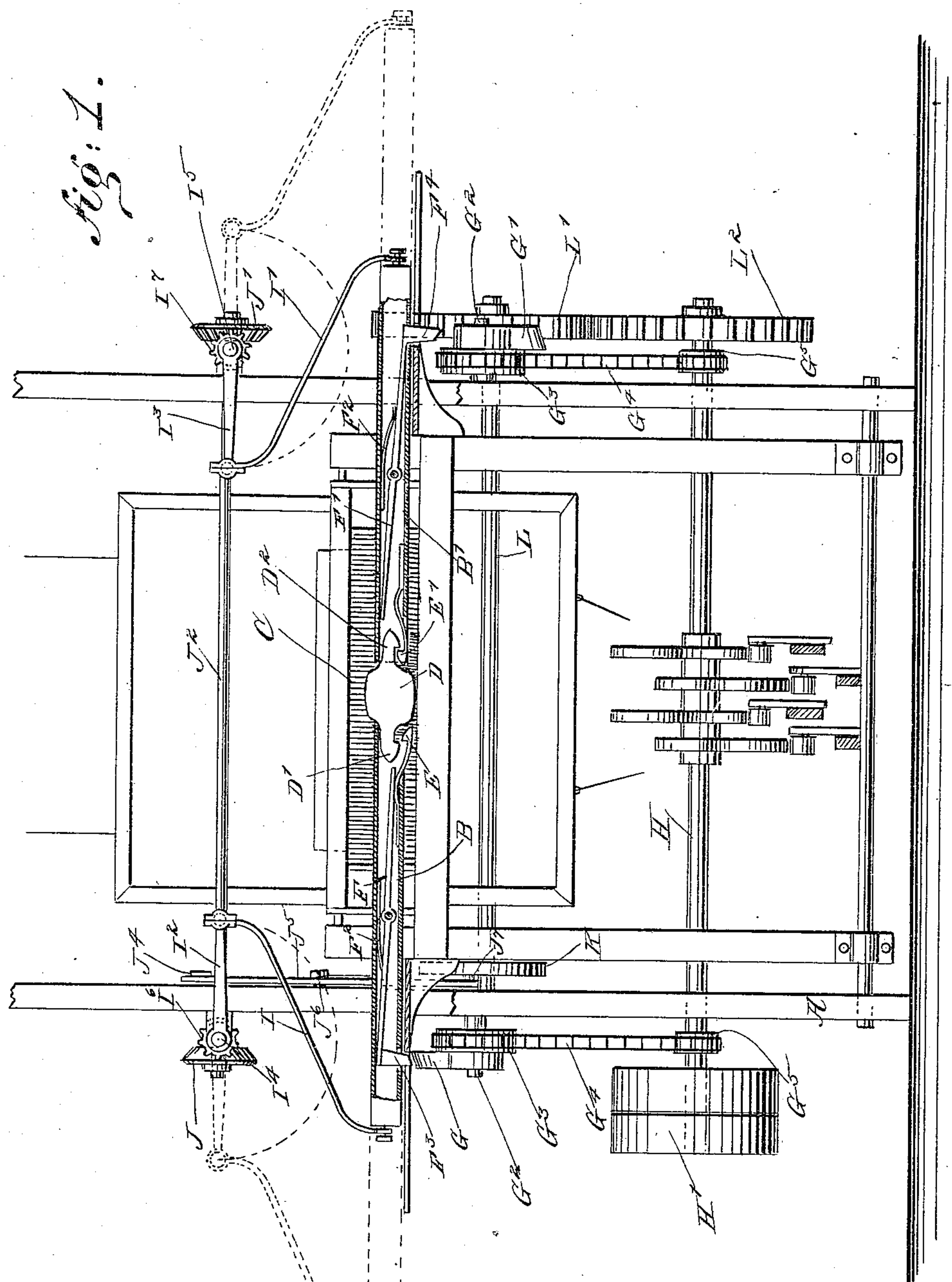
(No Model.)

3 Sheets—Sheet 1.

L. K. HEATHCOTE.  
SHUTTLE WORKER FOR LOOMS.

No. 560,992.

Patented May 26, 1896.



WITNESSES:

Chas. Nide  
Rev. G. Foster,

INVENTOR

  
 BY   
 ATTORNEYS.

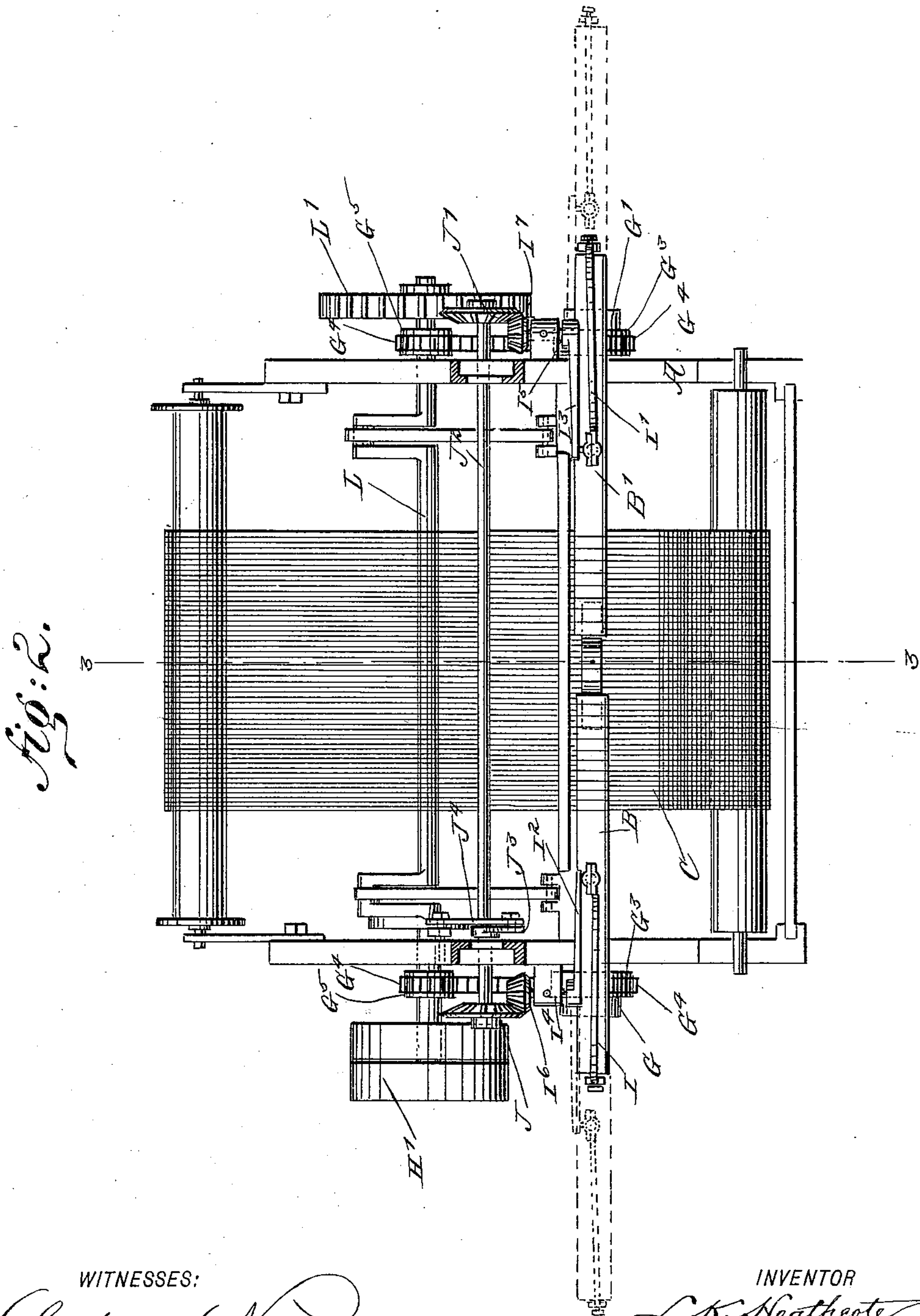
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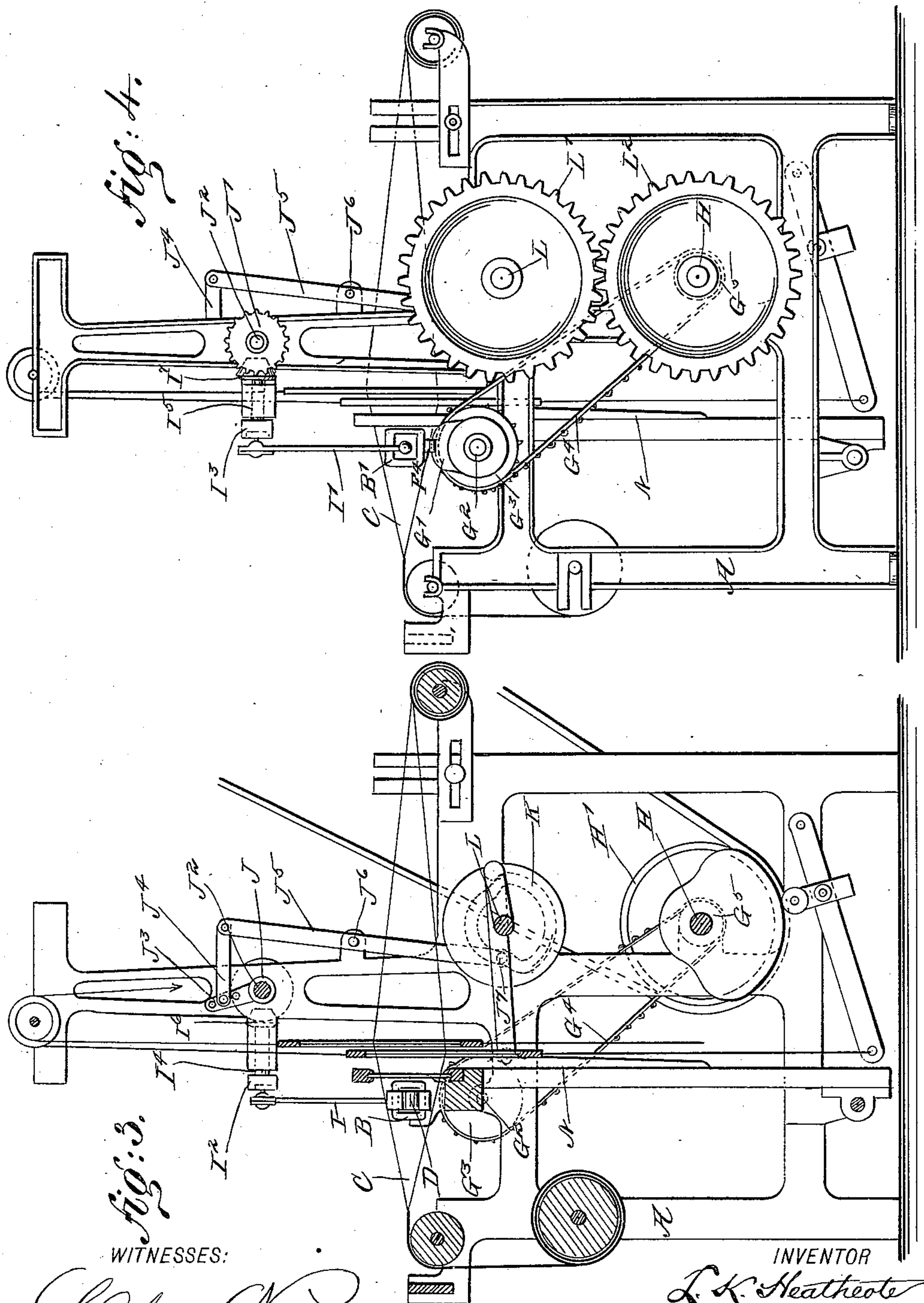
*L. K. Heathcote*  
 BY *Munn & Co*  
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# UNITED STATES PATENT OFFICE.

LEWIN K. HEATHCOTE, OF GLEN ROCK, PENNSYLVANIA.

## SHUTTLE-WORKER FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 560,992, dated May 26, 1896.

Application filed July 17, 1895. Serial No. 556,252. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIN K. HEATHCOTE, of Glen Rock, in the county of York and State of Pennsylvania, have invented a new and Improved Shuttle-Worker for Looms, of which the following is a full, clear, and exact description.

The invention relates to looms; and its object is to provide a new and improved shuttle-worker which is simple and durable in construction, very effective in operation, and arranged to insure a positive transmission of the shuttle through the open shed.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a partly sectional front elevation of a loom having my improvement applied. Fig. 2 is a plan view of the same with parts in section. Fig. 3 is a sectional side elevation of the same on the line 3 3 of Fig. 2, and Fig. 4 is a side elevation of the same.

The loom on which the improvement is applied is provided with the usual frame A, on which are mounted to slide transversely the tubes B and B' in alinement one with the other and adapted to slide toward and from each other in an open shed C, to carry the shuttle D through the open shed and alternately from one side of the machine to the other. The shuttle D is provided with hooks D' and D<sup>2</sup>, adapted to be alternately engaged by spring-hooks E and E', respectively, held within the tubes B and B' at their inner or adjacent ends. The spring-hooks E and E' are adapted to be pressed out of engagement with the shuttle-hooks D' and D<sup>2</sup> by levers F and F', respectively, fulcrumed within the tubes B and B', respectively, and each pressed on by a spring F<sup>2</sup>, so as to hold the inner forward end out of contact with the corresponding spring-hook E or E'. The levers F F' and spring-hooks E E' form gripping devices for the shuttle-hooks D' D<sup>2</sup>.

The outer ends of the levers F and F' are provided with downwardly or outwardly ex-

tending lugs F<sup>3</sup> and F<sup>4</sup>, respectively, passing through openings in the bottoms or sides of the tubes B and B' to be engaged at their outer ends by cams G and G', respectively, mounted to turn on studs G<sup>2</sup>, projecting from the sides of the frame A. The cams G and G' are adapted to be driven from a shaft H, provided with fast and loose pulleys H', connected by belt with other machinery to impart a rotary motion to the said shaft H, to actuate the loom in the usual manner.

The cams G and G' carry sprocket-wheels G<sup>3</sup>, over each of which passes a sprocket-chain G<sup>4</sup>, also passing over a sprocket-wheel G<sup>5</sup>, held on the shaft H, so that when the latter is rotated a rotary motion is transmitted by the said sprocket wheels and chains to the cams G and G', and the latter, standing in diametrically opposite directions, alternately actuate the levers F and F', to move the spring-hooks E and E' alternately out of engagement with the shuttle-hooks D' and D<sup>2</sup>. This movement takes place at the time the tubes B and B' are in their innermost position, as illustrated in Fig. 1, so that the shuttle is released at one hook from its corresponding hook E and engaged by the other spring-hook. When this has been done, the tubes B and B' both slide outward, the one engaging with its spring-hook the shuttle and carrying the latter into an outermost position. At the next inward stroke of the tubes B and B' the shuttle is delivered to the other tube, to be carried by the next outward movement of the tube to the other side of the machine. Now in order to impart this reciprocating motion to the tubes B and B', I connect the outer ends of the said tubes by pitmen I and I', respectively, with crank-arms I<sup>2</sup> and I<sup>3</sup>, respectively, secured on short shafts I<sup>4</sup> and I<sup>5</sup>, respectively, extending longitudinally and journaled in suitable bearings attached to the frame A. On the inner ends of the shafts I<sup>4</sup> and I<sup>5</sup> are secured the beveled pinions I<sup>6</sup> and I<sup>7</sup>, respectively, in mesh with the beveled gear-wheels J and J', respectively, fastened on a transversely-extending shaft J<sup>2</sup>, likewise journaled in the frame A.

On the shaft J<sup>2</sup> is secured a crank-arm J<sup>3</sup>, connected by a link J<sup>4</sup> (see Figs. 3 and 4) with a lever J<sup>5</sup>, fulcrumed at or near its mid-



dle at  $J^6$  to one side of the frame A. The lower end of this lever  $J^5$  carries a friction-roller  $J^7$ , engaged by the cam-groove of a cam K, fastened on the crank-shaft L, connected in the usual manner with the lay N of the loom. The crank-shaft L is driven in the usual manner from the shaft H by the gear-wheels  $L^1$  and  $L^2$  in mesh with each other and secured on the said shafts in the usual manner.

Now it will be seen that when the loom is in motion the shaft L, by the cam K, imparts a swinging motion to the lever  $J^5$ , and the latter, by the link  $J^4$  and crank-arm  $J^3$ , rocks the shaft  $J^2$ , whereby a like motion is given by the gear-wheels  $J^1$  and  $J^1$  to the shafts  $I^4$  and  $I^5$ , respectively, to cause the crank-arms  $I^2$  and  $I^3$  to make one half-revolution forward and backward, as indicated in dotted lines in Fig. 1. This movement of the crank-arms  $I^2$  and  $I^3$  causes the pitmen I and  $I'$  to move the tubes B and  $B'$  inward simultaneously to move the shuttle D through the open shed, as previously described.

Thus it will be seen that by the arrangement described a positive transmission of the shuttle D through the open shed C takes place, it being understood that the transmitting devices described for manipulating the tubes B and  $B'$ , and the gripping devices in the said tubes, are so timed as to accomplish the above-described result and operate in conjunction

with the other parts of the loom to properly form a fabric.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a shuttle-worker, the combination with the longitudinally-movable shuttle-carriers, of the shuttle-securing latches held therein, levers pivoted within the said shuttle-carriers and arranged at one end to release the said latches and having abutments for engagement by the revolving cams, and a shaft provided with reversely-projected cams arranged to operate their respective latch-working levers, substantially as shown and described.

2. The combination substantially as described of the shuttle-carriers, shafts provided with cranks connected with the said shuttle-carriers, pinions on said crank-shafts, gears meshing with said pinions, a shaft supporting said gears and having a crank-arm, a lever pivoted between its ends, connections between one end of said lever and the crank of the gear-shaft, and operating devices connected with the other end of said lever, substantially as shown and described.

LEWIN K. HEATHCOTE.

Witnesses:

L. M. BAUGHMAN,  
S. E. HEATHCOTE.