

E. G. THOMAS.

Cut-Off Valves and Link-Motions.

No. 146,487.

Patented Jan. 13, 1874.

Fig. 1

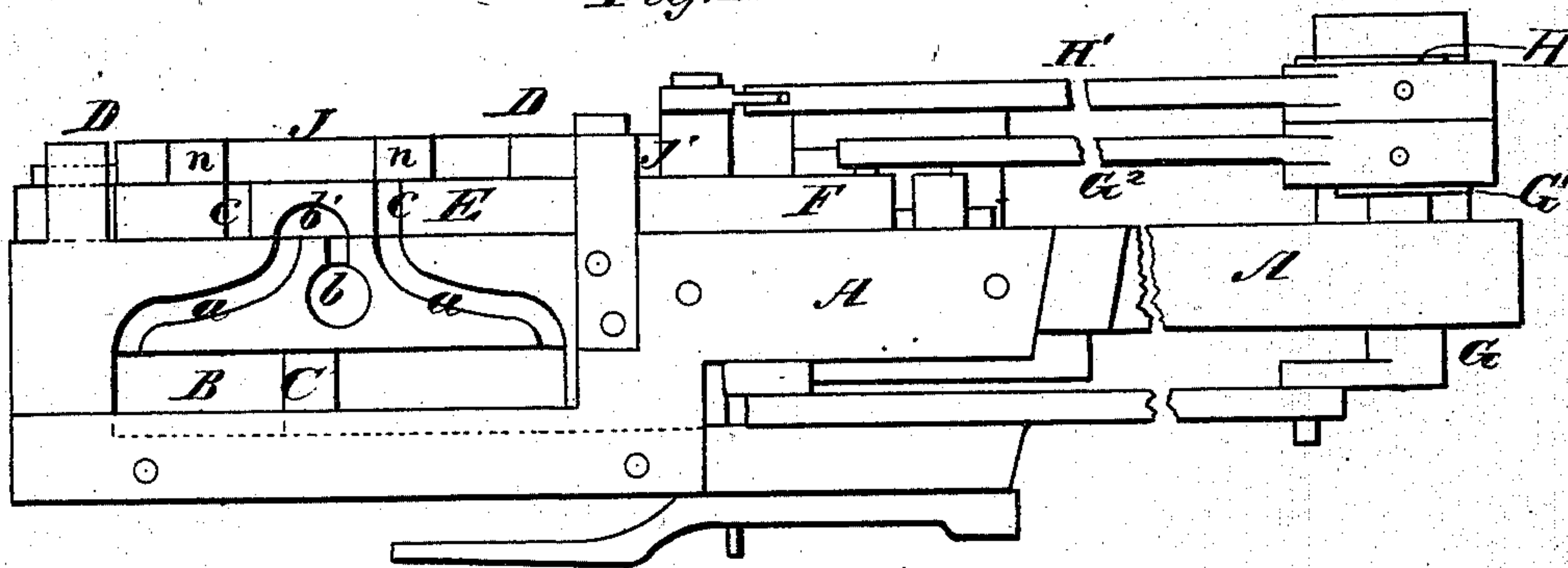


Fig. 2

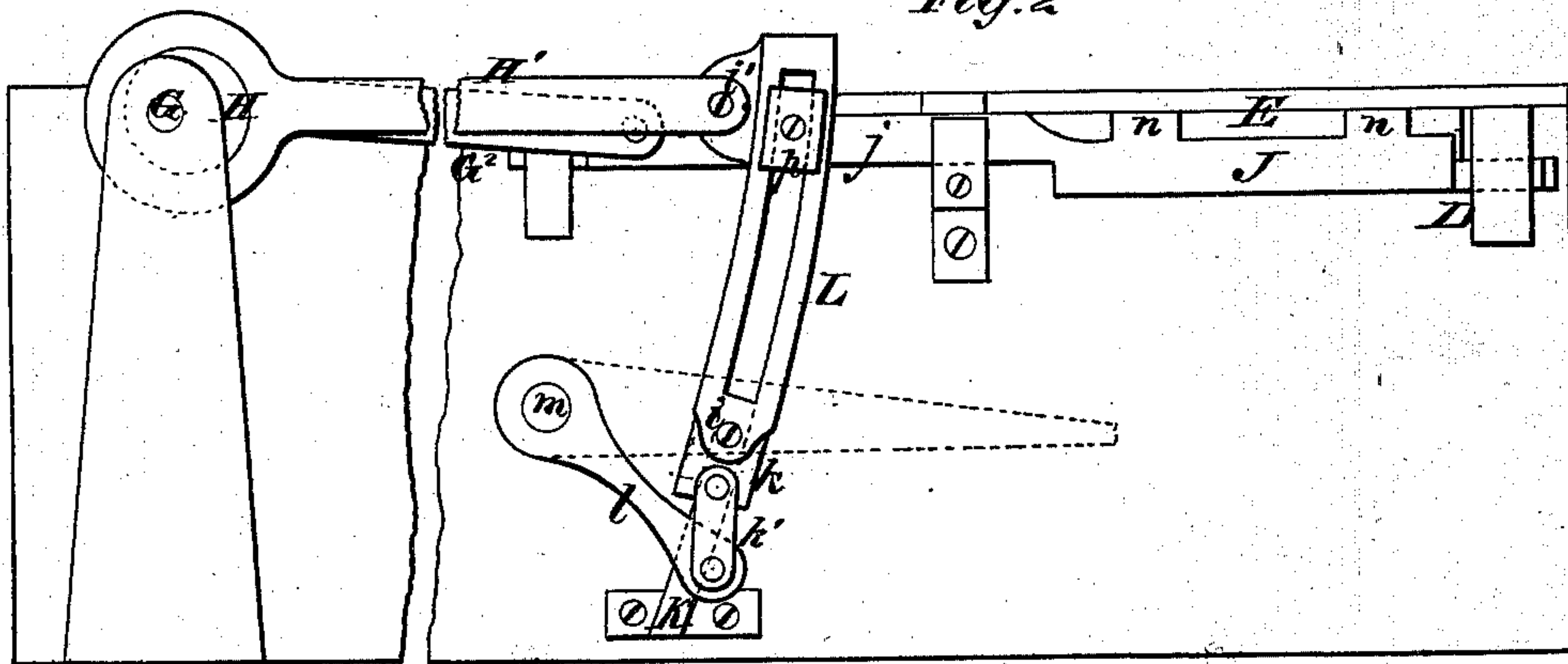


Fig. 3

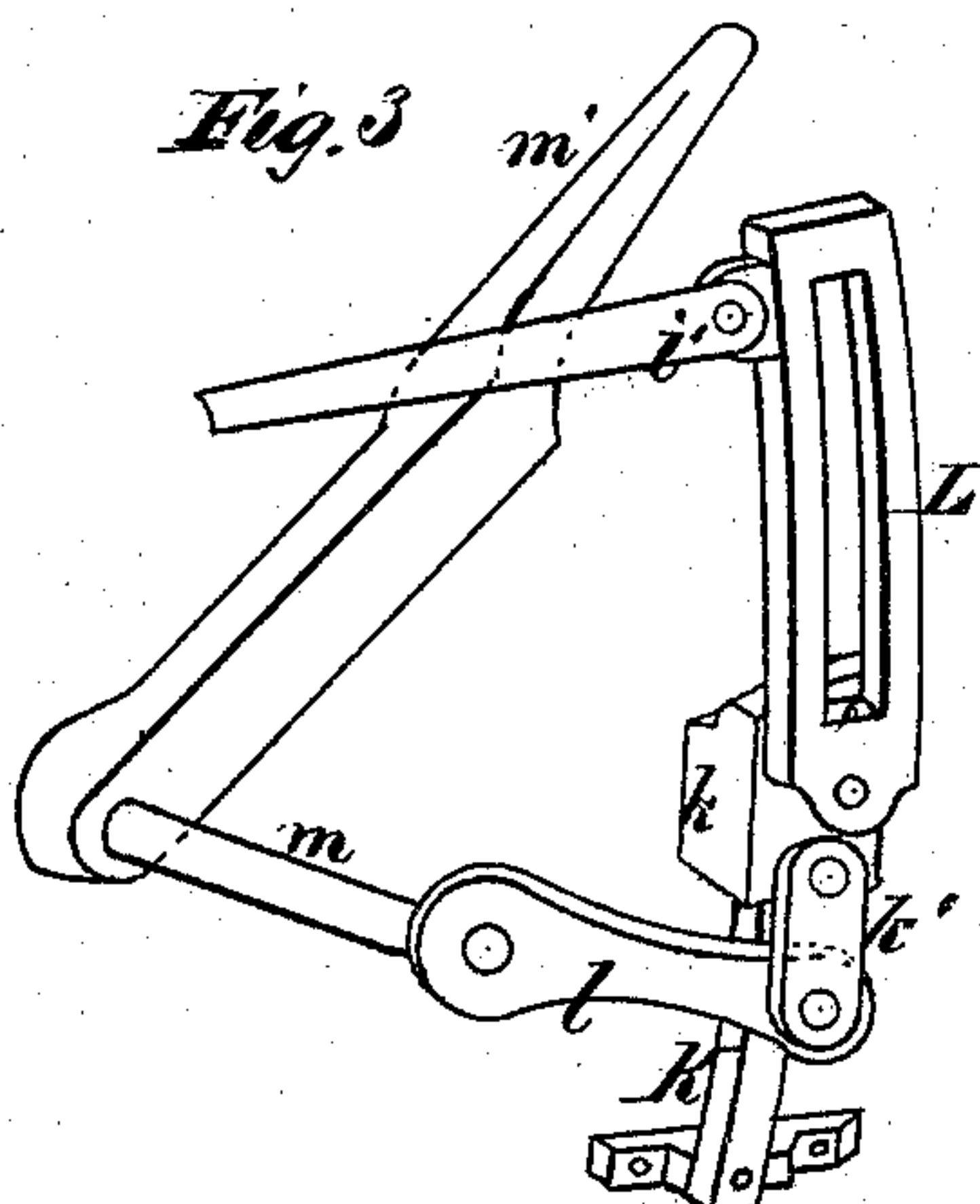


Fig. 4

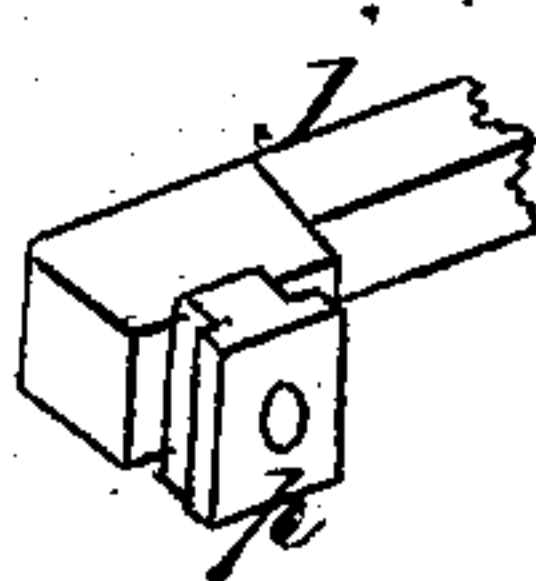


Fig. 5



Fig. 6



WITNESSES
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Fig. 7.

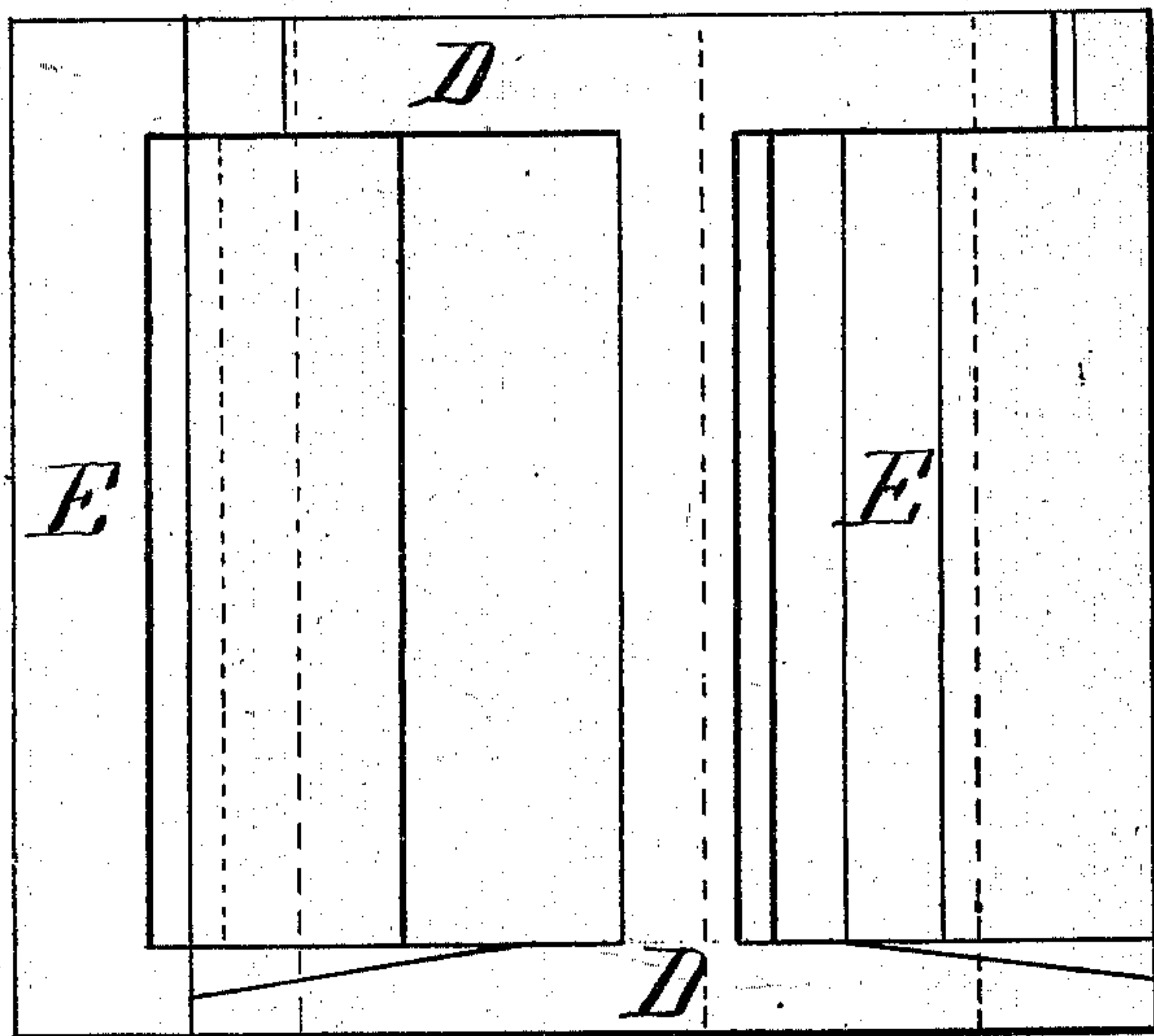
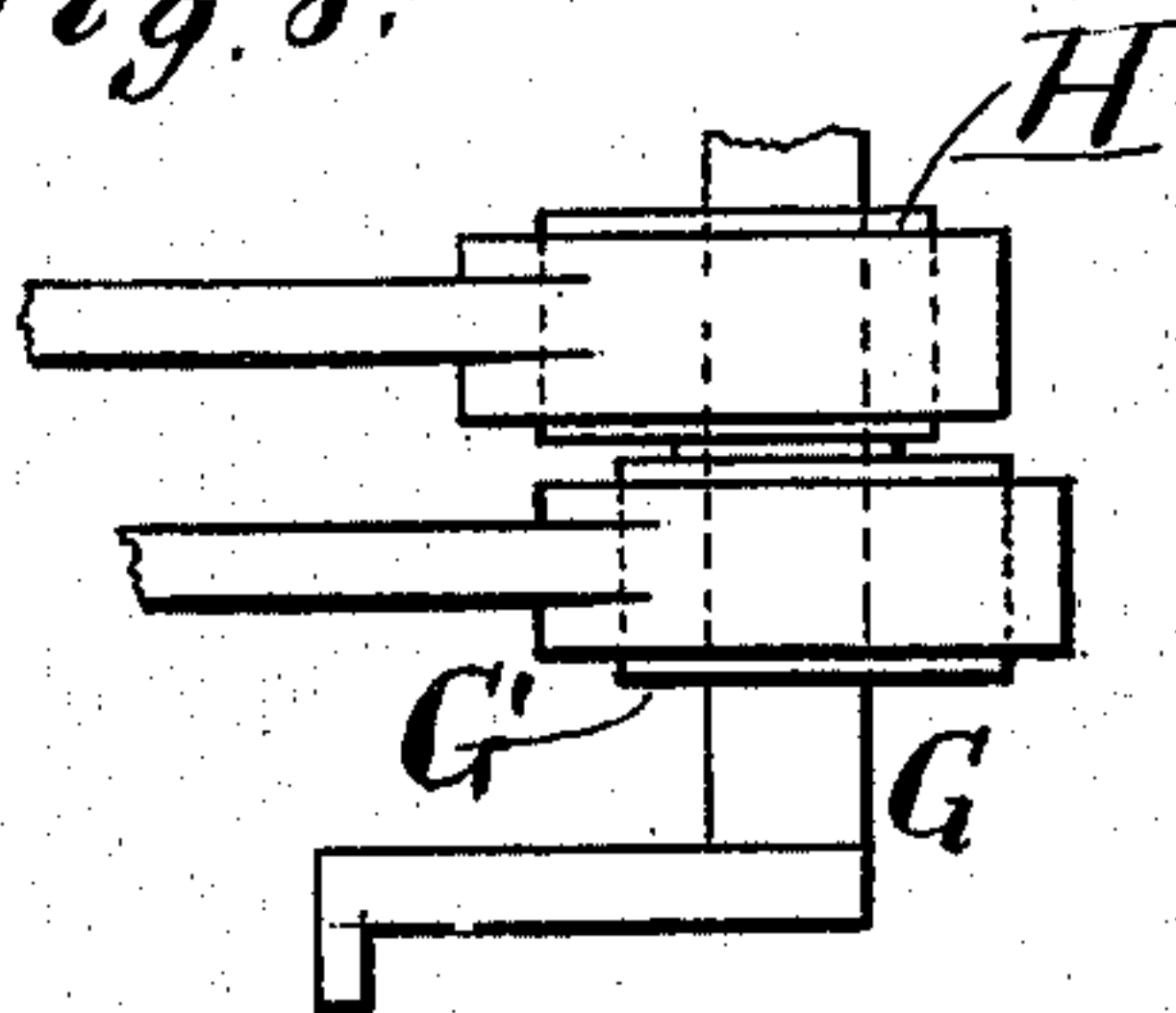


Fig. 8.



WITNESSES

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UNITED STATES PATENT OFFICE.

ENOCH G. THOMAS, OF HUNTINGTON, INDIANA.

IMPROVEMENT IN CUT-OFF VALVES AND LINK-MOTIONS.

Specification forming part of Letters Patent No. **146,487**, dated January 13, 1874; application filed November 29, 1873.

To all whom it may concern:

Be it known that I, ENOCH G. THOMAS, of Huntington, in the county of Huntington and State of Indiana, have invented a new and valuable Improvement in Cut-Off Valve and Link-Motion; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of my device. Fig. 2 is a plan view of the same. Figs. 3, 4, 5, 6, 7, and 8 are detail views of the same.

This invention has relation to variable cut-off devices, which are designed for cutting off steam to the cylinder at variable points in the strokes of the piston. The nature of my invention consists in a novel link-motion, which connects the auxiliary valve with the pitman which moves the same, for the purpose of adjusting the strokes of this valve and cutting off at any desired point during the strokes of the piston, as will be hereinafter explained.

The following is a description of my improvements:

In the annexed drawings, A represents the engine-bed of a high-pressure engine; B, the steam-cylinder; C, the piston working therein; D, the valve-chest; E, the main slide-valve; and F, the valve-rod, which is connected to an eccentric, G¹, on the crank-shaft G by means of a pitman-rod, G². The ports *a a*, by which steam is admitted into the cylinder B and exhausted therefrom, are arranged in the usual manner, the exhaust taking place through the D in valve E, and out through the port *b*. On opposite sides of the exhaust-space *b'* in valve E are steam-inlets *c c*, which admit steam from the steam-chest to the ports *a a*, when said inlets are caused to register with these ports. On the back of the valve E is an auxiliary valve, J, which is connected by its rod, *j*, to a link-motion, hereinafter explained, and which receives a reciprocating movement from an eccentric, H, on crank-shaft G, by means of a pitman-rod, H', independently of the movement given to valve E. This auxiliary or secondary valve J is constructed with two transverse cut-offs, *n n*, which are intended for alternately cutting off the admission of steam from the steam-chest

into the cylinder B, by closing one or the other of the inlets *c* through valve E at proper times during the stroke of the piston. The eccentric H, carrying the auxiliary valve J, follows at, say, one-sixth of a revolution behind the eccentric G¹, carrying the main valve, and when the piston has reached the proper point for cutting off the steam and working it expansively. The valve J, at its shortest travel, admits steam the entire length of the strokes of the piston, and as its travel is increased it cuts off sooner, extending to one-half of the strokes, more or less.

For the purpose of adjusting the valve J to cut off at different points in the stroke of the piston, I have invented the following link-motion: K designates a segment-guide, which is rigidly secured to the engine-bed, on which is a movable sleeve, *k*, that is connected by a link, *k'*, to the free end of an arm, *l*. This arm is keyed on a rock-shaft, *m*, which passes through the engine-bed, and carries a hand-lever, *m'*, provided with a sector and pin, or their equivalents, for fixing it when adjusted. L designates a slotted link, which is movable in a guide, *p*, fixed on one end of the auxiliary valve-rod *j*, and which is connected by a pivot, *i*, to the slide or sleeve *k*. The upper end of the slotted link L is connected by a pivot, *i'*, to the pitman-rod H' of the eccentric H, so that motion is communicated to valve J through the medium of the said slotted link.

It will be seen from the above description that the travel of the cut-off or auxiliary valve J can be shortened or lengthened by adjusting the hand-lever *m'* so as to raise or depress the slotted link L.

What I claim as new, and desire to secure by Letters Patent, is—

The combination, with the valve J, of the fixed segment-guide K, sliding sleeve *k*, link *k'*, arm *l*, shaft *m*, and hand-lever *m'*, combined with the slotted link L, guide *p*, valve-rod *j*, and pitman-rod H', substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ENOCH G. THOMAS.

Witnesses:

W. I. CAMPBELL,
C. M. MAKEPEACE.