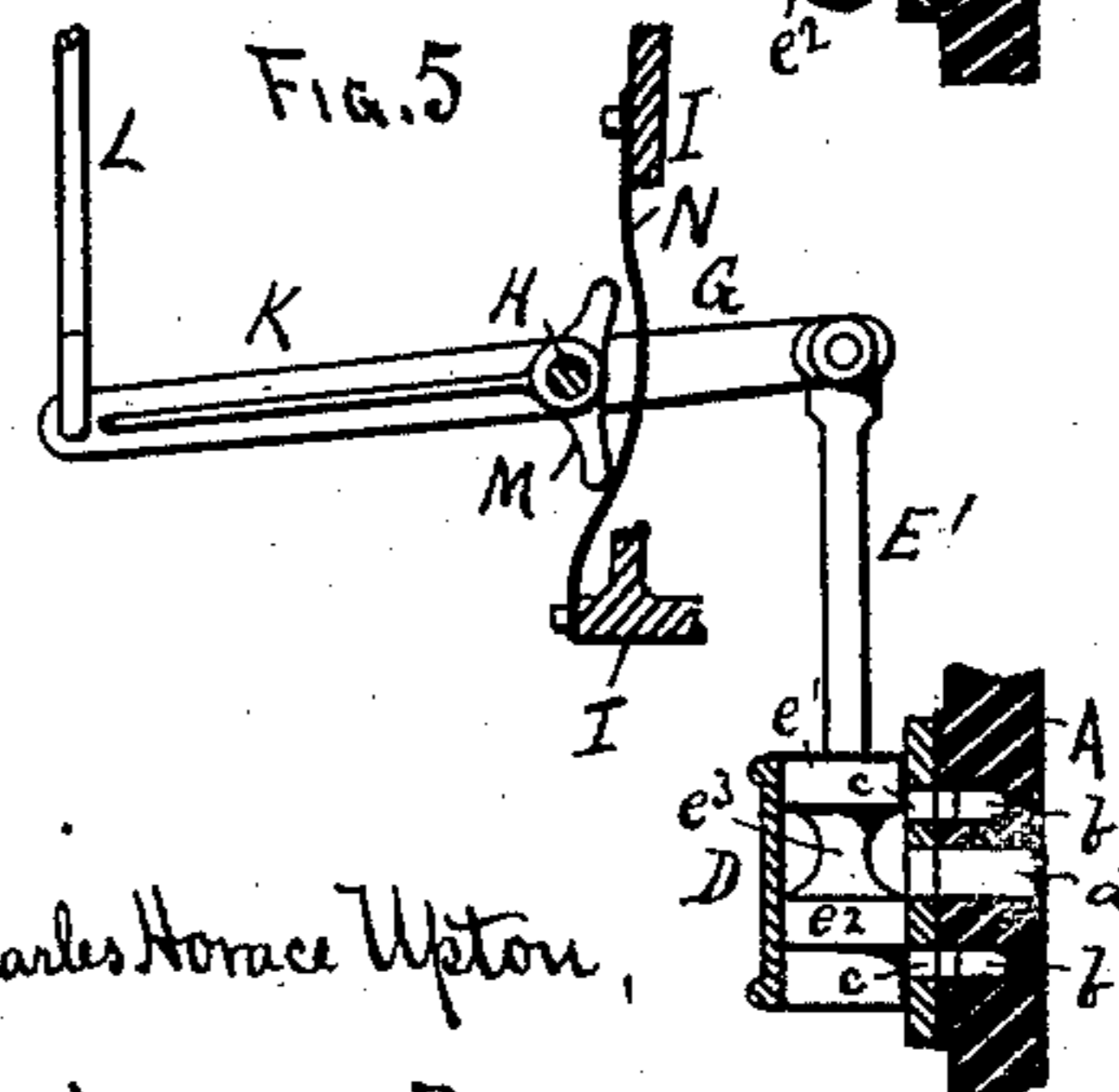
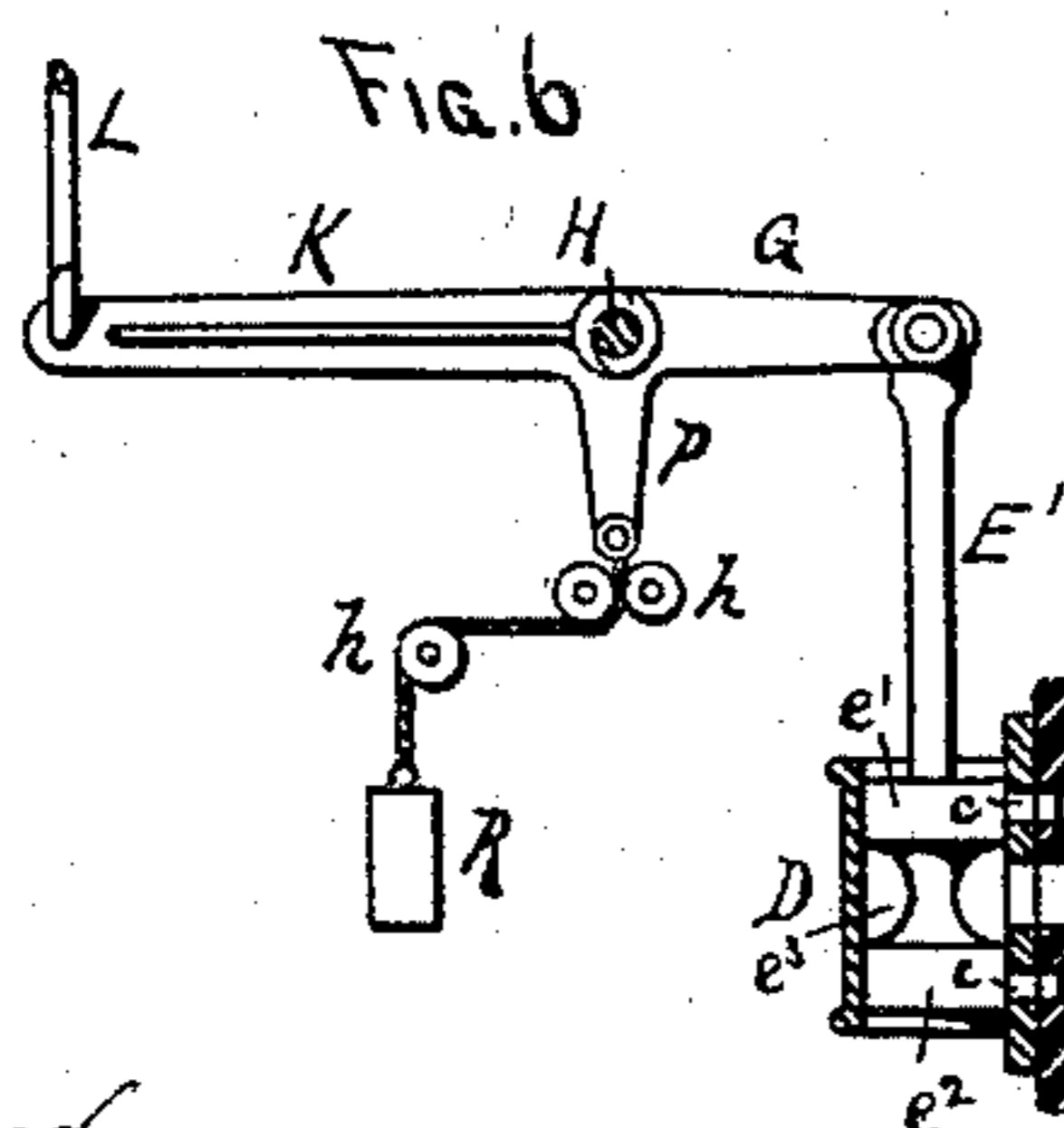
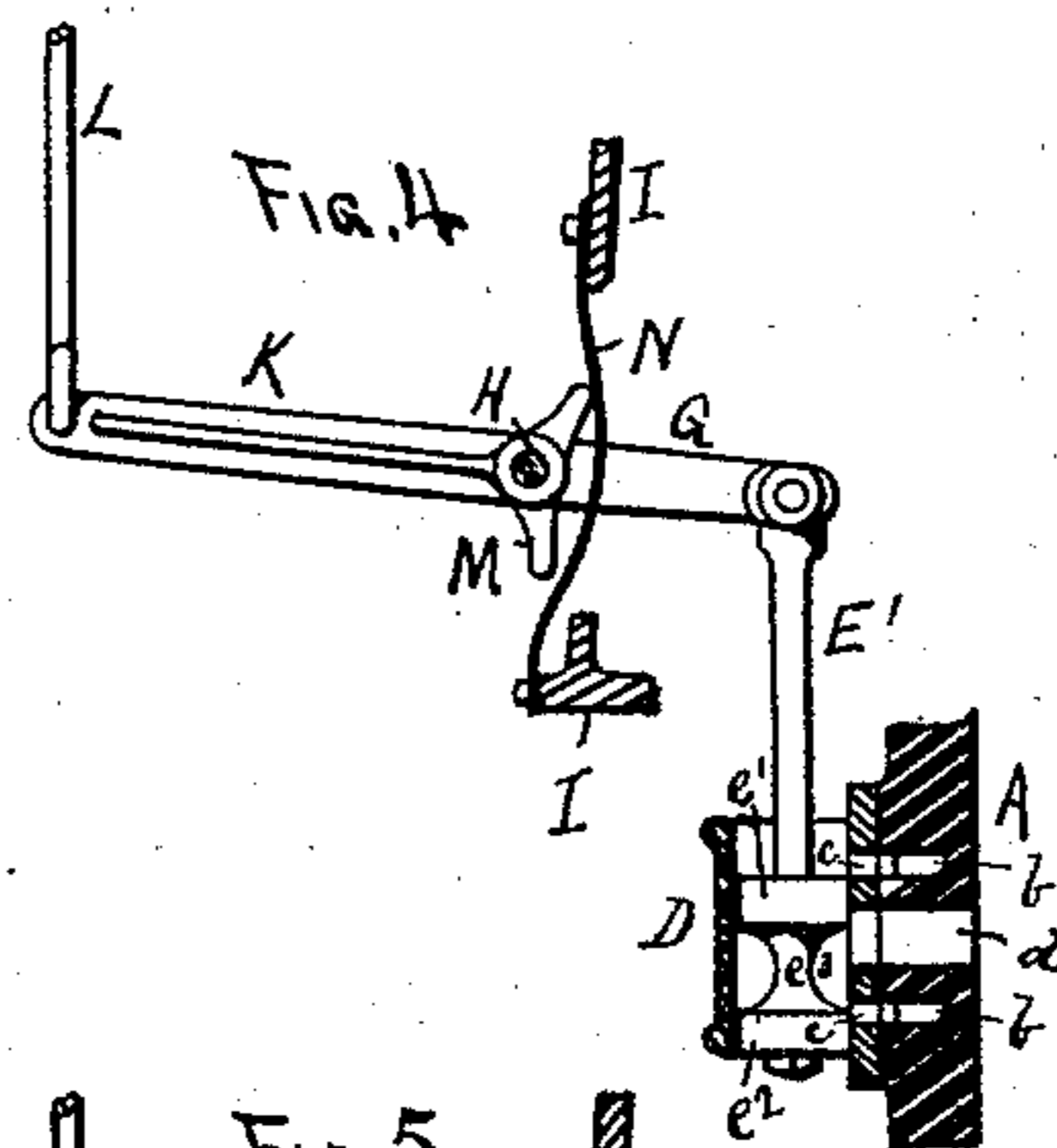
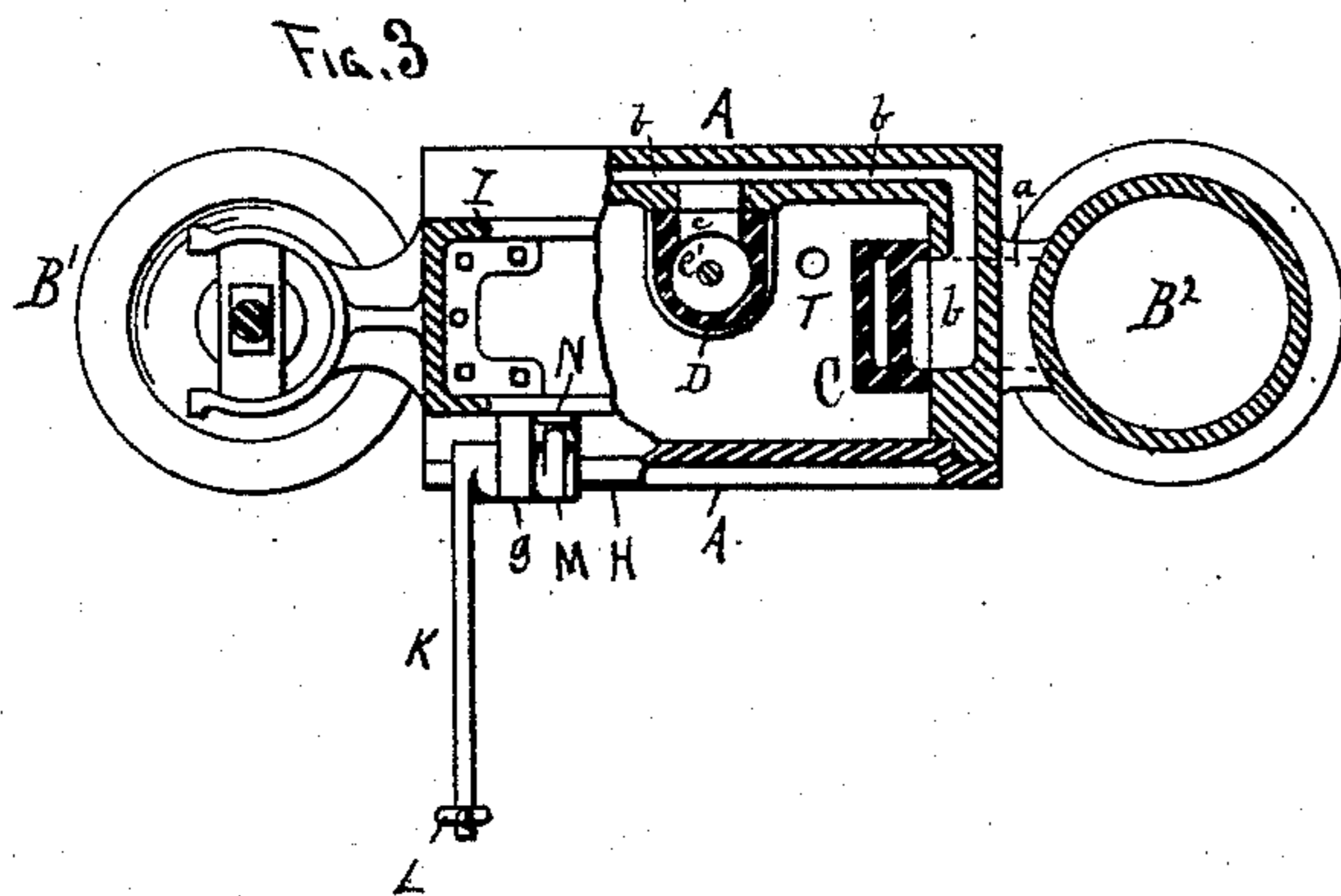
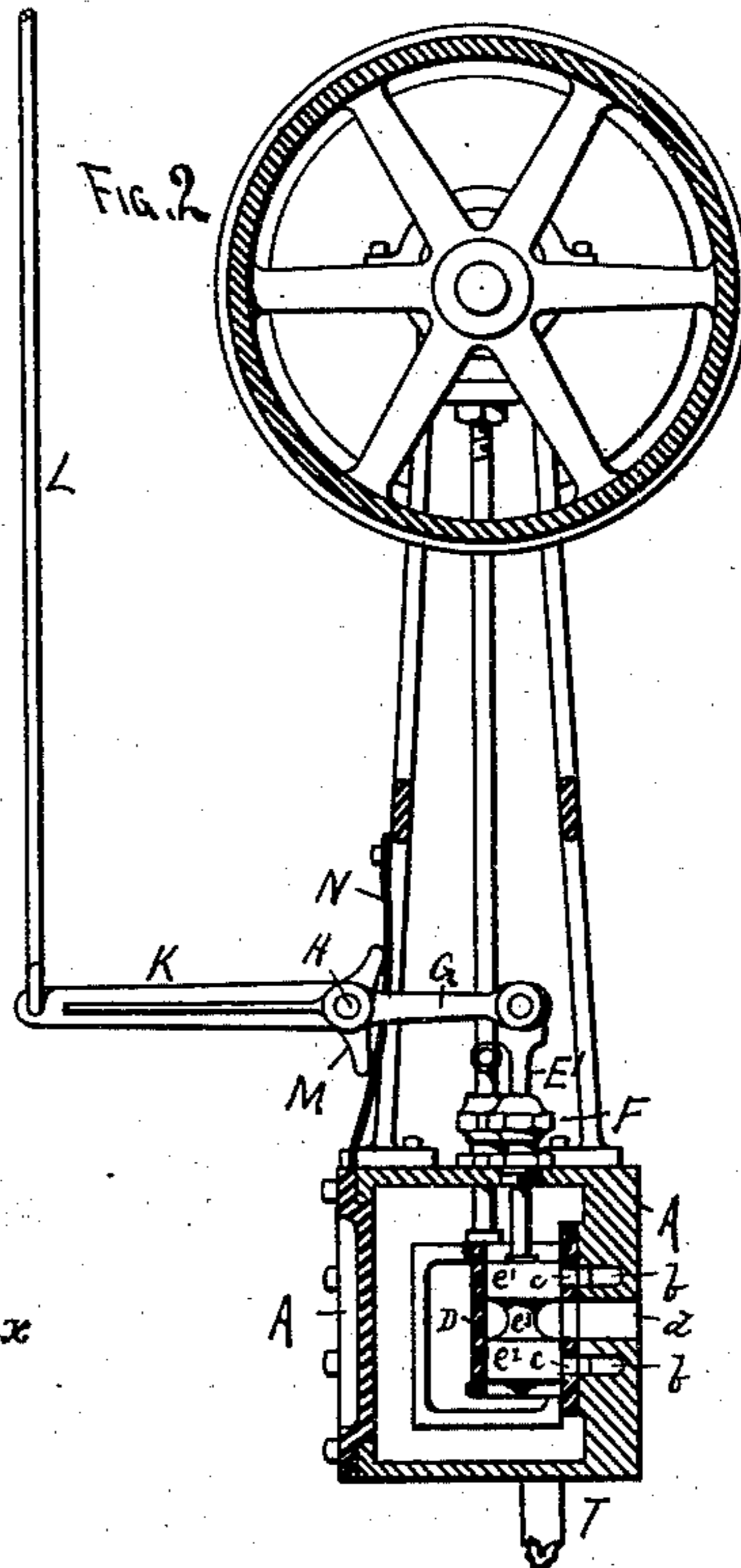
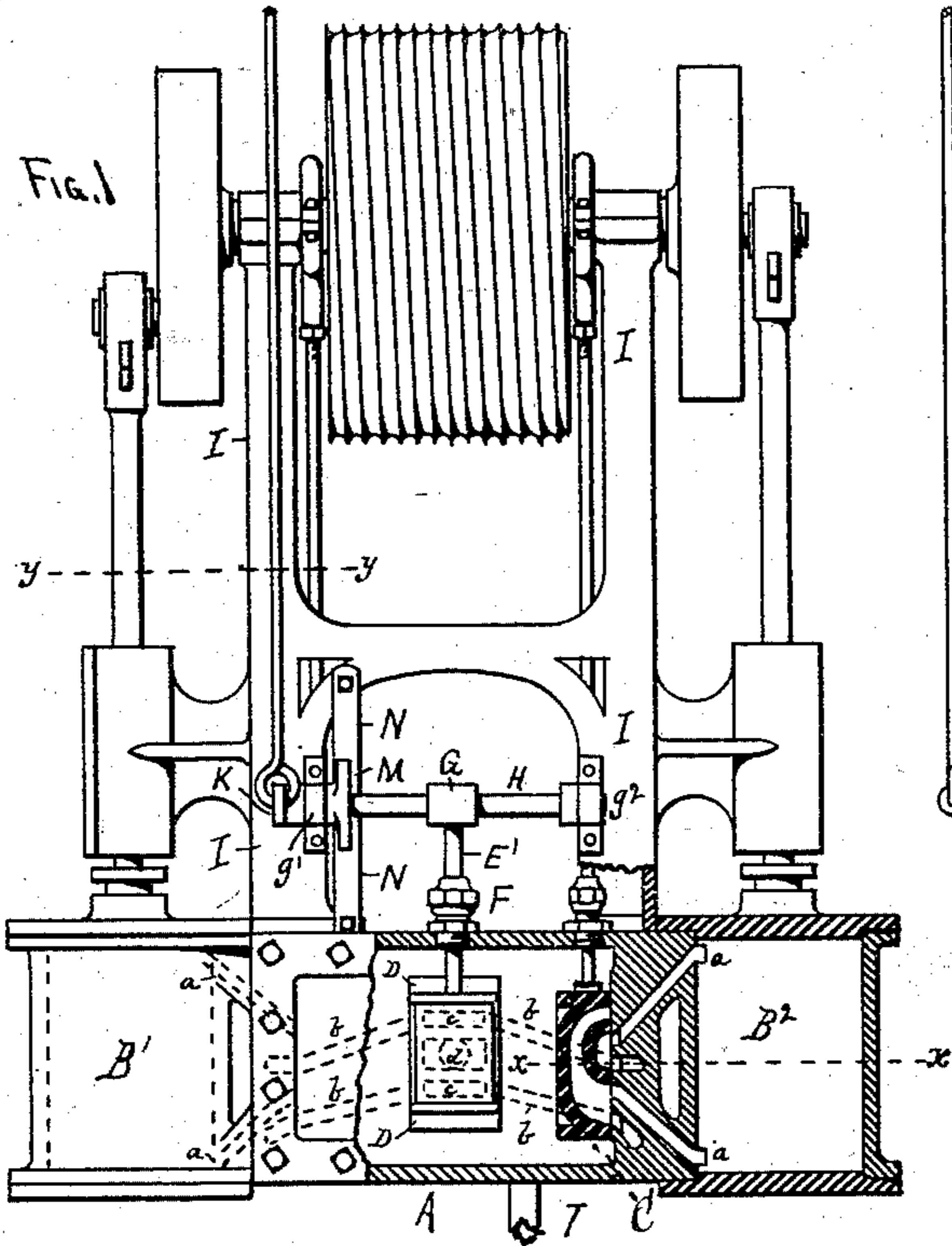


(No Model.)

C. H. UPTON.
REVERSING VALVE FOR STEAM ENGINES.

No. 283,046.

Patented Aug. 14, 1883.



WITNESSES

H. V. Butterford
Louis Freese Jr.

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UNITED STATES PATENT OFFICE.

CHARLES H. UPTON, OF MINNEAPOLIS, MINNESOTA.

REVERSING-VALVE FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 283,046, dated August 14, 1883.

Application filed March 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HORACE UPTON, a citizen of the United States, and a resident of Minneapolis, in the county of Hennepin, in the State of Minnesota, have invented certain new and useful Improvements in Reversing-Valves for Steam-Engines, of which the following specification is a full, clear, and exact description, reference being also had to the accompanying drawings, in which—

Figure 1 is a semi-sectional front elevation. Fig. 2 is a longitudinal sectional elevation; and Fig. 3 is a cross-sectional view, the right-hand portion in section on the line $x x$ of Fig. 1 and the left-hand portion in section on the line $y y$ of Fig. 1. Fig. 4 is a detached detail of the piston-valve and its operating-levers, showing the extreme downward portion of the valve. Fig. 5 is a similar view showing the extreme upward portion of the valve, and Fig. 6 is a similar view showing the portion of the valve when the steam is shut off, Fig. 6 also showing a slight variation in the manner of arranging the automatic shut-off mechanism.

A is the steam-chest, having the cylinders $B' B^2$ cast in one piece therewith at its ends, and provided with steam-ports a , leading from the chest A into the cylinders, and combined supply and exhaust ports b , leading in opposite directions from a valve-seat in the central back portion of the steam-chest to the valve-seats of the cylinder, and opening out into the steam-chest beneath slide-valves C. The courses of the ports b , where they pass through the metal of the steam-chest, are shown in dotted lines in Fig. 1.

D is a small open-ended cylinder attached to the back of the steam-chest and provided with ports c , connecting its interior with the ports b , and with an exhaust-port, d , leading from the cylinder out through the steam-chest, as shown. Fitted into this cylinder D is a piston-valve composed of two disks, $e' e^2$, fitting the interior of the cylinder steam-tight, and with a space, e^3 , of a smaller diameter, between them. The space e^3 is wide enough to cover the exhaust-port d , and each of the disks $e' e^2$ are wide enough to cover and reach beyond the steam-ports b , as shown in Figs. 2 and 6, so that when the piston-valve is placed

equidistant from the ends of the cylinder D the steam will be entirely shut off.

The throw of the piston-valve is shown by Figs. 4 and 5, the former showing steam being admitted into the upper port, b , and exhausted from the lower one, and the latter showing the reverse position of the valve. By operating this valve steam may be admitted into either end of the cylinder $B' B^2$ or shut off entirely, so that the engines may be run in either direction. By forming the cylinder D open at both ends the pressure on the valve is the same at both ends; hence a perfect balanced valve is produced.

E' is the rod by which the piston-valve is operated, and runs upward through a stuffing-box, F, in the upper side of the steam-chest A, and is connected to a rock-arm, G, on a rock-shaft, H, secured in bearings $g' g^2$ on the frame I of the engine. On one end of this rock-shaft H is an arm, K, to which a rod, L, is attached, leading to any desired point, so that the valve may be manipulated from any distance.

M is a cam having two oppositely-branching arms and attached to the shaft H, and adapted to be pressed upon by a powerful spring, N, connected by its ends to the frame I to hold the piston-valve in its central position, as shown in Fig. 2. By this means the piston-valve may be opened and closed by raising or lowering the arm K and compressing the spring N by one of the arms of the cam M; but when the arm K is released the spring N will at once, by its pressure upon the cam, throw the piston-valve to its central position and shut off the steam, thus forming an automatic "shut-off." This style of engine is intended more particularly for operating the carriages in saw-mills, as it is very important that the engine be started, stopped, or reversed very quickly and certainly, as the delay of an instant causes very serious consequences. Many other forms of machinery also require such quick, certain, easy-acting engines. By reason of the perfect "balance" of the piston-valve and the advantage gained by the leverage of the shaft H and arms K G the engine can be controlled with great ease and certainty, and by reason of the spring N acting upon the cam M the engine will be at once "shut off"

should any accident occur to the rod L, or from neglect or carelessness of the operator.

A short arm, P, on the shaft H, having a weight, R, attached thereto and running over pulleys *h*, may be substituted for the spring N, if desired; but I prefer the spring N, as being more certain in its action and less liable to become disarranged.

T represents the steam-supply pipe.

10 Having described my invention and set forth its merits, what I claim is—

1. In a steam-engine, the combination of the open valve cylinder D, communicating by steam supply and exhaust ports with the steam cylinder or cylinders of the engine, reversing and shut-off valve *e' e²* in the valve-cylinder, and mechanism E' G H M N, connected with

the said valve for automatically stopping the engine.

2. The combination of the steam-chest A, 20 having ports *b b d* in the back thereof, one or more steam-cylinders, B' B², slide valve or valves C, valve-cylinder D, valve *e' e²*, rod E', rock-arm G, rock-shaft H, arm K, rod L, cam M, and spring N, substantially as and for the 25 purpose herein specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES HORACE UPTON.

Witnesses:

C. N. WOODWARD,
LOUIS FEESER, Sr.