

(Model.)

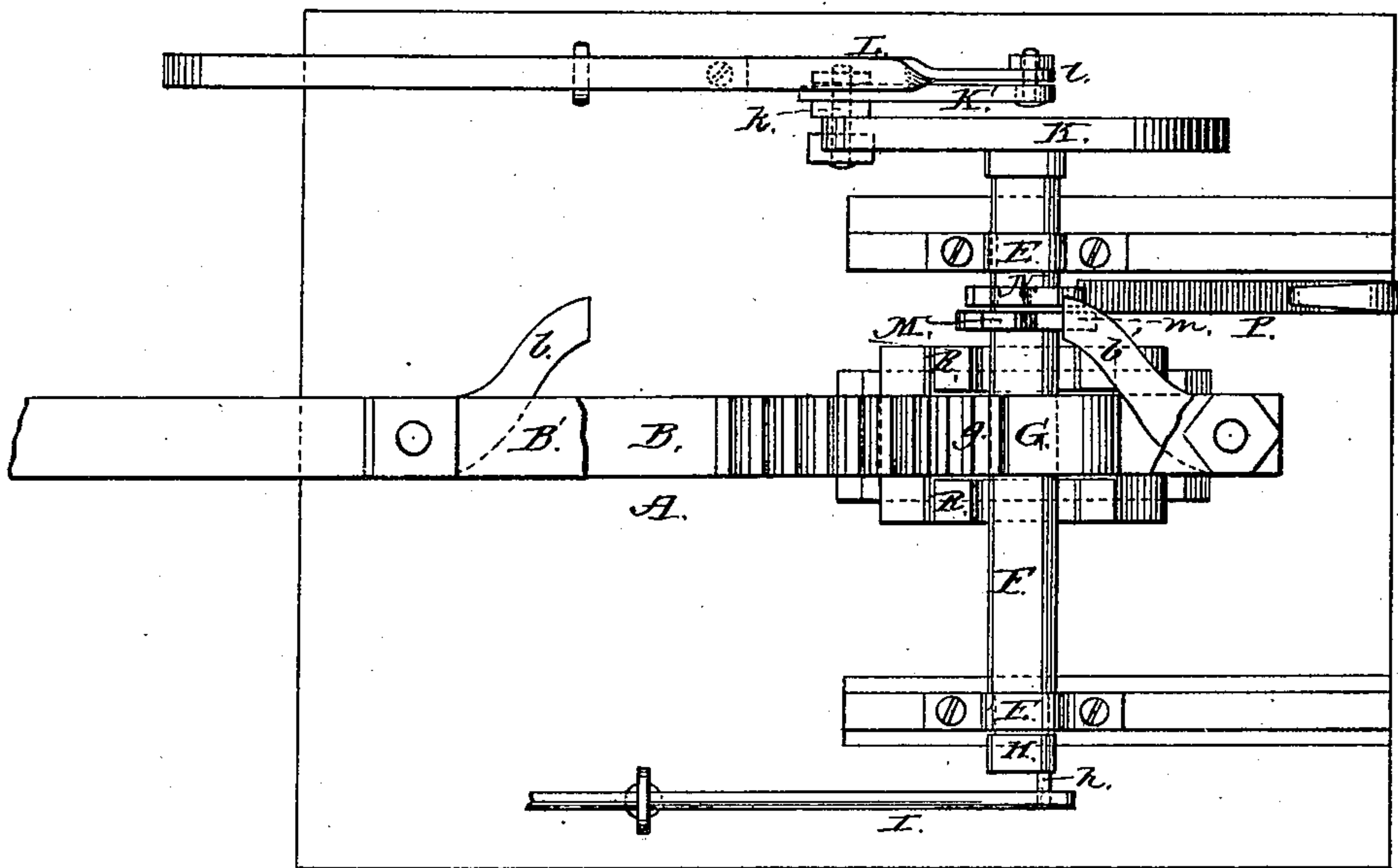
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VALVE MOTION FOR STEAM ENGINES.

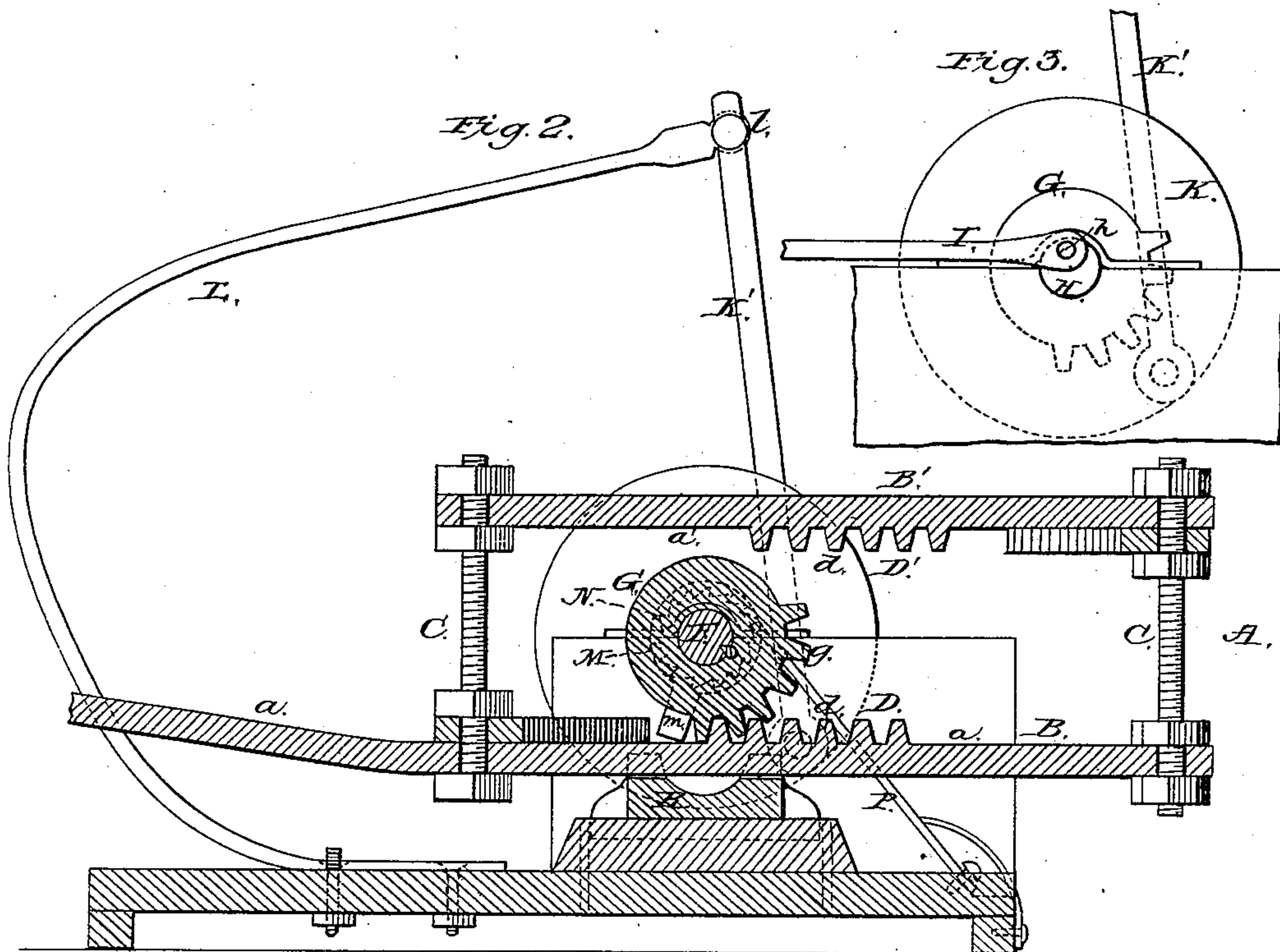
No. 246,376.

Patented Aug. 30, 1881.

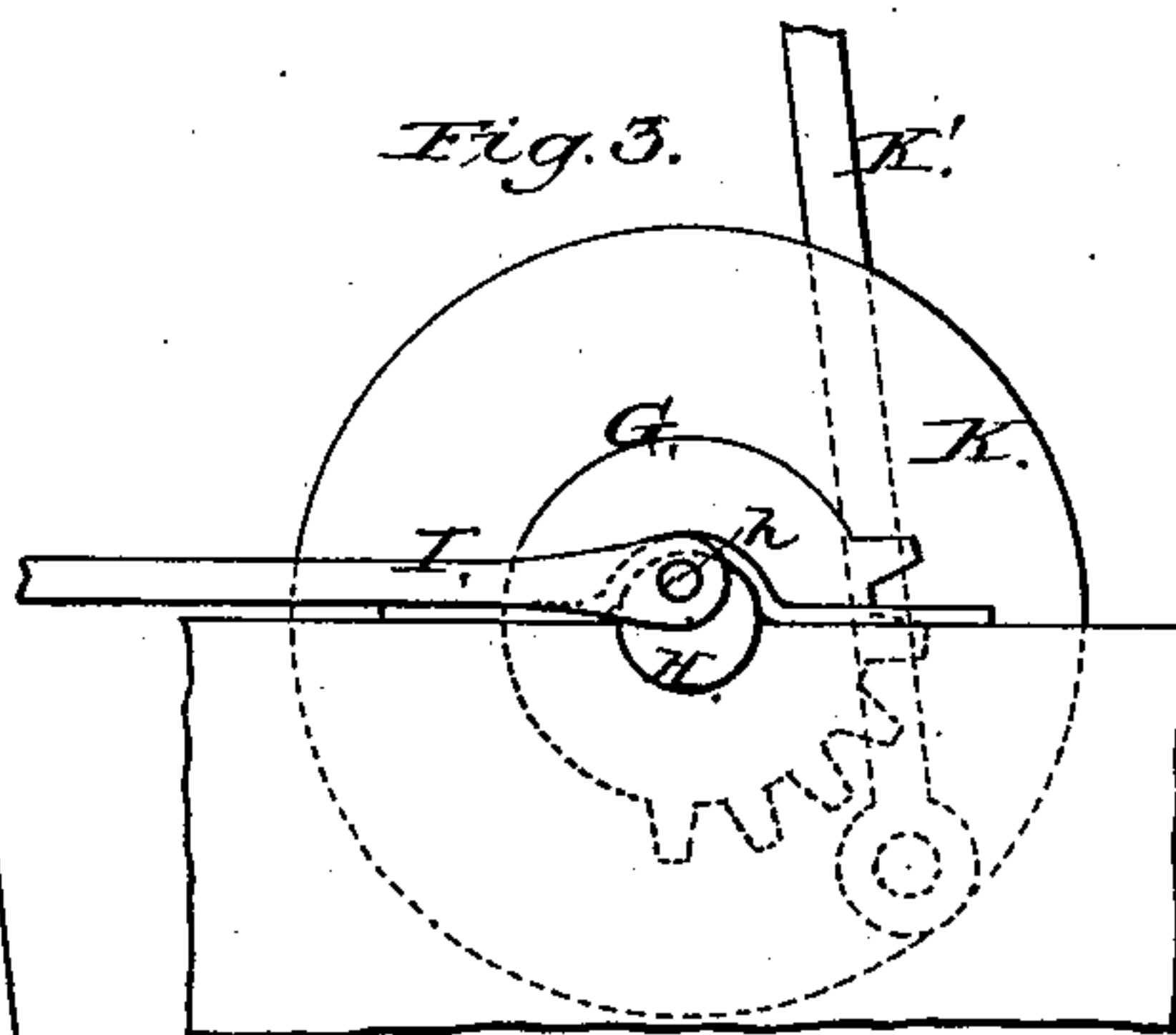
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

MARK A. DEES, OF SCRANTON, MISSISSIPPI.

## VALVE-MOTION FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 246,376, dated August 30, 1881.

Application filed January 15, 1881. (Model.)

*To all whom it may concern:*

Be it known that I, MARK A. DEES, a citizen of the United States, resident at Scranton, in the county of Jackson and State of Mississippi, have invented certain new and useful Improvements in Valve-Motions for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification, in which—

Figure 1 is a plan view. Fig. 2 is a longitudinal section. Fig. 3 is an end view.

This invention has relation to devices for regulating the motion of slide-valves in steam-engines; and it consists in the improved features of construction and combination herein-after fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, A is a rectangular frame, consisting of parallel bars B B' and ends C C', formed in one piece or separate.

*a* is the extension of the lower bar for attachment to the pitman of the engine. At one end of the lower bar, B, is a finger, *b*, and at the opposite end of bar B' is a finger, *b'*. On the inner faces, *a a'*, of bars B B', for a portion of their lengths, are the racks D D', these racks having the same number of teeth *d*, but the teeth of one extending at one end beyond those of the other, and those of the latter at the other end beyond those of the former.

Journaled in bearings E E is a transverse shaft, F, passing between bars B B', and having keyed to its body, where it passes between these bars, the segment gear-wheel G, with teeth *g*; or this latter may be a simple sector, with the teeth on its periphery, the relation between said teeth and the racks being such that as the frame reciprocates the racks will alternately engage with said teeth and give to the shaft F a continuous rotary movement. At one end of shaft F is the crank or eccentric H, having pin *h*, to which is attached the rod I, connected with the valve of the engine. At its other end there is attached to said shaft

F a crank-disk or simple crank, K, having pin *k*, to which is attached, through a rod, K', one end, *l*, of a spring, L, its other end being firmly attached to some of the stationary parts of the machine.

Made fast to shaft F, upon the same side as fingers *b b'*, is an annulus, M, having a tappet, *m*, extending radially therefrom; or the tappet may be secured to the shaft in any suitable manner. To one side of this tappet there is secured to the shaft F a ratchet, N; or the ratchet may be made upon a flange or annulus, M. The teeth of this ratchet have a rake in the direction opposite to that in which the shaft F revolves, and P is a spring-pawl engaging said teeth, and thereby preventing the shaft from turning backward. This device is to be placed in any convenient position with relation to the engine, the end *a* being connected with the pitman, and the frame A held straight by the guides R R.

It will be noticed that the pins *h* and *k* are upon opposite sides of the shaft F. As the piston moves forward the frame A is thrust out, the rack D engages with teeth *g* of wheel or sector G, and causes shaft F to turn toward the engine or piston, which compresses spring L, and through rod I shoves the slide-valve in a direction opposite to that of the travel of the piston. When the rack D reaches the end of its path the piston will have gone half its distance, and the slide-valve will be at the end of its stroke, and the pin *k*, carrying the loose end *l* of spring L, will have nearly made a semi-revolution. As the rack D and teeth *g* become disengaged the frame A continues on to the end of the stroke of the piston. At the same time the compressed spring L throws the pin *k*, shaft F, and wheel G past the center, and consequently retracting the slide-valve as the piston and frame finish the stroke. The ratchet and pawl prevent any rebound of the spring throwing the shaft backward, and in case the spring should not perform its duty the fingers *b b'* would alternately come in contact with tappet *m* and throw the shaft around and start the slide back.

What I claim is—

1. The combination of a frame having racks upon the inner faces of its top and lower bars, a transverse shaft having a segment toothed

wheel between said racks, a spring attached to a crank upon one end of said shaft, and a crank upon the other end for the attachment of the slide-valve connecting-rod, substantially as described.

5 2. A shaft having a segment toothed wheel, a spring at one end of said shaft, a rack-frame having a finger at each end, and a tappet upon said shaft, all arranged and combined substantially as set forth.

3. A shaft and a spring for throwing the former past the dead-point, in combination with a device for preventing rebound of the spring, substantially as described.

In testimony whereof I affix my signature 15 in presence of two witnesses.

MARK ASHLEY DEES.

Witnesses:

GEO. W. WILKES,  
W. A. HENSLEE.