D. O'B. LADD.

Automatic Governor and Cut-Off for Engines.

No. 207,608. Patented Sept. 3, 1878.

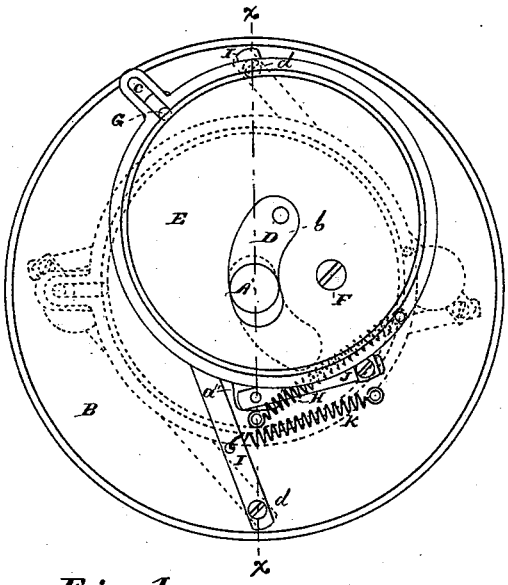

Fig. 1

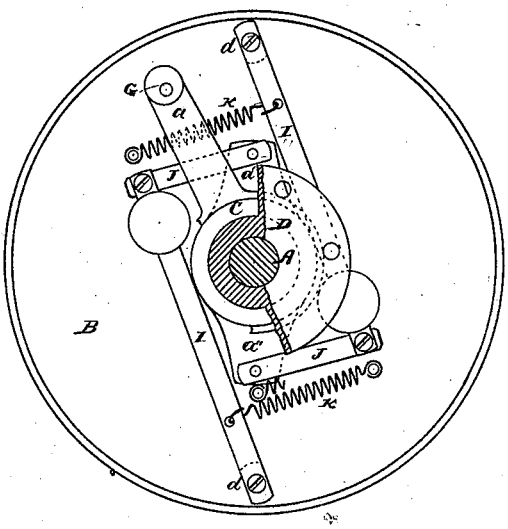

Fig. 2

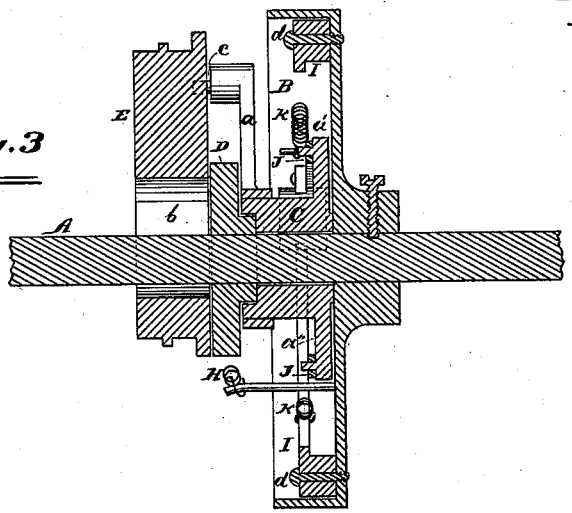

Fig. 3

Attest:

James A. Coyne

W. J. Mackellar

INVENTOR:

Dennis O'B Ladd

By F. F. Warner, his

Attorney

UNITED STATES PATENT OFFICE.

DENNIS O'B. LADD, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN AUTOMATIC GOVERNOR AND CUT-OFF FOR ENGINES.

Specification forming part of Letters Patent No. **207,608**, dated September 3, 1878; application filed February 23, 1878.

To all whom it may concern:

Be it known that I, DENNIS O'B. LADD, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Governor and Cut-Off for Steam-Engines, of which improvements the following is a specification, reference being herein had to the accompanying drawing, forming a part hereof, and in which—

Figure 1 is a side view of a governor and cut-off embodying my invention; Fig. 2, a like view, the valve-eccentric being removed and some of the parts shown in section; and Fig. 3 is a section in the plane of the line *x x*.

Like letters of reference indicate like parts.

In the drawing, A represents the crank-shaft. B is a disk rigidly attached to the shaft A. C is a sleeve loosely mounted on the said shaft, and *a*, *a'*, and *a''* are arms extending radially or laterally from the said sleeve. D is a fixed hub or collar on the shaft A, and E is the eccentric. The order in which these parts are arranged on the shaft is clearly indicated in Fig. 3.

F is a pin passing through a closely-fitting hole in the eccentric, and entering a like hole or opening in the part D. This pin is rigid in the part D; but the eccentric is not rigidly fitted to the pin, the object being to allow the eccentric to swing on the pin, the eccentric being slotted in the arc of a circle of which the pin is a center, as shown at *b*, the shaft thus forming no obstacle to such movement. The movement, however, may be limited by the length of the slot.

G is a pin extending laterally from the arm *a*, and entering the radial slot *c* in the eccentric. H is a close spiral spring attached at one end to the eccentric, and at the other to a pin or post on the disk B. I I are weighted arms or levers pivoted to the disk B at the points *d d*, and connected, by means of the links J J, to the arms *a' a''*, respectively, as represented in Fig. 2. K K are retracting-springs connected to the arms I I and to the disk B, as is also shown in Fig. 2.

In construction, this gear is substantially the same as that shown and described in my application filed December 21, 1877, excepting that, as there shown, the eccentric-slot was toothed or racked to engage a pinion fixed on the shaft.

In that application I stated that the rack and pinion were not absolutely essential, and indicated how the gear could be rendered operative without them.

My present object is to provide further means for avoiding the use of the rack and pinion when they may not be deemed necessary; and to that end this invention consists in the specific means herein described for accomplishing the purpose set forth.

I deem it best to set the pin F in, or nearly in, a line passing through the center of the shaft and the crank-pin, when the engine is on the center or dead-point, preferably either a little above or below the said line, according to the direction of motion, so as to keep the lead on the valve accurate at all times.

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

The eccentric E, mounted directly on the shaft A, the latter passing freely through the curved slot *b* in the said eccentric, and the eccentric hung pivotally on the pin F, set in the center on which the slot *b* is described, and carried by a hub or collar fixed on the shaft A, the said eccentric also connected pivotally to a non-eccentric sleeve controlled by centrifugal and centripetal forces, substantially as and for the purposes specified.

DENNIS O'B. LADD.

Witnesses:

C. H. WILLETT,

J. M. PHELPS.