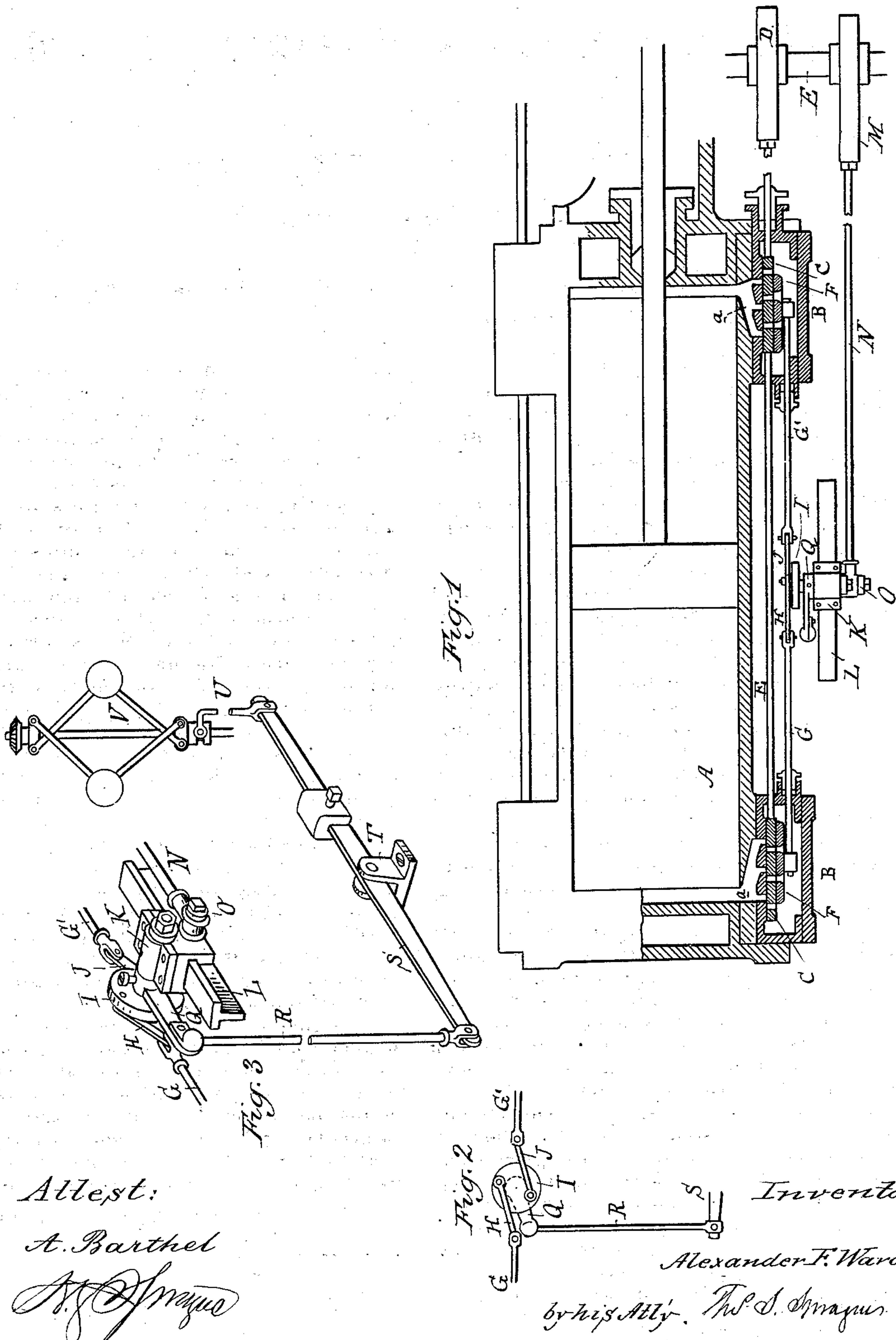


(No Model.)

A. F. WARD.
CUT-OFF VALVE GEAR.

No. 280,103.

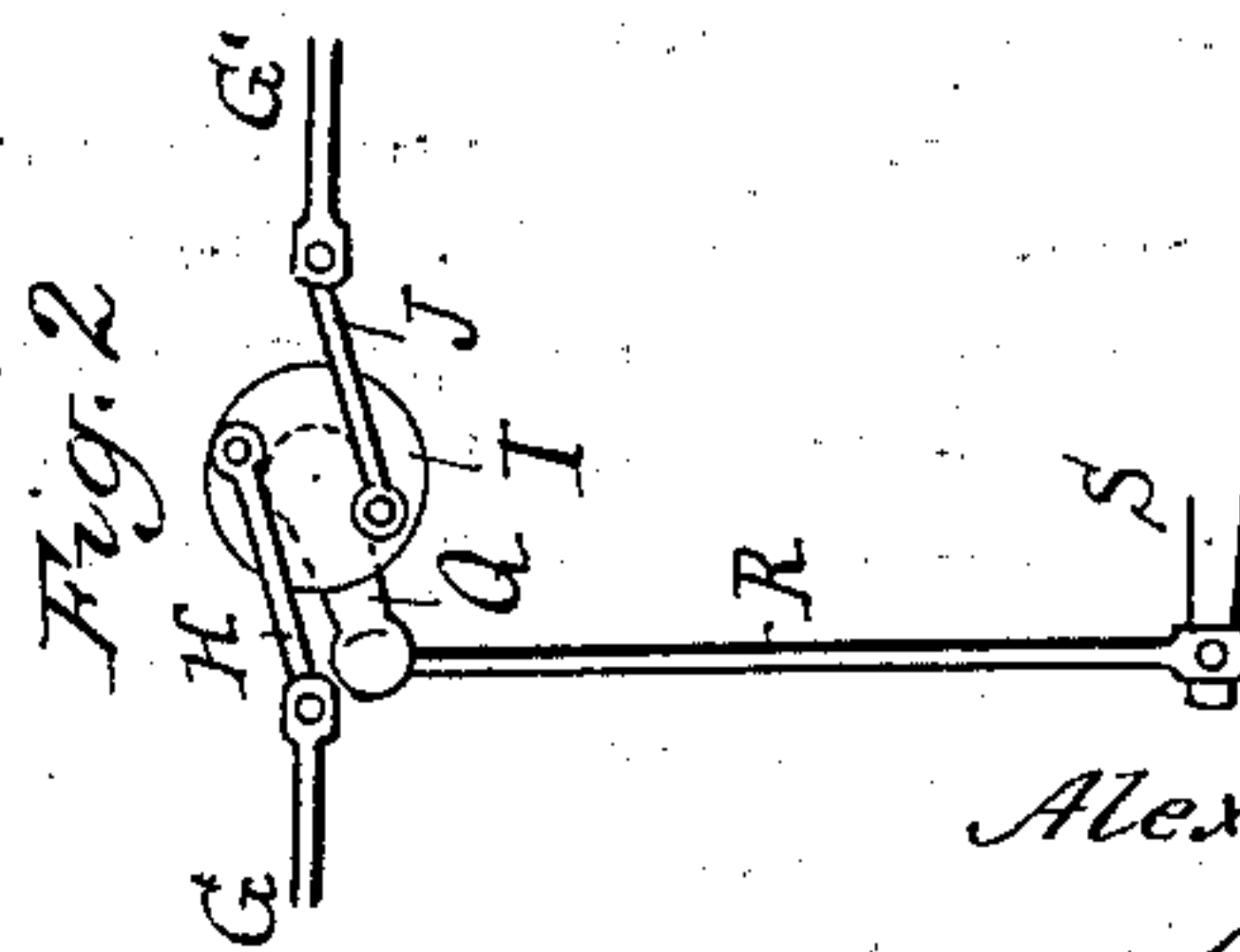
Patented June 26, 1883.



Attest:

A. Barthel

[Signature]



Inventor

Alexander F. Ward

by his Atty. *Thos. J. Sprague*

UNITED STATES PATENT OFFICE.

ALEXANDER F. WARD, OF DETROIT, MICHIGAN.

CUT-OFF-VALVE GEAR.

SPECIFICATION forming part of Letters Patent No. 280,103, dated June 26, 1883.

Application filed March 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER F. WARD, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful
5 Improvements in Cut-Off-Valve Gear; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

10 This invention relates to certain new and useful improvements in governor-connections between the governor of a steam-engine and its valves, by means of which the cut-off valves are simultaneously operated and changed as
15 the load, differing as it does at times, requires.

The invention consists in combining with the governor appliances which will simultaneously operate both cut-off valves at opposite ends of the engine and change their position automatically, as more fully hereinafter
20 described.

Figure 1 is a sectional plan of a direct-acting engine with my improvements thereto attached. Fig. 2 is a detail in elevation. Fig.
25 3 is a perspective detail.

In the accompanying drawings, A represents the cylinder of a direct-acting engine, provided at each end with steam-inlet ports a, steam-chest B, and valves C, of the usual
30 construction, such valves being actuated from the eccentric D by means of the valve-stem E; and the construction and operation of these parts are of the usual character.

F are the cut-off valves, each of which is connected to a valve-stem, G and G'. The stem G is connected to the link H, the opposite end of which is connected with the disk or wheel I, and the stem G' is connected with the link J, the opposite end of which is also connected
35 with the disk I. These links are connected to the disk at opposite points, and one nearer the center thereof than the other. The disk I

is secured to a shaft which is journaled in the box K, and this box is so constructed, as shown in Fig. 3, that it may have a reciprocating
45 motion on the slide L, being compelled thereto by the eccentric M and its connecting-rod N, one end of which is attached to a wrist-pin, O, projecting from one side of the sliding box. Both the eccentrics D and M are driven by the
50 shaft E. A rocker-arm, Q, is adjustably secured to the shaft which carries the disk, between the box K and such disk, and to the free end of this arm is attached the connecting-rod R, the opposite end of which is secured to the
55 lever S, which is fulcrumed in the bearing T, and the opposite end of this lever is attached by the connecting-rod U to the governor V. By these means any variation in the load upon the cut-off valves is immediately compensated
60 for, and the slightest variation in the governor is immediately communicated to the cut-off valves.

What I claim as my invention is—

1. In a valve-gear, the combination, with
65 the cut-off valves connected loosely to the disk I, and the disk I, hung upon a rock-shaft journaled in a movable box, of the governor V and its connections with said rock-shaft, and means for reciprocating the sliding box, substantially
70 as shown and set forth.

2. In combination with the cut-off valves, the rock-shaft carrying the disk I, and the connections between said valve and disk, the sliding box K, in which the shaft is journaled,
75 having connections M N with the shaft E, and the arm Q, rigid in the rock-shaft, having connections R, S, and U with the governor V, all operating as and for the purposes set forth.

ALEXANDER F. WARD.

Witnesses:

H. S. SPRAGUE,
E. SCULLY.