

(No Model.)

E. F. GORDON
ENGINE VALVE.

No. 465,925.

Patented Dec. 29, 1891.

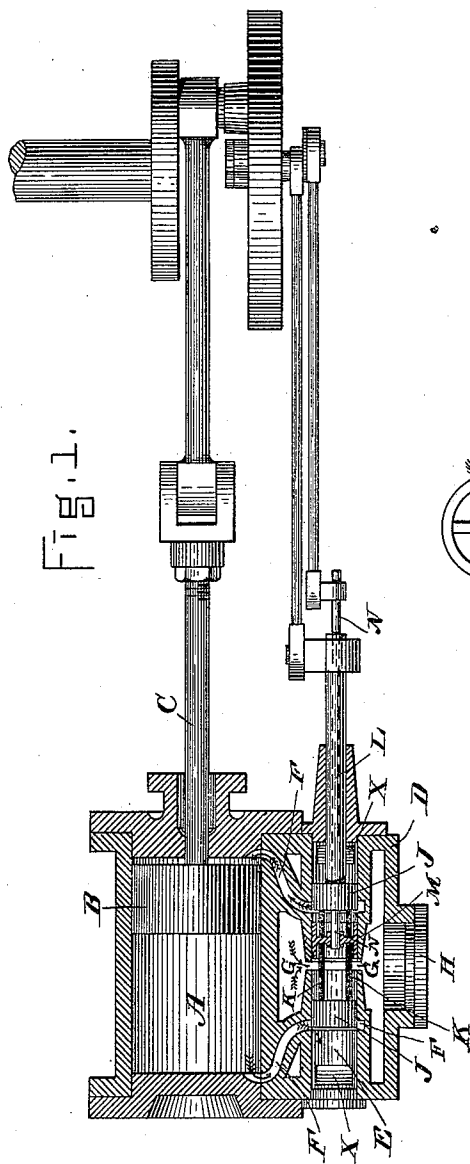


Fig. 1.

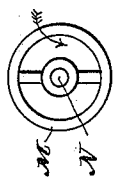


Fig. 2.

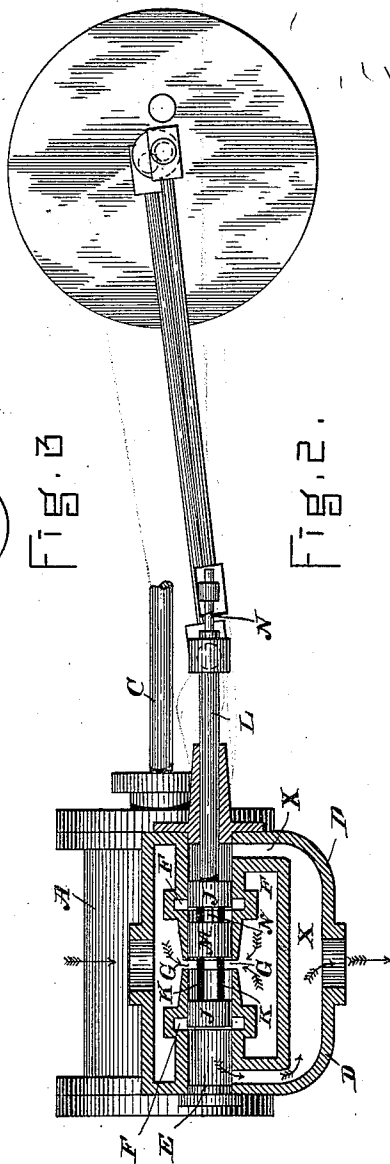


Fig. 3.

WITNESSES.

R. Henry Marsh.
G. F. Butterfield

INVENTOR.

Edward F. Gordon
by A. H. Jones, atty

UNITED STATES PATENT OFFICE.

EDWARD F. GORDON, OF CONCORD, NEW HAMPSHIRE, ASSIGNOR OF ONE-HALF TO ARMENIA W. HOBBS, ADMINISTRATRIX OF HORATIO HOBBS, DECEASED, OF SAME PLACE.

ENGINE-VALVE.

SPECIFICATION forming part of Letters Patent No. 465,925, dated December 29, 1891.

Application filed March 9, 1889. Serial No. 302,624. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. GORDON, of Concord, in the county of Merrimac and State of New Hampshire, have invented certain new and useful Improvements in Engine-Valves, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of my invention is to furnish a balanced engine-valve adapted to control the admission of steam to the cylinder and provided with a separately-actuated cut-off device by means of which the current may be automatically regulated and cut off at any desired part of the stroke, so as to use the steam expansively and secure a particularly quick-acting engine of simple and inexpensive form.

My valve is represented as reciprocating in a valve-casing wholly within the steam-chest, in which the steam is at boiler-pressure. The main valve has two cylindrical heads connected to each other by rigid rods so as to reciprocate together, with a steam-space between them, into which steam is admitted from the surrounding steam-chest through an opening in the center of the valve-casing. Within this space, between the heads, is a reciprocating hollow cylinder, forming the adjustable cut-off to exclude the steam when desired. This portion of the valve has its own actuating mechanism, so that the time of its movement relative to the main valve may be varied. Such mechanism, original with me, is not herein claimed, but constitutes the subject-matter of my Letters Patent on valve-gear for engines, No. 422,343, dated February 25, 1890, granted on application filed simultaneously herewith.

In the drawings, Figure 1 is a longitudinal and nearly horizontal section through the cylinder, steam-chest, valve-casing, and cut-off valve. Fig. 2 is a vertical longitudinal section through the chest and valve-casing, and Fig. 3 an end view of the cut-off valve.

A represents the steam-cylinder, B the piston therein, and C the piston-rod.

D is the steam-chest, E the valve-casing, and F F ports leading from the casing to the ends of the cylinder.

G is the central annular steam-inlet from the chest D into the valve-chamber. A cap H, made removable or transparent and located in the side of the chest and opposite to this inlet, as in Fig. 1, permits inspection of the movements of the cut-off valve. The valve is peculiar in construction and mode of operation. It consists of two solid cylindrical heads J J, connected rigidly to each other by two rods K, leaving between them, within the casing E, a space to which steam is admitted through the inlet G.

L is the enlarged valve-stem, which gives reciprocation to the valve.

X is the exhaust-passage.

Between the heads J J is the cut-off valve M, a cylindrical hollow shell fitting snugly within the walls of the casing E and reciprocated by a distinct stem N, running lengthwise through stem L and secured centrally to the cross-piece of said valve, as in Figs. 1 and 3. By this construction I am enabled to operate the cut-off valve and to vary automatically its movement relative to the main valve. Steam entering the space between the heads J J through the inlet G is admitted through the ports F F alternately to opposite sides of the piston B, causing its reciprocation. Now by the independent action of the cut-off valve the steam may be cut off from admission through the inlet G at the instant the current begins to enter one end of the cylinder, in which case its action on the piston is by expansion alone. Instead of this, the cut-off may uniformly occur at the quarter or the half stroke, or it may vary automatically, according to the load carried by the engine.

In my aforesaid patent I have set forth efficient means for operating the two separately-actuated portions of the valve from a single crank so as to secure a variable cut-off. I do not, however, design to limit my present invention to the combination with said means for actuating the valves.

I claim as my invention—

1. In an engine-valve, the valve-chamber formed with a central steam-inlet and with ports leading to and from the ends of the cylinder, in combination with the reciprocating valve having two solid heads rigidly joined

together, leaving a steam-space between them and with a separately-movable cut-off valve located in said steam-space and controlling the inlet-port, substantially as set forth.

5 2. The steam-chest D, the valve-casing E therein, with ports F F and central steam-inlet G, as described, in combination with the main valve having two cylindrical heads with space between them and with the hollow cylindrical cut-off valve M, reciprocating between said heads and controlling the inlet-port, substantially as and for the purpose set forth.

10 3. The steam-chest with inclosed valve-cas-

ing, having central steam-inlet and ports F F 15 and X X, in combination with a steam-valve and an inclosed cut-off valve controlling the inlet-port and with means of reciprocating the cut-off through the stem of the main valve, substantially as set forth. 20

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 2d day of March, A. D. 1889.

EDWARD F. GORDON.

Witnesses:

L. C. MORRILL,
H. E. BROWN.