(No Model.)

G. W. ANDERSON.

CUT-OFF VALVE.

No. 307,738. Patented Nov. 11, 1884.

Fig. 1.

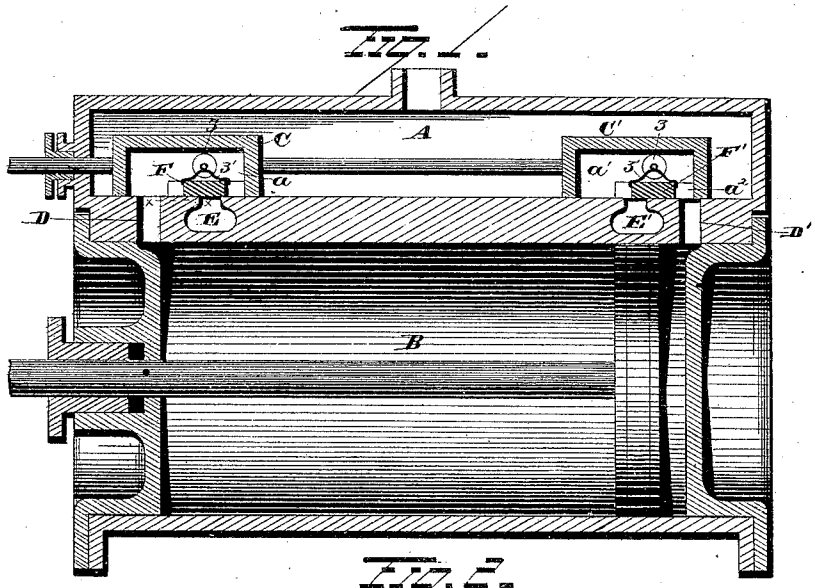


Fig. 2.

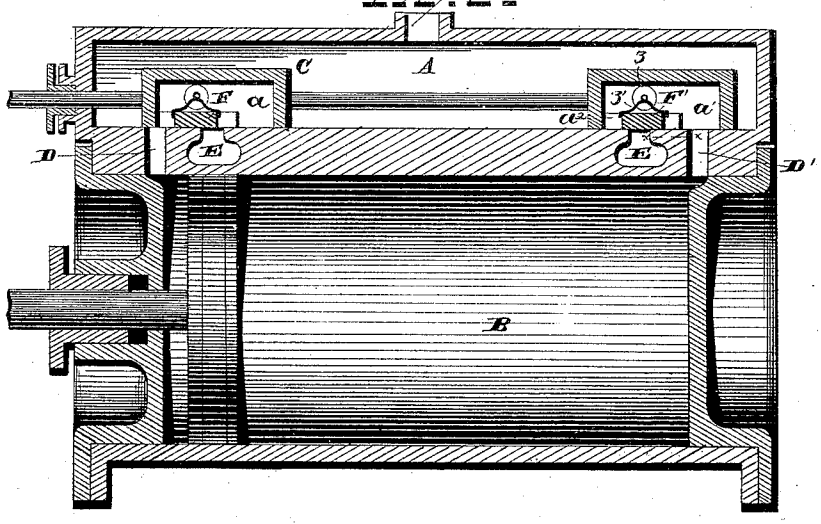


Fig. 3.

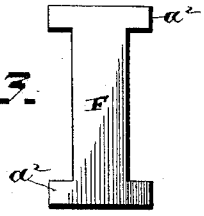
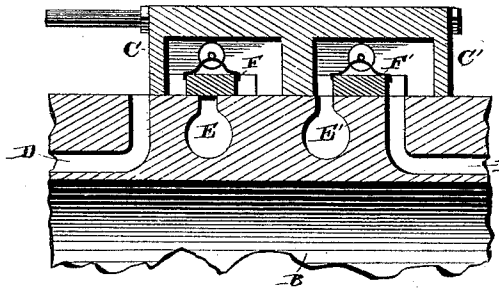


Fig. 4.



WITNESSES

C. F. Nottingham

George F. Downing.

INVENTOR

Geo. W. Anderson,

By H. A. Seymour

Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE W. ANDERSON, OF WESTPORT, INDIANA.

CUT-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 307,738, dated November 11, 1884.

Application filed December 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. ANDERSON, of Westport, in the county of Decatur and State of Indiana, have invented certain new and useful Improvements in Cut-Off Valves; 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.

My invention relates to an improvement in steam cut-off valves, the object being to provide simple and effective mechanism by means of which back-pressure on the exhaust side of the piston shall be prevented, no matter at what part of the stroke the steam may be cut off.

With this end in view my invention consists in a slide-valve constructed in two sections, similar to the ordinary cut-off, firmly connected and adapted to engage movable blocks, which blocks open and close the exhaust-ports.

My invention further consists in certain features of construction and combinations of parts, as will be fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of the valves in position within the steam-chest when the piston is about completing its stroke to the right; Fig. 2, the same when the piston is about completing its stroke to the left. Fig. 3 is a plan view of the bottom of the valve, and Fig. 4 is a modification.

A is a steam-chest of any approved construction in connection with the cylinder B. The steam cut-off valve C and C′ is constructed to slide over the steam-ports D and D′, alternately opening and closing the same. The two exhaust-ports E and E′ are situated under the chambers *a* and *a′* in the valve C and C′. Blocks of metal, F and F′, are constructed of sufficient length to fit transversely in the chambers *a* and *a′* of the valve C and C′, and to have an easy sliding motion therein. The thickness of these blocks F and F′ is much less than the height of the chambers *a* and *a′*, thus allowing the steam a free passage between the upper surfaces of the blocks and the tops of the chambers. The blocks F and F′ are provided with projecting corners a^2, with which the inner walls of the chambers *a a′* alternately come in contact. The distances *x* and *x′* between the steam-port D and the exhaust-port E, and between the steam-port D′ and the exhaust-port E′ are equal in width to the blocks F and F′, thus allowing the said blocks to rest between a steam and exhaust port and leave both open. The shoulders or projections a^2 on the blocks F and F′, which engage the walls of the chambers *a a′*, are of such extent that they do not come in contact with the chamber-walls and cause the blocks F and F′ to move until the stroke of the piston is nearly completed in either direction. Suppose the eccentric to be so adjusted that the steam shall be cut off at the end of one-third of the stroke. At the beginning of the stroke toward the right the steam-port D is open to the steam-chest, the steam-port D′ open to the chamber *a′*, the exhaust-port E′ open, and the block F′ situated on the rest between D′ and E′. At the end of one-third of the stroke the port D is closed to the steam-chest by the motion of the valve C C′ toward the left, while this motion of the valve has not yet disturbed the blocks F and F′, nor will it move these blocks until the piston is just to complete its stroke, when the block F′ will slide over the port E′ and the block F be removed from the port E. From the time the steam was cut off at the end of the first third of the stroke until just as the stroke was completed the exhaust E′ remained open and the exhaust E closed. The expansive force of the active steam was thus exerted in a slight degree under the section C, while no resistance took place in front of the piston by the compression of expended steam, or only so much as might be required to lift the block F′ if this block has slid partially or entirely over the steam-port D′ before the stroke is completed. At the end of the stroke, the steam-port D′ being now open to the steam-chest and the port D open to the chamber *a*, and the exhaust-port E being also open, the operation of the parts as above described will be repeated in reverse order. The pressure of the active steam under the valve after the steam has been cut off from the chest has a tendency to lessen the friction of the valve on its seat by partially counterbalancing the pressure exerted by the steam in the steam-chest.

The modification represented in Fig. 4 con-

sists in leading the steam-ports from the ends of the cylinder toward the middle of the steam-chest, placing the exhaust-ports near each other, and constructing the sections of the valve C and C′ integral. The operation is in every respect the same as described. The blocks F and F′ are held in position over the exhaust-ports by the pressure of the steam, and are prevented pitching too far by means of rollers *z*, mounted in spring-straps *z′*, which hold the rollers against the upper surfaces of the chambers with light pressure. This latter device is desirable when the engine is to be driven at a high rate of speed, and the blocks thereby rendered more liable to move farther than is necessary.

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

1. The combination, with a cylinder having a steam-port and an exhaust-port, of a sliding cut-off valve and a movable block over which the exhaust-steam passes, the above parts combined and operating substantially as set forth.

2. The combination, with a cylinder provided with two steam-ports and two exhaust-ports and a steam-chest, of a sliding cut-off valve having two separate compartments firmly connected, and the movable blocks within these compartments, the said blocks being moved by the valve so as to alternately close and open its respective exhaust-port at the proper moment, substantially as set forth.

3. The combination, with a cylinder provided with ports and a steam-chest, of a sliding valve provided with compartments, and movable sections which are provided with projecting corners and constructed to slide within these compartments, thereby opening and closing the exhaust-ports, substantially as set forth.

4. A sliding cut-off valve consisting of the sections C C′, provided with the chambers *a a′*, the movable blocks F and F′, and the bearings *z*, constructed and arranged substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEORGE W. ANDERSON.

Witnesses:

MILTON M. MEWHINNEY,

JAS. T. CONNELL.