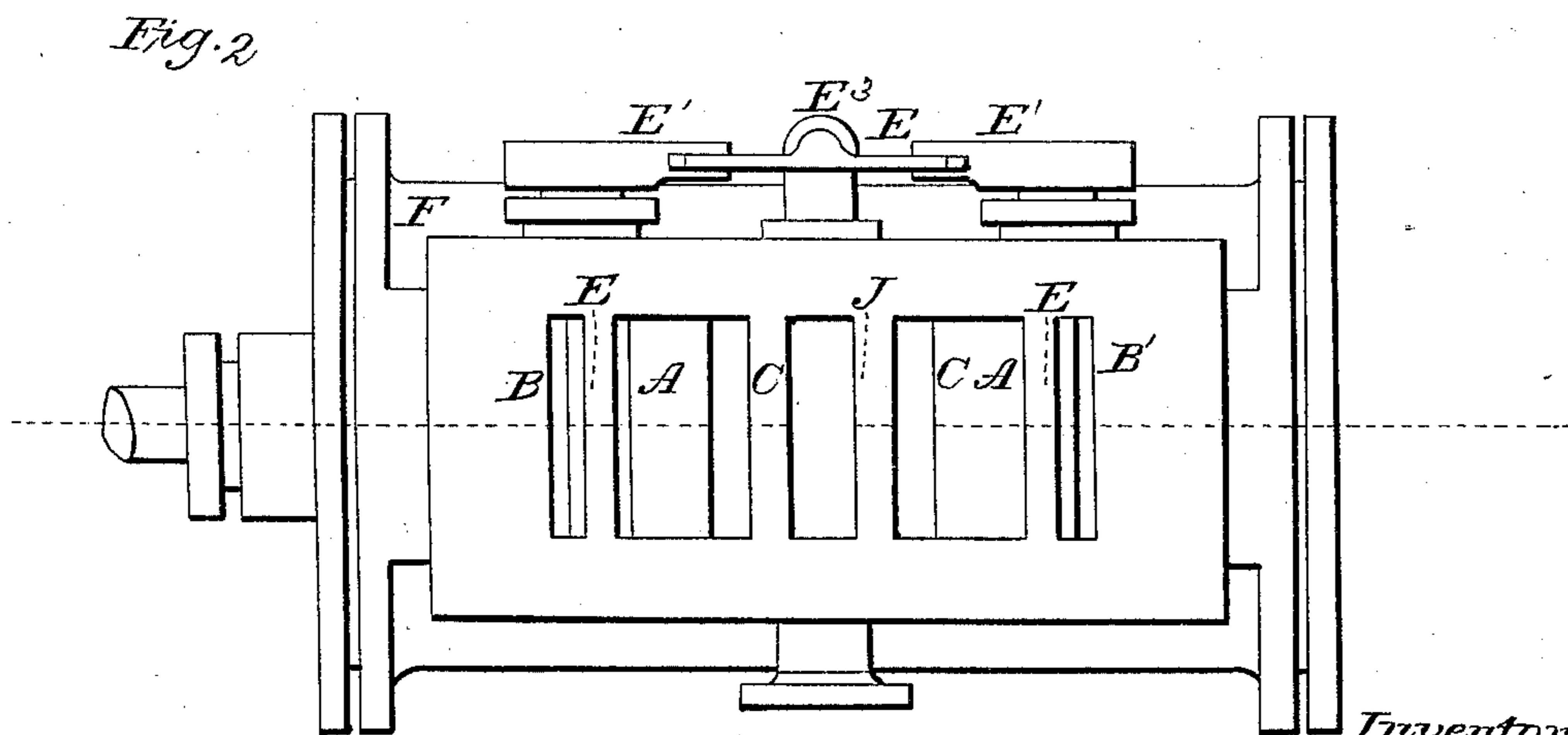
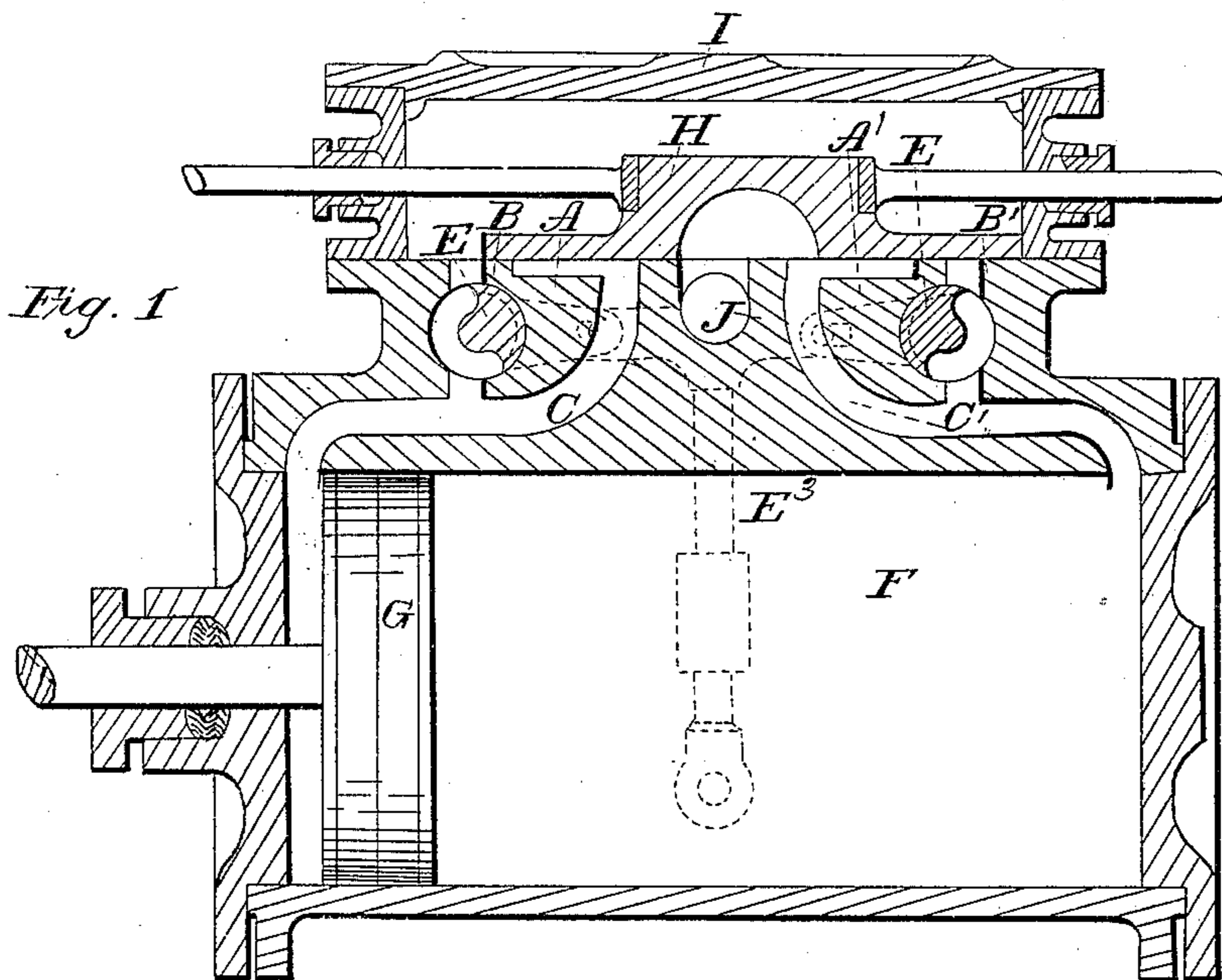


*G. Verry,  
Steam Cut-Off.*

*N<sup>o</sup> 78,556.*

*Patented June 2, 1868.*



*Witnesses:  
Chas. D. Smith  
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*Inventor:  
Geo. Verry  
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# UNITED STATES PATENT OFFICE.

GEORGE VERRY, OF NORWICH, CONNECTICUT, ASSIGNOR TO HIMSELF AND  
O. G. GRAVES, OF SAME PLACE.

## IMPROVEMENT IN VALVES AND STEAM-PASSAGES.

Specification forming part of Letters Patent No. 78,556, dated June 2, 1868.

*To all whom it may concern:*

Be it known that I, GEORGE VERRY, of Norwich, in the county of New London and State of Connecticut, have invented a new and useful Improvement in the Arrangement of Valve-Seats and Valves for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure 1 is a vertical longitudinal section of a steam-cylinder and its surmounting valve-seat, valve, and steam-chest, illustrating my invention. Fig. 2 is a top view of the cylinder, showing the construction of the valve-seat thereof.

Similar letters of reference indicate corresponding parts in the two figures.

The objects of this invention are, first, to cut off and regulate the supply of steam to the cylinder by means of movable plugs so situated as to control the ports or passages which admit steam from the chest to the cylinder; and, secondly, to provide a more effective means of relieving the valve from pressure.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe it with reference to the accompanying drawing.

F may represent a steam-cylinder, G the piston, H the valve, and I the steam-chest.

My invention is involved in the arrangement of the ports and the cut-off plugs within the valve-seat, which is cast upon the cylinder, as shown.

B B' are ports which conduct steam from the chest to the opposite ends of the cylinder, the same being alternately opened and closed by the valve in customary manner.

C C' are exhaust-ports. The concave recess in the valve H being, by the valve's motion, brought alternately over the upper orifices of the exhaust-ports C C', brings said ports alternately into communication with the main exhaust-opening J. The valve-seat is recessed at A A', the space thus left directly beneath the valve being nearly equal in area

to the sole of the valve. The area of the valve due to the difference between the same and the recesses A A' beneath, is only so much as to afford a proper bearing-surface for the valve, and enable the latter to close communication between the port J and the ports C C' alternately, which it does as it plays forth and back.

E E are oblong plugs, fitted to turn in transversely circular seats within the body of the valve-seat. The bearing side of each plug E is semicircular, while its other sides may be curved, as shown. Outside of the valve-seat these plugs may be connected by arms E<sup>1</sup> E<sup>1</sup> and a link, E<sup>2</sup>. A top view of these connections is given in Fig. 2, and they are represented by dotted lines in Fig. 1.

E<sup>3</sup> is a rod, through the medium of which the link E<sup>2</sup> may be connected with a lever, or any convenient actuating device by which to impart motion to the plugs E E, for the purpose of opening, closing, or partially closing the receiving-ports B B'.

The operation is as follows: Steam, being admitted to the cylinder through the port B, drives the piston toward the right, and this live acting steam also has access, through the port C, to the space A, thus relieving the pressure of steam upon the valve at one side, and the exhaust-steam at the back of the piston escapes, through the port C' and the valve, into the exhaust-opening J, and has access to the recess A', thus relieving the valve of pressure at that side.

When it is desired to cut off or vary the quantity of steam admitted to the cylinder, the object can be effected instantaneously by turning the plugs E E, said plugs serving to stop, start, or change the speed of the engine, by opening, closing, or varying the effective area of the receiving-ports B B', as the case may be.

It will be seen that the exhaust-ports not only enable the valve to be balanced by the employment of the recesses A A', but they constitute an absolutely indispensable adjunct of the plugs E E, because the latter could not be successfully used as cut-offs in the receiving-ports if the receiving-ports were traversed by the exhaust-steam on its way to the exhaust-port. Thus, without this arrangement of ex-

haust-ports, if one of the plugs should cut off from the back side of the piston, it would cut off the exhaust, which, of course, is inadmissible; and if one should cut off on the front side, the lead would be cut off, and the piston consequently fail to get steam in time. From the above it will be obvious that the cut-off plug could not be used in the receiving-ports in the absence of the co-operative exhaust-ports.

Having thus described my invention, the following is what I claim as new herein and desire to secure by Letters Patent:

1. The arrangement of the receiving and exhaust ports B B' C C' and cut-off plugs E E, substantially as herein described.

2. The recesses A A', in combination with the ports B B' C C', substantially as and for the purpose described.

GEORGE VERRY.

Witnesses:

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C. F. ROULLET.