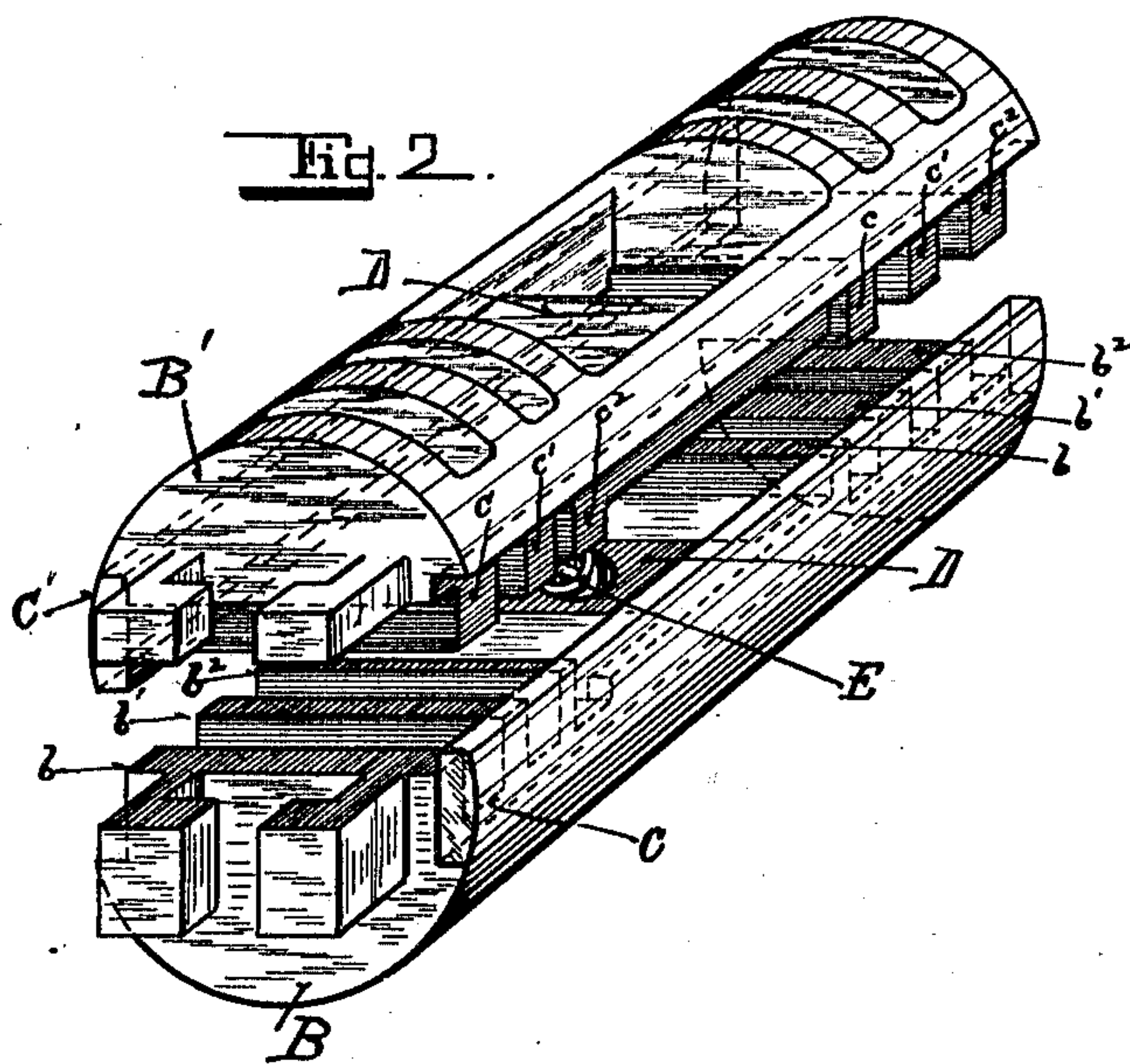
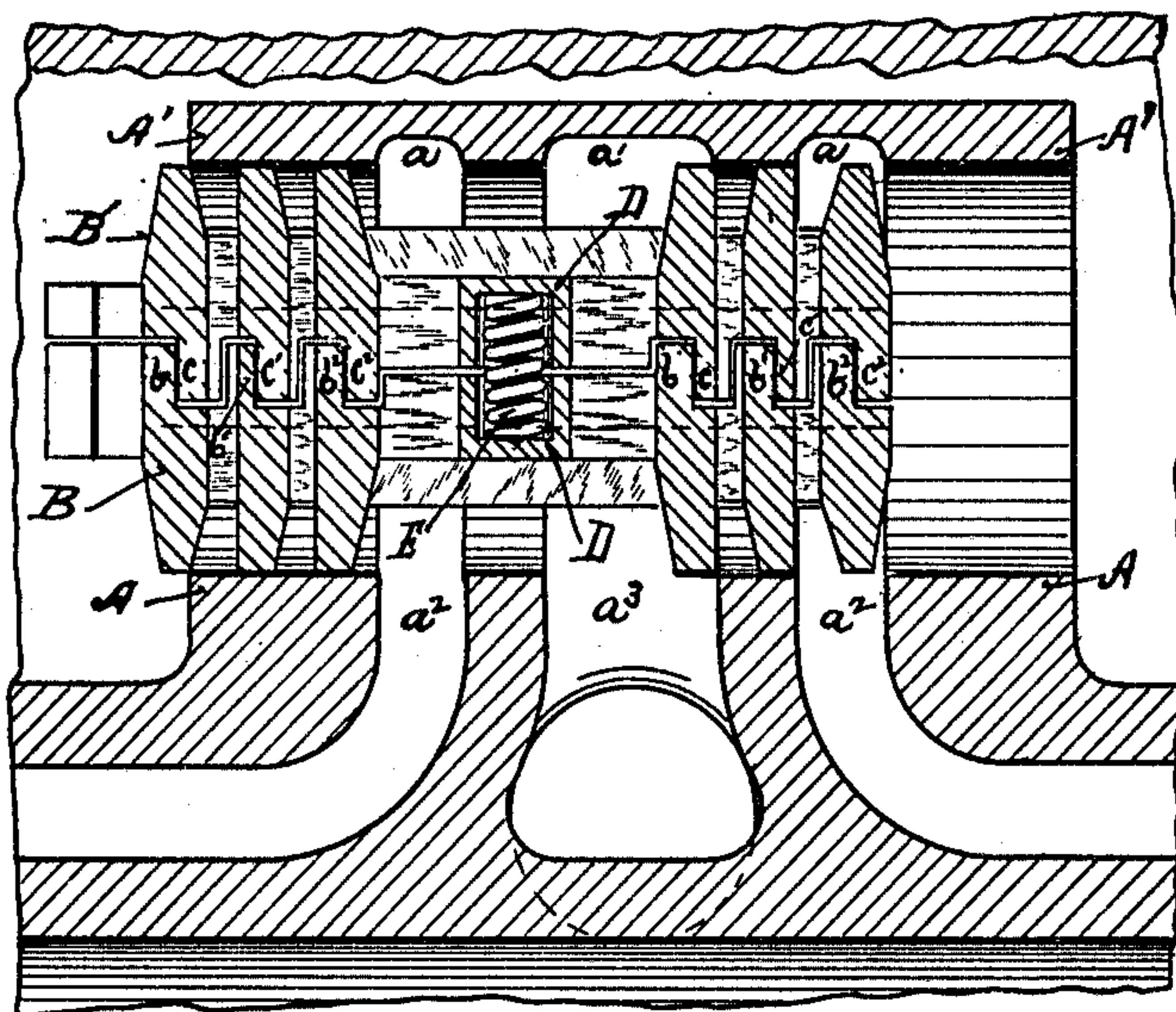


**990,304.**

Patented Apr. 25, 1911.



Witnesses.  
Florence Stockert.  
G. J. Mead.

Inventor.  
Le Grand Skinner  
By J.C. & H. M. Stegman  
Attys.



# UNITED STATES PATENT OFFICE.

LE GRAND SKINNER, OF ERIE, PENNSYLVANIA.

ENGINE-VALVE.

990,304.

Specification of Letters Patent.

Patented Apr. 25, 1911.

Application filed June 30, 1910. Serial No. 569,681.

*To all whom it may concern:*

Be it known that I, LE GRAND SKINNER, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Engine-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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to engine valves, and particularly to that class thereof known as piston-valves, and has for its object the construction of a piston-valve for a steam engine, which will at all times be steam-tight, notwithstanding any amount of wear incident to long continued use thereof.

I accomplish the object of my invention by constructing a piston engine valve composed of two semi-cylindrical members, one superimposed upon the other, the said members having therethrough the usual transverse steam-ports adjacent to the ends thereof, and the usual exhaust port opening in the intermediate portion thereof, the flat surfaces thereof meeting; the end portions of the flat meeting surfaces are so divided into transversely raised and depressed horizontal planes and transverse vertical planes, that each alternate vertical plane between said horizontal planes will be located in the solid wall portion between the steam ports, and the remaining alternate vertical planes being so located as to extend through the ports, this forming offset overlapping surfaces within the walls of the ports, those on one member facing toward those on the other member, so that the right hand end of the upper valve member and the left hand end of the lower valve member present a greater area to the steam in the steam-chest than do the remaining portions of the ends of said valve members, thereby causing the overlapping surfaces within the steam port walls to form steam-tight closures, while permitting said valve members to be moved apart to compensate for the wear thereof in the valve-chamber. These and other features of my invention will appear hereinafter in the specification and claims, and are illustrated in the accompanying drawings, in which:

Figure 1, is a vertical central section of a portion of a steam-chest and cylinder, with my improved valve therein. Fig. 2, is a perspective view of my improved piston valve.

In these drawings, A, indicates the lower valve-seat, and, A', the upper wall of the valve chamber, in which my improved valve, B—B', reciprocates. This upper wall, A', is preferably provided with transverse recesses,  $a$ , which coincide with the steam ports,  $a^2$ , in the valve seats, A, and a recess,  $a'$ , which coincides with the exhaust port,  $a^3$ , these recesses being co-extensive with the width of the ports in the valve-seat, all of which parts are of usual construction.

Within the valve chamber between the upper wall, A', thereof, and the seat, A, I place my improved valve, B—B'. This valve is composed of two semi-cylindrical valve members, B, and B', the member, B, resting upon the valve-seat, A. The flat upper surface of the member, B, is, at each end portion thereof through which the transverse steam ports pass, divided into raised and depressed horizontal and vertical planes, the raised horizontal planes being designated by,  $b$ ,  $b'$ ,  $b^2$ , and the flat under surfaces of the member, B', is likewise divided into downward extending, transverse, horizontal planes,  $c$ ,  $c'$ , and  $c^2$ , which at each end of the valve extend into the spaces between the transverse, horizontal planes,  $b$ ,  $b'$ ,  $b^2$ , the vertical, transverse planes between the horizontal planes,  $b—c$ ,  $b'—c'$ , and  $b^2—c^2$ , meeting and overlapping on lines within the walls of the steam ports and forming steam-tight closures therein, the other vertical planes between the horizontal planes, being imaginary where they extend through the steam-ports, do not form closures, but on the contrary form steam spaces. It will be noticed that in every exposed surface the overlapping portion is greater than the under-lapping portion, so that the pressure exerted by the steam upon said valve members, always tends to keep these vertical closures,  $b—c$ ,  $b'—c'$ , and  $b^2—c^2$ , steam-tight. In a recess in a cross-piece, D, in the central portion of my improved valve I place a spring, E, adapted to hold said valve members apart so that steam may enter between the horizontal planes and hold the members, B, and B', apart, the lower member, B, in contact with the valve-seat, A, and the upper member,



B', in contact with the upper wall, A', of the valve-chamber.

In Fig. 2, I have shown a preferable construction of my improved valve, in which I employ side closure-bars, C, and C', which are secured in rabbets in the edges of the valve members, B, and B', the bar C, being secured to the member, B, and the bar, C', being secured to the member, B', by means of screws, or in any other suitable manner, each of said bars being adapted to act as a closure for the ends of the transverse steam spaces between the transverse planes,  $b-c$ ,  $b'-c'$ , and  $b^2-c^2$ .

From the foregoing description it will be manifest that many modifications in the construction of my improved piston valve may be made without departing from the spirit of my invention.

Therefore having shown and described my invention so as to enable others to construct and use the same, what I claim as new and desire to secure by Letters-Patent of the United States is:

1. The combination in an engine valve of semi-cylindrical valve members having transverse steam ports in the end portions and an exhaust port in the intermediate portions thereof, the meeting surfaces of said semi-cylindrical valve members being so raised and depressed as to form transverse over-lapping and under-lapping vertical surfaces within the walls of the steam-ports, substantially as set forth.

2. The combination in an engine valve, of semi-cylindrical valve members having steam ports in the ends thereof, and an exhaust port in the intermediate portion thereof, raised transverse planes in the end portions of the meeting surfaces of each of said valve members, those on one member intermeshing between those on the other member and so arranged that steam-tight vertical transverse closures will be formed between said members at each side of the exhaust port and springs between said valve members to maintain a steam-space therebetween, substantially as set forth.

3. The combination in an engine valve mechanism, of a steam-chest, a cylindrical valve chamber therein with which steam and exhaust ports communicate, a piston valve in said valve chamber composed of semi-cylindrical, valve members having steam ports through the end portions thereof and an exhaust port through the central portion thereof, the meeting surfaces between said valve members being provided with over-lapping steam-tight closure surfaces between said steam ports and said exhaust port, substantially as set forth.

4. The combination in an engine valve

mechanism, of a steam-chest, a cylindrical valve chamber therein with which steam and exhaust ports communicate, a piston valve composed of semi-cylindrical valve members having steam ports through the end portions thereof and an exhaust port through the central portion thereof, overlapping, steam-tight, transverse surfaces between the outer ends of said valve members and the steam ports therethrough, and between said steam-ports and the exhaust port there-through, and longitudinal overlapping surfaces lying transversely to said transverse overlapping surfaces, substantially as set forth.

5. The combination in an engine valve mechanism, of a steam-chest, a cylindrical valve chamber therein with which the steam and exhaust ports communicate, a piston valve in said valve chamber composed of semi-cylindrical valve members, having transverse steam ports through the end portions thereof, and an exhaust port through the central portion thereof, the meeting surfaces between said members being provided with over-lapping steam-tight closure surfaces between said steam ports and the exhaust port, between said steam ports and the extremities of said valve members, and means to retain said valve members yieldingly in contact with the walls of said valve chamber, substantially as set forth.

6. The combination in an engine valve mechanism, of a steam-chest, a cylindrical valve chamber therein with which steam and exhaust ports communicate, a piston valve composed of semi-cylindrical, valve members having transverse steam ports through the end portions thereof and an exhaust port through the middle portion thereof imposed upon each other so as to form a complete cylindrical valve, the meeting surfaces between said valve members being provided with overlapping steam-tight transverse closure surfaces between said steam ports and said exhaust port, between said steam ports, and between said steam ports and the extremities of said valve members, longitudinal overlapping steam-tight closure surfaces lying transversely to said transverse closure surfaces adapted to close the ends thereof, and means to retain said members yieldingly in contact with the walls of said valve chamber, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

LE GRAND SKINNER.

Witnesses:

H. J. CURTZE,

FLORENCE STOCKERT.