

(No Model.)

2 Sheets—Sheet 1.

J. PLAYER.
VALVE FOR COMPOUND ENGINES.

No. 481,057.

Patented Aug. 16, 1892.

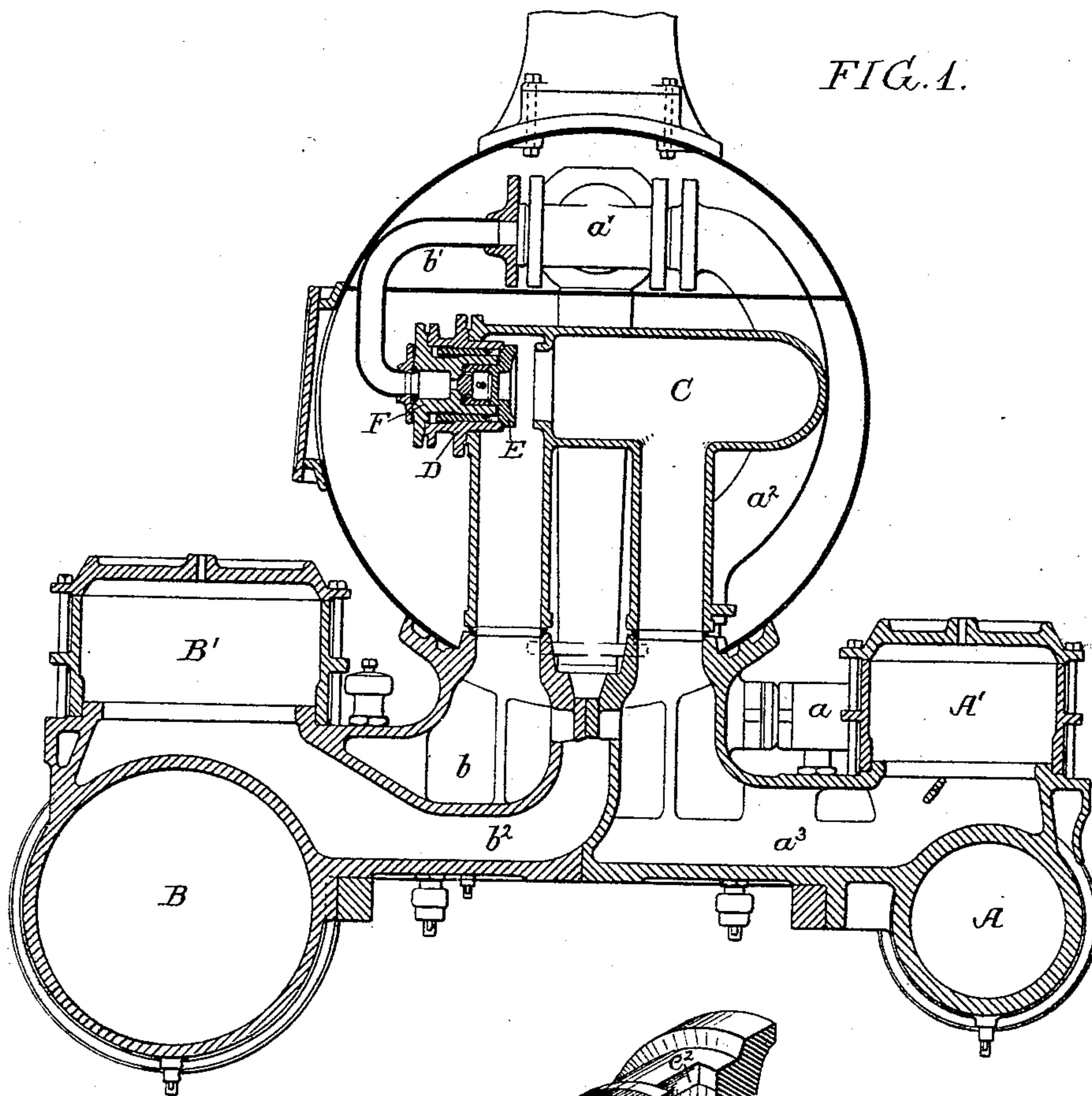


FIG. 1.

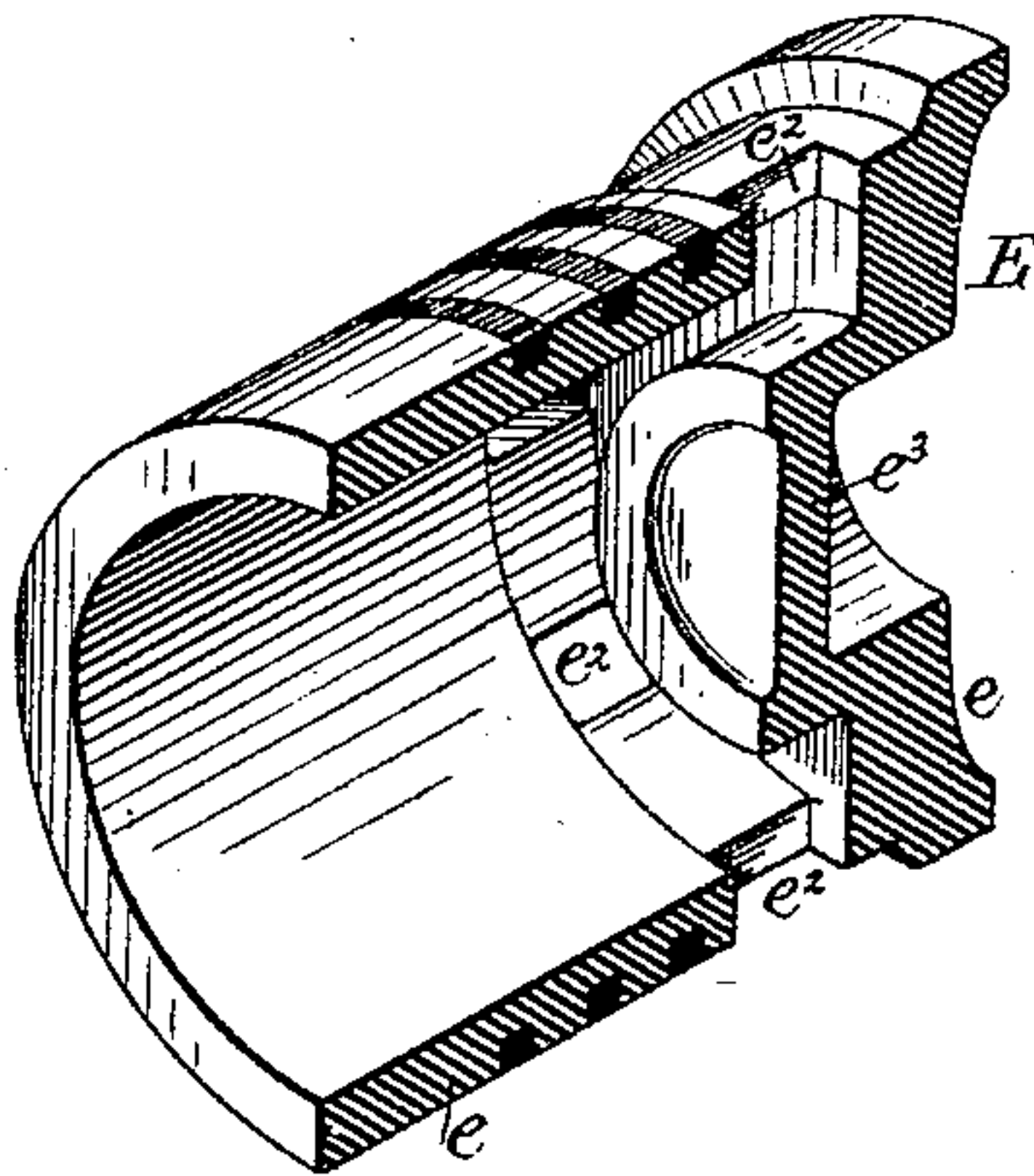
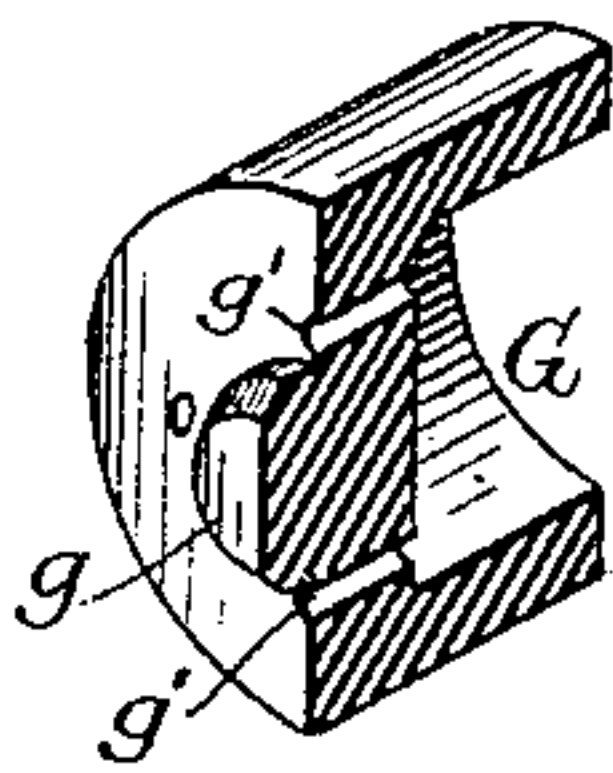


FIG. 4.

FIG. 5.



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Inventor:
John Player
by his Attorneys
Howson & Howson

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FIG. 2.

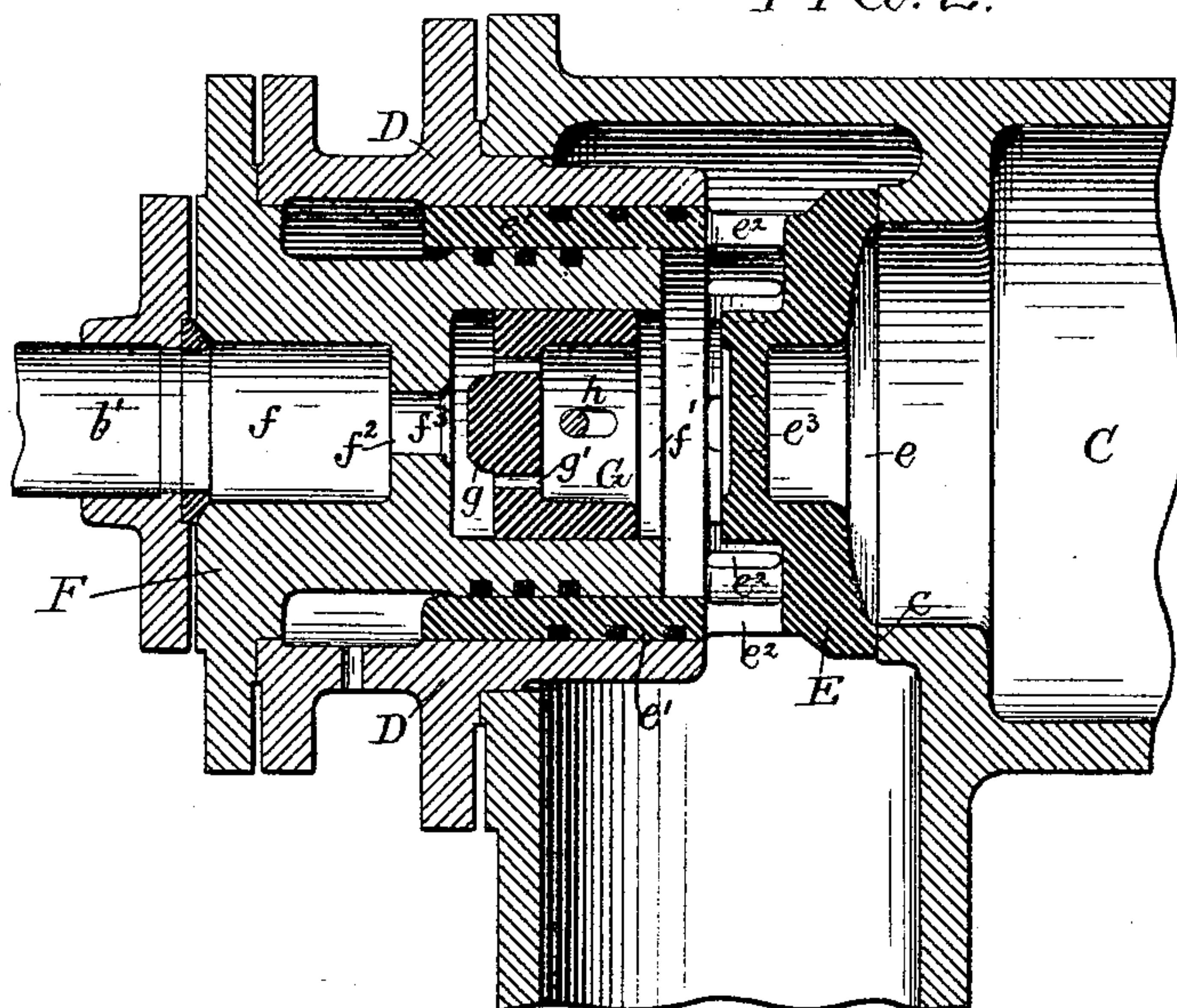
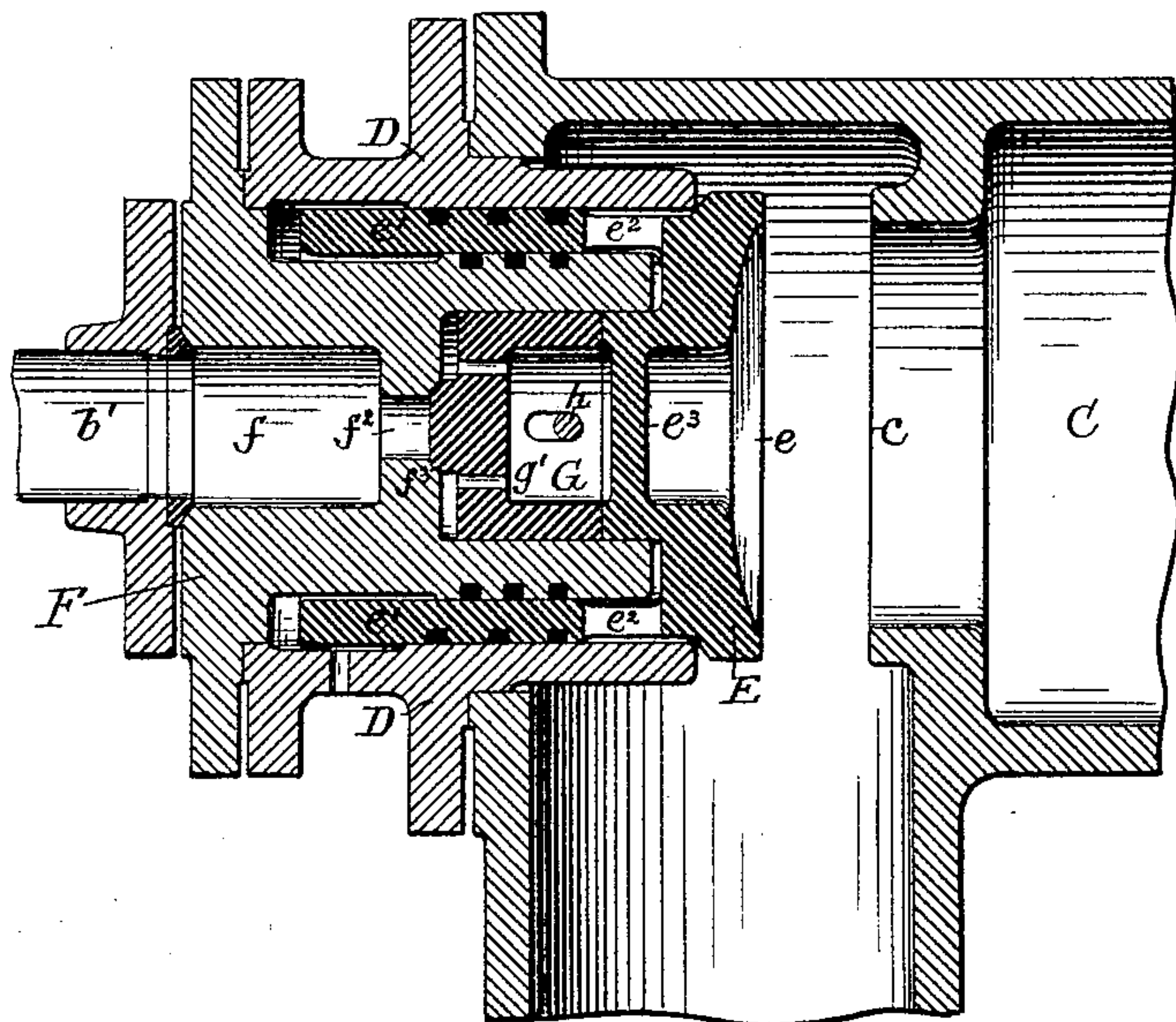


FIG. 3.



Witnesses:
J. H. Goodwin
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Inventor:
John Player
by his Attorneys
Hudson & Hudson

UNITED STATES PATENT OFFICE.

JOHN PLAYER, OF DUNKIRK, NEW YORK, ASSIGNOR TO THE BROOKS
LOCOMOTIVE WORKS, OF SAME PLACE.

VALVE FOR COMPOUND ENGINES.

SPECIFICATION forming part of Letters Patent No. 481,057, dated August 16, 1892.

Application filed April 15, 1892. Serial No. 429,267. (No model.)

To all whom it may concern:

Be it known that I, JOHN PLAYER, a resident of Dunkirk, Chautauqua county, New York, have invented a Combined Admission and Intercepting Valve for Compound Engines, of which the following is a specification.

My invention relates to compound locomotive or other engines of that type in which for the purpose of obtaining full power at starting high-pressure steam is employed in both cylinders simultaneously, that portion which is admitted to the large or low-pressure cylinder being automatically reduced in pressure and controlled at such pressure that the mean effective pressure on both sides of the engine is equalized or regulated in any desired ratio.

My present invention is a modification of the valve mechanism claimed in the application filed by me on February 24, 1892, Serial No. 422,630, and relates particularly to an intercepting-valve and an admission-valve.

The object of my invention is to so combine the two valves that the intercepting-valve will keep the admission-valve closed when the engine is compounding, and that the admission-valve will act upon the intercepting-valve at starting and will wire-draw steam passing from the supply to the low-pressure cylinder until such time when the exhaust from the high-pressure cylinder will overcome the reduced pressure in the low-pressure cylinder, causing the intercepting-valve to open and to close the admission-valve.

In the accompanying drawings, Figure 1 is a transverse sectional view of sufficient of a locomotive to illustrate my invention. Fig. 2 is a sectional view of the valve structure, showing the admission-valve open and the intercepting-valve closed. Fig. 3 is a sectional view of the valve structure, showing the intercepting-valve open and the admission-valve closed. Fig. 4 is a sectional perspective view of the intercepting-valve. Fig. 5 is a sectional perspective view of the admission-valve.

Referring to Fig. 1, A is the high-pressure cylinder, and B the low-pressure cylinder. A' is the high-pressure valve-chest, and B' the low-pressure valve-chest. a is the live-steam in-

let to the high-pressure cylinder connected to the main steam-supply a' through the pipe a^2 . a^3 is the exhaust-passage from the high-pressure cylinder. C is the receiver-pipe connected with the high-pressure exhaust-passage a^3 and the low-pressure inlet-passage b . b' is a pipe communicating with the main steam-supply a' and the admission-valve mechanism described hereinafter, whereby live steam under reduced pressure may be admitted to the low-pressure cylinder. b^2 is the exhaust-passage for the low-pressure cylinder communicating with the exhaust-nozzle.

I will now describe the valve mechanism to which my invention particularly relates.

D is the valve-casing projecting into the receiver-pipe C, and in this casing is mounted the intercepting-valve E. This intercepting-valve when closed seats itself against a seat c , cutting off communication between the high-pressure end of the receiver-pipe and the low-pressure end. The intercepting-valve E has a head e and a rearward extension e' , provided with packing and works within the casing D. This rearward extension is connected to the head e by a perforated section e^2 , the perforations in said section allowing live steam to enter the low-pressure steam-chest after passing through the admission-valve.

Projecting into the casing D is a chest F, with which communicates the pipe b' from the live-steam supply a' . The chest is divided into two portions in the present instance ff' by a partition, and in this partition is a passage f^2 , forming a communication between the two chambers ff' . Adapted to the chamber f' is an admission-valve G, having a head g , which is adapted to a seat f^3 in the chest F, so that when the valve is closed against the seat live steam will be cut off. In the valve G are passages g' , through which the live steam is wire-drawn as it enters the space between the said valve and the intercepting-valve prior to its entering the low-pressure valve-chest. At the back of the intercepting-valve in the present instance is a projection e^3 , which, when the valve is open, as shown in Fig. 3, enters the chest F and rests against the admission-valve G, keeping

said valve to its seat. The valve G is limited in its stroke by a stop-pin *h*, which passes through slots in the valve.

The operation of my improved valve structure is as follows: On starting, steam is admitted from the main supply *a'* through the pipe *b'* to the admission-valve, causing it to open and push the intercepting-valve the amount of its travel. The steam then passing the valve G causes the intercepting-valve E to close. The steam passing through the admission-valve, being reduced in pressure by throttling, passes into the low-pressure end of the receiver C and operates upon the piston of the low-pressure cylinder. When the pressure on the high-pressure side of the intercepting-valve becomes equal to or slightly in excess of that on the low-pressure side, it causes the intercepting-valve to open and operate against the admission-valve, at the same time closing the admission-valve, preventing any further escape of high-pressure steam into the receiver while the engine is working.

The valve structure may be arranged in the steam-admission passage of the low-pressure cylinder instead of in the upper portion of the receiver, as the receiver in fact extends from the high-pressure valve-chest to the low-pressure valve-chest, and the valve structure may be placed at any point between the two chests.

I claim as my invention—

1. In a combined admission and intercepting valve for compound engines, the combination of the receiver-casing forming a communication between the high and the low pressure cylinders, an intercepting-valve therefor, a live-steam passage communicating with the low-pressure end of the receiver, and admission-valve therefor, capable of movement independently of the intercepting-valve, but arranged in such relation to the intercepting-valve that the said admission-valve will be opened and the intercepting-valve will be closed by the live steam, said admission-valve having openings through which the steam is wire-drawn, substantially as described.

2. The combination, with the receiver pipe or passages of a compound locomotive or other engine, of the intercepting-valve having an

annular balancing device working within its casing and having one seat to cut off the high-pressure steam from the receiver and having a projection on its back, with the admission-valve working within its casing and being caused to close by the operation of the projection or stop on the back of the intercepting-valve, said admission-valve casing forming the interior of the balancing-chamber for the intercepting-valve, said balancing-chamber being connected to the atmosphere, as and for the purpose set forth.

3. The combination, with the receiver pipe or passages of a compound locomotive or other engine, of the live-steam pipe connecting with the admission-valve chamber, the admission-valve chamber, the admission-valve, its seat, its stop, its steam passages and extension, with the projection on the back of the intercepting-valve, having the annular balancing device and steam-passages, said intercepting-valve working within its casing externally and outside of the projection on the admission-valve chamber, said projection forming the balancing-chamber for said intercepting-valve, which is connected to the atmosphere, as and for the purpose set forth.

4. The combination, with the receiver pipe or passages of a compound locomotive or other engine, of the intercepting-valve chamber formed externally by its own casing and internally by the admission-valve chamber and being connected to the atmosphere, the intercepting-valve having the annular balancing device working within said chamber, its steam-passages, its seat closing against the receiver, with the projection on the back end of the intercepting-valve, arranged to close the admission-valve against its seat and the admission-valve closing against its seat, working within its chamber and regulated in travel by its stop, as and for the purpose set forth.

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

JOHN PLAYER.

Witnesses:

WILLIAM D. CONNER,
HENRY HOWSON.