

H. FAIRGRIEVE.

Improvement in Valves for Compound Steam-Engines.

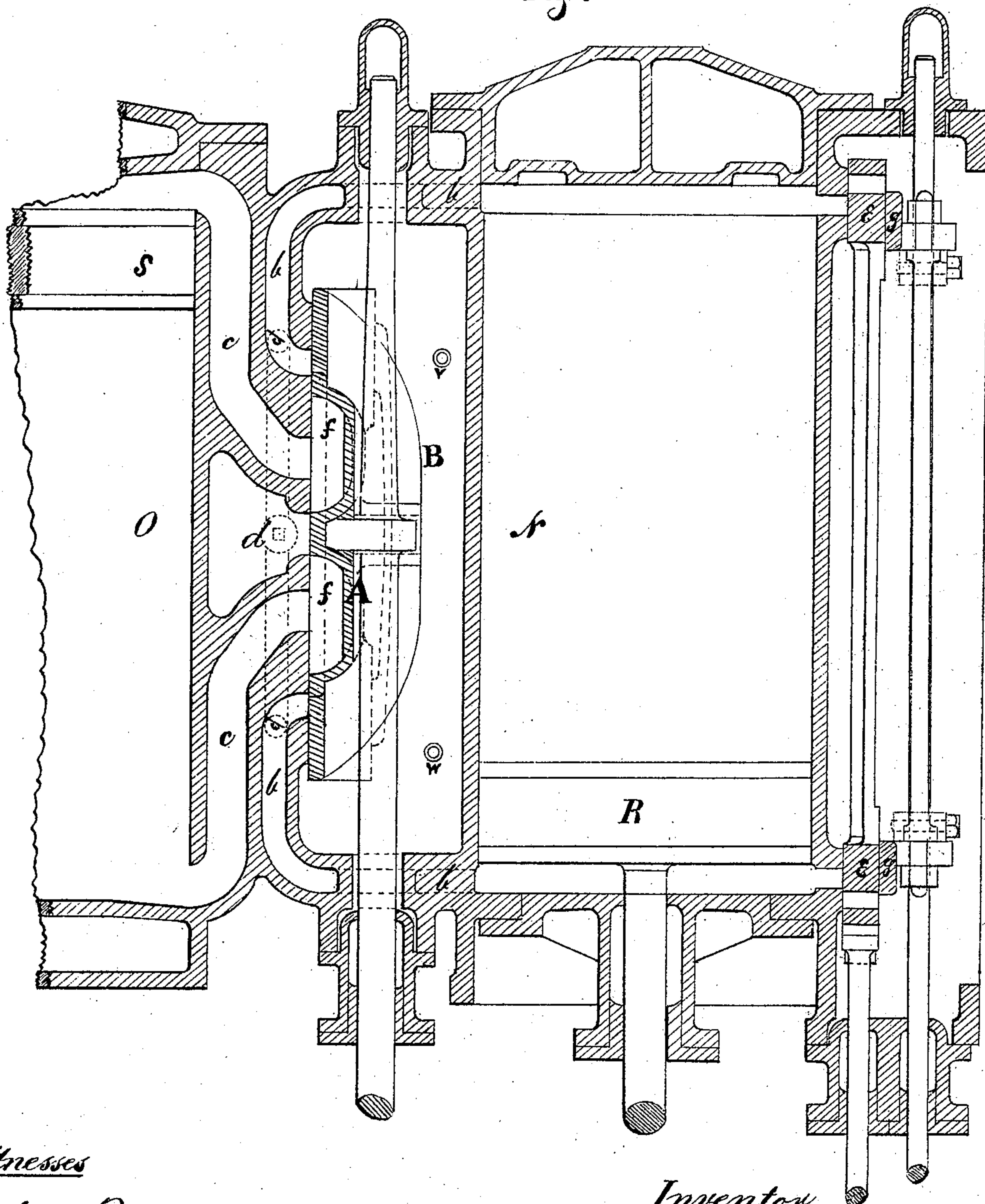
No. 132,649.

Patented Oct. 29, 1872.

Sectional Elevation

Scale 1 1/2 in. = 1 foot.

*Fig 1*



Witnesses

*J. B. Fairgrieve  
William Gill*

Inventor

*Hugh Fairgrieve*

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Fig 3

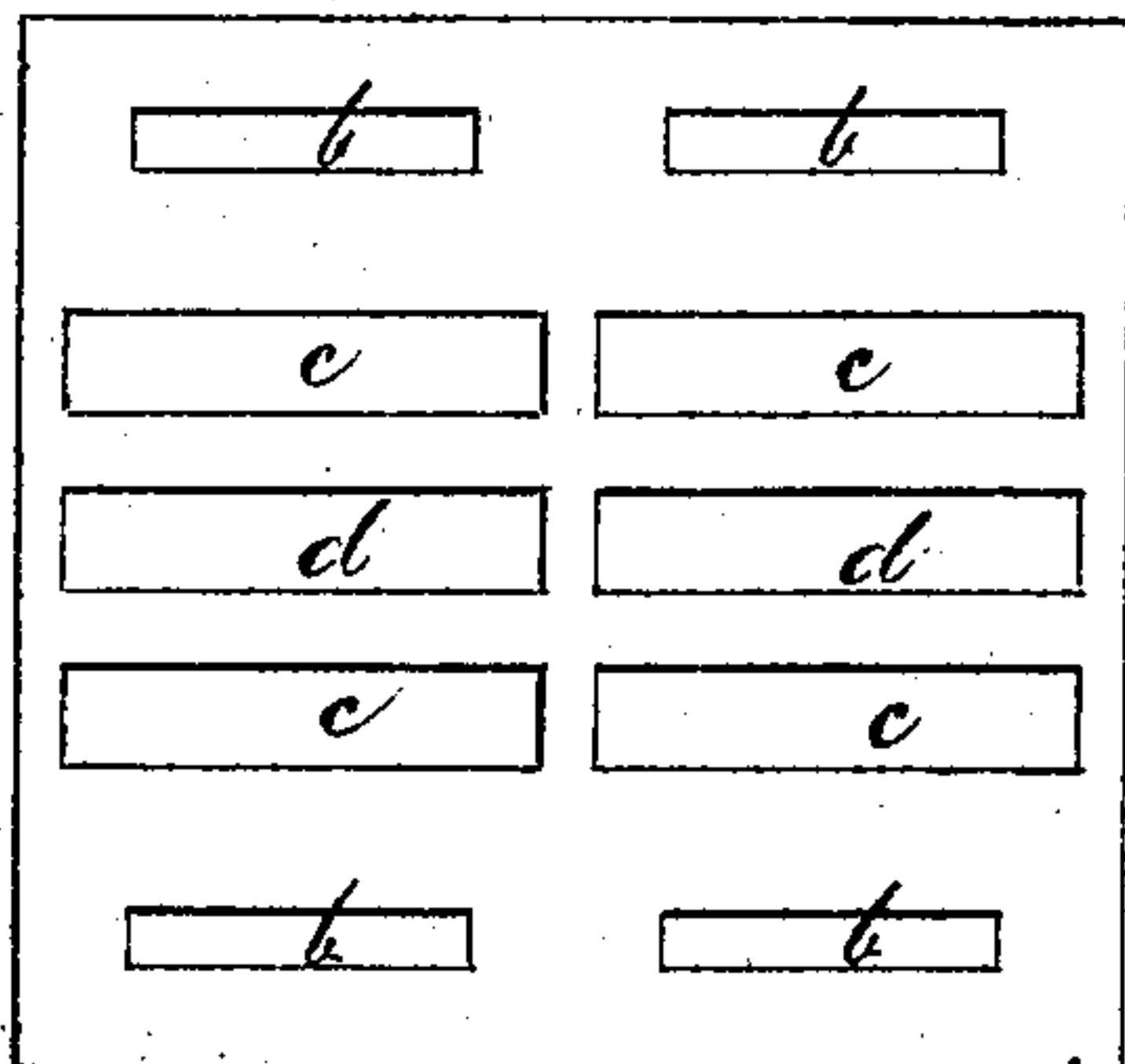


Fig 2

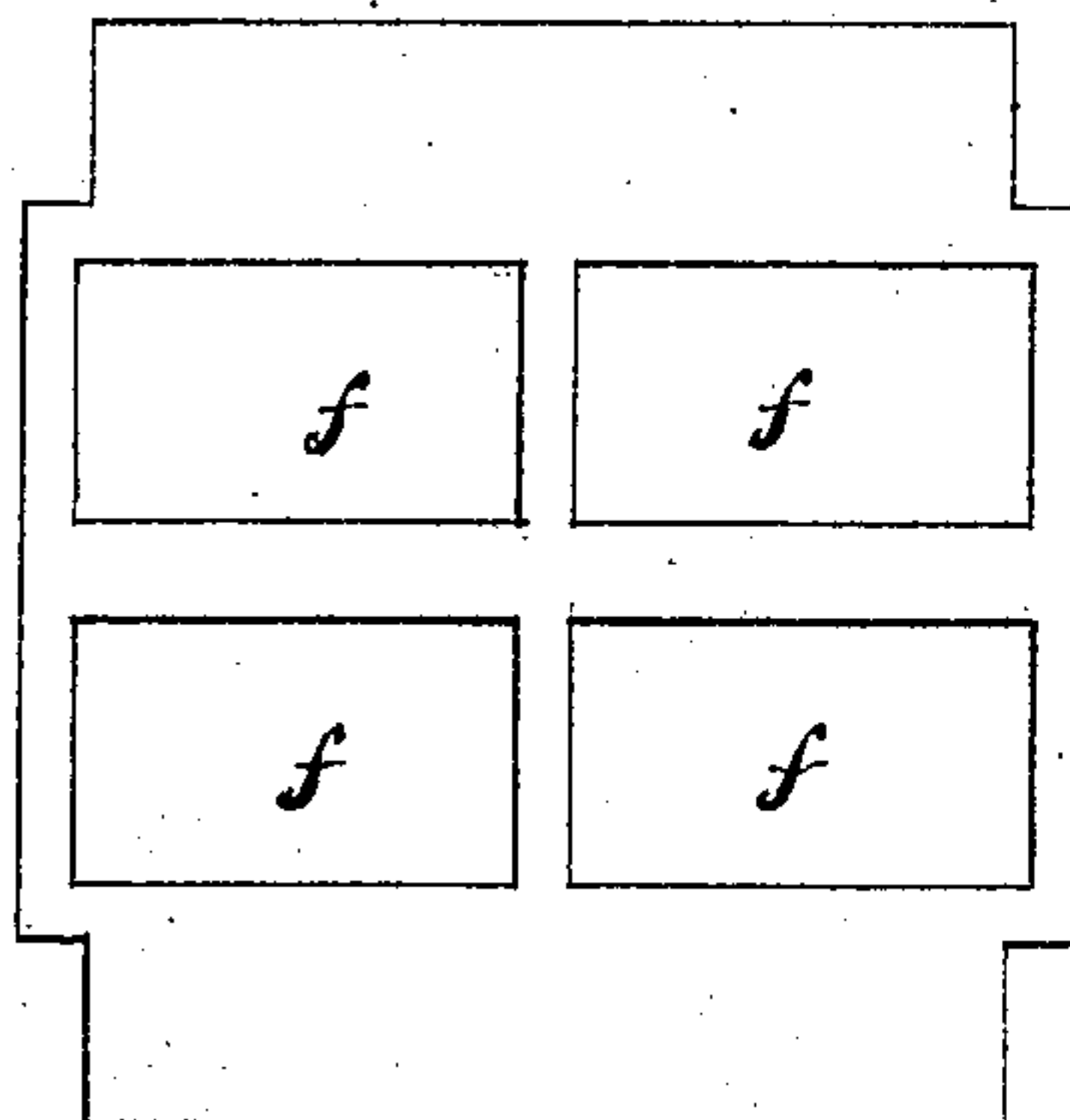


Fig 6

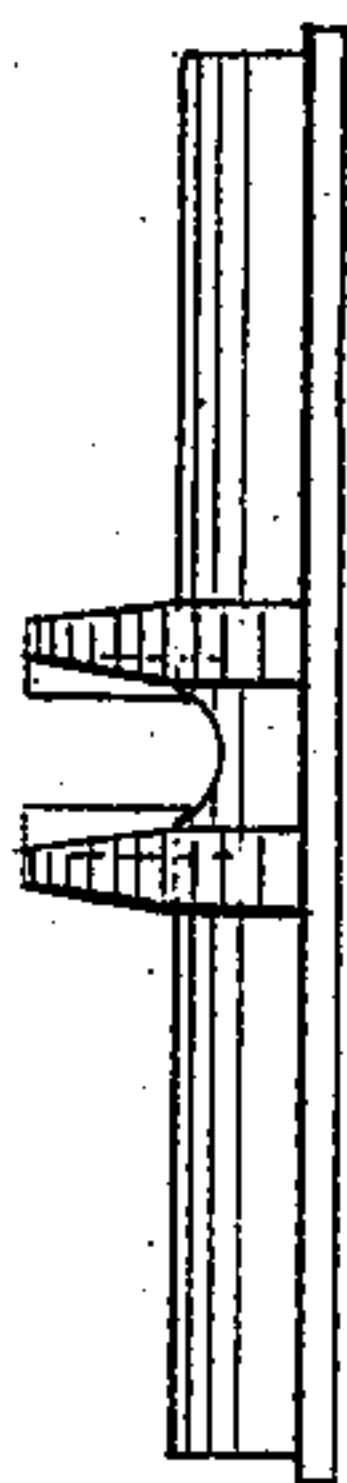


Fig 5

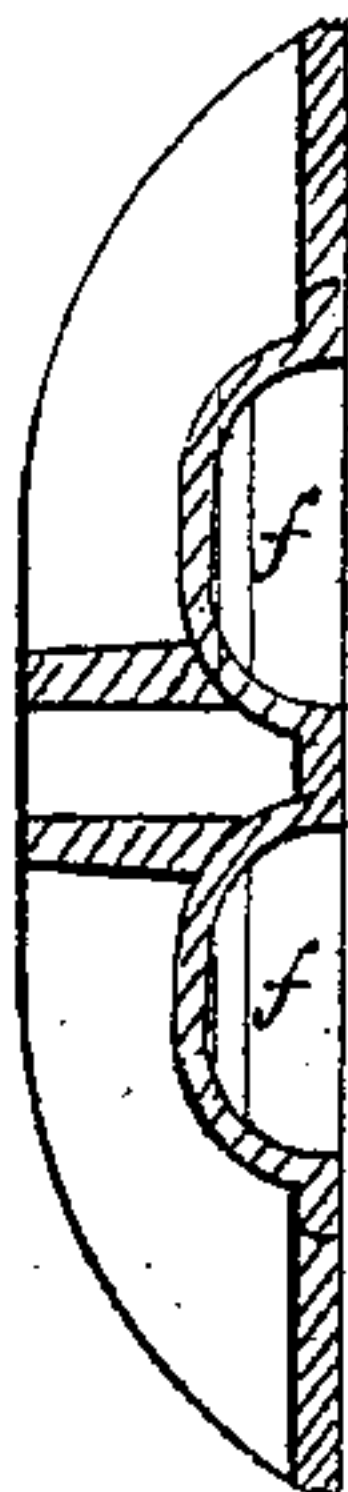
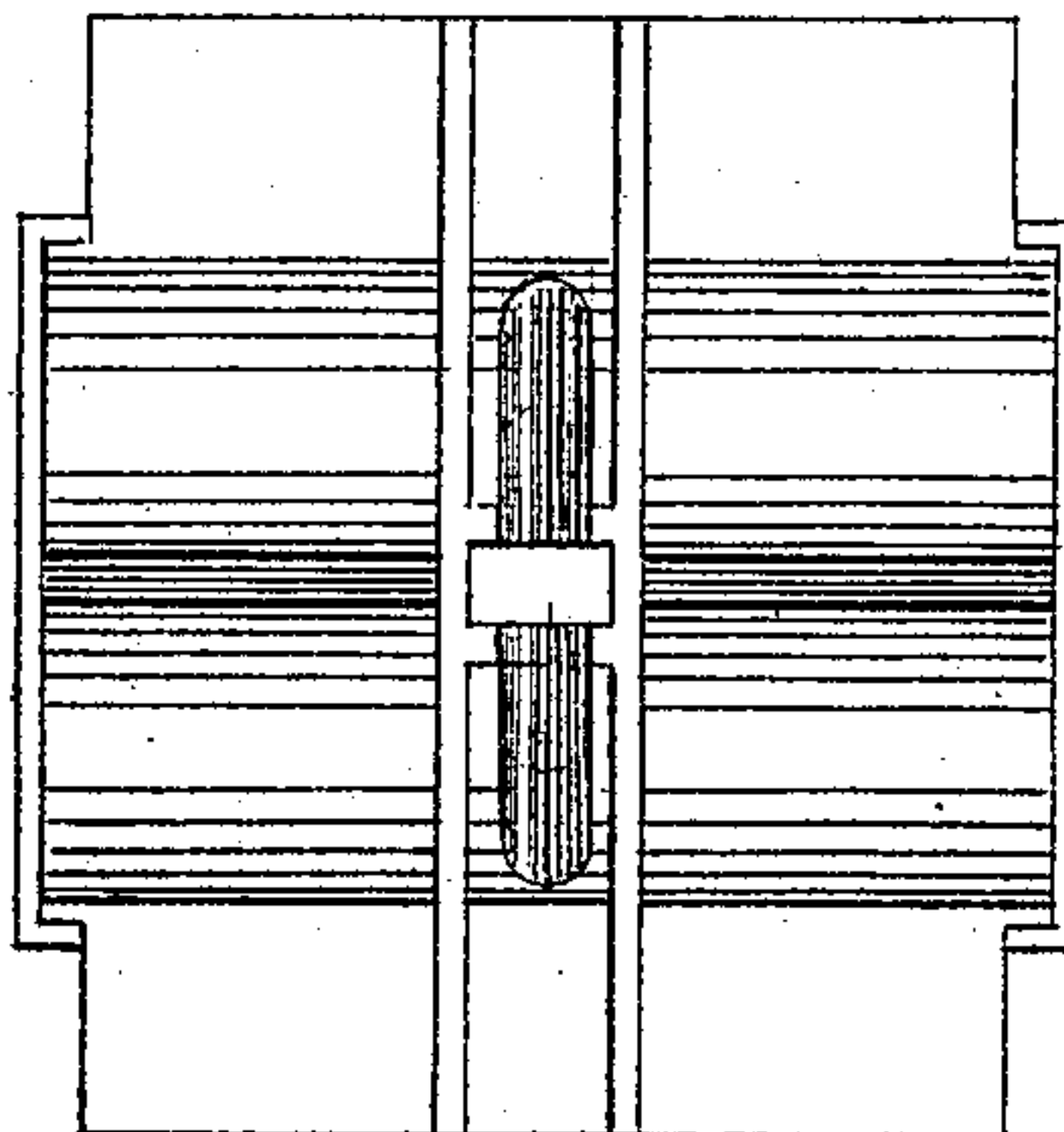


Fig 4



Scale 1 inch = 1 foot.

witnesses

J. R. Fairgrieve  
William Gill

Inventor

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# UNITED STATES PATENT OFFICE.

HUGH FAIRGRIEVE, OF HAMILTON, CANADA.

## IMPROVEMENT IN VALVES FOR COMPOUND STEAM-ENGINES.

Specification forming part of Letters Patent No. 132,649, dated October 29, 1872.

*To all whom it may concern:*

Be it known that I, HUGH FAIRGRIEVE, of the city of Hamilton, county of Wentworth, Province of Ontario, Canada, have invented a new and useful Improvement in the Valves of Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the arts to make and use the same, reference being had to the accompanying drawing forming part of this specification.

The object of this invention is to effect a greater economy in the working and using of compound or single-cylinder steam-engines; first, by the removal of friction from the face of the slide-valve as applied to either compound or single-cylinder engines, as hereinafter described; second, from the small amount of unproductive expansion as well as from the non-exposure of the steam to condensing influences between the two cylinders as applied to compound steam-engines.

In the accompanying drawing similar letters of reference indicate corresponding parts.

Figure 1 is a sectional elevation of a portion of the two cylinders, marked N and O, with their respective pistons R and S; of the valve-chest B with the adjustable pressure-valves V and W; and of the valve A, in which valve A there are two cavities, *ff*.

In the face of the large cylinder O, which is shown in section, there are five ports, (four steam-ports and an exhaust-port.) The ports *bb* form a direct communication between the cylinders N and O, outside and independent of the valve-chest B. The steam-ports *cc*, by means of the cavities *ff* of the valve A, form a communication with the aforesaid ports *bb*, which releases the steam from the cylinder N and admits it to the cylinder O. The cavities *ff* form, also, a communication between the ports *cc* and the exhaust-port *d*, which conducts the steam to the condenser of the engine.

Fig. 2 is a front view of the valve A, showing the cavities *ff*. Fig. 3 is a front view of the face of the large cylinder O, showing the ports *bb*, *cc*, and *d*. Fig. 4 is a view of the back of valve A. Fig. 5 is a side view of the valve A, with one side removed to show the cavities *ff* in section. Fig. 6 is an end view of the valve A.

Returning to Fig. 1, to the right of the small or high-pressure cylinder N, we find the

admission-valves E E and the cut-off valves *gg* for regulating the admission of the steam from the boiler to the high-pressure cylinder N, which are shown only in the drawing. (They forming no part of this invention, it was not considered necessary to show them in the model.)

This improved valve, as applied to compound steam-engines, works upon the face of the large or low-pressure cylinder O, and receives the steam from the high-pressure cylinder N under its face, through the ports *bb*, which are outside and independent of the valve-chest B; and, as applied to single-cylinder engines, it receives the steam direct from the boiler through the ports *bb*, without the intervention of the high-pressure cylinder N, the valve-chest B in both cases being used solely for the purpose of balancing the valve A, in the manner described.

It will be observed by the operation of the model that while any one of the cavities *ff* of the valve A is allowing the steam to escape from the one end of the high-pressure cylinder N, through the corresponding ports *b* and *c* into one end of the low-pressure cylinder O, the other cavity *f* of the said valve A is allowing the steam that has just performed its duty in the other end of the low-pressure cylinder O to escape through the other port *c* into the exhaust-port *d*, which conducts it to the condenser of the engine.

I make no claim to a slide-valve, such as the valve A, as adapted to be used in the ordinary steam-chest of any steam-engine where the steam must pass through the said chest in its passage to the cylinder or cylinders; but

What I do claim as my invention is—

1. The arrangement of the valve A adapted for operation in relation to the cylinders N and O, with the valve-chest B, as and for the purpose described.

2. The valve-chest B and the adjustable pressure-valves V and W, for the purpose of balancing the said valve A, in connection with either compound or single cylinder engines, substantially as described, and for the purpose set forth.

HAMILTON, March 9, 1872.

HUGH FAIRGRIEVE.

Witnesses:

J. B. FAIRGRIEVE,  
WILLIAM GILL.