

(No Model.)

S. S. WILLIAMSON.

BALANCE SLIDE VALVE.

No. 272,393.

Patented Feb. 13, 1883.

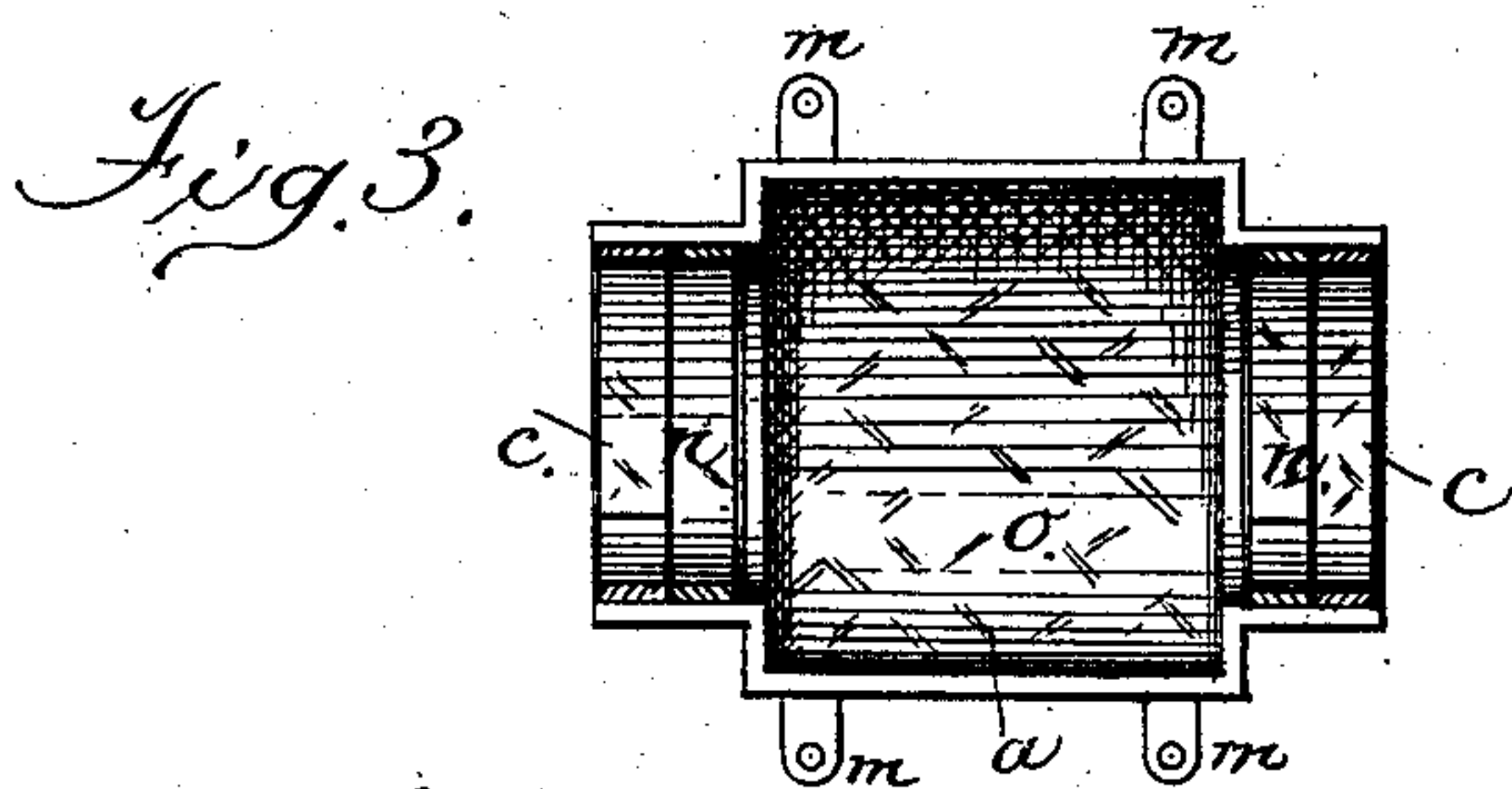
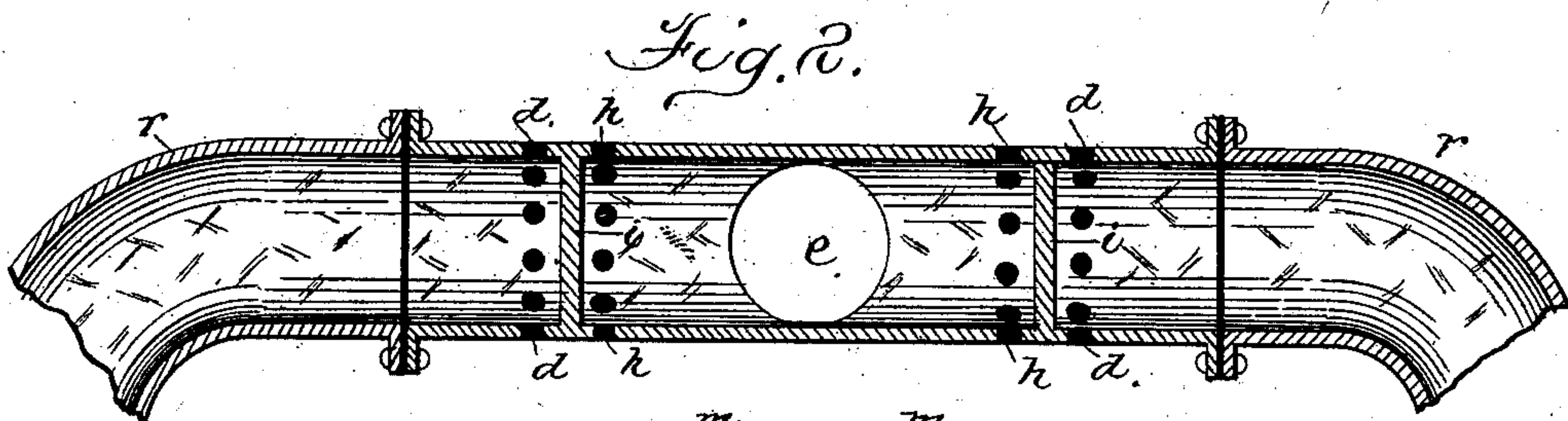
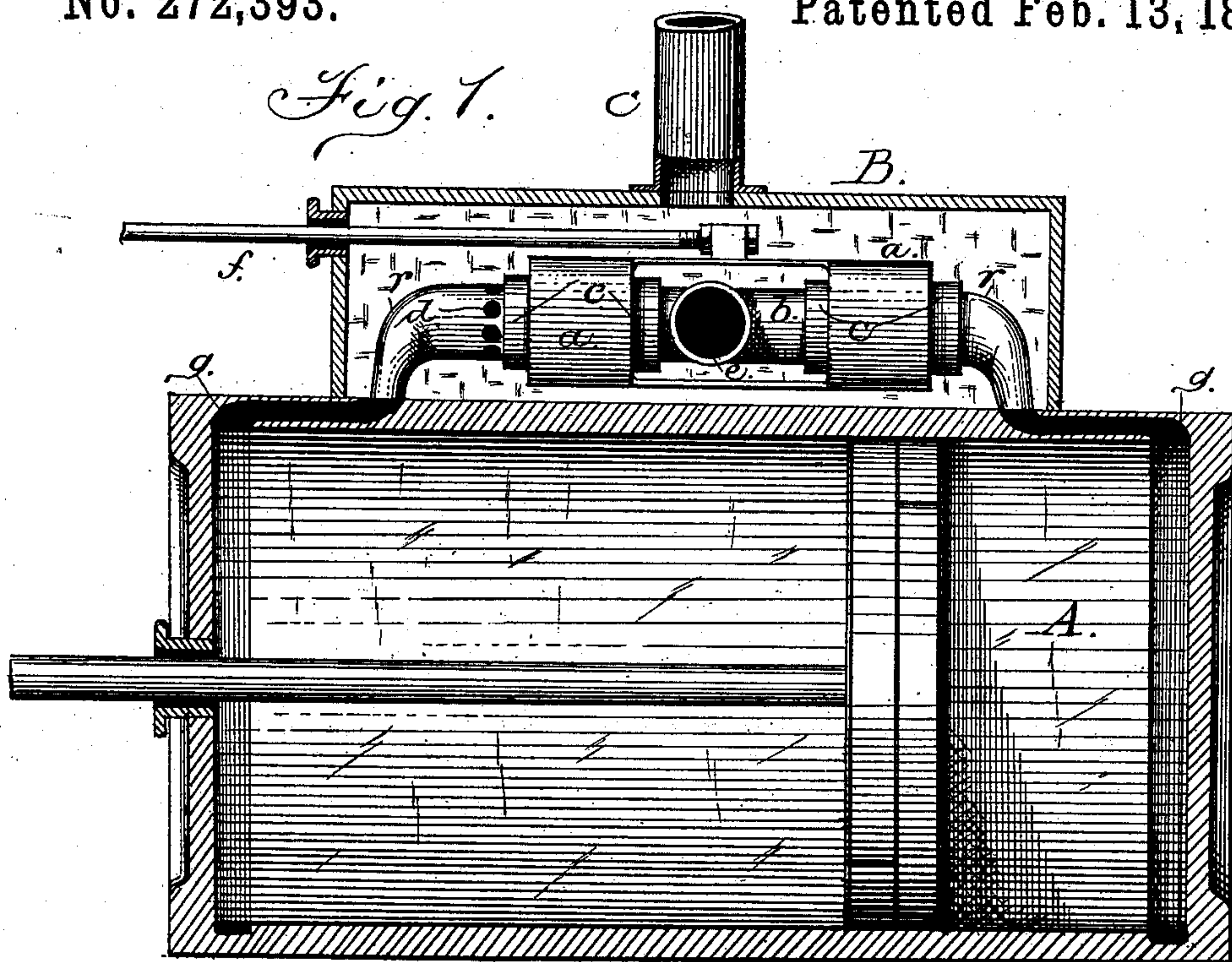
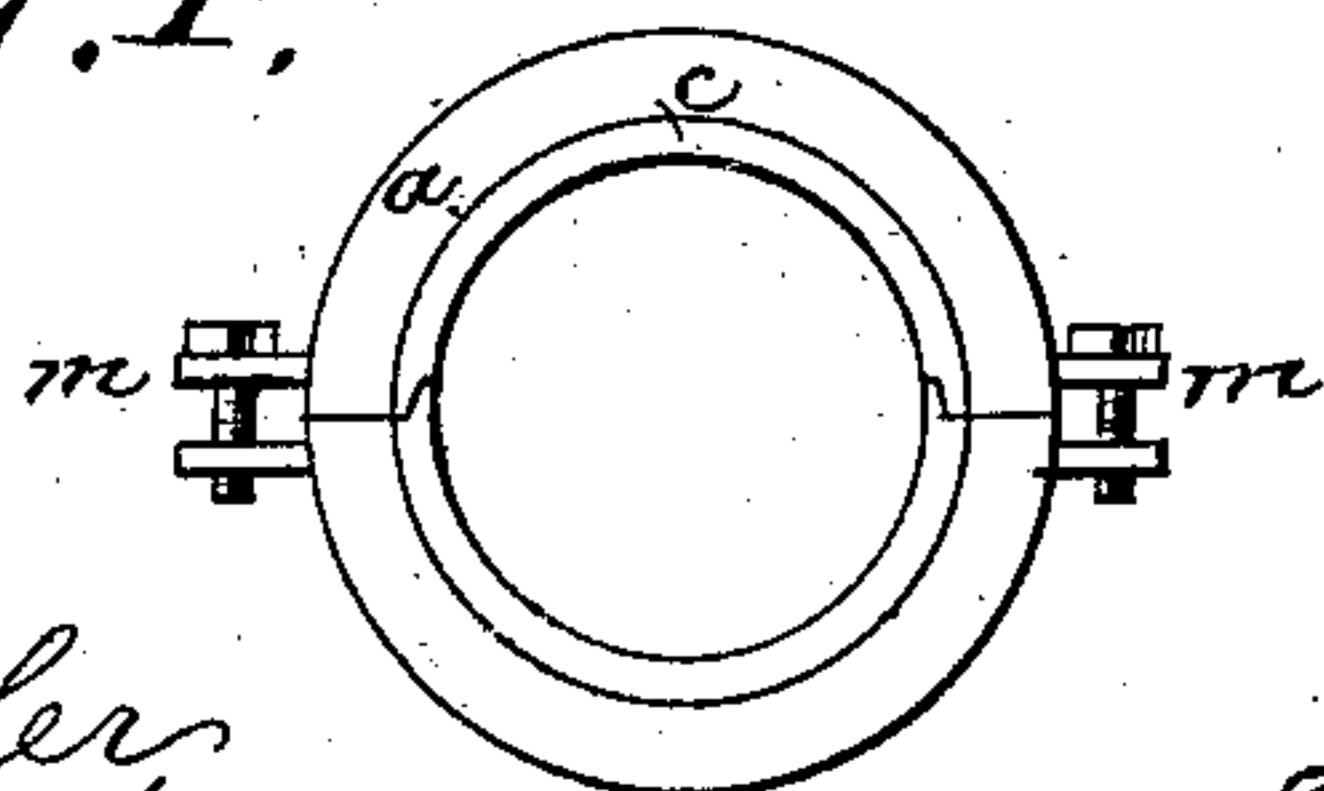


Fig. 4.



Witnesses;

Shafter Fowler,
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Inventor;

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UNITED STATES PATENT OFFICE.

S. STUART WILLIAMSON, OF WASHINGTON, D. C., ASSIGNOR OF ONE-EIGHTH
TO DAVID K. CARTER, OF SAME PLACE.

BALANCE SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 272,393, dated February 13, 1883.

Application filed June 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, S. STUART WILLIAMSON, a citizen of the United States, residing at Washington, in the District of Columbia, have
5 invented certain new and useful Improvements in Balance Slide-Valves for Steam-Engines; 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
10 art to which it appertains to make and use the same.

The object of this invention is to provide a simple, cheap, and durable anti-friction slide-valve, which shall be operated by the eccentric
15 in the same positive manner as those now in use; and to this end it consists in a cylindrical valve provided with ring-packing and fitted around a cylindrical valve-seat, around whose periphery ports and exhausts are cut,
20 so as to equalize the steam-pressure, preventing friction and wear, hereinafter more fully set forth in the annexed specification, and pointed out in the claims.

Reference being had to the accompanying
25 drawings, which form a part of this specification, Figure 1 is a section of the cylinder and steam-chest and an elevation of the valve and valve-seat. Fig. 2 is a cross-section of the valve-seat, showing the ports, exhausts,
30 and bridges. Fig. 3 is one-half of one side of the valve, showing the ring-packings; and Fig. 4 is an end view of the valve.

Corresponding letters represent like parts.

A is the cylinder, to which is attached in
35 the ordinary manner the steam-chest B.

C is the steam-pipe connected with the boiler.

b is the cylindrical valve-seat, around which fits valve a, having cavities o and covers c.
40 In covers c are fitted ring-packings n, that will expand and contract with the valve-seat b, preventing leakage or bindage.

d are the ports, which may be made in any number, around the periphery of valve-seat b.

45 h are the exhausts corresponding with ports d. i are the bridges which separate ports d from exhausts h, causing the exhaust-steam to flow out of ports d, around through cavities o in exhausts h, and out of general exhaust e,
50 which leads into the air or stack.

m are the ears through which pass bolts to fasten the two halves of the valve a together

and around valve-seat b; or in practice the valve may be cast in one piece and followers bolted on the ends to secure ring-packings, as
55 in the piston.

f is the valve-rod, of ordinary construction.

Valve-seat b may be secured by means of bolts to pipes r at each end, which gradually diverge into oblongs entering the cylinder at
60 clearances g. The circumference of valve-seat b may be of such dimensions as to allow the ports and exhausts to be made very narrow, materially decreasing the throw of the eccentric.
65

From the foregoing description it will be obvious that the steam-pressure, instead of causing an increase of friction by its action upon the back of the valve only, will be equally distributed and leave but the weight of the
70 valve to cause friction, which will be comparatively nothing.

I am aware that cylindric valves and valve-seats have been used to equalize the steam-pressure; but for the lack of provision being
75 made for expansion and contraction they "bind," causing great friction and noise. Therefore I do not broadly claim the same; but

What I do claim as new, and desire to secure by Letters Patent of the United States, is—
80

1. In a slide-valve for engines, the cylindrical valve a and ring-packings n, in combination with cylindrical valve-seat b, substantially as and for the purpose specified.
85

2. In a slide-valve for engines, the cylindrical valve a, cavities o, covers c, and ring-packings n, in combination with cylindrical valve-seat b, substantially as and for the purpose specified.
90

3. In a slide-valve for engines, the cylindrical valve a, cavities o, covers c, and ring-packings n, in combination with cylindrical valve-seat b, ports d, exhausts h, bridges i, and
95 general exhaust e, substantially as and for the purpose specified.

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

S. STUART WILLIAMSON.

Witnesses:

W. T. JOHNSON,

L. D. WILLIAMSON.