

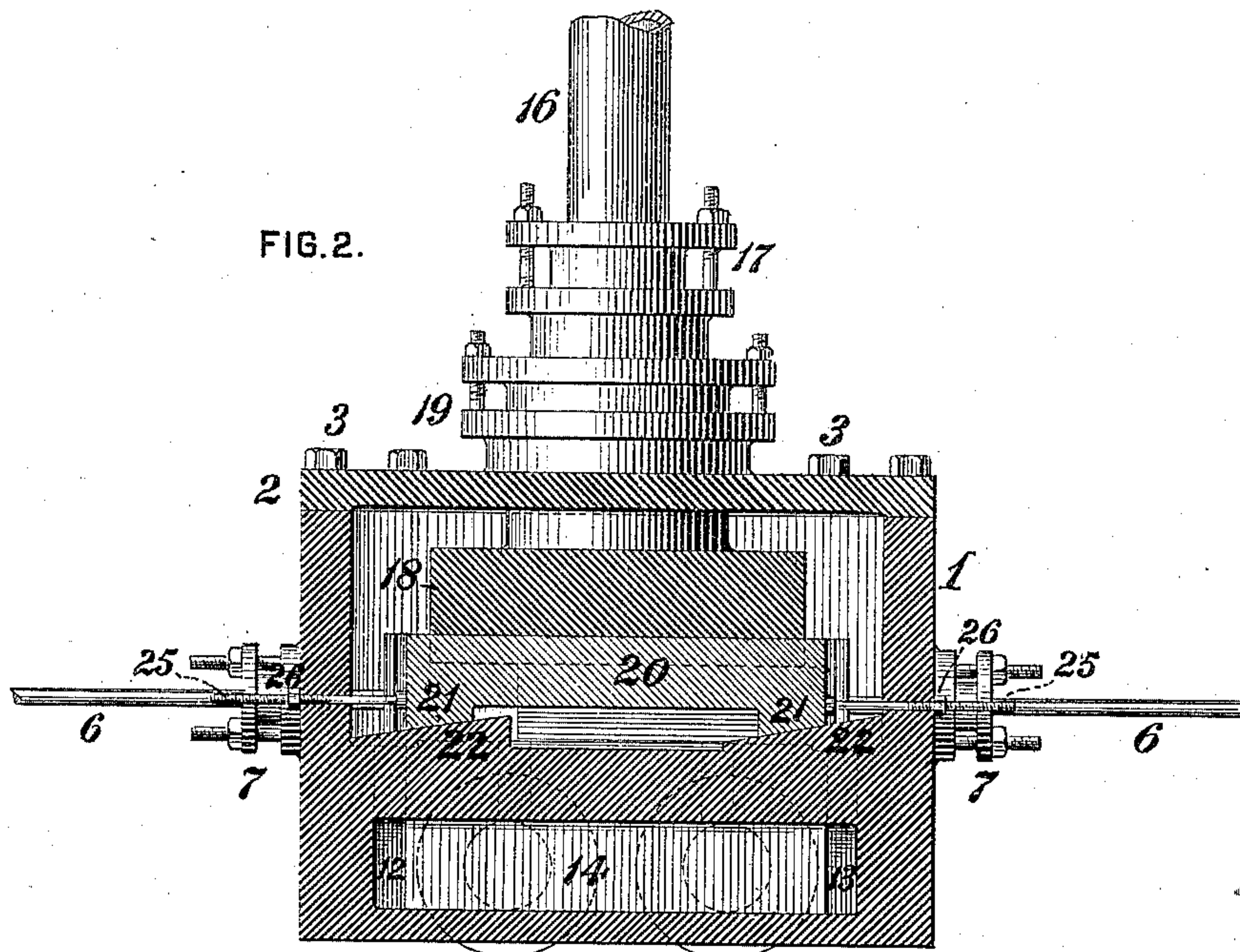
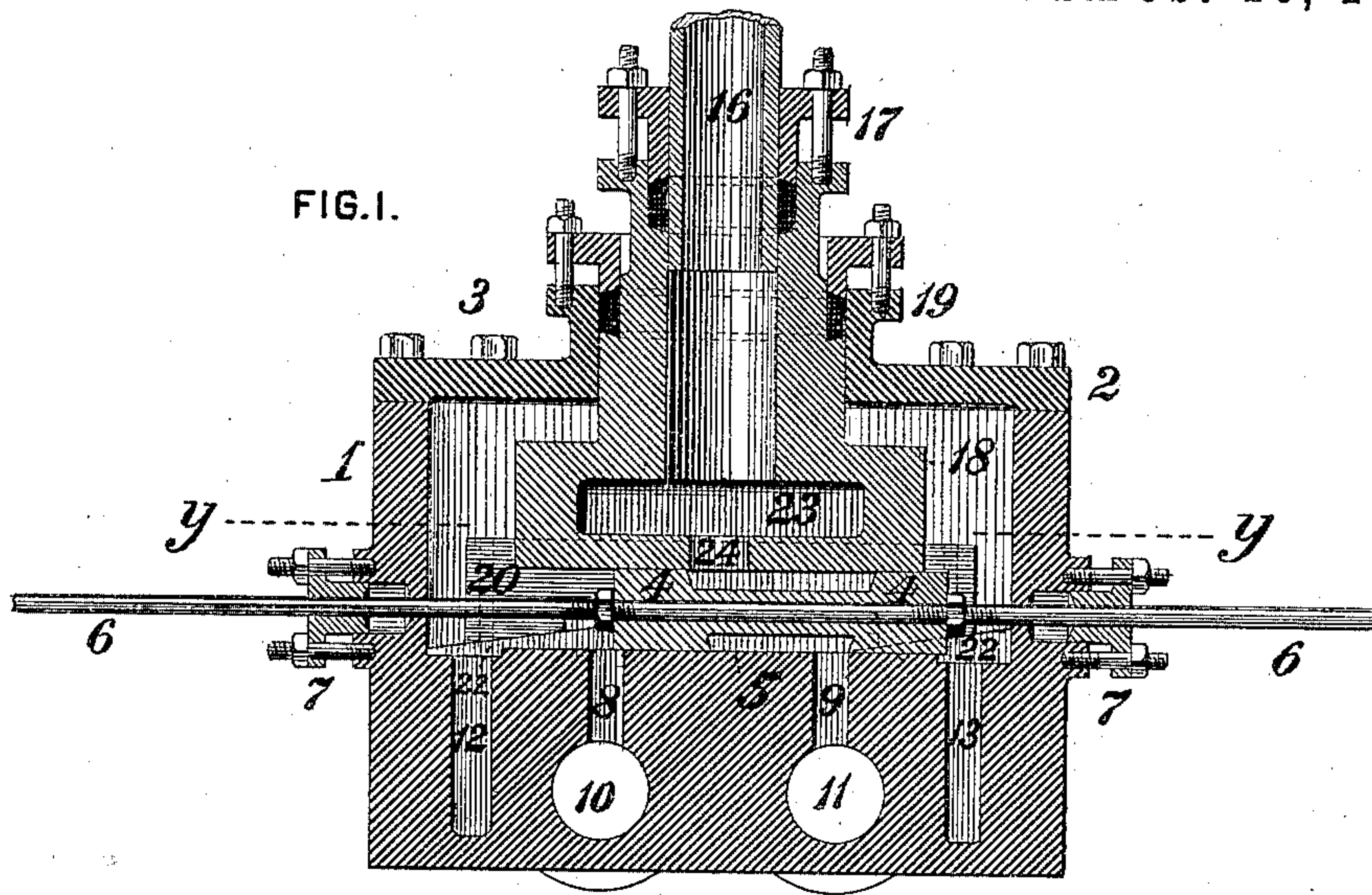
(No Model.)

2 Sheets—Sheet 1.

D. MERCER.  
BALANCED VALVE.

No. 312,000.

Patented Feb. 10, 1885.



WITNESSES:

*R. H. Whittlesey*  
*E. M. Clarke*

INVENTOR

*David Mercer,*  
*by J. Snowden Bell,*  
*Atty*



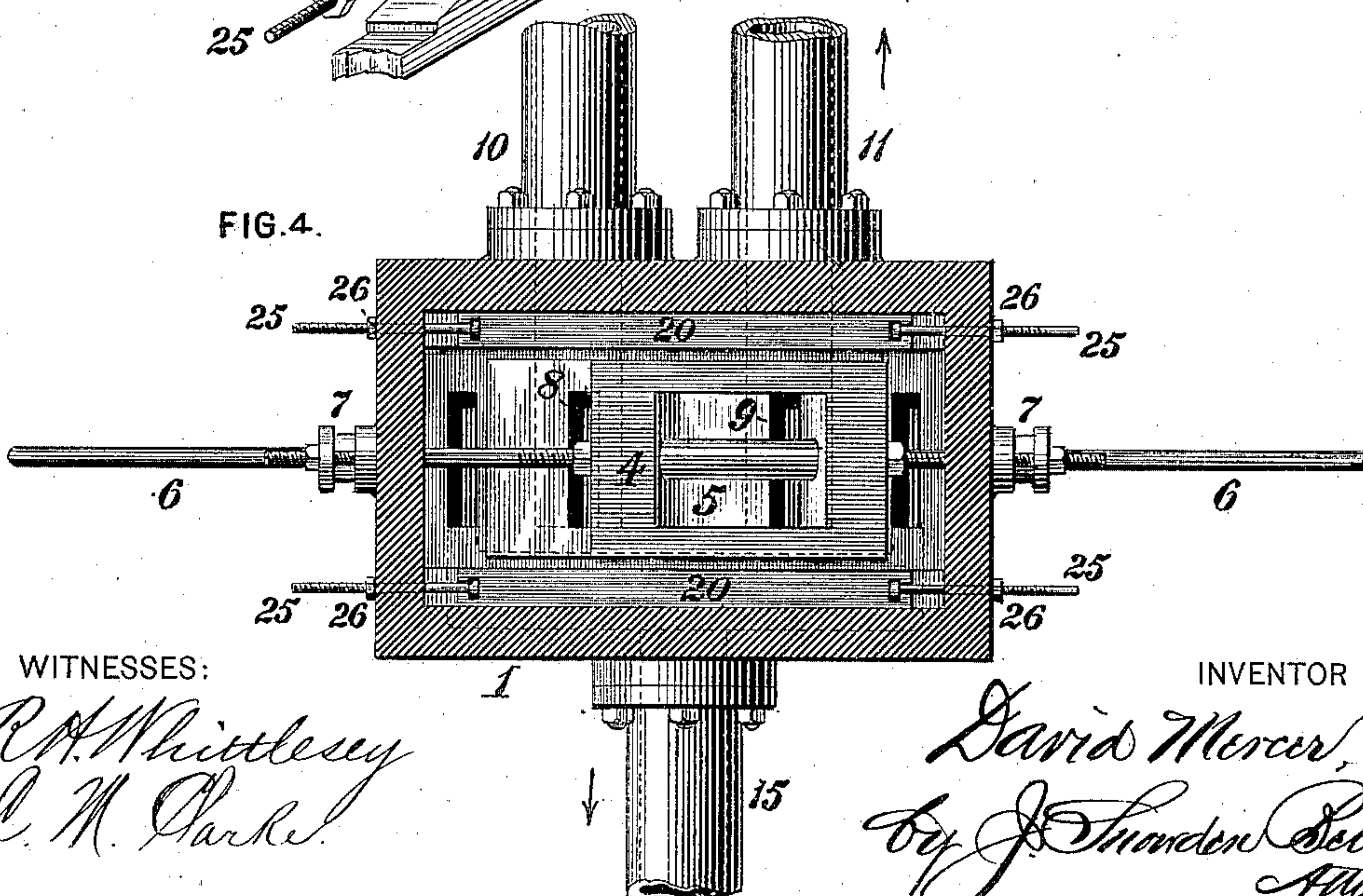
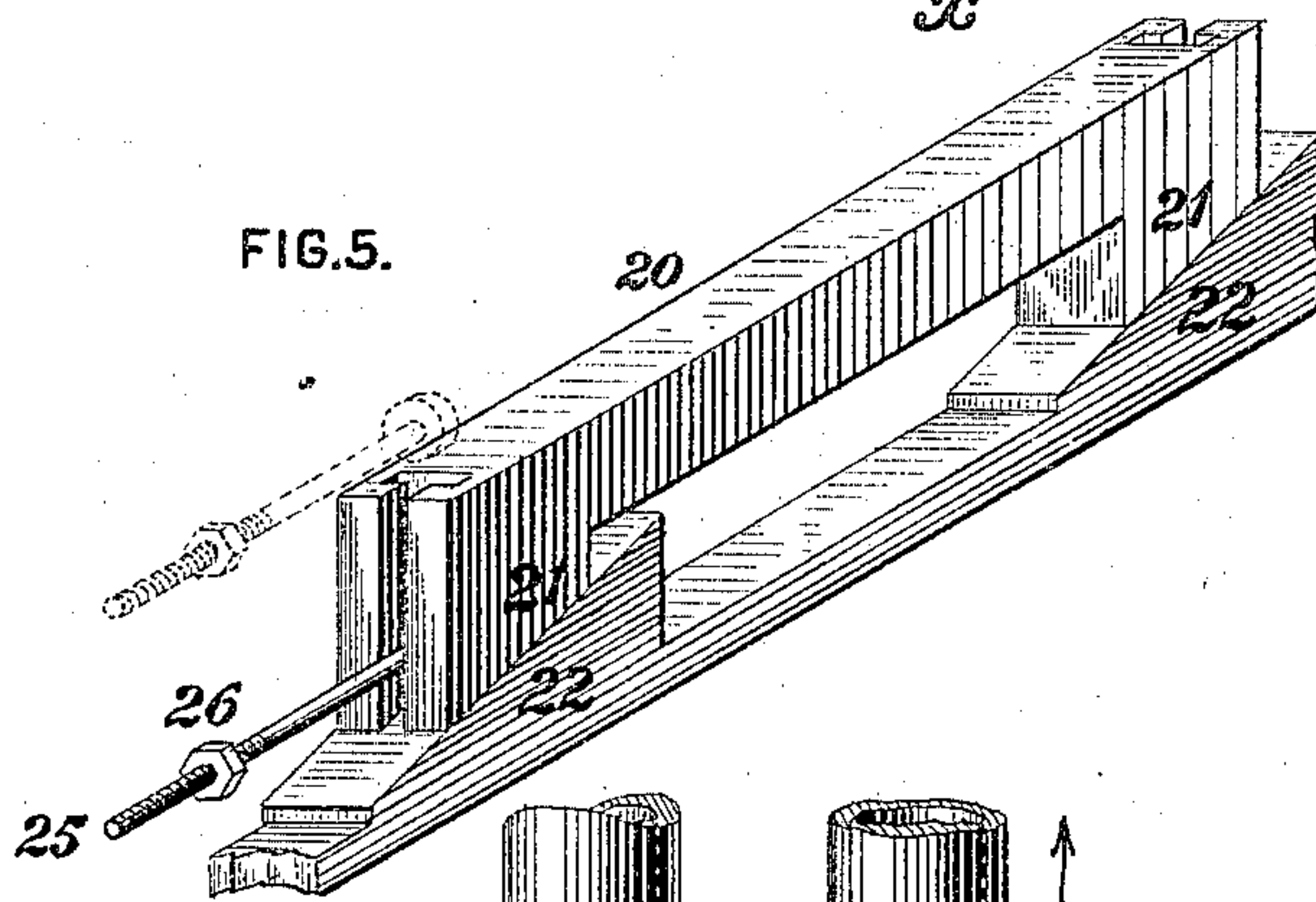
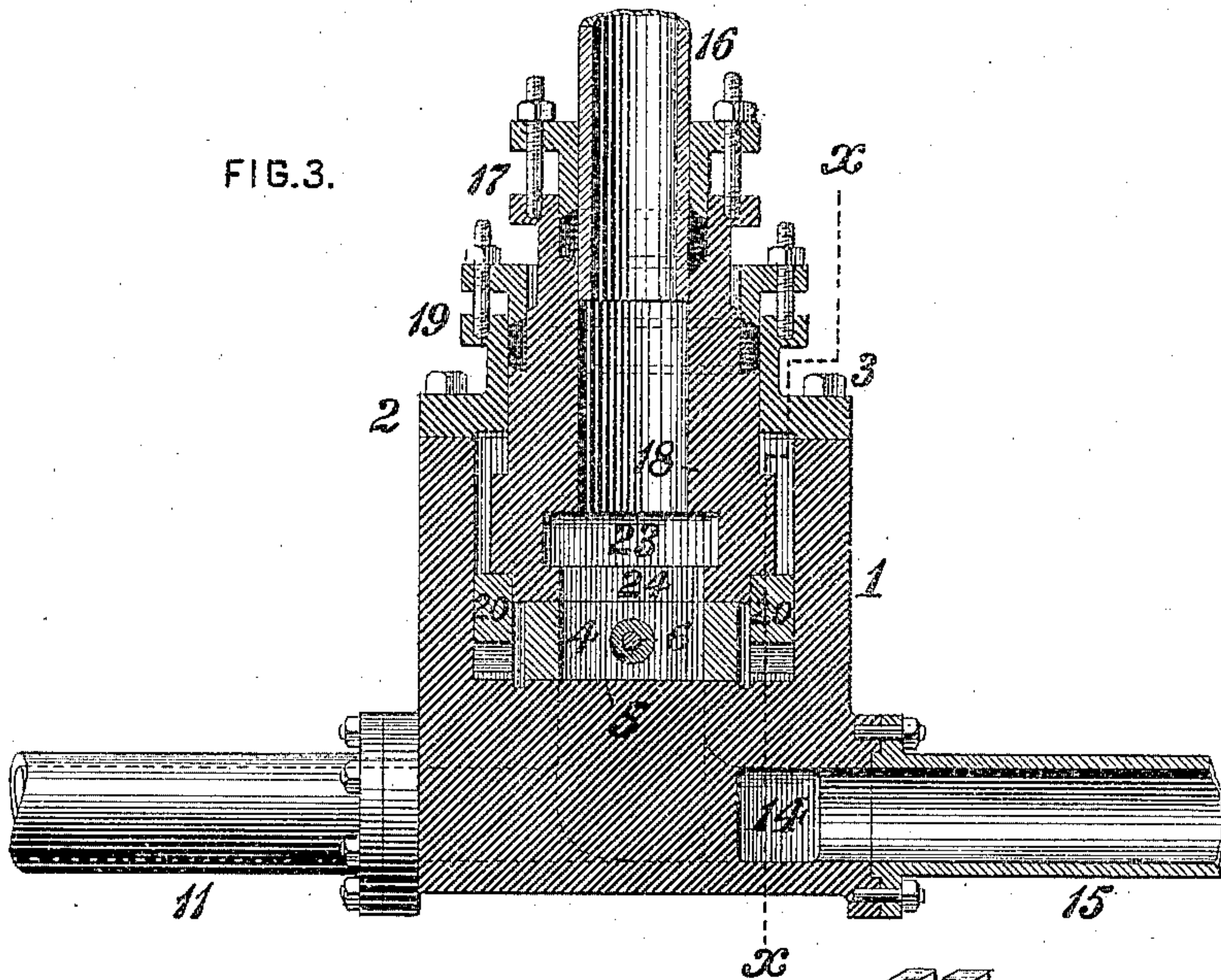
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2 Sheets—Sheet 2.

D. MERCER.  
BALANCED VALVE.

No. 312,000.

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WITNESSES:

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# UNITED STATES PATENT OFFICE.

DAVID MERCER, OF BETHLEHEM, PENNSYLVANIA.

## BALANCED VALVE.

SPECIFICATION forming part of Letters Patent No. 312,000, dated February 10, 1885.

Application filed July 5, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID MERCER, of Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain  
5 new and useful Improvements in Balanced Valves, of which improvements the following is a specification.

My invention relates to valves for regulating and directing the passage of fluids under  
10 high pressures; and its object is to prevent the rapid wear of the surfaces in contact, and the waste by leakage of the fluid thereat, which has heretofore been occasioned by the excessive pressure acting on such valves.

15 To this end my improvements consist in certain novel devices and combinations of mechanism for relieving the valve of undue pressure and maintaining it in such normal relation to its seat that its movement may be  
20 effected without injurious friction, and the leakage of fluid shall be effectually prevented.

The improvements claimed are hereinafter fully set forth.

In the accompanying drawings, Figure 1 is  
25 a vertical longitudinal central section through a valve and casing embodying my invention; Fig. 2, a vertical longitudinal section through the same at the line *x x* of Fig. 3; Fig. 3, a vertical transverse central section; Fig. 4, a horizontal  
30 section through the casing at the line *y y* of Fig. 1, with the pressure-cage removed; and Fig. 5, a view in perspective of one of the bearing-blocks and its inclined ways or bearings.

35 In the practice of my invention I provide a valve chest or casing, 1, of proper strength to resist the pressure of the fluid whose passage is to be governed by the valve, which is closed at its top by a removable lid or bonnet, 2, secured by bolts 3 to the casing, and  
40 forming a tight joint therewith. A valve or gate, 4, formed of two rectangular plates or bars connected by longitudinal bars, is fitted truly to and adapted to slide longitudinally  
45 on a valve-face, 5, in the casing, the movement of the valve being effected by a stem, 6, passing through properly-packed stuffing-boxes 7 in the casing 1. Ports 8 9,  
50 formed in the valve-face 5, communicate, respectively, with induction and eduction pipes 10 and 11, secured to nozzles on one side of the valve-chest and leading therefrom to connec-

tions with the cylinder or other chamber or reservoir to and from which the fluid is to be supplied and exhausted, and ports 12 and 13, 55 located between the ports 8 and 9, and the ends of the valve-chest, communicate with a chamber, 14, on the opposite side of the chest to the pipes 10 11. A discharge-pipe, 15, connected to a nozzle on the side of the chamber 14, serves to carry off the fluid which has been exhausted through the eduction-pipe to a desired point of discharge. Fluid is led into the chest through a supply-pipe, 16, connected through a stuffing-box, 17, to the outer  
60 end of a pressure cage or box, 18, which passes through a stuffing-box, 19, in the bonnet 2 of the valve-chest, and bears at bottom upon the top of the valve 4, and on two lateral adjustable blocks, 20, having longitudinally beveled or inclined lower faces, 21, which rest on  
70 corresponding inclined ways or guides, 22, in the valve-chest on each side of the valve 4. A chamber, 23, of enlarged transverse sectional area relatively to that of the supply-pipe 16, is formed in the lower portion of the pressure-cage 18, and a delivery-opening, 24, of smaller sectional area than the supply-pipe, is formed in the bottom of the chamber 23, establishing communication from the same to  
75 the space between the two end plates or bars of the valve 4. The bearing of the pressure-cage upon the bearing-blocks 20 may be increased or diminished, as required, by the adjustment of the packing in the stuffing-box  
80 19, and the proper fitting of the pressure-cage against the valve 4 may be accurately regulated by the longitudinal adjustment of the bearing-blocks, which is effected by means of  
85 adjusting-screws 25, having heads which fit in T-shaped slots in the ends of the bearing-blocks, said screws passing through the valve-chest and being provided with nuts 26, adapted to bear against the outside thereof. By the  
90 provision of the chamber 23 and delivery-opening 24 the valve 4 is relieved of the pressure of the incoming fluid, which acts upon the pressure-cage instead of upon the valve, and by proper adjustment of the bearing-blocks 20, which may be readily made without  
95 interfering with the operative relation of the parts, the bearing of the pressure-cage upon the valve may be regulated to and maintained at such degree as is requisite to afford  
100



proper tight joints between the pressure-cage, the valve, and the valve-face, and undue and excessive friction and wear of the parts and leakage of fluid will be effectually prevented.

5 In the position shown in the drawings fluid supplied through the pipe 16 will pass through the delivery-opening 24, and between the end plates of the valve 4 through the port 9 and pipe 11 to the cylinder or other place of utili-  
10 zation, the discharge therefrom being made through the pipe 11, ports 9 and 13, chamber 14, and discharge-pipe 15. By the movement of the valve to the left, so as to uncover the port 8 to the opening 24, the supply of fluid  
15 will be effected through the pipe 10, and its exhaust through the pipe 10 effected by the further movement of the valve to the left.

I am aware that balancing or pressure plates fitting over a valve and resting adjustably  
20 upon fixed supports have been heretofore known, and such therefore I do not broadly claim.

I claim as my invention and desire to secure by Letters Patent—

25 1. The combination of a valve-chest, a valve governing ports in a valve-face therein, a pressure cage or box fitting against the valve on the side thereof opposite the valve-face, said pressure-cage having a closed internal supply-  
30 chamber, a supply-pipe leading into the supply-chamber and of smaller transverse sectional area than said chamber, a delivery-pas-

sage of smaller transverse sectional area than the supply-pipe and leading from the side of the chamber opposite said pipe into the valve-  
35 chest, and bearings supporting the pressure-cage on opposite sides of the valve, substantially as set forth.

2. The combination of a valve-chest, a valve, a pressure-cage, and adjustable bearing-blocks  
40 for supporting the pressure-cage and regulating the bearing thereof against the valve, substantially as set forth.

3. The combination of a valve-chest, a valve, a pressure-cage, adjustable bearing-blocks  
45 supporting the pressure-cage on its lower end, and a stuffing-box adapted to regulate the bearing of the pressure-cage upon the bearing-blocks, substantially as set forth.

4. The combination of a valve-chest, a valve, a pressure-cage, bearing-blocks having longi-  
50 tudinally inclined or beveled lower faces, inclined guides or ways supporting said bearing-blocks, adjusting-screws coupled to said bearing-blocks and passing through the walls  
55 of the valve-chest, and nuts engaging said screws and adapted to bear against the outside of the valve-chest, substantially as set forth.

DAVID MERCER.

Witnesses:

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JNO. TAYLOR.