

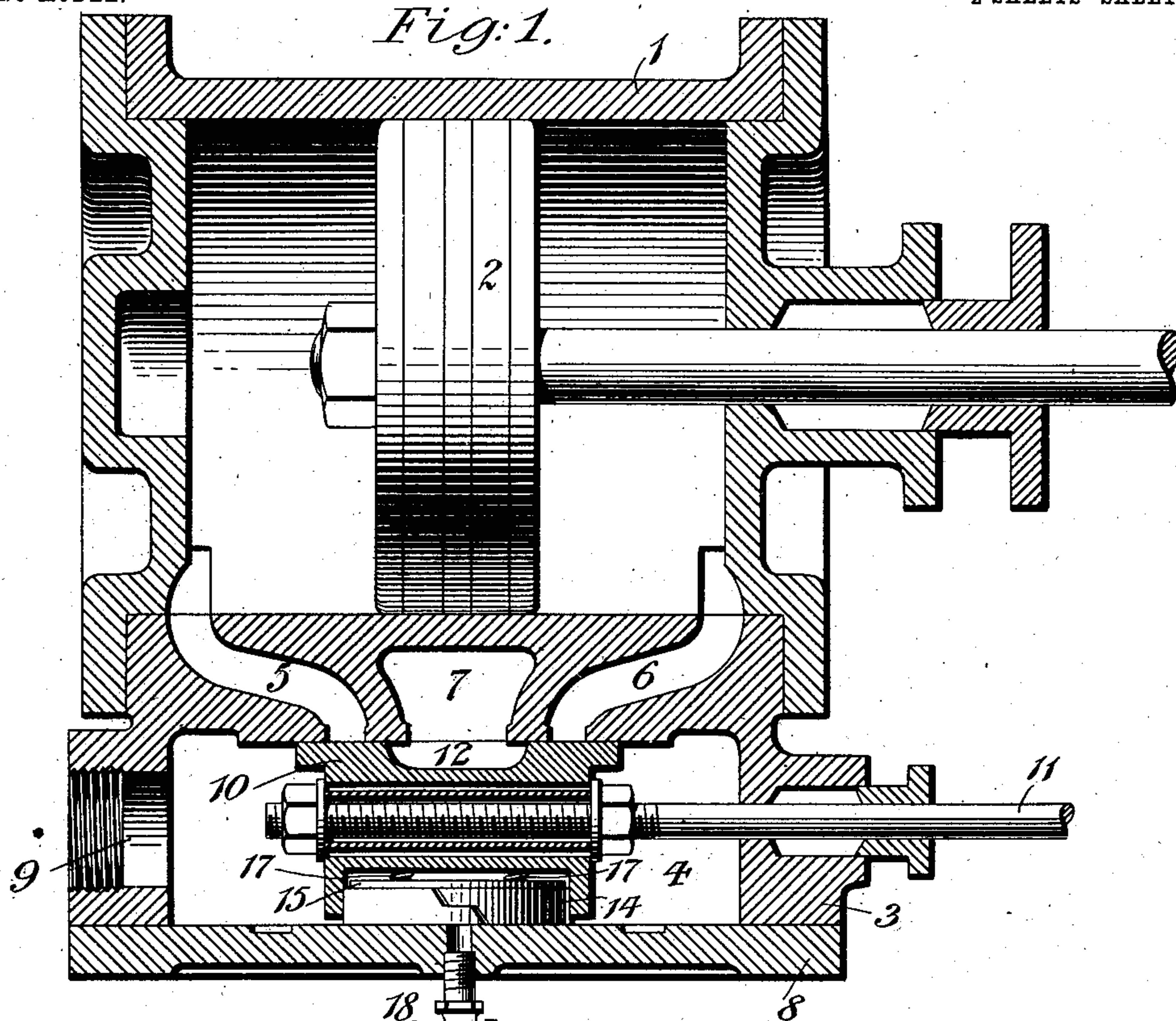
No. 721,356.

PATENTED FEB. 24, 1903.

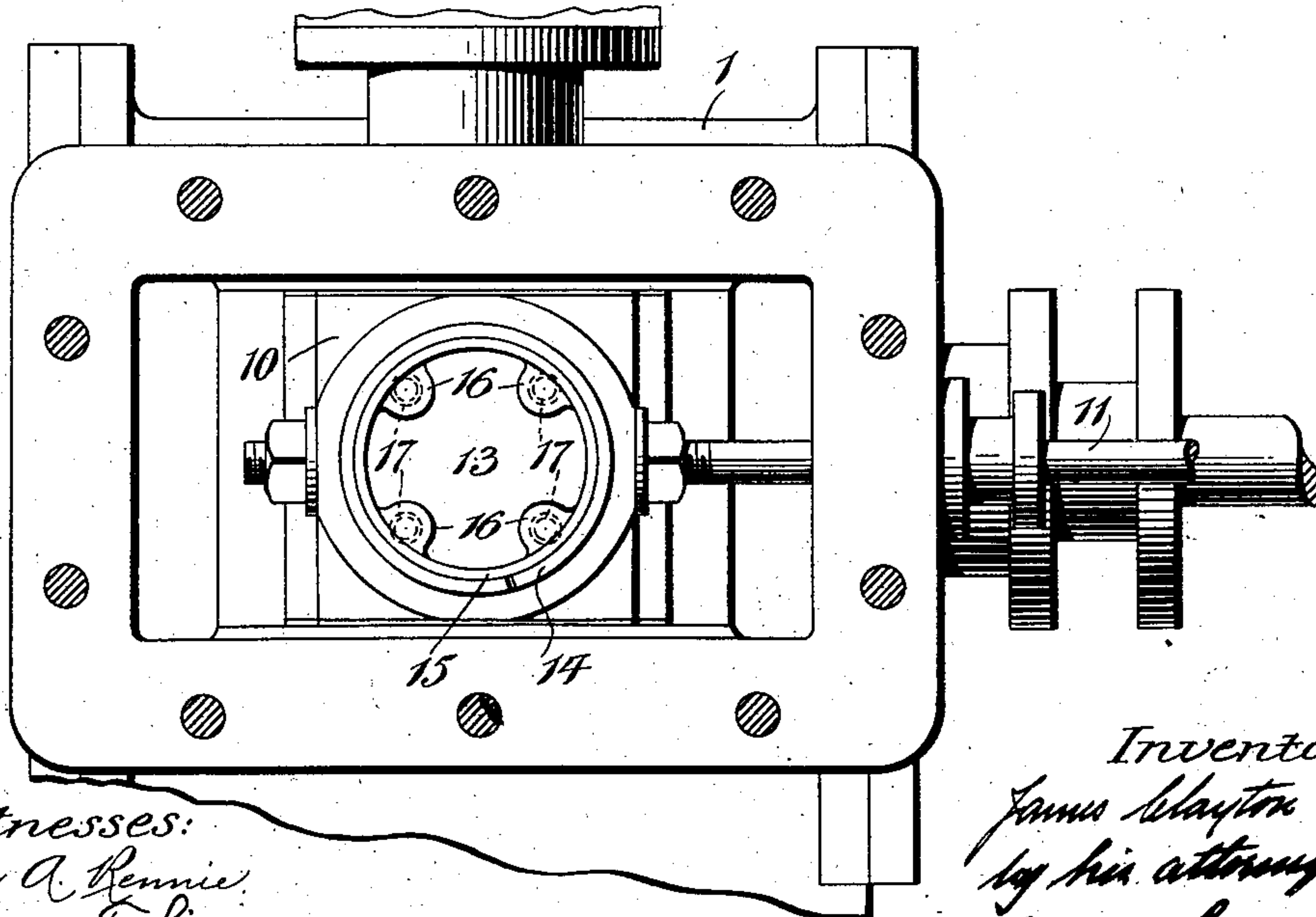
J. CLAYTON.  
BALANCED SLIDE VALVE.  
APPLICATION FILED JAN. 25, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



*Fig. 2.*



Witnesses:  
John A. Rennie.  
Henry T. Lueme.

Inventor:  
James Clayton  
by his attorney  
Spencer & Howard

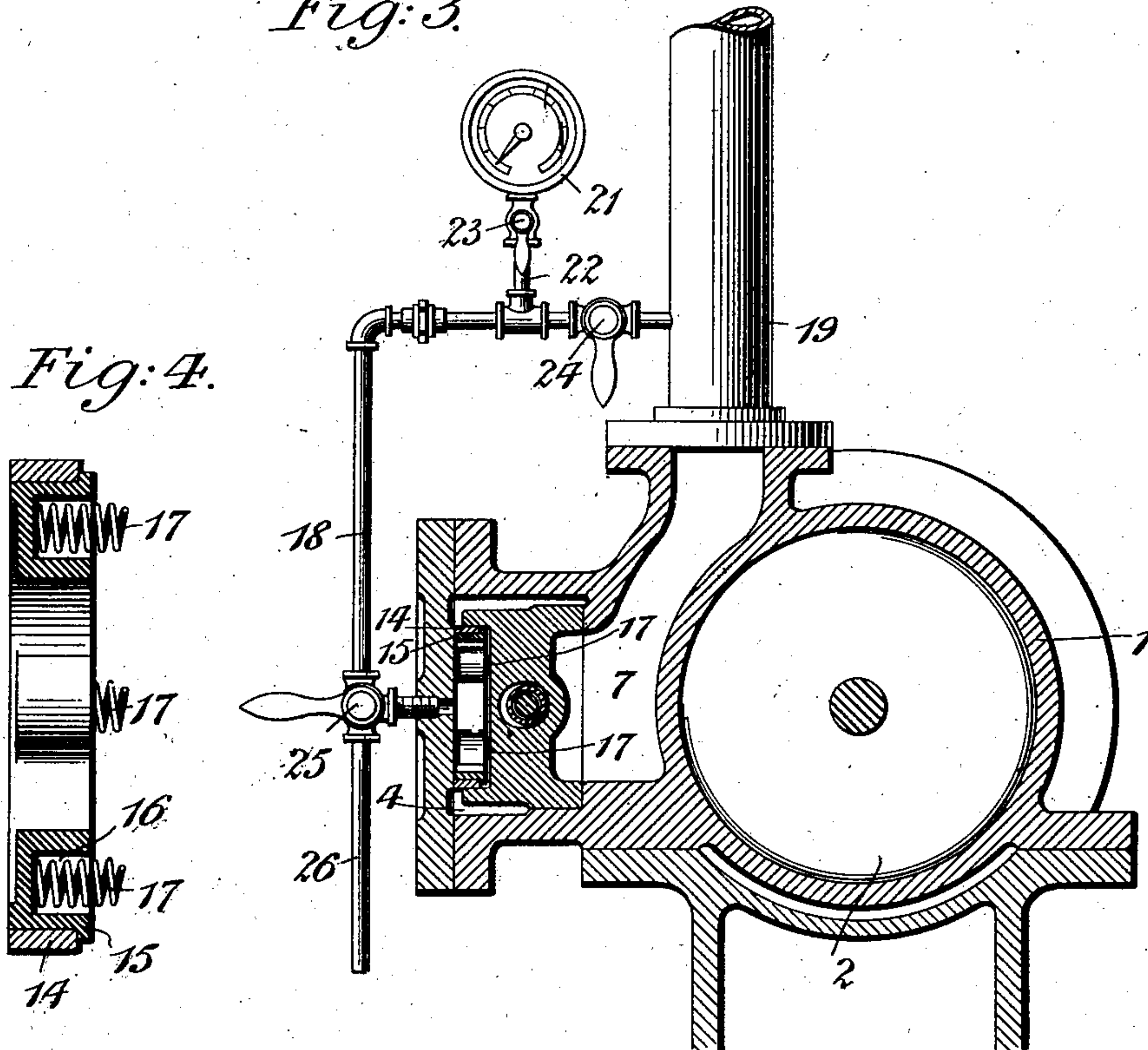
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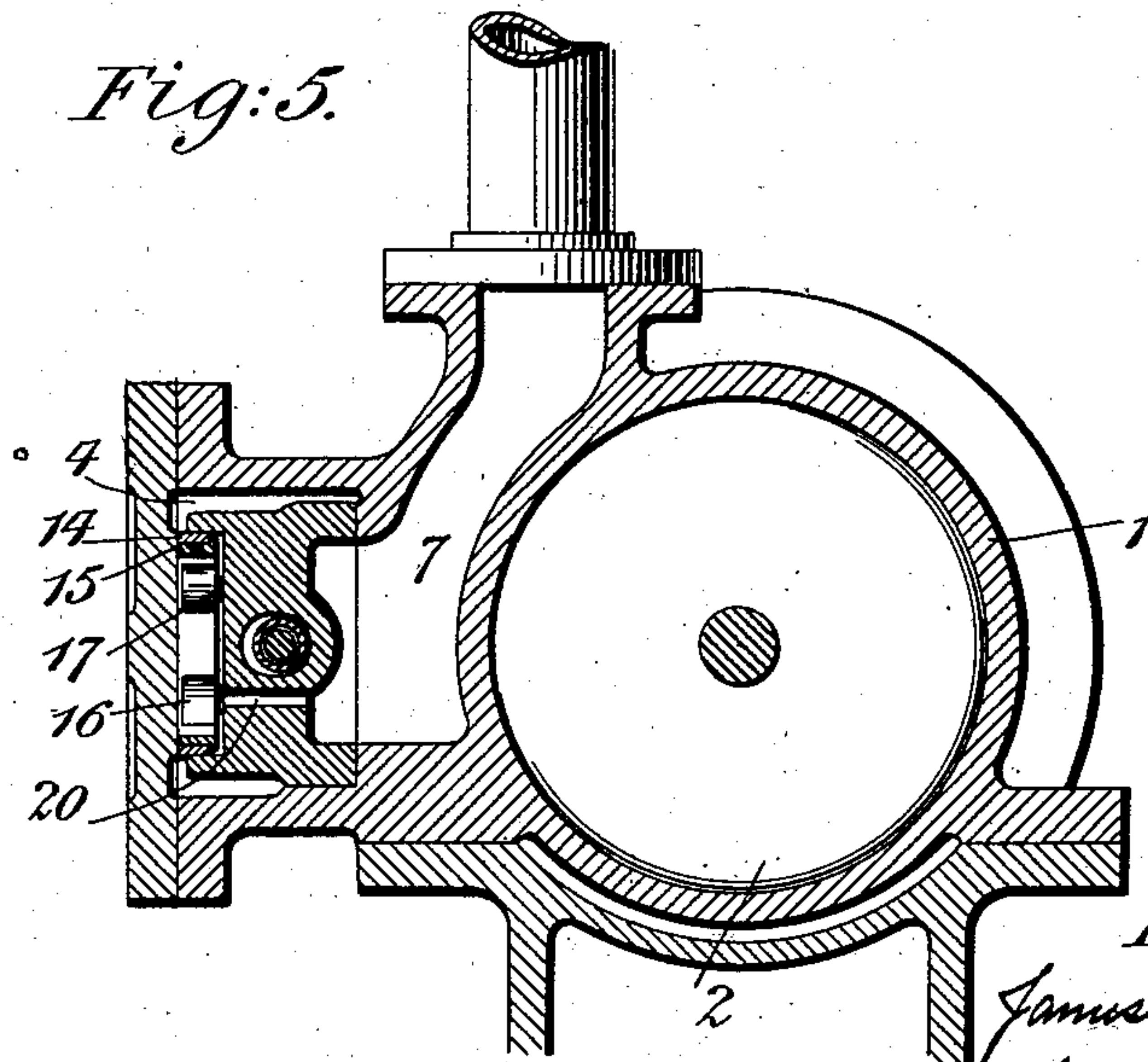
2 SHEETS—SHEET 2.

*Fig. 3.*

*Fig. 4.*



*Fig. 5.*



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Henry Thierne.

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James Clayton  
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# UNITED STATES PATENT OFFICE.

JAMES CLAYTON, OF BROOKLYN, NEW YORK.

## BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 721,356, dated February 24, 1903.

Application filed January 25, 1902. Serial No. 91,143. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES CLAYTON, a citizen of the United States, and a resident of the borough of Brooklyn, in the city and State of New York, have invented a new and useful Improvement in Balanced Slide-Valves, of which the following is a specification.

My invention relates to an improvement in balanced slide-valves, and has more particularly for its object to provide an improved means for balancing the slide-valve, so as to prevent as far as possible the wear on the valve by taking most of the weight or pressure of the steam off the back of the valve.

A further object is to provide means for reducing the pressure upon the back of the valve, together with means for testing the pressure upon the back of the valve to ascertain whether the reducing or balance chamber is leaking.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a longitudinal central section through an engine-cylinder and its valve-chest. Fig. 2 is an exterior view of a portion of the cylinder and its valve-chest, the cover of the valve-chest being removed to show the chamber on the back of the valve and the spring-actuated packing-ring therein. Fig. 3 is a transverse section, on a smaller scale, through the cylinder and valve-chest, showing a pipe leading from the exhaust-pipe into communication with the chamber on the back of the valve, an indicator connected to said pipe, and cocks for opening and closing communication between the exhaust-pipe and the chamber on the back of the valve and between the said chamber and the indicator to throw the steam on the gage. Fig. 4 is an enlarged sectional view of the spring-actuated packing-ring for the back of the valve; and Fig. 5 is a view similar to Fig. 3, showing a modified form in which the exhaust-port is directly connected with the chamber on the back of the valve by means of a port extending through the said valve.

The cylinder is denoted by 1, and the piston therein by 2.

The valve-chest comprises a casing 3, containing the steam-space 4, the cylinder-ports 5 and 6, communicating with the ends of the

cylinder, and an intermediate exhaust-port 7, and a cover 8 for inclosing the steam-space. The inlet for the steam-space in the valve-chest is denoted by 9.

The slide-valve within the valve-chest is denoted by 10, and it is operated by the usual valve-rod 11. This valve 10 is provided in its face with the usual exhaust-port 12 for alternately connecting the steam-ports 5 and 6 with the exhaust-port 7.

The valve 10 is provided with a chamber 13 on its back, which chamber is separated from the steam-space 4 by a spring-actuated packing-ring, which has a sliding engagement with the inner face of the cover 8 of the valve-chest as the valve is reciprocated.

The wall of the chamber 13 is shown herein as cylindrical, to which wall the packing-ring is fitted. This packing-ring comprises an outer split section 14 and an inner follower-section 15. This inner follower-section 15 is provided with a plurality of sockets 16 for the reception of extension-springs 17, the said springs being engaged by the back of the valve for forcing the packing-ring and valve apart into engagement with their respective surfaces. In the present instance I have shown four of these sockets 16 and extension-springs 17. This chamber 13 on the back of the valve 10 is connected to the cylinder exhaust-port 7 for equalizing the pressure upon the valve.

In the form shown in Fig. 3 the chamber 13 is connected to the exhaust-port 7 by means of a pipe 18, extending from the said chamber 13 to an exhaust-pipe 19, leading from the exhaust-port 7.

In Fig. 5 I have shown the chamber 13 and exhaust-port 7 directly connected by means of a port 20, extending through the valve 10 from its exhaust-port 12 to the said chamber 13.

In the form shown in Fig. 3 I have provided the connecting-pipe 18 with a pressure indicator or gage 21, connected to the said pipe 18 through a short pipe 22, within which there is provided a cut-off valve 23. I have also provided the said connecting-pipe 18 with a cut-off valve 24 intermediate the pressure-indicator 21 and the exhaust-pipe 19. A valve 25 is also provided in the connecting-pipe 18 between the pressure-indicator and the chamber 13. An extension 26 of the pipe 18 leads from the said valve 25, which valve



is arranged to open communication from the interior of the chamber to the exterior through the extension 26 or open communication from the said chamber to the pipe 18. By this arrangement it will be seen that the pressure within the chamber 13 is accurately indicated by connecting the said chamber with the pressure-indicator, so as to disclose the exact pressure within the said chamber, and there-  
10 by ascertain whether the valve is leaking or not. This is done by opening the valve 23, closing the valve 24, and turning the valve 25 so as to open communication from the chamber to the indicator and closing it from  
15 the chamber to the exterior. By opening the valve 24 open communication is established from the cylinder exhaust-port 7 to the chamber 13.

By the use of the device, as above described,  
20 it will be seen that the valve may be accurately balanced within the valve-chest, so as to insure its working with a minimum amount

of friction and wear, because of the reduction of the live steam upon the back of the valve.

What I claim is—

In combination, a steam-cylinder, a valve-chest therefor, a valve fitted to slide in the valve-chest, said valve having a chamber therein separated from the steam-space within the valve-chest, a pipe leading from the cylinder-exhaust to the chamber and to the exterior and a valve for opening and closing communication between the chamber and the exhaust and between the chamber and the exterior, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 20th day of January, 1902.

JAMES CLAYTON.

Witnesses:

FREDK. HAYNES,  
HENRY THIEME.