

(No Model.)

J. CAMPBELL.  
BALANCED SLIDE VALVE.

No. 606,119.

Patented June 21, 1898.

Fig. 1.

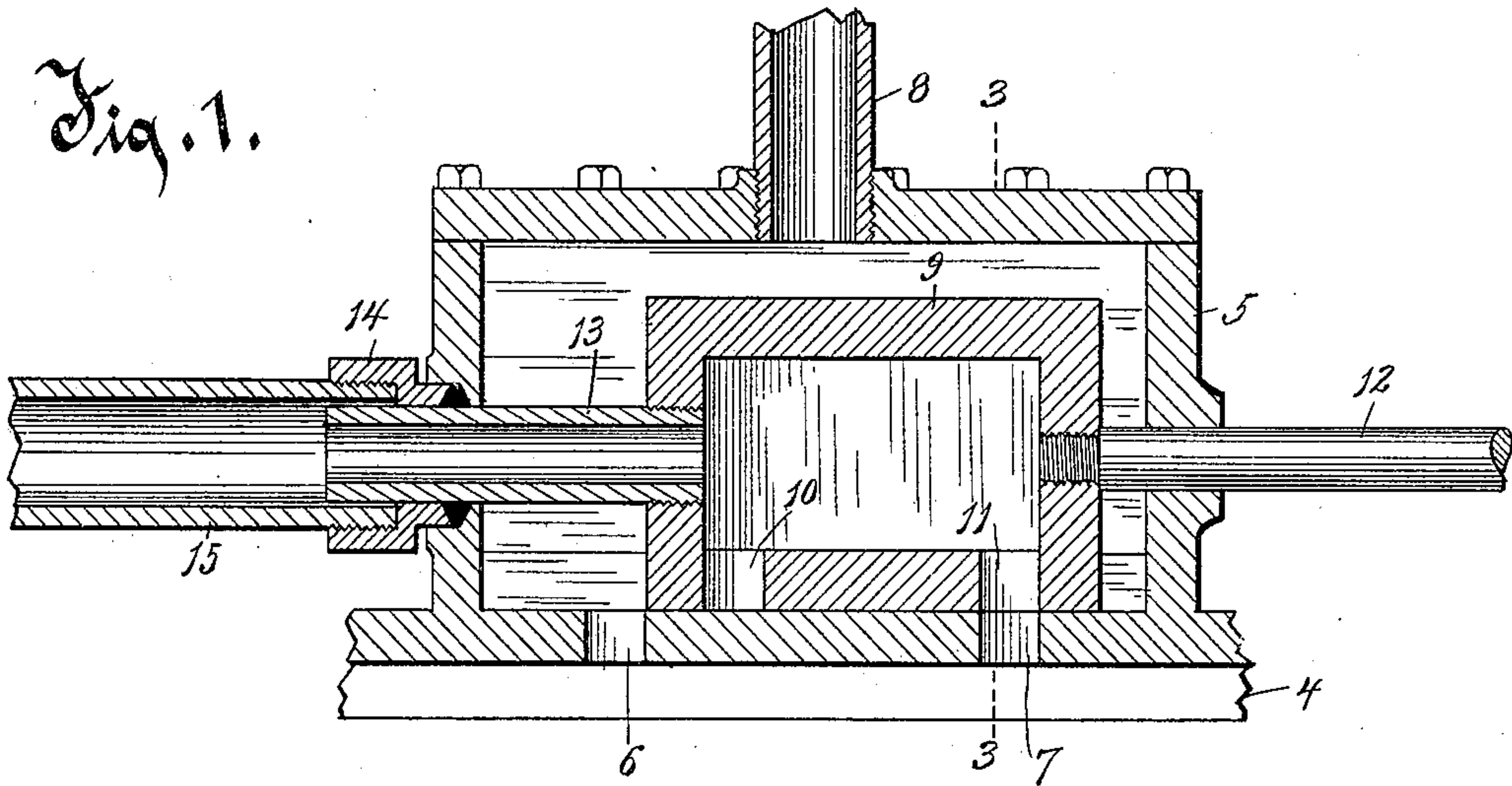


Fig. 2.

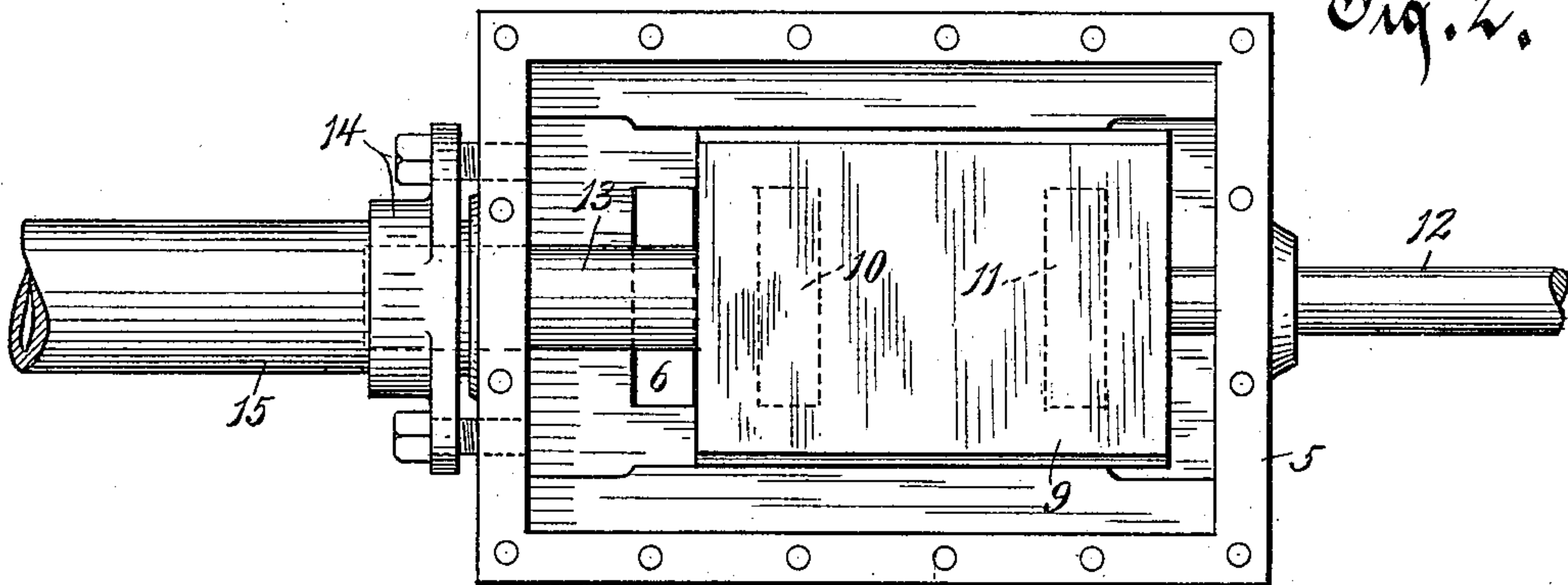
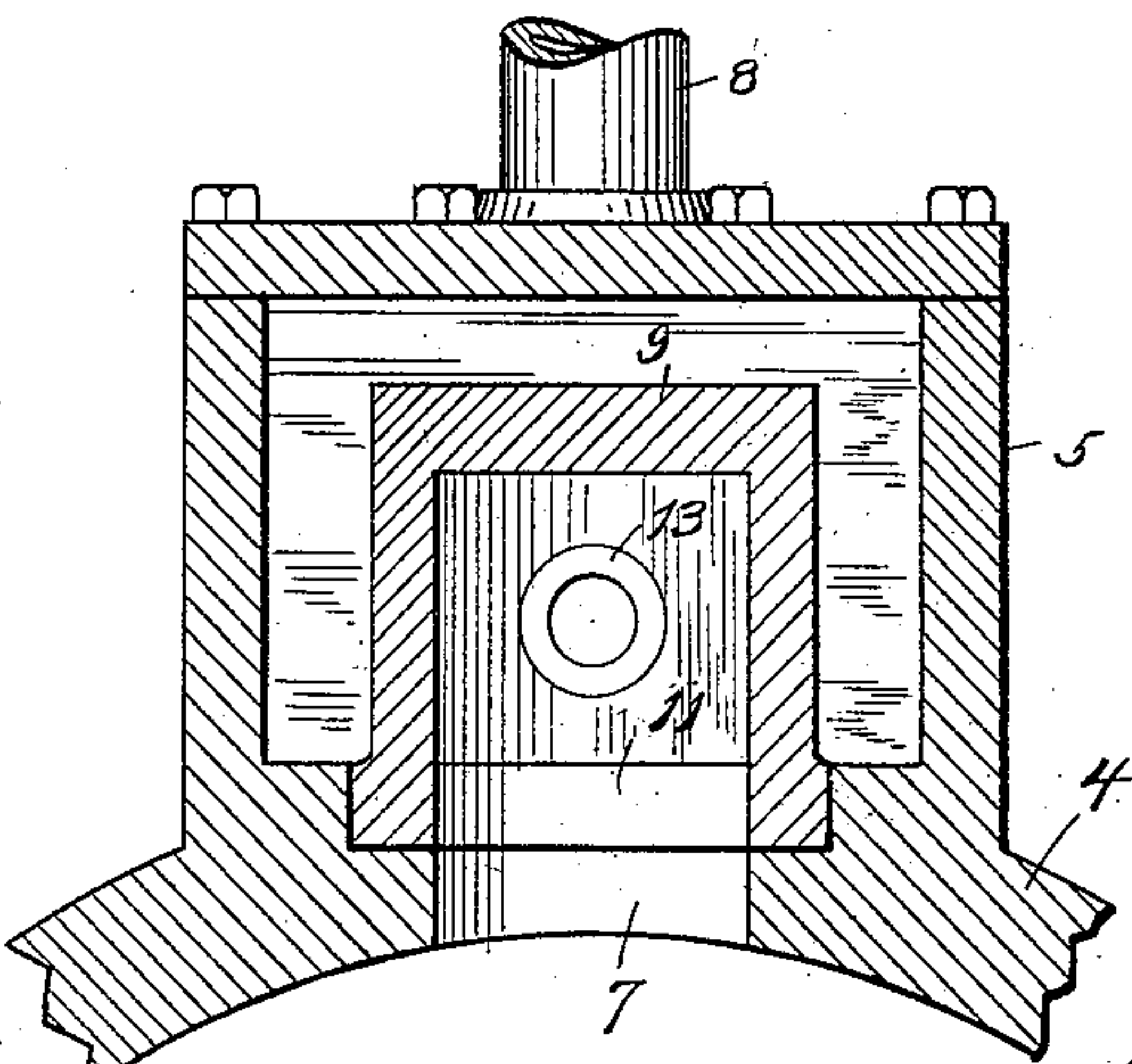


Fig. 3.



Witnesses.

*A. H. Keeney*

*Anna V. Faust*

Inventor.

*James Campbell*  
*By Benedict & Morell*  
*Attorneys*



# UNITED STATES PATENT OFFICE.

JAMES CAMPBELL, OF MILWAUKEE, WISCONSIN.

## BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 606,119, dated June 21, 1898.

Application filed December 10, 1897. Serial No. 661,378. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES CAMPBELL, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Balanced Slide-Valves, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in balanced slide-valves.

It is the object of my invention to provide an improved form of reciprocating valve which shall not only be simple in construction, but at the same time will be of such character as to be equally and uniformly balanced, so that only the minimum power is required for reciprocating the same; and with this object in view the invention consists of the parts, combination of parts, or their equivalents for admitting the inlet-steam first into the hollow valve, thence permitting the steam to pass through registering ports in the valve and steam-chest into the cylinder and the exhaust-steam to pass out of the cylinder through another port of the steam-chest, and finally from said steam-chest through the exhaust-opening thereof.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my invention. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a cross-section on the line 3 3 of Fig. 1.

Referring to the drawings, the numeral 4 indicates a fragment of a cylinder, and 5 the steam-chest mounted thereon. The bottom of the steam-chest is provided with ports 6 and 7, leading to the cylinder and which alternately admit steam to and exhaust the same from said cylinder. The steam-chest has leading from its top or any other suitable point an exhaust-pipe 8.

The numeral 9 indicates a hollow reciprocable valve. This valve is provided in its bottom with the ports 10 and 11, which as the valve is reciprocated are alternately brought into register with the ports 6 and 7. Secured to one end of the cylinder and extending outwardly therefrom through the end of the steam-chest is the actuating-rod 12, which is worked and moved in the usual and well-known manner. From the opposite end of the valve extends a pipe 13, which is fitted in

an opening in said end of the valve, and consequently leads to the interior of the valve. The opposite end of this pipe extends freely through the end of the steam-chest and through a stuffing-box 14. This stuffing-box is internally threaded, and to the threaded portion thereof is connected an inlet-pipe 15, into which the pipe 13 freely telescopes.

The above being a description of the parts of my invention, its operation will now be described.

In the position of the valve shown in the drawings the steam will pass through the inlet-pipe 15 into the pipe 13, and thence into the valve. From the valve it passes through the registering ports 11 and 7 of the valve and steam-chest, respectively, and enters the cylinder. The exhaust-steam on the opposite side of the piston of the cylinder is free to pass through the port 6 in the bottom of the steam-chest and to flow from said steam-chest out through the exhaust-pipe 8. As the valve is reciprocated toward the opposite end of the steam-chest the port 10 is brought into register with the port 6, while the port 7 in the bottom of the steam-chest is open. The inlet-steam now passes through the registering ports 10 and 6 into the cylinder and exhausts through the port 7. From this it will be seen that the inlet-steam is not admitted at all into the steam-chest, and consequently the friction of the live steam against the reciprocating valve is obviated. Whatever retarding influence that may be caused by the live steam within the valve is to a certain extent counteracted by the exhaust-steam flowing into the steam-chest.

While I have herein described my valve as particularly applicable for use in connection with steam, as the actuating agent, yet I do not wish to be understood as restricting myself to such particular adaptation, as it is obvious that it is equally adapted for use with gas, air, or other elastic-fluid-actuating agent without departing from the spirit and scope of my invention.

What I claim as my invention is—

The combination of a chest having ports leading to a cylinder, and also provided with an exhaust-passage, a pipe fitted to one end of the chest, a hollow valve located within



the chest and provided with ports, one of said  
ports adapted, when the valve is reciprocated  
in one direction, to be brought into register  
with one of the ports of the valve-chest lead-  
5 ing to the cylinder, the other port of the valve  
being closed by the bottom of the chest, and  
at the same time the other port of the chest  
leading to the cylinder being opened to the  
chest, and, when the valve is reciprocated in  
10 the opposite direction, said other port of the  
valve adapted to be brought into register with  
the other port of the chest leading to the cyl-  
inder, and the other port of the valve being  
closed by the bottom of the chest, and at the  
15 same time the other port of the chest leading  
to the cylinder being opened to said chest, the  
uncovered port of the chest in communication  
with the cylinder, in each instance, adapted  
for the passage therethrough of the exhaust-  
20 actuating agent from the cylinder, which ex-

haust-actuating agent is free to fill the chest  
and pass out of the final exhaust-pipe, a pipe  
leading from one end of the valve, and ex-  
tending freely through the end of the chest,  
and telescoping freely into the pipe connected 25  
to the end of said chest, through which latter  
pipe the inlet-actuating agent is free to enter  
and pass into the pipe extending from the  
valve, and thence through said pipe into the  
valve for passage through the port of the 30  
valve which is brought into register with one  
of the ports of the chest leading to the cylin-  
der, and means for reciprocating the valve.

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

JAMES CAMPBELL.

Witnesses:

A. L. MORSELL,  
ANNA V. FAUST.