

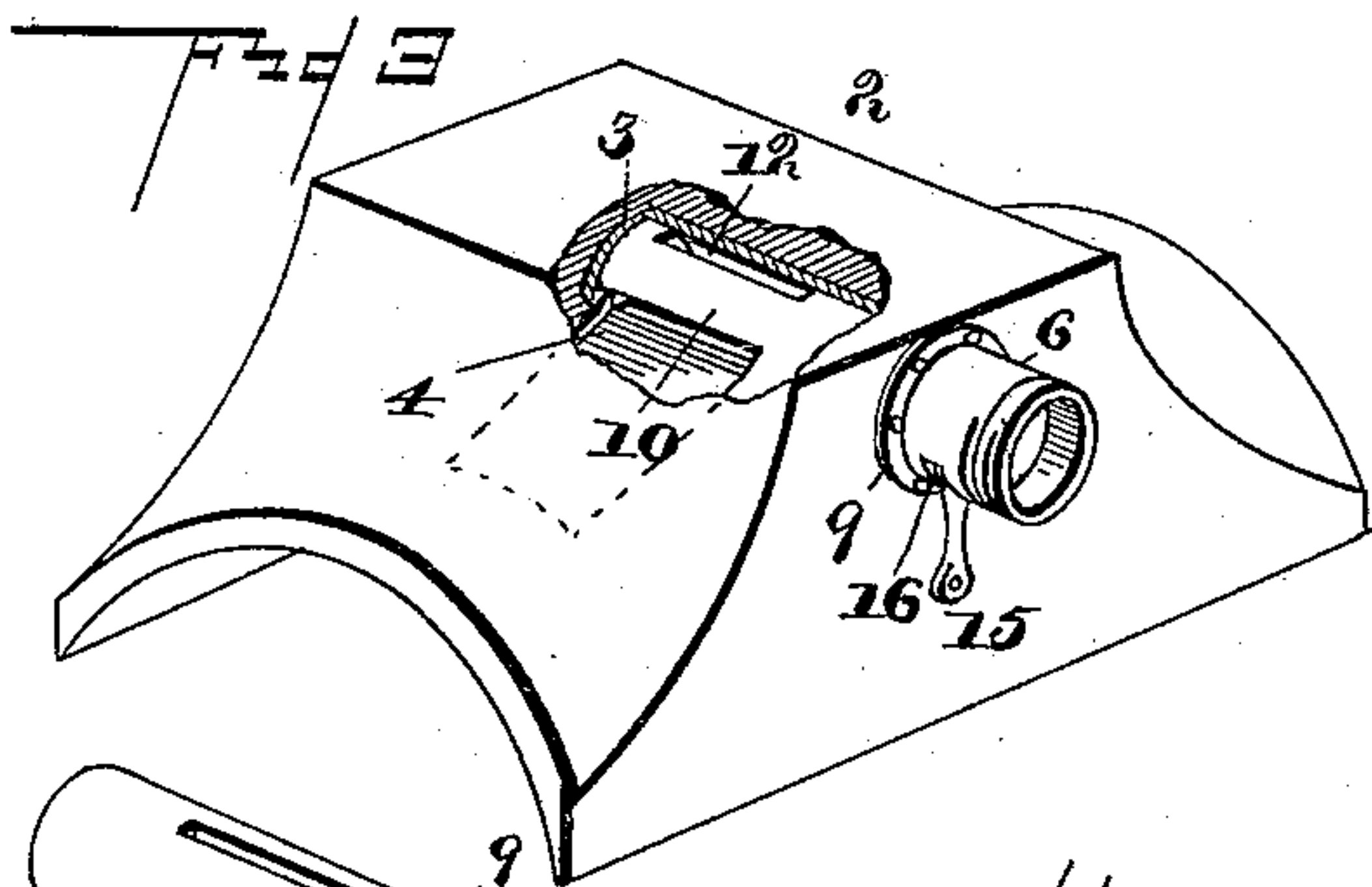
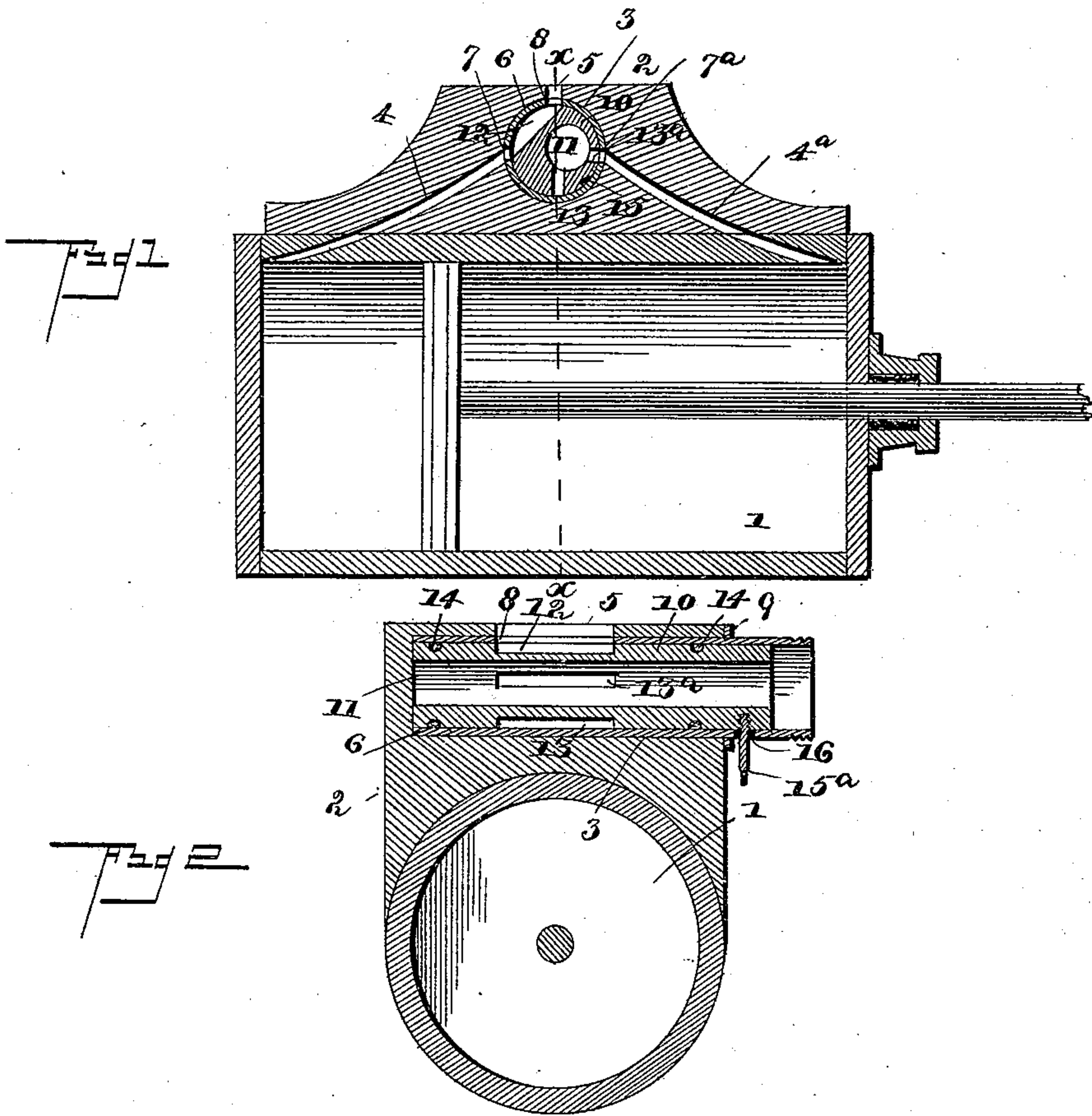
(No Model.)

J. CHEEK.

OSCILLATING VALVE FOR STEAM ENGINES.

No. 446,056.

Patented Feb. 10, 1891.



Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH CHEEK, OF BEARDSTOWN, ILLINOIS.

OSCILLATING VALVE FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 446,056, dated February 10, 1891.

Application filed December 12, 1889. Serial No. 333,426. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH CHEEK, a citizen of the United States, residing at Beardstown, in the county of Cass and State of Illinois, have invented a new and useful Oscillating Valve for Steam-Engines, of which the following is a specification.

My invention relates to oscillating valves for steam-engines; and it has for its object to construct an oscillating valve which shall be so perfectly balanced as to be capable of operating with the least possible degree of friction, and thus saving the power which is ordinarily lost on account of the frictional resistance of the valve.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a longitudinal sectional view of a cylinder and steam-chest equipped with my improved oscillating valve. Fig. 2 is a vertical transverse sectional view of the same, taken on the line xx in Fig. 1. Fig. 3 is a perspective view of the steam chest and valve, with parts broken away for the purpose of showing the construction more clearly. Fig. 4 is a perspective view showing the parts constituting my improved oscillating balanced valve separated or detached from each other.

The same numerals of reference indicate the same parts in all the figures of the drawings.

1 designates the cylinder, and 2 is the steam-chest, which is mounted thereon, and which consists merely of a casing having a transverse cylindrical bore 3, which is connected by the ports 4 and 4^a with the ends of the cylinder. The top of the bore of the steam-chest is also provided with the exhaust-port 5.

6 designates the valve-casing, which consists of a tubular cylindrical shell, which is fitted neatly in the transverse bore of the steam-chest and is provided with slots 7, 7^a, and 8, registering with the ports therein. The tube or shell 6 is open at both ends and its outer end, which extends beyond the wall of the steam-chest, may be provided with a collar or annular flange 9, fitting against the latter to re-

ceive the bolts or other devices, whereby it is secured in position. The inner end of the bore of the steam-chest is obviously closed, as shown in the drawings. The projecting outer end of the shell or valve-casing is adapted to be connected with the live-steam pipe, which latter, however, is not shown in the drawings.

10 designates the valve, which is cylindrical in shape, and is adapted to fit neatly in the cylindrical tubular casing. The said valve has a bore or longitudinal opening 11, which extends through its entire length. This bore has in the annexed drawings been shown as being formed eccentrically therein; but this is merely for the purpose of enabling the recess 12 to be conveniently formed in the upper side of said valve, and it will be understood that by making the said valve-tube of a proper thickness no necessity will be found for locating the bore eccentrically therein. This construction has, however, been shown for the reason that I consider it to be preferable and in several respects advantageous. The valve is provided with slots or ports 13 and 13^a, adapted to register alternately with the ports 7 4 and 7^a 4^a in the valve-casing and steam-chest, the recess or passage 12 being adapted to connect either steam-port with the exhaust-port when the opposite steam-port communicates with the steam-port of the valve. The latter is provided near its ends with annular packing-grooves 14 14, and the latter are connected by a longitudinal packing-groove 15, extending between the slots or steam-ports of said valve.

An arm or arms 15^a extend radially from the valve through a slot 16 in the projecting end of the tubular valve-casing, and said arm or arms may be connected with the eccentric rods of the engine or be operated in any other suitable manner, so as to impart an oscillating movement to the valve at the proper intermittent periods.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood.

My improved valve is exceedingly simple in construction, and it may be applied at a trifling expense to engines of almost every type now in use without necessity for radical

changes of any kind in the general structure. The valve and valve-casing, being cylindrical in shape, may be fitted in an accurate and steam-tight manner far more easily than any slide-valve, and the parts are few and simple, and are therefore not liable to get out of order. The inner end of the valve, it will be observed, is open, and the entire surface of the valve is consequently exposed to an equal pressure of steam. It follows that the valve is absolutely balanced and that there can be absolutely no friction, save the natural friction between the walls of the valve and the steam-chest, which, being subject to no pressure of steam, is so trifling as to be of no consequence practically.

I have in the foregoing described what I consider to be the preferable construction of my improved valve; but I desire it to be understood that I do not limit myself to the precise construction and arrangement of details herein described, but reserve the right to any modifications in the construction thereof which may be resorted to without departing from the spirit of my invention.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In an oscillating balanced valve, the combination of a cylindrical tubular shell or casing open at both ends and having longitudinal slots 7, 7², and 8, forming the steam and

exhaust ports, the cylindrical tubular valve 10, seated in said casing and having the steam-ports 13, and provided in its outer side with a recess 12, forming an exhaust-passage, and an arm or stem 15, extending from said valve through a transverse slot 16 in the shell or casing, substantially as and for the purpose set forth.

2. The combination, with the steam-chest having the transverse cylindrical bore closed at its inner end and the steam and exhaust ports, of the cylindrical tubular shell or valve-casing seated in said bore, having a collar or annular flange near its outer end and provided with steam and exhaust ports and with a transverse slot near its outer end, and the tubular cylindrical oscillating valve seated in the said shell or casing and having the steam-ports, the exterior exhaust-passage, and an arm or arms extending radially through the transverse slot in the shell or casing, substantially as and for the purpose herein shown and specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOSEPH CHEEK.

Witnesses:

HENRY H. DURHAM,
JOHN E. McLIN.