

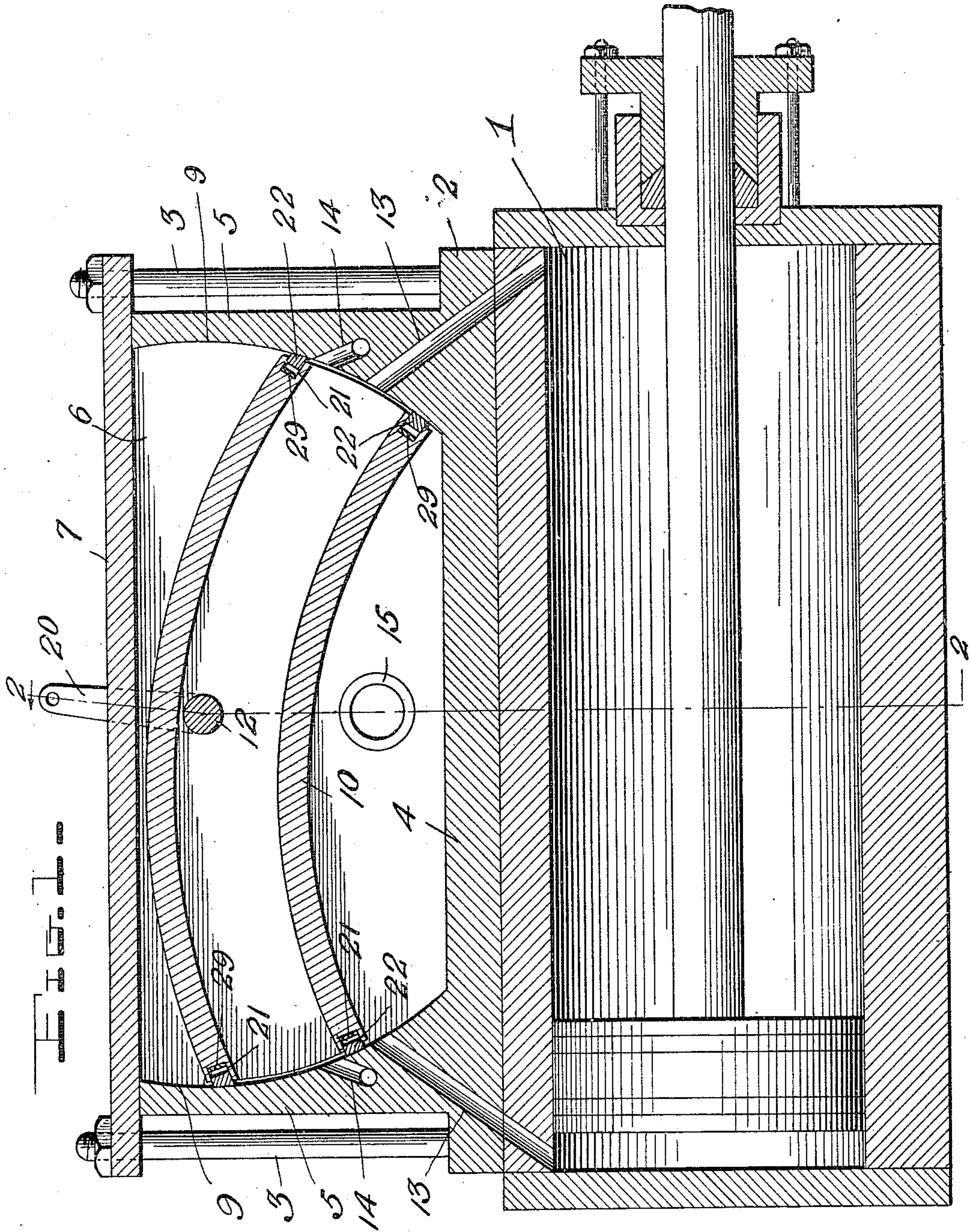
A. J. ANDERSON & G. A. HANSON.
ENGINE VALVE.

APPLICATION FILED APR. 22, 1909.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

959,689.



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Witnesses

Chas. L. Griestauer.
E. M. Ricketts.

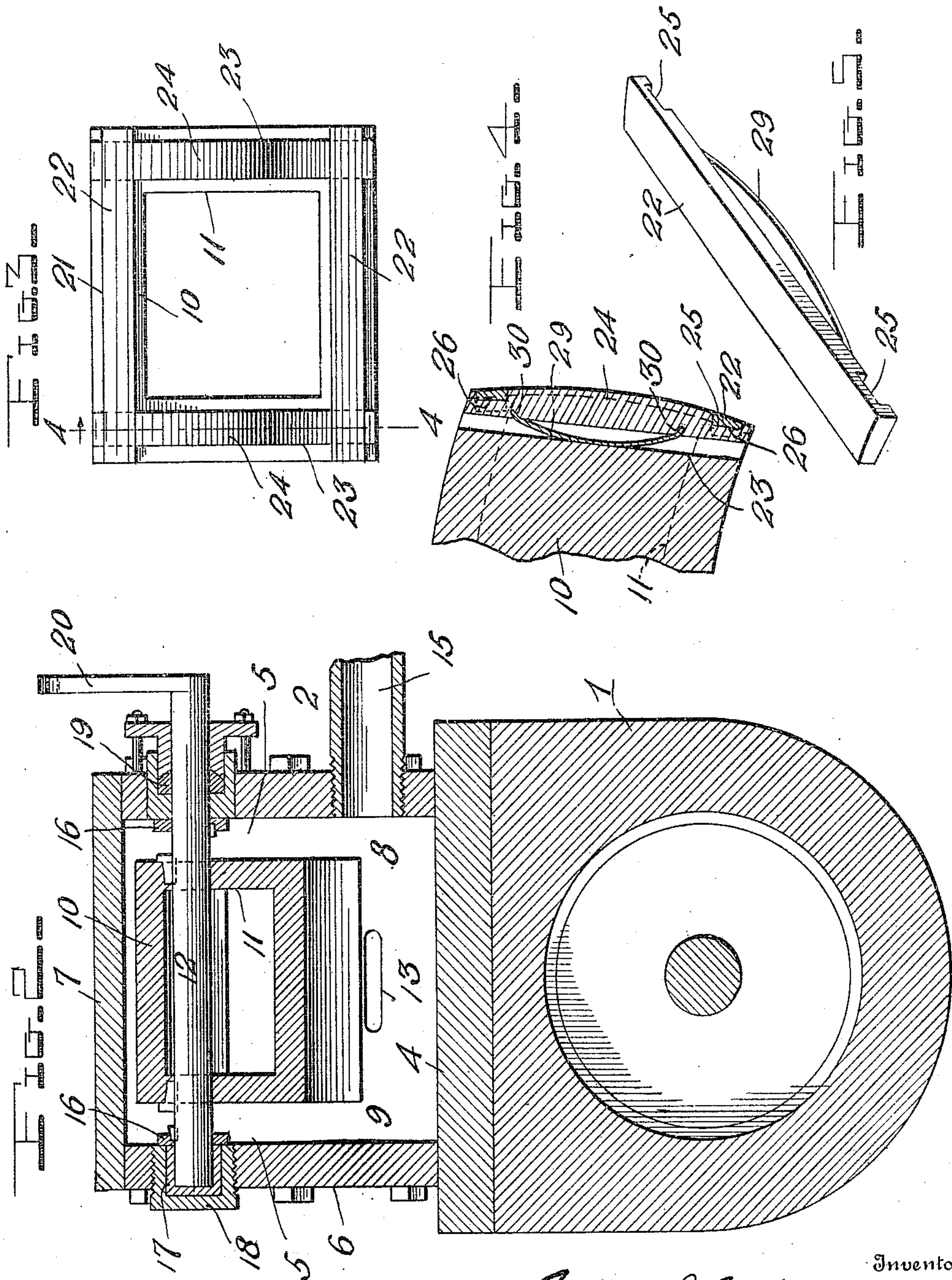
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UNITED STATES PATENT OFFICE.

ARTHUR J. ANDERSON AND GEORGE A. HANSON, OF ABERDEEN, SOUTH DAKOTA.

ENGINE-VALVE.

959,689.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed April 22, 1909. Serial No. 491,515.

To all whom it may concern:

Be it known that we, ARTHUR J. ANDERSON and GEORGE A. HANSON, citizens of the United States, residing at Aberdeen, in the county of Brown and State of South Dakota, have invented certain new and useful Improvements in Engine-Valves, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in steam engine valves.

The object of the invention is to provide a simple and practical balanced valve which may be produced at a comparatively small cost and will be more efficient and durable than steam engine valves now in use.

With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section through the improved valve; Fig. 2 is a transverse section taken on the plane indicated by the line 2—2 in Fig. 1; Fig. 3 is an end view of the valve proper; Fig. 4 is a detail section taken on the plane indicated by the line 4—4 in Fig. 3; and Fig. 5 is a perspective view of one of the packing strips for the valve.

Referring more particularly to the drawings, 1 denotes an engine cylinder and 2 a steam chest which contains the improved valve and which is removably secured to the cylinder by bolts or similar fastenings 3. Said steam chest 2 is of substantially rectangular form having a bottom 4, end walls 5 and open side portions which are closed by side plates 6 bolted in position, as shown in Fig. 2, or otherwise secured. The top of the steam chest 2 is also open and closed by a removable top plate 7, preferably secured in position by the bolts or fastenings 3.

The space within the chest 2 provides a live steam chamber 8 and the end walls 5 of said chest or chamber are curved to provide arc-shaped seats 9 for the ends of an oscillatory valve proper 10 mounted in the chamber 8. The valve 10 is in the form of a tubular body containing an exhaust steam cavity 11 and mounted on a centrally arranged transverse pivot 12. The ends of the valve 10 are curved on arcs concentric with the pivot 12 and move over the arc-shaped valve seats 9, which latter are also

concentric with said pivot 12, as clearly shown in Fig. 1. The ends of said valve 10 are adapted to cover and uncover steam ports 13 extending through the lower portion of the chest 2 and communicating with the opposite ends of the engine cylinder 1 and the open portions of said ends of the valve are constantly in communication with exhaust ports 14 formed in the seats 9 and extending through the end walls 5 of the chest 2. Steam is admitted to the space or cavity 8 in the chest through an inlet 15 arranged in the lower portion of one of the side walls or plates 6 and since the pressure of steam will be the same on all the side faces of the valve 10, the latter will be balanced. To prevent lateral shifting movement of the valve 10, stop collars 16 are secured to the pivot 12, which latter is in the form of a shaft and has its rear end mounted for rotation in a suitable steam tight bushing 17 arranged in a bearing 18 in the rear side plate or wall 6 of the chest.

The front end of the pivot shaft 12 extends through a stuffing box 19 arranged in the front wall or side plate 6 of the chest 2 and on said projecting end of the shaft is an arm 20 which may be connected to any kind of valve gear. To prevent the escape of steam around the ends of the valve 10 and to reduce friction, said ends of the valve are grooved to receive steam packing strips.

As illustrated more clearly in Fig. 3 of the drawings, the end of the valve 10 is of rectangular shape and its top and bottom portions are formed with longitudinal grooves 21 to receive horizontal packing strips 22 while its ends are formed with vertical grooves 23 to receive packing strips 24. The grooves 21, 23 intersect each other and the strips 21 are straight and have formed in their bottom faces, adjacent their ends, transverse notches 25 to enter notches 26 formed in the upper faces of the end portions of the strips 24, which latter are curved longitudinally to conform to the curvature of the valve seats 9. Longitudinally curved leaf springs 29 are arranged beneath the several packing strips 22, 24 and have their ends set in notches or seats 30 in the bottom face of said strips while their curved or bowed central portions rest upon the bottoms of the grooves 21, 23, as will be clearly understood on reference to Fig. 4 of the drawings.

The operation of the invention will be

readily understood on reference to Figs. 1 and 2. When the arm 20 on the valve stem or shaft is rocked the valve 10 will be oscillated so that the steam ports 13 will be made to communicate alternately with the live steam space 8 of the chest 2 and the exhaust steam cavity 11 in said valve.

From the foregoing it will be seen that the invention provides an exceedingly simple, practical and efficient balanced valve for a steam engine, the parts of which may be produced at a comparatively small cost and will be strong and durable in use. The peculiar construction of the combined steam chest and valve seats enables such parts to be replaced at a small cost when worn out and the provision of the packing strips in the ends of the valves not only reduces friction but provides an effective steam tight packing at such points. By making the valve extend from end to end of the cylinder, the steam ports from valve seat to cylinder are very short, thereby increasing the efficiency of the valve and engine. When the valve is used on a locomotive engine, the packing strips can be made comparatively wide so that the valve may be given the proper amount of lap.

Having thus described the invention what is claimed is:

1. The combination of a valve chest having an arc-shaped valve seat formed with ports, a tubular valve mounted for oscillation and adapted to co-act with said valve seat, the end of the valve opposed to said

seat being formed with intersecting grooves, overlapping packing strips arranged in said intersecting grooves and having their crossed portions notched to receive each other and springs in said grooves for projecting said packing strips.

2. The combination with a steam engine cylinder, of a steam chest arranged thereon and of substantially the same length, the end walls of said steam chest being shaped to provide arc-shaped valve seats and being formed with steam ports communicating with the ends of the cylinder, and also with exhaust ports, stuffing boxes arranged centrally in the side walls of the chest, a rock shaft extending through one of said stuffing boxes and having its inner end arranged in the other stuffing box, a tubular valve fixed to the intermediate portion of said shaft and adapted to co-act with said valve seats, the ends of said valve being formed with intersecting grooves, overlapping packing strips arranged in said intersecting grooves and having their crossed portions notched to receive each other, and springs in said grooves for projecting said packing strips.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

ARTHUR J. ANDERSON
GEORGE A. HANSON.

Witnesses:

J. H. POND,
D. M. REHFELD.