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UNITED STATES PATENT OFFICE.

R. BAILEY, OF TROY, NEW YORK.

VALVE FOR STEAM-ENGINES.

Specification of Letters Patent No. 22,692, dated January 25, 1859.

To all whom it may concern:

Be it known that I, ROBERT BAILEY, of Troy, in the county of Rensselaer and State of New York, have invented an Improved Balanced Puppet-Valve for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, making part of this specification, in which—

Figure 1 is a vertical section of my improved valve applied as an induction valve, showing also a portion of the steam cylinder of the engine to which it is applied. Fig. 2 is a plan of a pair of my improved valves, as arranged one for the induction and the other for the eduction of steam to an engine. Fig. 3 is a front view of the valve shaft and cams for operating the induction and eduction valves. Fig. 4 is a side view of the eduction cam.

Similar letters of reference indicate corresponding parts in the several figures.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

The construction of my improved balance puppet valve, which, from its construction, I term the tubular puppet valve, is best illustrated in Fig. 1, though also shown in Fig. 2. The valve represented in Fig. 1 is the induction valve, but the construction of the eduction valve and its seat and passages and the method of fitting it to the pipe are the same as for an induction valve.

A, is the cylinder.

B is the valve box, of circular form, cast with the cylinder and communicating therewith by a port *a*.

C, is the valve-seat, like that of an ordinary puppet valve, but having no passage through its interior, arranged in the center of the valve box, with the sides of which it is connected by two or more wing pieces *b, b*, which leave a steam space all around it which space is always in communication with the port *a*.

D, is the induction pipe which is provided with a flange *e, e*, by which it is secured to

two stationary pillars *d, d*, which are attached to the cylinder. The pipe D extends below the flange *e, e*, and the part D' so extended is turned cylindrically to form a gland to fit a stuffing box in the head of the valve stem, the axis of which gland is in line with the axis of the valve seat.

I, is the valve, consisting of a tube, open throughout, having its lower part of the same transverse area as the pipe D, and having its lower extremity formed like an ordinary puppet valve and ground to fit the seat C.

G, is a stuffing box in the valve box, surrounding the lower part of the tubular valve stem and fitted with a cap *f*, to confine the packing. The upper part of the tubular stem of the valve is enlarged to form a stuffing box *g*, to fit the gland D', and is fitted with a screw cap F, to confine the packing in said stuffing box. The shoulder *e*, at the bottom of the enlarged part of the tubular valve stem, receives just a sufficient pressure of steam to overcome the friction of the stuffing box, for the purpose of closing the valve and confining it to its seat when closed, and hence—the lower part of the tube being cylindrical—the valve is balanced as nearly as desirable.

H, is a lever connected with the valve by a forked end, which embraces the tubular valve stem, and operated by a cam J, on a shaft K, which derives a continuous rotary motion from the main shaft of the engine. This cam J, only serves to open the valve which is closed by the pressure of the steam, and it is of such form that it may be adjusted to permit the closing of the valve to cut off steam at any point in the stroke of the piston. The said cam J, is only used in going ahead, and another cam J' of the reverse form is used in backing; the two cams being movable on the shaft to bring one or other at pleasure in operation on the lever.

E, in Fig. 2, is the eduction valve. The box L of this valve is arranged close beside the box B of the induction valve and communicates with the cylinder by a separate port like *a*. The eduction valve is opened

by a forked lever M, like the lever H, of the induction valve, said lever being operated by a cam N, on the shaft K.

h, h, in Fig. 2, are pillars like d, d, for supporting the eduction pipe.

A similar arrangement of two valves is required for each end of the cylinder.

These valves do not require any particular kind of valve gear but may be operated by valve gear suitable for other puppet valve engines.

What I claim as my invention, and desire to secure by Letters Patent is:—

The arrangement and combination of the tubular valve I, seat C, induction pipe D, 15 eduction valve E, levers H M and cams J, J', N, substantially as and for the purpose herein shown and described.

ROBERT BAILEY.

Witnesses:

MOSES WARREN,
CHARLES W. ROOT.