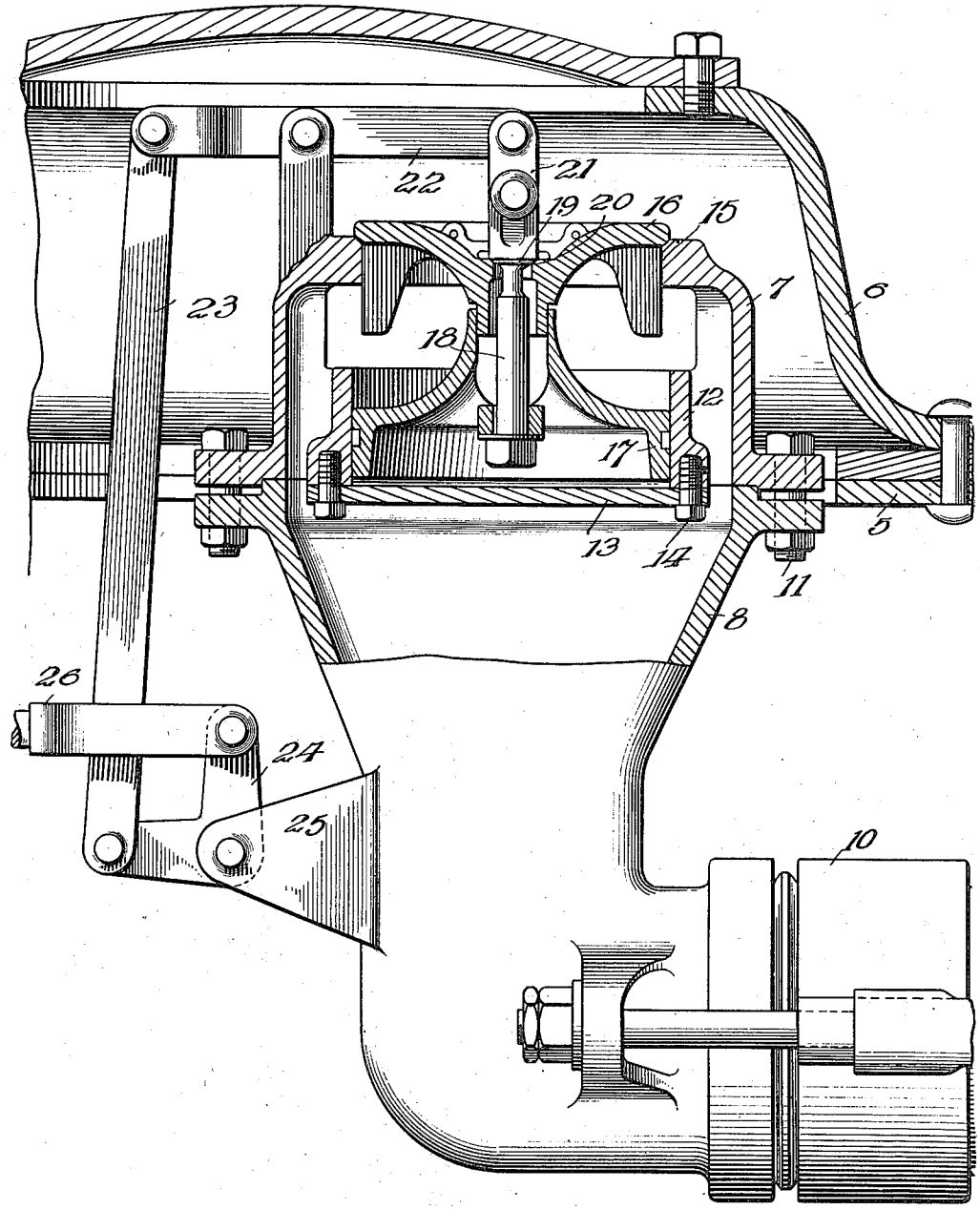
J. M. COFFEY.

THROTTLE.

APPLICATION FILED JUNE 4, 1917.

1,260,646. Patented Mar. 26, 1918.



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THROTTLE.

1,260,646. Specification of Letters Patent. Patented Mar. 26, 1918.

Application filed June 4, 1917. Serial No. 172,759.

To all whom it may concern:

Be it known that I, JOSEPH M. COFFEY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Throttles, of which the following is a specification.

This invention relates to improvements in throttles, and more particularly to improvements in throttle boxes particularly adapted for use in connection with steam boilers of the locomotive type.

One of the objects of the present invention is to provide an improved throttle and throttle box of the balanced valve type for use in locomotive boilers which will be of simple and practical construction. A further object is to provide a throttle box of the above character so constructed and arranged as to permit the various parts to be easily and quickly assembled in a minimum amount of time, trouble and expense. A further object is to provide in a throttle box for the equalization of pressure upon the balance valve and main valve, thereby permitting a greater ease of operation.

Other objects will be in part obvious from the annexed drawing and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, a drawing depicting a preferred form has been annexed as a part of this disclosure, wherein is shown a vertical longitudinal section of a portion of a locomotive boiler steam dome and throttle box showing such parts thereof as are necessary to fully understand the present invention.

Referring now to the drawing in detail—

5 denotes the shell of a locomotive boiler provided with the customary steam dome 6, within which is mounted the throttle box 7 preferably constructed in two parts of standard size, the lower part 8 being of elbow form and connected with or rather forming one end of a dry pipe 10 leading to the cylinders. The parts 7 and 8 are connected together in any desired manner as by means of bolts 11, and the upper part contains a balancing chamber formed by the annular member 12, and a cover 13 suitably secured to the under side thereof as by means of bolts 14.

The upper part of the throttle box 7 is provided with a main valve seat 15 with which a valve member 16 is adapted to coact. Within the balancing chamber is positioned a balancing piston 17 secured to the valve 16 by means of a common valve stem 18. The upper part of the valve stem is provided with a valve 19 coacting with a seat 20 in the central part of the valve 16 and when lifted permits the passage of steam from the steam dome into the balancing chamber and beneath the piston 17. As soon as the pressure is equalized on the upper side of the valve member 16 and the under side of the piston 17 the valve 16 may be readily lifted from its seat with a minimum amount of effort through any desired transmitting means extending rearwardly into the cab according to the type employed.

As herein shown, this means comprises a link 21 connected to the upper part of the valve stem 18 where it is attached to one end of a first degree lever 22, the opposite end of which is connected by means of a link 23 with a bell crank lever 24 pivotally mounted on a boss 25 projecting rearwardly from the lower part of the member 8 of the throttle box. A pull rod 26 is pivotally connected at one end with the vertical arm of the bell crank lever 24 while its opposite end (not shown) extends through the back head of the boiler and stuffing box to the throttle lever within the cab.

It is thus seen that a pull toward the left exerted upon the pull rod 26 will first cause the valve 19 to be lifted from its seat and allow steam to enter the balancing chamber after which a further movement will lift the main valve 16 the desired amount.

This throttle valve is similar in operation to that disclosed in F. H. Clark and J. M. Coffey Patent No. 1,220,729 dated March 20, 1917, for example, and requires no further detailed description.

One of the features of the present invention resides more particularly in the construction of the throttle box and the relative size of the main valve 16 and balancing piston 17, whereby the parts may be more easily and quickly assembled, and at the same time equally balance one another in operation, thereby permitting the parts to be operated with a minimum effort. In other words, the surface area of the balancing piston 17 is not less than the surface area of the main valve 16 subjected to boiler steam pressure. It will be seen that the smaller diameter of the valve seat 15 is less than the diameter of the balancing piston. Consequently, in order to permit the assembling of these parts the throttle box is made in two main parts and a removable cover applied to the balancing chamber, substantially as shown.

In assembling the parts, the upper part 7 of the throttle box is detached from the coöperating part 8 and the plate 13 removed. The balancing piston 17 is then put in place and the main throttle valve 16 dropped into position from above. The single or common stem 18 for both of these parts is then passed through their central openings to be subsequently connected with the actuating mechanism. The plate 13 is then secured in place and the parts 7 and 8 bolted together, thereby resulting in a simple and practically operative construction giving a full steam balanced valve.

The invention as herein disclosed comprises a simple, practical and inexpensive construction which will be reliable and efficient in use and operation and permit the ready assembling and disassembling or replacing of parts as may be necessary from time to time.

Without further anaylsis, the foregoing will so fully reveal the gist of this invention that others can by applying current knowledge readily adapt it for various applications without omitting certain features that, from the standpoint of the prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalency of the following claims.

What I claim is:

1. In combination a throttle box composed of two parts adapted to be rigidly secured together, one part of which is connected with the dry pipe and the other part of which carries the main inlet valve seat, a balancing chamber of larger diameter than the main valve seat having a removable bottom, a main valve co-acting with the main valve seat, a balancing piston loosely connected with the main valve and positioned within the balancing chamber, said balancing piston adapted to be admitted to the balancing chamber on removal of the bottom, and means for conducting steam to said balancing chamber.

2. In combination a throttle box composed of main upper and lower parts, the lower part of which is adapted to be connected with the dry pipe and the upper part of which carries a main inlet valve seat, a balancing chamber of larger diameter than said main inlet valve seat, a removable bottom therefor, a main valve co-acting with the main valve seat and adapted to be placed in operative position thereon from above, a balancing piston within the balancing chamber and admitted to the balancing chamber on removal of the bottom, said balancing piston being not less in diameter than the surface of the main valve subjected to boiler pressure.

3. In combination with a throttle box having two main parts adapted to be connected one with the other, one of said parts being of elbow form and supported from a dry pipe, a balancing chamber associated with the other of said parts, a main inlet valve seat of less diameter than the diameter of said balancing chamber, a main valve co-acting with said seat, a piston loosely connected with the valve positioned within the balancing chamber, an auxiliary valve associated with the main valve for admitting steam to the balancing chamber, and a removable bottom for the balancing chamber, said balancing piston and main valve being substantially equal in size whereby the steam pressure within the balancing chamber equalizes the boiler steam pressure exerted upon the main valve.

4. In combination a throttle box formed of two parts, one of which is of standard size adapted to be connected with the dry pipe and the other of which is also of standard size and provided with a balancing chamber, a valve seat associated with the upper portion of the second-mentioned part of said throttle box, a main valve co-acting with said seat, a balancing piston within the balancing chamber loosely connected with the main valve, a stem for said main valve and balancing piston, an auxiliary valve associated with the valve stem where it passes through said main valve to permit the passage of steam into the balancing chamber, thereby to fully counteract the steam pressure exerted upon the upper part of the main valve, said balancing piston being not less in diameter than the surface of the main valve subject to boiler pressure.

5. In combination a throttle box formed of two parts, one of which is of standard size adapted to be connected with the dry pipe and the other of which is also of standard size and provided with a balancing chamber, a valve seat associated with the upper part of said throttle box, a main valve

co-acting with said seat, a balancing piston within the balancing chamber loosely connected with the main valve, a stem for said main valve and balancing piston, an auxiliary valve associated with the valve stem where it passes through said main valve to permit the passage of steam into the balancing chamber, thereby to fully counteract the steam pressure exerted upon the upper part of the main valve, said balancing chamber having a removable bottom whereby the balancing piston may be inserted therethrough and connected with the main inlet valve which is assembled through the open top of the part containing the valve seat.

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

JOSEPH M. COFFEY.

Witnesses:
A. M. LINDENSTRUTH,
E. GOODMAN.