No. 872,797. PATENTED DEC. 3, 1907.

J. S. CHAMBERS.

THROTTLE VALVE.

APPLICATION FILED MAR. 31, 1906. RENEWED MAY 28, 1907.

2 SHEETS—SHEET 1.

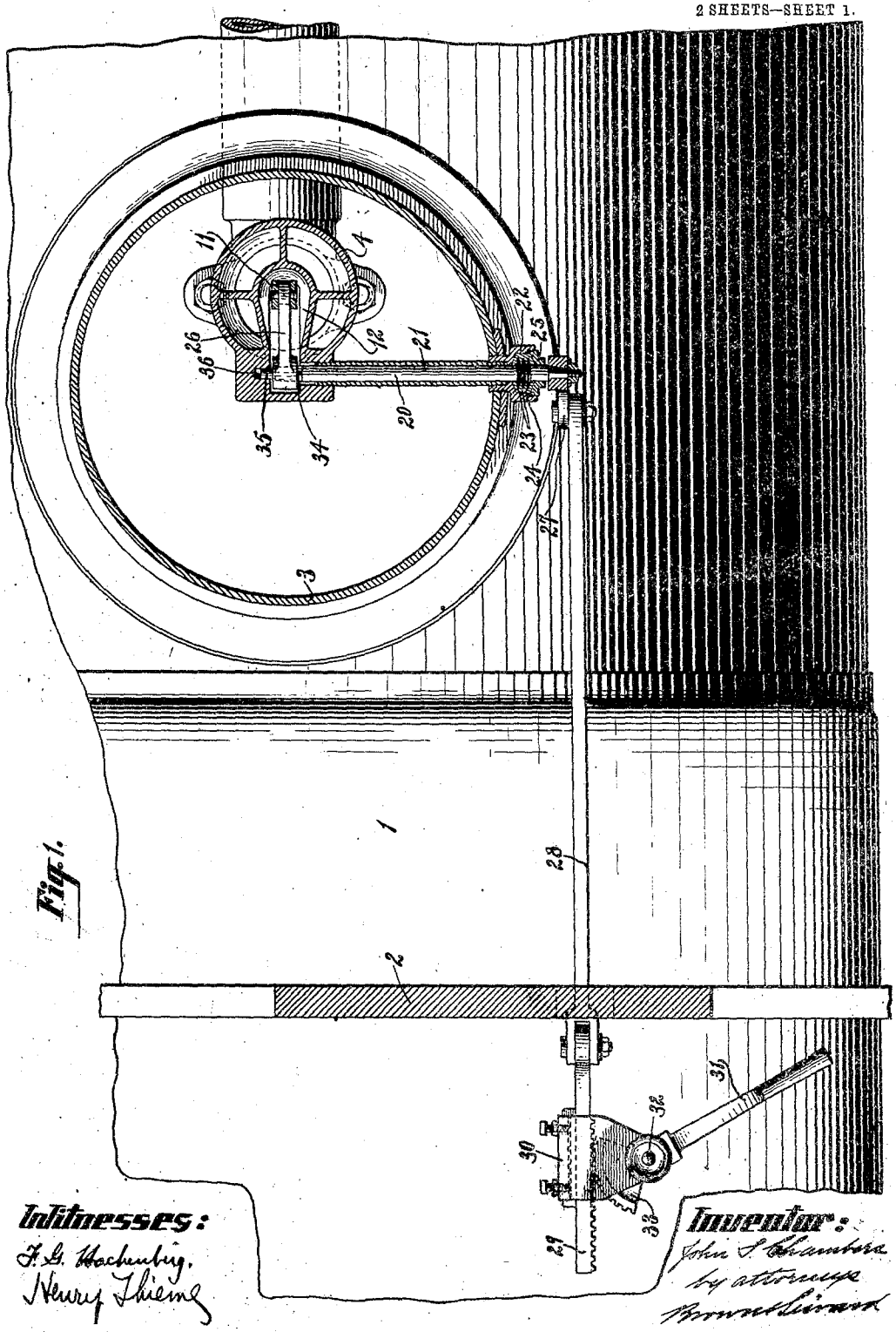

Fig. 1.

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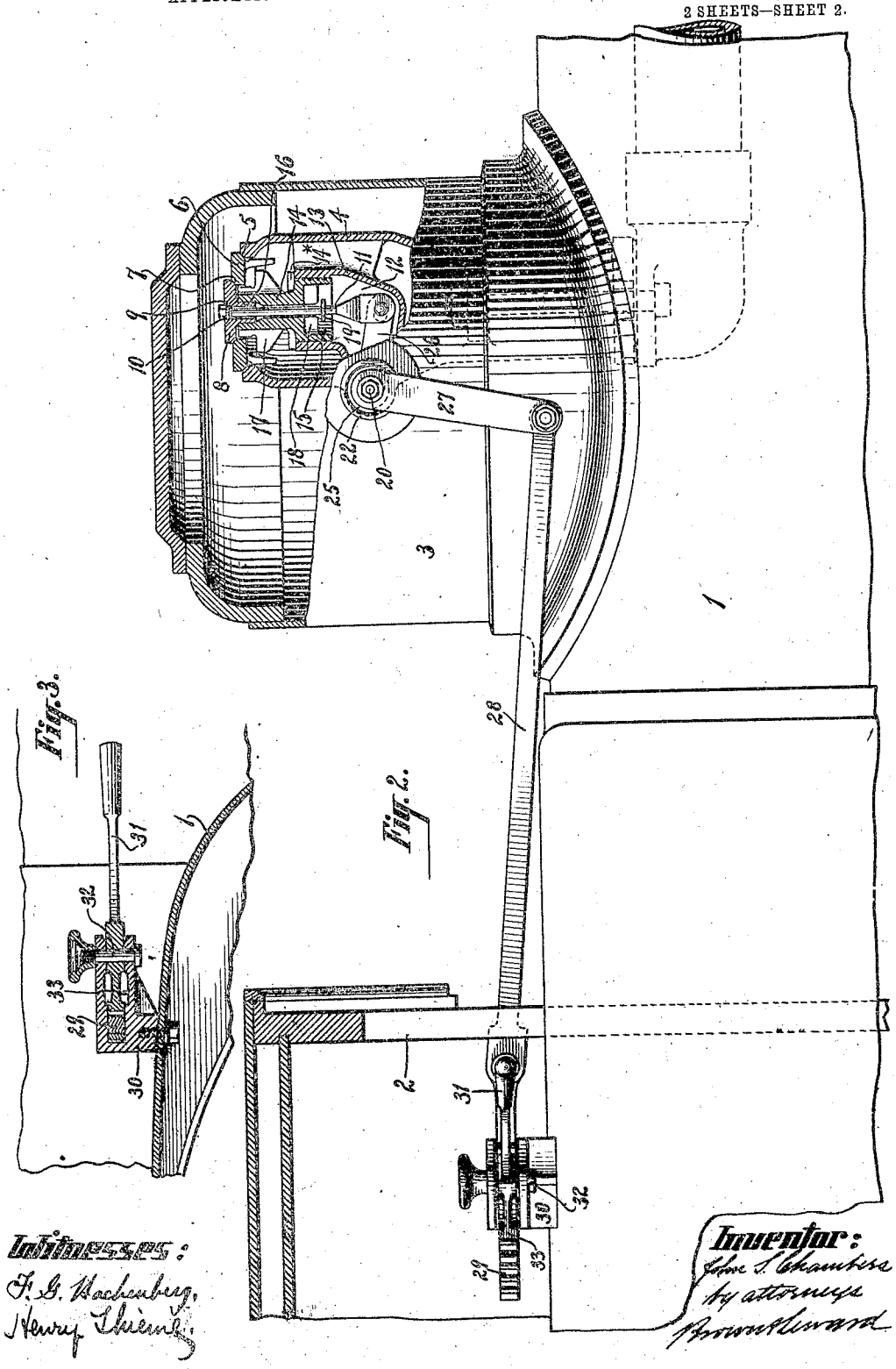

UNITED STATES PATENT OFFICE.

JOHN S. CHAMBERS, OF WILMINGTON, NORTH CAROLINA.

THROTTLE-VALVE.

No. 872,797. Specification of Letters Patent. Patented Dec. 3, 1907.

Application filed March 31, 1906, Serial No. 309,023. Renewed May 28, 1907. Serial No. 376,207.

To all whom it may concern:

Be it known that I, JOHN S. CHAMBERS, a citizen of the United States, and resident of Wilmington, in the county of New Hanover and State of North Carolina, have invented new and useful Improvements in Throttle-Valves, of which the following is a specification.

My invention relates to improvements in throttle valves and their operating mechanism and consists in certain novel changes in the construction, form and arrangement of the several parts by means of which the valve operating rod may be extended from a closed cavity in the standpipe laterally to a point exterior to the dome, the said rod being provided with a valve operating arm within the closed cavity in the standpipe and with an arm exterior to the dome for the attachment of the throttle lever connecting rod.

The objects of my invention are to provide a device of the above character in which the unbalanced area of the throttle stem is eliminated by reason of the closed cavity in the standpipe and also the use of a throttle stem packing is obviated because of this closed cavity. Furthermore, it is impossible for pins or cotters to work out on the inside of the dome thus putting the engine out of operation and also the operating rod may be removed or adjusted at pleasure while full pressure is on the boiler.

A practical embodiment of my invention is represented in the accompanying drawings, in which

Figure 1 represents so much of a locomotive boiler in top plan, partially in section as will give a clear understanding of the construction and operation of my invention, Fig. 2 is a detail side elevation partially in section, and Fig. 3 is a detail sectional view showing more clearly the throttle lever and its adjacent parts.

The boiler is denoted by 1 and the front wall of the cab by 2.

The dome is denoted by 3 and the standpipe therein by 4. The standpipe is provided at its top with the usual valve seat 5 in which is seated the outer throttle valve member 6. This throttle valve member 6 is provided with a seat 7 concentric with the seat 5 in which is seated an intermediate throttle valve member 8. This intermediate throttle valve member 8 is provided with a seat 9 for the inner throttle valve member 10 carried by a stem 11 which extends downwardly into a closed cavity 12 formed by extending a pipe 13 inwardly and upwardly in the standpipe 4.

A loose connecting piece 14 has a lower head 15 which is fitted to slide vertically in the upper end of the pipe 13. This connecting piece 14 extends upwardly into contact with the bottom of the intermediate throttle valve member 8 where it surrounds a depending lug 16 on said valve member. This connecting piece 14 is provided with radial arms 17 which are located beneath and spaced from the throttle valve member 6. The head 15 of the loose connecting piece 14 is provided with abutments 18 which are arranged to be engaged by a shoulder 19 on the stem 11. The connecting piece 14 is provided with lugs 14* which normally rest upon the top of the pipe 13.

A valve operating rod 20 extends laterally from within the closed cavity 12 to a point exterior to the dome 3, the said rod being located within a tube 21 which is secured at its inner end to the standpipe and at its outer end to the dome by means of a plug 22.

A steam-tight joint is provided for the operating rod 20 within the plug 22, which steam-tight joint in the present instance is shown as comprising a plurality of annular shoulders 23 on the rod 20 which are located in a suitable metal filling 24 in the plug 22 held in position by a screw cap 25. The valve operating rod 20 has fixed thereto within the cavity 12 an arm 26 to the free end of which is loosely pivoted the lower end of the valve stem 11. Exterior to the dome, the valve operating rod 20 has fixed thereto a depending arm 27 to the lower end of which is secured the forward end of a connecting rod 28, the end of which extends through the front wall of the cab and has hinged thereto a rack bar 29 which is fitted to slide in a suitable bracket 30.

A throttle lever 31 is pivoted at 32 in the bracket 30 and is provided with a toothed segment 33 which intermeshes with the rack bar 29 whereby the valve operating rod 20 may be rocked by the movement of the throttle lever 31.

In operating, supposing the parts to be in the position shown in Fig. 2, as the throttle lever is moved rearwardly, the arm 26 of the valve operating rod 20, located in the cavity 12 is swung upwardly. The first part of its upward movement will open the inner throttle valve member 10 thus permitting the

steam to flow into the cavity 12 for counterbalancing the intermediate throttle valve member 8. As the rod 11 is moved upwardly, its shoulder 19 will engage the abutments 18 of the connecting piece 14. As the connecting piece 14 moves upwardly, it will lift the valve member 8 away from the outer throttle valve member 6 and finally the arms 17 of the connecting piece will engage the bottom of the throttle valve member 6 and lift it from its seat in the top of the stand pipe. As the operation is reversed, the valve member 6 will first be closed, then the valve member 8 and finally the valve member 10, thus absolutely shutting off the admission of steam to the cavity 12 when the standpipe is closed. It will thus be seen that means are provided for counterbalancing the valve and at the same time the need of a throttle-stem packing is obviated.

For the purpose of permitting the valve operating rod 20 to be readily removed or adjusted, the inner end of the rod 20 is provided with an annular portion 34 which enters a recess in the arm 26 and the arm 26 is provided with a bearing stud 35 located in a recess 36 in the standpipe.

What I claim is:—

1. In a standpipe, a valve, its seat, a closed cavity in the standpipe below the valve and means extending into the closed cavity for opening and closing the valve.

2. In a standpipe, a valve comprising a plurality of members, seats therefor, a closed cavity in the standpipe below the valve and means extending into the closed cavity for opening and closing the valve.

3. In a standpipe, a valve comprising a plurality of valve members, seats therefor, a closed cavity in the standpipe below the valve, a valve stem extended into the said closed cavity and means extending into the cavity connected to said valve stem for opening and closing the valve.

4. In a standpipe, a valve comprising outer, intermediate and inner valve members, seats therefor, a closed cavity, a valve stem extended into said cavity and means extending into the cavity connected to said valve stem for opening and closing the valve.

5. In a standpipe, a valve comprising a plurality of valve members, seats therefor, a closed cavity in the standpipe below the valve, a valve stem extending from one of the valve members into the closed cavity, a connecting piece having a sliding movement in the cavity and operated by the valve stem and means extending into said cavity connected to the valve stem for opening and closing the valve.

6. In a standpipe, a valve comprising an outer member, its seat, an intermediate member, its seat and an inner member and its seat, a closed cavity in the standpipe below the valve, an intermediate piece engaging the intermediate valve member and having a sliding movement in said cavity and arranged to engage the outer valve member as the connecting piece is raised, a valve stem for the inner valve member having a shoulder arranged to engage the connecting piece as the valve stem is raised after the inner valve is opened to open communication to the closed cavity and means connected to the valve stem for opening and closing the valve.

7. In a standpipe, a valve, its seat, a closed cavity in the standpipe below the valve, a valve stem extended into the cavity and a valve operating rod extending into said cavity connected to the valve stem for opening and closing the same.

8. In a standpipe, a valve, its seat, a closed cavity in the standpipe below the valve, a valve stem extended into the cavity, a valve operating rod extended into the cavity and an arm fixed to the rod connected to the valve stem for opening and closing the valve.

9. In a standpipe, a valve, its seat, a closed cavity in the standpipe below the valve, a valve stem extended into the cavity, a throttle lever and a valve operating rod extended into the cavity having an arm within the cavity connected to the valve stem and an arm exterior to the cavity connected to the throttle lever.

10. A steam dome, a standpipe therein, a throttle valve, its seat, a valve stem and a rocking valve operating rod having an arm connected to the valve stem said rod being extended to the exterior through the side of the steam dome.

11. A steam dome, a standpipe therein, a throttle valve, its seat, a valve stem, a throttle lever and a rocking valve operating rod having an arm connected to the valve stem at a point within the standpipe and an arm exterior to the steam dome connected to the throttle lever.

12. A steam dome, a standpipe therein, a throttle valve, its seat, a closed cavity in the standpipe below the valve, a valve stem extended into the closed cavity and a valve operating rod having an arm in said closed cavity connected to the valve stem, said valve operating rod extending to the exterior of the dome.

13. A steam dome, a standpipe therein, a throttle valve, its seat, a closed cavity in the standpipe below the valve, a valve stem extended into the said closed cavity, a throttle lever, a valve operating rod having an arm in the closed cavity connected to the valve stem and an arm exterior to the dome connected to the throttle lever.

14. A steam dome, a standpipe therein, a closed cavity in the standpipe, a tube connecting the closed cavity with the side wall of the dome, a throttle valve, its seat, a valve stem extended into said cavity and a valve operating rod located in said tube having an

arm in the cavity connected to the valve stem.

15. A steam dome, a standpipe therein, a closed cavity in the standpipe, a tube connecting the closed cavity with the side of the dome, a throttle valve, its seat, a valve stem extended into the closed cavity, a throttle lever and a valve operating rod located in said tube having an arm in the closed cavity connected to the valve stem and an arm exterior to the drum connected to the throttle lever.

16. A steam dome, a standpipe therein, a closed cavity in the standpipe, a throttle valve, its seat, a valve stem extended into the closed cavity, a valve operating rod extended into the closed cavity, a valve operating rod extended from the exterior of the dome into the closed cavity and an arm removably engaged with the valve operating rod within the cavity, said arm being connected to the valve stem.

17. A steam dome, a standpipe therein, a closed cavity in the standpipe, a tube connecting the side wall of the dome with the cavity, a throttle valve, its seat, a stem extended into the cavity, an arm located in said cavity connected to the valve stem and a valve operating rod located in said tube removably engaged with said arm in the closed cavity.

18. A steam dome, a stand-pipe therein, a throttle valve, its seat, a valve stem, a rocking valve operating rod extending through the wall of the dome and a steam-tight joint for said rocking rod comprising a stationary metal filling through which the operating rod passes and a plurality of annular shoulders fixed on the rod and located in said filling.

19. A steam dome, a stand-pipe therein, a closed cavity in the stand-pipe, a tube connecting the side wall of the dome with the cavity, a throttle valve, its seat, a stem extended into the cavity, a valve operating rod in the tube connected to said valve stem and a steam-tight joint comprising a metal filling through which the rod passes and a plurality of annular shoulders on the rod located in the said filling.

20. A steam dome, a stand-pipe therein, a closed cavity in the stand-pipe, a tube connecting the side wall of the dome with the cavity, a throttle valve, its seat, a stem extended into the cavity, a valve operating rod located in the tube and connected to the said stem and a steam-tight joint comprising a plug, a metal filling therefor through which the rod passes and a plurality of annular shoulders on the rod located in the said filling.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this twenty-fourth day of March, 1906.

JOHN S. CHAMBERS.

Witnesses:
O. M. BUTLER,
JAS. P. WINGO, JR.