Aug. 26, 1930. H. M. PFLAGER 1,773,750

LOCOMOTIVE SMOKE BOX

Filed Feb. 23, 1929

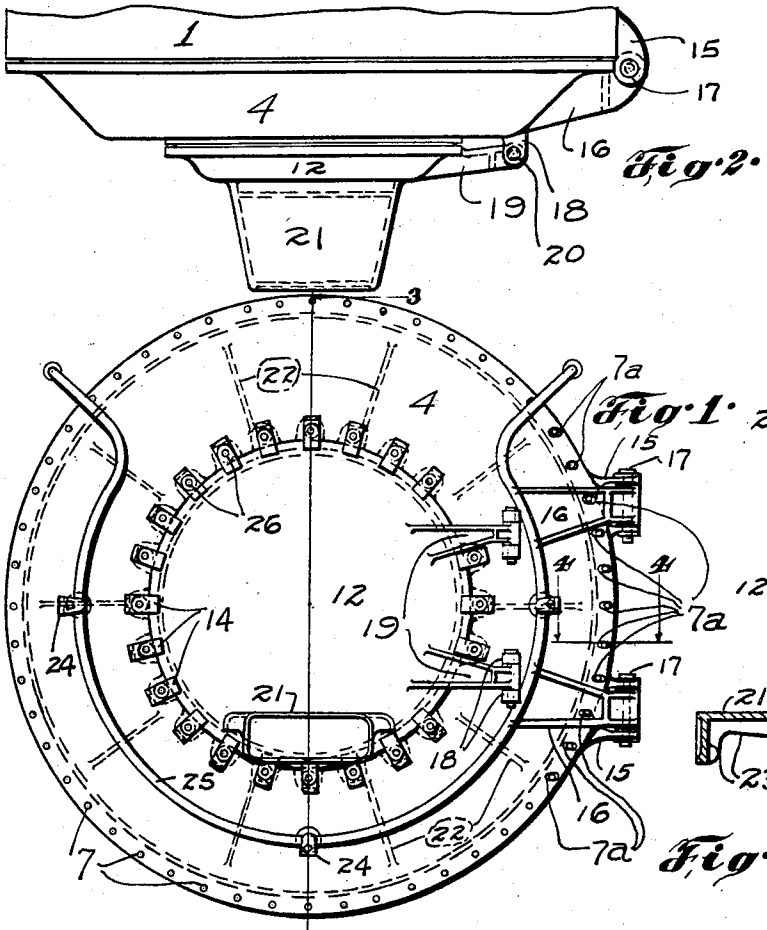


Fig. 2.

Fig. 1.

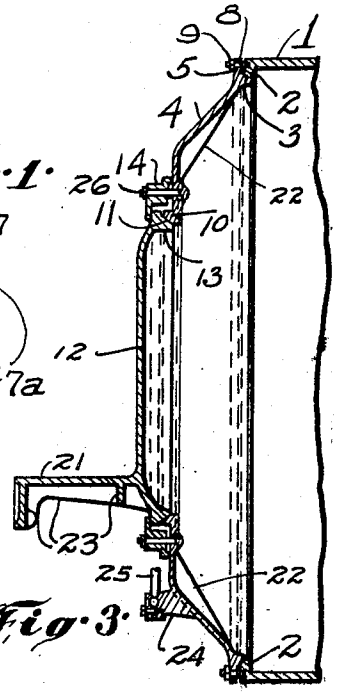


Fig. 3.

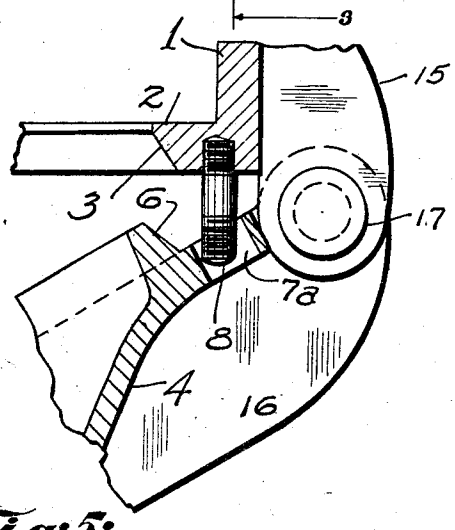


Fig. 5.

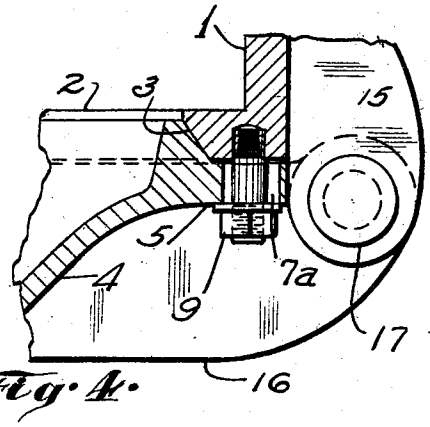


Fig. 4.

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UNITED STATES PATENT OFFICE

HARRY M. PFLAGER, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GENERAL STEEL CASTINGS CORPORATION, OF GRANITE CITY, ILLINOIS, A CORPORATION OF DELAWARE

LOCOMOTIVE SMOKE BOX

Application filed February 23, 1929. Serial No. 342,271.

My invention relates to railway rolling stock and consists in a novel locomotive smoke box structure.

The closing of the front end of such smoke boxes is accompanied by problems of maintaining a tight joint between the closure and the body of the box and by maintaining a tight joint between the closure and the door which is usually provided therein for access to the interior of the box. It is desirable to hinge such a door onto the closure and also to hinge the closure onto the body of the box and these hinge mountings also are attended by problems because of the necessity of providing suitable fastening means whereby the door may be clamped to the closure and the closure member may be clamped to the body.

Special hinges have been designed for this purpose and it is one of the objects of my invention to make it possible to use an ordinary hinge without requiring different fastening devices than have been used heretofore.

It is another object of my invention to provide a door and closure structure which may be assembled with each other and with the body of the box to provide thoroughly tight joints between the various parts. to avoid leakage of cold air into the smoke box or the escape of products of combustion from the smoke box.

Another object of my invention is to provide smoke box structure which will be rigid under all conditions of service and in which the various elements of the respective parts will be free from the necessity of frequent inspection and tightening. These and other detailed objects of my invention referred to below are embodied in the structure illustrated in the accompanying drawings forming a part of this specification in which—

Figure 1 is a front elevation of my novel smoke box structure.

Figure 2 is a top elevation of the same.

Figure 3 is a vertical section taken on the line 3—3 of Figure 1.

Figure 4 is an enlarged detail horizontal section taken on the line 4—4 of Figure 1.

Figure 5 is a corresponding section showing the parts in a different position.

The body of the smoke box is indicated at 1 and is shown as comprising a cylindrical member having a front end consisting of an inturned flange 2 provided with an outwardly bevelled surface 3 on its inner periphery. The closure member for the body is indicated at 4 and comprises a ring-shaped plate casting having an outer periphery flanged, as shown at 5, and provided with a body engaging surface 6 bevelled to correspond to the bevelled surface 3 on the body and perforated, as indicated at 7, to receive studs 8 which project through the perforations in the closure member. Nuts 9 serve to clamp member 4 against the body. The interengaging surfaces 3 and 6 form a section of a cone having its base located outside of the smoke box with its tip located inside of the smoke box.

The intermediate portion of member 4 is bulged outwardly and its inner periphery is formed by a flange 10 having an outwardly bevelled surface 11 for mounting the door 12, the outer periphery of which is flanged, as indicated at 13, this flange being provided with a bevelled surface corresponding to surface 10. Suitable clamps 14 are mounted on studs 26 in member 4 and serve to thrust the edges of door 12 against inner periphery of member 4.

Body 1 is provided with hinge butts 15 and member 4 is provided with hinge arms 16 mounted on butts 15 by means of suitable hinge pins 17. Member 4 is provided with hinge butts 18 and door 12 is provided with hinge arms 19 mounted on butts 18 by means of suitable pins 20.

Door 12 is also provided with a head light bracket 21 and preferably the parts 1, 4 and 12 are formed of one piece castings and the same will be reinforced by suitable ribs, as indicated at 22, on the member 4, and at 23 on door 12.

The openings 7 in member 4 for receiving studs 8 will be large enough to clear the studs easily and only slight clearance will be required for most of the studs. The studs near the hinge elements, however, will require

more than ordinary clearance and, in order to provide for this requirement, the openings 7a will be elongated transversely of the smoke box so that, as the member 4 is turned upon pins 17, the edges of the stud receiving openings will clear the ends of the stud (see Figure 5).

Member 4 is also provided with a series of integral brackets 24 for mounting a hand rail 25. It will be understood that this hand rail extends rearwardly from the smoke box closure and is mounted on the sides of the smoke box and the boiler.

By using studs 8 and 26 which are threaded into the body and closure plate respectively without extending through the same, I avoid the possibility of leakage through the openings which would be required for bolts extending through and gripping ordinary plates as is customary with built-up structure. By using cast members, I can provide any required thickness of metal at the point where the holes or studs are to be located. By providing the perforated flange 5 on the outside of the joint between the plate and the body, I eliminate the possibility of the escape of gases through the openings in the plate for the studs 8. A similar flange could be provided on door 12 but I have illustrated clamps 14 for the purpose of showing different methods of utilizing my invention.

My construction also eliminates the use of rivets and bolts for assembling the hinge arms and butts with their respective members and for securing the head lamp bracket and hand rail brackets. This construction avoids openings in the door and closure plate for the fastening elements through which openings gases would pass if the securing elements did not fit exceptionally tightly. This construction also avoids the necessity of frequent inspection of the parts for looseness and the tightening of securing elements.

The bevelled joint structure provides an efficient and simple means of sealing the joints between the respective parts and this seal will be a permanent one, lasting until the joint is intentionally broken for repairs or cleaning or other purposes. With built-up constructions previously used, it is practically impossible to secure a tight joint between the smoke box and the front door. Casting the parts enables me to form the strongest construction for a given amount of metal.

The casting of the door, for example, may include the lamp bracket and the hinge arms all in one piece or these parts may be produced separately and welded together to form an integral structure free of securing elements. Similarly, the front plate or smoke box front end may each be cast in a single piece or otherwise made integral with its respective hinge elements, flanges, brackets, etc.

It is obvious that the details of the described construction may be otherwise varied without departing from the spirit of my invention and I contemplate the exclusive use of such modifications as come within the scope of my claims.

I claim:

1. In combination, a locomotive smoke box body having an opening, a closure plate for said opening, the interengaging surfaces of said body and plate forming a bevelled joint, and means at close intervals all around the edge of said plate for thrusting said interengaging surfaces together.

2. In combination, a locomotive smoke box body having an opening, a closure plate for said opening, the interengaging surfaces of said body and plate forming a bevelled joint, and means engaging said body and said plate at points located outside of said joint for thrusting said interengaging surfaces together.

3. In combination, a locomotive smoke box body having an opening, a closure plate for said opening, the interengaging surfaces of said body and plate forming a bevelled joint, and a flange on said plate extending outwardly from said joint and provided with openings for elements for attachment of said plate to said body.

4. In combination, a locomotive smoke box body having an opening, a closure plate for said opening, the interengaging surfaces of said body and plate forming a bevelled joint, a flange on said plate extending outwardly from said joint for attachment to said body, and means at close intervals all around the edge of said body and said flange for thrusting said surfaces together.

5. In combination, a locomotive smoke box front end member provided with an opening having an outwardly bevelled edge, a ring-like closure plate seated on said edge and having a door opening with an outwardly bevelled edge, a door seated on said latter mentioned edge, and means for thrusting said plate and door against their respective seating edges.

6. In combination, a locomotive smoke box front end member comprising a cylindrical casting having an end flange with an outwardly bevelled edge, a ring-like closure plate casting having an outer peripheral flange bevelled to seat on said edge and having an inner peripheral flange provided with an outwardly-facing bevelled surface, a door casting having a peripheral flange bevelled to seat on said surface, and means for thrusting said door and closure plate against their respective seats.

7. In combination, a locomotive smoke box front end member comprising a cylindrical casting having an end flange with an outwardly bevelled edge, a ring-like closure plate casting having an outer peripheral flange

bevelled to seat on said edge and having an inner peripheral flange provided with an outwardly-facing bevelled surface, a door casting having a peripheral flange bevelled to seat on said surface, means for thrusting said closure plate against its seat and located outside of the joint between said closure plate and said front end member, and means for thrusting said door against its seat and located outside of the joint between said door and said closure plate.

8. In a locomotive smoke box front end structure, a body comprising a cylindrical shell provided with an outwardly-inclined forwardly-facing bevelled surface for seating a closure plate and having integral hinge butts for mounting such a plate.

9. In a locomotive smoke box front end structure, a body casting comprising a cylindrical shell with an inturned flange at its end provided with an outwardly-bevelled inner periphery for seating a closure plate.

10. In a locomotive smoke box front end structure, a plate formed of a one-piece ring-shaped casting with inner and outer peripheral flanges, said flanges having bevelled surfaces for engaging door and body members respectively.

11. In a locomotive smoke box structure, a front cover plate casting having a peripheral flange for engaging a body member, the portion of said casting inside of said flange being bulged outwardly, and a plurality of reinforcing ribs on the inside wall of said casting adjacent said bulged portion.

12. In a locomotive smoke box structure, a front cover plate casting having a peripheral flange for engaging a body member, the portion of said casting inside of said flange being bulged outwardly and adapted to mount a front door.

13. In a locomotive smoke box front end structure, a front cover plate casting having a bevelled outer periphery for engaging a body member, and a hinge arm formed integrally with said plate.

14. In a locomotive smoke box front end structure, a front cover plate casting having a hand rail bracket formed integrally therewith.

15. In a locomotive smoke box front end structure, a front door casting having a lamp bracket formed integrally therewith.

16. In a locomotive smoke box front end structure, a front cover plate casting having hinge arms, door hinge butts and hand rail brackets, all formed integrally therewith.

17. In combination, a locomotive smoke box body end wall having an opening, a closure plate for said opening, and a flange on said plate extending outwardly outside of the joint between said plate and body wall and perforated outside of said joint, and attaching elements extending through said flange and into but not through said wall.

18. In combination, a locomotive smoke box body end wall having an opening, a closure plate for said opening having a door opening, a door for said latter mentioned opening, elements on said closure plate and on said door extending outside the joints between said closure plate and said body and between said door and said closure plate respectively, said elements being perforated, said body end wall and said closure plate being otherwise imperforate, and studs in said body and in said closure plate located outside said joints for insertion through perforations in said elements, and attaching nuts on said studs.

19. In combination, a locomotive smoke box body having an opening, a closure plate for said opening hinged to one side of said body, interengaging elements on said body and plate forming a joint between the same, studs on said body, a flange on said plate having perforations for receiving said studs, said perforations being elongated in the direction of movement of said plate on its hinge and said perforations being located outside of said joint.

20. In a locomotive smoke box front end structure, a detachable front cover plate casting having a body engaging annular member, a perforated attaching flange located outside of said member, and a hand rail bracket inside of said member, all formed integrally.

21. In a locomotive smoke box front end structure, a detachable front cover plate casting having a body engaging annular member, a perforated attaching flange located outside of said member, and a hinge arm element inside of said member, all formed integrally.

22. In a locomotive smoke box front end structure, a detachable front cover plate casting having a body engaging annular member, a perforated attaching flange located outside of said member, and a door hinge butt inside of said member, all formed integrally.

23. In a locomotive smoke box front end structure, a detachable front cover plate casting having a body engaging annular member, a perforated attaching flange located outside of said member, and a hand rail bracket, hinge arm element and door hinge butt inside of said element and all formed integrally.

24. In combination, a locomotive smoke box front end member provided with an opening having an outwardly bevelled edge, a closure plate hinged to said member seated on said edge, said plate having a door opening with an outwardly bevelled edge, a door hinged to said plate and seated on said latter mentioned edge, and means for thrusting said plate and door against their respective seating edges.

25. A cast metal smoke-box front for a locomotive, having integral brackets and pads at the front for attachments; and integral reinforcing ribs at the rear.

In testimony whereof I hereunto affix my signature this 19th day of February, 1929.

H. M. PFLAGER.