N. T. McKEE.

FRONT END CLOSURE.

APPLICATION FILED JAN. 18, 1918.

1,301,144. Patented Apr. 22, 1919.

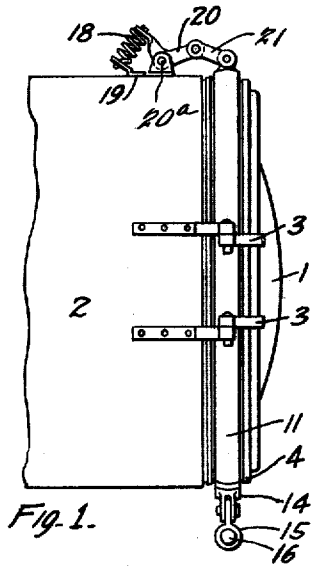


Fig. 1.

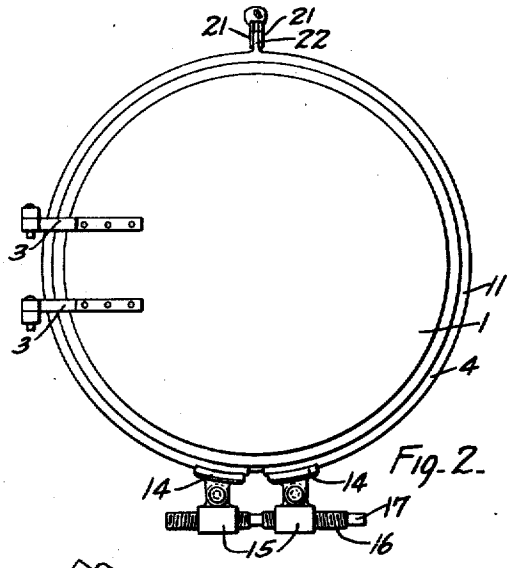


Fig. 2.

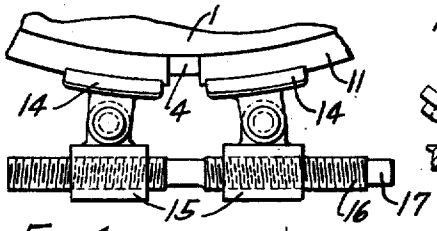


Fig. 4.

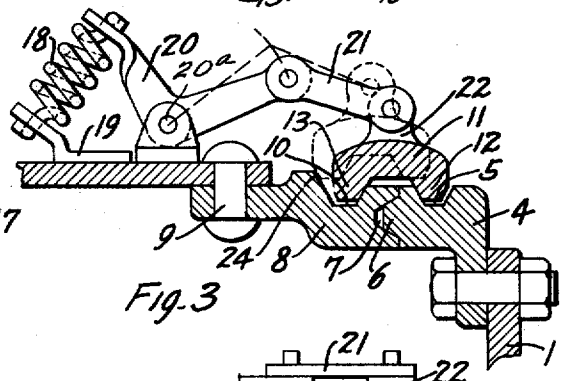


Fig. 3.

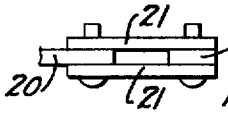


Fig. 6.

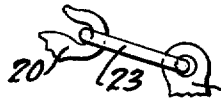


Fig. 7.

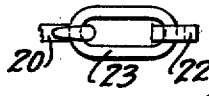


Fig. 8.

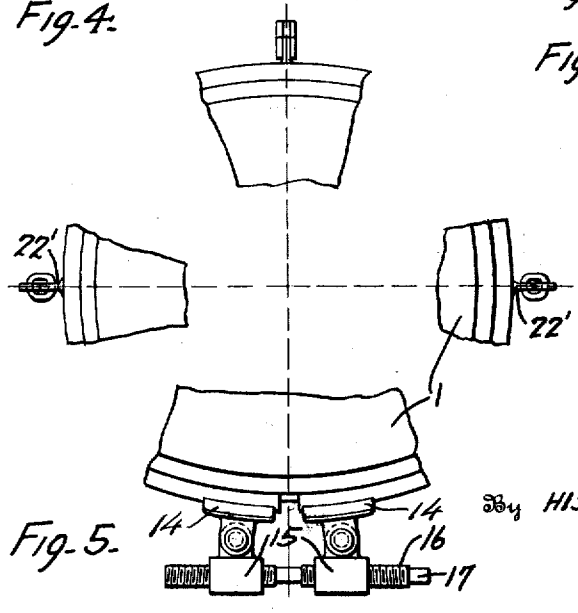


Fig. 5.

NEAL T. McKEE Inventor

By HIS Attorney O. V. Thiele

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

NEAL T. McKEE, OF YONKERS, NEW YORK, ASSIGNOR TO LOCOMOTIVE SUPERHEATER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

FRONT-END CLOSURE.

1,301,144. Specification of Letters Patent. Patented Apr. 22, 1919.

Application filed January 18, 1918. Serial No. 212,455.

To all whom it may concern:

Be it known that I, NEAL T. McKEE, a citizen of the United States, residing at Yonkers, in the county of Westchester, State of New York, have invented certain new and useful Improvements in Front-End Closures, of which the following is a specification.

My invention deals with closures for the front end of locomotive boilers, though it may be found of utility in other connections.

With the means at present usually employed for closing the front end, access may be had to the smokebox through a comparatively small central door by loosening a rather large number of nuts. If for any purpose it is necessary to have an unobstructed passage to the smokebox, this can be secured only by taking off the annular front which carries the door. As this front is bolted to the front ring with a large number of bolts, the operation is a laborious one.

My invention has for its object the provision of a closure of this sort which is readily opened and closed, and which, in its open position, leaves the entire front unobstructed.

The invention will be readily understood from the following description which is to be read in connection with the accompanying drawings. In the latter, Figure 1 is a side elevation of the front end of a locomotive equipped with a closure according to my invention; Fig. 2 is a front view of the same; Figs. 3 and 4 are details on an enlarged scale; Fig. 5 shows a modification; Figs. 6, 7, and 8 show a detail of the modification on a larger scale.

Reference numeral 1 designates the door proper, which I use to close the front end. This door, it will be noted, is substantially of the same diameter as the smoke box 2, to which it is secured by the hinges 3, 3. Bolted to the door 1 is the ring 4, made of cast iron or other suitable material. This ring 4 has the circumferential groove 5, and bears on its inner face, which is parallel to the door, the annular tongue 6. This tongue 6 engages with the groove 7 of the ring 8, which is secured to the smokebox sheet by rivets 9. The ring 8 is also provided with a groove, 10, similar to groove 5 of ring 4. When the door is in closed position, tongue 6 engages with groove 7, and grooves 5 and 10 lie parallel to each other. To hold the door in closed position, and to force tongue 6 home into groove 7 and make a tight joint, I employ the band 11, made of steel or other suitable material. Its two tongues 12 and 13 engage grooves 5 and 10 respectively. This band 11 is split at the bottom or other convenient point, its two ends carrying the brackets 14—14. Secured to each bracket 14 by a pin is a nut 15. One of the latter has a right hand thread and the other a left hand thread, the two being alined and engaged by the correspondingly threaded screw 16. This screw may be provided with a square end 17, or other means for turning it with a wrench or otherwise. Turning this screw in one direction or the other, will evidently respectively loosen or tighten the band 11. The surfaces of the tongues 12 and 13 that engage the grooves 5 and 10 are so beveled, that a tightening of the band 11 forces the rings 4 and 8 together, and seats tongue 6 tightly in groove 7.

To move band 11 out of the way, when it has been loosened, so that door 1 may be swung open, I employ a spring 18, one end of which is attached to the bracket 19, the other end engaging one end of the bell crank 20, which is pivoted at 20^a and the other end of which is connected by means of a pin to the two links 21, the other ends of these links being secured by a pin to the lug 22 integral with band 11. Spring 18 is in tension, and when band 11 is loosened it is drawn back into the position indicated in Fig. 3 by dotted lines. In this position it clears grooves 5 and 10, and the door may be swung open.

The ring 8 has on it a shoulder 24, which may be a continuation of the beveled outer surface of the groove 10, and which extends beyond the remainder of the ring 8. When the spring 18 draws the band 11 back, the band, as is shown in dotted lines, lies in contact with this shoulder. When the band 11 is again contracted, the tongue 13, guided by the beveled surface with which it is in contact again, enters the groove 10, tongue 12 of course simultaneously entering groove 5.

In Fig. 5 is shown a modification. Here, instead of having a single device to draw the band 11 out of the way when the band is opened up, there are three such devices. One of them is at the top, as before, and is like that described above, its two links 21, 21 are clearly shown in Figs. 5 and 6. The

latter figure also shows the end of the bell crank 20, and the lug 22. The other two devices, located one at each side, are in every respect like the one described before, except that each has the end of the bell crank 20 connected to the lug 22^1 by means of a single link as shaped as shown in Figs. 7 and 8. These figures give a side and a top view respectively of the arrangement. The purpose of this modification of the connecting link is that some upward movement of the lugs 22^1 occurs when the band is drawn out of the way by the springs. The arrangement shown is flexible and admits of such movement.

It will be clear that a number of variations are possible in the invention as disclosed.

Where these fall within the spirit of the appended claims, I intend that they shall be covered by them.

What I claim is:—

1. In apparatus of the class described, the combination of a smokebox ring having a peripheral groove, a door with a ring of the same diameter as said smokebox ring and having a similar groove, said smokebox ring having an annular groove in its face, said door ring having an annular tongue adapted to engage said annular groove, the sides of the annular groove and tongue being beveled, an expansible band with two tongues adapted to engage the peripheral grooves of the two rings, the engaging surfaces of the band and rings being beveled, means to contract said band and thereby to cause its tongues to engage the peripheral grooves, an annular abutment on the smokebox ring, and automatic means to move the band when in its expanded condition out of engagement with the peripheral grooves and against the abutment.

2. In apparatus of the class described, the combination of a smokebox ring and a door ring, one of them having in its face a circular groove with sloping sides the other having a complementary tongue, both of them having peripheral conical portions sloping outward and toward each other when the two rings are placed so the tongue and groove engage, an expansible band with an inner annular channel whose sides slope and are spaced so they will simultaneously engage the said conical portions when the band is contracted; and means to contract and expand the band.

3. In apparatus of the class described, the combination of a smokebox ring having a peripheral groove, a door with a ring of the same diameter as the smokebox ring, the door ring having a similar groove, said smoke box ring having an annular groove in its face, said door ring having an annular tongue adapted to engage said annular groove, the sides of the annular groove and tongue being beveled, an expansible band with two tongues adapted to engage the peripheral grooves of the two rings, the engaging surfaces of the band and rings being beveled, and means to contract said band and thereby to cause its tongues to engage the peripheral grooves.

NEAL T. McKEE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."