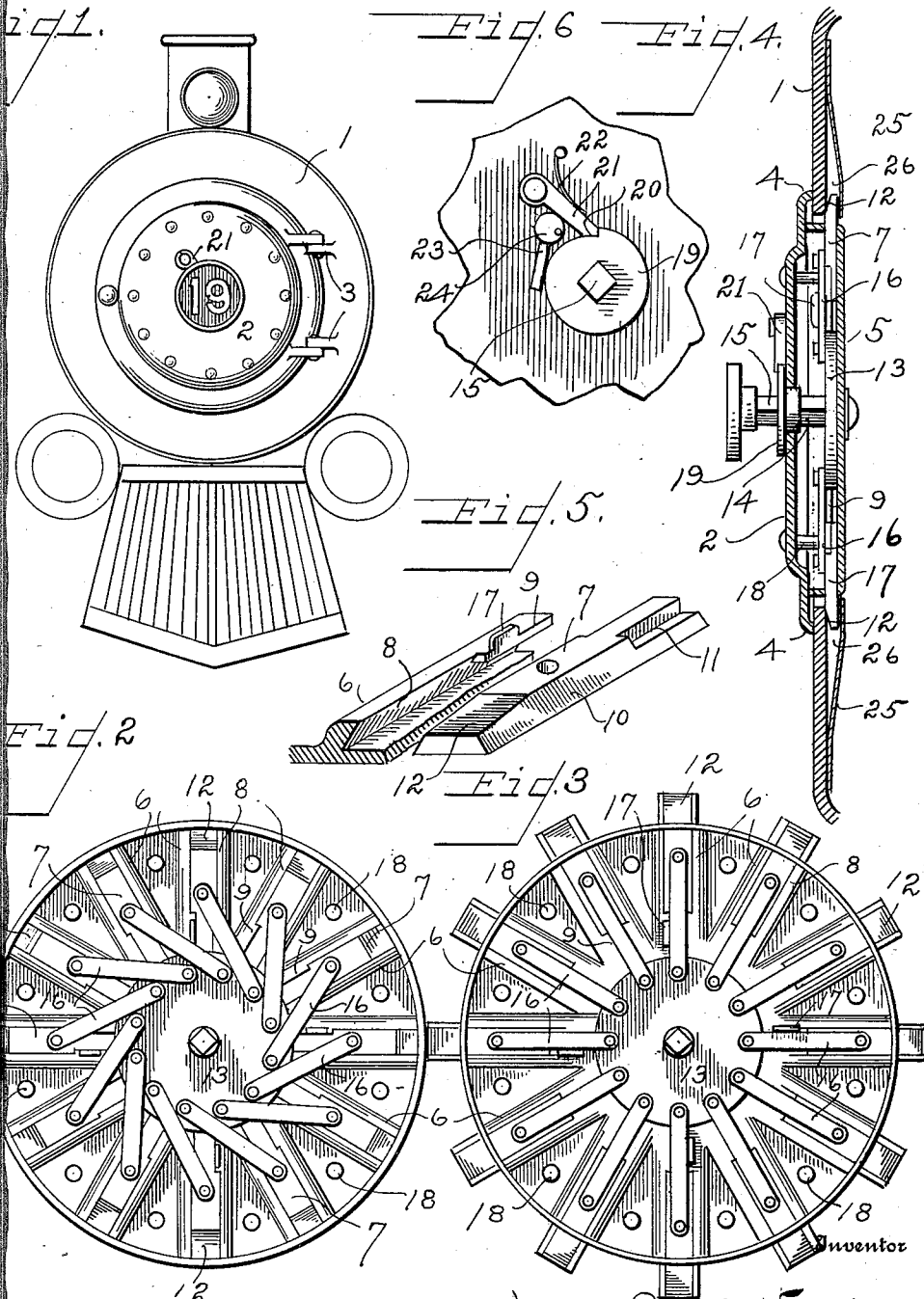


J. B. HUNTER & C. H. CHAMBERS.
DOOR.

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Witness
J. H. Dickinson
J. B. Carr

Inventor
James Burdell Hunter
Carlton H. Chambers
J. D. Walker, Attorney

UNITED STATES PATENT OFFICE.

JAMES BURDELL HUNTER, OF HAMILTON, AND CARLTON H. CHAMBERS, OF DAYTON,
OHIO.

DOOR.

1,011,9

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JAMES BURDELL HUNTER and CARLTON H. CHAMBERS, both citizens of the United States, residing, respectively, at Hamilton, in the county of Butler, and Dayton, in the county of Montgomery, State of Ohio, have invented certain new and useful Improvements in Doors, of which the following is a specification.

Our invention relates to doors and particularly to a closure for the smoke chamber of locomotives or to a closure for similar constructions, and the method of securing the same.

The object of the invention is to simplify the structure as well as the means and mode of operation of the smoke chamber closures of locomotives, whereby they will not only be cheap in construction, but will be more efficient, easily operated, and unlikely to get out of repair.

With the above primary and other incidental objects in view, as will more fully appear from the specification, the invention consists in the means, mechanism, features of construction, the parts and combinations thereof, and the mode of operation, as hereinafter described and set forth in the claims.

It is well known in locomotive engineering practice that it is quite essential that the closure of the smoke chamber located at the forward end of the locomotive boiler be made substantially air-tight. If the smoke chamber closure is not air-tight the engine with no "steam" properly, and considerable trouble and annoyance will be caused. Heretofore it has been customary to secure the closure of the smoke chamber by clamps and bolts which prevented ready access to the smoke chamber. On account of the difficulty of removing and replacing the smoke chamber closure, the smoke chamber has frequently not received the proper attention, thereby resulting in trouble and

annoyance. One of the primary objects of the present invention is to provide a closure which may be readily and quickly adjusted or removed, and which will render the smoke chamber substantially air-tight.

Referring to the drawings, Figure 1 is a front view of a locomotive showing the location of the smoke chamber closure. Fig. 2 is an interior view of the operated parts of the closure, the bolts being in their

innermost position, as when the door is unlocked. Fig. 3 is a similar view showing the bolts in their extended position. Fig. 4 is a sectional detail view through the closure and boiler head. Fig. 5 is a detail perspective view of one-half of the bolt guide or keeper and the bolt removed from said guide or keeper. Fig. 6 is a detail view of the locking device for securing the bolts of the closure in their locked position.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawings, 1 is the head of the locomotive boiler which is provided with a man-hole closed by a closure plate or door 2. The closure 2 is preferably hinged to the head 1 as at 3. The door 2 is provided with a peripheral flange 4 bearing upon the outer side of the head 1 and drawn tightly into contact therewith by the locking means to be described. Secured to the inner side of the door 2 is a housing 5 provided with a plurality of radial guides or keepers 6 in which are mounted radially movable bolts or locking bars 7. The guides or keepers 6 may be either dovetailed in form or may comprise guides engaging the bolts or locking bars 7, but are preferably a combination of these forms as shown in Fig. 5. The keeper or guide as shown in Fig. 5 is dovetailed throughout the outermost portion as at 8, while at the inner part is provided a projecting lip 9. The locking bar 7 is correspondingly beveled on its outer face as at 10 while adjacent to the rear portion thereof are recesses 11 engaged by the lip 9 of the keeper 6. The outer extremity of the locking bar 7 is provided with an inclination or bevel face 12 adapted to engage the head 1 about the edge of the man-hole as hereinafter mentioned. Centrally mounted in the housing 5 is a revoluble actuating disk 13 provided with a stem or shaft 14 extending beyond the closure door 2 and having a square head 15 for the reception of a wrench or spanner by which the actuating disk 13 may be rotated. Links 16 are pivoted at one end to the revoluble disk 13, and at the opposite end to the locking bars 7 at a point substantially mid-length of said bars. The construction is such that upon the rotation of the disk 13 the links 16 will cause the locking bars 7

to move outward within their guides 6 and to be projected radially beyond the housing 5 as shown in Fig. 3.

The locking bars 7 are of such length that in their innermost position or that shown in Fig. 2 the inner ends of the locking bars will contact the revoluble disk 13, and thereby limit the movement of the locking bar 7 and by the attachment of the links 16 therewith will also limit the revoluble movement of the disk 13. Projecting lugs 17 are provided on the keepers or guides 6 which are engaged by the links 16 when the locking bars 7 have reached their outermost position, and thereby limit the further movement of the locking bars and disk 13. It is obvious that after the links 16 have assumed a radial position as shown in Fig. 3, if the disk was further rotated, the locking bars 7 would tend to move inward. This is effectually prevented by the engagement of the links 16 with the said lugs 17. The housing 5 containing the locking mechanism is secured to the closure door 2 by studs or bolts 18. The adjustment of the parts is such that when the smoke chamber door 2 is closed and the disk 13 is rotated by means of the shaft 4 to thrust the locking bars 7 outward, the inclined faces 12 of the locking bars 7 will engage the edge of the man-hole as shown in Fig. 4, and by their movement will draw the smoke chamber door 2 tightly against the head 1. It is obvious that the greater the inclination 12 of the locking bars 7 the greater will be the drawing action of the door. However, it is not necessary that the angle of such inclined surface 12 be great. It has been found in practice, that with fairly close adjustment of the door at the time of its manufacture a comparatively slight angle will effectually draw the door into close contact with the head 1, making a particularly air-tight closure. However, this drawing action is an essential feature.

In order that the locking bars may not become disengaged through the constant jarring and jolting of the engine while running, means is provided for locking the disk 13 against rotation and comprises a disk 19 secured upon the shaft 14 on the outer side of the door 2. The disk 19 is provided with a notch 20 engaged by a pawl 21 pressed into engagement therewith by a spring 22. In order that the pawl 21 may be lifted out of the notch 20 and positively held out of engagement therewith when it is desired to open the smoke chamber door, a lever 23, having an eccentric head 24 is pivoted adjacent to the pawl 21 adapted upon movement, to engage and elevate said pawl out of the notch 20. When the pawl 21 has been disengaged from the plate 19 a wrench may be applied to the head 15 and the disk 13 readily rotated to

withdraw the locking bars 7 from their engagement with the head 1.

In order that the locking mechanism may be protected from the flame and fine cinders, soot and products of combustion, a shield plate 25 is attached to the inner side of the head 1 and projects over the outer ends of the locking bars 7 in their extended position, forming between said shield plate 25 and the head 1 a recess 26, into which the said locking bars extend.

While the closure forming the subject-matter hereof has been described as applied to the smoke chamber of locomotives, it is to be understood that it is applicable to other structures, as for instance, oil storage tanks, or tank cars, and similar purposes.

From the above description it will be apparent that there is thus produced a closure for chambers which may be readily engaged and disengaged, and which, when in engagement with the chamber will tend to draw the closure or door into close contact, thus making the chamber practically air-tight, and which possesses the other features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportion, detail construction, and arrangement of parts, without departing from the principle involved or sacrificing any of its advantages.

Having thus described our invention we claim:

1. In a device of the character described, the combination with a chamber having an opening therein, of a closure therefor comprising a housing, having inner and outer walls, the inner walls being of less area than the chamber opening, the outer wall being of greater extent than the inner wall and extending beyond the periphery of the opening, the inner and outer walls being so located as to provide an intervening space, a plurality of radially disposed guides located within the said space, a plurality of locking bars reciprocating within the said guides, the extremities of the bars being tapered and adapted to engage the inner side of the chamber wall adjacent to the opening and by their cam action to draw the extended portion of the outer wall of the closure into contact with the outer side of the chamber wall, actuating means for the bars, a false wall on the inner side of the chamber wall surrounding the opening and forming an intermediate space within which the locking bars project, the said false wall and inner wall of the closure cooperating to cover the locking bars and actuating mechanism and to protect said parts from the contents of the chamber.

2. In a construction as described, the combination with a chamber having a man hole therein, of a closure therefor, a plurality of radially movable locking bars on said

closure, the sides for said locking bars the
 recesses which are dovetailed or formed
 with inclined sides throughout a portion of
 their length and provided with overhang-
 ing or projecting lips throughout
 5 the remainder of their length, the locking
 bars having inclined sides corresponding to
 those of the guides, and further having in-
 dentations or recesses corresponding to the
 10 inward projecting lips of the guides, and
 means for reciprocating said locking bars in
 said guides substantially as specified.

3. In a construction as described, the com-
 bination of a chamber having a man hole
 15 therein, a closure therefor, a plurality of
 radially movable locking bars on said clo-
 sure, tapered extremities on said locking bars
 adapted to engage the edge of said man hole,
 a revoluble actuating member, independent
 20 links connecting each of said locking bars
 with the actuating member, said bars being
 of such length that they contact the actu-
 ating member when in their innermost posi-
 tions and are limited in their movements
 25 thereby projecting lugs on the inner face
 of said links are adapted to be contacted by
 said links whereby the movement of said
 links and locking bars will be limited when
 the locking bars reach their outer most po-

sitions and means to rotate said actuating 30
 member, substantially as specified.

4. In a construction as described, the com-
 bination with a chamber having a man hole
 therein, of a closure therefor, a plurality of 35
 radially movable locking bars on said clo-
 sure, a revoluble actuating member, links
 connecting each of said bars with said actu-
 ating member whereby the bars will be
 simultaneously operated, the stem of said
 actuating member projecting through said 40
 closure, a disk secured on said stem and
 having a notch therein, a spring actuated
 pawl adapted to engage said notch to pre-
 vent the rotation of said disk, a lever, an
 eccentric head on said lever engaging said 45
 pawl and adapted when operated to lift said
 pawl from the notch in said disk and hold
 said pawl out of engagement therewith, sub-
 stantially as specified.

In testimony whereof, we have hereunto 50
 set our hands this 8th day of January A. D.
 1909.

JAMES BURDELL HUNTER.
 CARLTON H. CHAMBERS.

Witnesses:

HARRY F. NOLAN,
 MABEL B. CARR.