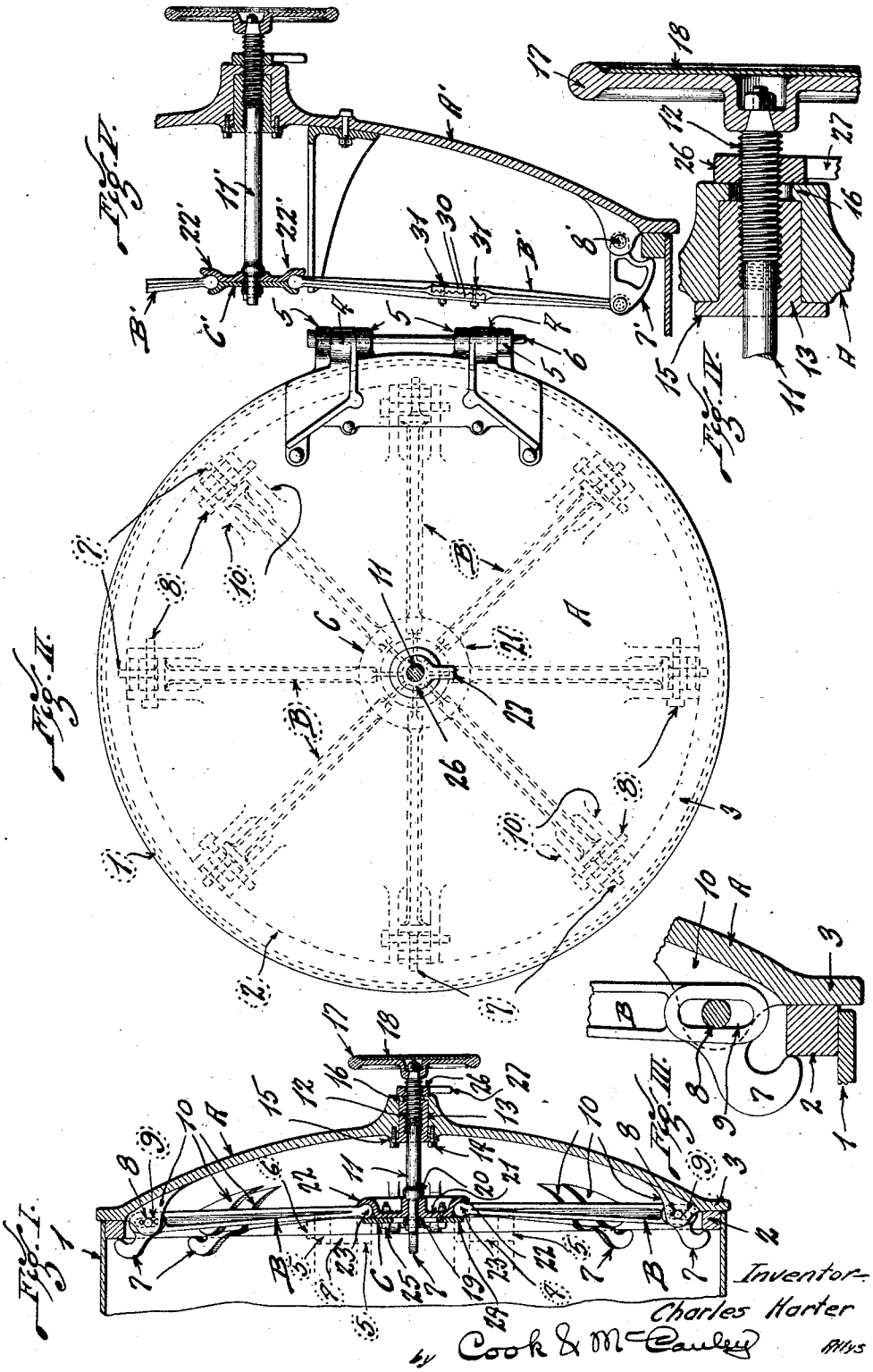
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CLOSURE FOR FRONT ENDS OF LOCOMOTIVES.

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1,407,858. Patented Feb. 28, 1922.



UNITED STATES PATENT OFFICE.

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CLOSURE FOR FRONT ENDS OF LOCOMOTIVES.

1,407,858. Specification of Letters Patent. **Patented Feb. 28, 1922.**

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To all whom it may concern:

Be it known that I, CHARLES HARTER, a citizen of the United States of America, a resident of the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Closures for Front Ends of Locomotives, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in closures for front ends of locomotives, one of the objects being to produce a simple and efficient means whereby a locomotive front end door can be easily and quickly forced onto and released from its seat at the front of the smoke box.

According to the standard practice which has been adopted and in general use prior to this invention, a locomotive front end is provided with an internal ring forming a seat for the front end door, and to secure the door on its seat, a very large number of horizontal studs are screwed into this ring, the margin of the door being accurately drilled to receive these studs. The door is forced onto its seat by means of nuts applied to the numerous horizontal studs which project through the outer margin of the door. The first cost of equipping a locomotive with these old standard devices is relatively high, for the internal ring must be accurately drilled and threaded to receive the studs; the door also must be accurately drilled to receive the studs, and the cost of making the studs and nuts is a substantial item of expense. In addition to this, a special door hinge must be employed to permit operation of the door which moves in a straight line at the horizontally extended studs. However, one of the most important items of expense involved in the use of these ordinary standard devices lies in the labor required to open and close the door. In closing the door, all of the numerous nuts must be carefully tightened on the studs, and all of these nuts must be removed to open the door. Furthermore, if a stud is not located in a horizontal position, or if it does not accurately register with the corresponding hole in the door, the screw thread will be mutilated by engagement with the door.

The present invention includes a simple clamping device whereby the door is very firmly forced onto its seat, and owing to the manner in which the elements of the clamping device are associated with each other and combined with the door, I have eliminated practically all of the labor of opening and closing the door. To firmly seat the door it is only necessary to actuate a simple operating device at the exterior of the door, and this operating device is preferably a wheel to be turned in one direction to seat the door and in the opposite direction to release the door.

Fig. I is a section illustrating the front end of a locomotive equipped with my closure.

Fig. II is a front elevation, the central operating rod being shown in section.

Fig. III is an enlarged detail view illustrating a part of the clamping device whereby the closure is forced onto its seat.

Fig. IV is an enlarged section illustrating the operating members at the center of the closure.

Fig. V is a fragmentary section illustrating another form of the invention.

To illustrate the invention I have shown a locomotive front end comprising a horizontal cylindrical shell 1, known as a "smoke box," and having an internal ring 2 secured in its outer margin.

The front end door A has a concave inner face and a flat margin 3 adapted to engage the outer face of the ring 2, the latter forming a seat for the door or closure. Hinge members 4 are secured to the door so as to cooperate with hinge members 5 secured to the shell 1, and a vertical pintle 6 passes through these hinge members. The door is thus supported by a hinge which allows it to swing into and out of engagement with the ring 2, but the hinge connection is loose enough to permit operation of a separate and independent means for firmly forcing the door onto its seat.

The clamping device shown in Figs. I, II and III comprises long levers B arranged radially to the door and provided at their outer ends with clamping jaws 7 in the form of hooks adapted to engage the inner face of ring 2. Pivot pins 8 pass through slots 9 in the levers B, said pins being mounted in lugs 10 extending from the concave inner face of the door near the outer margin thereof. Each lever B is thus fulcrumed near the

outer edge of the door, and a long lever arm extends from the fulcrum point to a point near the center of the door, while the lever arm formed by the clamping jaw 7 is relatively short.

A horizontal operating rod 11, extending through the center of the door, is provided with an enlarged threaded portion 12 mounted in a threaded bushing 13 seated in the door, said bushing being secured by means of screws 14 shown in Fig. I. One end of the bushing 13 has an abutment flange 15 seated on the inner face of the door, and the opposite end of said bushing is seated on an abutment flange 16 formed on the door. A rotary operating wheel 17 is fixed to the outer end of the threaded operating rod 11, and a circular plate 18 is secured to the outer face of this wheel to receive the locomotive number which usually appears on a circular plate at the center of the door.

A non-rotary thrust device C is mounted between abutments 19 and 20 on the rotary operating rod 11, said thrust device comprising a circular member 21 engaging the abutments 19 and 20 and provided with sockets 22 at its outer margin to receive the rounded ends 23 of the clamping levers D. A retaining ring 24 is secured to the member 21 by means of bolts 25 to retain the rounded ends in the sockets 22. The thrust device C is thus pivotally interlocked with all of the clamping levers B.

By merely turning the operating wheel 17 at the exterior of the door, a rotary movement will be imparted to the screw threaded operating rod 11, and said rod will also move horizontally to impart a horizontal movement to the non-rotary thrust device C, which lies inside of the door. In response to movements of this kind, all of the clamping levers B will move on their pivots 8. To force the door onto its annular seat, the thrust device C is moved away from the inner face of the door, thereby actuating levers B to force the rounded ends of the clamping jaws 7 onto the inner face of ring 2, and this is accomplished by merely turning the operating wheel 17 in one direction. To release the door, the operating wheel is turned in the opposite direction, so as to move the clamping jaws 7 toward the center of the ring 2, thereby permitting said jaws to pass through the ring. In unlocking the door, the operating rod 11 is turned a few revolutions to release its threaded portion 12 from the threaded bushing 13, and thereafter the unthreaded portion of said rod may be pulled into the bushing to quickly release the clamping jaws from the ring.

After the door has been firmly seated on the ring 2, the operating mechanism and the clamping jaws 7 may be locked by means of a threaded ring 26 mounted on the threads 12 and engaging the outer face of the door to serve as a jam nut. A handle 27 extends from the ring 26.

The rounded ends 23 of levers B are interlocked with the thrust device so as to travel therewith in straight horizontal lines, and the levers are therefore slotted at 9 to receive the pivots 8. The slots 9 permit operation of the levers in response to a horizontal movement of the thrust device with which the levers are interlocked.

In Fig. V the threaded operating rod 11′ is provided with a horizontally movable thrust device C′ having sockets 22′ in which the rounded ends of links B′ are secured, the outer ends of said links being pivoted to clamping jaws 7′ in the form of levers pivoted at 8′ to the door A′. The links B′ and levers 7′ are arranged radially to the door A′, and in response to longitudinal movements of said links the levers 7′ will move toward and away from the center of the door. Each link B′ is preferably made of two adjustable sections having lapping portions 30 which interlock with each other to provide an adjustable connection. Bolts 31 connect the lapping portions 30.

It will be readily understood that in either form of the invention the clamping jaws can be easily and quickly operated to seat or unseat the door, and a very desirable leverage can be obtained by transmitting motion to the clamping jaws, as herein shown and described.

I claim:

1. A locomotive front end comprising a cylindrical shell provided with a ring at its outer end, the outer face of said ring being provided with an annular closure seat, a front end door adapted to engage said closure seat, a hinge adapted to support said door in its open position, clamping jaws in the form of levers pivotally secured to the inner side of said door and adapted to engage the inner face of said ring, operating means extending through said door, said operating means including a manually actuated operating member at the outer side of the door, and a thrust device whereby motion is transmitted from said operating means to said clamping jaws.

2. A locomotive front end comprising a cylindrical shell, a ring secured in the end of said shell, the outer face of said ring being provided with an annular closure seat, a front end door adapted to engage said closure seat, a hinge connecting said door to said shell, clamping jaws pivotally connected to the inner side of said door, and adapted to engage the inner face of said ring, an operating screw extending through the center of said door, said operating screw being movable transversely of the door, and means whereby motion is transmitted from said operating screw to said clamping jaws.

3. A locomotive front end comprising a horizontal cylindrical shell, a ring secured in the outer end of said shell, the outer face of said ring being provided with an annular closure seat, a front end door having a concave inner face and a flat marginal portion adapted to engage said annular closure seat, a hinge connecting said door to said horizontal cylindrical shell, the axis of said hinge being vertical, lugs extending from the inner face of said door, clamping jaws in the form of levers pivoted to said lugs and adapted to engage the inner face of said ring, said levers being radial to said ring and shell, a central thrust device pivotally connected to said levers, a central operating screw rotatably mounted in said thrust device and extending through the center of said door, said thrust device being movable horizontally in response to horizontal movements of said operating screw, an operating member secured to said screw and located at the exterior of said shell, and means for locking said screw to secure said levers in their operative positions.

4. A locomotive front end comprising a horizontal cylindrical shell, a ring secured to the outer end of said shell, the outer face of said ring being provided with an annular closure seat, a front end door adapted to engage said closure seat, a hinge connecting said door to said horizontal cylindrical shell, the axis of said hinge being vertical, clamping jaws in the form of levers pivotally secured to the inner side of said door and adapted to engage the inner face of said ring to force the door onto said seat, said clamping jaws being movable toward the axis of said ring to permit movement of the door on its hinge, an operating member at the exterior of said door, and means whereby motion is transmitted from said operating member to said clamping jaws.

5. A locomotive front end comprising a horizontal cylindrical shell, a ring secured inside of the outer end of said shell, the outer face of said ring being provided with an annular closure seat, a front end door adapted to engage said closure seat, a hinge connecting said door to said horizontal cylindrical shell, the axis of said hinge being vertical, clamping jaws in the form of levers pivotally secured to the inner side of said door and adapted to engage the inner face of said ring to force the door onto said seat, said clamping jaws being movable toward the axis of said ring to permit movement of the door on its hinge, an operating member at the exterior of said door, and means whereby motion is transmitted from said operating member to said clamping jaws, said means comprising a rotary screw passing through said door, a non-rotary thrust device located inside of said door and mounted on said screw so as to move horizontally in response to rotary movements of the screw, and means whereby said thrust device is connected to all of said clamping jaws.

6. A locomotive front end comprising a cylindrical shell provided with abutments and a closure seat at its outer end, a front end door adapted to engage said closure seat, a hinge adapted to support said door in its open position, clamping jaws in the form of levers pivotally secured to the inner side of said door and adapted to engage said abutments to force said door onto said seat, operating means extending through the door, said operating means including an operating member at the outer side of the door, and a thrust device whereby motion is transmitted from said operating means to said clamping jaws.

In testimony that I claim the foregoing I hereunto affix my signature.

CHARLES HARTER.