June 26, 1923. 1,459,872

C. R. BELK

HINGE

Filed April 19, 1922 2 Sheets-Sheet 1

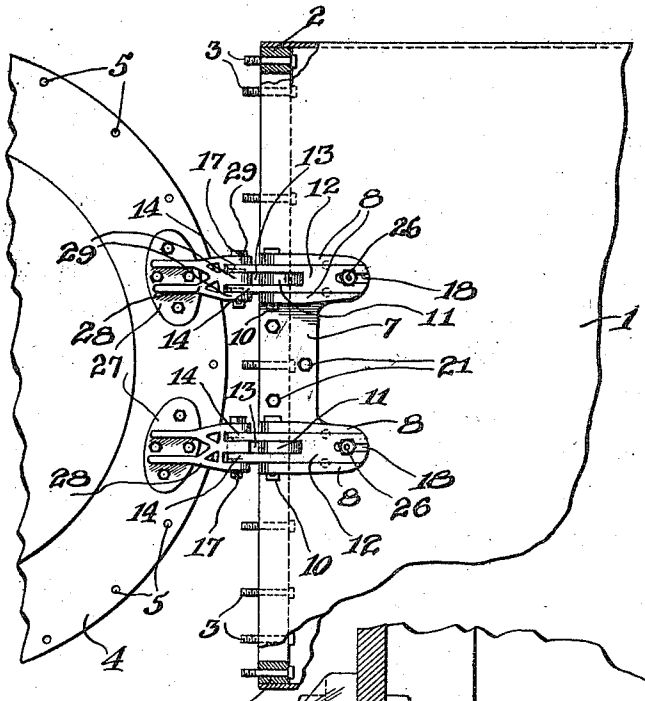


Fig. 1.

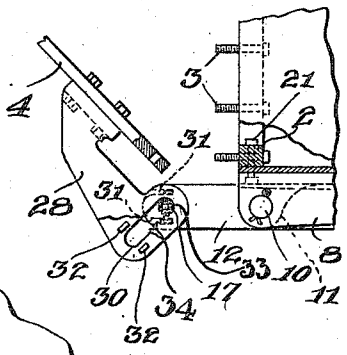


Fig. 3.

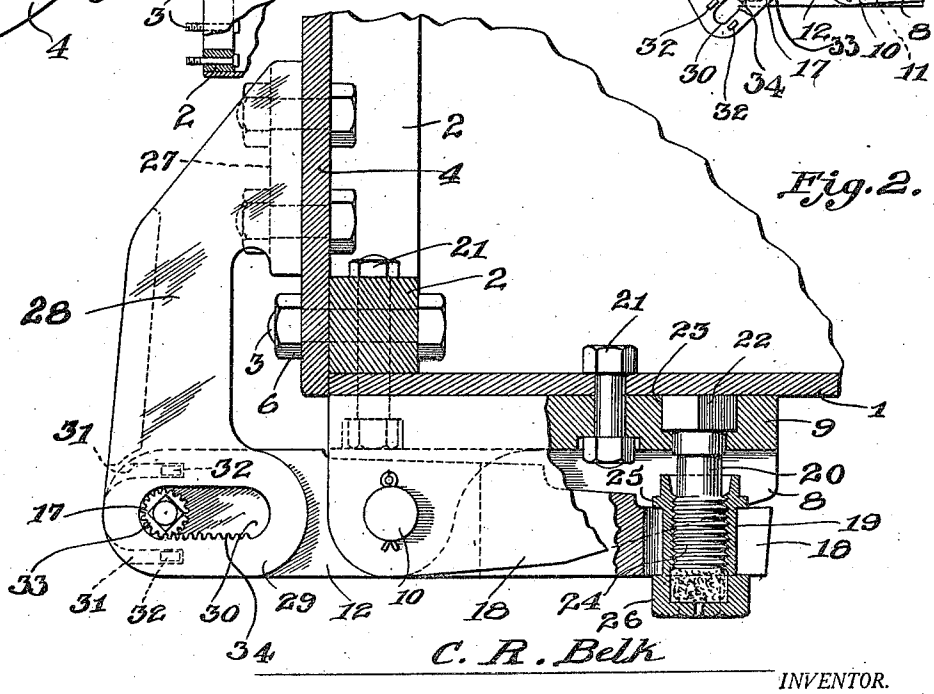


Fig. 2.

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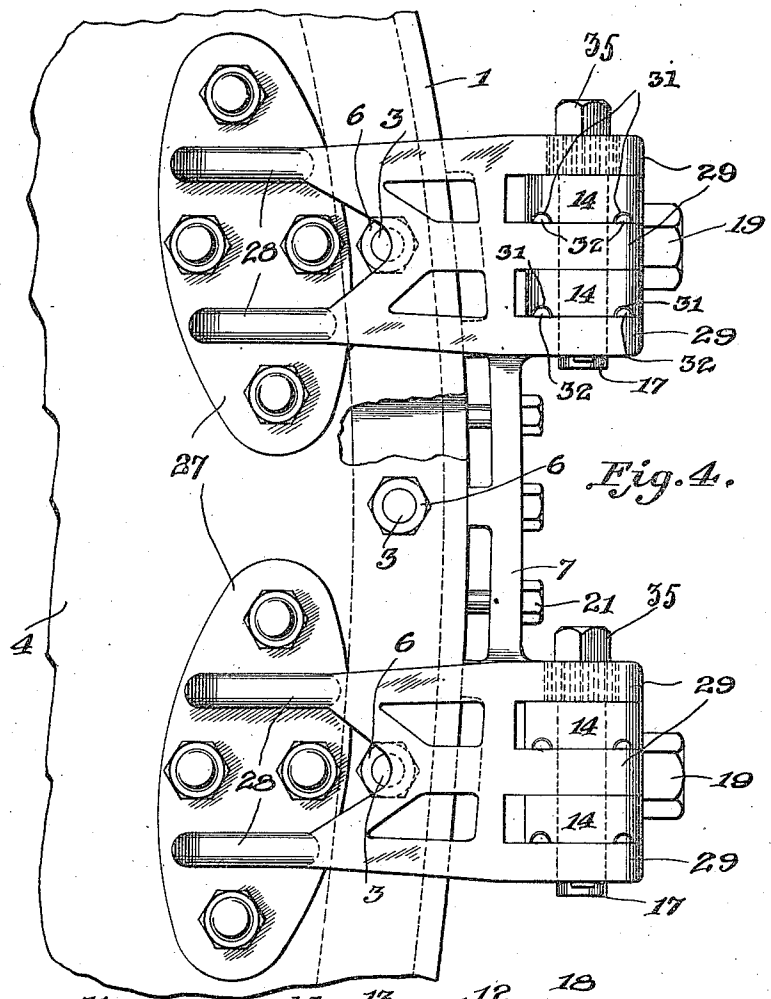


Fig. 4.

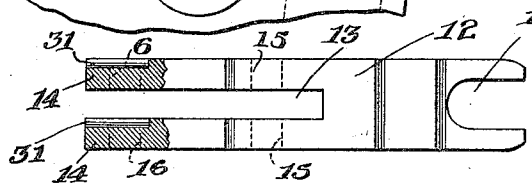


Fig. 5.

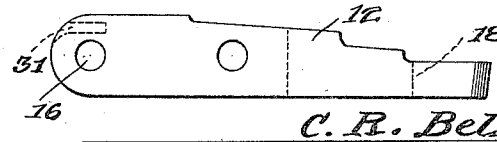


Fig. 6.

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Patented June 26, 1923. 1,459,872

UNITED STATES PATENT OFFICE.

CHARLES R. BELK, OF PITTSBURGH, PENNSYLVANIA.

HINGE.

Application filed April 19, 1922. Serial No. 555,648.

To all whom it may concern:

Be it known that I, CHARLES R. BELK, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hinges; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in locomotive boilers, and more particularly to means for mounting the smoke box front of the same whereby they can be quickly and readily detached from the boiler and swung to an open position by means of an improved hinge member whereby access to the interior of the smoke box can be readily gained.

Another object of the invention is the provision of a new and improved hinged member for supporting a locomotive smoke box front whereby the same can be quickly and readily removed and replaced when it is desired to make repairs to the interior of the boiler or smoke box with a minimum amount of expense in the employment of labor or the usual block and tackle device used for removing these smoke box fronts.

As a general rule when it is desired to remove a smoke box front, it is necessary to erect a block and tackle device and several laborers are used for the assistance in removing this smoke box front, but by hinging the front onto the body of the locomotive boiler, the same can be quickly and readily detached from the end of the boiler or smoke box and swung to an open position by a single unskilled laborer and after the repairs have been made, the front can be quickly and readily returned to its closed position and secured by the usual bolt fastening means in a short space of time.

With the above and other objects in view, the invention consists in the novel features of construction, combination and arrangement of parts hereinafter more fully set forth, pointed out in the claims and shown in the accompanying drawings, in which:

Figure 1 is a side elevation of a boiler front end hinge constructed in accordance with my invention;

Fig. 2 is a top plan view, parts being broken away and illustrated in section;

Fig. 3 is a similar view, the hinge being shown in an open position;

Fig. 4 is a front elevation of the hinge member;

Fig. 5 is a plan view of one of the adjustable arms, and

Fig. 6 is a side elevation of the same.

Referring now more particularly to the drawings, the numeral 1 indicates a locomotive boiler having arranged at its outer end the usual securing ring 2 supporting a plurality of bolts 3 which are used in retaining the smoke box front 4 in its closed position against the end of the body member 1. It will be noted that the front 4 is provided with a plurality of perforations 5 adapted to receive the bolts 3 and after the bolts are placed in position within the perforations 5, suitable nuts 6 are threaded upon the outer ends of the bolts 3 to securely retain the front 4 in its proper position whereby to close the forward end of the body 1 of the smoke box end of the boiler.

As a general rule, this smoke box front end 4 is removed under difficulties requiring the services of several skilled laborers and the use of block and tackle in view of the weight of this boiler front, therefore providing considerable expense for the removal of this boiler front in order to obtain access to the interior of the boiler or smoke box when repairs are required. In order to eliminate the necessity of the requirement of several skilled laborers to remove this front end head besides the use of the block and tackle, I provide a new and improved hinge whereby the boiler front 4 is hingedly connected to one side of the smoke box of boiler 1 and after removing the nuts 6 from the bolts 3 which retain the boiler front in its closed position, the same can be swung to an open position as shown in Fig. 1 by a single unskilled laborer, thus reducing the cost of the removal of these boiler fronts to a minimum. It will also be apparent that this operation can be carried out without the necessity of placing the locomotive in a roundhouse, but the front end can be readily removed in the yards, on the main line or any other place where it may be required to gain access to the interior of the smoke box or boiler for repairs.

The hinge itself comprises a body plate

7 arranged to conform to the general outlines of the body of the boiler 1 and secured upon the side of the body at the outer end thereof as shown in Fig. 1. Arranged at each end of the body plate 7 are the spaced ribs 8, the inner ends of which extend beyond the inner longitudinal edge of the body plate 7 and are integrally formed at their inner ends with the extension 9 formed at the ends of the plate 7. These ribs 8 project outwardly at right angles to the plates 7 and are perforated to receive a pivot bolt 10. The plates 7 are further provided at their ends with outstanding perforated ears 11 arranged midway between the ribs 8 and through which the pivot pins 10 project.

Mounted upon the pivot pins 10 are the movable supporting arms 12, said arms being bifurcated at their outer ends as shown at 13 to form spaced arms 14 arranged upon opposite sides of the lugs 11 and perforated as at 15 and 16, the perforations 15 being adapted to receive the pivot pins 10, while the perforations 16 receive the pivot pins 17 that connect the arms to the front end 4.

The inner ends of the arms 12 are slotted as at 18, said slot being adapted to receive an adjusting sleeve 19 which is threaded upon a bolt 20 supported by the extension members 9 of the plate 7. The plate member 7 is attached to the body 1 of the boiler by means of suitable securing bolts 21 whereby this plate 7 can be quickly and readily detached from the body 1 or attached thereto as the occasion may require. The bolt 20 is provided at its inner end with a square head member 22 fitted within a square recess 23 formed in the inner face of the plate 7, the end of the head 22 abutting against the outer wall of the body member 1 whereby to prevent any movement on the part of the head 22. The outer end of the bolt 20 is provided with suitable screw threads 24 and mounted upon these screw threads is the adjusting sleeve 19 which is fitted within the recess 18 of each of the arms 12. The sleeve 19 is provided adjacent its inner end with a flange portion 25 adapted to engage the inner face of the arms 12 adjacent the slot 18 while the outer end of the sleeve is provided with a nut 26 for engagement with the outer face of each of the arms 12, said head portion 26 being preferably hollow to receive a lubricant to lubricate the screw threads 24. The sleeve 19 can be quickly and readily adjusted upon the bolt 20 for adjusting the positions of the arms 12, relative to plate 7.

The boiler front end 4 is provided upon its outer face and adjacent its circumferential edge with plates 27 having bracket arms 28 formed integral therewith, said plates being bolted or otherwise secured to the side edge of the boiler front end 4 and the outer ends of the bracket arms 28 which extend at right angles to the plates 27 project beyond the edge of the boiler front end 4 and are provided with spaced ears 29 having slots 30 formed therein, extending perpendicularly to plate 27, said slots being adapted to receive the pivot bolts 17 to hingedly connect the bracket arms 28 to the supporting arms 12.

The spaced arms 14 on the supporting arms 12 are provided with longitudinally extending recesses 31 adapted to receive lugs 32 which are carried by certain of the spaced ears 29 whereby the boiler front 4 will be retained in its proper position prior to bolting the same to the body 1.

Each of the pivot pins 17 are provided adjacent the head portion 35 with a pinion 33, which is adapted to engage with the rack 34 formed upon one of the longitudinal side walls of each of the slots 30. From this it will be apparent that after the nuts 6 have been removed from the bolts 3 the pivot pins 17 can be rotated by engaging any suitable tool with the heads 35, the rotation of the pins imparting a similar movement to the pinions 33 which in turn will cooperate with the rack 34 and move the end portion 4 away from the front of the boiler. This movement will tend to remove the lugs 32 from the recesses 31 so as to permit the end member 4 to swing outwardly away from the end of the smoke box.

From the above, it will be noted that by using a construction of this character, the end member 4 can be moved away from the front of the smoke box with very little effort.

In Fig. 2, I have illustrated the door or head portion 4 of the locomotive in its closed position and in order to move the same from the body 1, the nuts 6 are detached from the bolts 3 and the head 4 moves away from the body 1 until the lugs 32 are removed from the recesses 31 to permit swinging movement of the front 4 through the medium of the bracket arms 28 and the supporting arms 12 which are pivotally connected by means of the bolts 17, the open position of the hinged members being illustrated in Fig. 3. From this it will be apparent that a single unskilled laborer can quickly and readily remove the locomotive boiler head 4 by removing the nuts 6 from the ends of the bolts 3 and prying outwardly upon the boiler head 4 until the same is moved a sufficient distance away from the body 1 to permit the removal of the lugs 32 from the recesses 31, the door or head 4 can then be swung upon the pivot pins 17, to an open position as illustrated in Figs. 1 and 3.

I claim:

1. A hinge of the character described comprising a body plate carried by a stationary

object, spaced ribs on said plate, perforated ears on the plate between said ribs, movable supporting arms mounted upon said ears for pivotal movement, spaced plates carried by a movable object, bracket arms formed integral with said plates and having pivotal connection with one end of the supporting arms and means engaging the other end of said supporting arms for adjusting the position of the same.

2. A hinge of the character described comprising a body plate carried by a stationary object, supporting arms pivotally mounted upon said plate in spaced relation, bracket arms secured to a movable object and arranged in spaced relation, means for pivotally connecting said bracket arms with one end of the supporting arms, bolts carried by the body plate and movable through the other end of the supporting arms and adjustable collars mounted upon said bolts and engaging the supporting arms.

3. A hinge of the character described comprising a body plate carried by a stationary object, supporting arms pivotally mounted in spaced relation upon said plate, bracket arms carried by a movable object and having pivotal connection with one end of the supporting arms, the ends of the supporting arms being provided with longitudinal recesses and lugs carried by the bracket arms for engagement within said recesses as and for the purpose set forth.

4. A hinge of the character described comprising a body plate secured to a stationary object, supporting arms pivotally mounted upon said body plate, bracket arms carried by a movable object and having pivotal connection with one end of the supporting arms, the other end of said supporting arms being bifurcated, threaded bolts carried by the body plate and disposed within said bifurcations, adjusting sleeves mounted upon the bolts and arranged within the bifurcations, flanged portions formed upon said sleeves for engagement with opposite faces of the supporting arms whereby adjustment of the sleeves upon the bolts will impart movement to the supporting arms.

5. A hinge of the character described comprising a body plate carried by a stationary object, supporting arms pivotally mounted upon said plate in spaced relation, bracket arms secured to a movable object, means for pivotally connecting said bracket arms with one end of the supporting arms, the ends of the supporting arms being provided with longitudinal recesses, lugs carried by the bracket arms for engagement within said recesses and means whereby to move said bracket arms laterally to disengage the lugs from the recesses.

6. A hinge of the character described comprising a body plate carried by a stationary object, supporting arms pivotally mounted upon said plate, bracket arms carried by a movable object and having pivotal connection with the outer ends of the supporting arms, the ends of the supporting arms being provided with longitudinal recesses, lugs carried by the bracket arm for normal engagement within said recesses, a rack carried by each of the bracket arms and a pinion on each of the supporting arms whereby rotation of the pinion will move the bracket arms laterally to disengage the lugs from the recesses.

7. A hinge of the character described comprising a body plate, supporting arms pivotally mounted upon said plate, bracket arms having pivotal connection with one end of the supporting arms, the ends of the supporting arms being provided with longitudinal recesses, lugs carried by the bracket arms for normal engagement within said recesses, spaced ears on said bracket arms having slots, a rack formed upon one of the longitudinal side walls of each of said slots, a pinion carried by the supporting arms for engagement with the rack whereby rotation of the pinion will disengage the lugs from the recesses.

8. A hinge of the character described comprising in combination a body member, a supporting arm pivotally supported on the body member, means for adjusting the supporting arm angularly relative the body member a second supporting arm pivotally secured to the first supporting arm and means for varying the position of said last mentioned pivotal connection longitudinally of the first supporting arm.

9. A hinge of the character described comprising in combination a body member, a supporting arm pivotally supported on the body member, means for adjusting the supporting arm angularly relative the body member, a second supporting arm pivotally secured to the first supporting arm, means for varying the position of said last mentioned pivotal connection longitudinally of the first supporting arm and means associated with said last mentioned pivotal connection for securing said supporting arms in a predetermined angular relation at a predetermined position of the pivot relative the first supporting arm.

10. A hinge of the character described comprising in combination a body member, a supporting arm pivotally supported on the body member, means for adjusting the supporting arm angularly relative the body member, a second supporting arm pivotally secured to the first supporting arm, means for varying the position of said last mentioned pivotal connection longitudinally of the first supporting arm and means associated with said last mentioned pivotal connection for securing said supporting arms in a predetermined angular relation at a pre-

determined position of the pivot relative the first supporting arm comprising a groove upon one of said supporting arms and a lug upon the other supporting arm slidable in said groove.

11. A hinge of the character described comprising two arms, one adapted to be fixedly secured to a closure, the other pivotally supported by an attachment member, means for angularly adjusting the pivoted arm relative its supporting member, an adjustable pivotal connection between said two arms whereby said pivotal connection can be moved longitudinally relative this pivotal arm, and locking means operated by the longitudinal adjustment of said pivot.

In testimony whereof I affix my signature.

CHARLES R. BELK.