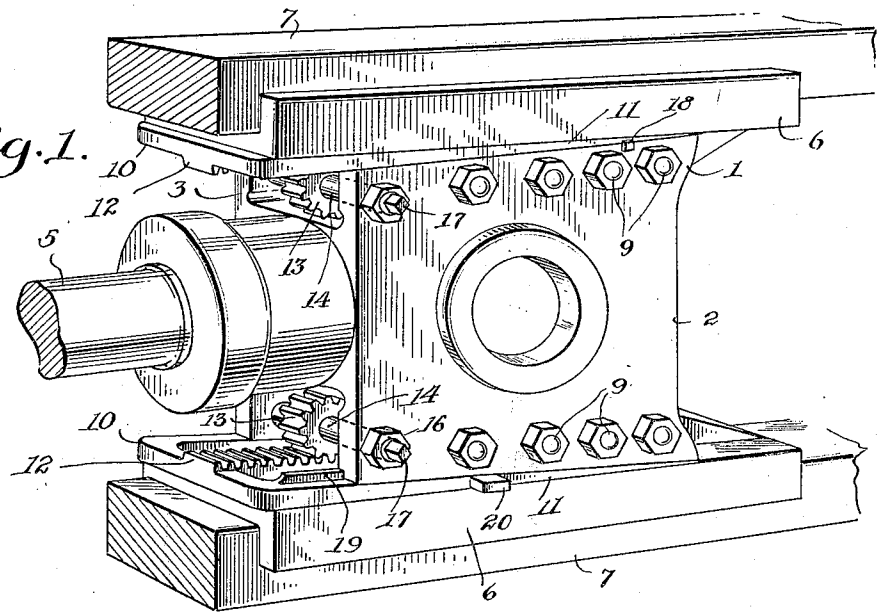
Aug. 23, 1932. T. ROGATCHOFF 1,873,482

ADJUSTABLE CROSSHEAD

Filed March 3, 1927 2 Sheets-Sheet 1

Fig. 1.



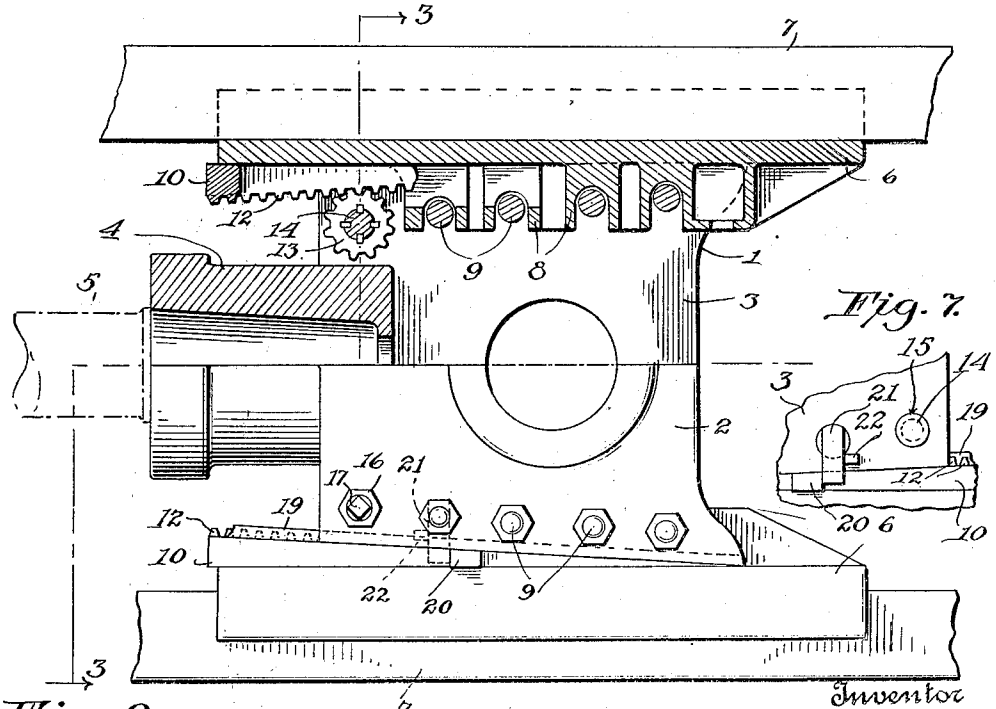


Fig. 2.

Fig. 7.

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Aug. 23, 1932. T. ROGATCHOFF 1,873,482

ADJUSTABLE CROSSHEAD

Filed March 3, 1927 2 Sheets-Sheet 2

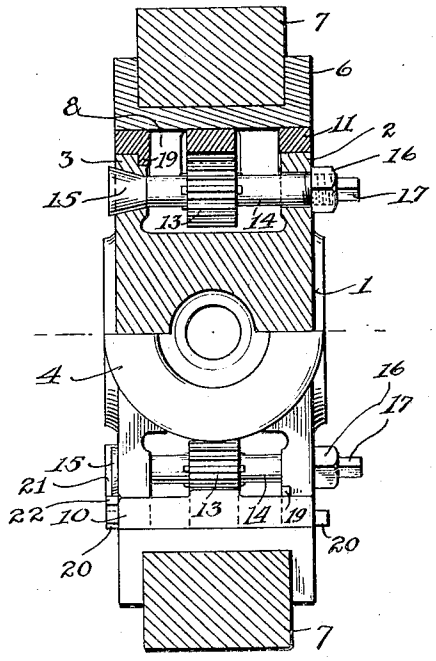


Fig. 3.

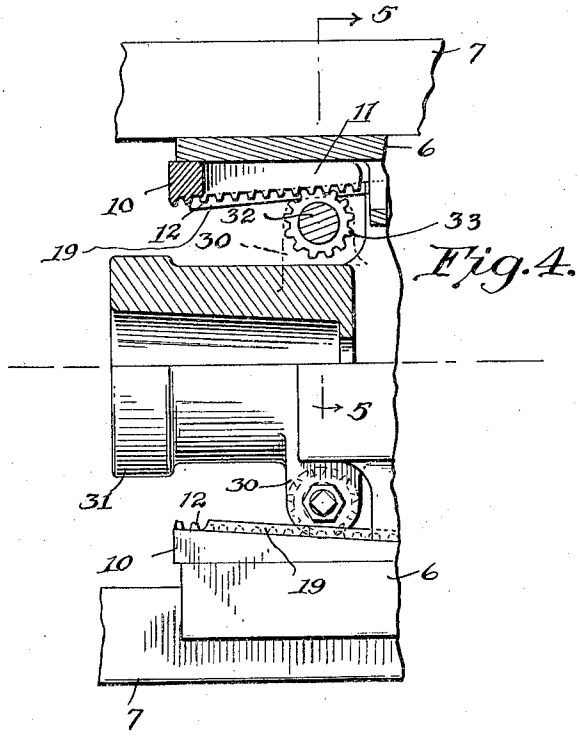


Fig. 4.

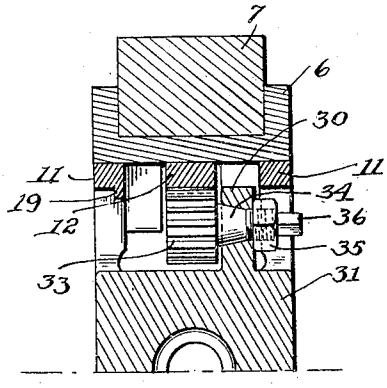


Fig. 5.

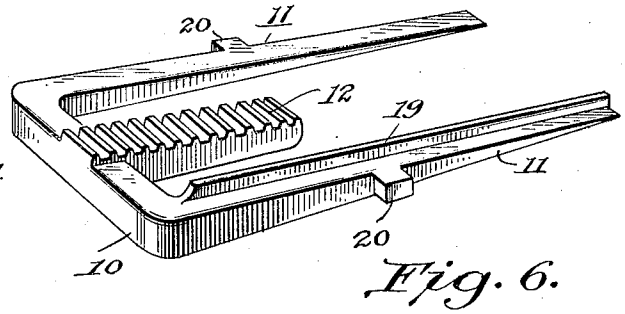


Fig. 6.

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UNITED STATES PATENT OFFICE

THEODORE ROGATCHOFF, OF BALTIMORE, MARYLAND

ADJUSTABLE CROSSHEAD

Application filed March 3, 1927. Serial No. 172,505.

This invention relates to the adjustment of crossheads of locomotives although it is of course adapted for use on other steam engines, or power plants in which crossheads are employed.

One of the primary objects of the invention resides in the provision of means for the adjustment of a crosshead which is comparatively simple in construction, whereby the adjustment may be quickly accomplished and thereby avoid pounding of a crosshead between the guide bars, which not only rapidly increases wear and tear on crosshead shoes, but also other parts as well.

Another object of the invention consists in the provision of a reliable mechanism for securely locking the adjusting means against displacement after the adjustments have been made.

Other objects and advantages of the invention will be apparent from the following description when taken in connection with the accompanying drawings; in which

Figure 1 is a perspective view of a locomotive crosshead with the improved adjusting means in place thereon.

Figure 2 is a side elevation of the crosshead, partly in section.

Figure 3 is a vertical transverse section taken on line 3—3 of Figure 2.

Figure 4 is a fragmentary side elevation, partly in section, of a slightly modified form of crosshead.

Figure 5 is a vertical transverse section taken on line 5—5 of Figure 4.

Figure 6 is a perspective view of one of the adjusting wedges; and

Figure 7 is a fragmentary detail view showing one of the locking devices for the wedge.

Referring to the drawings in detail and especially to Figures 1, 2, 3 and 6, the numeral 1 indicates generally the usual crosshead, the body portion of which is formed of the side plates 2 and 3 and the sleeve 4 in which the piston rod 5 is securely fastened.

Mounted on the top and bottom of the body portion of the crosshead are the usual shoes 6 which are guided on the guide bars 7 and which are provided with the inwardly extending projections 8 which are received between the plates 2 and 3. Tie bolts 9 extend transversely through the plates 2 and 3 and through grooves formed in the extensions 8 thereby serving to hold the plates against spreading and also serving to prevent movement of the shoes 6 longitudinally of the crosshead.

The foregoing structure is well known in crosshead construction and is mentioned here only insofar as is necessary to emphasize the present invention which will now be described.

Disposed between the shoes 6 and the body portion of the crosshead are U-shaped wedges 10, the prongs 11 of which engage the edges of the side plates 2 and 3 and the base of the shoes 6. The purpose of these wedges is to provide an adjustment whereby the wear on the shoes may be taken up so as to avoid pounding of the crosshead as well as other detrimental effects directly attributable to loose connections between the crosshead and guide bars. In the present embodiment of the invention the wedges 10 are adapted to be adjusted longitudinally of the crosshead by means of a rack and pinion, the rack being integrally formed on the wedge 10 and designated by the numeral 12. This rack extends between the prongs 11 of the wedge and cooperates with a pinion 13 which is keyed or otherwise formed on a shaft or bolt 14.

This shaft or bolt 14 extends transversely through the plates 2 and 3, and in order that rotation of the shaft and pinion may be prevented after the wedge is moved to adjusted position one end of the shaft is formed with a frusto-conical head 15 which fits into a similarly shaped opening in the plate 3. After the wedge is properly installed or after a later adjustment of the wedge the head 15 is brought into wedging action with the walls of the opening in the plate 3 by tightening up on the nut 16 threaded to the shaft or bolt 14. It will be readily understood that the wedge may be adjusted by merely loosening up on the nut 16 and the nuts on bolts 9 and then turning the shaft by means of a wrench applied to the squared end 17 of the shaft.

The upper and lower wedges for the shoes 6 are identical and may be used interchangeably; and in order to assist in preventing longitudinal movement of the wedges when in adjusted position one of the prongs 11 is provided with a rib 19 which seats in a notch in the inner side wall of the side plates 2 or 3 depending upon whether the upper or lower wedge is referred to. These notches are clearly shown in Figure 3 and are of slightly less width than the ribs 19, whereby the prong 11 is brought into tight gripping contact with the shoe and side plates when the bolts 9 are tightened up. Also to prevent spreading of the wedges 10 metal strips or lugs 18 are connected to the side plates 2 and 3 so as to slightly overhang the prongs 11 and prevent outward movement thereof.

It will be understood by those skilled in the art that the crosshead of an engine is under a very heavy strain when in use and that therefore under certain circumstances there is a possibility of the bolt or shaft 14 becoming loose due to bad, worn or stripped threads on the bolts 9 or 14, and furthermore, careless mechanics will sometimes fail to properly tighten the tie bolts 9. Under such conditions the pinion 13 would be permitted to turn upon its axis with a consequent possibility of loss of the wedge 10. To prevent this contingency each of the wedges 10 is provided with stop lugs 20, which, when the wedge is in position, cooperate with one of the projecting ends of a bar 21 fixed on the head of one of the tie bolts 9, thereby preventing retrograde movement of the wedge. There would of course be a tendency under these circumstances for the bolt 9 carrying the bar 21 to be rotated about its axis and to avoid this movement of the bar 21 a lug 22 is formed on the side plate 3 and cooperates with the adjacent end of the bar 21 so as to prevent its rotation.

In the modified form of the invention shown in Figures 4 and 5 the identical form of U-shaped wedge is employed as depicted in Figure 6 and heretofore described. In this second form of the invention however, the means for mounting the pinion is slightly modified due to the fact that a somewhat different type of crosshead is employed; i. e., a crosshead in which the side plates are such as to preclude the use of a shaft such as shaft 14 previously described. Consequently the modified form of the invention contemplates the use of a lug 30 arising from the sleeve 31 and in which is mounted a shaft or bolt 32. A pinion 33 is formed on this shaft 32 for cooperation with the rack 12 of the U-shaped adjusting wedge, and this shaft is also provided with a frusto-conical portion 34 which is caused to wedge into the tapered opening in the lug 30 when the nut 35 is tightened up and thus prevent rotation of the bolt. The end of the bolt remote from the pinion 33 is provided with flat faces 36 for the reception of a wrench in operating the pinion 33.

The operation of this form of the invention is identical with that previously described and need not be further referred to; likewise the several safeguards described in connection with the first form of the invention form a part of the modified form and need not be here described in detail.

From the foregoing description taken in connection with the accompanying drawings it will be apparent that I have devised a comparatively simple means for adjusting crossheads, and one which may be easily and quickly installed on all types of crossheads now in use; that the adjusting means is readily accessible and easily operated; that all necessary safeguards are provided against loss or disorganization of the adjusting means; and that due to the simplicity of adjustment the "play" between the shoes and the guide bars will be more often remedied thereby permitting a much longer service of the shoes as well as a reduction in repairs and purchases of new parts.

In accordance with the patent statutes I have described what I now believe to be the best embodiment of the invention, but I do not wish to be understood thereby as limiting myself or the scope of the invention as many changes and modifications may be made without departing from the spirit of the invention; all such I aim to include within the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. An adjusting element for locomotive crossheads comprising a U-shaped wedge, an integral arm extending midway between the prongs of said wedge and provided with means whereby the wedge may be operated.

2. An adjusting element for locomotive crossheads comprising a U-shaped wedge, an arm extending midway between the prongs of said wedge, and a rack formed on said arm.

3. An adjusting element for locomotive crossheads comprising a U-shaped wedge, a rack disposed midway between the prongs of said wedge and a rib extending longitudinally along the inner edge of one of said prongs.

4. An adjusting element for locomotive crossheads comprising a U-shaped wedge member, a rack formed integrally with the base of said wedge and extending between the prongs thereof, an integral rib extending longitudinally along the inner edge of one of said prongs, and an integral stop lug extending outwardly from one of the prongs.

5. A locomotive crosshead including a body portion composed of spaced apart side plates, shoes mounted on the top and bottom of said body portion and having one or more projections extending into the space between said side walls, a wedge disposed between one of said shoes and the body portion of the

crosshead, means for adjusting said wedge longitudinally, a stop lug on said wedge, tie bolts extending transversely through said plates, and a projection formed on one of said bolts so as to extend into the path of said stop lug and prevent loss of the wedge.

6. A locomotive crosshead including a body portion composed of spaced apart side plates, shoes mounted on the top and bottom of said body portion and having one or more projections extending into the space between said side walls, a wedge disposed between one of said shoes and the body portion of the crosshead, means for adjusting said wedge longitudinally, a stop lug on said wedge, tie bolts extending transversely through said plates, a projection formed on one of said bolts so as to extend into the path of said stop lug and prevent loss of the wedge, and a lug on the body portion of the crosshead for cooperation with said bar to prevent rotation of the bolt when the wedge is in position.

7. A locomotive crosshead including a body portion, shoes at the top and bottom of said body portion, a wedge interposed between one of the shoes and the body portion of the crosshead, a rack integral with and located midway between the prongs of said wedge, a rotatable shaft disposed transversely of said body portion for cooperation with said rack, said shaft having a tapered portion fitting in a tapered opening in said body portion, and a nut threaded on the shaft for producing locking engagement of the tapered surfaces to prevent rotation of said shaft.

8. An adjusting wedge for locomotive crossheads and the like comprising a U-shaped body member with uniformly inclined homologous faces on its prongs, and a rack-bar approximately midway between the legs of said body member, the face of said rack-bar carrying the rack teeth being approximately in the same plane with said homologous faces and similarly inclined, substantially as set forth.

9. An adjusting wedge for locomotive crossheads and the like comprising a U-shaped body member with uniformly inclined homologous faces on its prongs, and a rack-bar approximately midway between the legs of said body member, the face of said rack-bar carrying the rack teeth being approximately in the same plane with said homologous faces and similarly inclined, and lugs at the outer sides of said prongs adapted to cooperate with stops on the body of a crosshead for preventing loss of a wedge, substantially as set forth.

THEODORE ROGATCHOFF.