M. D. JOYNER.

CROSSHEAD.

APPLICATION FILED SEPT. 29, 1919.

1,362,422. Patented Dec. 14, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

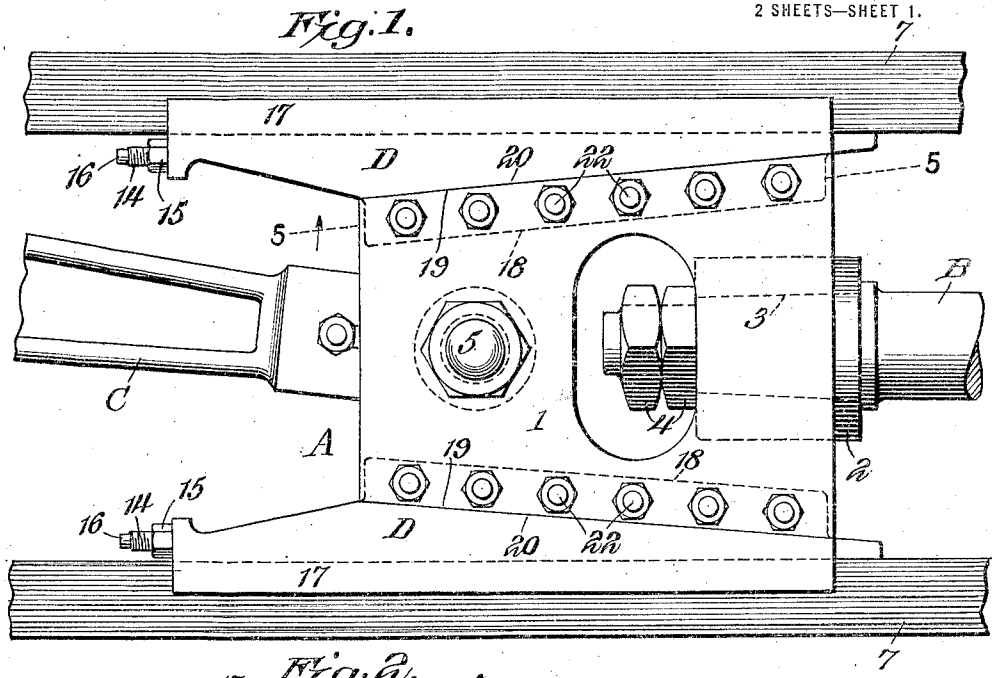
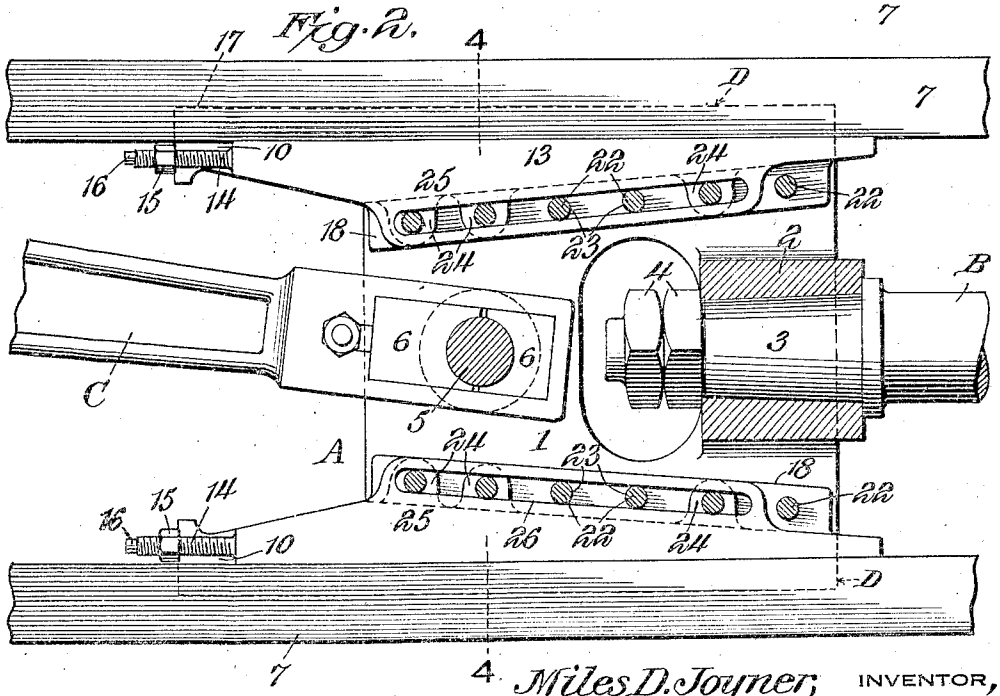


Fig. 2.



Miles D. Joyner, INVENTOR,

WITNESSES

Howard D. Orr

F. T. Chapman

BY E. G. Siggers

ATTORNEY

M. D. JOYNER.

CROSSHEAD.

APPLICATION FILED SEPT. 29, 1919.

1,362,422. Patented Dec. 14, 1920.

2 SHEETS—SHEET 2.

Fig. 3.

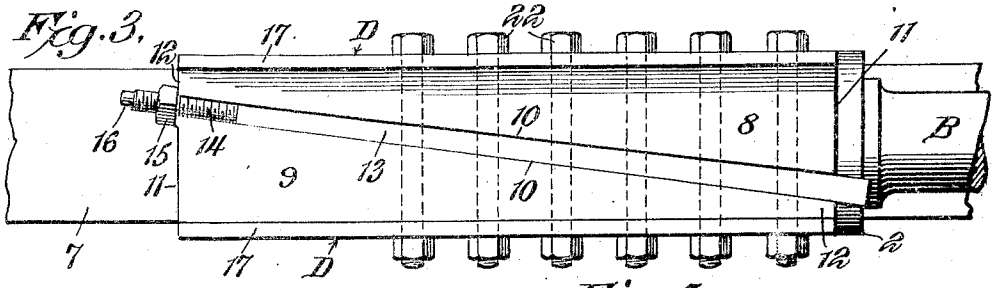


Fig. 4.

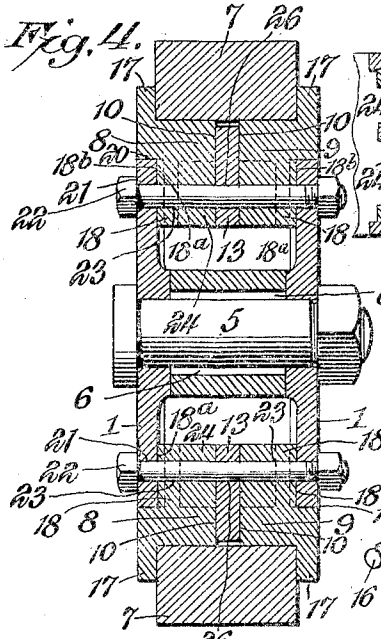


Fig. 5.

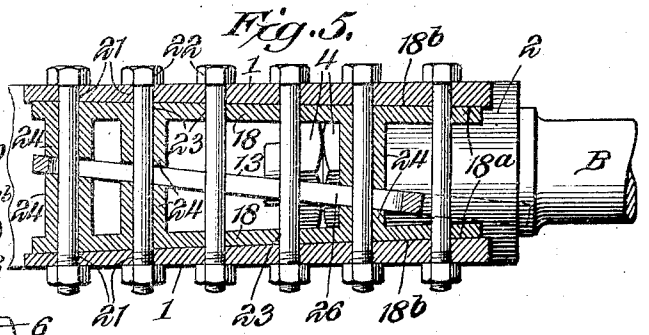


Fig. 6.

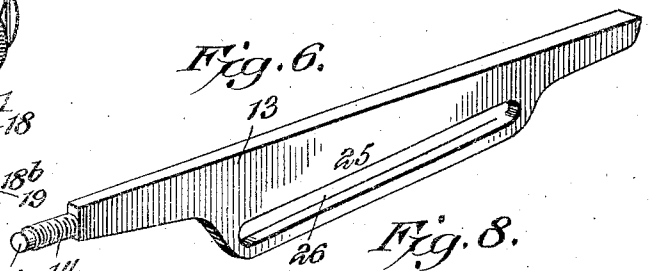


Fig. 7.

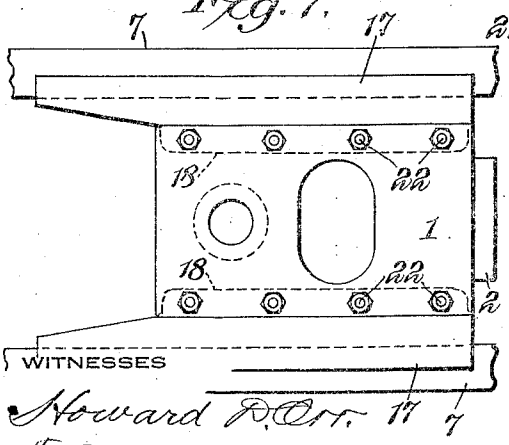


Fig. 8.

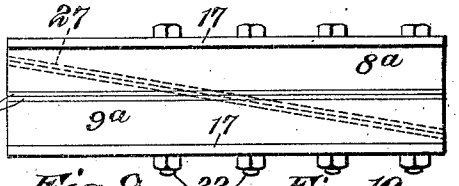


Fig. 9.

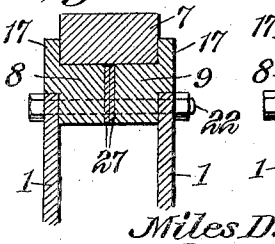
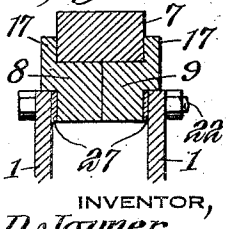


Fig. 10.



WITNESSES

Howard R. Orr.

F. T. Chapman.

INVENTOR,

Miles D. Joyner;

BY

E. L. Siggers.

ATTORNEY

UNITED STATES PATENT OFFICE.

MILES D. JOYNER, OF SPARTANBURG, SOUTH CAROLINA.

CROSSHEAD.

1,362,422. Specification of Letters Patent. Patented Dec. 14, 1920.

Application filed September 29, 1919. Serial No. 327,144.

To all whom it may concern:

Be it known that I, MILES D. JOYNER, a citizen of the United States, residing at Spartanburg, in the county of Spartanburg and State of South Carolina, have invented a new and useful Improvement in Crossheads, of which the following is a specification.

This invention has reference to cross heads of any style to which it is adapted, and it relates more particularly to an adjustable gib and parts associated therewith, the object being to provide for the take-up of wear and thereby insuring smooth running and long life of the machinery provided with the cross head.

In accordance with the invention the cross head comprises a body or boxing composed of side plates joined together at one end of the cross head by the piston rod socket and at the other end by the pivot bolt of the corresponding pitman bearing. The side plates taper, or may taper from one end to the other, and lodged between these plates are gibs each formed of two parts split longitudinally with the split preferably, though not necessarily extending diagonally of the length of the gib. Moreover, each gib is provided with side flanges inset with relation to the side edges of the gib to enter the space between the plates. The side edges of the gibs overhang the plates to about their outer faces, and projecting from the outer faces of each gib are longitudinal side flanges, constituting on each gib a longitudinal channel for the corresponding guide bar of the cross head structure.

The inset side flanges have strengthening bosses while the face plates of the cross head are provided with series of perforations matching the bosses which are likewise hollow or tubular.

The meeting edges of each gib are arranged to receive a key or liner, or more than one liner, between them, and such key is preferably set diagonally of the length of the gib. This key may also be a taper or wedge shaped key. Whether the key be a simple liner or wedge shaped, both the key and the bosses as well as the side plates are traversed by bolts or keys for securing the parts together.

With such an arrangement ample provision is made for taking up wear, both laterally and longitudinally of the cross head, so that the gibs may be adjusted from time to time and the cross head will run smoothly without play, thereby greatly prolonging the life of the cross head and particularly of the gibs, but materially contributing to smooth, noiseless action.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing, with the understanding, however, that in its practical embodiment the invention is not confined to any strict conformity with the showing of the drawing but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings,

Figure 1 is a side elevation of a cross head embodying the invention.

Fig. 2 is a longitudinal vertical section thereof.

Fig. 3 is a plan view of the cross head shown in Fig. 1 but omitting the top guide bar.

Fig. 4 is a section of line 4—4 of Fig. 2.

Fig. 5 is a section of line 5—5 of Fig. 1.

Fig. 6 is a perspective view of a taper key or liner.

Fig. 7 is an elevation showing a somewhat modified form of the cross head.

Fig. 8 shows a cross head construction in which liners or shims are employed and arranged either straight longitudinally, or arranged diagonally.

Fig. 9 is a cross section of the structure of Fig. 8, with the shims in the initial or central position.

Fig. 10 is a section similar to Fig. 9 except that it is assumed that the shims between the gib section have been transferred to the outer walls where they engage the inner walls of the side plates of the cross head.

Referring to the drawings, there is shown a cross head A to one end of which there is attached a piston rod B and to the other end of which there is connected a pitman C.

The body of the cross head comprises two plates 1, which may be flat plates sufficiently heavy for the purposes of the invention. The plates are connected together at one end by a sleeve 2 which may be cast in one piece with the plates and is of sufficient dimensions to receive one end 3 of the piston rod B.

Following the usual custom the end 3 may be tapered and is suitably threaded at its extremity for the application of nuts 4, whereby the cross head is firmly secured to the piston rod after the usual manner.

The pitman C is also connected to the cross head in the usual manner as by a pivot bolt 5 traversing the side plates 1 and bearing blocks 6 in the corresponding end of the pitman, such end entering the space between the side plates 1. Carried by the plates 1 are gibs D at opposite edges of the cross head, these gibs being interposed between the plates 1 and parallel guide bars 7, such as are employed in the usual two-bar guide. The gibs may be made in various ways, the preferable form being that shown in Figs. 1 to 6, some other forms being shown in Figs. 7, 8, 9 and 10.

The preferable form of gib is composed of two like members 8 and 9, respectively, having adjacent walls 10 extending diagonally of the length of the two-part gib. Since the parts 8 and 9 are substantially alike, a description of one will apply to the other. Because of the diagonal division line of the two parts of the gib, each gib section is wedge shape, being relatively wide at one end 11 and relatively narrow at the other end 12. Moreover, the adjoining edge 10, in the form shown in Fig. 1 and associated figures and best appearing in Fig. 3, are not parallel, but diverge slightly from one end toward the other of the gib. Adapted to the space between the edges 10 is a strip 13 slightly tapering from end to end at the small end terminating in a threaded stem 14 for the application of the nut 15. Furthermore, the stem 14 is provided with a smooth termination 16 of somewhat smaller diameter than the threaded portion, whereby to withstand blows of a hammer or other implement without injury to the threads of the stem 14.

On what constitutes the outer long edge of each gib member 8 and 9, there is formed a flange 17 which, when the gib is applied to the cross head, outstands therefrom in a manner causing the flanges 17 to be in parallel relation to each other and embrace and receive the guide bars.

Formed on what may be termed the inner face of each member 8 and 9 of the gib are longitudinal flanges 18 inset with relation to those side edges of the body members 8 and 9 of the gib by a sufficient distance to permit the gib to seat on the corresponding edges of the face plate 1, with said face plates about flush with the outer faces of the flanges 17. In Fig. 1 and associated figures, each face plate has slanting or diverging long edges 19 so that each plate 1 is a taper plate and the flanges 18 have correspondingly tapered edges 20. Adjacent to each edge 19 the plates 1 are provided with a series of holes or perforations 21 to pass bolts 22 which may be sufficient in number for the purposes of the invention. Each flange 18 is provided with a suitable number of passages or perforations 23 spaced similarly to the perforations 21. Projecting from the inner faces of each flange 18 are hollow bosses 24 continued to the inner taper edge of the respective gib member 8 or 9 as the case may be. Because of the inner taper edges of the gib members the bosses vary in length from one end of a tapered member to the other end thereof. With the ends of the taper members of the gib opposite each other the corresponding passages 23 of the gib members 8 and 9 aline, and the bolts 22 may then be freely inserted through the alined passages.

The strip 13, constituting a key or liner, is, in the showing of Figs. 3, 5, and 7, of slightly taper form and has an intermediate, elongated, widened portion 25, with a longitudinal slot 26 therealong. The key or liner 13 is so shaped that the slot 26 is traversed by the bolts 22 with the edge of the key remote from the slot about or nearly flush with that surface of the gib members engaging the respective guide bar 7.

When the cross head is assembled the piston rod B is secured to the sleeve 2 by the nuts 4 and the pitman C is secured to the cross head by the bolt 5. The two members 8 and 9 of each gib are brought toward each other so that the flanges 17 straddle the respective guide bars 7, with the key or liner 13 interposed between the two members. Then the bolts 22 are inserted but are not yet tightened up. Now, by properly adjusting the bolts the gibs are suitably tightened to produce a smooth, snug fit and the wedge key or liner is drawn by the nut 15 to lock the gib in the adjusted position, such gib having a certain amount of longitudinal adjustment, without interference from the bolts traversing it by way of the slot 26.

When the cross head is first installed it is, of course, suitably fitted. After having been in use for some time the rubbing parts wear and unless the wear be taken up, undue looseness develops. In order to take up the looseness the bolts 22 are removed and the gibs are moved bodily lengthwise the taper edges 19 and 20, causing the gibs to move apart or toward the bars 7. By arranging the bolts 22 sufficiently close together with the slant of the taper edges 19 and 20 appropriately gentle, the movement of the gibs to an extent corresponding to the distance between two adjacent bolt holes will be sufficient to again tighten the cross head with respect to wear of the cross head as between the guide bars 7. Wear also occurs between the flanges 17 and the sides of the guide bars 7, thus permitting side play of the cross head. To remedy this outer walls 18ª of the

flanges 18 taper longitudinally toward one end of the gib and the inner faces 18[b] of the face plates 1 taper correspondingly, so that the flanges 17 are caused to approach as the gib is adjusted lengthwise of the guide bars 7, thus taking up side wear. The taper key or liner 13 compensates for variations in the longitudinal and lateral adjustments for the taper key may be moved lengthwise in the taper space provided for it, thus at all times producing a snug fit.

The smooth, snug running of the cross head may be restored at any time that wear produces undue looseness and repeated adjustments are permissible. The cross head of the invention therefore, will outlast numerous other forms of cross heads, thus making a material saving in material and labor.

The diagonally placed key or liner 13, because of its position, avoids liability of grooving or scoring the guide bars 7 and also may be inset slightly with relation to the surfaces of the gibs engaging the guide bars, thus forming pockets for lubricant.

It is not obligatory that a taper key or liner like the wedge 13 be employed, since flat liners or shims 27, as indicated in Figs. 8, 9, and 10, may be utilized. The shims 27 may be thin plates or sheets, so that an appropriate number of shims may be used, side by side, to permit equally small adjustments, in order to maintain the fit of the cross head close at all times, with provision for taking up wear before it has become serious. In such case the shims 27 are placed between the two members of the gib as in Figs. 8 and 9, where the two associated members of the gib are indicated at 8[a] and 9[a], and the meeting edges are parallel with the side edges of the gib. Or, the meeting edges may be diagonally arranged as shown in dotted lines in Fig. 8, the diagonally placed shims 27 being also indicated in dotted lines in the same figure. When it is desired to adjust the two members of each gib toward each other, a shim 27 may be taken from between the gib members and placed between each side plate 1 and the corresponding flange 18 of the gib, the shim either being cut in two lengthwise or another shim be substituted. It is evident that either the wedge-shaped key or liner, or straight liners or shims, or a combination of the two may be used as desired.

What is claimed is:—

1. In a cross head, a gib divided and separated longitudinally into two parts with the division running diagonally of the gib, and a key or liner lodged between and separating the two parts.

2. In a cross head, a gib divided and separated longitudinally into two parts with the division running diagonally of the gib, and a key or liner lodged between and separating the two parts, the key tapering lengthwise and the walls bordering these plates separating the two parts of the gib correspondingly tapering.

3. A cross head comprising face plates, longitudinally divided gibs each with flanges associated to form tongues for entering between the face plates, a key or liner for each gib lodged between the adjacent portions of the gib, and fastening means traversing the face plates, the gib where provided with flanges, and the key or liner.

4. A cross head comprising face plates, longitudinally divided gibs each with flanges associated to form tongues for entering between the face plates, a key or liner for each gib lodged between the adjacent portions of the gib, and fastening means traversing the face plates, the gib where provided with flanges, and the key or liner, said key or liner where traversed by the fastening means being provided with a longitudinal slot for passing the fastening means.

5. A cross head comprising face plates, longitudinally divided gibs with tongues entering between the face plates and the tongues being inset with relation to the face plates, gibs overhanging and engaging the edges of the face plates with the overhanging portions of the tongues and the edges of the face plates slanting, bolts traversing the face plates and tongues and arranged in a corresponding slanted position, and a key or liner for each gib lodged in the divided portion thereof and separating the two parts of the gib.

6. A cross head comprising face plates, longitudinally divided gibs with tongues entering between the face plates and the tongues being inset with relation to the face plates, gibs overhanging and engaging the edges of the face plates with the overhanging portions of the tongues and the edges of the face plates slanting, bolts traversing the face plates and tongues and arranged in a corresponding slanted position, and a key or liner for each gib lodged in the divided portion thereof and separating the two parts of the gib, said keys or liners tapering from one end toward the other and the walls of the divided gibs, where engaged by the keys, correspondingly tapering.

7. In a cross head, face plates with edges tapering lengthwise and the inner faces of the face plates tapering in thickness, longitudinally split gibs formed with channels to embrace guide bars and having flanges inset to enter between the face plates, with the gibs engaging the taper edges of the face plates and the gibs correspondingly tapered, said flanges and face plates being provided with longitudinal, slanting series of matching perforations to pass bolts for securing the face plates and the gib to-

gether, and liners or keys lodged in the divided portions of the liners, and traversed by the bolts.

8. In a cross head, face plates with edges tapering lengthwise and the inner faces of the face plates tapering in thickness, longitudinally split gibs formed with channels to embrace guide bars and having flanges inset to enter between the face plates, with the gibs engaging the taper edges of the face plates and the gibs correspondingly tapered, said flanges and face plates being provided with longitudinal, slanting series of matching perforations to pass bolts for securing the face plates and the gib together, and liners or keys lodged in the divided portions of the liners and traversed by the bolts, the liners or keys each tapering lengthwise and the walls of the gibs where divided being correspondingly tapered.

9. In a cross head, face plates with edges tapering lengthwise and the inner faces of the face plates tapering in thickness, longitudinally split gibs formed with channels to embrace guide bars and having flanges inset to enter between the face plates, with the gibs engaging the taper edges of the face plates and the gibs correspondingly tapered, said flanges and face plates being provided with longitudinal, slanting series of matching perforations to pass bolts for securing the face plates and the gib together, and liners or keys lodged in the divided portions of the liners and traversed by the bolts, the liners or keys each tapering lengthwise and the walls of the gibs where divided being correspondingly tapered, and each key or liner terminating in a threaded stem to receive an adjusting nut.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

MILES D. JOYNER.

Witnesses:
C. J. MILLER,
F. G. AUSTELL.