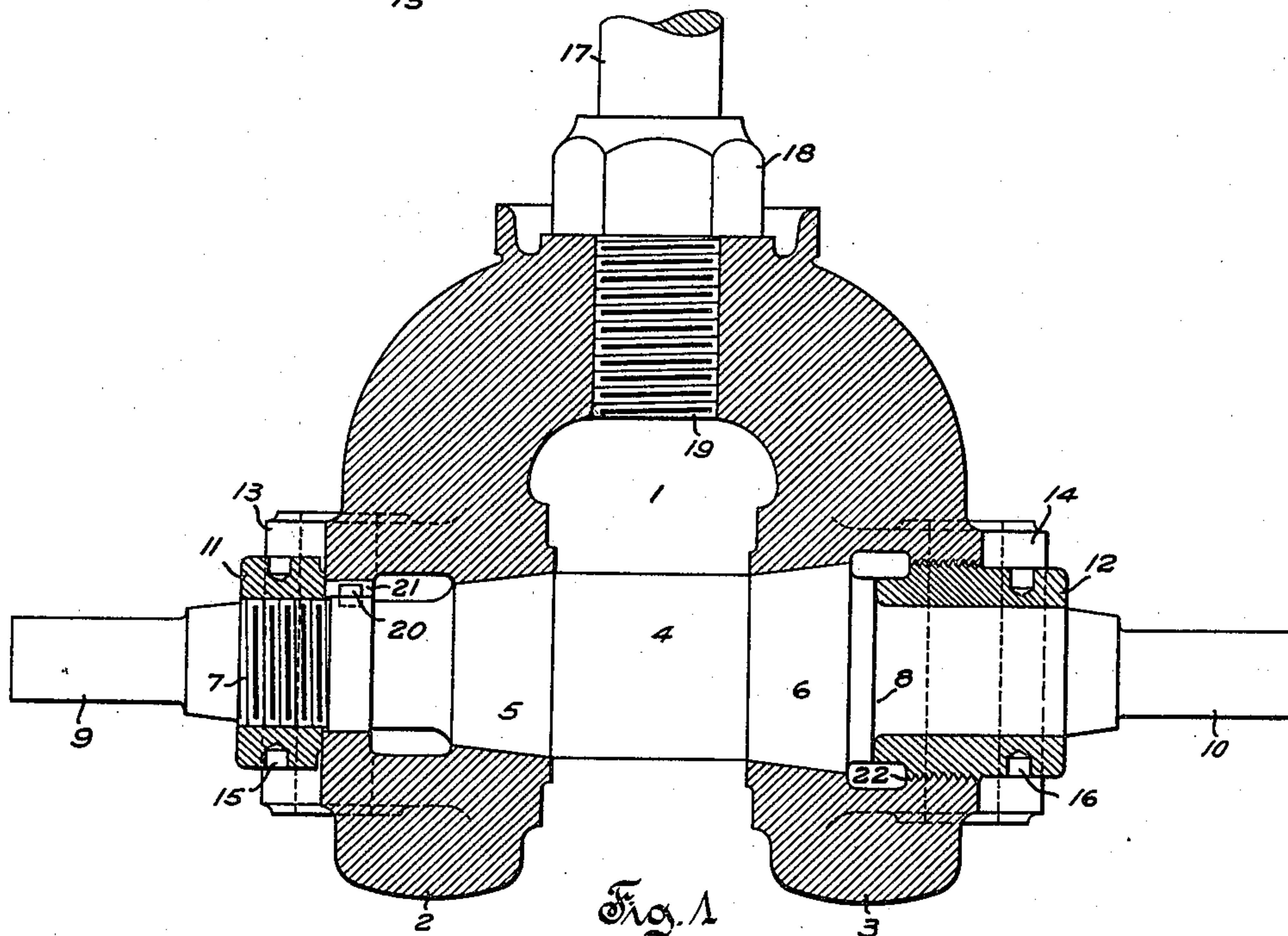
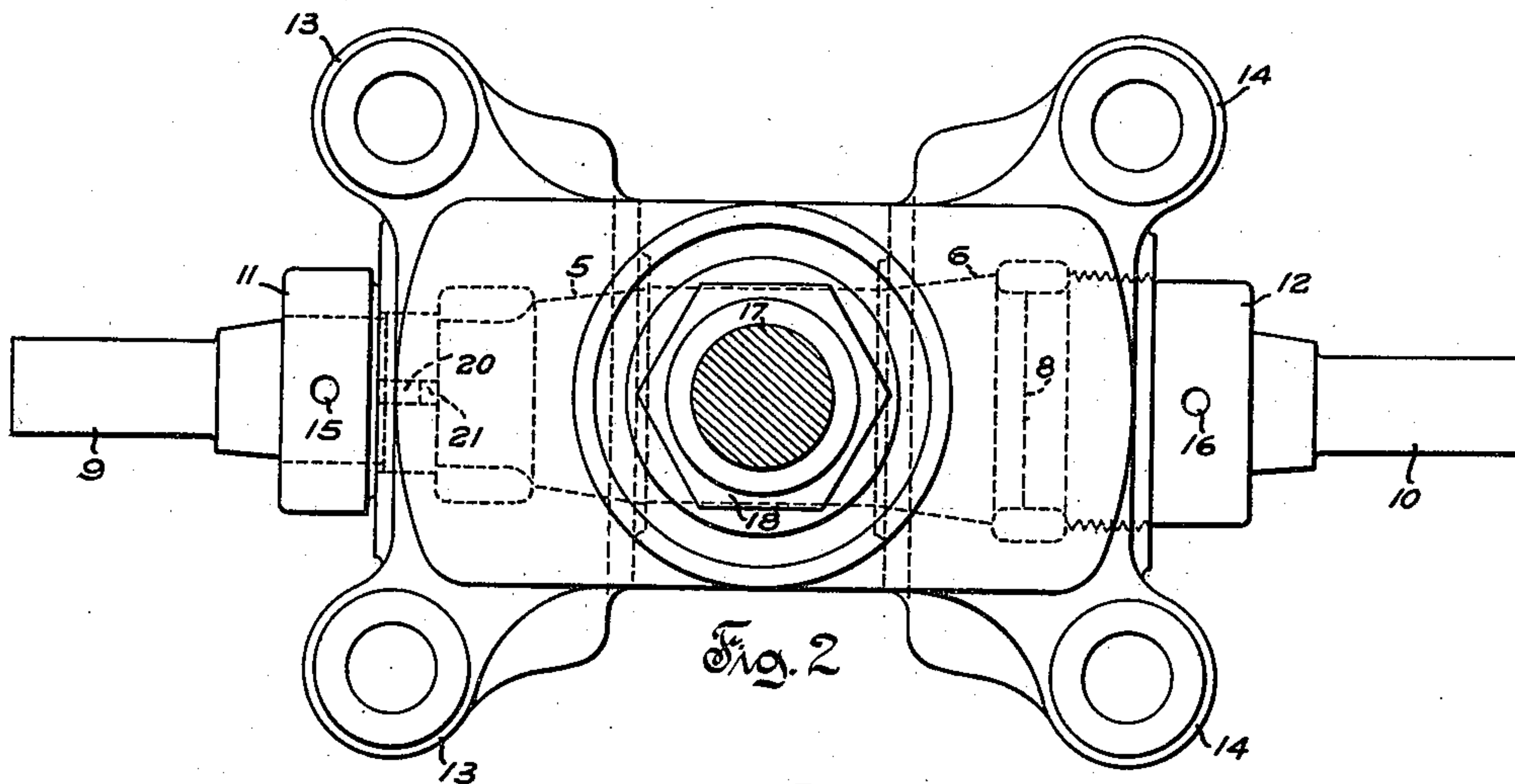


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CROSS HEAD.  
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1,154,780.

Patented Sept. 28, 1915.



Witnesses

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## CROSS-HEAD.

1,154,780.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed December 14, 1914. Serial No. 877,812.

*To all whom it may concern:*

Be it known that I, GUSTAF L. KOLLBERG, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Cross-Heads, of which the following is a specification.

This invention relates to improvements in the construction of cross-heads, and particularly to devices for clamping the pins into the cross-head bodies.

An object of the invention is to provide a cross-head which is simple in construction and efficient in its operation.

One of the more specific objects is to provide simple and efficient devices for firmly clamping a cross-head pin into a bifurcated integral body portion whereby a rigid assembled structure is produced.

Another object is to provide means for permitting independent clamping of the pin to the several branches of the bifurcated body by means of circumferential wedge surfaces coaxial with the pin.

Still another object is to provide means for clamping the pins in place, which are readily accessible and which permit rapid assembling and disassembling of the cross-head.

In prior constructions of bifurcated cross-heads it has been customary to provide the several branches of the body with alined tapered bores and to clamp a correspondingly tapered pin into these bores by means of a single nut or other clamping device applied to one end of the pin. It has also been proposed to clamp the pin in position by means of the usual devices applied at one end thereof and to provide an additional pin retaining means in the form of a plate at the other end thereof which contacts with end portions of the pin, this plate being secured in place by means of a series of bolts or cap screws threaded into the cross-head branch. The use of both of these structures has been found objectionable, especially when applied to pumping engines having such a bifurcated cross-head, since the pin would become loose and would de-

stroy the rigidity and accuracy of the connection afforded thereby. In such a clamping engine the forces on the piston rod are transmitted through the cross-head and the distance rods to the plunger. As the distance rods are connected directly to the branches of the cross-head and as these forces reciprocally reverse their direction for successive strokes, the stresses on the cross-head tend to bring together and to separate the branches thereof during successive strokes. These then are the conditions that tend toward loosening of the pin.

In order to overcome the objections of the prior devices, the present invention contemplates the use of a single nut adjacent to each of the tapered portions of the pin, for firmly, adjustably and independently clamping these portions into the adjacent branches of the cross-head.

A clear conception of an embodiment of the invention may be had by referring to the drawing accompanying and forming a part of this specification, in which like reference characters designate the same or similar parts in the various views.

Figure 1 is a transverse vertical section through a bifurcated cross-head and the pin clamping means therefor, showing the cross-head applied to a fragment of the piston rod. Fig. 2 is an end view of a bifurcated cross-head, a section being taken through the piston rod connected therewith.

The bifurcated cross-head 1 comprises essentially a body having a pair of branches 2, 3 formed integral therewith. The branch 2 is provided with a pair of bosses 13 having parallel bores therein. The branch 3 is provided with bosses 14 having parallel bores therein, the bores of the bosses 13, 14, being parallel to each other for connection to four distance rods extending to and connected with the plunger head. The body of the cross-head 1 is provided with a screw-threaded opening within which the screw-threaded portion 19 of the piston rod 17 is fitted and is clamped by means of the piston rod nut 18. The branches 2, 3, of the cross-head 1 are provided with tapered, alined bores of different diameters extend-



ing transversely relative to the axis of the piston rod 17. The cross-head pin 4 is provided at its mid portion with a cylindrical bearing portion adjacent to which are formed tapered, conical portions 5, 6, which fit the tapered bores of the branches 2, 3, respectively. The protruding ends of the pin 4 are provided with cylindrical bearing portions 9, 10, which normally co-act within the cross-head guiding shoes, not shown. The pin 4 at its portion near the tapered portion 5 thereof, is provided with a threaded portion 7 upon which is fitted a clamping ring nut 11. The nut 11 is formed with a suitable plane clamping surface which coacts with an adjacent plane surface of the cross-head branch 2. The ring nut 11 is rotatable by means of a spanner wrench which may be fitted into the sockets 15 of the nut 11. In order to prevent the pin 4 from turning within its tapered bearings, the same is provided with a projecting dowel 20 which fits into an adjacent recess or slot 21 formed in the opening through the branch 2.

Adjacent to the tapered portion 6, the pin 4 is provided with a shoulder 8. The sleeve nut 12 has an internal bore which coacts with a cylindrical portion of the pin and also has an end surface which coacts directly with the shoulder 8. The peripheral surface of the sleeve nut 12 is screw-threaded, the screw-threaded portion normally coacting with and being adjustable within the internally screw-threaded portion 22 of the branch 3. These screw threads form wedge surfaces coaxial with the pin 4. The sleeve nut 12 is adjustable within the screw-threaded portion 22 of the branch 1 by means of a spanner wrench which may be applied to the sockets 16.

When it is desired to secure the pin 4 within the branches 2, 3, of the cross-head 1, it is first necessary to have the tapered conical portions 5, 6, snugly fit the adjacent tapered bores of the cross-head branches. The proper fit is usually obtained by grinding the tapered portions of the pin 4 into their bearings preliminarily to clamping. The independent clamping of the pin 4 to the cross-head at the tapers 5, 6, is then proceeded with by tightening nuts 11, 12. The tightening of the nut 12 places entirely under compression those portions of the nut lying between the screw threads and the taper 6, as contradistinguished from the prior construction hereinbefore referred to where a plate is brought against the end of the pin by cap screws threaded into the adjacent branch of the cross-head. There comparatively weak screws are placed under tension and would be inadequate to resist the forces tending to bring together and to separate the branches of the cross-head.

It will be noted that with the pin 4 thus provided with circumferential coaxial wedge devices for independently clamping each of the tapers 5, 6, into the adjacent branches 2, 3, of the cross-head 1, a very rigid structure is produced and the possibility of having the pin 4 become loosened, is reduced to a minimum. The nuts 11, 12, are readily accessible for manipulation and may be adjusted independently of each other at any time, in case loosening of either end of the pin occurs. By providing ring and sleeve nuts 11, 12, with screw threads of larger diameter coacting with the adjacent elements, large surfaces of coaction are obtained, thus producing a structure of maximum strength. The use of the nuts 11, 12, also permits rapid assembling and disassembling of the cross-head, since the pin 4 is readily removable by means of a blow delivered against the end thereof, after the nuts 11, 12, have been removed.

It should be understood that it is not desired to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

It is claimed and desired to secure by Letters Patent,—

1. In combination, a bifurcated body having a pair of branches, means connecting said branches, means having screw-threaded coaction with said connecting means for clamping together one of said branches and said connecting means, and means for clamping together at engaging surfaces the other of said branches and said connecting means, said clamping means including circumferential wedge surfaces coaxial with said connecting means and said wedge surfaces placing entirely under compression the portions of said clamping means lying between said wedge surfaces and said engaging surfaces.

2. In combination, a bifurcated body having a pair of branches, a pin connecting said branches, a nut having screw-threaded coaction with said pin for clamping one of said branches to said pin, and a second nut having screw-threaded coaction with the other of said branches for clamping the same to said pin.

3. In combination, a bifurcated body having a pair of branches, a pin having a plurality of tapered portions, a nut having screw-threaded coaction with said pin for clamping one of said branches to at least one of said tapered portions, and a second nut having screw-threaded coaction with the other of said branches for clamping the same to at least one of said tapered portions.

4. In combination, a bifurcated body having a pair of branches, a piston rod and reach rods subjecting said body to alternate tension and compression stresses in the di-



resection of the length of said branches, a pin connecting said branches, and circumferential wedge means coaxial with said pin and located at each of said branches for separately clamping together said pin and branches.

inventor is affixed hereto in the presence of two witnesses.

GUSTAF L. KOLLBERG.

Witnesses:

L. E. STROTHMAN,

W. H. LIEBER.

In testimony whereof, the signature of the

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."