(No Model.)

W. S. HUGHES.

STEAM ENGINE CROSS HEAD.

No. 458,054. Patented Aug. 18, 1891.

Fig. 1

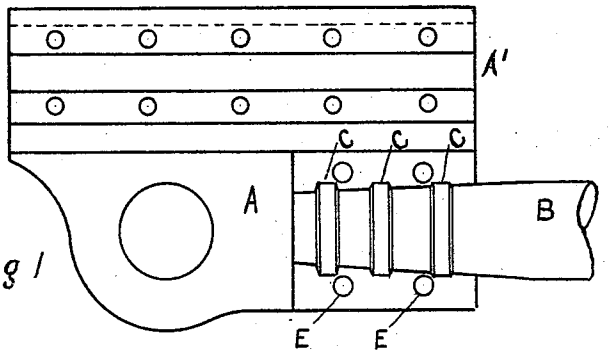


Fig. 2.

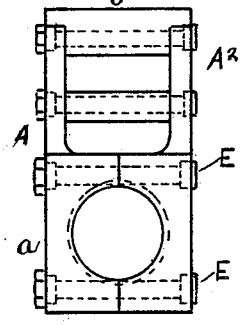


Fig 3

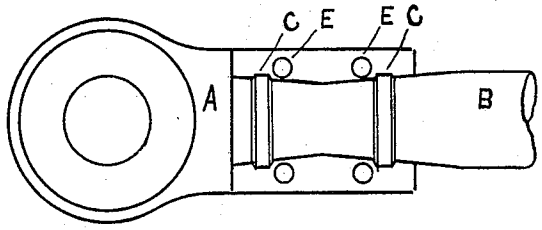
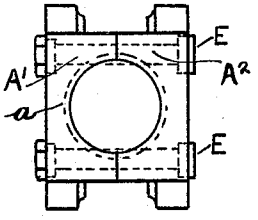


Fig. 4



WITNESSES:

Jennie Miller

Ralph Miller

INVENTOR

William Stewart Hughes

BY

Robt Hardie

his ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM STEWART HUGHES, OF NEW YORK, N. Y.

STEAM-ENGINE CROSS-HEAD.

SPECIFICATION forming part of Letters Patent No. 458,054, dated August 18, 1891.

Application filed November 28, 1890. Serial No. 372,853. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM STEWART HUGHES, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a new and useful Improvement in Steam-Engine Cross-Heads, of which the following is a specification.

My invention relates to an improvement in the cross-heads of steam-engines, and has for its object to provide a means whereby the valve-rod or piston may be attached to the cross-head without threading the rod or piston or employing a key, cotter, or similar device.

A further object of the invention is to so unite a cross-head with a piston that a secure connection will be effected and the piston rotated or turned around to another position without altering the distance from the center of the cross-head to the face of the piston, and whereby also the cross-head and piston may be conveniently and expeditiously disconnected, when desired, without injury to either.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of one section of a cross-head, the connected piston being in side elevation also. Fig. 2 is an end view of the complete cross-head. Fig. 3 is a view similar to Fig. 1, illustrating a slightly-modified form of the cross-head, the piston having a corresponding form; and Fig. 4 is an end view of the modified form of cross-head.

Heretofore it has been the almost invariable practice to fasten or attach cross-heads to valve-rods or piston-rods by a screw-thread and lock-nut or by a key or cotter. The former method is not a secure one, inasmuch as the piston-rod is liable to become loose while working, and by the latter method the rod is weakened by cutting a hole through it to receive the key or cotter at a point already weakened by the necessary reduction to fit the cross-head. The latter method is also open to the objection that it is difficult to separate the piston-rod from the cross-head for repairs, the rods clinging to the cross-head at times to such an extent as to involve an almost total destruction of the cross-head before the separation is effected.

In the form of the device shown in Fig. 1, and likewise in the form illustrated in Fig. 3, the cross-head A is made in two sections A′ and A^2. Each cross-head is provided with a longitudinal bore adapted to receive ene end of a piston or valve rod B.

In the form of the cross-head illustrated in Fig. 1 the bore is a gradually-tapering one, and in the walls of the bore diametrical recesses *a* are produced at proper intervals apart, as illustrated in dotted lines, Fig. 2. The end of the piston or valve rod B, adapted to enter the cross-head, is tapered to correspond to the taper of the cross-head bore, and the diameter of the tapered portion of the rod corresponds to the diameter of the bore in which it is to be inserted. The piston or valve rod has produced upon its peripheral tapered surface a series of annular ribs C, the said ribs corresponding in number and location to the number and location of the diametrical grooves *a* in the cross-head. When the two sections of the cross-head have been placed in position around the valve or piston rod, said sections are firmly tied together by bolts E or equivalent fastening devices, as shown in Fig. 2.

In the modification shown in Fig. 3 the bore in the cross-head is made in the shape of a reverse taper, and near the ends of the bore diametrical grooves or recesses *a* are also produced. The piston or valve rod B at the end adapted to enter the cross-head has a reverse taper *b* produced upon its outer face, and an annular rib C is formed upon the rod at each extremity of the tapered surface. The sections of the cross-head are secured together around the piston or valve rod in like manner to that illustrated in Fig. 2.

In order to secure a good clamping fit a thin lining of sheet-iron may be inserted between the parts of the cross-head before they are bored out. This lining is removed when the cross-head is fitted to the rod, and the lining may be employed as a gage for preparing the rod to fit the cross-head.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. The combination, with a cross-head constructed in two sections, said sections being provided with aligning tapering bores, the walls whereof have diametrical channels produced therein, of a valve or piston rod having one end tapered to enter the bore of the cross-head and provided with annular ribs adapted to enter the channels in the walls of the bores, substantially as and for the purpose specified.

2. The combination, with a cross-head constructed in two sections, said sections being provided with a reverse tapering bore, and diametrical channels in the walls of the bore, of a valve or piston rod having a reverse taper produced upon the exterior surface at one end corresponding to the taper of the cross-head bore, and annular ribs adapted to enter the channels in the walls of the cross-head bore, the said ribs corresponding in number and location to said channels, as and for the purpose specified.

WILLIAM STEWART HUGHES.

Witnesses:

RALPH MILLER,

JENNIE MILLER.