March 9, 1926. 1,575,620

G. CHAMBON

APPARATUS FOR REMOVING THE PISTON ROD OF LOCOMOTIVES AND OTHER ENGINES FROM PISTON CROSSHEADS

Filed Dec. 21, 1923 3 Sheets-Sheet 1

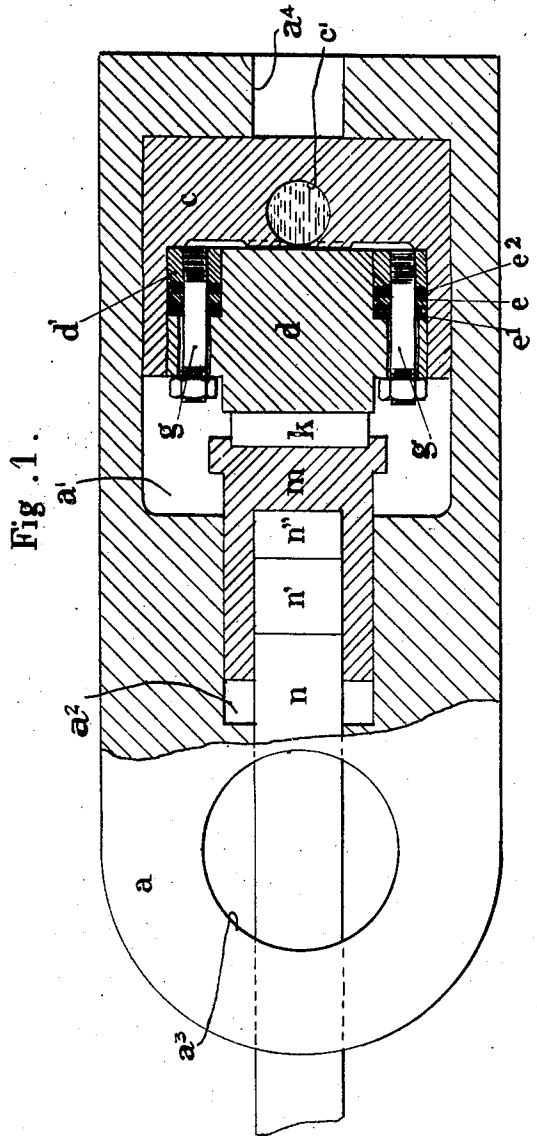


Fig. 1.

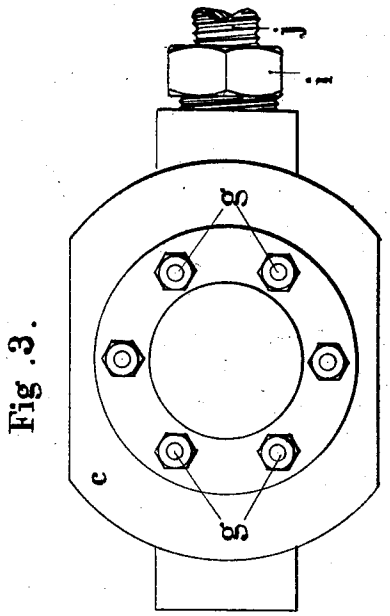


Fig. 3.

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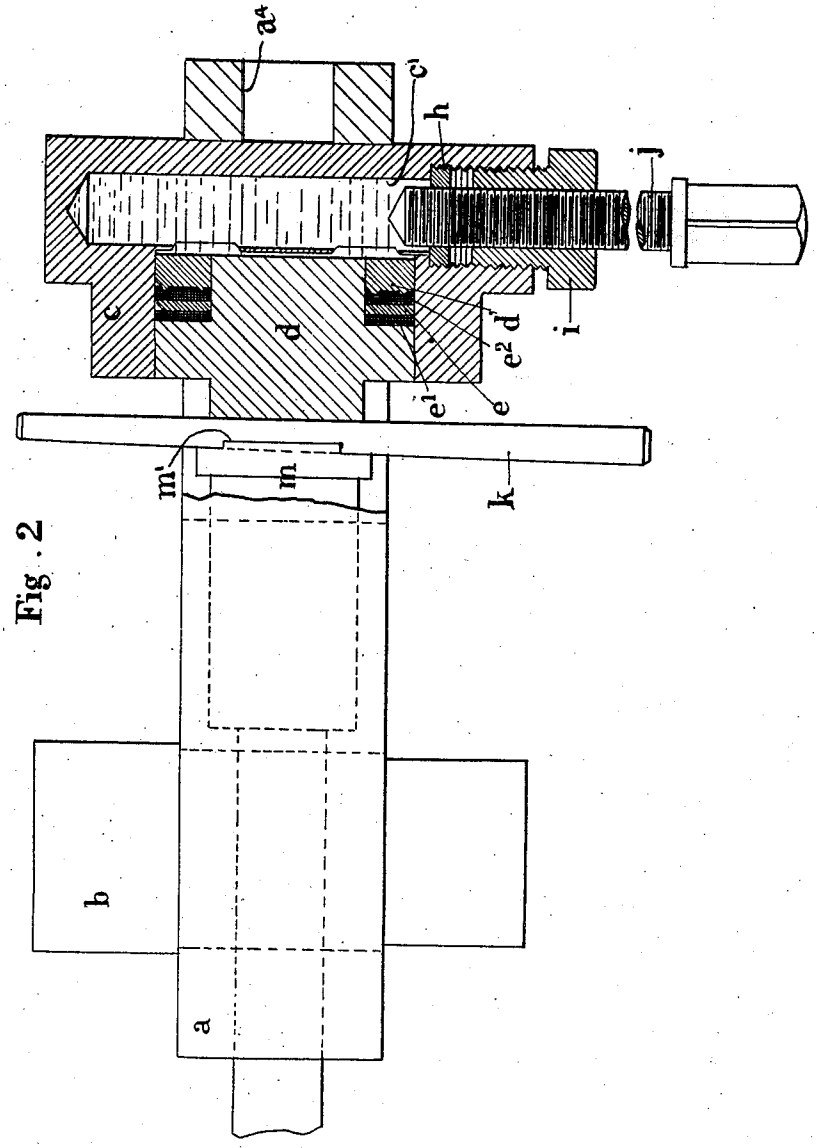


Fig. 2

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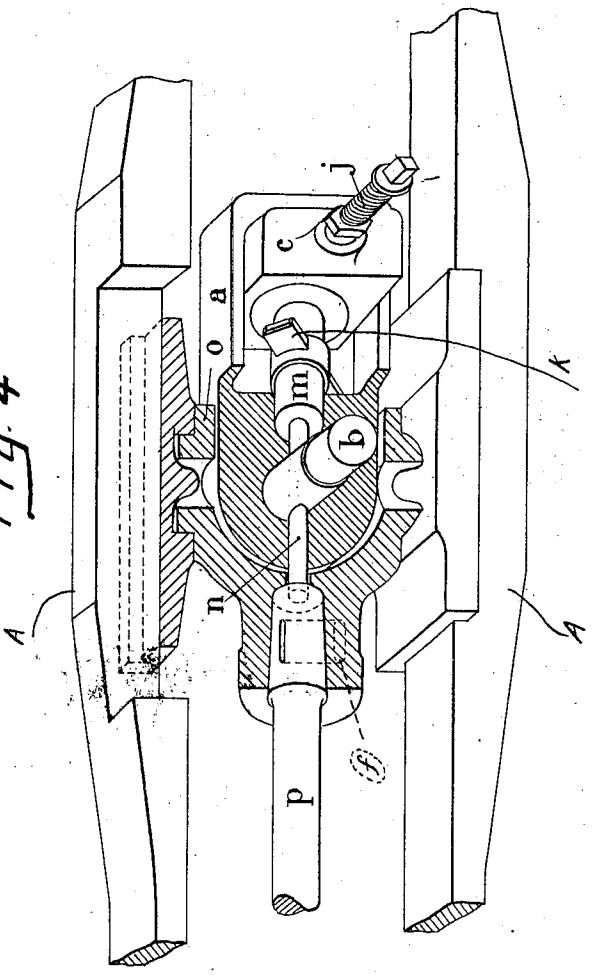
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Fig. 4



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UNITED STATES PATENT OFFICE.

GILBERT CHAMBON, OF PARIS, FRANCE.

APPARATUS FOR REMOVING THE PISTON ROD OF LOCOMOTIVES AND OTHER ENGINES FROM PISTON CROSSHEADS.

Application filed December 21, 1923. Serial No. 681,967.

To all whom it may concern:

Be it known that I, GILBERT CHAMBON, a citizen of the Republic of France, residing at Paris, France, have invented Apparatus for Removing the Piston Rods of Locomotives and Other Engines from Piston Crossheads, of which the following is a full, clear, and exact description.

The removal of piston rods of locomotives from piston crossheads is actually effected by means of apparatus usually composed of a bolt which is secured on the crosshead and a more or less complicated system of screws or wedges, which permit the exertion of pressure on the face of the piston rod to be removed from the crosshead. Besides the fact that the placing in position of such apparatus is not always easy, their manipulation is rendered difficult owing to the fact that the arrangement of the parts of the mechanism of the locomotive and their small power sometimes necessitate a long-drawn-out operation and very great effort, 5 or 6 workmen actuating the screw by means of a lever, or producing powerful shocks on a wedge. Moreover, it is frequently necessary to heat and hammer the crosshead.

This invention is adapted to remedy these inconveniences, and relates to an apparatus for rapidly and very easily removing the piston rods of all types of locomotives from piston crossheads. The apparatus consists substantially in the combination of a yoke which can be easily secured on the piston crosshead, with a hydraulic device which may be quickly fitted into the yoke after the latter has been placed in position, the pressure taking place in this device through a screw arranged at right angles to the longitudinal axis of the machine.

The drawings accompanying and forming part of this specification illustrate by way of example only, one form of apparatus constructed in accordance with the present invention, in which drawings,

Figs. 1 and 2 are respectively a partly sectional side view and a partly sectional plan view of the apparatus;

Fig. 3 is an end view of the hydraulic device forming a part of the apparatus; and

Fig. 4 is a partly sectional perspective view, on a reduced scale, showing the apparatus applied to the crosshead of a locomotive.

Referring to the drawings, the improved apparatus comprises a steel yoke *a* having adjacent to one end thereof a transverse opening or chamber a^1, within which is mounted a hydraulic apparatus to be hereinafter described. The yoke *a* is also provided with a longitudinally extending opening throughout its length, said opening intersecting the chamber a^1. The longitudinally extending opening is of enlarged diameter immediately forward of the chamber a^1, as shown at a^2, Fig. 1, and in this enlarged portion is disposed for sliding movement a flanged cap *m*. Within the cap *m* is fitted one end of a pushrod *n* that extends through a continuation of the opening a^2 in the yoke and to a considerable distance beyond the end of the yoke, the rod being slidable in said opening. The yoke is further provided with a cylindrical transverse opening a^3 for the reception of a pintle or bearing pin *b*, the ends of which are adapted to engage the openings usually provided in crossheads for connection with the connecting rod, the pin *b* being provided with a transverse opening for the passage of the rod *n*. Between the inner end of the rod *n* and the end wall of the cap *m*, removable washers *n'* and *n''* are interposed, so that, by substituting washers of greater or less thickness, or by varying the number of washers, the distance through which the rod *n* is caused to slid may be varied.

The hydraulic apparatus above referred to comprises a cylinder block *c* having formed therein an axially extending cylinder chamber in which is slidable a piston *d*. The cylinder block is also provided with an opening *c'* extending transversely of the cylinder chamber and constituting an oil chamber communicating at one side thereof with said cylinder chamber. Threaded into the open end of the oil chamber is a stuffing box, comprising a flanged sleeve *i* and a washer *h*, said washer being adapted to abut against a shoulder formed in the oil chamber, as clearly shown in Fig. 2. Between the end of the sleeve *i* and the washer *h* any suitable packing material may be inserted, thereby to render the oil chamber fluid-tight. A screw *j* is threaded into the stuffing box

and is of sufficient length to extend a considerable distance into the oil chamber thereby to exert pressure on the oil or other fluid in said chamber.

In order to provide a fluid-tight contact between the piston d and the cylinder wall, the piston is provided in its rear end with an annular recess in which is inserted a metallic packing washer e and a pair of rubber or other suitable washers e^1 and e^2, one at each side of the washer e, all of said washers being clamped together by an end washer d' secured in place by a plurality of bolts g threaded into the end washer d' and passing through openings in the washers e, e^1 and e^2 and in the body of the piston, said bolts being provided with nuts threaded on their free end.

A clamping key k is provided for taking up the space between the cap m and the end of the piston d, said key being provided with a transverse groove in one side thereof for the reception of a projecting portion m', of said cap, as shown in Fig. 2.

In Fig. 4, the apparatus is shown in operative engagement with the crosshead o of a locomotive, the crosshead being shown supported for sliding movement between the usual spaced parallel guide members A.

The apparatus is operated in the following manner: After the connecting rod has been disconnected from the crosshead and the key f which secures the piston rod p in the crosshead has been removed, the rounded front end of the yoke a is inserted into the hollow portion of the crosshead until its opening a^3 is in alinement with the openings in the crosshead from which the pintle of the connecting rod has been removed. The pin b is then inserted into one of said openings and pushed through the opening a^3 until it engages the other pintle opening in the crosshead. The pushrod n is then inserted through the rear opening a^4 in the yoke and pushed forward through the guide opening in the pin b until only its rear end projects into the opening a^2 of the yoke, it being understood that the hydraulic device is not at that time within the yoke. The cap m, with the proper number of washers therein, is then placed on the rear end of the rod n, and the hydraulic cylinder block placed in position in the yoke so that its piston d is in alinement with the cap m, whereupon, by rotating the screw j by means of any convenient lever or wrench said screw will exert pressure on the fluid in the oil chamber, which pressure will be transmitted by the piston d to the cap m, thus forcing the rod n against the piston rod p thereby to dislodge the same.

It will be understood, from the foregoing, that the main advantages of this apparatus are the following:—

It can be rapidly and easily placed in position. The complete apparatus which is comparatively light for the power it can produce, can be divided in two distinct parts at the time of assemblage, namely, the yoke which can be rapidly secured by the pin, and the hydraulic device, which can also be easily and rapidly secured in the yoke.

In the apparatus generally in use, the workmen working along the side or within the frame of the machine are placed in a position which is often uncomfortable for producing the necessary effort, hindered as they are by the other parts. The essential advantage of the new apparatus is its great ease of manipulation by a single operator, resulting from its simplicity and the fact that the direction of the pressure screw is at right angles to the flank or side of the machine. An economy in time and work is obtained, thus rendering the apparatus very advantageous from every point of view, while its simple and strong construction does not involve any delicate mechanism, such as flap valves, or any valves liable to imperfect operation or costly maintenance.

The power of the apparatus is very high. Thus, for a weight of about 55 kilograms, a power of 150 tons and more can be produced. However, as the work of removing a piston rod from the piston crosshead of a locomotive absorbs only at the maximum 75 tons, it will be seen that the apparatus is capable of effecting this result without difficulty and without distortion of the crossheads, the latter having on locomotives a resistance at least equal to 100 tons before any permanent distortion takes place. Such power being avoidable, the removal of the piston rod from the piston crosshead is very easily effected without heating or hammering of the crossheads. A further and very important economy in time and labor is thus obtained.

The fluid-tightness of the movable parts is perfect. For the piston, the higher the pressure the more the washers are compressed and consequently the tighter the fit in the cylinder. For the screw, it is possible, by means of the sleeve i and washer h, to tighten the packing without increasing the friction stress of the latter.

Repairs are easy. The separation of the apparatus into two parts, one of which, the hydraulic device, is easily removable from the other, allows cleaning or repairs of any part of the apparatus to be effected.

The above arrangements are given by way of example only. The forms, dimensions and details of construction may be varied according to circumstances without departing from the principle of the invention.

Claims:

1. An apparatus for ejecting piston rods from crossheads, comprising, in combination, a yoke member adapted to be seated

within the crosshead, removable means passing transversely through said yoke and crosshead for securing them together, a member slidable in said yoke and securing means and adapted to contact with the end of the piston rod, a hydraulic device removably carried by said yoke member and adapted to operate said slidable member thereby to exert pressure on the piston rod in the direction of its axis, and means operating at right angles to the direction of movement of said slidable member for actuating said hydraulic device.

2. An apparatus for ejecting piston rods from crossheads, comprising, in combination, a yoke having a chambered portion and a portion adapted to engage the crosshead, a thrust rod slidable in said crosshead-engaging portion and adapted to contact with the end of the piston rod, and a hydraulic device removably carried within the chambered portion of said yoke and adapted to exert pressure on said thrust rod thereby to urge the same against the piston rod.

3. An apparatus for ejecting piston rods from crossheads, comprising, in combination, a yoke having a chambered portion and a portion adapted to engage the crosshead, a thrust rod slidable in said crosshead-engaging portion and adapted to contact with the end of the piston rod, a hydraulic device removably carried within the chambered portion of said yoke and adapted to exert pressure on said thrust rod thereby to urge the same against the piston rod, and means operated at right angles to the direction of movement of said thrust rod for actuating said hydraulic device.

4. An apparatus for ejecting piston rods from crossheads, comprising, in combination, a yoke having a chambered portion and a portion adapted to fit within the crosshead, a removable pintle carried by said crosshead-engaging portion and adapted to engage the crosshead thereby to secure the yoke therein, a thrust rod slidable in said crosshead-engaging portion and adapted to contact with the end of the piston rod, said thrust rod passing transversely through said pintle, and a hydraulic device removably carried within the chambered portion of said yoke and adapted to exert pressure on said thrust rod thereby to urge the same against the piston rod.

The foregoing specification of my "apparatus for removing the piston rods of locomotives and other engines from piston crossheads" signed by me this 5th day of December, 1923.

GILBERT CHAMBON.