

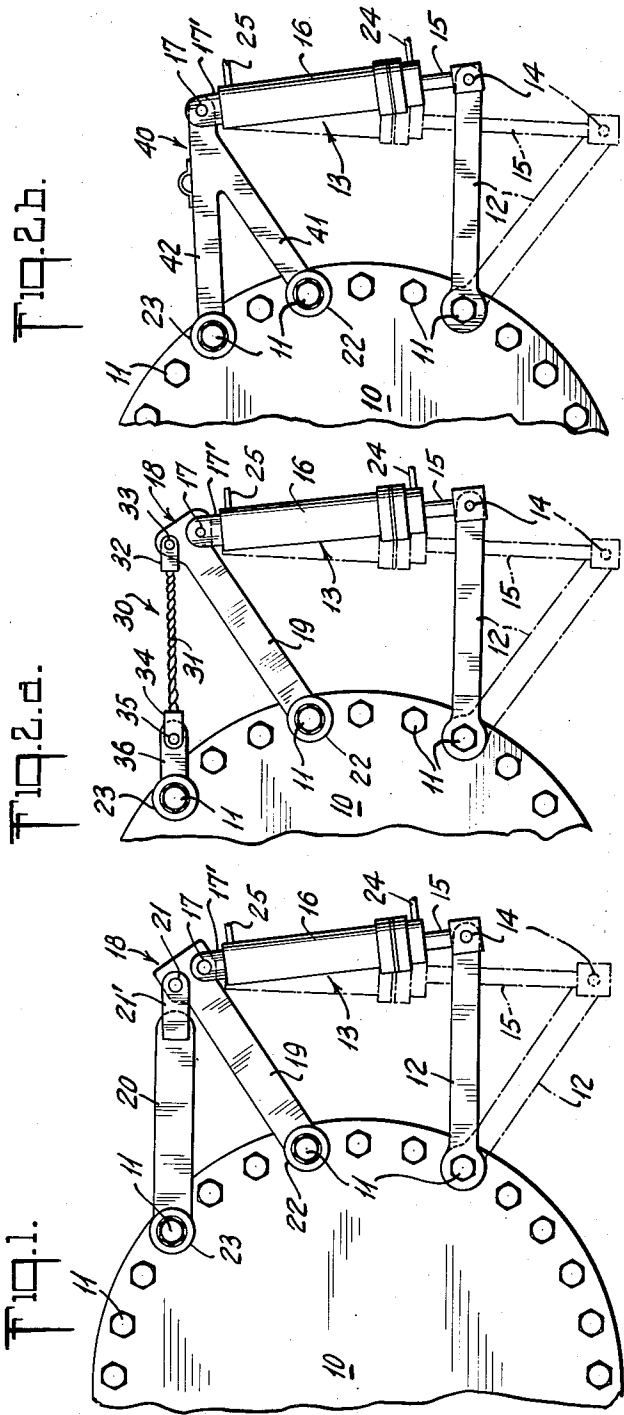
Feb. 28, 1961

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2,972,918

DEVICE FOR USE WITH A FLUID PRESSURE ACTUATED WRENCH

Filed May 27, 1959



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DEVICE FOR USE WITH A FLUID PRESSURE ACTUATED WRENCH

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Filed May 27, 1959, Ser. No. 816,256

2 Claims. (Cl. 81-53)

This invention relates generally to the head closures of heaters and exchangers and specifically to a device for supporting means for fastening and unfastening large size nuts used on the bolting for such head closures.

In petroleum refining, catalytic reforming units have heaters and exchangers with a diametral dimension of 48 inches and more, the closure heads of these units being subject to test and inspection at least twice a year. The relatively large size nuts (1½ inches and larger) used with the bolting to fasten the heads must be tightened with several hundred pounds pressure to prevent leakage, and after about 6 months service, are very difficult to loosen and require excessive time to do this, especially, since the units may be in elevated positions and usually are in limited and confined spaces. The loosening and/or the tightening of the nuts on the head bolting require more power than is produced by available pneumatic wrenches or could be made available with large hand wrenches.

Accordingly, it is an object of the present invention to provide an improved means for working on the relatively large size nuts used for fastening closure heads to heater and exchanger units.

Another object of the invention is to provide an improved means for use in the fastening and unfastening nuts to head bolting in limited and confined spaces.

Still another object of the invention is to provide a rig for a hydraulic wrench for use in limited and confined spaces for working on the nuts fastening the closure heads of heater and exchanger units.

And another object of the invention is to provide a device for supporting a fluid pressure actuated wrench which is simple and light weight in structure, built for hard service, is easy to maintain and make economically.

These and other objects, features and advantages of the invention will become apparent from the following description when taken in conjunction with the drawings wherein:

Fig. 1 is a diagrammatic showing of the supporting means for a hydraulic wrench in position on an exchanger head;

Fig. 2a is a partial showing of an alternative form of the supporting means for the hydraulic wrench; and

Fig. 2b is a partial showing of still another modification of the supporting means for the hydraulic wrench.

The objects of the invention are accomplished by anchoring a hydraulic operated wrench on a closure head, positioning the supporting device on the fastening nuts thereof for selectively tightening and/or loosening other nuts on the cylinder head.

Referring to the drawings in detail, Fig. 1 shows an exchanger head at 10, which is fastened to the body of a catalytic reforming unit by means of the partially shown circular row of nuts at 11, fitted on the head bolting, e.g. stud bolts, and fastened in final position or loosened by means of the wrench 12, which is actuated by the hydraulic ram 13, being joined at the pivot point 14, e.g. by

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a bolt, to the rod 15 of the ram 13. The piston is housed in cylinder 16 of ram 13 and the cylinder is joined at pivot point 17, e.g. by a bolt, to an A-frame indicated generally at 18, consisting of a radius rod 19 and a supporting arm at 20, the latter being joined at pivot point 21, e.g. by a bolt, to the radius arm 19. The shackles at 17' and 21' are fastened respectively to the end of the cylinder of the ram and to the supporting arm. At the respective support ends of the radius rod 19 and supporting arm 20, there are fastened cylindrical elements, e.g. pipe nipples, indicated respectively at 22 and 23, which are adapted to fit snugly over the hexagonal nuts on the stud bolts fastening the head of the catalytic reforming unit. The length of the supporting arm 20 is such that the hydraulic ram is held in substantially vertical position above the outer end of the wrench while it is fitted over the nuts to be loosened or tightened. Application of hydraulic pressure, by appropriate means, such as a hydraulic pump (not shown), through the hose connections indicated at 24 and 25, either below or above the piston in the cylinder will either loosen or tighten the nuts on the head as required.

Referring to Fig. 2a, there is disclosed a modification of the support structure disclosed in Fig. 1, with the same numeration for the same corresponding elements, for which no further description will be supplied. The difference in construction is the replacement of the solid supporting arm 20 by the flexible supporting arm indicated generally at 30, consisting of a cable at 31, which is joined to the radius rod 19 by means of the shackle at 32 and the pivot pin at 33, e.g. by a bolt. The cable is fastened at its opposite end to a second shackle 34, which is pivoted at 35, e.g. by a bolt, to the flat strip 36. As in the case of the radius rod 19 to which is fastened a pipe nipple 22, there is fastened a corresponding nipple 23 to the end of the flat strip 36.

Fig. 2b discloses another modification of the jig or supporting device for the hydraulically operated wrench. The same numeration is used for the same corresponding elements as disclosed in Fig. 1. The supporting device, indicated generally as 40, comprises the radius rod 41 and the supporting arm 42, at the respective support ends of which are fastened the pipe nipples 22, 23, and which are adapted to be fitted over the nuts on the head bolting. At their opposite ends, the radius rod and supporting arm are joined together to form a rigid angle-shaped member 40. This device is adapted for special use where the spacing of the stud bolts is uniform.

It is apparent that the size of the pipe nipples at the support ends of the radius rod and the supporting arm is such that the fit over the hexagonal nuts must be close. As the size of the nuts changes, it is necessary to have a different A-frame member with the new size nipples attached thereto for proper fit over the nuts.

Thus there has been shown and described, a device which is supported by the nuts on the bolting of a closure head for holding a hydraulic operated wrench for the loosening and tightening of the nuts.

Obviously, other modifications and variations of the invention, as hereinbefore set forth, may be made without departing from the spirit and scope thereof, and therefore, only such limitations should be imposed as are indicated in the appended claims.

We claim:

1. In combination, a device for supporting a hydraulic actuated wrench for removing nuts on a relatively large diameter unit in petro-chemical operations comprising an A-frame type member adapted to be supported by said nuts at the terminal ends of the legs thereof, a hydraulic ram consisting of a piston and a housing cylinder therefor pivoted at one end thereof to the apex of said member,

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a wrench pivotally supported by said hydraulic means at the other end thereof for engaging a nut located at a distance from the nuts supporting said A-frame type member, and means to provide fluid under pressure to said ram operatively connected thereto.

2. In combination, means for fastening and unfastening nuts spaced on the periphery of a bolted head of a relatively large diameter unit and for operating in limited and confined spaces comprising an A-frame type member adapted to be supported by said nuts by engagement with the legs of said member, a hydraulic means pivotally connected at one end thereof to the apex of said A-frame type member including a piston and a housing cylinder, means for engaging nuts at a distance from the nuts supporting said A-frame type member pivotally joined to the

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other end of said hydraulic means, and means for providing to and withdrawing pressurized fluid from said hydraulic means.

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