Oct. 24, 1950 E. T. ABLE ET AL 2,527,288

ANCHOR MEANS FOR WRENCHES

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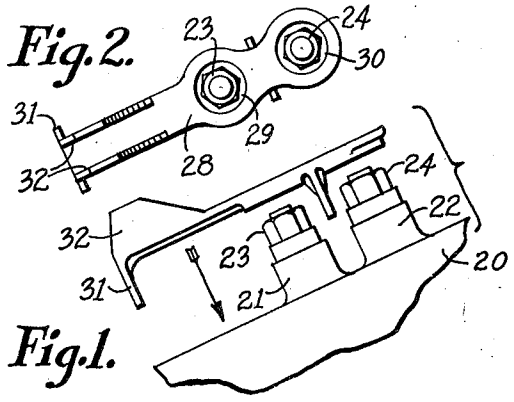


Fig. 2.

Fig. 1.

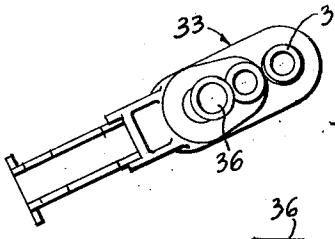


Fig. 4.

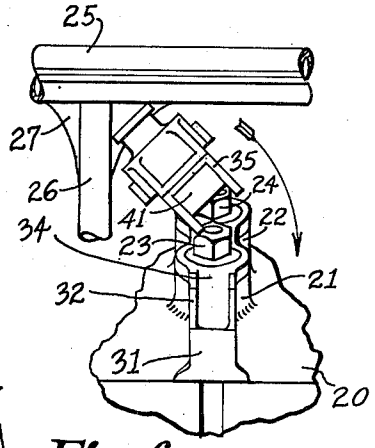


Fig. 6.

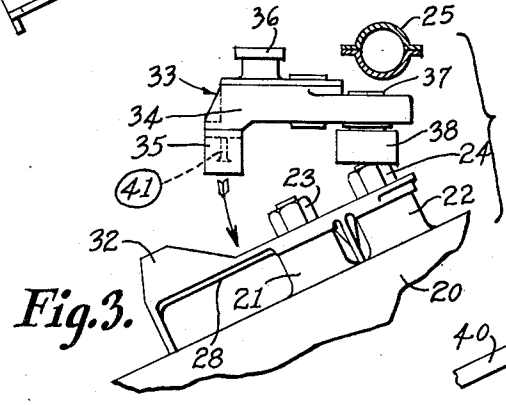


Fig. 3.

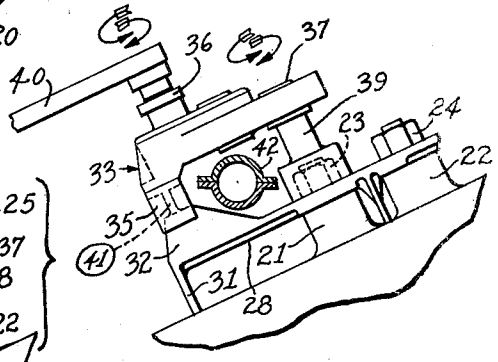


Fig. 7.

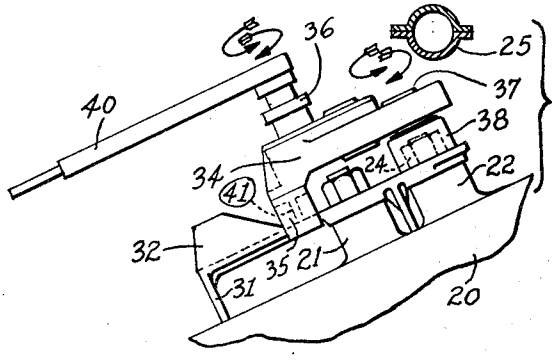


Fig. 5.

INVENTORS

EDWARD T. ABLE

WILLARD KRIEGER

BY Bertha L. MacGregor

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Fig.9.

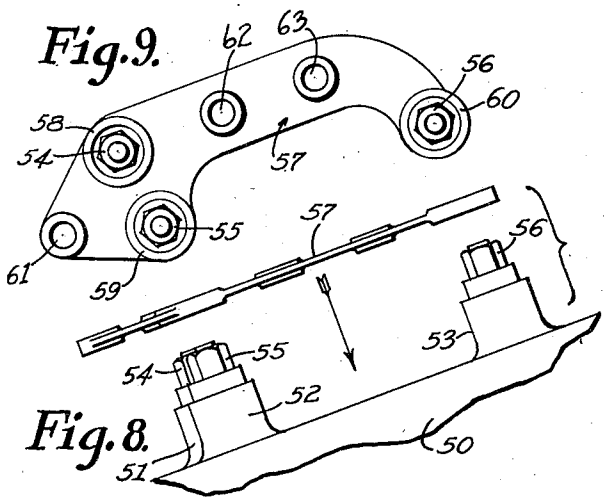


Fig.8.

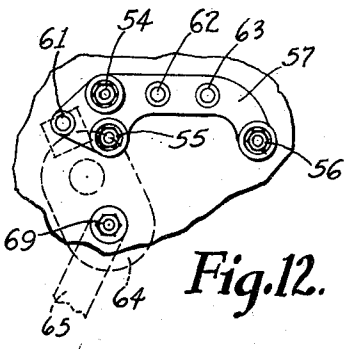


Fig.12.

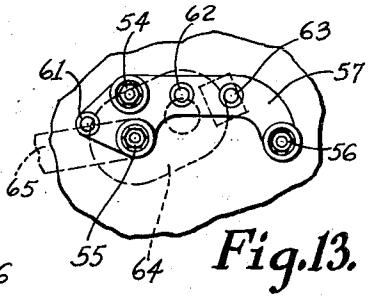


Fig.13.

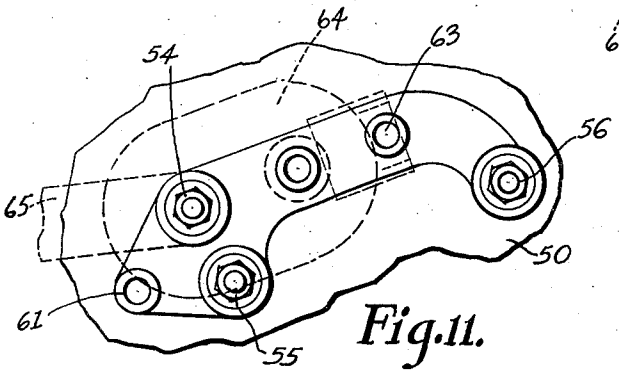


Fig.11.

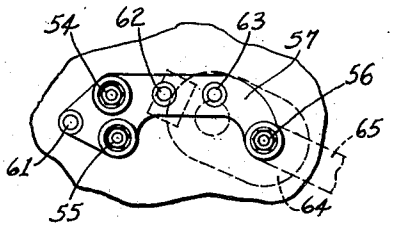


Fig.14

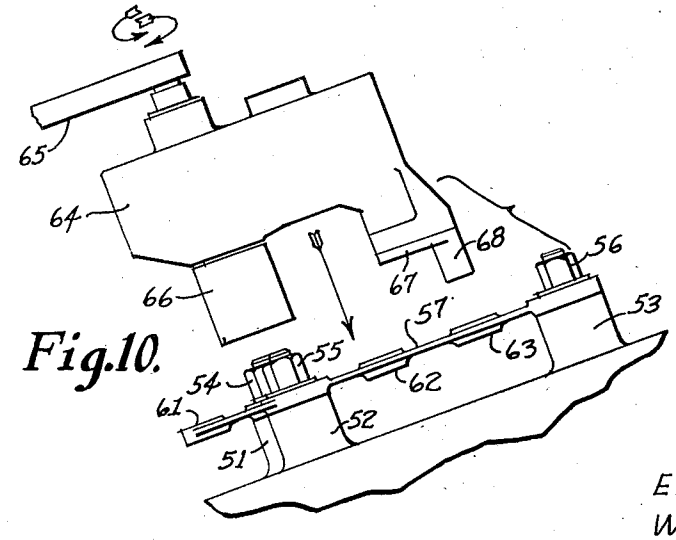


Fig.10.

INVENTORS
EDWARD T. ABLE
WILLARD KRIEGER
BY Bertha L. Mac Gregor

Oct. 24, 1950 E. T. ABLE ET AL 2,527,288

ANCHOR MEANS FOR WRENCHES

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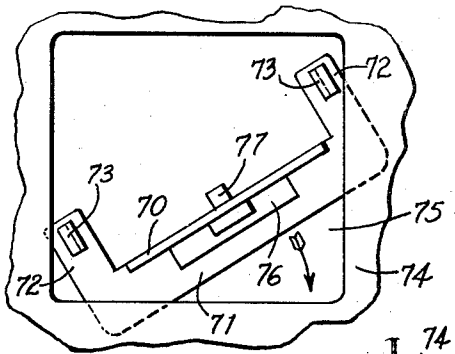


Fig.15.

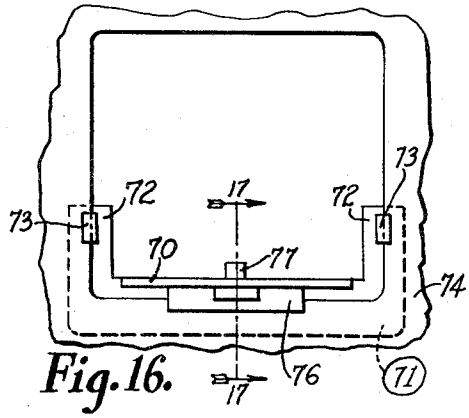


Fig.16.

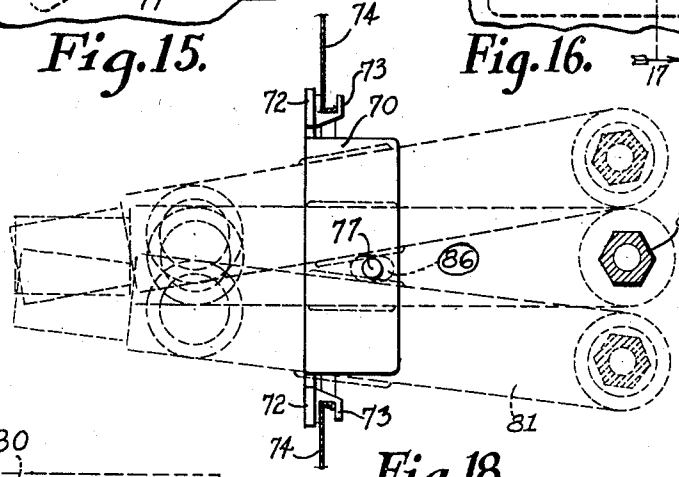


Fig.18.

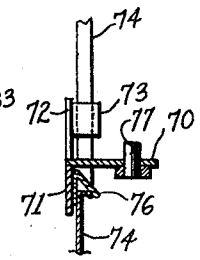


Fig.17.

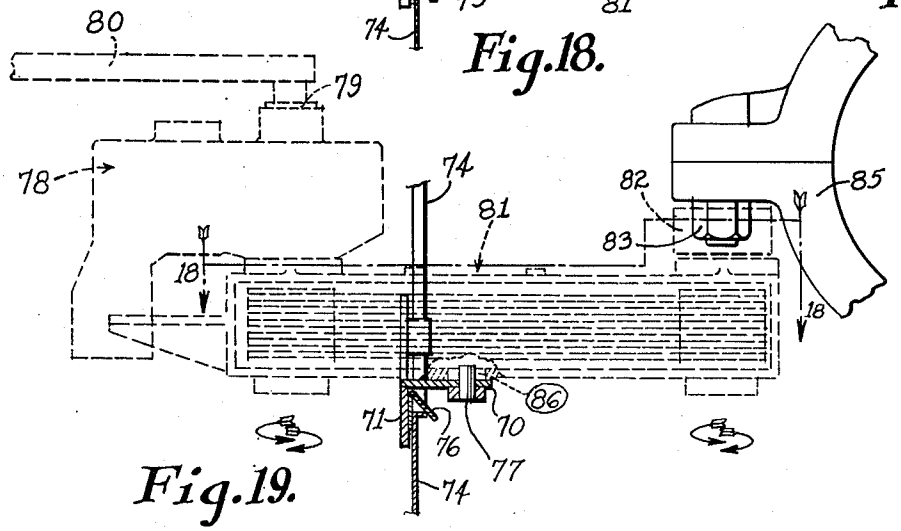


Fig.19.

INVENTOR.

EDWARD T. ABLE
WILLARD KRIEGER

BY Bertha L. MacGregor

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2,527,288

UNITED STATES PATENT OFFICE

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ANCHOR MEANS FOR WRENCHES

Edward T. Able and Willard Krieger, Denver, Colo., assignors to B. K. Sweeney Manufacturing Company, Denver, Colo., a corporation of Colorado

Application May 3, 1948, Serial No. 24,815

4 Claims. (Cl. 81—57)

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This invention relates to anchor means for gear or chain driven wrenches, and particularly to means for anchoring such wrenches in operative positions for tightening and loosening nuts in the interiors of Diesel type engines.

The interiors of Diesel engines are provided with numerous nuts located in places which are inaccessible or difficult to reach and work on with tools heretofore available. Frequently the nuts are located closely adjacent water lines, oil lines, wiring and other parts of the apparatus which may be injured by the tools required for working on the nuts. The engine head on which some of the nuts are mounted is an inclined surface on which it is difficult if not impossible to mount a wrench for efficient operation on a nut, or without injury to other parts of the apparatus.

The main object of our invention is to provide portable anchor means for gear or chain driven wrenches, designed to support and anchor the wrenches in order to prevent relative turning of the wrench in operation.

The anchor means of our invention may be embodied in numerous forms, three of which have been illustrated herein, designed for use on different types of engines and in different places in the same engine. Regardless of specific form, said anchor means are provided with two or more support-engaging devices which cooperate with a like number of fixed parts of the engine or its housing for holding the anchor means stationarily on the engine.

The support engaging devices on the anchor means may be round or other shaped holes which permit the anchor means to be placed over and to surround two or more nuts on the engine which thus serve to prevent lateral movement of the anchor means, and these may be the same nuts, or some of them, intended to be worked on by the wrench. The support engaging devices of the anchor means may also take the form of straddling or engaging devices for holding the anchor means on a part of the engine or engine housing. In other words, the support engaging devices on the anchor means which cooperate with fixed parts of the engine for holding the anchor means stationarily on the engine may consist of two or more openings, or of straddling means, or both straddling means and openings.

In addition to devices for holding the anchor means stationarily on the engine or engine housing, said anchor means are provided with wrench supporting means whereby one end of the wrench is fixedly or pivotally mounted on the

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anchor means and the opposite free end of the wrench is in operative position relatively to a nut to be loosened or tightened.

The anchor means are designed to permit the wrench to be mounted thereon in different positions so that the operative end of the wrench may work on more than one nut without moving the anchor means.

By using the anchor means of our invention for mounting a wrench in stationary, operative position on an engine, the operator is relieved of supporting the wrench while he is operating it, and the wrench operation is more efficient due to the fact that it is positively positioned and supported. When the nut to be worked on has been engaged by the socket end of the wrench, both ends of the wrench are restrained and the wrench is bodily held in stationary position even when subjected to severe strains during the operation of removing or tightening nuts.

Other objects and advantages will be apparent from the following specification.

In the drawings:

Fig. 1 is an elevational side view of one of several forms of wrench anchor means embodying our invention, shown in juxtaposition to a portion of the head of a Diesel engine, preparatory to being mounted on the head.

Fig. 2 is a top plan view of the anchor means shown in Fig. 1, as it appears when in position on the engine head.

Fig. 3 is an elevational side view of the anchor means of Fig. 1 mounted on the engine head, showing a wrench in the act of being positioned on the anchor means for the purpose of anchoring the wrench in operative relationship to a rear nut located under the conventional water line on the engine head.

Fig. 4 is a top plan view of the wrench and anchor means as they appear when looking down on Fig. 3.

Fig. 5 is an elevational side view of the parts shown in Fig. 3, after the wrench has been moved to operative position.

Fig. 6 is an elevational end view of the anchor means of Fig. 1 in position on the engine head, showing a wrench in the act of being positioned on the anchor means for operation on a rear nut located under the water line reinforcing web on the engine head.

Fig. 7 is an elevational side view showing the parts described in connection with Fig. 5, the wrench being mounted on the anchor means for operation on a front nut on the engine head.

Fig. 8 is a elevational side view of a modified

form of wrench anchor means embodying our invention, shown in juxtaposition to a portion of the head of a Diesel engine preparatory to being mounted on the head.

Fig. 9 is a top plan view of the anchor means shown in Fig. 8, positioned on the engine head.

Fig. 10 is an elevational side view of the anchor means of Fig. 8 mounted on the engine head, showing a wrench in the act of being positioned on the anchor means for the purpose of anchoring the wrench in operative relationship to one of a plurality of nuts on the engine head.

Fig. 11 is a top plan view of the anchor means and engine head of Fig. 10, with a wrench indicated in dotted lines thereon.

Figs. 12, 13 and 14 are plan views similar to Fig. 11 showing the wrench, in dotted lines, in different operative positions on the anchor means.

Fig. 15 is an elevational front view of another modified form of wrench anchor means embodying our invention, shown in juxtaposition to a part of a Diesel engine housing, preparatory to being mounted in the housing.

Fig. 16 is a view similar to Fig. 15 showing the anchor means mounted in operative position in the engine housing.

Fig. 17 is a transverse vertical sectional view taken in the plane of the line 17—17 on Fig. 16, looking in the direction indicated by the arrows.

Fig. 18 is a top plan view of the anchor means of Fig. 16 mounted in operative position, showing part of the engine housing in horizontal section, and showing part of a wrench in dotted lines, the sections being taken in the plane of the line 18—18 on Fig. 19.

Fig. 19 is an elevational side view showing the anchor means of Fig. 16 partly in vertical section, and a wrench in operative position relatively to a main bearing cap nut, said wrench being shown in dotted lines.

Referring to Figs. 1 to 7, inclusive, part of a Diesel engine head is indicated at **20**, crabs holding down the head at **21**, **22**, and nuts on said crabs at **23**, **24**. Other apparatus within the engine housing includes a water line **25** supported on a standard **26** and reinforcing web **27**. These parts are shown merely to illustrate the operation of the anchor means of our invention.

In that embodiment of our invention shown in said Figs. 1 to 7, inclusive, the anchor means comprises a flat plate **28** provided with openings **29**, **30**, adapted to be passed over the nuts **23**, **24**, respectively, and to rest on the crabs **21**, **22**, as shown in Figs. 5 and 7. The plate **28** is also provided with a leg or legs **31** of a height to support the plate on the engine head **20** when the apertured portion is resting on the crabs **21**, **22**. A pair of raised supports **32** extend upwardly from the plate sides near the end removed from the openings **29**, **30**.

The openings **29**, **30**, and the leg or legs **31** constitute the "support engaging devices" on the anchor means referred to in the general description of objects and advantages of the invention, whereby the anchor means are mounted stationarily but removably on the engine.

A wrench indicated as a whole at **33** comprises a housing **34**, anchor engaging means **35** near one end, a power input shaft **36**, power output shaft **37**, and intermediate gearing (not shown) in the housing. The power output shaft **37** is located in the end of the housing **34** opposite the end which carries the anchor engaging means **35**. The shaft **37** is adapted to drivingly engage a detachable socket **38** (Fig. 5) or **39** (Fig. 7) which is shaped to receive and engage the nut to be worked on by the wrench. A manually operated lever or handle **40** engages the input shaft **36** for rotating the same in either direction. The part **35** of the wrench includes a reinforcing cross piece **41** which aids said part **35** in engaging the anchor means. Since the wrench, per se, is not the subject of this invention, it need not be described in detail.

When a rearwardly located nut **24** is to be worked on, a short wrench socket such as that shown at **38** in Figs. 3 and 5 is used to engage the nut for the reason that the space between the nut and the water line **25** is restricted. As shown in Fig. 3, after the anchor means has been positioned by placing the plate **28** on the crabs **21**, **22**, with the nuts extending through the openings **29**, **30**, the wrench **33** is moved to the position shown preparatory to lowering the forward end so that the anchor engaging bracket **35** straddles the plate **28** and the reinforcing cross piece **41** rests on said plate as shown in Fig. 5. By tilting the wrench in the manner indicated by Fig. 3, the socket **38** is moved into nut engaging position without interference from the flanged water line **25**.

Fig. 6 shows the manner in which the wrench is tilted, sidewise, in the act of being mounted on the anchor means for operation on a rear nut located under the reinforcing web **27** of the water line **25**.

Fig. 7 shows the wrench **33** in position for operating on a forwardly located nut **23**, the bracket **35** straddling the raised support **32** on the plate. When the wrench is thus positioned, a long socket **39** is used to engage the nut **23**. Whether a short or long wrench socket is used, the object is to mount the wrench on the anchor means so that the axes of the output shaft **37** and of the nut will be aligned and perpendicular to the anchor plate **28**. It will be understood that in certain environments a short socket must be used because of restricted space available for the operating end of the wrench, and in others a longer socket is required because the wrench has to be supported in raised position to avoid contact with engine apparatus located adjacent the nut. In Fig. 7 such an obstruction is indicated at **42**.

The anchor plate **28** thus serves to support and anchor the wrench in operative relationship to the two nuts, **23**, **24**, without shifting the anchor plate. The wrench is held stationary, for efficient operation, without danger of injuring oil lines, wiring and water lines which may be located in close proximity to the nut being worked upon by the wrench.

In Figs. 8 to 14, inclusive, is shown a modified form of anchor means especially adapted for use on certain types of engines and in particular places on the engine where three spaced apart crabs or bosses and nuts provide the fixed parts required for cooperating with the support-engaging devices of the anchor means. Part of an engine head is indicated at **50**, and bolt holding crabs at **51**, **52** and **53** on which are mounted nuts **54**, **55** and **56**, respectively. The anchor means, in this embodiment, comprises a plate **57**, provided with round openings **58**, **59** and **60** for permitting the plate to be placed on the crabs **51**, **52** and **53**, with the nuts **54**, **55** and **56** projecting through said openings. These openings provide the plate with support-engaging devices for anchoring the plate on the engine.

The plate is also provided with means for anchoring a wrench on the plate in operative relationship to a plurality of nuts; not only those which aid in holding the anchor means but others which may be adjacent thereto. The wrench anchoring means in this embodiment of the invention comprise openings 61, 62, 63, preferably provided with a bead surrounding the opening for reinforcement purposes, said openings being adapted to receive, for pivotal mounting therein, a part of the wrench to be anchored thereon.

A wrench adapted to be anchored on the plate 57 is indicated in the drawings at 64. The internal mechanism need not be described for the wrench gearing is not a novel feature of the invention. Suffice to say that it is provided with an input shaft adapted to be engaged by the operating lever 65 and an output shaft adapted to rotate the socket 66. Opposite the socket end, the wrench has a base 67 provided with a depending spindle 68, for pivotally engaging one of the openings 61, 62 or 63. When the wrench is positioned as shown in Fig. 11, its operative end is in engagement with the nut 54 and its spindle 68 is mounted in the opening 63 of the anchor plate 57.

Figs. 12, 13 and 14 show how the anchor means may be used to anchor the wrench in different positions, to work on different nuts, without shifting the position of the anchor plate. In Fig. 12, the socket of the wrench is engaging a nut 53, which is not one of the three which the plate 57 is engaging, and the opposite end of the wrench is mounted in the opening 61 by means of the spindle 68. In Fig. 13, the wrench socket is engaging the nut 55 and the spindle 68 is pivotally mounted in the opening 63. In Fig. 14, the wrench is anchored in the opening 62 and the socket is in operative position on the nut 56.

Another modification of the anchor means of our invention is shown in Figs. 15 to 19, inclusive. This form of anchor means is especially adapted to anchor and support a wrench designed to work on nuts in the interior of the engine housing and at a distance therefrom. It comprises a bed plate 70, horizontally disposed and generally rectangular in shape, provided with an apron 71 depending from one longitudinal edge of the plate, and vertical side members 72, 72 on which are fixed straddling or support engaging devices 73, 73. This anchor means is adapted to cooperate with the wall 74 of the engine housing surrounding the opening 75 through which access is obtained to the interior of the housing. The bed plate 70 rests on the lower edge or sill 76 of the housing defining said opening 75, with the rear surface of the apron 71 facing the housing, and the straddling means 73 on the side members 72 engaging the vertical side edges of the housing adjacent the opening 75. Thus the plate 70 is held stationarily on a fixed support and is capable of anchoring and supporting a wrench designed to work on nuts, for example those which hold connecting rod parts or main bearing parts together.

To aid in supporting and anchoring a wrench on the anchor plate 70, said plate is provided with a protuberance 77, adapted to be received in a recess or slot in the wrench. The wrench 78 is shown in dotted lines and its internal mechanism need not be described in detail because it does not constitute an element, per se, of this invention, but is the subject of a co-pending application. The wrench comprises an input shaft 79 driven by a lever 80, a chain driven transmission device 81 which transmits rotary motion from the input

shaft 79 to a shaft drivingly connected to the socket 82 which engages the nut 83 on the main bearing 85. The transmission device 81 of the wrench is provided with a slot 86 for engaging the pin or protuberance 77 on the anchor plate 70.

As shown in Figs. 18 and 19, the wrench including the mechanism 78 and the chain driven transmission member 81 is supported on the anchor plate 70 in a chosen position to place the socket 82 into operative position relatively to the nut 83. The wrench may be positioned centrally of the plate, so that the recess or slot 86 in the transmission device 81 will engage the pin or protuberance 77 on the anchor plate, or the transmission device 81 and wrench member 78 may be placed at one side or the other of said protuberance 77 and be held between it and a side member 72 of the anchor means as shown in Fig. 18.

Essential to the operation of the anchor means of our invention are the following: the anchor means must have support-engaging devices which cooperate with at least two fixed parts of the engine or engine housing for the purpose of stationarily anchoring said anchor means on the engine or housing; and the anchor means must be provided with wrench engaging and supporting devices for holding and restraining one end of the wrench while the opposite, socket end is in working position on a nut, whereby the wrench as a whole is supported and held stationarily in efficient operative position relatively to the work.

As will be obvious from the foregoing description, the anchor means may be produced in various forms to fit specific requirements, and our invention is not limited to the several modifications shown and described herein. Since the anchor means of our invention are firmly mounted on fixed parts of the engine or housing, the wrench can be supported and restrained thereon in such manner that the wrench can be subjected to very great strains and stresses required for working on difficult to operate parts.

It will be noted that in addition to the essential elements of construction herein described, a common feature of all of the anchor means disclosed is the fact that the means for supporting and restraining the non-operative end of the wrench, that is, the anchored portion removed from the socket or nut engaging end, is some means other that any one of the nuts or other means which secure the anchor means in stationary position on the engine or engine housing.

The claims are directed to anchor means for socket wrenches. The wrenches comprise gear driven wrenches, chain driven wrenches, and gear and chain driven wrenches; particularly any kind of heavy duty socket wrench.

Changes may be made in the form and dimensions of the anchor means of our invention shown herein, as well as in details of construction to render the same suitable for the environments in which the devices operate, without departing from the scope of our invention as set forth in the appended claims.

We claim:

1. Portable anchor means for anchoring a wrench in operative position for working on nuts in Diesel type engines, said anchor means comprising an anchor body provided with a plurality of spaced apart, engine-engaging means which contact with a like number of fixed parts of the engine when resting thereon, lateral movement of said anchor body being prevented solely by the contact of the engine-engaging means of the anchor body with said fixed parts of the engine

when the anchor body is resting on said engine, and fastener-free means on the anchor body for stationarily but removably supporting a portable wrench on said anchor body.

2. The portable anchor means defined by claim 1, in which the engine-engaging means of the anchor body comprises a bed plate provided with an apron depending from one longitudinal edge of the bed plate and a pair of side members extending from the bed plate in a direction opposite to that of the depending apron, each of said side members having spaced apart portions adapted to engage opposite sides of a fixed part of the engine.

3. The portable anchor means defined by claim 1, in which the engine-engaging means of the anchor body comprises a plate provided with a plurality of openings through which nuts on the engine are adapted to protrude.

4. The portable anchor means defined by claim 1, in which the fastener-free means on the anchor body for supporting the portable wrench comprises a raised support near one end of the body for engaging a part of the wrench while the socket of the wrench is in engagement with a nut on the engine.

EDWARD T. ABLE.
WILLARD KRIEGER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,002,229	Curtis	Sept. 5, 1911
1,191,873	Cressey et al.	July 18, 1916
1,801,697	Strickling	Apr. 21, 1931
1,877,595	Royal	Sept. 13, 1932
1,948,028	Edwards	Feb. 20, 1934
2,268,802	Coffman	Jan. 6, 1942
2,492,470	Farkas	Dec. 27, 1949