Dec. 21, 1937. M. HOLHUT 2,102,897

BOLT SETTING TOOL

Filed Sept. 16, 1936 2 Sheets-Sheet 1

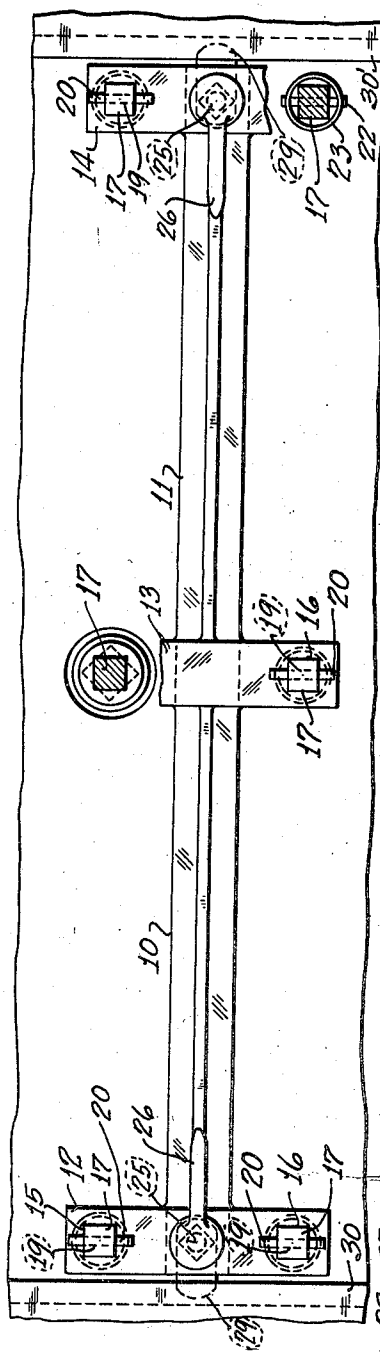


Fig. 1.

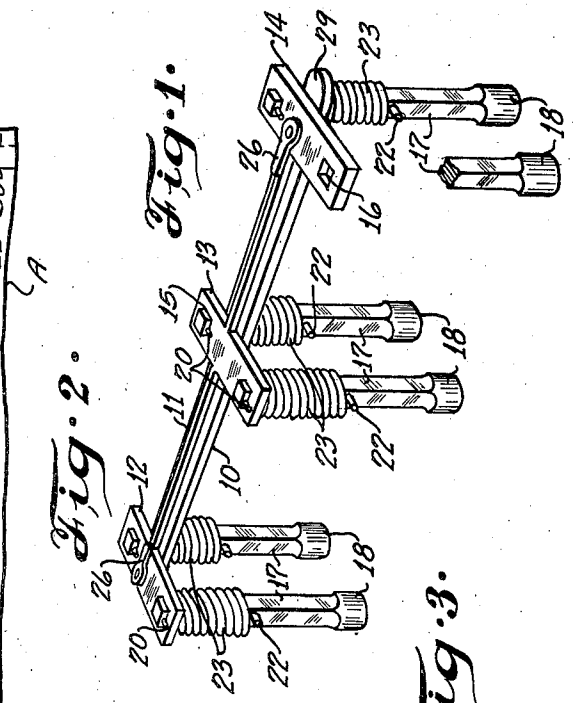


Fig. 2.

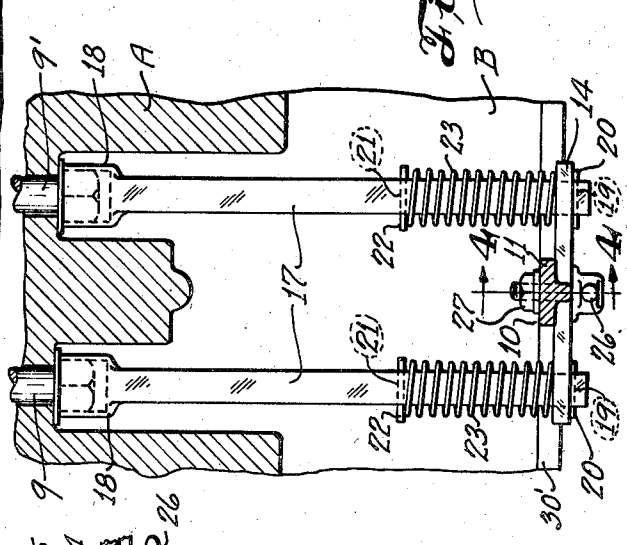


Fig. 3.

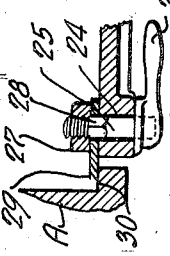


Fig. 4.

INVENTOR.
Michael Holhut.
BY
ATTORNEY.

Dec. 21, 1937. M. HOLHUT 2,102,897

BOLT SETTING TOOL

Filed Sept. 16, 1936 2 Sheets-Sheet 2

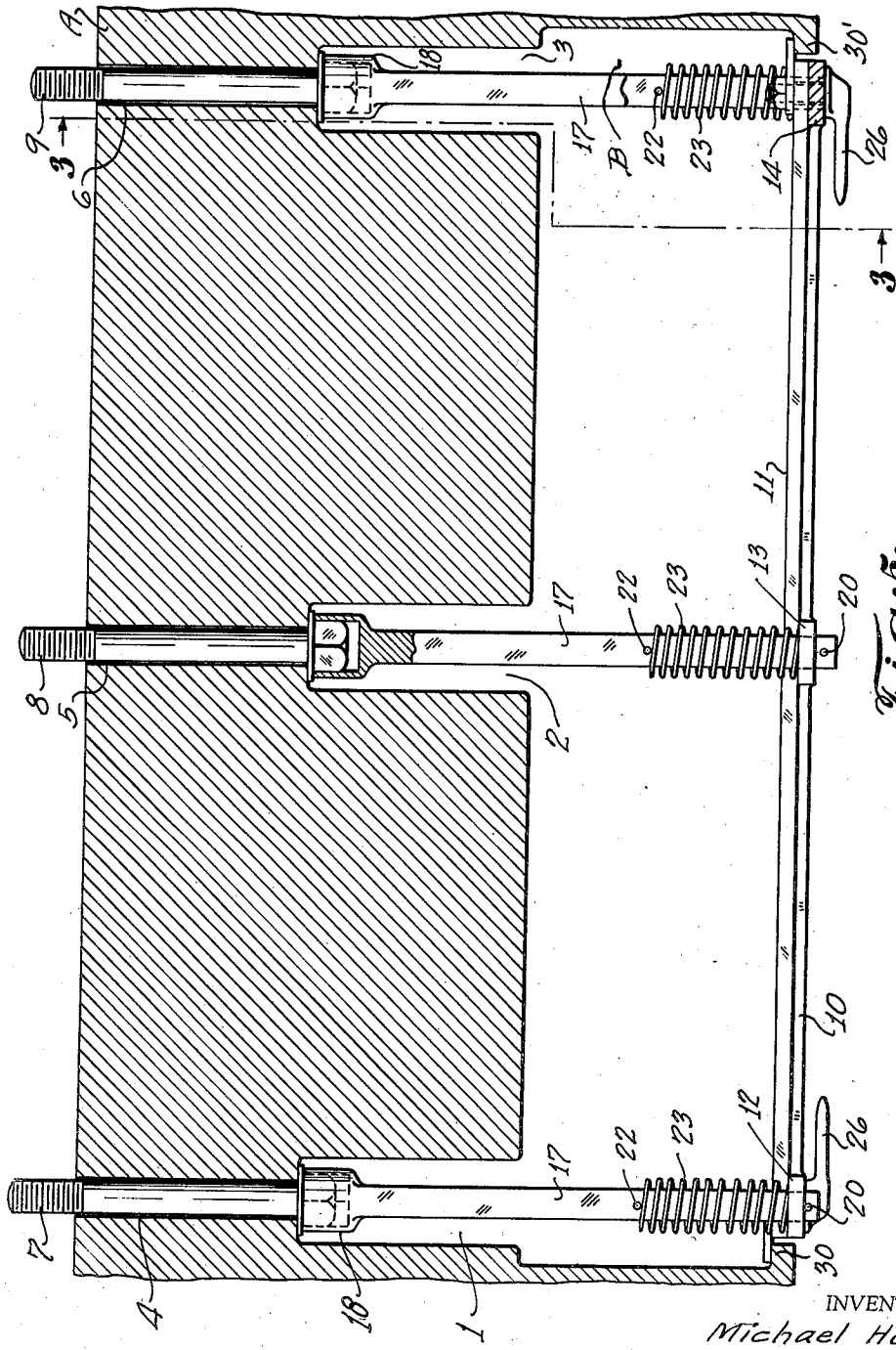


Fig. 5.

INVENTOR.
Michael Holhut.

BY

ATTORNEY.

Patented Dec. 21, 1937 2,102,897

UNITED STATES PATENT OFFICE

2,102,897

BOLT-SETTING TOOL

Michael Holhut, Jennings, Mo., assignor to H & H Machine & Motor Parts Co., St. Louis, Mo., a corporation of Missouri

Application September 16, 1936, Serial No. 101,004

8 Claims. (Cl. 81—13)

This invention relates generally to tools for use in the assembly and repair of automotive engines and, more particularly, to a certain new and useful improvement in tools especially adapted for holding an assembly of main-bearing bolts in place for installation of the main-bearings and associated mechanism.

In the case of a great many automotive engines of the so-called "low-priced class" and especially "Ford" engines, original assembly and subsequent overhaul work should be accomplished in the most efficient, accurate, and time-saving manner possible. Heretofore, one of the laborious and time-consuming operations in this type of work has been main-bearing installation. This is largely attributable to the fact that the main-bearing bolts must be inserted through channels which are positioned deeply within the cylinder block and are relatively inaccessible. Further, the mechanic must reach down into such inaccessible locations to hold the head of each bolt while he affixes the nut or other part to the extended end thereof, an operation which calls for considerable dexterity on the part of a single operator and may even require the services of two operators.

My invention, therefore, has for its primary object the provision of a simple and efficient tool for positioning and holding the main-bearing bolts of an automotive engine during assembly and repair operations.

My invention has for another object the provision of a tool so constructed that an entire set of main-bearing bolts may be simultaneously positioned and held for installation.

My invention has for a further object the provision of an accurate, simple, efficient, and time-saving tool for installing main-bearing bolts in automotive engines.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings (2 sheets),—

Figure 1 is a perspective, partially broken view of an automotive engine tool constructed in accordance with my present invention;

Figure 2 is a partially broken, plan view of the tool;

Figure 3 is a vertical sectional view of the tool in operative position in the cylinder block;

Figure 4 is a sectional detail view of the clamp-portion of the tool, taken approximately on the line 4—4, Figure 3; and

Figure 5 is a fragmentary vertical sectional view of an automotive cylinder block, showing the tool in operative position therein.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of my invention, A designates the lower section of an automotive cylinder block in which the main-bearings are placed, and B designates the inter-cylinder space normally provided in such cylinder blocks, the cylinder block A being shown in inverted position in Figures 3 and 5 for a purpose presently appearing.

Extending vertically upwardly, as shown in Figures 3 and 5, from the inter-cylinder space B, is a plurality of recesses 1, 2, 3, at the end of which are bolt-retaining apertures 4, 5, 6, in which are positioned the main-bearing bolts 7, 8, 9, the heads of which are abuttingly engaged in the end of the recess 1, 2, 3, respectively, as best seen in Figure 5.

Formed for flatwise horizontal disposition across the open side of the inter-cylinder space B, is a preferably wrought iron plate-like frame 10 having a longitudinally extending central member 11 and a plurality of right angularly disposed cross-members or arms 12, 13, 14, the "center-to-center" distance between the cross-members 12, 13, and 13, 14, respectively, being exactly equal to the "center-to-center" distance between the main-bearing bolts 7, 8, and 8, 9, correspondingly.

Formed in each of the cross-arms 12, 13, 14, equi-distantly on opposite sides of the central member 11, is a pair of preferably square-shaped apertures 15, 16, the "center-to-center" distance therebetween being exactly equal to the "center-to-center" distance between the main-bearing bolts 9, 9', as best seen in Figure 3.

Loosely mounted in the apertures 15, 16, for shiftable movement, are square-shanked post-like members or stems 17, each having at an end a preferably integral bolt-head engaging socket 18. Transversely disposed adjacent an end of the respective stems 17, is a drilled or otherwise provided opening 19 for receiving a retaining pin 20, a second parallel opening 21 being disposed intermediately along the stem between the shank 17 and the socket-end 18, as best seen in Figures 3 and 5, for receiving a spring-retaining pin 22.

Coiled on each of the respective stems 17 and impinging the pin 22 and the adjacent face of the frame 10, is a compression spring 23 normally urging the socket-end 18 of the stem 17 outwardly from the frame 10.

Disposed in each end of the frame 10, are longi-

tudinal apertures 24, in which are respectively arranged for rotation stub shafts 25 rectangular in section, but having an annular outwardly extending end, upon which are mounted handle or shifting members 26. Mounted and secured, as by nuts 27 upon the square or rectangular portion 26 of the shafts 25, are detents 29, which are of sufficient length to project beyond the respective end cross-arms 12, 14, so as to engage the adjacent shoulders 30, 30', of the cylinder block A, when the handles 26 are suitably turned as best seen in Figures 4 and 5.

In use and operation, the cylinder block A is mounted in a suitable supporting cradle or similar structure in common use in machine shops and positioned with the open side of the inter-cylinder space B presented upwardly. The several main-bearing bolts are then dropped into the recesses 1, 2, 3, and through the apertures 4, 5, 6, so that the respective heads thereof rest in the bottom of the recesses, respectively, as described. The tool is then disposed in the space B and shifted about until the several stems 17 drop into the respective block recesses, and the bolt-heads fitted into the stem-sockets 18. The frame 10 is then depressed inwardly against the tension of the springs 23, until the detents 29 are in position opposite the block-shoulders 30, 30' whereupon the handles 26 are turned and the detents 29 shifted into locking engagement with the shoulders 30, 30', the frame 10 being thereby securely attached to the cylinder block A. It will be evident that, in such position, the tool will retain the several main-bearing bolts rigidly in place, and further, since the stem-shanks 17 are non-rotatable in the frame 10, the main-bearing bolts will be also retained against axial rotation. The cylinder block A may then be turned over, so that the main-bearing bolts are in convenient position for further assembly operations, said bolts continuing in such rigidly retained position without further attention until the desired operations are completed, whereupon the tool may be quickly and conveniently removed by reversely turning the handles 26 and releasing the detents 29 from block engagement.

By my present invention, I thus provide a unique tool, which simplifies a hitherto difficult and time-consuming operation in automotive engine assembly and repairing operations and makes it relatively easy for a single operator to position a complete set of main-bearing bolts and retain the same non-rotatably so positioned as a unit for all further operations. By my present invention, I also enable facile movement of the cylinder block A to any position after the main-bearing bolts are set with the tool in place.

The tool as a whole is of simple inexpensive structure, readily and conveniently manipulated, and exceedingly efficient in the performance of its intended functions.

It will be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the tool may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is,—

1. In a bolt-setting tool, a frame having a central-member and a plurality of cross-arms disposed at right angles to the central-member, means on the frame for releasably securing the frame to an automotive cylinder block, and a plurality of bolt-engaging stems yieldingly and non-rotatively mounted in each of the cross-arms for registration with the several bolt-openings in the block.

2. In a bolt-setting tool, a frame sized to fit a selected type of automotive cylinder block and having a plurality of non-circular apertures, stems each comprising a shank shaped to shiftably fit in a respective aperture and an outwardly opening socket shaped to receive and snugly engage a selected bolt-head, and spring-means cooperatively associated with the frame and stems for resiliently urging the sockets of the stems outwardly away from the frame.

3. In a bolt-setting tool, a frame sized to fit a selected type of automotive cylinder block, means on the frame for releasably securing the frame to a cylinder block, the frame having a plurality of non-circular apertures, a plurality of stems each comprising a shank for shiftably fitting in a respective aperture and having an outwardly opening socket shaped to receive and snugly engage a selected bolt-head, and springs associated with the frame and the respective stems for yieldingly urging the sockets of the stems outwardly away from the frame.

4. In a bolt-setting tool, a frame sized to fit a selected type of automotive cylinder block and having a plurality of non-circular apertures, stems each comprising a shank shaped to snugly fit a respective aperture, each shank having an outwardly opening socket shaped to receive and snugly engage a selected bolt-head, and a shaft mounted rotatively in the frame adjacent an outer edge thereof, said shaft having a handle mounted on one end and a radially outwardly extending detent bar mounted on its other end for frame-retentive engagement with a portion of the cylinder block.

5. In a bolt-setting tool, a frame sized to fit a selected type of automotive cylinder block and comprising a central main rib and a plurality of spaced cross-ribs, each of said cross-ribs having adjacent its outer extremity a non-circular aperture, and a stem mounted in and extending through each of said apertures, said stems comprising a shank shaped to snugly fit a respective aperture and an outwardly opening socket shaped to receive and snugly engage a selected bolt-head.

6. In a bolt-setting tool, a frame sized to fit a selected type of automotive cylinder block and comprising a central main rib and a plurality of spaced cross-ribs, each of said cross-ribs having adjacent its outer extremity a non-circular aperture, a stem mounted in and extending through each of said apertures, said stems comprising a shank shaped to snugly fit a respective aperture and an outwardly opening socket shaped to receive and snugly engage a selected bolt-head, and spring means cooperatively associated with each of said stems for resiliently holding the stems in a predetermined position with respect to the frame.

7. A bolt-setting tool including, in combination, a plate-like frame contoured and shaped for removably fitting an automotive cylinder-block, means on the frame for detachably securing the same to the block, and a plurality of rigid stems having endwise yieldable and non-rotative connection at one end-portion thereof with the frame and extending in spaced approximately parallel relation one to the other from the same side face of the frame for registration with the several bolt-retaining recesses of the

block, said stems having respective sockets at their opposite free end for engagement with selected bolt-heads.

8. An automotive multiple bolt-setting tool including, in combination, a rigid plate-like frame contoured and shaped for removably fitting an automotive cylinder block, and a plurality of stems mounted yieldingly and non-rotatively upon the frame for lengthwise shiftable movement, said stems lengthwise extending in spaced parallel relation one to the other from the same side face of the frame for respective longitudinal alignment with selected bolts of the block and being respectively provided with a socket opening endwise of the particular stem for holding engagement with the heads of said bolts.

MICHAEL HOLHUT.