

V. D. EARL & F. E. MANGOLD.
ADJUSTABLE SOCKET WRENCH BIT.
APPLICATION FILED MAR. 19, 1913.

1,107,769.

Patented Aug. 18, 1914.

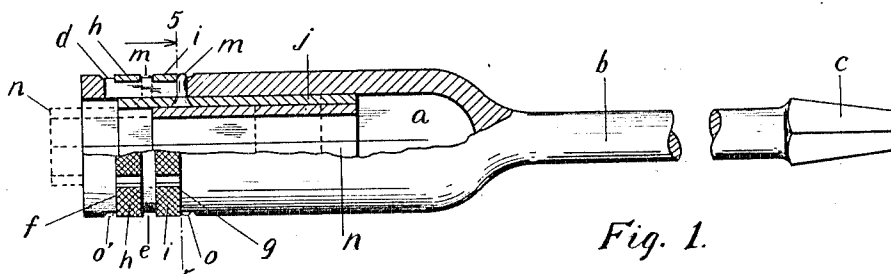


Fig. 1.

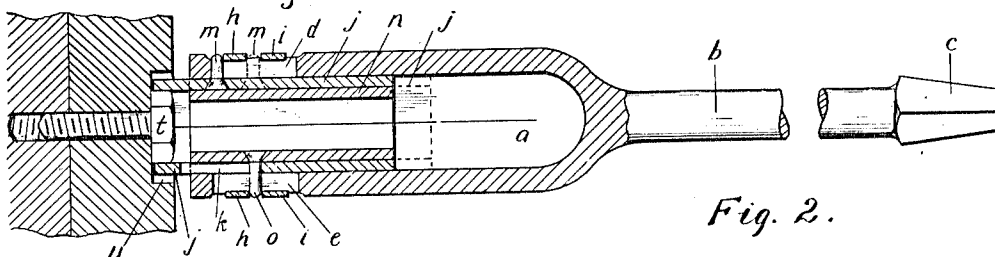


Fig. 2.

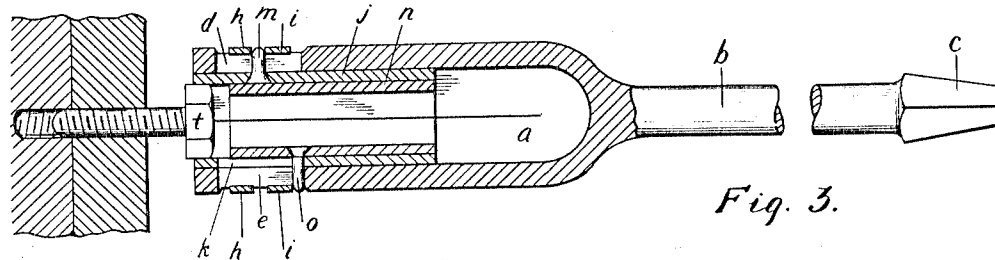


Fig. 3.

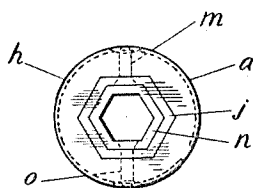


Fig. 4.

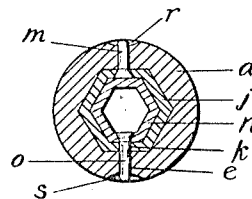


Fig. 5.

WITNESSES:

Wm. S. Schmitt
Cecil Long

INVENTORS
Virgil D. Earl.
Frank E. Mangold.
BY *J. H. Geisler*
ATTORNEY

UNITED STATES PATENT OFFICE.

VIRGIL D. EARL AND FRANK E. MANGOLD, OF PORTLAND, OREGON.

ADJUSTABLE SOCKET-WRENCH BIT.

1,107,769.

Specification of Letters Patent.

Patented Aug. 18, 1914.

Application filed March 19, 1913. Serial No. 755,566.

To all whom it may concern:

Be it known that we, VIRGIL D. EARL and FRANK E. MANGOLD, citizens of the United States, and residents, respectively, of the city of Portland, county of Multnomah, State of Oregon, have invented a new and useful Improvement in Adjustable Socket-Wrench Bits, of which the following is a specification.

Our invention relates generally to socket wrenches, and particularly to that type of such wrenches wherein the socket is provided with a plurality of adjustable telescopable auxiliary socket heads adapted to be individually thrown into service for turning bolt-heads or bolt-nuts of various sizes, and equally serviceable for use on a counter-sunk, and on a projecting bolt-head or nut.

The wrenches heretofore known were not adapted to such use in a convenient and practical manner, and one of the main objects of our invention is to provide a socket wrench bit which will be adapted for use under all circumstances as mentioned.

A further object is to so construct our wrench bit that after the parts have once been assembled, no part is detachable from the others, thereby eliminating the annoyance caused by the loss of parts.

Incidental special features of our invention are the providing of a socket wrench which embodies practical and economical structural details, and is adapted to facilitate its convenient adjustment and use.

These and other incidental features of our invention are fully illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of our tool, partly in section, showing all parts in their normal position; the broken lines of this figure show one of the auxiliary socket heads projected so as to be able to operate on a countersunk nut; Fig. 2 is a vertical, longitudinal section of the tool showing one of the adjustable sliding heads projected for turning a countersunk bolt; the broken lines of this figure show the same auxiliary socket head retracted into the main socket head of the bit; Fig. 3 is a view similar to Fig. 2, showing one of the auxiliary socket heads positioned for turning a bolt not countersunk; Fig. 4 is an end elevation of the tool, showing the parts positioned as shown in the broken lines of Fig. 2; and Fig. 5 is a section on the line 5—5 of Fig. 1.

In the device illustrated in the drawings we have shown one designed especially for automobile use, the different adjustable auxiliary socket-heads being adapted to accommodate the various sizes of bolt-heads or nuts used on automobiles. However, by slight modification of the size and shape of these adjustable heads, to suit the circumstances, our wrench bit could be used in connection with any machine.

The main socket head *a*, of our wrench bit is of the common type. The shank, *b*, adapts said socket to be inserted in a brace or similar device and used in places where any other kind of wrench could not be used. The end, *c*, of the shank is shaped to permit its use with a T-brace, or other turning means, the latter not being shown in these drawings.

The main socket-head, *a*, is cored out to an angular cross-section, *e. g.*, hexagonal, and is provided with two diametrically opposed longitudinal slots, *d, e*, and two parallel peripheral grooves, *f, g*, said grooves being perpendicular to said slots. The peripheral surface of the main socket, *a*, over the slots, *d, e*, is countersunk to bring the rings, *h, i*, flush with the external surface of the main socket *a*. The rings, *h, i*, are rotatably seated in the peripheral grooves, *f, g*, and they are longitudinally spaced apart from each other and the extremities of the slots, *d, e*. The outer portions of the slots, *d, e*, are enlarged laterally, as shown at *r, s* in Fig. 5, for the purpose of giving convenient access to the outer ends of the pins *m, o*, which slide in said slots. Split lock-rings, *h, i*, are snapped into place in the grooves, *f, g*, respectively, the separated ends of each lock ring being spaced apart a distance equal to the width of either of the slots *d* or *e*. For convenience in turning, the outside peripheries of these rings may be nurlled, as shown in Fig. 1.

An auxiliary socket head *j*, having a corresponding cross-section, slides in the main socket head, *a*, and has a longitudinal slot *k* centrally located in one of its faces, which, when the parts are assembled, will register with the slot, *e*, of the socket *a*. The auxiliary socket head *j* also has diametrically opposite the slot *k* a hole in which is inserted a lock pin *m*, projecting through the slot *d* of the socket *a*, and thus forming means by which the sleeve auxiliary socket head *j* may be moved longitudinally and locked in

place. A shorter and smaller sized hexagonal sleeve auxiliary socket head *n* slides and telescopes, as it were, in the sleeve auxiliary socket head *j*. One of the lateral faces of the sleeve auxiliary socket head, *n*, has a hole which registers with the slots, *h*, *e*, and in which is inserted a lock pin *o*, projecting outwardly through said slots and forming the means whereby the auxiliary socket head *n* may be moved longitudinally and locked in place. The telescoping sleeve auxiliary socket heads, *j*, *n*, are moved longitudinally for effecting a relative adjustment with respect to each other or to the main socket-head *a*. Such adjustment is permitted after the split rings, *h*, *i*, have been rotated to bring the openings between their separated ends in registration with the slot in which bears the pin of the sleeve auxiliary socket head to be so moved. By such adjustments the wrench bit is given different working phases. For example, when the smallest socket head, *n*, is moved inward, as shown in Fig. 3, our wrench is adapted for turning an ordinary bolt of given size.

When the socket head *j* is projected outward of the main socket head *a*, our wrench is arranged for turning a countersunk bolt, as shown in Fig. 2. When both the auxiliary socket heads, *j*, *n*, are moved inward the socket-head, *a*, is adapted for engaging a larger size ordinary bolt, as illustrated in Fig. 1. The slidable sleeve auxiliary socket heads are locked in the position to which adjusted by a corresponding adjustment of the lock-rings *h*, *i*.

The operation of our wrench bit in actual practice will be readily understood by reference to Figs. 2 and 3. In Fig. 2 the head of the bolt, *t*, lies in a cavity *u*. The size of this bolt is such as to require the use of the head *j*. By turning the split-rings, *h*, *i*, as previously explained, the pin *m* of the socket-head *j* may be moved to the forward end of the slot *d*, thereby causing the head *j* to be projected. A further turn of the ring *h* will then cause the pin *m*, and consequently the socket-head *j*, to be locked in place. In a similar manner, any one of the other adjustments may be made.

Our wrench bit is adapted to be used in connection with any standard form of T or brace handle.

We claim:

1. A device of the character described comprising a main socket head, a plurality of auxiliary socket heads telescoping in the main socket head, each of said auxiliary socket heads being provided with an outwardly projecting lock pin; the main socket head having diametric longitudinal slots for

accommodating the movement of said lock pins, the outermost auxiliary socket head having a registering slot for accommodating the movement of the lock pin of the inner auxiliary socket head; peripheral grooves formed on the main socket head over its said slot; split lock rings rotatably seated in such peripheral grooves, said rings being longitudinally spaced from each other and from the extremities of said slots; and the slots being adapted to permit the projection as well as the inward movement of either auxiliary socket head.

2. A device of the character described comprising a main socket head, a plurality of auxiliary socket heads telescoping in the main socket head, each of said auxiliary socket heads being provided with an outwardly projecting lock pin; the main socket head having diametric longitudinal slots for accommodating the movement of said lock pins, the outermost auxiliary socket head having a registering slot for accommodating the movement of the lock pin of the inner auxiliary socket head; peripheral grooves formed on the main socket head over its said slot; split lock rings rotatably seated in such peripheral grooves, said rings being longitudinally spaced from each other and from the extremities of said slots; and the slots being adapted to permit the projection as well as the inward movement of either auxiliary socket head, but not permitting the removal of the auxiliary socket heads.

3. A device of the character described comprising a main socket head, a plurality of auxiliary socket heads of unequal length telescoping in the main socket head, each of said auxiliary socket heads being provided with an outwardly projecting lock pin; the main socket head having diametric longitudinal slots for accommodating the movement of said lock pins, the outermost auxiliary socket head having a registering slot for accommodating the movement of the lock pin of the inner auxiliary socket head; peripheral grooves formed on the main socket head over its said slot; split lock rings rotatably seated in such peripheral grooves, said rings being longitudinally spaced from each other and from the extremities of said slots; and the slots being adapted to permit the projection as well as the inward movement of either auxiliary socket head, but not permitting the removal of the auxiliary socket heads.

VIRGIL D. EARL.

FRANK E. MANGOLD.

Witnesses:

CECIL LONG,

WM. C. SCHMITT