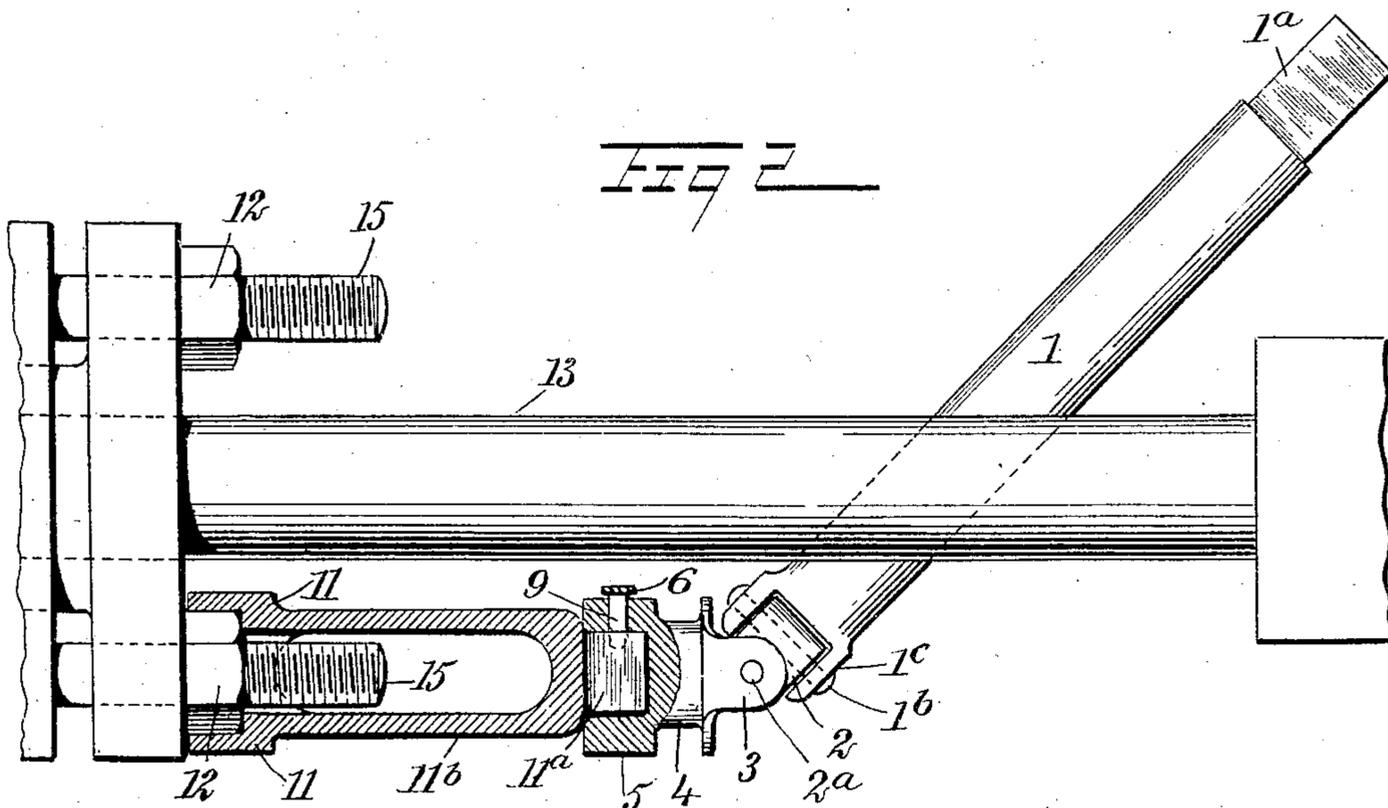
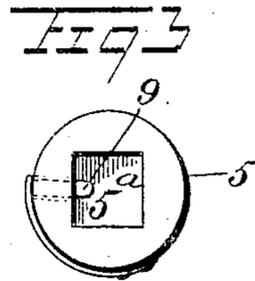
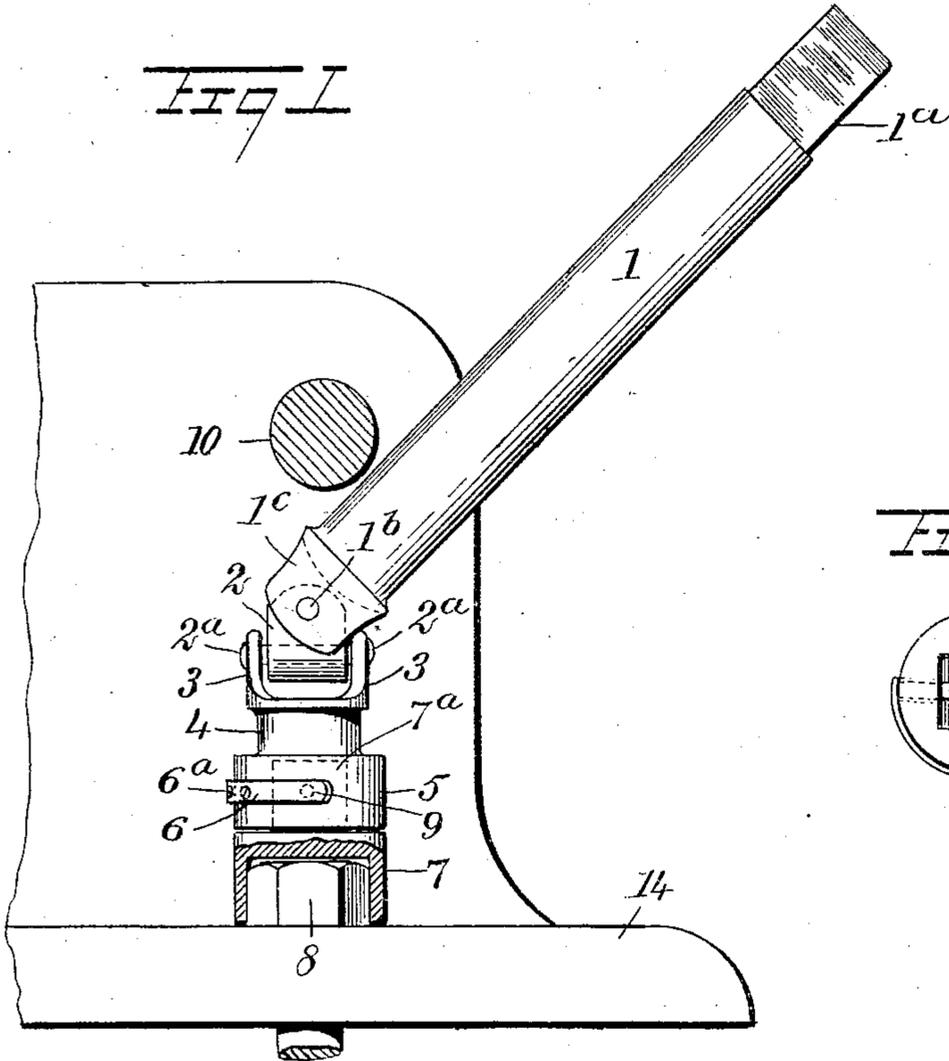


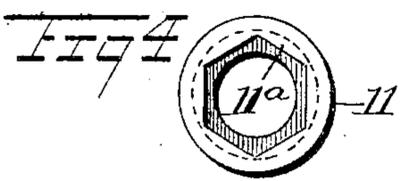
No. 868,454.

PATENTED OCT. 15, 1907.

M. KORTH.  
UNIVERSAL WRENCH.  
APPLICATION FILED JULY 27, 1906.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

MAX KORTH, OF SEATTLE, WASHINGTON.

## UNIVERSAL WRENCH.

No. 868,454.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed July 27, 1906. Serial No. 328,071.

To all whom it may concern:

Be it known that I, MAX KORTH, a citizen of the United States, and a resident of Seattle, in the county of King and State of Washington, have invented a new and Improved Universal Wrench, of which the following is a full, clear, and exact description.

My invention has for its object to produce a wrench adapted to be used in places inaccessible to the ordinary socket wrench, or wrench having a sliding jaw, and also to provide means for adjusting and regulating the length of a socket shank adapted to be used with such a wrench. These objects I accomplish by the means illustrated in the accompanying drawings, in which drawings like characters of reference indicate like parts throughout the views, and in which

Figure 1 is a side elevation partly broken away, of a wrench embodying my invention applied to a stud bolt attached to a bracket; Fig. 2 is a side elevation of the wrench shown in Fig. 1, partly broken away, having a socket head provided with an elongated shank secured thereto; Fig. 3 is a plan view of the underside of a main socket head attached to the wrench shown in Fig. 1; and Fig. 4 is a plan view of the underside of an auxiliary socket head adapted to be attached to the wrench as illustrated in Fig. 2.

As illustrated in the drawings, the main bar 1 of the wrench is provided on one end with a square head 1<sup>a</sup> adapted to be clamped by a socket wrench, or a wrench having a movable jaw. The opposite end of this bar is hinged to a connecting block 2 by means of pivots 1<sup>b</sup>, passing through the sides of the block, and the block 2 is hinged to the ears 3 of a socket head 4 by means of pins 2<sup>a</sup> extending through the ends of the block at right angles to the pins 1<sup>b</sup>, thereby forming a gimbal or universal joint between the bar 1 and the socket head 4 connected therewith. The socket head 4 is provided with an enlarged boss 5 which is provided with a recess 5<sup>a</sup> having its walls arranged at an angle to each other, as indicated in Fig. 3. The boss 5 of the socket head 4 is also provided with a spring 6 rigidly secured at one end to the socket head by means of screws or pins 6<sup>a</sup> and having its opposite end free to bear against a pin 9 having a sliding engagement with the socket head and projecting into the recess 5<sup>a</sup> formed in such head so as to be adapted to engage a corresponding recess formed in an auxiliary socket head 7. The socket head 7 is provided with a boss 7<sup>a</sup> indicated by dotted lines in Fig. 1, having its sides formed at an angle with each other and adapted to be received by the recess 5<sup>a</sup> formed in the main socket head 5 attached to the bar 1. The boss 7<sup>a</sup> of the socket head 7 is also provided with a recess corresponding in outline with the end of the pin 9 projecting into the recess 5<sup>a</sup> formed

in the socket head 5. The pin 9 is held in constant engagement with said recess in the boss 7<sup>a</sup> of the socket head 7 by means of the spring 6 which bears at its free end against the outer end of the pin 9. The auxiliary socket head 7 may be modified without departing from my invention, so as to adapt the wrench to be used under different conditions. Where the wrench is designed to be applied to a stud bolt 8 attached to a plate 14 wherein a cross bar 10 lies in the vertical plane of the stud bolt and at a short distance therefrom, a short auxiliary socket head may be used similar to the socket head 7 already described herein, having a boss 7<sup>a</sup> formed directly on to the socket head. In other instances, however, it is not possible to use a short socket head. Thus where a nut 12 is locked upon a stud bolt 15 which projects beyond the nut so that it cannot be clamped by a short auxiliary socket head similar to that shown in Fig. 1, an auxiliary socket head 11 may be used, which is provided with an elongated hollow shank 11<sup>b</sup> having an angular boss 11<sup>a</sup> formed thereon adapted to engage the angular recess 5<sup>a</sup> formed in the main socket head 5. By means of such construction the wrench may be connected with a bolt or nut in any position or location however inaccessible to the ordinary wrench, and may be provided with a suitable auxiliary socket head, and the main socket head and auxiliary socket heads rotated by the bar 1 while extending in a plane at an angle to the plane of the main and auxiliary socket heads. The bar 1 is provided with ears 1<sup>c</sup>, which bear against the side walls of the connecting block 2. The ears 3 of the socket head 4 are also adapted to bear against the end walls of the connecting block 2, so that when the bar 1 is rotated the ears 1<sup>c</sup> of the bar and the ears 3 of the main socket head will have a broad bearing on the walls of the connecting block 2, and thereby enable considerable torsional strain to be exerted on the bar 1 and the socket head clamping the bolt or nut, without weakening or injuring the parts of the device.

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

A universal wrench comprising an operating bar, a stub head provided with a socket, a universal joint between said head and bar, a pin movable transversely in said head, a spring secured at one end to said head having its opposite free end engaging the outer end of said pin, and a socket member detachably connected with said head and adapted to be engaged by said pin.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MAX KORTH.

Witnesses:

G. A. HIBNER,  
M. P. CAPLES.