

No. 803,692.

PATENTED NOV. 7, 1905.

C. K. HILL.  
SOCKET WRENCH.  
APPLICATION FILED NOV. 14, 1904.

Fig. 1.

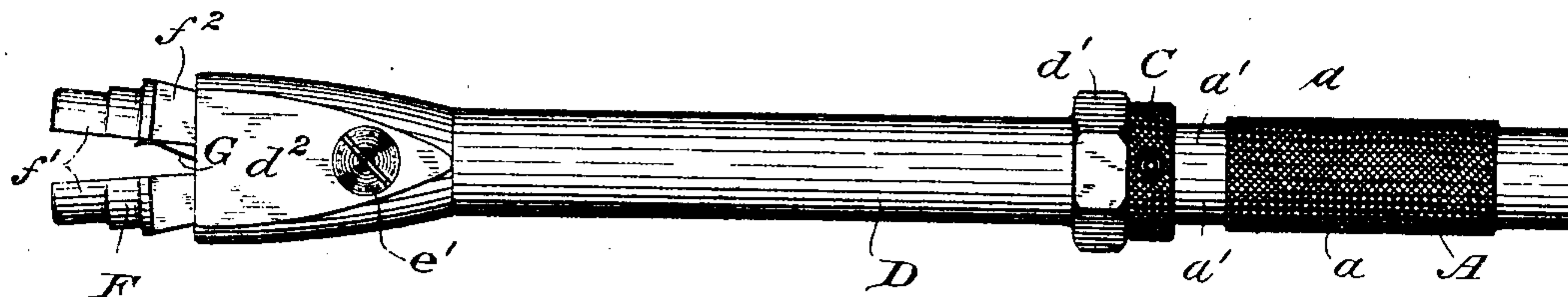


Fig. 2.

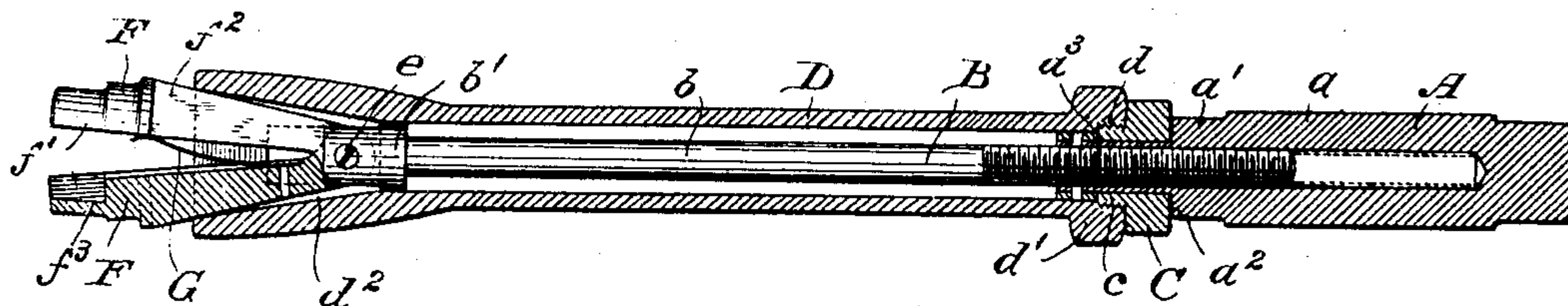


Fig. 3.

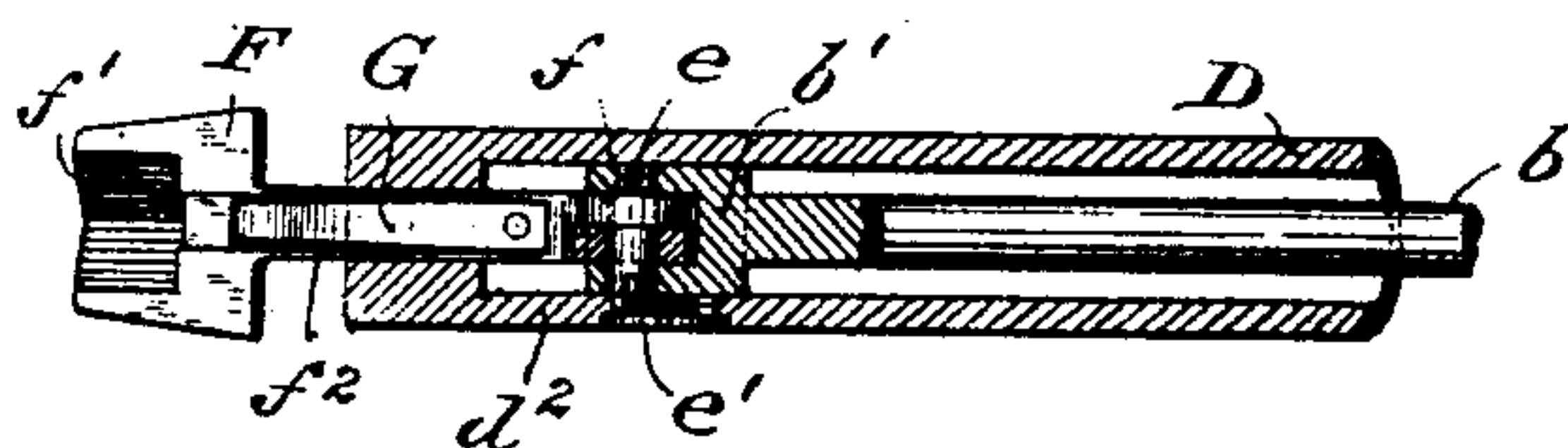


Fig. 4.

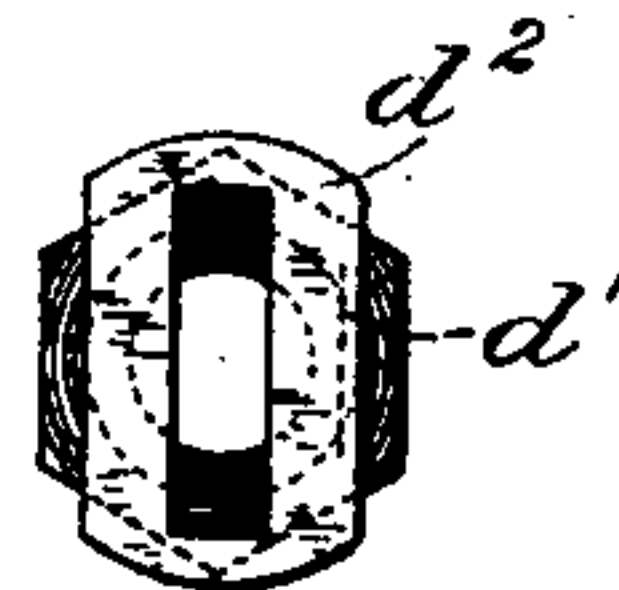
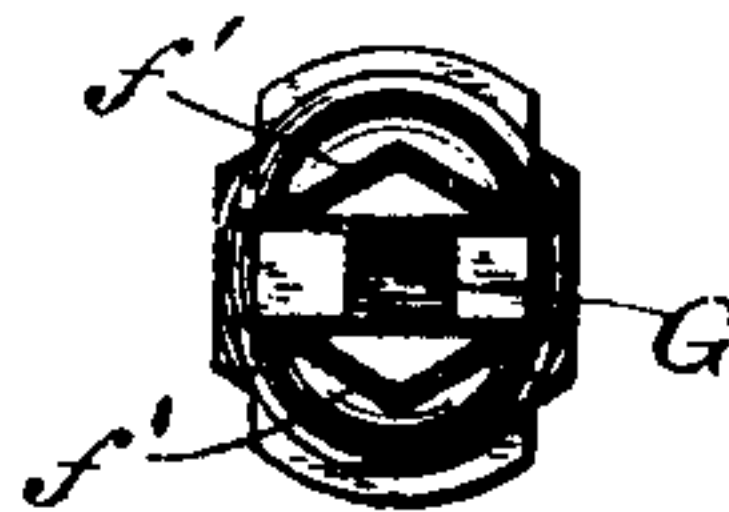


Fig. 5.



WITNESSES:

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by his attorney  
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# UNITED STATES PATENT OFFICE.

CHARLES K. HILL, OF CLEVELAND, OHIO.

## SOCKET-WRENCH.

No. 803,692,

Specification of Letters Patent.

Patented Nov. 7, 1905.

Application filed November 14, 1904. Serial No. 232,599.

*To all whom it may concern.*

Be it known that I, CHARLES K. HILL, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Socket-Wrenches, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle so as to distinguish it from other inventions.

My invention relates to adjustable wrenches, and particularly to that class of the latter which is provided with an end socket; and its object is to provide a wrench of such a character which is simple and effective and adapted for use upon a wide range of sizes of nuts and bolts. Said invention consists of means hereinafter fully described, and specifically set forth in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure 1 represents an elevation of my improved socket-wrench. Fig. 2 represents a central longitudinal section partially in elevation. Fig. 3 represents a detail longitudinal section taken at right angles to Fig. 2. Figs. 4 and 5 represent end views of the outer casing and the adjustable jaws, respectively.

My improved socket-wrench provides efficient means for removing or securing nuts which are so positioned as to be inaccessible to other kinds of wrenches or to the hand and is adjustable, so that nuts and bolts of different sizes may be operated upon. It is especially useful in catching hold of nuts and pulling them out of otherwise inaccessible places. Said improved wrench comprises a handle A, into which is tapped a member B, comprising a long shank  $b$  and socket portion  $b'$  at its outer end. The handle A comprises a gripping portion  $a$  and a reduced inner end portion  $a'$ , upon which is journaled between suitable shoulders  $a^2$  and  $a^3$  a sleeve C, provided with an exteriorly-screw-threaded hub  $c$ , adapted to engage a suitable interiorly-screw-threaded portion  $d$  of an outer casing D, within which the member B is for the most part contained. Said casing D is provided at its outer end with a shoulder  $d'$  of any desired form—hexagonal, as shown—

with which a pipe, T, carriage, or monkey-wrench or any other suitable kind may engage to operate my improved wrench, as will be readily understood. Pivoted between the opposing surfaces of the socket portion  $b'$  by means of a suitable pin  $e$  are two jaws F F, comprising each a small lug  $f$  for receiving the pivot-pin  $e$ , an outer portion  $f'$ , forming a half of a nut-engaging member and an intermediate arm  $f^2$ . The pin  $e$  is held to place and the exterior of the casing D provided with a smooth surface by means of a suitable screw-cap  $e'$ , as plainly seen in Figs. 1 and 3. The inner end  $d^2$  of the casing D is flaring, as shown in Figs. 1 and 2. Secured to the inner surface of the arm  $f^2$  of one of the jaws F is a spring G of a tension so as to bear upon the arm of the other jaw and tend to cause said jaws to diverge. Such outward movement of the jaws is limited by the inner walls of the flaring portion  $d^2$  of the casing D, which form, in effect, a tapered slide for the jaws.

It will be now readily seen that with the parts assembled as shown in Fig. 2 the actuation of the handle A will move the member B longitudinally of said handle and of the casing D, causing the jaws F F to project more or less from the flaring portion  $d^2$  of said casing, thereby varying the width at which the nut-engaging member  $f'$  may be opened and enabling nuts and bolts of different sizes to be embraced and securely gripped by said member  $f'$ .

The jaws F of my improved wrench are interchangeable so that any desired shape or size may be inserted in a given wrench, and this substitution of one pair of jaws for another may be effected without taking the stem or member B out of the casing D or without interfering with any other part of the wrench because of the provision of the aperture in the casing D through which the pin  $e$  is inserted and in which the cap  $e'$  is fitted. It will be noted that the sleeve C provides positive means for feeding the stem or member B, and consequently the jaws F, outwardly, when the handle A is turned to produce a movement in such direction.

I do not limit myself to any one form of nut-engaging member  $f'$ , one adapted to engage a square nut being shown, but others can be used within the spirit of my invention, and it will be found very convenient in practice to provide with each wrench two pairs of jaws F F, one pair having a square nut-engaging member and the other a hexagonal



one. It will also be found very economical and convenient to form the casing D out of ordinary drawn tubing.

In order that the two portions  $f'$  of the jaws F F forming the nut-engaging member may most nearly maintain parallelism for all sizes of nuts and bolts which it is adapted to catch, I have tapered the inner surfaces of said portions  $f'$ , as plainly shown at  $f^3$ , Fig. 2, so that a longitudinal section of a jaw does not increase in width from the outer to the inner part of its nut-engaging portion, as plainly shown in Fig. 2, and the inner and outer surfaces of said nut-engaging portion lie substantially parallel. These portions  $f'$  are tapered to such an extent as to allow them to be exactly parallel when engaging a nut of a size half-way between the sizes of the largest and smallest nuts that the wrench is adapted to take.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be used.

I therefore particularly point out and distinctly claim as my invention—

1. In an adjustable socket-wrench, the combination of a casing; a rotatable handle having a portion intermediate of its ends reduced in cross-section; a sleeve journaled upon such reduced portion of said handle and having screw-threaded engagement with said casing; a member connected with said handle, contained within said casing and longitudinally movable of the latter upon the rotation of said handle; and jaws pivotally secured to said member, constructed to open or close upon the longitudinal movement of the latter, and forming a nut-engaging member.

2. In an adjustable socket-wrench, the

combination of a casing; a handle; a sleeve journaled upon the latter and having screw-threaded engagement with said casing; a member having screw-threaded engagement with said handle, contained within said casing, and provided with a socket in its outer end; two jaws pivoted in said socket, forming a nut-engaging member, and adapted to open or close upon the movement of said first-mentioned member relatively to said handle; and means tending to open said jaws independently of said movement.

3. In an adjustable socket-wrench, the combination of a casing; a member lying within said casing; means connected to said casing and member and constructed to actuate the latter longitudinally of the former; and jaws connected to said member, adapted to be opened or closed by the longitudinal movement of the latter, forming a nut-engaging member, and so tapered upon their inner faces that their inner and outer surfaces lie substantially parallel.

4. In an adjustable socket-wrench, the combination of a casing; a rotatable handle connected therewith; a member longitudinally movable of said casing and handle, upon the rotation of the latter, said member contained within said casing and provided with a socket; two jaws connected together in said socket by a pivot-pin, and forming a nut-engaging member; a removable member fitted into said casing and adapted to hold said pivot-pin in place; a spring intermediate of said jaws and tending to hold the same open; and a tapering jaw-slide connected to said casing and limiting the opening movement of said jaws.

Signed by me this 10th day of November, 1904.

CHARLES K. HILL.

Attest:

D. T. DAVIES,  
G. W. SAYWELL.