No. 816,674. PATENTED APR. 3, 1906.

O. MEDHUS.

COMBINATION TOOL.

APPLICATION FILED AUG. 18, 1905.

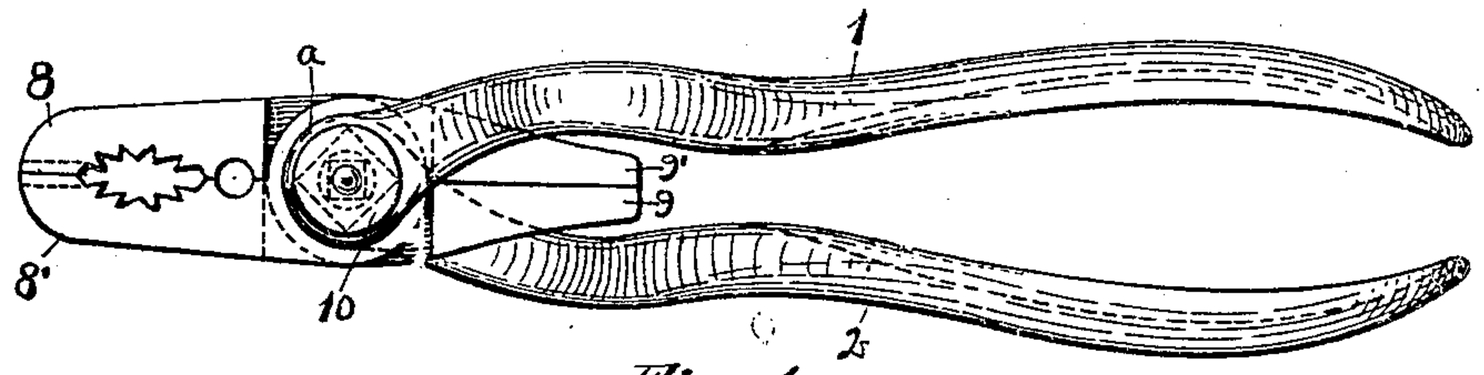

Fig. 1.

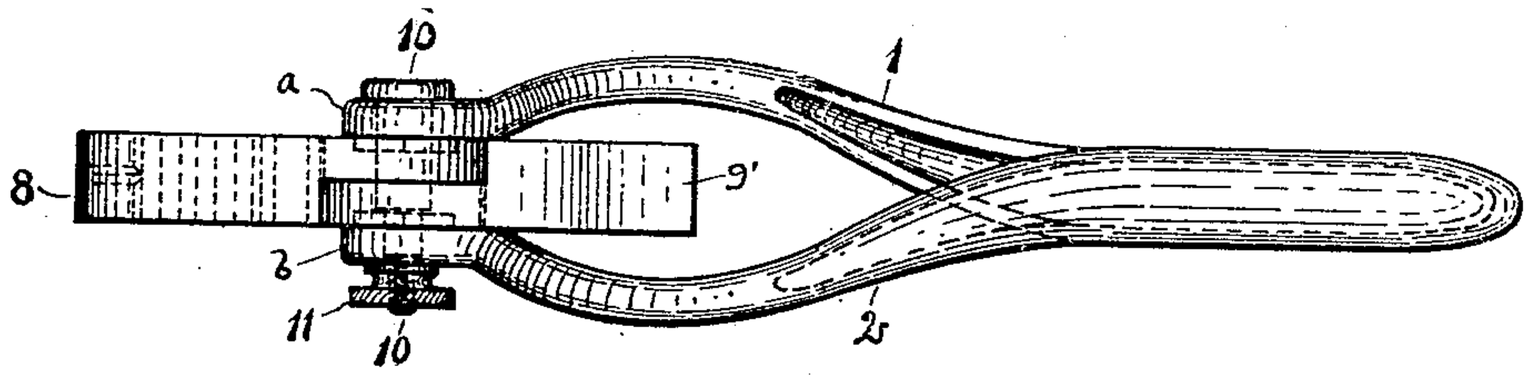

Fig. 2.

Fig. 5. Fig. 3.

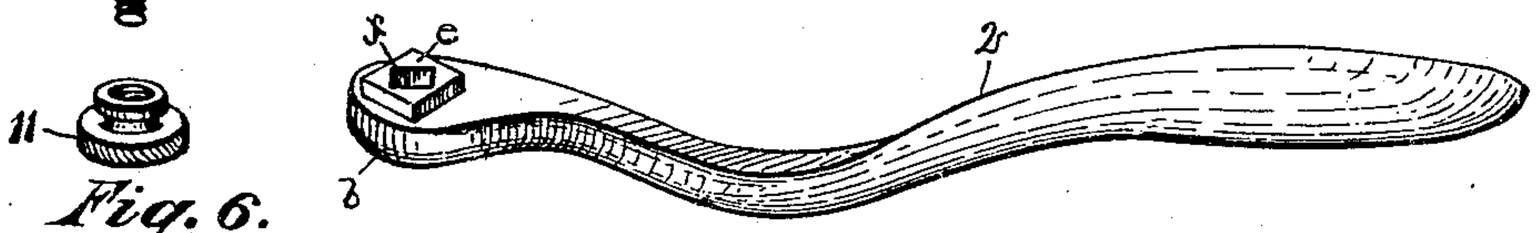

Fig. 6. Fig. 4.

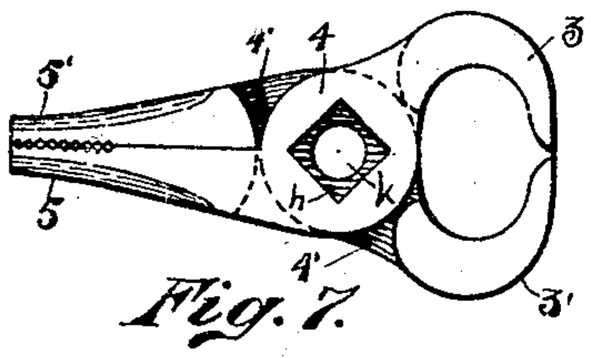

Fig. 7.

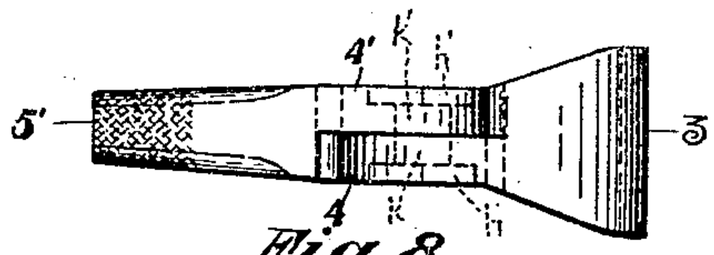

Fig. 8.

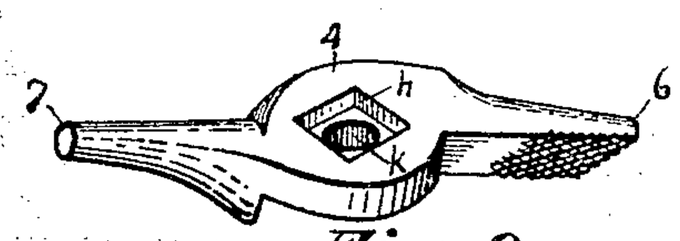

Fig. 9.

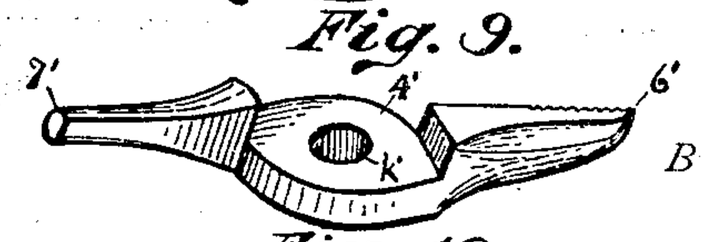

Fig. 10.

WITNESSES:

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COMBINATION-TOOL.

No. 816,674. Specification of Letters Patent. Patented April 3, 1906.

Application filed August 18, 1905. Serial No. 274,664.

To all whom it may concern:

Be it known that I, OLE MEDHUS, a citizen of the United States, and a resident of the city of Faribault, in the county of Rice, and in the State of Minnesota, have invented certain new and useful Improvements in Combination-Tools, of which the following is a specification, which when taken in connection with the accompanying drawings, forming a part thereof, is sufficiently clear and concise as to enable others skilled in the art to which it appertains to make and use the same.

A particular object of my invention is to provide a tool having detachable and interchangeable pairs of jaws, whereby a great variety of work may be done and a great variety of material operated upon with a single tool, thereby dispensing with the necessity for a large assortment of tools, as now used in many trades and occupations.

Further, I propose not only to accomplish the objects stated in the preceding paragraph, but also to provide a tool in which the changes or transfers may be easily and quickly made, even by one unfamiliar with the operation of devices of this character.

The distinctive features of my invention, briefly stated, consist of a pair of lever-handles, a plurality of pairs of jaws, each pair being especially adapted for a different variety of work, the novel means I employ for connecting the handles to the various pairs of jaws, the arrangement of two pairs of jaws upon a single pair of shanks, and the means for assembling the parts into a complete tool.

My invention consists in a combination-tool embodying new and useful features and details of construction and the relative disposition of the several parts, substantially as particularly described elsewhere in this specification, and in the legitimate combinations herein set forth.

One manner of carrying out my invention, and that which in practice has been found the most desirable, is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my assembled tool, showing two pairs of jaws, one pair being in operative position. Fig. 2 is a plan view of same parts shown in Fig. 1. Fig. 3 is an isometrical view of one of the handles. Fig. 4 is an isometrical view of the other handle. Fig. 5 is an isometrical view of the transverse bolt. Fig. 6 is an isometrical view of the knurled tap of said bolt. Fig. 7 is a side elevation of a set of double pairs of jaws, united by their respective shanks, shown in their operative position with reference to each other, the two parts being identical in construction. Fig. 8 is a plan view of same parts as shown in Fig. 7, and Figs. 9 and 10 are perspective views of two identical parts containing two pairs of jaws and being adapted to be operated in conjunction with each other.

Similar indices refer to and denote like parts throughout the several views of the drawings.

With all of the above-designated views in mind I will now take up the detail description of my invention and will describe the various parts and operation as briefly and compactly as I may.

In the drawings, the numeral 1 denotes the upper or left-hand handle, and the figure 2 denotes the lower or right-hand handle, the two forming the one pair of handles for various combinations of tools. The said handles are of peculiar contour, their inner ends being somewhat flattened and circular, forming the heads *a* and *b*, respectively, and then extending back in oppositely-disposed outward and then inward curves, with their free ends parallel and lying one above the other, substantially as shown in Fig. 2.

Formed on the inner face of the head *a* is the square flat-faced lug *c*, as shown in Fig. 3, and formed transversely and centrally through the head *a* and the lug *c* is the round aperture *d*. Formed on the inner face of the head *b* is the square flat-faced lug *e*, as shown in Fig. 4, and formed transversely and centrally through the head *b* and the lug *e* is the square aperture *f*.

In Fig. 7 I have shown cutting-nippers having the jaws 3 and 3′, having the shanks 4 and 4′ crossing each other and terminating in the oppositely-disposed taper-nose pliers having the jaws 5 and 5′, it being understood that the jaws 3 and 5 are integral, being united by the shank 4, and also that the jaws 3′ and 5′ are integral, being united by the shank 4′. The shanks 4 and 4′ are identical in construction, but are oppositely disposed with reference to each other, each having a square socket *h* and *h*′, respectively, in its outer face, which sockets are of infinitesimally larger dimensions than are the lugs *c* and *e*, which are adapted to fit snugly therein. The depth of said sockets is substantially one-

half the thickness of said shanks, and continuing on through the shanks from said sockets are round apertures *k* and *k'*, respectively.

It will now be apparent that the shanks for the other pairs of tools (shown in Figs. 1, 2, and 9, 10) are identical with the shanks of the tools shown in Figs. 7, 8, and for convenience of description are similarly indicated, the only difference in said parts being the shape of the working parts at the ends—that is to say, the jaws 6 and 6' (shown in Figs. 9 and 10) may form flat-nose pliers, while their consorts (the jaws 7 and 7') may be round-nose pliers. In like manner the jaws 8 and 8' in Figs. 1 and 2 may form wire-grips or pipe-wrenches, while their consorts (the jaws 9 and 9') may form flat-nose pliers.

The numeral 10 denotes the transverse bolt having a permanent integral head on one end thereof, the opposite end being threaded and on which threaded portion the knurled tap 11 may be run. A portion of the shank of the bolt 10 is formed round and a portion is formed square in cross-section, the round portion extending from the head being of a length substantially the same as the combined thickness of the head *a* and one and one-half times the thickness of one of the shanks 4 or 4', and from said round portion the shank of the bolt is square, said square portion being slightly less in length than the thickness of the head *b* and one-half the thickness of the shank 4 or 4'. By reason of the square portion of the shank of the bolt it should be noticed that the square aperture *f* will fit thereover when the parts are assembled, whereby as the handles are operated the handle 2 will at all times move the bolt 10 and the tap 11 therewith, and thus effectually preventing the tap 11 from working loose from its contact with the handle 2.

It will now be seen that any two sets of the tools may be brought together, as in Figs. 7 and 8, and the handles brought to the positions shown in Figs. 1 and 2, entering the lugs *c* and *e* in the respective sockets *h* and *h'*. Then by inserting the bolt 10 through the apertures *d*, *k*, *k'*, and *f* in the order named and running the tap 11 tightly on the threaded portion of the bolt 10 the parts will be assembled substantially as shown in Figs. 1 and 2 and whereby as the handles are moved apart or toward each other a corresponding motion will be given to the jaws when in position as in Figs. 1 and 2. It will also be noticed that by removing the knurled tap 11 and then the handle 2 the tools then in the device may be reversed—that is, causing the jaws 8 8' to exchange position with the jaws 9' 9, after which the handle 2 and the tap 11 may be replaced, as before, or, if desired, after the handle 2 and the tap 11 are removed an entirely different set of pairs of jaws may be positioned and secured, as before stated. There is no limit to the number of sets of pairs of jaws that may be used, that depending entirely on the pleasure of the operator or the character of the work for which the device may be employed.

Having now fully shown and described my invention and the best means for its construction to me known at this time, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A combination-tool consisting of a plurality of double pairs of jaws each two pairs of said jaws being united by a pair of shanks crossing each other with square sockets formed in their outer faces and round apertures extending transversely through said shanks and central of said sockets, a pair of handles having flat heads on their inner ends with transverse apertures formed therethrough, the aperture in one of said heads being round and the aperture in the other head being square, lugs formed on the inner faces of said heads of the handles which lugs are adapted to fit into said sockets in the shanks of the jaws, a bolt having a permanent head on one end the other end being threaded with its shank adapted to extend through said apertures in the shank and the heads of the handles, one portion of the shank of the bolt being formed square to fit in the square aperture of one of the heads of one of the handles, and a knurled tap adapted to be run on the threaded portion of said bolt to bind the parts together, all substantially as set forth.

2. A combination-tool embodying two pairs of jaws, a pair of shanks integrally connecting the pairs of jaws, with apertures extending transversely through the shanks in the center of their crossing-points, and with a square socket formed in the outer face of each shank central of said apertures, a pair of handles having flattened heads from which they extend in outward and inward oppositely-disposed curves with the rear portions of the handles parallel with each other, a square lug extending in from the face of the head of each handle which lugs are of a size to fit said sockets in the jaw-shanks, a bolt for connecting the shanks of the jaws with the handles, a tap for retaining the bolt in position, and means for preventing the turning of the nut by the operation of the handles, all substantially as shown and described.

In testimony whereof I have hereunto signed my name to this specification, in the signed my name to this specification in the presence of two subscribing witnesses, this the 12th day of August, 1905.

OLE MEDHUS.

Witnesses:
E. J. PIHL,
W. M. ERICKSON.