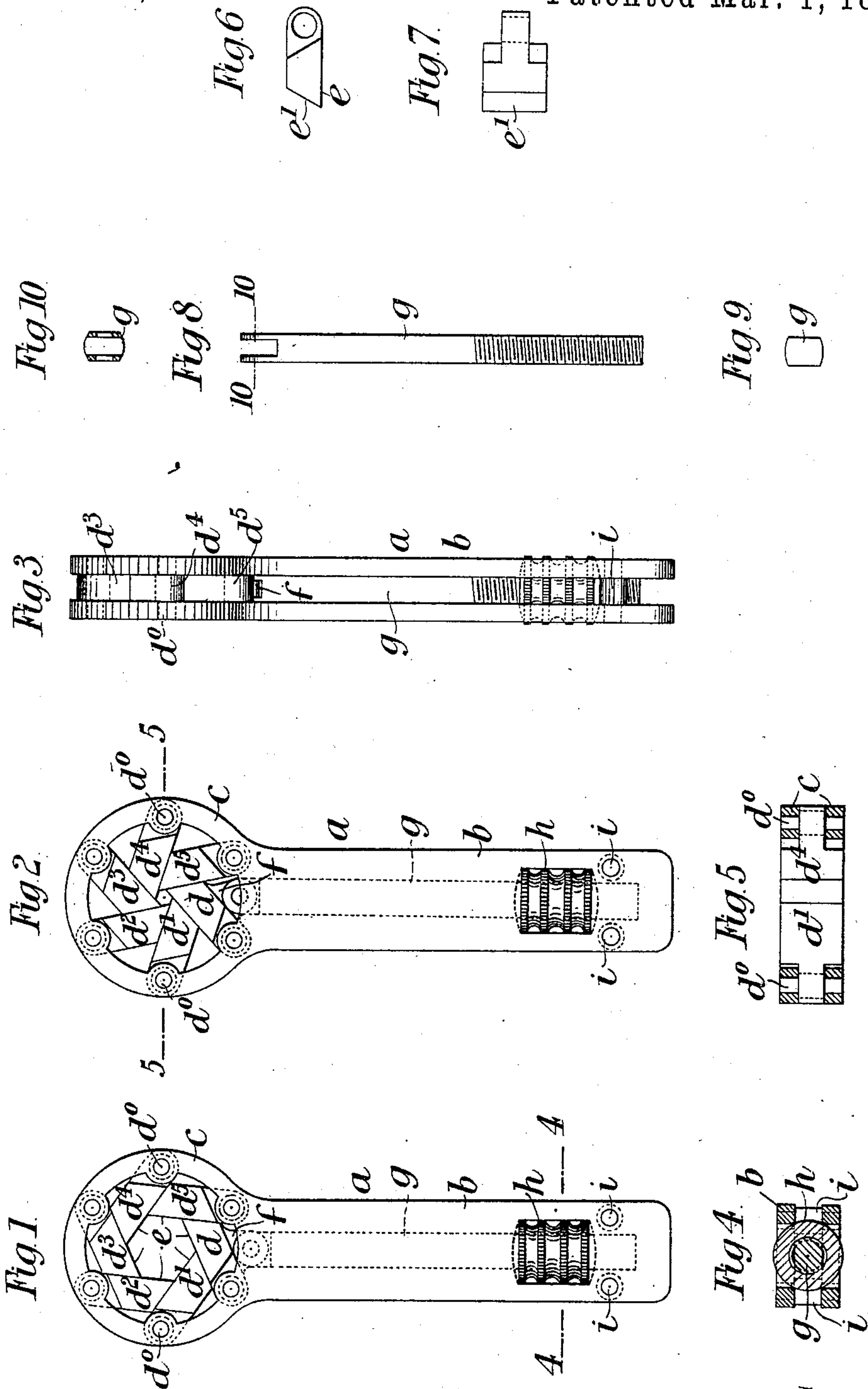


(No Model.)

W. G. HARRIS.  
ADJUSTABLE SPANNER OR WRENCH.

No. 599,837.

Patented Mar. 1, 1898.



Witnesses

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# UNITED STATES PATENT OFFICE.

WILLIAM GEORGE HARRIS, OF IPPLEPEN, ENGLAND, ASSIGNOR OF ONE-HALF TO FREDERICK PERTWEE, OF LONDON, ENGLAND.

## ADJUSTABLE SPANNER OR WRENCH.

SPECIFICATION forming part of Letters Patent No. 599,837, dated March 1, 1898.

Application filed November 15, 1897. Serial No. 658,543. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM GEORGE HARRIS, a subject of the Queen of Great Britain, residing at Ipplepen, England, have invented  
5 new and useful Improvements in Adjustable Spanners or Wrenches, of which the following is a specification.

This invention relates to what are known as "socket" spanners or wrenches—that is to  
10 say, spanners or wrenches which are adapted to fit over the nuts or the like and to embrace them on all sides—the object of the said invention being to provide a spanner of this class which can be adjusted to fit several  
15 sizes.

A spanner or wrench constructed according to this invention has a series of jaw-sections pivoted at their outer ends in a suitable frame in such relation to each other that an  
20 aperture is formed between them at their inner free ends, and which may be increased or diminished in size according as the jaws are moved away from or toward a common center. In practice six pivoted sections or jaws  
25 are used, the said sections or jaws having those surfaces which form the sides of the hole or aperture flat and the end of one jaw in contact with the flat surface of an adjacent jaw. The jaws may be adjusted to vary the  
30 size of the aperture by a screw in the handle of the wrench.

To enable the invention to be fully understood, it must be described by reference to the accompanying drawings, in which—

35 Figure 1 is an elevation of a spanner or wrench constructed according to the said invention. Fig. 2 is a view similar to Fig. 1, but showing the sections adjusted for a hexagon of small size. Fig. 3 is an edge view of  
40 the spanner as shown in Fig. 2. Fig. 4 is a section on the line 4 4, Fig. 1; and Fig. 5 is a section on the line 5 5, Fig. 2. Figs. 6 and 7 are respectively an edge view and a face view of one of the lever-jaws, and Figs. 8 and 9 are  
45 respectively an elevation and an end view of the screw-rod for operating the said jaws. Fig. 10 is a section through the said rod on the line 10 10, Fig. 8.

*a* is the body of the spanner, which has the  
50 handle portion *b* and the frame portion *c*, and

*d d' d<sup>2</sup> d<sup>3</sup> d<sup>4</sup> d<sup>5</sup>* are the lever-jaws pivoted in the said frame portion, the pivots *d<sup>0</sup>* of the said jaws being arranged equidistant on the circumference of a circle the center of which is at the center of the frame portion *c*. Each  
55 of the jaws, one of which is shown detached in Figs. 6 and 7, has one of its surfaces *e* (which is designed to come into contact with the nut) flat, and the end surface *e'* also flat and formed at an angle of sixty degrees to  
60 the surface *e*, the surface *e'* of each jaw being adapted to make contact with the surface *e* of an adjacent jaw in a manner which will be readily understood by reference to Figs. 1  
65 and 2, whereby the surfaces *e e* of adjacent jaws will be at an angle of one hundred and twenty degrees. When the jaws are arranged in the manner hereinbefore described, it will be obvious that so long as the surface *e'* of  
70 one jaw is in flat contact with the surface *e* of an adjacent jaw the angle contained by the surfaces *e e* of these two jaws will be invariable whether the contact of the end of one jaw is near the pivot, as shown in Fig. 1,  
75 or near the free end, as shown in Fig. 2, of such adjacent jaw. With the jaws thus arranged any movement imparted to one jaw causes the corresponding movement of all the other jaws. For instance, any movement of the jaw *d* from the position shown in Fig. 1  
80 toward that shown in Fig. 2 causes the movement of the jaw *d'* on its fulcrum or pivot pin *d<sup>0</sup>*, and this jaw in its turn similarly operates the jaw *d<sup>2</sup>*, and so on to the jaw *d<sup>5</sup>*. In the movement of the jaw *d* from the position  
85 shown in Fig. 2 to that shown in Fig. 1 the jaw *d* first operates the jaw *d<sup>5</sup>*, which operates in its turn the jaw *d<sup>4</sup>*, and so on to the jaw *d'*.

Any suitable means may be employed for  
90 operating the jaw *d*. The drawings represent the latter as being provided with a lug *f*, to which a rod *g*, extending through the handle portion *b* of the spanner, which is made hollow, is jointed at one end, the other end of  
95 the said rod being screw-threaded and carrying a nut *h*, which is fitted in a suitable aperture in the said handle portion *b* and held against longitudinal movement. With this arrangement it will be readily understood  
100



that the rotation of the nut *h* causes the longitudinal displacement of the rod *g* to move the jaw *d* in the required manner.

In practice it is advantageous to make the body of the spanner of two plates, which are connected together at one end by rivets *i i* and at the other end by the pivot-pins *d'* of the jaws, the said rivets and pivot-pins having enlarged central portions or shoulders, which form distance-pieces between the two plates, as will be clearly understood by reference to Figs. 3 and 5. As shown also, the rod *g* is flattened on opposite sides, so that it does not necessitate the placing of the said two plates at too great a distance apart. Fig. 9 shows the sectional shape of the rod.

As when the rod *g* is moved longitudinally it also has a slight lateral movement, the recesses in the side plates in which the nut *h* is located are made with the surfaces against which the said nut bears of a curved or arched shape, and the ends of the said nut are correspondingly shaped, as indicated by the dotted lines in Figs. 1 to 3, thereby preventing any undue friction owing to the lateral movement of the said rod.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. An adjustable spanner wherein is a series of lever-jaws, each pivoted at its outer end in a frame provided with an adjusting-spindle, the pivots of said jaws being upon a circle having its center at the center of said frame, substantially as described.

2. In an adjustable spanner, the combination of a series of lever-jaws each pivoted at its outer extremity in a circle and applied as shown so that the free inner end of each jaw bears against the side of the next adjacent one, and whereby when one of these lever-jaws is moved, all the other levers will partake of a corresponding movement, substantially as described.

3. In an adjustable spanner wherein a series of pivoted jaws are arranged in a frame provided with a handle in such a manner that movement imparted to any one of the jaws causes all the other jaws to move correspondingly, a rod connected to one of the said jaws and at the other end carrying a nut held against longitudinal movement in the handle of the spanner, substantially as described.

4. In an adjustable spanner, having a series of lever-jaws, two plates riveted together and forming a frame in which the said jaws work, and a handle for the spanner, the rivets serving also as fulcrum-pins for the lever-jaws, substantially as described.

5. In combination with the lever-jaws pivoted at their outer ends, and with the rod and its nut for adjusting these jaws, the body of the spanner serving to hold all the parts together by means of rivets and pivot-pins having enlarged central portions or shoulders serving as distance-pieces between the plates, all substantially as described.

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Witnesses:

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