F. HUMPHRIS.

WRENCH.

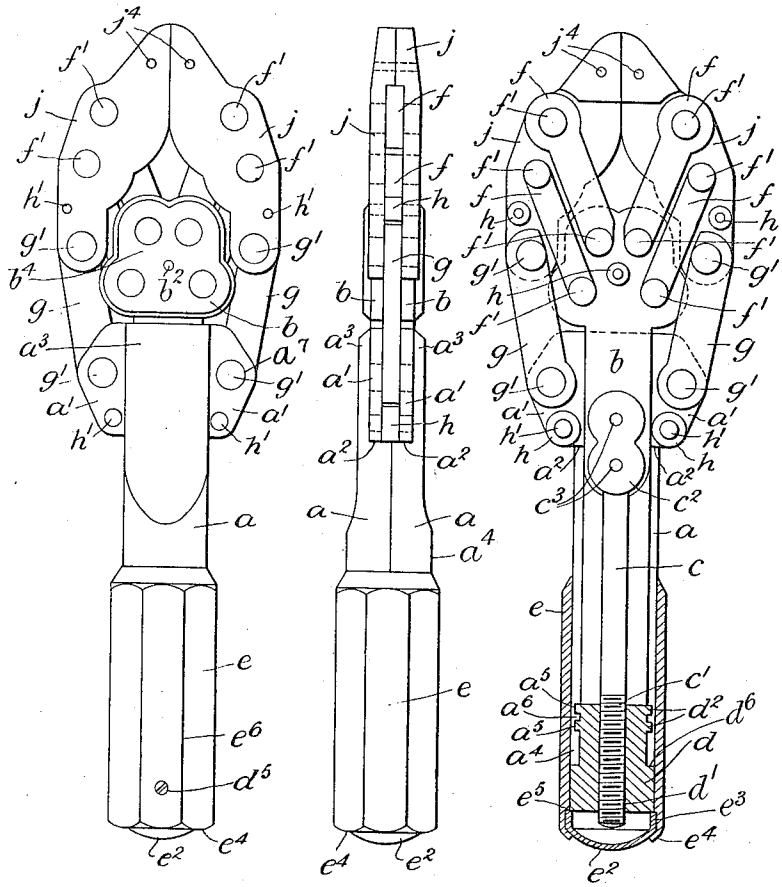
APPLICATION FILED MAR. 29, 1915.

1,157,540.

Patented Oct. 19, 1915.

2 SHEETS—SHEET 1.

Fig. 1. Fig. 2. Fig. 3.



Inventor.
Frank Humphris,
by
Wilkinson, Giusta & MacKaye
Attorneys

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

Fig. 4.

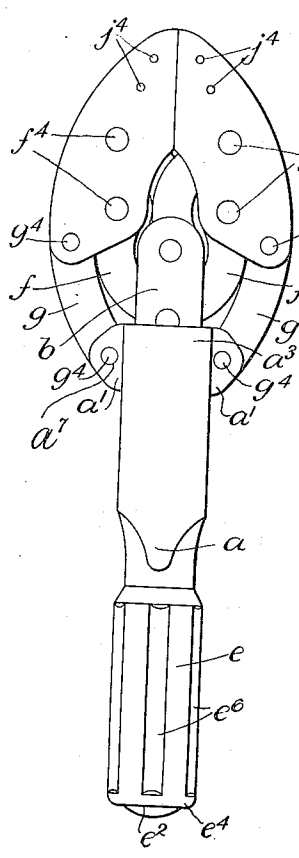


Fig. 5.

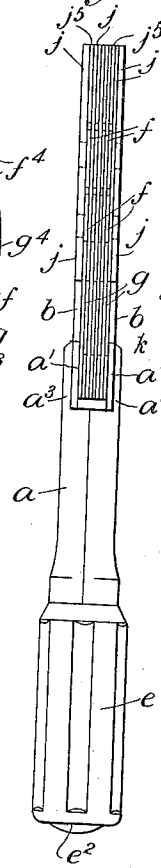
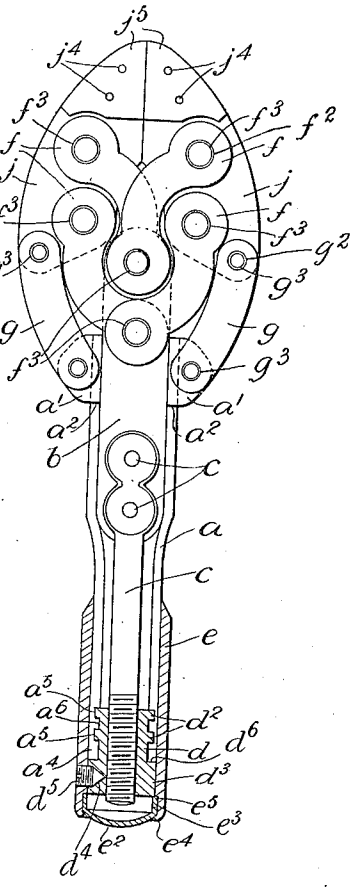


Fig. 6.



Inventor:
Frank Humphris,
by Wilkinson, Gjusta & Mackaye
Attorneys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK HUMPHRIS, OF KINGSTON-ON-THAMES, ENGLAND.

WRENCH.

1,157,540. Specification of Letters Patent. Patented Oct. 19, 1915.

Application filed March 29, 1915. Serial No. 17,907.

To all whom it may concern:

Be it known that I, FRANK HUMPHRIS, a subject of the King of Great Britain, residing at 31 Knights Park, Kingston-on-Thames, in the county of Surrey, England, engineer, have invented new and useful Improvements in Wrenches, of which the following is a specification.

The present invention relates to improvements in wrenches, and consists in the constructions, combinations and arrangements of parts hereinafter described and claimed. It is an object of the present invention to provide an improved wrench which will be constructed of few and simple parts, readily assembled, and capable of easy operation; the arrangement being such that the jaws of the wrench will open and close in parallel relation.

In the accompanying drawings forming a part of this application, and in which similar reference symbols indicate corresponding parts in the several views: Figure 1 is a side elevational view of an improved wrench constructed in accordance with the present invention. Fig. 2 is an end elevational view of the same. Fig. 3 is a longitudinal view, partly in section, and with parts broken away to show the interior construction of the improved wrench. Fig. 4 is a side elevational view of a slightly modified form of the invention. Fig. 5 is an end elevational view of the same; and Fig. 6 is a longitudinal view, partly in section, and with parts broken away to show the interior construction thereof.

Referring more particularly to the drawings, *a* represents the handle of the improved wrench, which is preferably divided longitudinally into a pair of semicylindrical sections assembled together and provided with ears a^1, bent, as indicated at a^2, from the upper angular end a^3 of said handle. The ears a^1, project in opposite directions from each of the sections *a* of the handle, and are maintained spaced apart by circular blocks *h* formed with reduced ends h^1 riveted or otherwise secured in the ears. The jaws *j* of the wrench are each constituted of a pair of plates secured together and connected by anchor links *g* to the respective ears a^1, said links *g* being secured at their several ends by pivots g^1. The pairs of plates constituting the jaws *j* are maintained in proper spaced relation by circular blocks *h*, similar to those above described with respect to the ears a^1, the same being formed with reduced ends h^1, as disclosed to advantage in Figs. 1 and 3. The outer working ends of the jaws *j* are secured together by rivets j^4, and the same may be constructed in any suitable manner to engage the faces of nuts or the like.

The jaws *j* of the wrench are connected by pairs of links *f* to a movable head constituted by a pair of plates *b*, the same being spaced apart by a circular or other block *h*, and secured by rivets c^3 to the upper end c^2 of an adjusting rod *c*. The adjusting rod *c* is mounted within the handle *a* of the wrench, and is threaded at its lower end, as indicated at c^1, for coöperating with threads d^1 formed on a stationary nut *d* connected to be revolved from a sleeve *e* by a set screw d^5. The sleeve *e* surrounds the lower rounded portion a^4 of the handle of the wrench, and operates to maintain the handle sections in assembled relation. The handle is formed with manipulating flanges or faces e^6, and is inclosed, at its lower end, by a cap e^2, secured in position by flanges e^4, said cap being adapted to engage the lower end of the nut *d*, as shown to advantage in Figs. 3 and 6. The nut *d* is enlarged and shouldered, as indicated at d^3, for receiving the lower end of the handle *a*, complemental annular grooves a^5 and a flange a^6 being provided on said handle to coöperate with similar flanges d^2 on the nut *d* for preventing axial movement of the same.

In operation, by revolving the sleeve *e*, through the screw d^5 the nut *d* will be simultaneously revolved, and will move the adjusting rod *c* axially therethrough to shift the movable head *b* to open and close the jaws *j*. As the head *b* is raised, the operating links *f* will move the jaws *j* apart and about the anchor links *g*, which will permit the jaws to open and close in parallelism and will provide a strong and rigid structure capable of great clamping strength.

The links *f*, as indicated in Fig. 3, may be arranged in parallel pairs and connected between the jaws *j* and the plates of the head *b* by pivots f^1; or the same may be arranged as more particularly seen in Fig. 6, wherein the links are secured to the jaws *j* and head *b* by shouldered pins f^3, the same acting in the capacity of spacing blocks, and being provided with reduced ends f^4 riveted or otherwise secured in other respective parts. Similarly, the anchor links *g*, as shown in

Fig. 6, may be connected between the jaw plates j and the ears a^1 by pins g^3 provided with reduced ends g^4, as shown in Fig. 4.

As disclosed in the modification in Figs. 4, 5 and 6, the operating faces of the jaws are formed by a plurality of pieces j^5 secured together by spaced pairs of rivets j^4, and washers k may be inserted between the anchor links g as disclosed in Fig. 5; although it is to be understood that the invention is not limited to this precise construction, as the jaws and links of the wrench may be constructed in any approved manner.

It is obvious that those skilled in the art may vary the details of construction and arrangements of parts without departing from the spirit of my invention, and therefore I do not wish to be limited to such features except as may be required by the claims.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In an adjustable wrench the combination with a hollow handle, and a member longitudinally adjustable in said handle, of a pair of jaws, parallel links pivotally mounted upon said adjustable member and connected on either side with each jaw, and links connecting said jaws to a fixed part of said handle.

2. An adjustable wrench comprising a hollow handle, a sleeve rotatably mounted on said handle, a nut fixed in said sleeve, a bolt engaged by said nut and formed with a head, a pair of jaws, parallel links pivotally mounted upon said head and connected on either side with said jaws, and links connecting said jaws to a fixed part of said handle.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FRANK HUMPHRIS.

Witnesses:

D. K. BOYLE,

E. L. H. EMOTO.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."