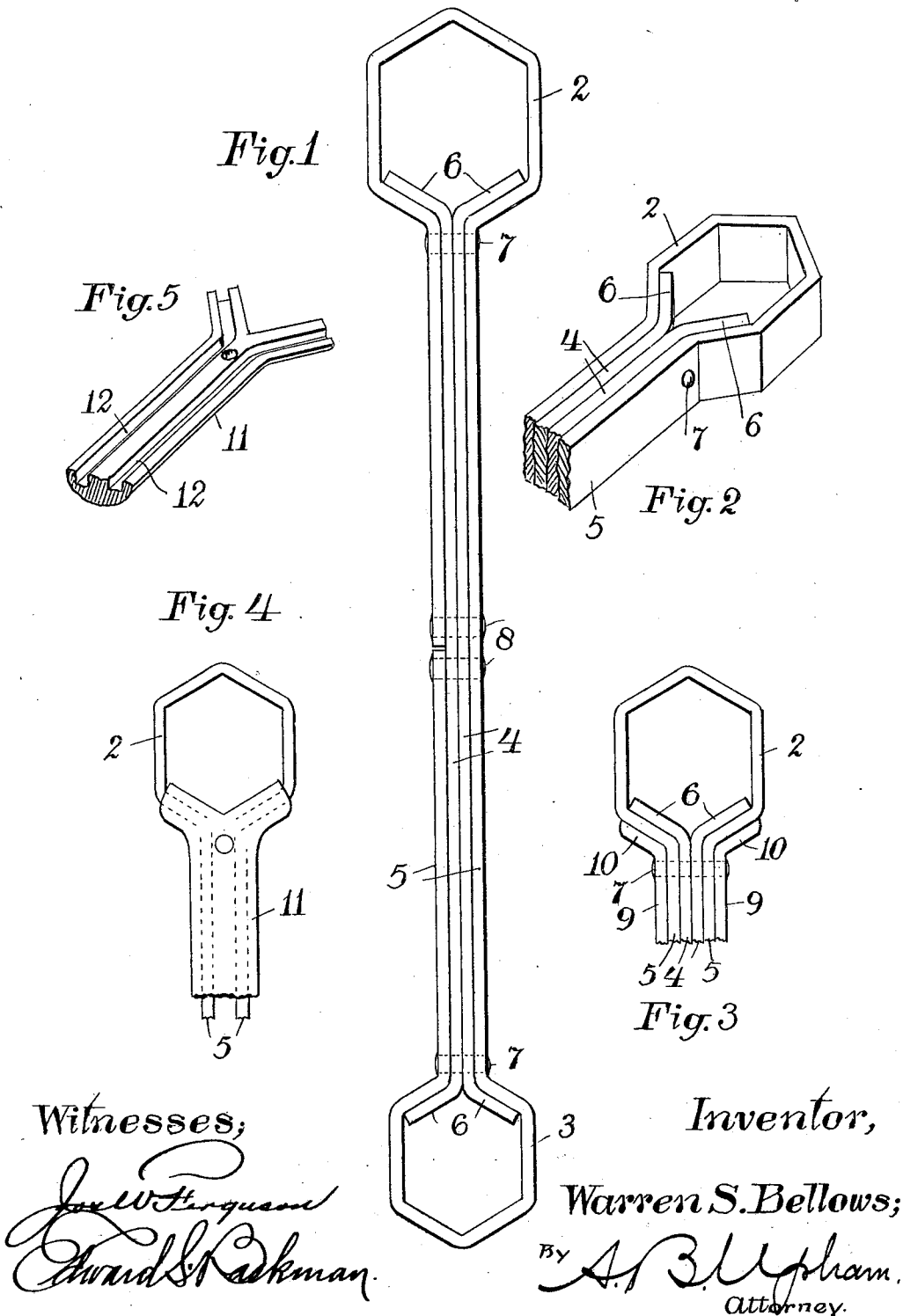


W. S. BELLOWS.  
WRENCH.  
APPLICATION FILED AUG. 3, 1908.

920,717.

Patented May 4, 1909.



Witnesses;

*James W. Ferguson*  
*Edward S. Parkman*

Inventor,

Warren S. Bellows;

By *A. B. Upham*  
Attorney.

# UNITED STATES PATENT OFFICE.

WARREN S. BELLOWS, OF BOSTON, MASSACHUSETTS.

## WRENCH.

No. 920,717.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed August 3, 1908. Serial No. 446,830.

*To all whom it may concern:*

Be it known that I, WARREN S. BELLOWS, a citizen of the United States, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Wrenches, of which the following is a full, clear, and exact description.

The object of this invention is the construction of a wrench of minimum cost and maximum strength. To this end my wrench is formed by suitably bending a length of strap-metal, to compose both handle and jaws, and strengthening the same to resist bending at the juncture of handle and jaws.

Referring to the drawings forming part of this specification, Figure 1 is a plan view of a wrench made in accordance with my invention. Fig. 2 is a perspective view of one end of the same. Fig. 3 is a plan view of one end or jaw of the wrench more strongly reinforced. Fig. 4 is a plan view of one end of a modified form of my invention. Fig. 5 is a perspective view of a part of the reinforcing member of the last-named form of wrench.

I prefer to make this wrench with a jaw at each end of a common handle for the sake of economy, with the jaws of different sizes, as illustrated in Fig. 1. To produce it, a length of strap metal, or bar metal, has its ends brought about and riveted to the intermediate portion thereof, so that said ends and intermediate portion will compose the handle; and the loops at the junctures of the ends or terminal sections and the intermediate section are made hexagonal or rectangular to form the nut-engaging jaws 2, 3.

Inasmuch as the tensile strength of the strap metal is much in excess of its flexure-resisting strength, the juncture of the handle and jaws will bend under the strain of turning a nut or bolt therewith before the jaws will part. Hence, in order to employ ribbon metal of a minimum thickness for the predetermined work, I strengthen said junctures or necks. My preferable manner of reinforcing said necks is to insert two other lengths of strap metal 4 between the parts of the ribbon composing the handle 5, the ends of which reinforcing members are bent outward to fit the adjacent inner surface of the jaws 2 and 3. To permit of this, each jaw is elongated sufficiently to render each exposed sur-

face of said bends or shoulders 6 equidistant from the jaw-center as compared with the remainder of the jaw, as shown in Fig. 1. Rivets 7 being inserted close to said necks, and rivets 8 through the ends and intermediate section of the strap, the wrench is ready for use.

In addition to the inner reinforcing members 4, similar ones 9 may be applied to the outer surfaces of the handle, with similar shoulders 10 bearing against the jaws, as shown in Fig. 3.

Another modification of the invention for the purpose of reinforcing the strap metal against bending, is that shown in Figs. 4 and 5, where in place of the members 4, two cast or forged handles 11 having grooves 12 for the reception of the edges of the members 5, are riveted thereto; said grooves embracing both the handle-sections and adjacent jaw-sections, and thereby suitably strengthening the wrench.

What I claim as my invention and for which I desire Letters Patent is as follows, to wit:—

1. A wrench composed of a single length of strap metal folded upon itself and having at the fold a polygonal loop to fit a nut or bolt; the terminal sections of the length of metal being riveted together to form an operating handle, the juncture of such loop and each terminal section being an abrupt bend strengthened against flexure.

2. A wrench composed of a length of metal folded upon itself and having at the fold a loop shaped to fit a nut or bolt, means fastening the folded parts together, and reinforcing means strengthening against bending the juncture of said loop and folded parts.

3. A wrench composed of a length of metal folded upon itself and having at the fold a loop shaped to fit a nut or bolt, the parts folded together being fixed to each other and forming a handle, and one or more lengths of metal in parallel contact with, and fastened to, said handle and terminally bent against a face of said loop for reinforcing the same.

4. A wrench composed of a length of metal folded upon itself at each end and having at each fold a loop shaped to fit a nut or bolt, and means for fastening the folded parts together and strengthening the loops against flexure.

5. A wrench composed of a length of metal

folded upon itself at each end and having a  
jaw-shaped loop at each bend, and two  
lengths of metal introduced between the  
parts folded together and having their ends  
bent to fit against sections of the inner sur-  
faces of the loops, said parts being fastened  
together.

In testimony that I claim the foregoing  
invention, I have hereunto set my hand this  
28th day of July, 1908.

WARREN S. BELLOWS.

Witnesses:

EDITH H. BELLOWS,

A. B. UPHAM.