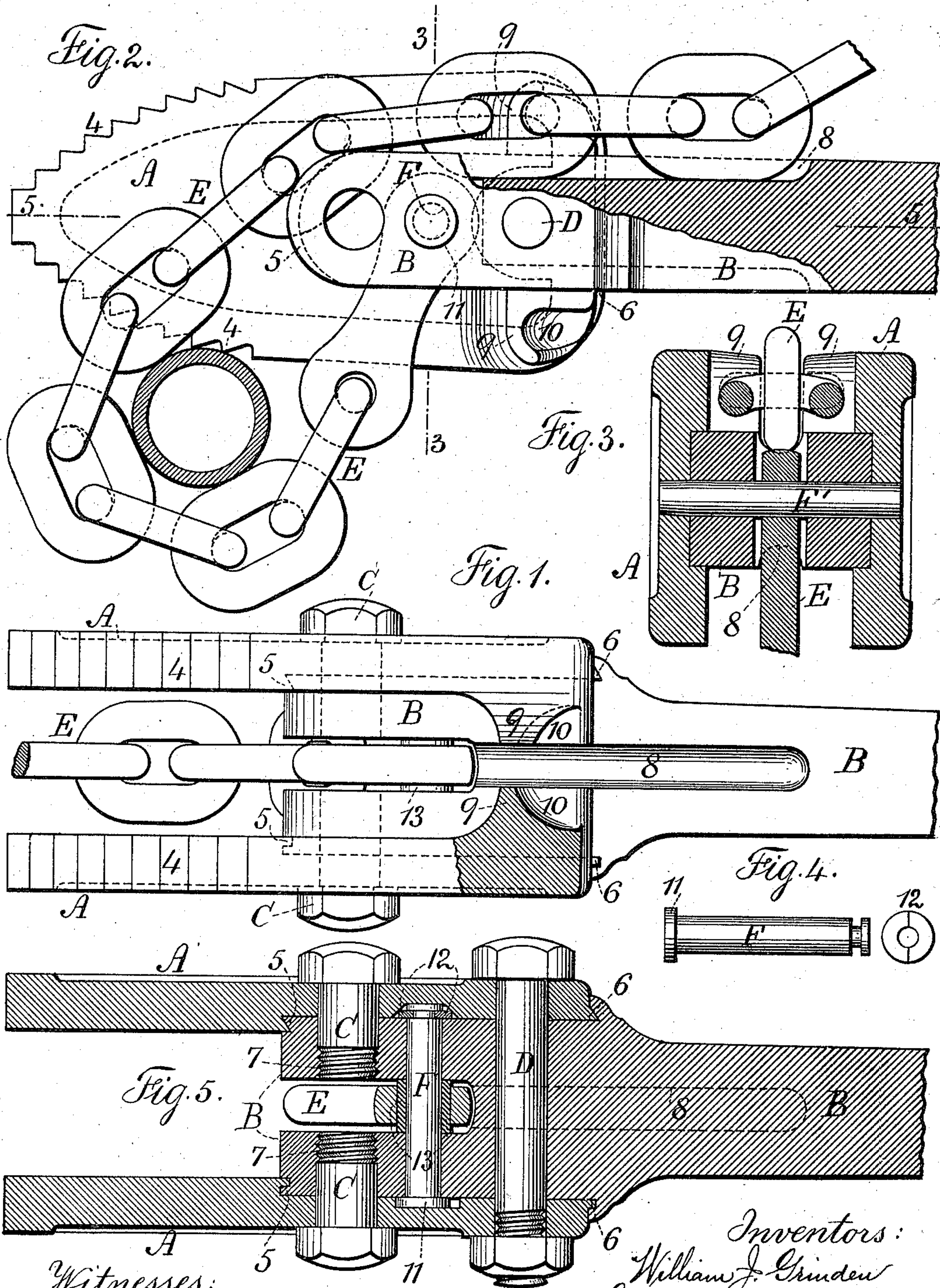


(No Model.)

W. J. GRINDEN & G. AMBORN, Jr.  
CHAIN WRENCH.

No. 577,654.

Patented Feb. 23, 1897.



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# UNITED STATES PATENT OFFICE.

WILLIAM J. GRINDEN AND GEORGE AMBORN, JR., OF BROOKLYN, NEW YORK,  
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## CHAIN WRENCH.

SPECIFICATION forming part of Letters Patent No. 577,654, dated February 23, 1897.

Application filed April 1, 1896. Serial No. 585,711. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM J. GRINDEN and GEORGE AMBORN, Jr., citizens of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Chain Wrenches, of which the following is a specification.

Wrenches have heretofore been made in which a cable chain is connected by one end to the handle-bar and the jaws at the end of the handle-bar are provided with teeth at one side, the chain passing around the pipe or other article and connecting with the jaws at the opposite sides to the serrations. This wrench is not convenient, because it can only be used with one side of the jaw against the pipe. The cable chain, however, has advantages over the flat link chain which has been made use of with wrenches having double jaws, each serrated on both edges, because the cable chain, being flexible in all directions, can be wrapped one or more times around the pipe and also turned in different directions, and the loose end of the chain can be wound more or less upon the handle-bar of the wrench to prevent the chain slipping out of its holding-jaws, especially when the wrench is used with the loose portion of the chain interlocked below the handle-bar and jaws.

The object of the present invention is to adapt a wrench having double jaws with curved serrated edges at both sides to a cable chain, so that the wrench can be used with either side against the pipe and the cable chain can be wound around the article to be rotated in any desired manner.

In the drawings, Figure 1 is a plan view of the chain wrench. Fig. 2 is an elevation with one jaw removed and part of the handle in section. Fig. 3 is a cross-section at the line 3 3 of Fig. 2. Fig. 4 shows a modification of the attaching-pin for the chain, and Fig. 5 is a longitudinal section at the line 5 5 of Fig. 2.

The jaws A are made with serrations 4 on the curved edges at both sides, so that both edges of the jaws are similar, and these jaws are grooved upon their inner surfaces and set against the sides of the handle B at the forked end thereof, and in order to obtain a very

strong connection between the forked end of the handle and the jaws the ends of the grooves are undercut or dovetailed at 5, and there is a shoulder at each side of the handle that is also undercut or dovetailed to receive the similarly-shaped back end of the jaw, as seen at 6, and the bolts C pass through the jaws and into the fork of the handle, and the holes that are bored in the parts for the bolts have parallel sides, and the holes in the outer portions of the fork are plain, so as to obtain all the strength of the bolts in resisting a cutting or shearing action when the wrench is in use, the inner ends only being screw-threaded at 7 sufficiently to hold the jaws in position, as there is comparatively little lateral thrust on the jaws or tension upon the bolts when in use, the principal strain being that of a shearing action between the jaws and handle.

We sometimes make use of a bolt D, passing across and through the jaws and the forked end of the handle-bar, so as to divide the strain and more securely hold the jaws to the handle-bar.

The opposite surfaces of the handle adjacent to the slot at the forked end are grooved at 8, so as to give ample room for the links of the cable chain E that stand perpendicular to the surface of the handle-bar, and the rear ends of the jaws project inwardly, as at 9, and they are recessed at the back portions, as shown at 10, the recesses being curved so as to properly receive the curved end of the cable link, which lies substantially parallel to the surface of the handle-lever and with the link that is perpendicular to the handle-lever between the inward projections 9, and the distance between the recesses 10 and the extreme end of the handle-fork is such that the links of the cable chain pass around the curved end of the handle-fork, the links lying upon the surface of the handle-fork, one adjacent to the inward projections 9 and the other against the end of the handle-fork, the intermediate link passing into the opening between the forks of the handle. In this manner the links are caused to take their proper relative strains, and a portion of the strain coming upon the side and end of the handle-fork lessens the strain upon the projections



9 where the end of the link is received into the curved recesses 10.

By the foregoing construction the handle-bar and jaws of the wrench are adapted to use with a cable chain, and the wrench can be used at either side, because the cable chain is connected by the pin F at equal distances from the edges of the jaw and midway between the edges of the handle-fork. Hence the chain will work in the same manner at either side of the handle-fork.

The pin may be made in any desired manner, such, for instance, as a straight pin F', passing across through the jaws and through the handle-fork, as seen in Fig. 3; but we prefer to make use of the pin F, having a head 11 at one side of the handle-bar fork and with a neck and divided washer 12 at the other side of the handle-bar fork, the inner surfaces of the jaws A being recessed for the head 11 and divided washer 12, and of course the two parts of the divided washer are held in position by passing into the recesses in the jaw. We also prefer to use a short tube or bushing 13 within the eye of the end link of the chain and around the pin F, so as to lessen the wear upon the pin itself and to prevent the fork from closing under stress.

We claim as our invention—

1. The combination in a chain wrench, of a handle-bar having a forked end, jaws having serrated edges at both sides and recessed on their inner surfaces to receive the outer edges of the handle-bar fork, the end of such handle-bar fork having undercut or dovetailed projections, and the ends of the recesses in the jaws being correspondingly shaped, substantially as set forth.

2. The combination in a chain wrench, of a handle-bar having a forked end, jaws having serrated edges at both sides and recessed on their inner surfaces to receive the outer edges of the handle-bar fork, the end of such handle-bar fork having undercut or dovetailed projections, and the ends of the recesses in the jaws being correspondingly shaped, there being shoulders upon the handle-bar fork undercut or dovetailed to receive the correspondingly-shaped back ends of the jaws, substantially as set forth.

3. The combination with the jaws and handle-bar, forked at the end, of a chain with the end link passing into the slot of the handle-bar fork, a cross-pin passing through the end link of the chain and through the handle-bar fork, such pin having a head at one end and a nut and divided washer at the other end, the jaw being recessed to receive the divided washer, substantially as set forth.

4. The combination with the handle-bar forked at one end, of jaws having serrated edges at both sides, two bolts each passing through one jaw and into the fork of the handle-bar and terminating at the inner surfaces of the fork, the screw-threaded portions of the bolts being only near the inner ends of such bolts so that the plain cylindrical portions of the bolts pass through the jaws and enter the handle-bar fork, substantially as set forth.

5. The combination with the handle-bar forked at one end, of jaws having serrated edges at both sides, two bolts each passing through one jaw and into the fork of the handle-bar and terminating at the inner surfaces of the fork, the screw-threaded portions of the bolts being only near the inner ends of such bolts so that the plain cylindrical portions of the bolts pass through the jaws and enter the handle-fork, a cable chain having open elliptical links and a separate cross-pin passing through the end link of the chain, substantially as set forth.

6. The combination with a handle-bar forked at the end, of jaws having serrated edges at both sides, two separate bolts for connecting the jaws to the handle-bar fork near its ends and terminating at the inner surfaces of the fork, and a second bolt to the rear passing across through the jaws and handle-bar, and a chain having its end link pivoted within the handle-bar fork, substantially as set forth.

7. The combination in a chain wrench, of a handle-bar having a fork and dovetail projections at its end, jaws having serrated edges at both sides and dovetailed recesses in the middle corresponding to the projections on the handle-bar fork for connecting the handle to the jaws, a chain and a connection for one end of the chain in the handle-bar fork, there being projections on the jaws for engaging the links of the chain, substantially as set forth.

8. The combination with the handle-bar forked at the end, of jaws having serrated edges at both sides, two separate bolts passing through the jaws and into the handle-bar fork, a bolt passing across through the jaws and handle-bar, and a chain having one end connected within the handle-bar fork, substantially as set forth.

Signed by us this 23d day of March, 1896.

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Witnesses:

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