

No. 832,440.

PATENTED OCT. 2, 1906.

H. S. WORDEN.  
WRENCH.

APPLICATION FILED APR. 23, 1906.



Fig. 1.

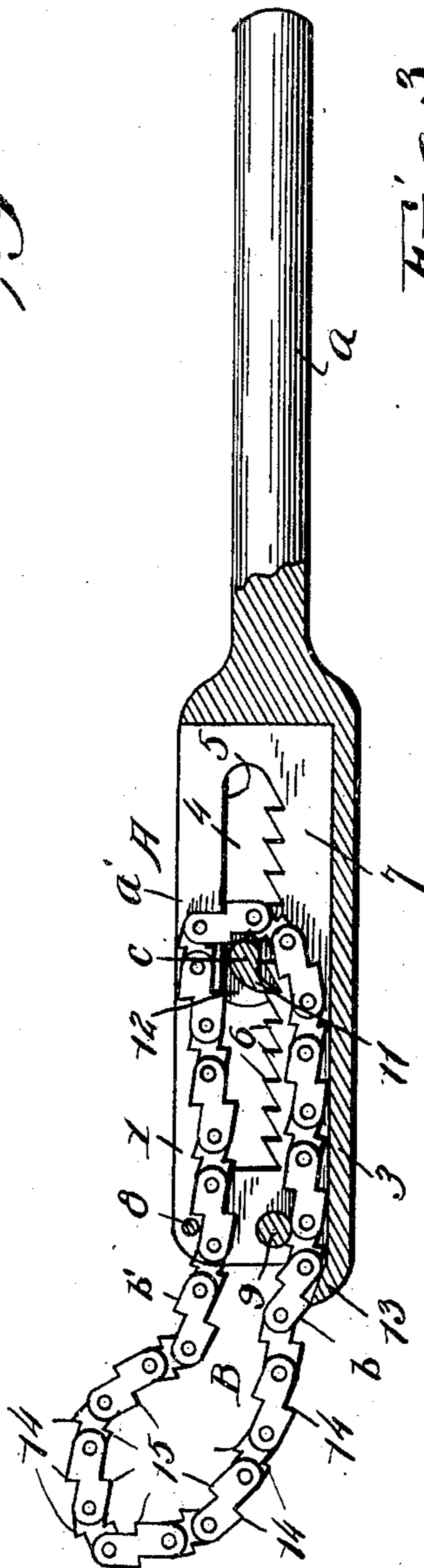


Fig. 2.

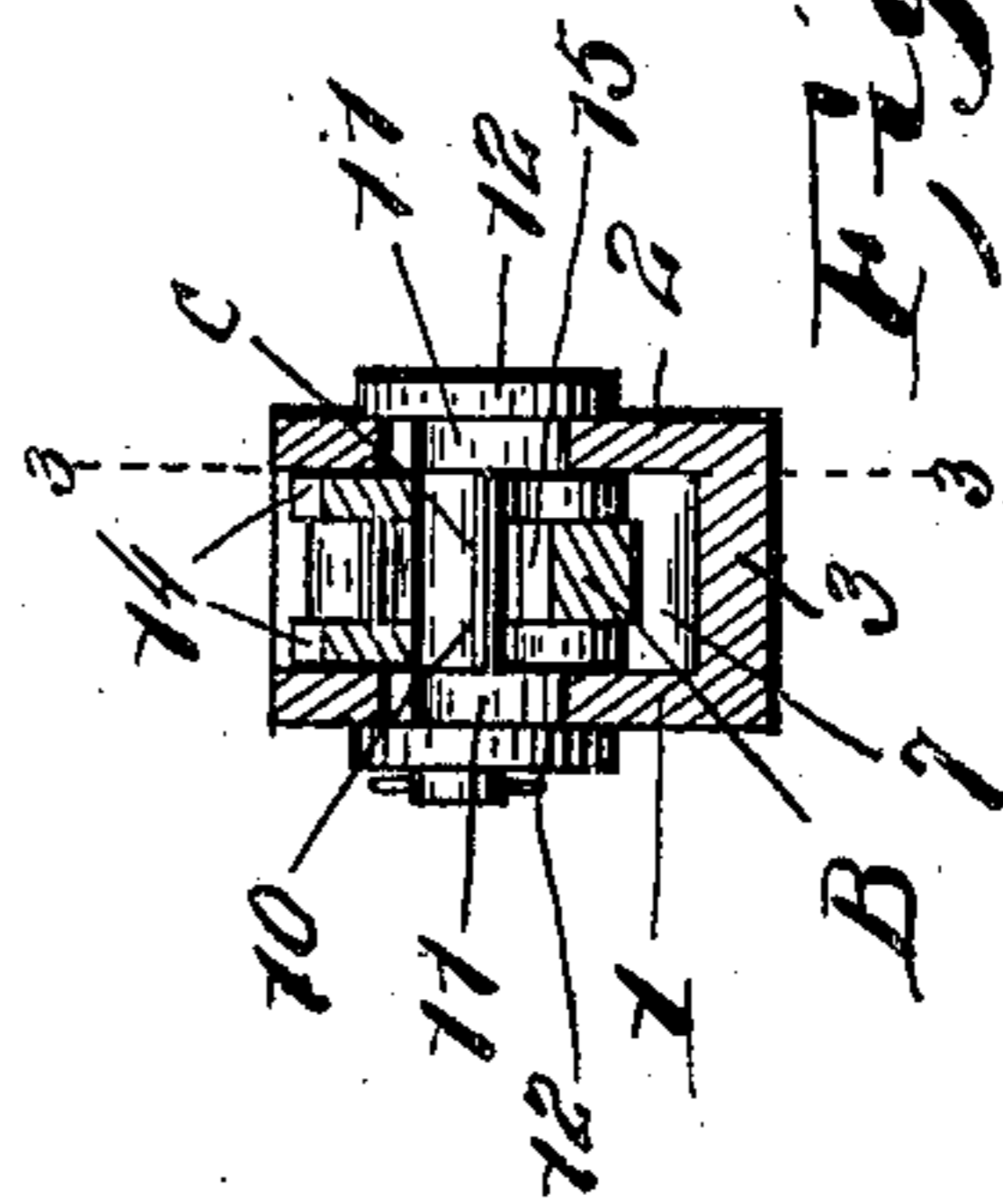


Fig. 3.

Witnesses

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# UNITED STATES PATENT OFFICE.

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## WRENCH.

No. 832,440.

Specification of Letters Patent.

Patented Oct. 2, 1906.

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*To all whom it may concern:*

Be it known that I, HIRAM S. WORDEN, a citizen of the United States, residing at Factoryville, in the county of Wyoming and State of Pennsylvania, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to improvements in wrenches, the details of which will be pointed out in the following specification, taken in connection with the accompanying drawings, in which—

Figure 1 is a side view of the wrench. Fig. 2 is a section on the line 2 2 of Fig. 1, and Fig. 3 is a section taken longitudinally through the channeled portion of the wrench-lever on the line 3 3 of Fig. 2.

Referring to the drawings, A indicates a lever, comprising a part *a*, suitably formed to be grasped by the hand, and a part *a'*, which is channeled longitudinally from the handle portion to the opposite end of the lever. The part *a'* forms a casing adapted to receive and guide an endless chain B. As shown in Fig. 2, the sides 1 and 2 of the casing are parallel and are connected together by the side or web 3. The sides 1 and 2 have parallel slots 4, extending longitudinally thereof, the edges 5 of the slots being plain and smooth, while the opposite edges of the slots are toothed, the teeth 6 forming racks. The endless chain B extends longitudinally within the channel 7 in the lever around an adjusting device *c*, and the chain is guided at the open end of the channel by pins 8 and 9, extending across the channel between the sides 1 and 2, the latter pin being between the opposite sides *b* and *b'* of the chain and also by the web 3. The adjusting device *c*, as shown, consists of a short bar or pin 10, which extends transversely across the channel and through the slots 4 and is provided with a pair of pawls 11 for engaging the rack-teeth 6 and also with heads 12, which fit against the outer sides of the casing. These heads serve to hold the device in position and also as a convenient means for rocking the rod 10, so as to lift the pawls 11 out of engagement with the rack-teeth when it is desired to move the adjusting device toward the open end of the channel. A fixed tooth or pawl 13, which is an extension of the web 3, projects beyond the sides 1 and 2 at the open end of the wrench, this pawl curving inwardly, as shown. Each link of the chain has on its outer edge a tooth 14, and the fixed tongue or pawl is adapted to engage these

teeth upon the outer edges of the links. The inner edges of the links are also provided with teeth 15, inclined oppositely to the teeth 14 and adapted to engage the nut 16 of a bolt or other object to which the wrench may be applied.

In operation the part of the chain which extends beyond the end of the lever is placed around the nut or other object which it is desired to turn, the adjusting device being moved toward the open end of the channel, if necessary, to provide a sufficient length of chain for this purpose and then drawn backward to take up the greater part of the slack in the chain. The pawls 11 on the adjusting device engaging the teeth 6 then lock the adjusting device. When the wrench is turned in the direction of the arrow in Fig. 1 after the chain is applied to the nut or other object, it will be seen that the fixed pawl or tongue 13 on the lever will be forced against the chain at a point between the object 16 and the guide-pin 9, and the remaining slack in the chain will be taken up between the object 16 and said pin by the lateral pressure of the pawl upon the chain between said points. The inner teeth 15 on the chain engage the object 16 in such manner as to bite into the object, and the pawl 13 engages a tooth on the outer side of one of the links, so that slippage between said tooth and the chain is prevented. If a nut or other object is to be turned in the opposite direction, the wrench is turned over, and it will be seen that the inner teeth on the chain will then engage the object properly to turn it in the opposite direction from that shown in Fig. 1.

What I claim is—

1. In a wrench, a handle or lever having a longitudinal channel, open at one end of the lever, and an endless chain arranged within said channel, the links of said chain having teeth on their outer edges, and said lever having a fixed pawl at the open end of the channel adapted to engage said chain.

2. In a wrench, the combination with a handle or lever having a longitudinal channel, open at one end of the lever, and having guiding devices near said open end and also a fixed pawl projecting from the end of the lever, of an endless chain extending into said channel and around one of said guiding devices, the links of said chain having teeth on their outer edges adapted to be engaged by said pawl.

3. In a wrench the combination with a

handle or lever having a longitudinal channel open at one end of the lever, and having guiding devices near said open end and also a fixed pawl projecting from the end of the lever, of an endless chain extending into said channel and around one of said guiding devices, the links of said chain having teeth on their outer edges adapted to be engaged by said pawl, and teeth on their inner edges adapted to engage a nut or other object that is to be turned.

4. In a wrench the combination with a handle or lever having a longitudinal channel, open at one end of the lever, and having guiding devices near said open end and also a fixed pawl projecting from the end of the lever, of an endless chain extending into said channel and around one of said guiding devices, the links of said chain having teeth on their outer edges adapted to be engaged by said pawl and means for adjusting the length of chain within the channel.

5. In a wrench, the combination with a handle or lever having a longitudinal channel, open at one end of the lever, the side walls of said channel having parallel slots therein, and one edge of each slot having a series of teeth, said lever having also a fixed pawl projecting from its end and having guides at the open end of the channel, of an endless chain within the channel extending around one of said guides, said chain having teeth adapted to be engaged by said fixed pawl, and an adjusting device for the chain comprising a bar or rod extending through the slots in the lever and having pawls adapted to engage the teeth in the edges of the slots.

In testimony whereof I affix my signature in presence of two witnesses.

HIRAM S. WORDEN.

Witnesses:

E. C. SMITH,

HENRY BAILY.