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WRENCH.

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1,155,158.

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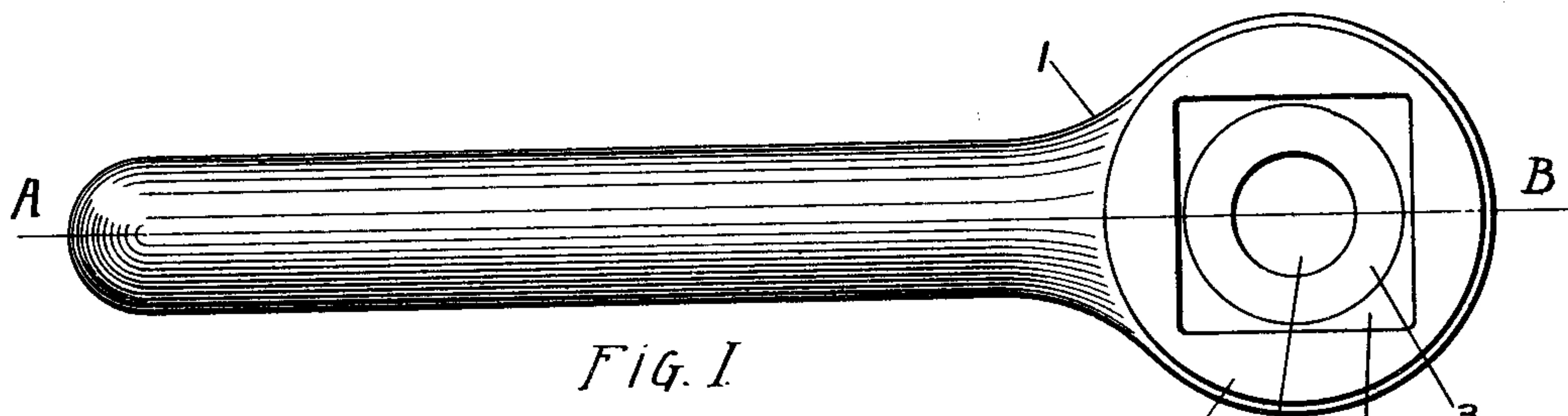


Fig. 1.

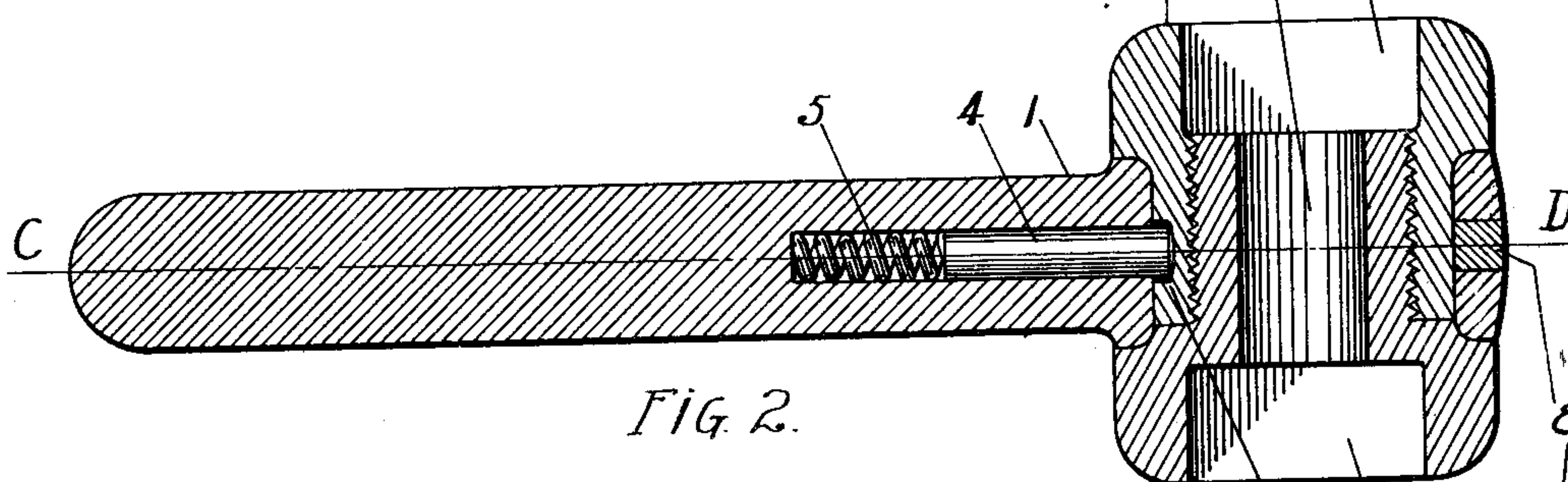


Fig. 2.

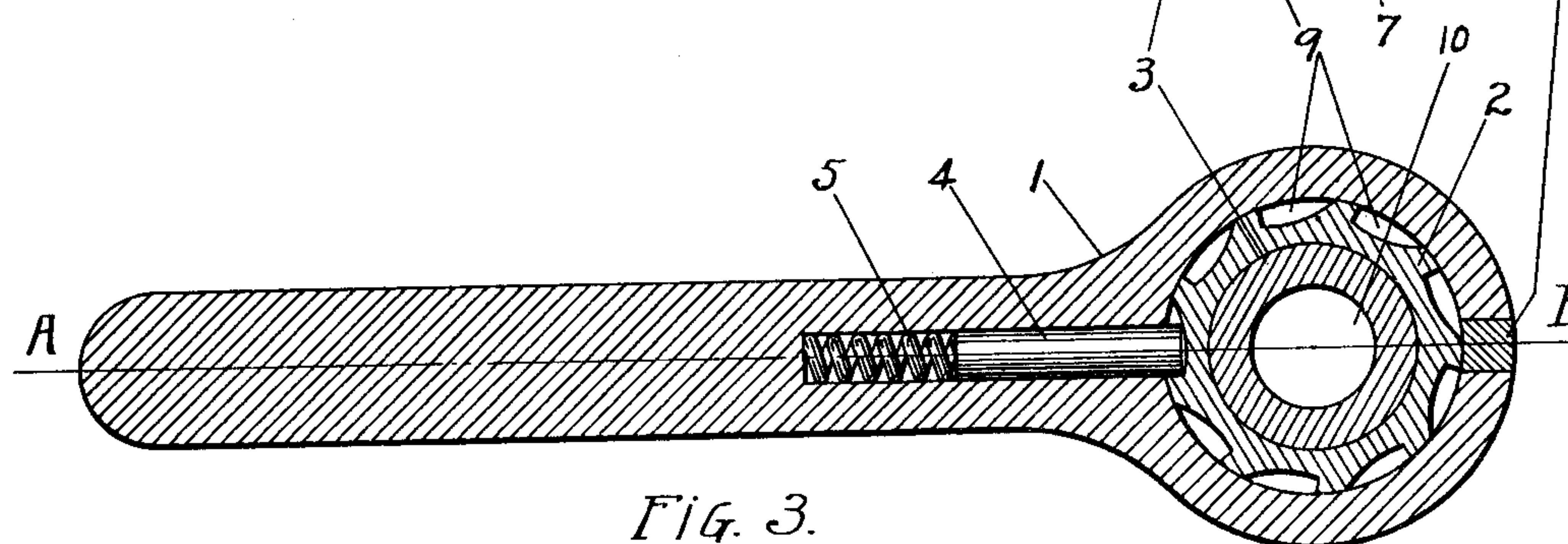


Fig. 3.

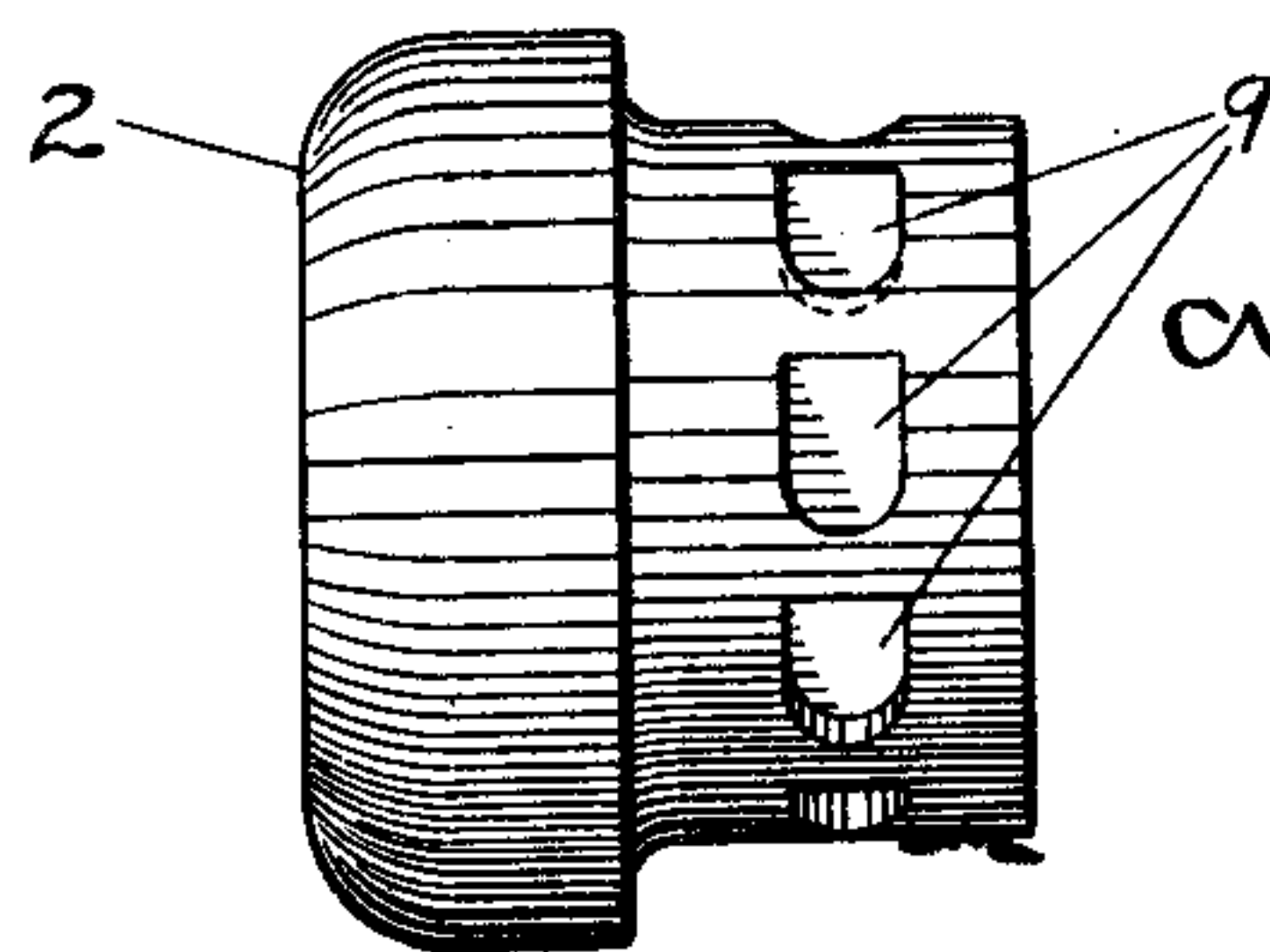


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## WRENCH.

1,155,158.

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*To all whom it may concern:*

Be it known that we, CHARLES B. MOULTHROP and LUCIAN C. JACKSON, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

Our invention relates to improvements in wrenches in which the jaws are operated in conjunction with a ratchet; and the object of our improvements is to provide a self contained reversible wrench in which the ratchet works continuously in one direction so that a nut can be tightened by using one side of wrench and loosened by using the other side. We attain this object by the mechanism illustrated in the accompanying drawing, in which—

Figure 1 is a plan of one side of the wrench; Fig. 2 is a longitudinal central section on the lines AB of Fig. 1 and Fig. 3; Fig. 3 is a central longitudinal section on the line CD of Fig. 2; Fig. 4 is a side view of the jaw containing ratchet holes.

Similar figures refer to similar parts throughout the several views.

1 is the body and handle of the wrench, 2 is one jaw fitting into the head of the wrench in which the ratchet holes 9, 9 &c., are located, 3 is a jaw fitting the opposite side of the head of the wrench and screwed into and bearing against the jaw 2, 4 is a pin fitting in a hole in the handle of the wrench and having a spring 5 in contact therewith to keep it engaged with the ratchet holes 9, 9 &c., of the jaw 2, 6 is a pocket in jaw 2 of suitable shape for engaging with a nut, 7 is a similar pocket in jaw 3 for engaging with a nut, 8 is a plug in the head of the wrench for filling a hole made in drilling the hole for holding the spring 5 and ratchet pin 4 in the handle and for the purpose of covering the ratchet holes 9, 9 &c., 9, 9 &c., are ratchet holes cut in the jaw 2 having a straight face on one end for engaging with the pin 4 when the wrench handle is moved in one direction and cut away on the other end to allow the pin 4 to slip from one ratchet hole 9 to the succeeding ratchet hole 9 when the wrench handle is moved in the opposite direction, 10 is a hole through jaw 3 for the reception of a bolt when its nut is screwed down beyond its end.

The threads on the jaws 2 and 3 and the

ratchet holes 9, 9 &c., are cut in such a manner that when the ratchet pin 4 is engaged with the ratchet holes 9, 9 &c., and the jaw 3 is used on a nut the tendency is to keep the jaws 2 and 3 locked together. The ratchet holes 9, 9 &c., being cut on the jaw 2 no action takes place to lock or loosen the jaws 2 and 3 when jaw 2 is engaged with a nut.

From the drawing and the description as given the operation of the wrench will be readily understood.

As shown, when the jaw 2 is engaged with a nut and the handle moved forward and back the nut on a bolt with a right hand thread will be unscrewed, and when the jaw 3 is engaged with a nut and the handle moved forward and back the nut will be tightened on a bolt with a right hand thread. By cutting the ratchet holes 9, 9 &c., opposite from those shown in the drawing jaw 2 will tighten a nut on a bolt with a right hand thread and jaw 3 will loosen a nut on a bolt with a right hand thread.

The pockets 6 and 7 in the jaws 2 and 3 as shown in the drawing accommodate a square nut but can be made to fit a nut of any desired shape.

The usual method of making ratchet holes is to cut straight faces on both ends of the ratchet holes and to flatten the pin on its bearing side (or driving side) and taper the pin on the opposite side to allow it to rise from the ratchet hole.

In our construction the driving ends of the ratchet holes are made round to conform to the shape of the pin so as to give the pin a bearing surface of one half of its circumference as shown in Fig. 4. The other ends of the ratchet holes are cut away to allow the ratchet pin 4 to rise from the ratchet holes 9, 9 &c. This construction allows the full strength of the round ratchet pin 4 to be utilized, also giving the maximum amount of strength of material between the ratchet holes.

The jaws 2 and 3 are designed to freely move in the head of the wrench when tightly locked together.

The construction is such as to inclose the entire ratchet mechanism of the wrench thus keeping out all dirt or other foreign substances which would be liable to interfere with its operation.

The outer ends of the jaws 2 and 3 as



shown, are rounded for convenience in use when used on railroad tracks, but can be made of any desired shape.

The end of the ratchet pin 4 which engages the ratchet holes 9, 9, &c., in the jaw 2 is slightly rounded and fits the bottom of the ratchet holes 9, 9 &c., which are cut on the arc of a circle.

What we claim as our invention, and desire to secure by Letters Patent, is,

1. In a wrench, in combination with a handle having an annular head, jaws capable of rotation in said head, means for securing said jaws in said head, a cylindrical shaped, spring actuated ratchet pin carried in said head at an angle with the center line of said jaws and semi-cylindrically shaped ratchet holes having inclined leads in one of said jaws, the radii of said ratchet pin and said semi-cylindrical ratchet holes being substantially equal.

2. In a wrench, in combination with a handle having an annular head, a jaw having an external annular seat to fit into said head, ratchet holes in the face of said seat, a ratchet pin and spring mounted in said head to engage said holes and a second jaw externally threaded to engage in said first mentioned jaw, said threads being cut in the direction to tighten when said second jaw is in use.

3. In a wrench, the combination of a nut-turning member having semi-cylindrically shaped ratchet holes with inclined leads and a ratchet mechanism external to, and adapted to revolve said nut-turning member.

4. In a wrench, in combination with a handle and a head, a rotating part, one side of said part used to tighten a nut and the opposite side of said part used to loosen said nut and a ratchet mechanism consisting of a spring and a ratchet pin, said pin having a uniform diameter with its axis at an angle with the axis of said rotating part and being operative when bearing on any side.

5. In a wrench, the combination of a handle and a head formed of a single piece of material having a hole formed through the head for the reception of two jaws inserted from opposite sides and locked together and held in place by means of threads, one of said jaws suitable for tightening a nut and the other of said jaws suitable for loosening said nut and a cylindrical ratchet pin having a uniform diameter, said pin being operated by means of a spring in contact with one end.

6. In a wrench, the combination of two jaws screwed together, one of said jaws having an inside thread and ratchet holes formed on its outer surface in such a manner that the driving or bearing end of said ratchet holes bear on one-half the circumference of a round ratchet pin, and the other of said jaws having an outside thread,

said thread and ratchet holes formed in such a manner that when the jaw with outside thread is used on a nut the tendency is to keep the jaws locked together, and an inclosed ratchet mechanism.

7. The combination, in a wrench of a handle and a head formed of a single piece of material and a rotating part composed of two opposite and projecting jaws screwed together and an inclosed ratchet mechanism composed of a cylindrical ratchet pin and a spring, said pin operating at an angle with the axis of said rotating part and with semi-cylindrical ratchet holes of substantially the same diameter as said ratchet pin and inclined leads to said holes.

8. In a wrench, in combination with a handle having an annular head, two opposite and projecting jaws screwed together, said jaws being reduced in size at their outer extremities, one of said jaws having an inside thread and ratchet holes formed on its outer surface in such a manner that the driving or bearing end of said ratchet holes bear on one-half the circumference of a round ratchet pin, and the other of said jaws having an outside thread, said thread and ratchet holes formed in such a manner that when the jaw with outside thread is used on a nut the tendency is to keep the jaws locked together and a ratchet mechanism.

9. In a wrench, a nut-turning member having curved ratchet teeth and a curved ratchet pin, said pin external to and adapted to engage in said teeth whereby said member may be rotated.

10. A wrench having a handle and a head formed of a single piece of material, a hole formed through said head for the reception of two jaws locked together and held in place by means of threads, a recess in the handle suitable for holding a ratchet pin and a spring in contact therewith, said ratchet pin being free to revolve about its axis and being operative when bearing on any side.

11. In a ratchet wrench having an inclosed ratchet mechanism, the combination of a rotating part, one side of said part adapted to tighten a nut and the other side of said part adapted to loosen said nut with a ratchet pin one end of which engages with suitable holes in said rotating part, said pin being operative when bearing on any side.

12. In a ratchet wrench having an inclosed ratchet mechanism, the combination of two opposite jaws screwed together, one of which is adapted to tighten a nut and the other of which is adapted to loosen said nut, and a ratchet pin operative when bearing on any side and one end of which engages with suitable holes in one of said jaws.

13. In a ratchet wrench having an inclosed ratchet mechanism, the combination



of a rotating part, one side of said part adapted to tighten a nut and the other side of said part adapted to loosen said nut, a ratchet pin, one end of which engages with  
 5 suitable holes in said rotating part, said pin being free to revolve axially and operative when bearing on any side and a spring in contact with said pin.

14. In a wrench, the combination of a  
 10 handle and a head formed of a single piece of material having a hole formed through the head for the reception of a rotating part, one side of which is adapted to tighten a nut and the other side of which is adapted  
 15 to loosen said nut, a recess in the handle suitable for holding a ratchet pin, said pin being free to revolve axially and one end of which engages with suitable holes in said revolving part and a spring in contact with  
 20 said pin.

15. In a wrench, the combination of a handle and a head formed of a single piece of material having a hole formed through said head for the reception of two opposite  
 25 and projecting jaws screwed together by means of threads, said jaws being revolved by means of a round ratchet pin operating in connection with ratchet holes constructed on the outer surface of one jaw and bearing  
 30 on one-half the circumference of said ratchet pin, in such a manner that both jaws are free to move in one direction whereby one of said jaws will tighten a nut and the other of said jaws will loosen a nut.

35 16. In a wrench, the combination of a revolving nut-turning member composed of two jaws fastened together by means of threads in such a manner that when in use on a nut the said jaws are kept locked to-  
 40 gether and a ratchet pin one end of which engages with suitable ratchet holes in one of said jaws.

17. The combination, in a wrench of a rotating part, said rotating part being com-  
 45 posed of two separate members and each of said members having jaws one of which is adapted to tighten a nut and the other of which is adapted to loosen said nut, and a ratchet pin, one end of which engages with  
 50 suitable holes in said rotating part and being operative when bearing on any side.

18. In a wrench in which the handle and head are formed of a single piece of material, the combination of an inclosed ratchet  
 55 pin and a nut-turning member projecting on opposite sides of said head, said pin operative when bearing on any side and having

its axis at an angle with the axis of said nut-turning part.

19. In a wrench, the combination of a nut- 60 turning member, one side of which is adapted to tighten a nut and the opposite side of which is adapted to loosen a nut, said member having semi-cylindrically shaped ratchet holes and a ratchet pin with its axis at an  
 65 angle with the axis of said member and having radii substantially equal to the radii of said semi-cylindrically shaped ratchet holes.

20. In a wrench, a handle, a head and a nut-turning member, one side of said mem- 70 ber adapted to tighten a nut and the opposite side of said member adapted to loosen a nut, said member adapted to be revolved by means of a ratchet pin operating at an angle with the axis of said member and in connec- 75 tion with curved ratchet holes with inclined leads in said member.

21. In a wrench, the combination of a handle, a head, a nut-turning member and a ratchet mechanism, external to said head, 80 said ratchet mechanism consisting of a ratchet pin and a spring, said member having curved ratchet holes with inclined leads and adapted to be revolved by means of said ratchet pin whereby one portion of said 85 member will tighten a nut and another portion of said member will loosen a nut.

22. In a wrench, the combination with a nut-turning member of a curved ratchet pin adapted to revolve said nut-turning mem- 90 ber, said pin engaging with said member at an angle to its axis.

23. In a wrench, a nut-turning member adapted to rotate a nut, said member having ratchet teeth formed by two surfaces meet- 95 ing at an angle, one of which surfaces is curved, means to hold said member and means to engage with said teeth to rotate said member.

24. In a wrench, a rotating member hav- 100 ing ratchet teeth formed by the meeting of two surfaces at an angle and forming a curved line of intersection and means to engage in said teeth whereby said member may be rotated. 105

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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 LUCIAN C. JACKSON.

Witnesses:

CLINTON T. HORTON,  
 ALFRED HURRELL.