

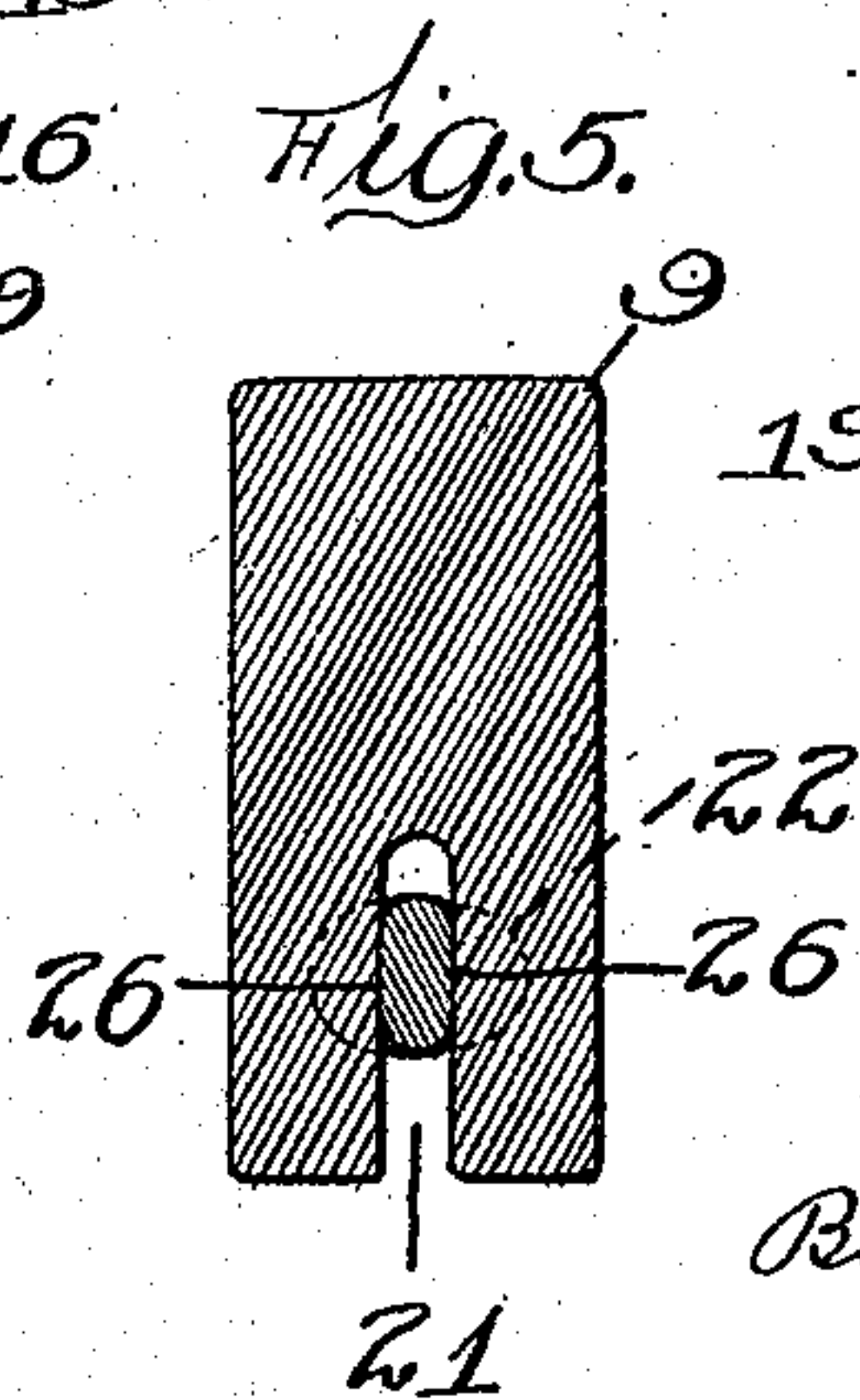
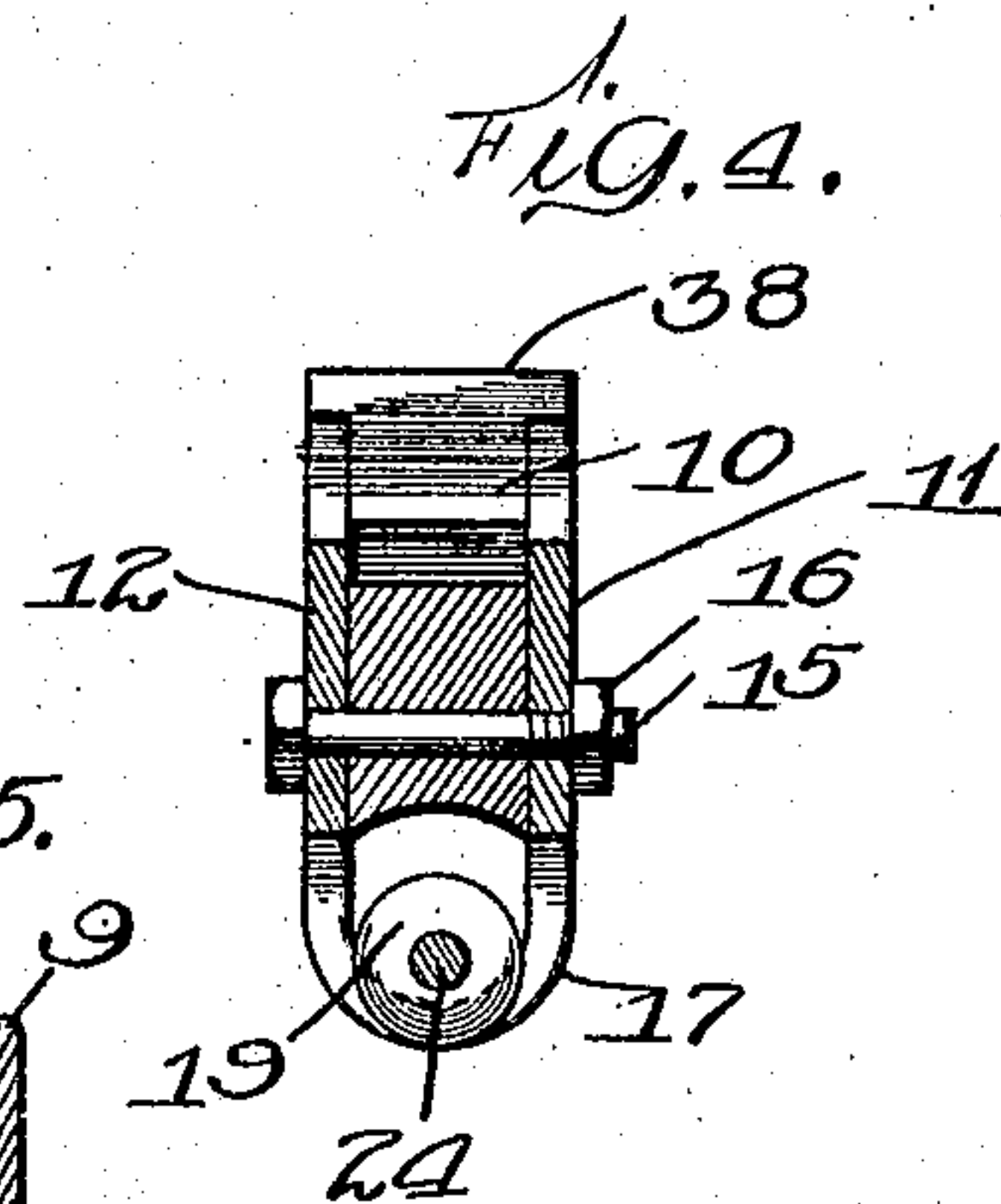
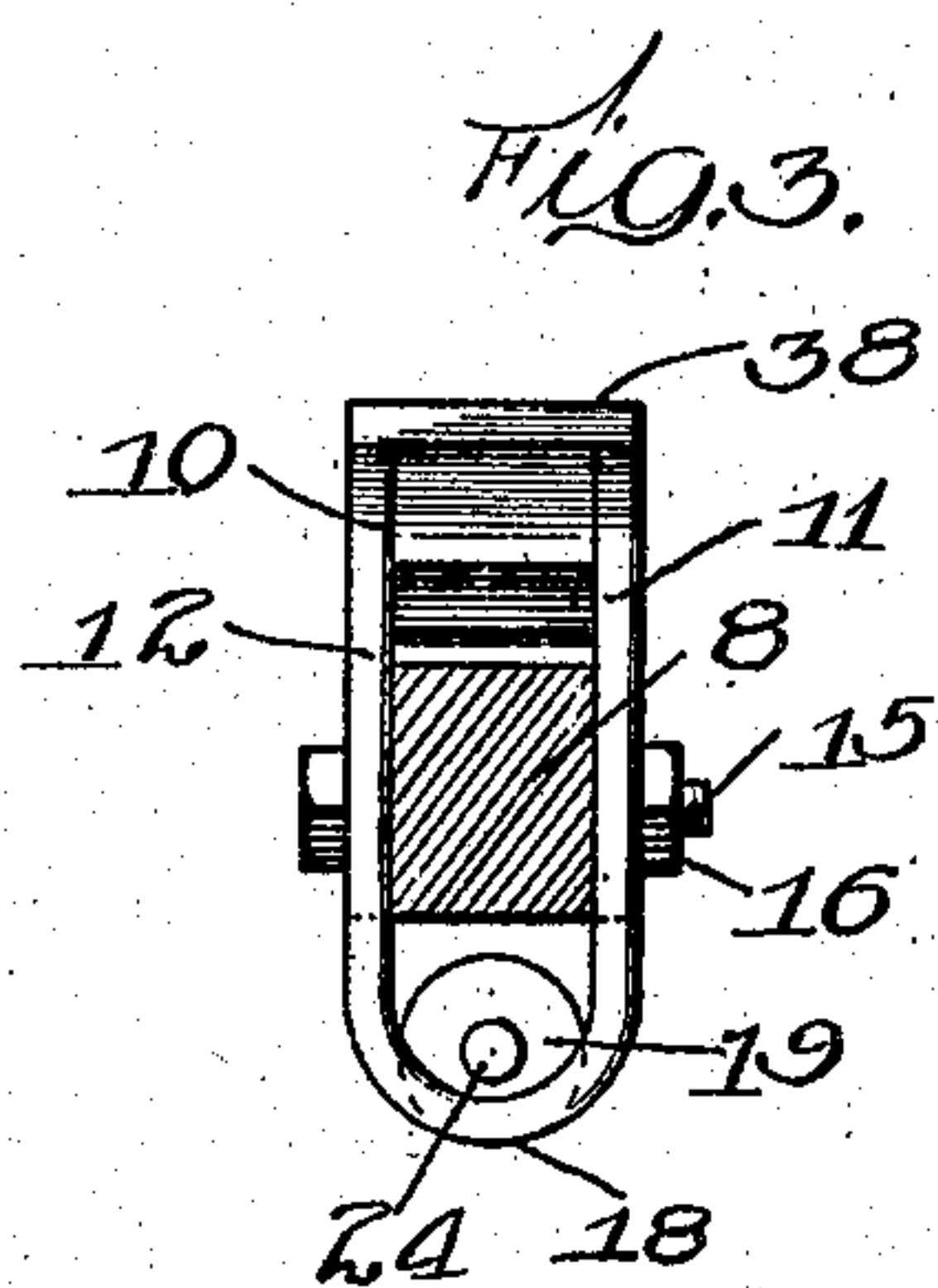
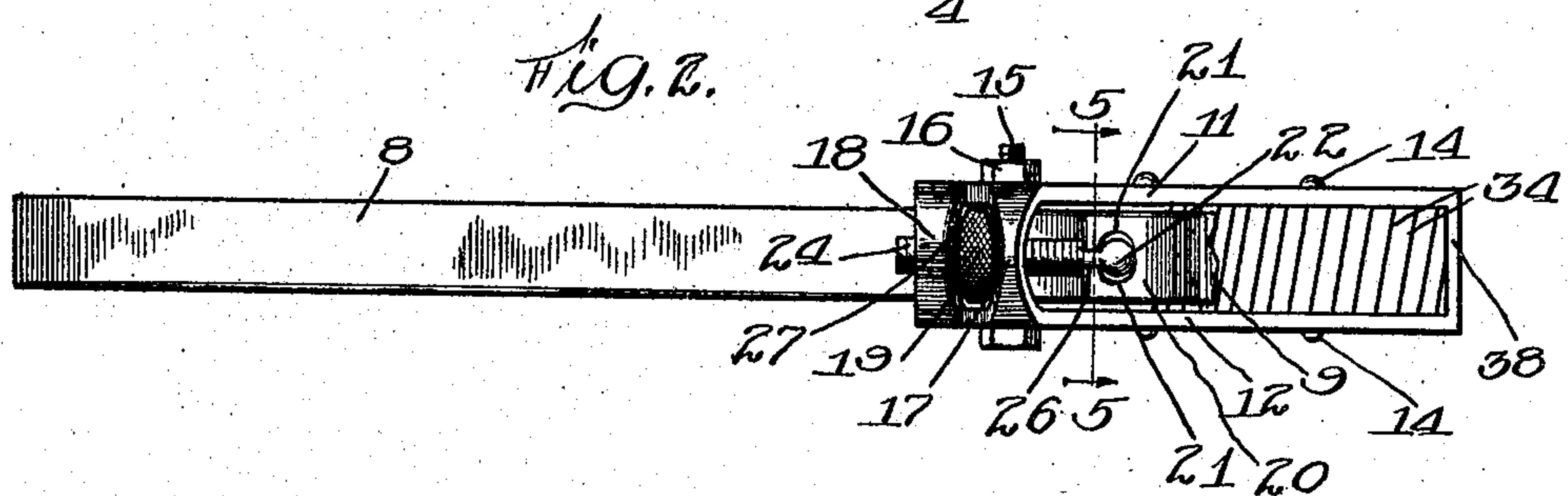
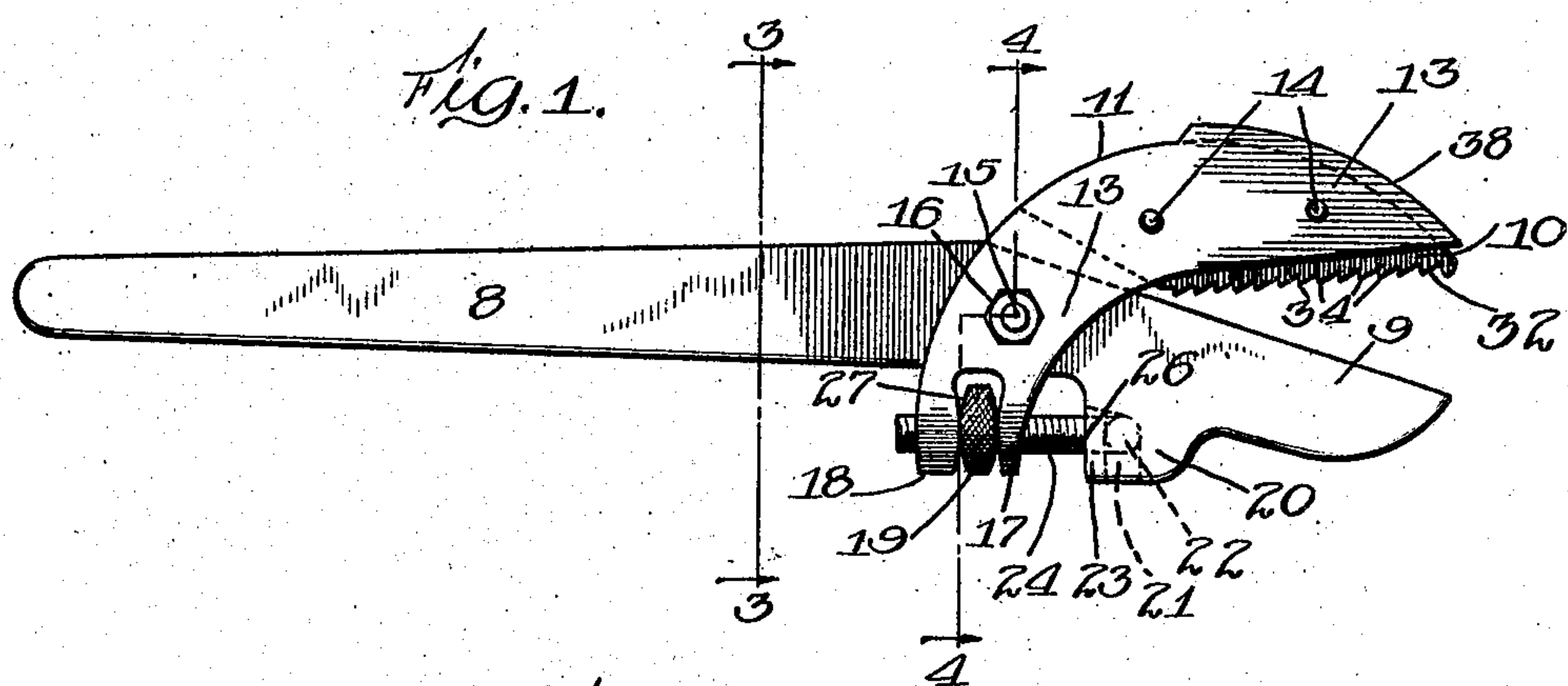
No. 885,191.

PATENTED APR. 21, 1908.

H. A. SMITH.  
WRENCH.

APPLICATION FILED MAY 17, 1907.

2 SHEETS—SHEET 1.



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2.6

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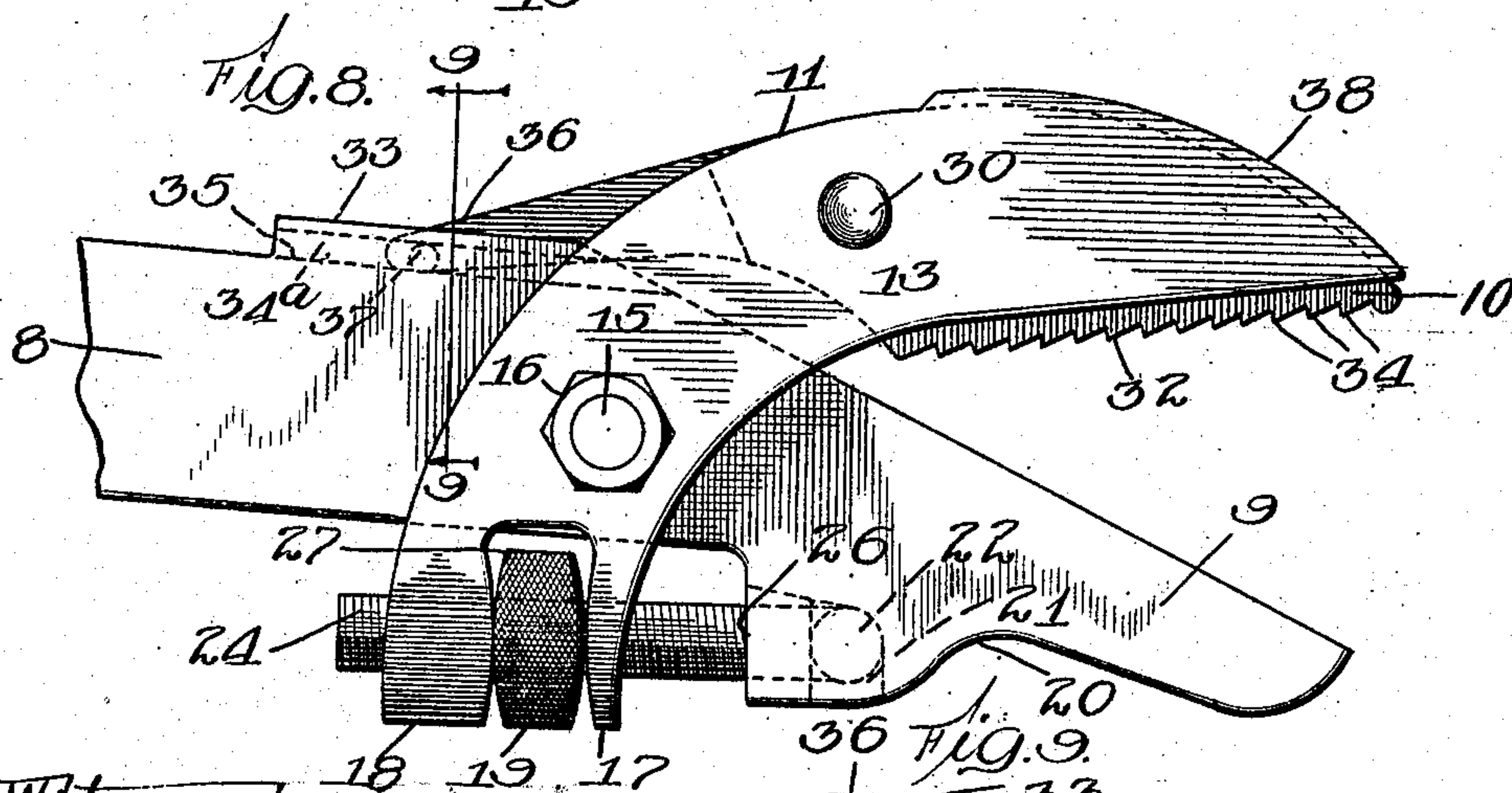
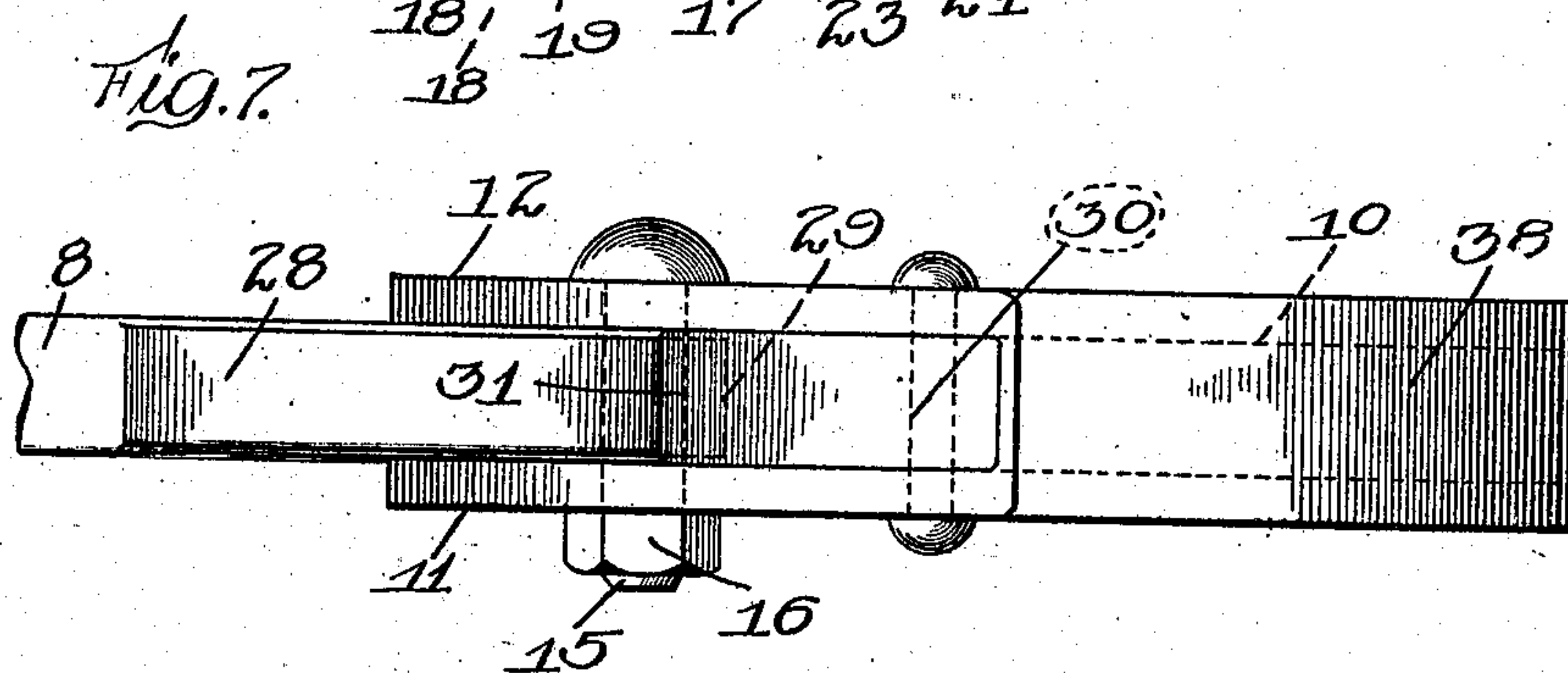
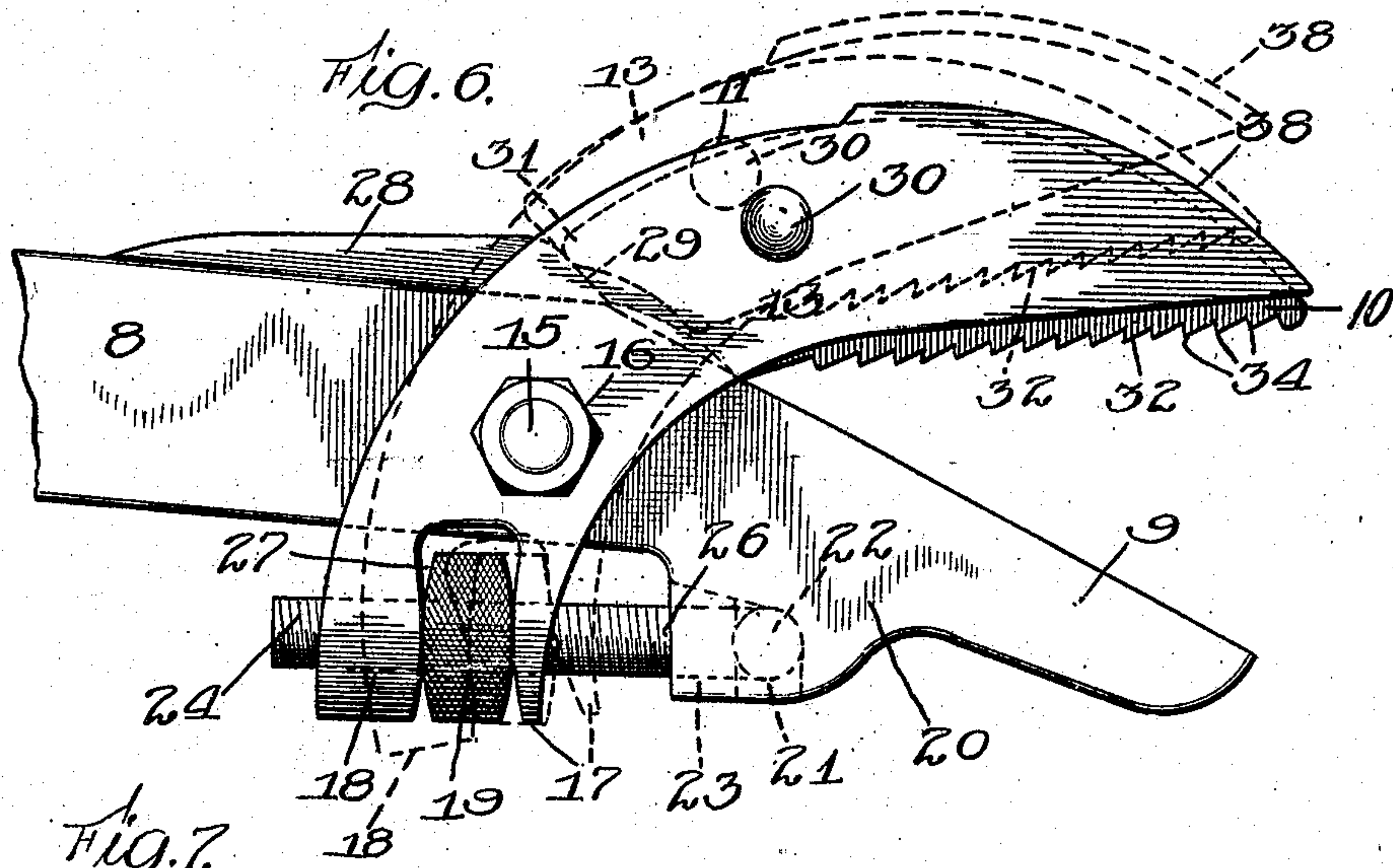
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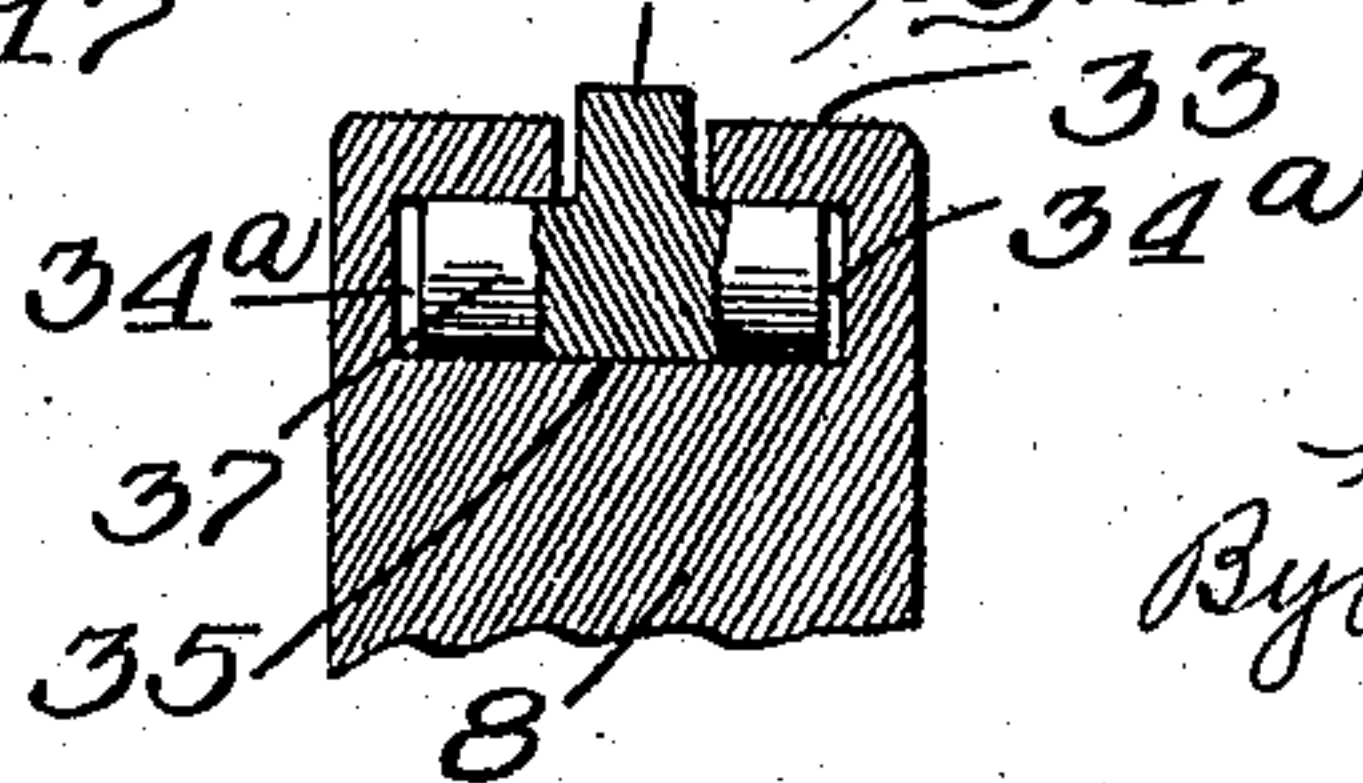
H. A. SMITH.  
WRENCH.

APPLICATION FILED MAY 17, 1907.

2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

HENRY ADALBERT SMITH, OF ELGIN, ILLINOIS.

## WRENCH.

No. 885,191.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed May 17, 1907. Serial No. 374,258.

*To all whom it may concern:*

Be it known that I, HENRY ADALBERT SMITH, a citizen of the United States of America, and resident of Elgin, Kane county, Illinois, have invented a certain new and useful Improvement in Wrenches, of which the following is a specification.

My invention relates to improvements in wrenches of the type known as "alligator wrenches", those having a V-shaped opening.

The object of my invention is to provide a wrench of simple construction, yet having a maximum of strength suitable for small or very large sizes.

A further object is the production of a device that can be produced in large size and be easily operated, and one that is adapted for use in almost any situation.

A further object is the production of a wrench of maximum as well as minimum size that can be cheaply manufactured and be very effective.

These and such other objects as may hereinafter appear are attained by my device, embodiments of which are illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved form of wrench with its upper jaw fixed in the jaw support. Fig. 2 is a bottom view of Fig. 1, with a portion of the fixed jaw broken away. Fig. 3 is a cross section on the line 3—3 of Fig. 1, looking in the direction indicated by the arrows. Fig. 4 is a cross section on the line 4—4 of Fig. 1, looking in the direction indicated by the arrows. Fig. 5 is a cross section on the line 5—5 of Fig. 2 through the fixed jaw only, looking in the direction indicated by the arrows. Fig. 6 is a side elevation of my improved form of wrench with its upper jaw movable in the movable jaw support. Fig. 7 is a top view of Fig. 5. Fig. 8 is a side elevation of a modified form of my invention. Fig. 9 is a cross section on the line 9—9 of Fig. 8, looking in the direction indicated by the arrows.

Like numerals of reference indicate like parts in the various figures of the drawing.

8 represents the handle of the wrench terminating in a fixed smooth jaw 9. A movable jaw 10 is secured between the slotted or recessed arms 11—12 of the hooded yoke 13 by means of pins 14 or other fastening. The yoke 13 is secured to the handle by means of a bolt 15 passing through the handle and yoke and held in place by a nut 16. The

base of the yoke is slotted and the arms 17—18 form bearings for the thumb nut 19. A lug 20 formed preferably integral with the fixed jaw 9 is channeled or recessed at 21 to permit the insertion of a ball or enlarged screw head 22 and at 23 to permit the passage of a screw bolt 24. This screw bolt passes between the bases of the yoke arms 11—12 through the bearing lugs 17—18 and the thumb screw 19. The recess 23 is deeper than the diameter of the screw permitting a perpendicular or radial play of the screw bolt and the sides of the screw bolt are flattened at the points 26 where they engage the walls of the recess 23 in order to prevent the bolt from turning. The ends of the thumb nut 19 are preferably curved as at 27, and the lug or bearing 18 which sustains the greater strain is made larger and stronger than the lug 17.

Referring to the modification illustrated in Figs. 6 and 7, the handle is provided with a lug 28 having a curved surface 29. The movable jaw 10 is pivoted to the yoke by a single bolt 30, and is provided with a finger or rearwardly extending portion 31 adapted to travel on the curved surface 29 of the lug. The jaw is provided with the usual teeth 34 placed at the proper angle to best grip or bite the article held between the jaws.

When the jaws are opened the end 31 of the movable jaw slides up on the curved portion 29 of the shoulder 28, and the gripping face 32 swings downwardly, as shown in dotted position in Fig. 6, maintaining a more effective gripping angle. When the jaws are closed, the movable jaw swings with the yoke, the finger raising up from the shoulder. As soon, however, as the pipe or article to be operated upon strikes the movable jaw it is forced back until the finger or rear portion engages the shoulder again, and the jaw is rigidly fixed.

It will be noted that I have, as usual, located the jaw actuating mechanism on the under-side of the wrench—that is, back of the smooth jaw. This makes the tool easy of operation, especially when the tool is held in one hand, in which case the wrench is grasped by the last three fingers, leaving the thumb and forefinger free to operate the thumb nut.

Referring to the modification illustrated in Figs. 8 and 9, the lug 33 is provided with a slot 34<sup>a</sup>, having an enlarged channel 35. The



movable jaw 10 is provided with an extended finger 36, and having a cross bolt 37 adapted to travel in the channel 35.

The head 22, of which the screw bolt 24 is an integral part, forms with the recess 21 a knuckle or loose socket joint, allowing extreme latitude of motion for the screw bolt and nut, as the movable jaw support or yoke is moved about the bolt 15 in opening and closing the jaw. The sides of the bolt are flattened at 26, thus preventing turning in case the screw bolt or thumb nut becomes rusted or fixed or jammed on the screw-thread. It is evident that a pin or shaft could be passed through the lug 20, to which the screw bolt could be attached, which construction would give a lateral or perpendicular motion in one plane but the pin would be liable to displacement and would not give the same freedom of movements as the construction shown. The faces or ends of the thumb nut 19 are curved, as shown at 27, permitting a freedom of action of the thumb nut 19. In Fig. 1 the adjustable jaw 10 is shown as rigidly fixed in the jaw support 13 by means of screws or pins 14, or other seating, and the support is preferably provided with a hooded end 38 affording greater strength. By a change in the position of the corresponding holes in the jaw, the angular inclination of the jaw with respect to the fixed jaw 9 can be varied.

It will be noted that the movable jaw is so shaped that it goes over or straddles the fixed jaw and projects below it, giving extra strength in leverage where strength is required to hold an adjusting knurl below the fixed jaw, and that receives the direct thrust of action, below the pivoted bolt, upon the knurl and knuckle jointed stay bolt on which the knurl works. Also the slotted housing for the stay and screw adjusting bolt permits a knuckle joint in which the adjusting bolt rises or lowers seeking its level as the swing of the lower end of the movable jaw requires the adjusting bolt to become level at either the upper or lower part of the slotted housing.

A wrench constructed in accordance with my device is enabled to be manufactured of large size and possesses a maximum of strength and simplicity, with a minimum number of parts and slight liability of disarrangement or breakage. It is easily operated by the workman and is adapted for use in almost any position on pipe or nuts and in every case where a wrench of the alligator type is required.

What I claim as my invention is:

1. In a wrench, the combination with a fixed jaw, a movable jaw support, of a movable jaw seated therein, and means carried by said fixed jaw for varying the angular position of said jaws, but always forming a V-shaped opening.

2. In a wrench, the combination with a

fixed jaw, a movable jaw support, of a movable jaw seated therein, operative mechanism located on the underside of said fixed jaw and engaging said movable jaw for varying the angular position of said jaws, but always forming a V-shaped opening.

3. In a wrench, the combination with a fixed jaw, of a movable jaw support, a movable jaw seated therein, operative mechanism located on the underside of said fixed jaw and engaging said movable jaw support for varying the angle of inclination between said jaws, but always forming a V-shaped opening.

4. In a wrench, the combination with a fixed jaw, of a radially movable jaw support, a movable jaw seated therein, operative mechanism located on the underside of said fixed jaw and engaging said movable jaw support for varying the angle of inclination between said jaws.

5. In a wrench, the combination with a fixed jaw, of a radially movable jaw support, a movable jaw seated therein, operative mechanism located on the underside of said fixed jaw and engaging said movable jaw support for varying the angle of inclination between said jaws, said operative mechanism comprising a knuckle or loosely fitting socket joint seated in a recess in said fixed jaw, and a screw-threaded bolt in engagement therewith and with said movable jaw support.

6. In a wrench, the combination with a fixed jaw, of a radially movable jaw support, a movable jaw seated therein, operative mechanism located on the underside of said fixed jaw and engaging said movable jaw support for varying the angle of inclination between said jaws, said operative mechanism comprising a knuckle or loosely fitting socket joint situated in a recess in said fixed jaw, and a screw-threaded bolt, a thumb nut seated on said bolt, and in operative engagement with said movable jaw support.

7. In a wrench, the combination of a fixed jaw, a movable jaw support, a movable jaw seated therein, operative mechanism for varying the angular position of said fixed jaw and movable jaw support, comprising a screw bolt connection seated in one of said parts and engaging the other, together with automatic means for varying the angular position of said fixed jaw and said movable jaw in a different degree.

8. In a wrench, the combination with a fixed jaw, of a radially movable jaw support, a movable jaw, operative screw bolt mechanism located on the underside of said fixed jaw and engaging said movable jaw support for varying the angle of inclination between said jaws, together with automatic means for varying the angular position of said fixed jaw and said movable jaw in a different degree.



9. In a wrench, the combination with a fixed jaw, of a radially movable jaw support, a movable jaw, operative mechanism located on the underside of said fixed jaw and engaging said movable jaw support for varying the angle of inclination between said jaws, said operative mechanism comprising a slotted knuckle or loose socket joint situated in a recess in said fixed jaw, and a screw-threaded bolt, a thumb nut seated on said bolt, and in operative engagement with said movable jaw support, together with automatic means for varying the angular position of said fixed jaw and said movable jaw in a different degree.

10. In a wrench, the combination of a fixed jaw, a movable jaw support, a movable jaw, operative mechanism for varying the angular position of said fixed jaw and movable jaw support, together with automatic means for varying the angular position of said fixed jaw and said movable jaw in a different degree, said means comprising a rearwardly extending finger carried by said movable jaw and adapted to travel over a bearing on said fixed jaw.

11. In a wrench, the combination of a fixed jaw, a movable jaw support, a movable jaw, operative mechanism for varying the angular position of said fixed jaw and movable jaw support, together with automatic means for varying the angular position of said fixed jaw and said movable jaw in a different degree, said means comprising a rearwardly extending finger integral with said movable jaw and adapted to travel over a bearing on said fixed jaw.

12. In a wrench, the combination of a fixed jaw, of a movable jaw support carried thereby, a knuckle or loose socket joint supported on a lug on said fixed jaw, a screw bolt carried by said knuckle or loose socket joint, a thumb nut carried by said screw bolt and in operative engagement with said movable jaw support, a movable tooth jaw adjustably seated in said movable jaw support, and means for automatically varying the rel-

ative angles of inclination between said movable jaw support and said movable jaw.

13. In a wrench, the combination of a fixed jaw, of a movable jaw support carried thereby, a knuckle or loose socket joint supported on a lug on said fixed jaw, a screw bolt carried by said knuckle or loose socket joint, a thumb nut carried by said screw bolt and in operative engagement with said movable jaw support, a movable tooth jaw adjustably seated in said movable jaw support, and means for automatically varying the relative angles of inclination between said movable jaw support and said movable jaw, said means comprising an integral extension of said movable jaw adapted to be slidably and automatically moved over an irregular plane on said fixed jaw.

14. In a wrench, the combination of a fixed jaw, a movable jaw, movable teeth within said movable jaw, and mechanism whereby said movable teeth may be automatically moved with reference to the angle of the fixed jaw, said mechanism comprising an extension of said movable jaw adapted to engage the fixed jaw.

15. In a wrench, the combination of a fixed jaw, a movable jaw straddling said fixed jaw and projecting below it, a knuckle joint stay bolt connecting said jaws, an adjustable knurl working therein, and a slotted housing permitting the rise and fall of said stay bolt.

16. In a wrench, the combination of a fixed jaw, a movable jaw straddling said fixed jaw and projecting below it, a knuckle joint stay bolt connecting said jaws, an adjustable knurl working therein, and a slotted housing permitting the rise and fall of said stay bolt.

Signed by me at Carpentersville Kane Co. Ill. this 25th day of April 1907.

HENRY ADALBERT SMITH.

Witnesses:

GEORGE EARLE WILBERN,  
JAS. W. JEFFREYS.