

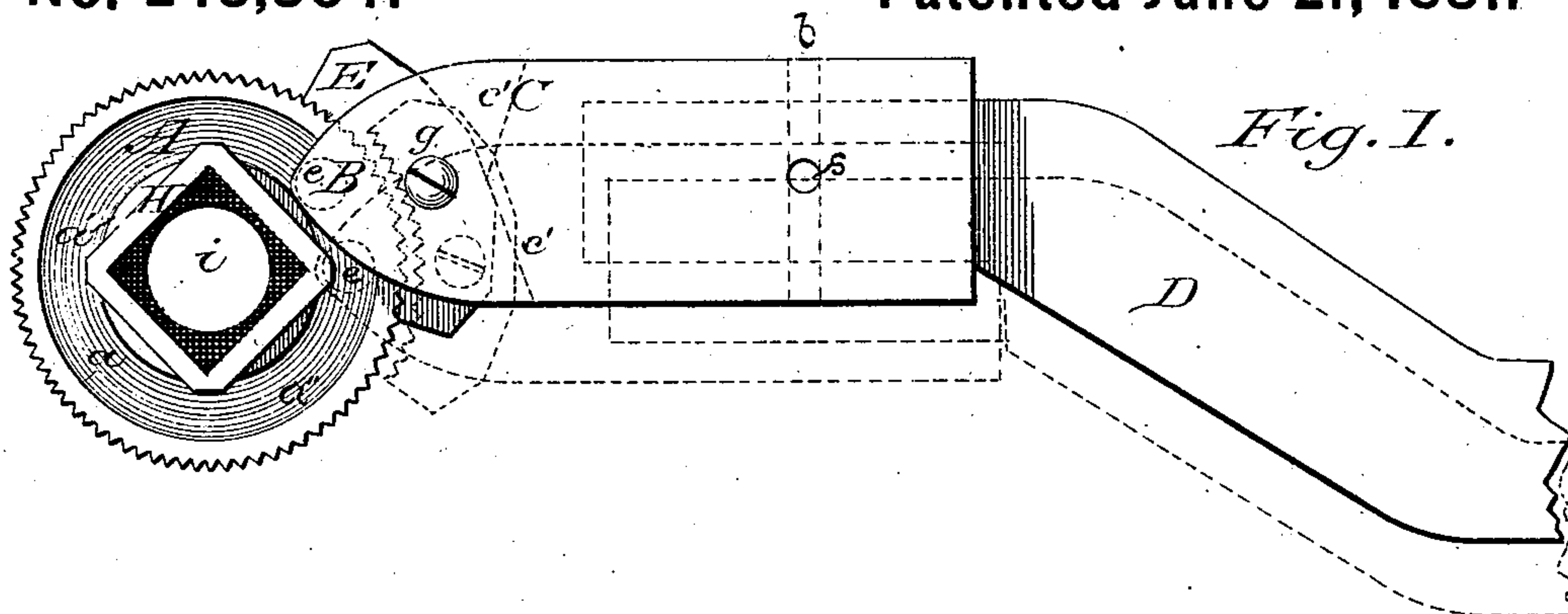
(Model.)

W. G. PRIDE & W. T. DONNELLY.

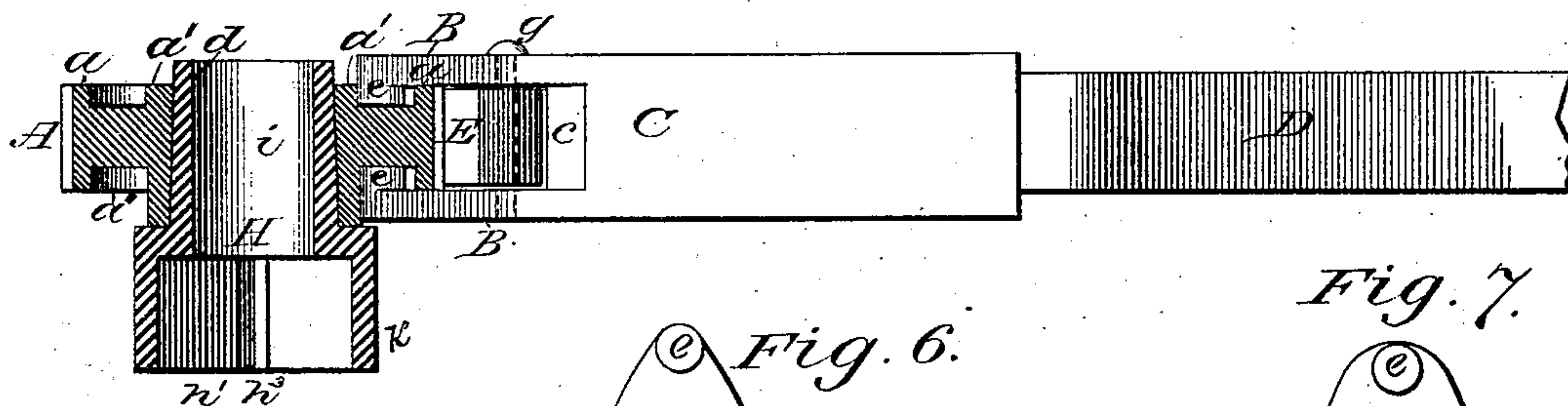
## Socket Wrench.

**No. 243,304.**

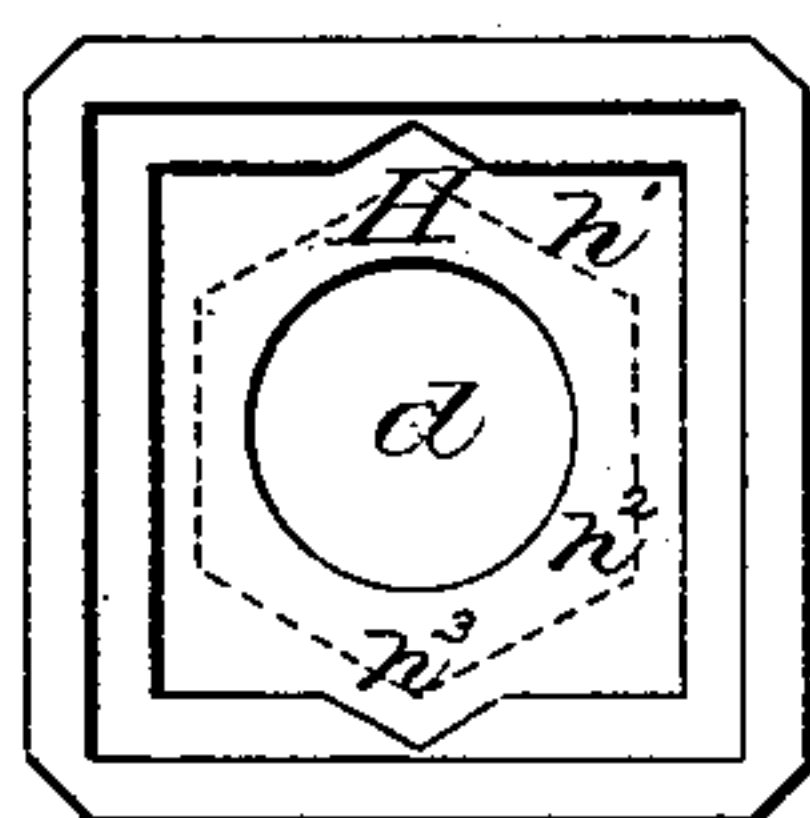
**Patented June 21, 1881.**



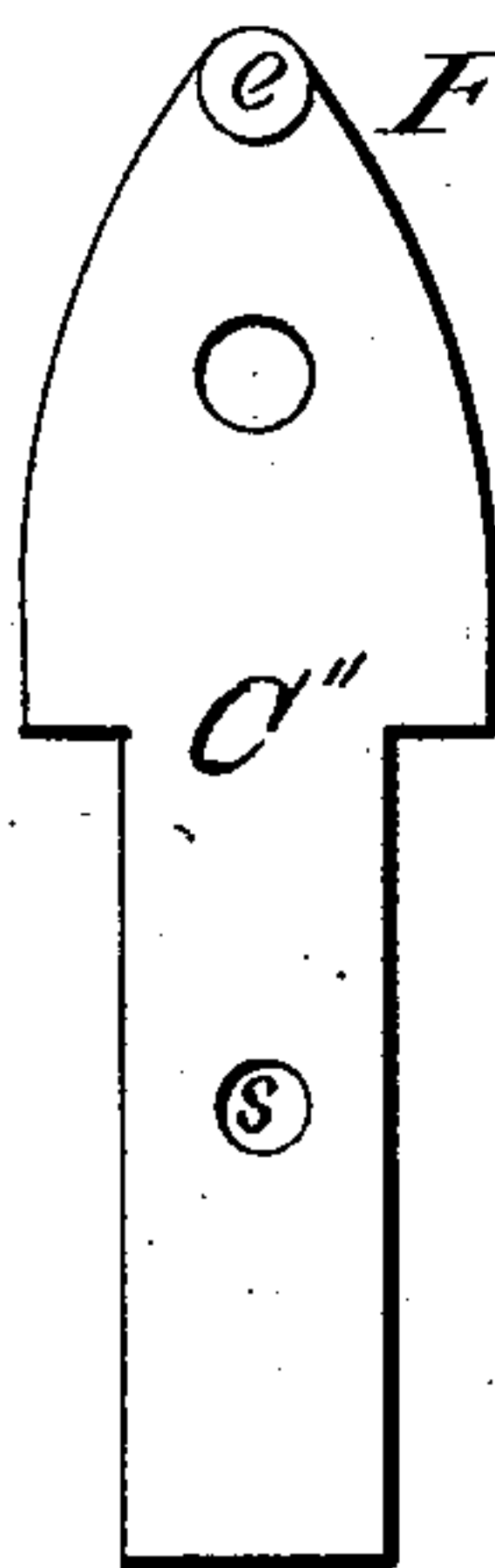
*Fig. 2.*



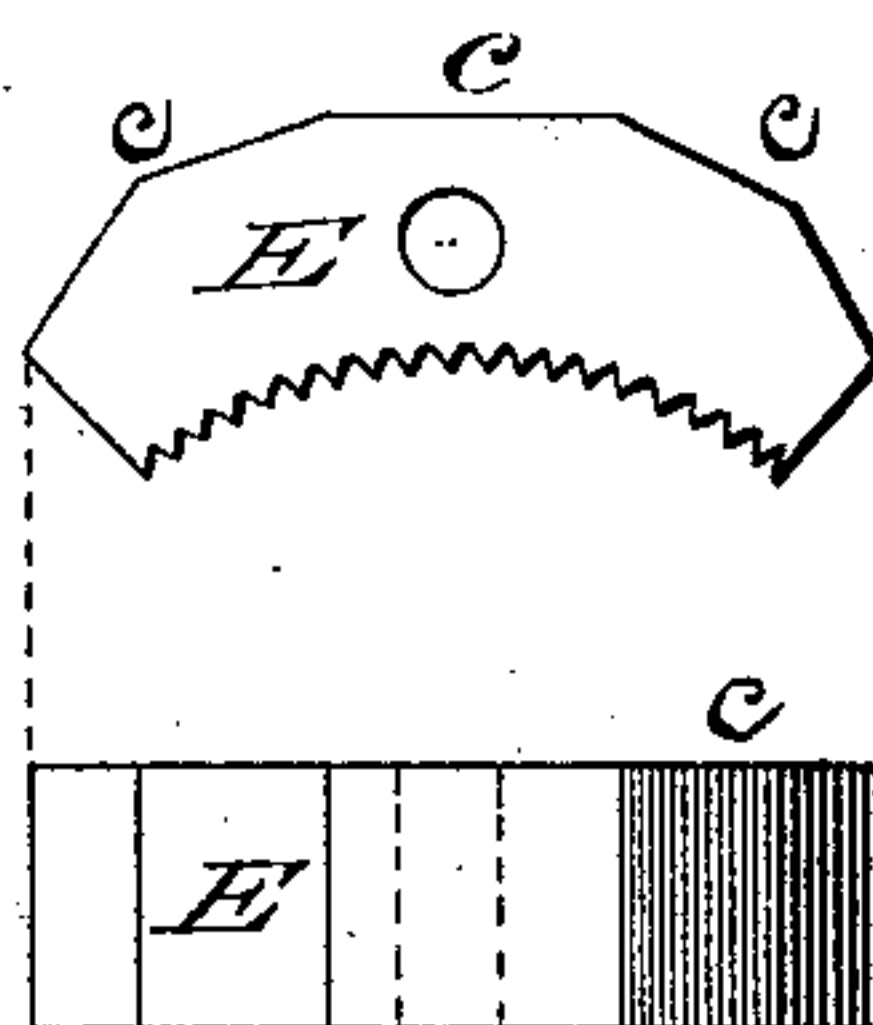
*Fig. 3.*



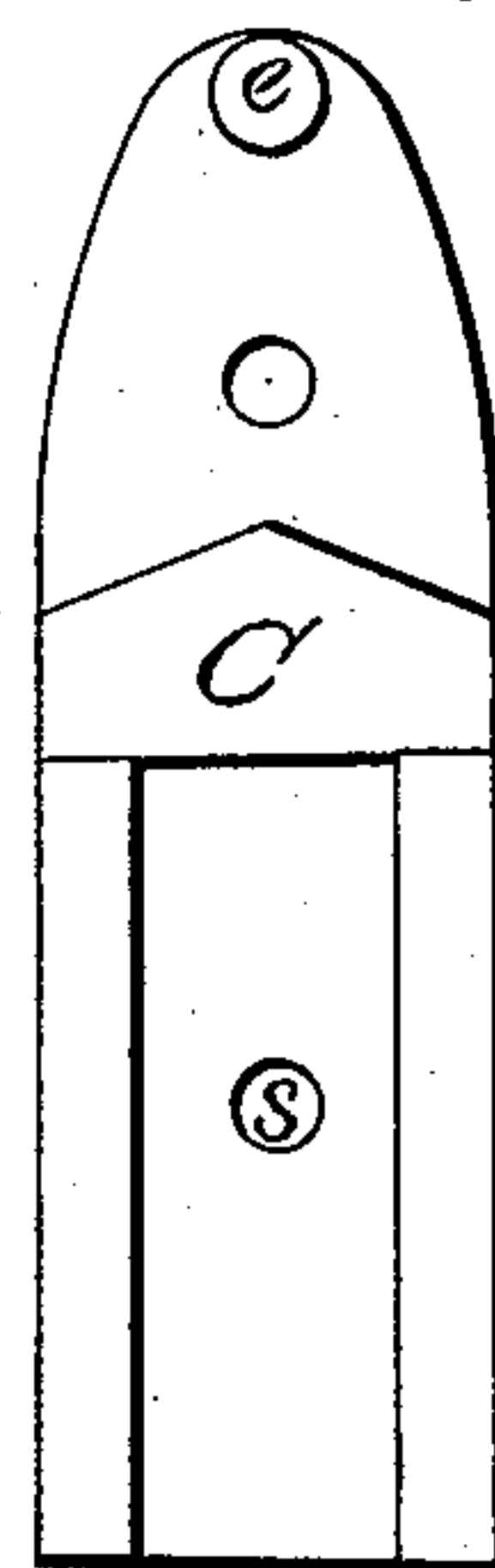
*Fig. 6.*



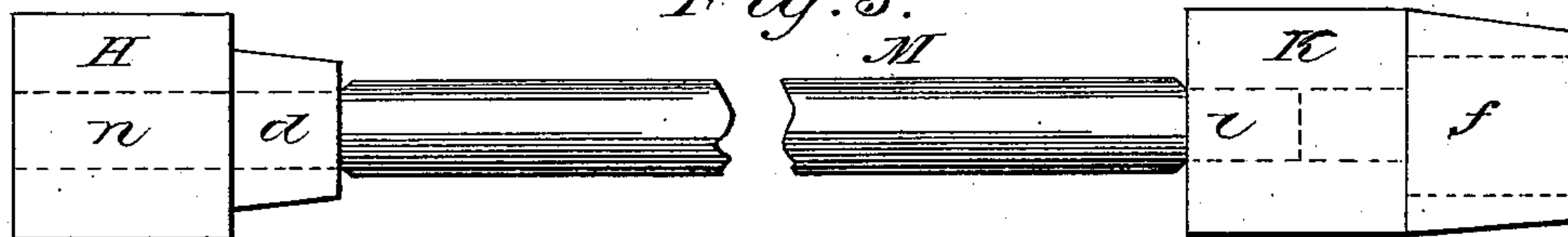
*Fig. 4.*



*Fig. 7.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

WILLIAM G. PRIDE, OF NEW YORK, AND WILLIAM T. DONNELLY, OF  
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## SOCKET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 243,304, dated June 21, 1881.

Application filed July 14, 1880. (Model.)

*To all whom it may concern:*

Be it known that we, WILLIAM G. PRIDE, of New York, in the county and State of New York, and WILLIAM T. DONNELLY, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Wrenches for Turning Nuts and for other Purposes, of which the following is a full, clear, and exact description, reference being  
10 had to the drawings accompanying and forming a part of this specification.

The object of our invention is to provide a wrench which is simple in construction, effective in working, and which possesses greater  
15 facility of adjustment than can be attained by the ordinary devices heretofore in use; and it consists in a peculiar combination and arrangement of a forked lever-bar with a cylindrical head, in connection with a segmental vibrating  
20 shoe.

It also consists in the combination, with the cylindrical head, of an adjustable socket, all as will be more fully hereinafter described.

In the accompanying drawings, Figure 1 is a plan view of our improved wrench, showing the operative parts both engaged and disengaged. Fig. 2 is a vertical sectional view of the cylindrical head detached, and with the adjustable socket inserted therein. Fig. 3 is a  
30 view of the socket from the under side. Fig. 4 is a detail view of the segmental shoe in side elevation, and Fig. 5 is a side view of the stem and socket. Figs. 6 and 7 are details of the parts of the lever-bar.

35 A is a cylindrical head, constructed with a channel or groove on both faces, and operates in connection with a ratcheted segment, as will be explained hereinafter.

C is the main bar or lever-bar of the wrench, which bar consists of box C' and plate C'', held together by screws. One end is provided with a square longitudinal opening, to serve as a socket to hold the handle D, which is adjusted and held therein by means of the screw or tapering pin b. The opposite end of this lever-  
45 bar C has a central longitudinal slot, converting it into a forked lever, within the prongs or jaws of which is pivoted a segmental brace or shoe, E, the front edge of such shoe being provided with a series of teeth, and the back or  
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inner edge with a bevel toward the center, as shown at c. The portion c' between the jaws B of the lever-bar is similarly beveled, so that when in operation the bevels or angular sides or points of the segment-shoe E and lever-bar C come into contact. A pin, g, passes through the jaws B and loosely through the shoe E, thus permitting the latter to have a rocking movement, while it is securely held in position. The head A is constructed in cylindrical form, with a broad peripheral edge, which is provided with teeth to correspond with those on the shoe E. It has a tubular opening slightly tapering toward one side, which opening is designed to receive a suitably-formed socket. The head is provided with an outer rim, a, and a similar inner rim, a', so that a groove or channel is formed on both the upper and lower faces of the head. Studs e e project from the ends of the jaws B and take into the groove or channel a'' in the head, and the studs e e travel the groove when a rotary motion is given to the head in the operation of tightening a nut or bolt. When in use the shoe E is engaged by the cylindrical head, the teeth meshing; but by a slight to-and-fro movement of the lever-bar C they are released from each other. When the device is adjusted upon the head of a nut or bolt and turned with a firm hold, the studs e e will bear against the inside of the flange or rim a, forming a fulcrum by such point of contact in connection with the shoe E, and then a pressure on the lever-bar C in any direction carries the head A with it.

H is an adjustable socket, provided with an opening, i, extending through it vertically, to allow of the passing up of the bolt or nut. The neck d is made somewhat tapering to conform to the gradual taper of the opening in the head A, so that a slight blow will drive it into the head and wedge it in place, as shown in Fig. 2. The head k of the adjustable socket H has a square opening, h', to adapt it to a square nut; but its rim is notched, as at h<sup>3</sup>, in order to admit of being used with prismatic nuts or bolts, as well as with square ones, and in Fig. 3 a hexagon nut, h<sup>2</sup>, is represented by dotted lines in the socket. This socket may be used with or without a stem, as occasion requires. In Fig. 5 the socket is shown with the stem M in-  
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serted at the end or neck *d*, and the head *n* is driven into the opening in the cylindrical head A. The stem M is designed for use with the socket where the nut or bolt to be turned is in a confined location, and where there is only room to insert the socket.

K is a movable socket, of similar construction to socket H, designed for use with the stem M, which is inserted at the end *l*, Fig. 5, while the end *f* takes over the nut or bolt to be operated.

The handle D, which may be made either straight, curved, or angular, has a square end made to conform to the socket-opening in the lever-bar C, and it is pierced with holes *s s*, which holes are arranged at right angles to each other, in order to admit the tapering pin *b* when the handle is changed in different positions. It may be inserted in four positions, and thus secure to the operator a greater freedom of movement, the grasping portion of the handle being arranged in the most convenient direction.

The operation of our device is as follows: The socket H having been driven into the opening in the head A, and its opening *k* adjusted over the nut or bolt to be turned, the operator gives a vibratory or to and-fro movement of the lever-bar C, and the teeth on the shoe E will mesh with the teeth on head A, and the head will be carried round with the movement of the lever-bar. When the pivotal points of the pin *g* and studs *e e* are brought in a direct line with the center of the head, the shoe E may be released by a side movement of the lever, and the shoe then carried around the head and again locked, and this rotation of the head can be continued until the nut is turned sufficiently to loosen or to withdraw it by hand. A great power is thus brought upon the nut or bolt, for when the teeth are firmly interlocked a strong force can be imparted to the head.

Our device is especially applicable where

there is but little space to operate in—such as corners and holes where nuts and bolts are to be turned, and where claw-wrenches would be of no use—as only space is needed for the head, the handle being so adapted as to be turned in whichever direction affords the most space to operate in conveniently. It can be inserted so as to be out of the way and not interfere with or retard the turning of the nut.

What we claim as new, and desire to secure by Letters Patent, is—

1. An improved wrench consisting of a slotted lever-bar having a serrated segment-shoe pivoted within it, and with a serrated cylinder-head adapted to engage the shoe, substantially as herein shown and described.

2. The combination, in a wrench, of a lever-arm provided with jaws and projecting studs, and a channeled cylinder-head, adapted to engage with a shoe loosely pivoted between said jaws, substantially as and for the purpose herein shown and described.

3. In a wrench, the combination of the lever-bar C with the cylindrical head A and pivoted shoe E, the said shoe being pivoted between the jaws of the lever-arm, and provided with a beveled surface to adapt it to a corresponding bevel on the lever-arm, substantially as and for the purpose set forth.

4. The combination of the handle D, lever-arm C, provided with the studs *e e*, vibrating shoe E, pivoted between the jaws B of the lever-arm, and a channeled cylindrical head, A, substantially as and for the purpose herein shown and described.

5. In combination with the head A, the sockets H and K and stem M, substantially as and for the purpose set forth.

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Witnesses:

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