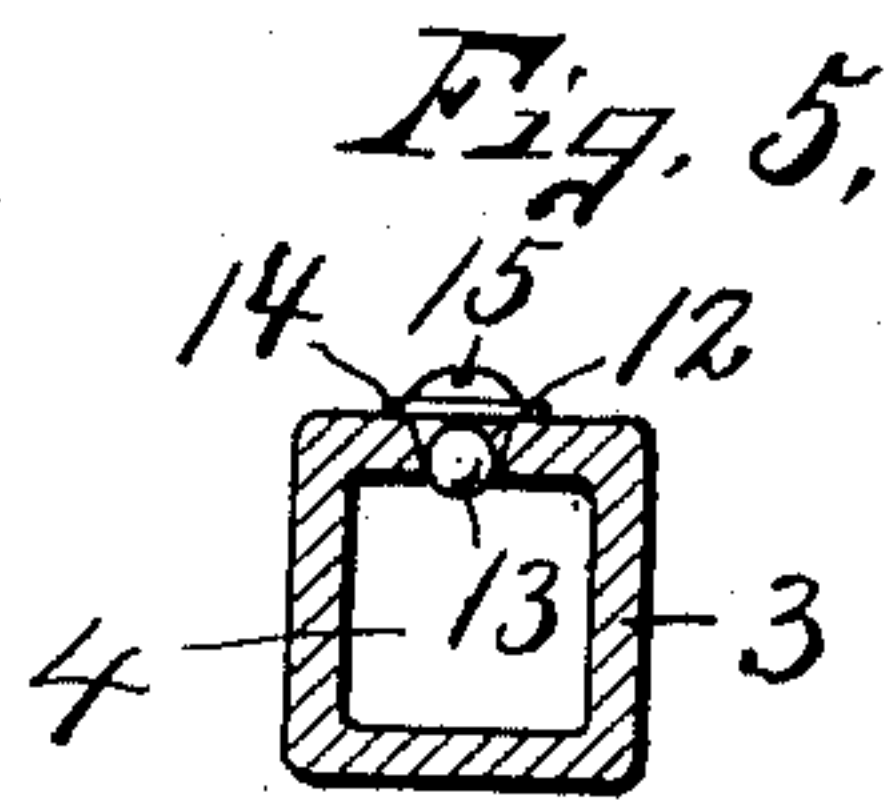
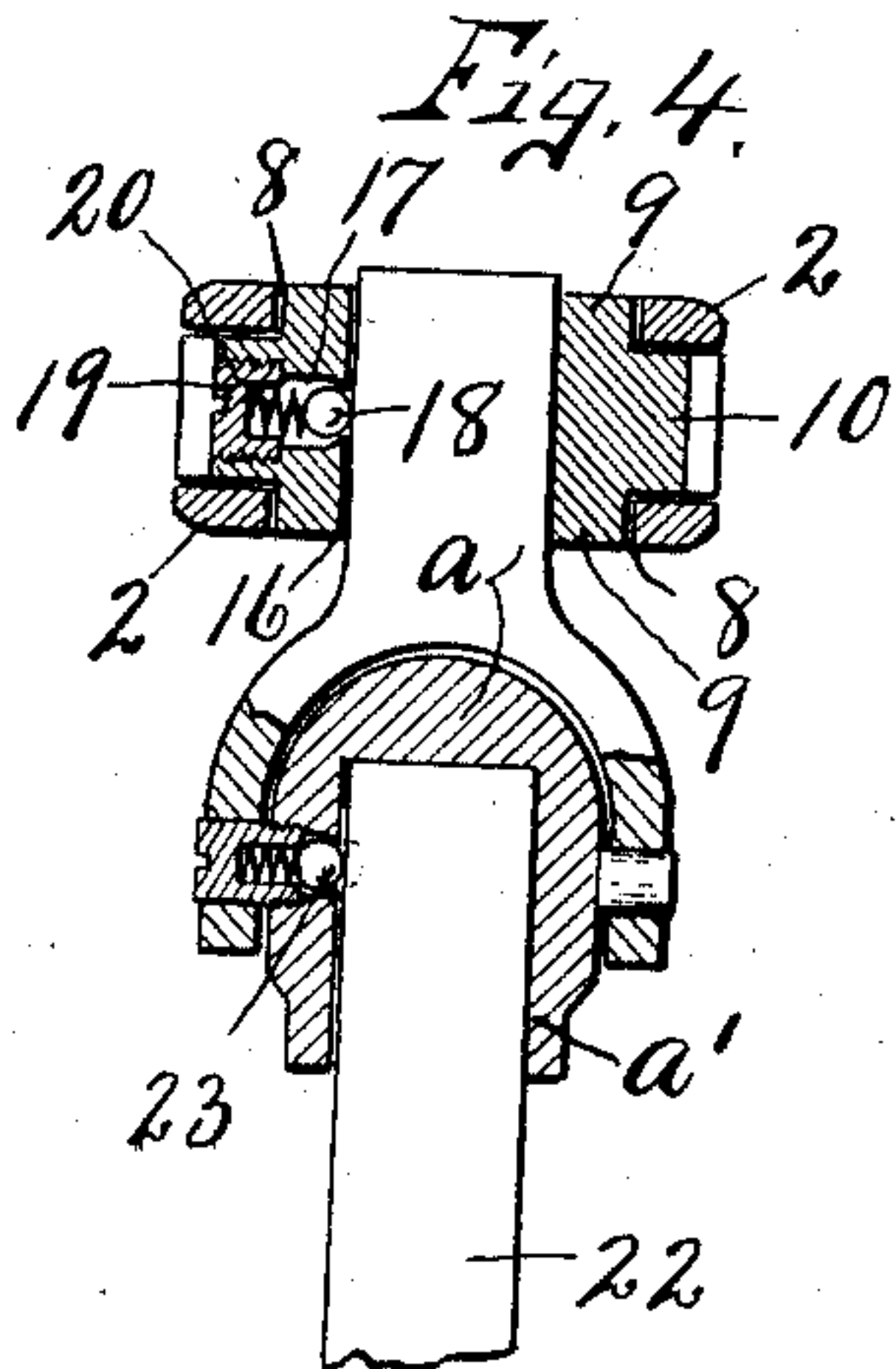
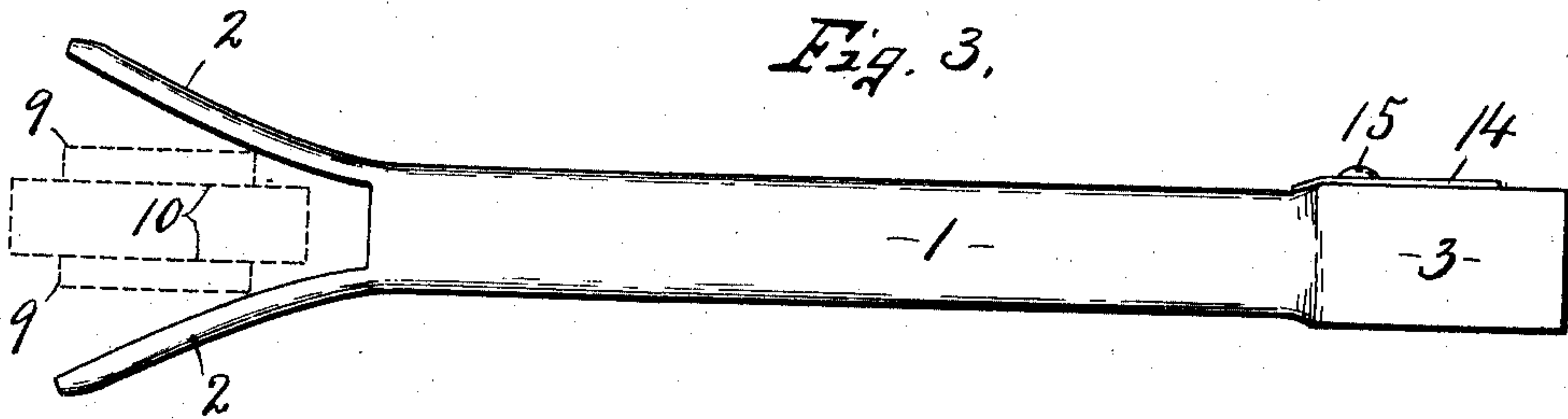
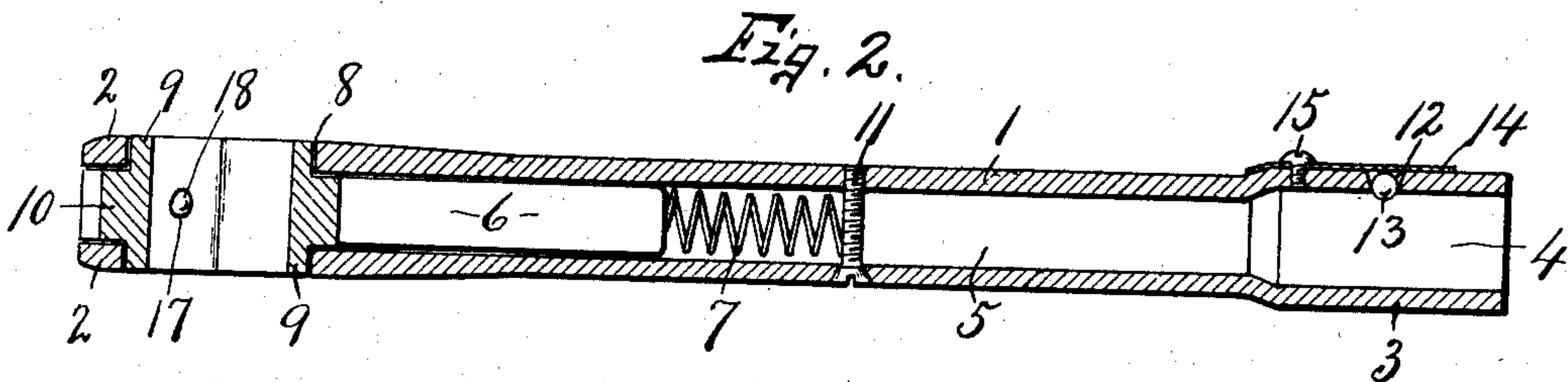
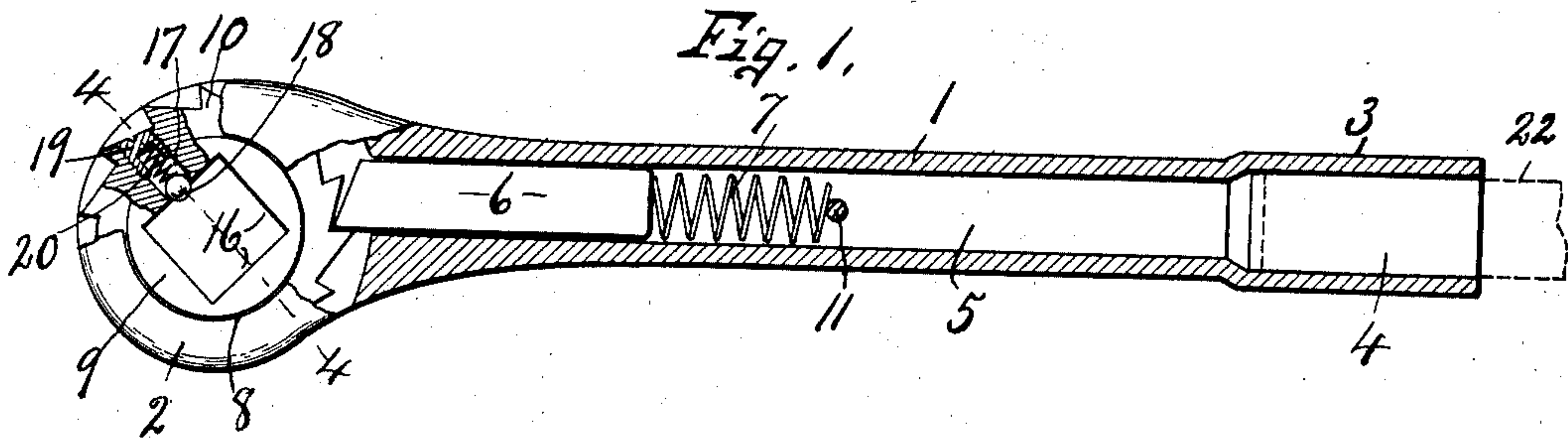


No. 873,977.

PATENTED DEC. 17, 1907.

J. J. ALBRECHT.  
RATCHET WRENCH.  
APPLICATION FILED MAR. 23, 1906.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JACOB J. ALBRECHT, OF SYRACUSE, NEW YORK.

## RATCHET-WRENCH.

No. 873,977.

Specification of Letters Patent.

Patented Dec. 17, 1907.

Application filed March 23, 1906. Serial No. 307,630.

*To all whom it may concern:*

Be it known that I, JACOB J. ALBRECHT, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Ratchet-Wrenches, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in ratchet wrenches comprising a hollow one piece handle having a bifurcated ratchet receiving head at one end and a tooth receiving socket in its opposite end.

My object is to produce a comparatively inexpensive ratchet wrench by making it with as few parts as possible and at the same time to increase the scope of utility of this class of devices.

This object is best carried out by making a hollow one-piece casing forming the handle and bifurcated ratchet receiving head, the opposite arms of which are bendable to and from each other to enable the ratchet wheel to be inserted between them, after which the sides are compressed upon the opposite hubs of the ratchet to retain the latter in place.

Other objects and uses will be brought out in the following description.

In the drawings,—Figures 1 and 2 are longitudinal sectional views of a ratchet wrench embodying the features of my invention, portions of the head of the wrench in Fig. 1 being shown in top plan. Fig. 3 is a side elevation of the hollow one-piece casing forming the handle and bifurcated ratchet-receiving head, the opposite arms of which are shown as bent or spread apart to permit the insertion of the ratchet wheel. Fig. 4 is an end view of the hollow one-piece casing, showing particularly the angular socket and means for frictionally retaining the tool in the socket. Fig. 5 is a cross sectional view on the line 5—5 of Fig. 3.

In carrying out the objects stated I provide a hollow or tubular one-piece metal casing forming a handle —1— terminating at one end in a bifurcated ratchet receiving head having opposed bendable arms —2— and terminating at its opposite end in an angular tool-receiving head —3— having a lengthwise socket —4— forming an enlarged continuation of the lengthwise central opening, as —5—, which extends entirely through the handle and communicates with the space between the arms —2— to enable the sliding

pawl, as —6—, and its actuating spring —7—, to be inserted therethrough. The arms —2— are provided with circular openings —8— for receiving the opposite hubs, as —9— of a ratchet wheel —10—, which is interposed between the arms —2— and rotatable in the circular openings or bearings —8—.

The arms —2— are first spread apart as seen in Fig. 3 a sufficient distance to permit the insertion of the ratchet wheel —10— between them with its hubs —9— in registration with the openings —8—, after which these arms —2— are compressed or drawn together as seen in Fig. 2, into parallelism, or until the hubs —9— are properly seated in their respective bearings or openings —8—, leaving sufficient clearance between the contiguous faces of the arms and the ratchet wheel to permit the latter to rotate freely in its bearings.

The pawl or sliding bolt —6— is movable endwise in the lengthwise opening —5— of the handle —1— of the ratchet wheel —10—. The spring —7— is interposed between the opposite end of the pawl or sliding bolt —6— and a suitable abutment, which in this instance consists of a screw —11— extending transversely through the handle —1— and socket —5— and may be removed at will to permit the spring —7— and pawl —6— to be readily removed or reinserted through the lengthwise opening —5— and socket —4—.

When the bolt —6— and its spring —7— have been inserted in operative position with reference to the ratchet wheel the spring —7— is compressed by any convenient tool, after which the screw —11— is inserted in the handle to hold the spring and sliding bolt in operative relation to the ratchet wheel.

The socket —4— is angular in cross section and adapted to receive various tools having a shank of the same angular cross section and is provided in one side with an aperture —12— in which is seated a ball —13—, the inner end of said aperture —12— being constricted and of slightly less diameter than the diameter of the ball to allow the latter to project a slight distance into the socket, said ball being retained in the socket by a spring, as —14—, which is secured to the outer face of the head —3— by suitable fastening means, as a screw —15—. The object of this ball —13— and spring —14— is to form a frictional holding device for the tools which



may be inserted into the socket —4— to prevent accidental displacement of the tools while the device is in use. In like manner the ratchet wheel —10— is provided with a central opening —16— extending axially therethrough and of angular cross section for receiving a similarly formed shank of a tool-holder, as —a—. This ratchet wheel is also provided with a radial opening —17— having its inner end communicating with the central opening —16— and receiving a friction ball —18— the inner end of said opening —17— being constricted to a diameter slightly less than that of the ball, which latter projects slightly into the opening —16— to frictionally engage and hold the tool-holder as —a—, in operative connection with the ratchet wheel. The plug or bushing —19— is screwed into the outer end of the opening —17— and between this bushing and the adjacent face of the ball is inserted a spring —20— for holding the ball against its seat with its inner face protruding into the opening —16— for the purpose previously mentioned.

The tool-holder —a— is shown in Fig. 4 as provided with a swinging member —a'— having a tool receiving socket —21— of substantially the same size and form as the socket —16— for receiving a tool, as —22—. This swinging member —a'— is mounted in a bifurcated end of the part which is inserted in the socket —16— and is provided with a friction bearing —23— similar to the bearing —18— for retaining the tool —22— in the socket —21—. The socket —16— is of substantially the same cross-sectional form and size as the socket —4— in the head —3— so that the tools may be interchanged and used

either in the head —3— or ratchet wheel —10—.

The invention briefly described consists in providing a hollow one-piece casing forming the handle —1— bifurcated ratchet-receiving head or bendable arms —2— and tool-receiving head —3— in combination with the ratchet wheel upon which the arms —2— are compressed and friction devices, one in the ratchet wheel and one in the opposite end of the handle for retaining the tools which it may be desired to use in their respective sockets.

The invention further consists in the insertion of the pawl and its operating spring through one end of the handle in which they are retained by a removable transverse abutment, such as a screw.

What I claim is,

In a ratchet wrench, a hollow malleable handle terminating at one end in diverging arms each provided with an aperture, a ratchet wheel having hubs journaled in said apertures of the arms and having a transverse opening, the inner end of which is of less diameter than the outer end and communicates with the axial opening of said ratchet wheel, a ball seated in said aperture and normally projecting partially into the axial opening of the ratchet wheel, a spring in the aperture bearing against said ball, and a plug threaded into the outer end of the aperture, as and for the purpose described.

In witness whereof I have hereunto set my hand on this 19th day of March 1906.

JACOB J. ALBRECHT.

Witnesses:

H. E. CHASE,  
J. M. HAMMEKEN.