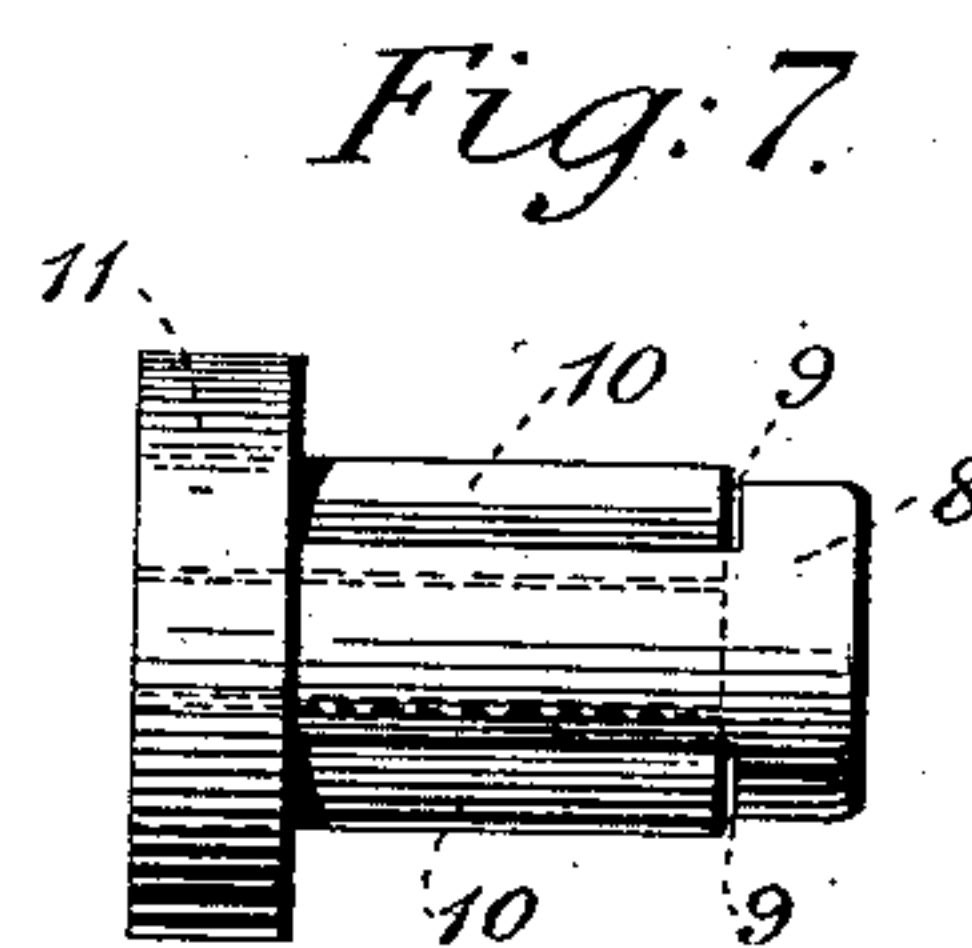
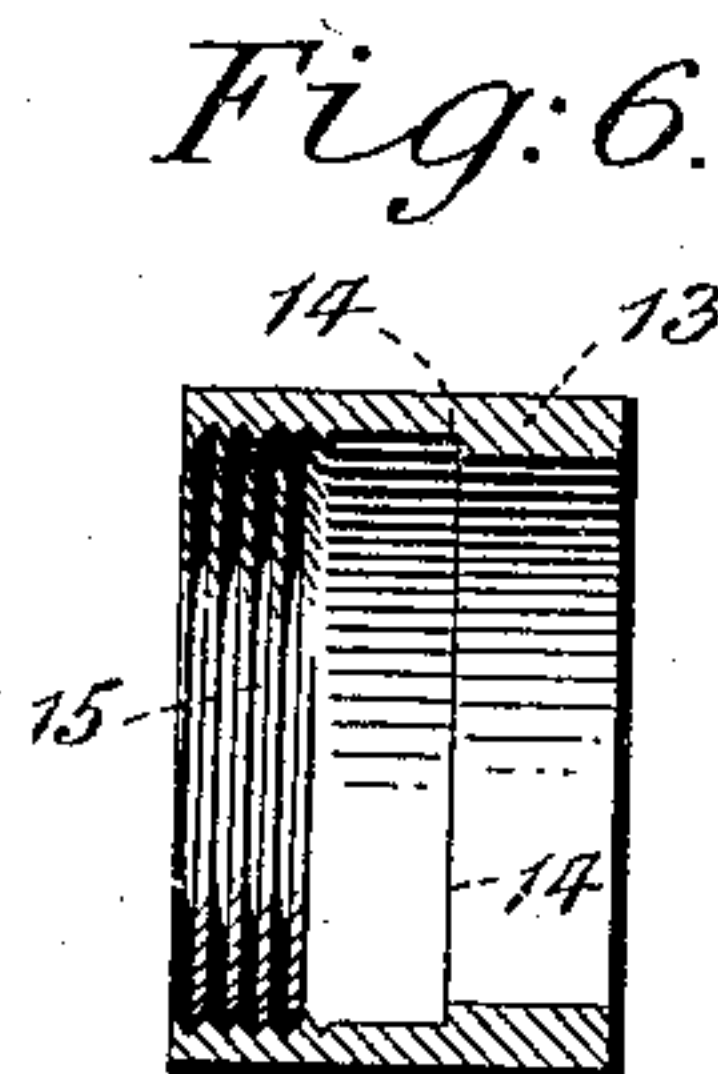
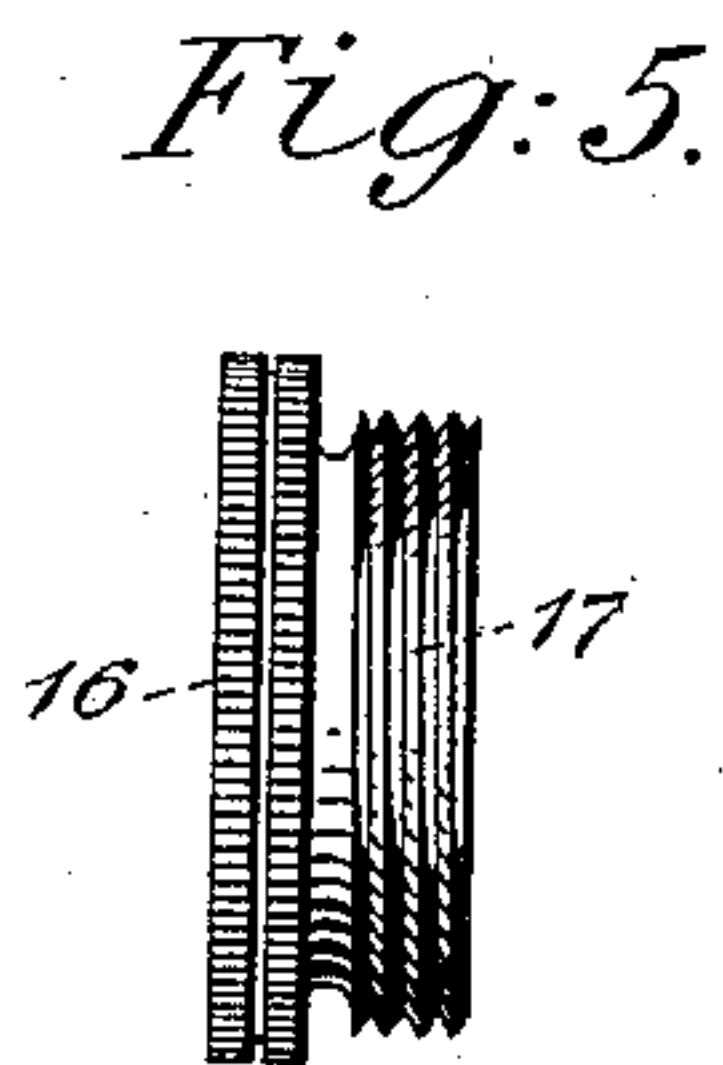
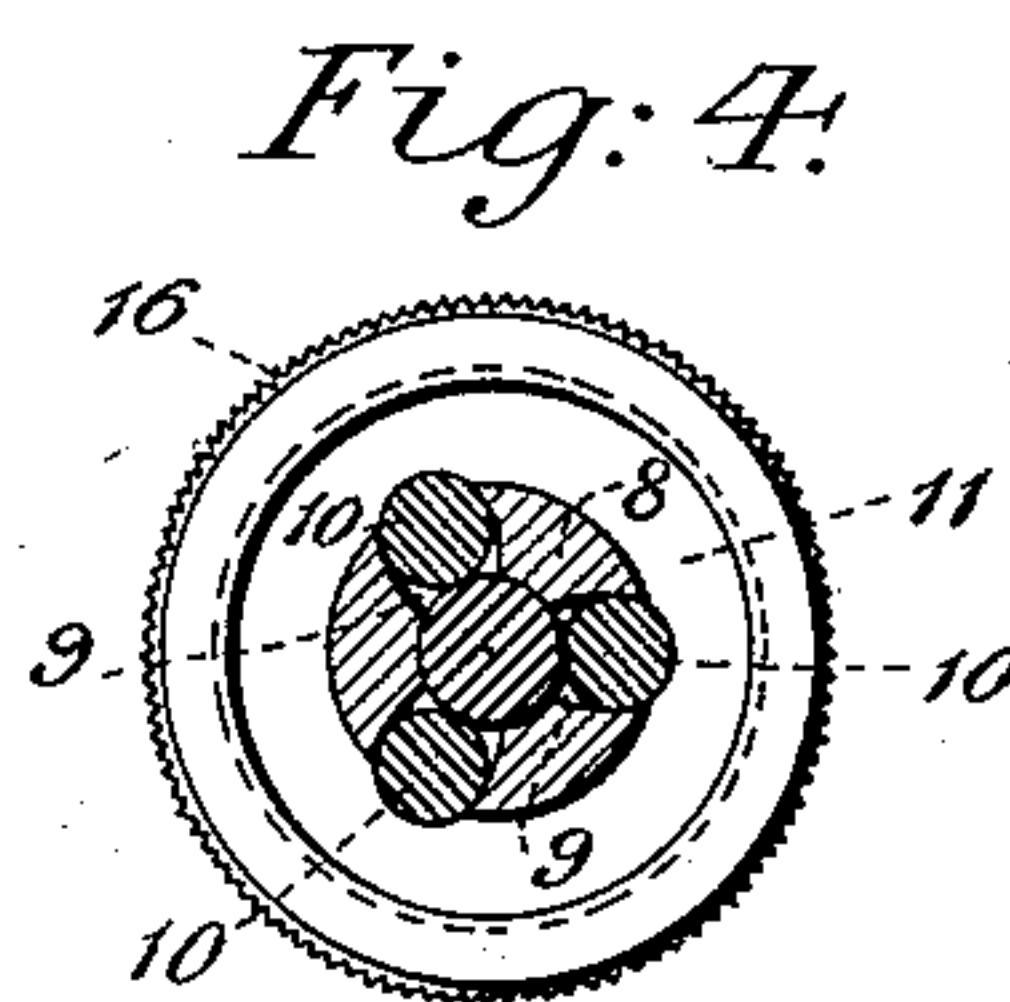
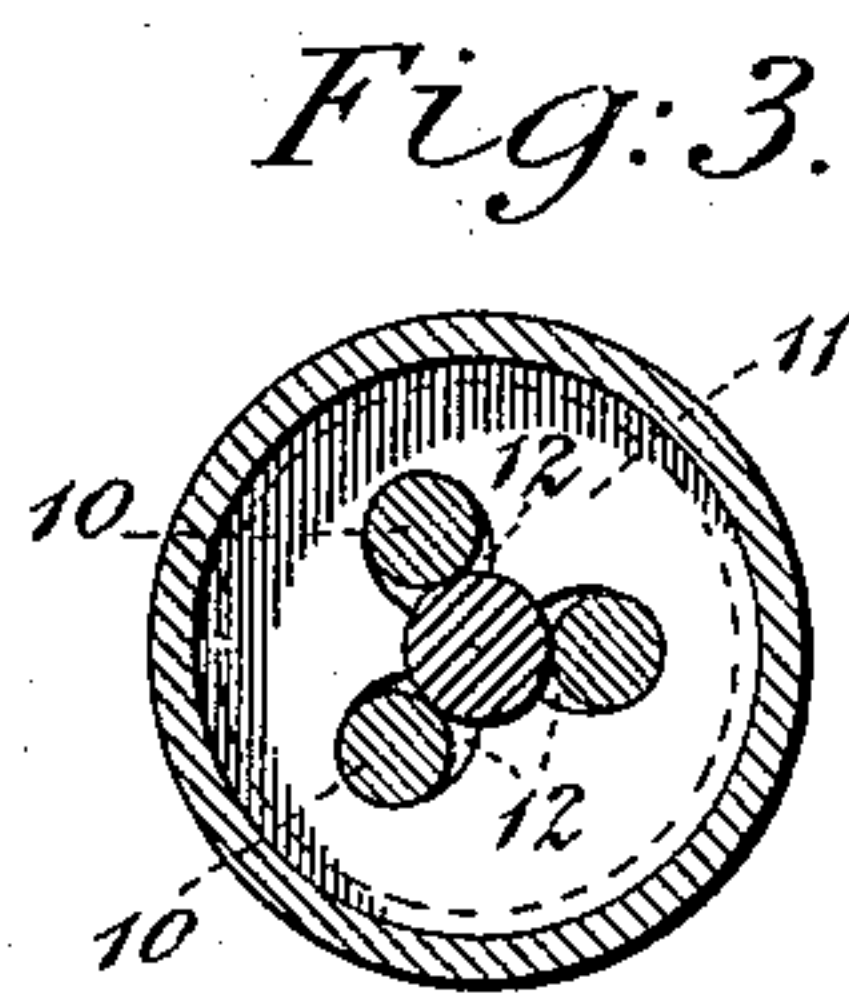
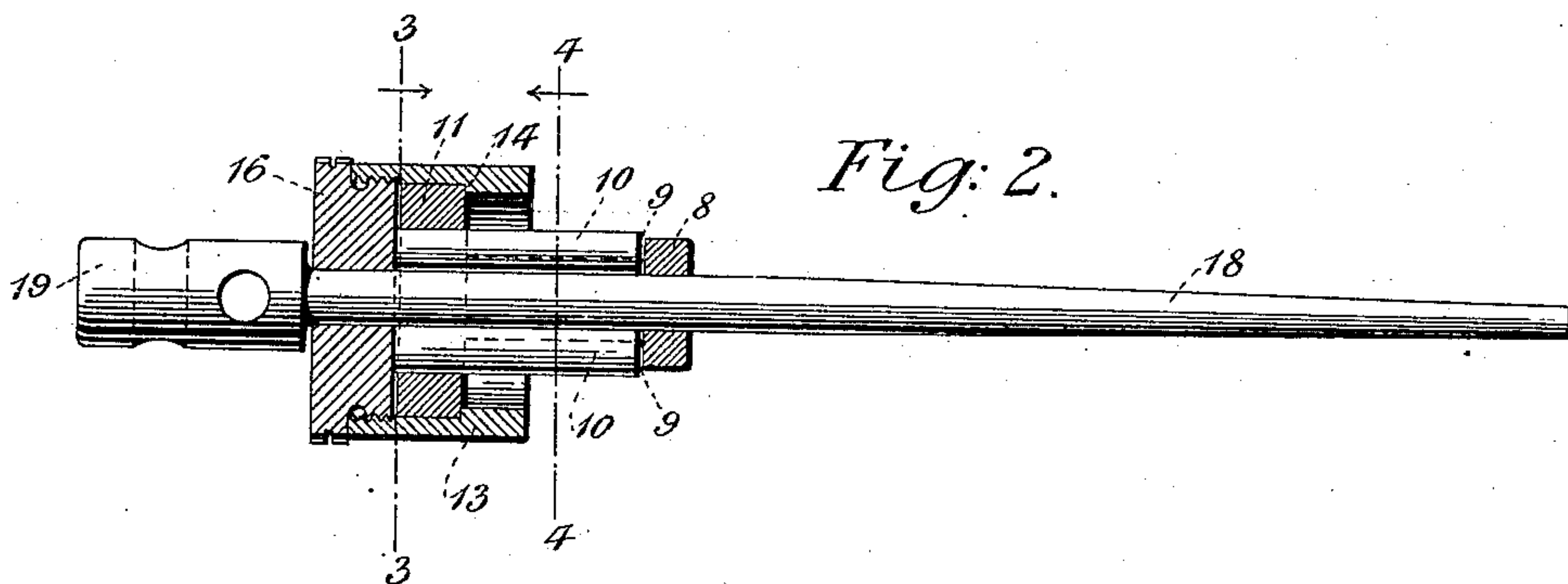
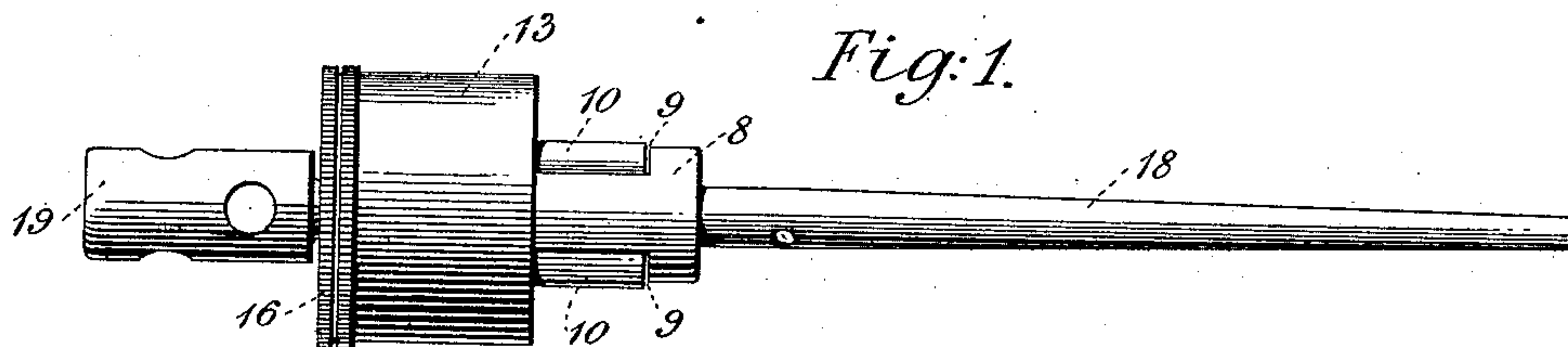


No. 842,569.

PATENTED JAN. 29, 1907.

W. H. MATHERS.
TUBE EXPANDER.
APPLICATION FILED OCT. 5, 1906.



WITNESSES:
J. A. Rennie
J. Conradi

INVENTOR
William H. Mathers
BY
Thos H. Gowersock
ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM H. MATHERS, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM M. DUDGEON, OF COLD SPRING HARBOR, NEW JERSEY, EXECUTOR OF RICHARD DUDGEON, DECEASED.

TUBE-EXPANDER.

No. 842,569.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed October 5, 1906. Serial No. 337,513.

To all whom it may concern:

Be it known that I, WILLIAM H. MATHERS, a citizen of the United States, residing at New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Tube-Expanders, of which the following is a specification.

This invention relates to tube-expanders, and has for its object the provision of a tool of this character which shall be simple and inexpensive in construction and dependable and durable in operation.

My invention further contemplates a tube-expander comprising a minimum number of parts and one in which each part is capable of being made entirely automatically by machinery, whereby no more handwork than is necessary for polishing and assembling is required to produce the finished product.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side view of a tube-expander embodying my invention. Fig. 2 is a central longitudinal section of the same. Figs. 3 and 4 are transverse sections on the lines 3-3 and 4-4, respectively, of Fig. 2; and Figs. 5, 6, and 7 are detail views of parts hereinafter described.

Referring now to the drawings in detail, numeral 8 refers to a tubular stock provided with longitudinally-extending slots 9-9, preferably three in number, equidistantly disposed from each other and within which are placed the rollers 10-10. Each of these slots is of comparative dimensions and suitable configuration to check lateral movement of the roller therein in both directions, said roller having, however, considerable lateral play therein.

The stock 8 is provided with an enlarged cylindrical head 11, which is preferably integral therewith and which has apertures 12-12 therein corresponding in position and preferably in configuration to the slots 9-9 in the stock 8, of which slots they form continuations. In assembling the parts the rollers 10-10 are inserted through these apertures.

The guide or guard ring 13 has a portion of its bore enlarged in diameter, forming an an-

nular shoulder 14, and is provided with the interior screw-threads 15. The head 11 of the stock 8 snugly fits within the enlarged portion of the bore and against the shoulder 14.

The cap 16 is provided with screw-threads 17, meshing with the threads 15, and serves to retain the rollers in position in their respective slots and at the same time lock the three principal parts firmly and rigidly together. This cap is centrally apertured for the reception of the mandrel, which I have shown of common and well-known pattern, provided with the tapering shank 18 and striking-head 19, apertured for the operating-lever. (Not shown.)

In operation the device which I have just described does not differ from other well-known forms of impact roller-expanders. In expanding the tubes of boilers, for which purpose a tool of this character is most generally employed, the mandrel is wholly or largely withdrawn and the stock 8 inserted in the end of the tube, the ring 13 contacting with the plate and gaging extent of insertion. The mandrel is then driven in and rotated from time to time, thus separating and rotating the rollers 10-10 and effecting the expansion of the tube end to any desired degree.

It will be noted that apart from the rollers and mandrel the device described comprises three parts only—i. e., the stock 8, the ring 13, and the cap 16—each of which is capable of being automatically made by machinery. Furthermore, while the head 11 of the stock 8 is firmly held between the shoulder 14 of the ring 13 and the cap 16 it is nevertheless free to rotate therein, so that during the operation of the device the ring 13, which is in contact with the boiler-plate, may remain stationary while the stock 8 is being rotated, thereby eliminating friction between ring and plate, and thus saving power and enhancing wearing qualities.

While I do not claim novelty for the broad idea of providing a non-rotating guard or guide ring with a rotating stock, I do claim to have materially simplified and otherwise improved the construction of expanders possessing this advantageous feature.

It will be further noted that I have provided a firm and rigid structure without the use of screws or other fastening means requiring special tools. The parts of my im-

proved expander may be rapidly and readily assembled entirely by hand.

Many modifications of minor details of my improved tube-expander will doubtless readily suggest themselves to those skilled in the art to which it appertains, and I therefore do not desire to limit my invention to the specific construction herein shown and described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a tube-expander, the combination, with the stock and the rollers therein, of a guard or guide ring in which said stock is rotatively mounted, and a retaining-cap screwed into said ring.

2. In a tube-expander, the combination, with the stock and the rollers therein, of a guard or guide ring in which said stock is rotatively mounted, and means secured directly to said ring which at the same time retain said stock in said ring and said rollers in said stock.

3. In a tube-expander, the combination, with the stock and the rollers therein, said stock being provided with an enlarged bearing-head at its inner end, of a guard or guide ring in which said head is rotatively mounted, and a retaining-cap screwed into said ring.

4. In a tube-expander, the combination, with a stock provided with longitudinal slots and rollers in said slots, of a bearing member within which said stock is rotatively mount-

ed, and means secured directly to said member which at the same time retain said stock in said member and said rollers in said stock.

5. In a tube-expander, the combination, with a stock provided with a bearing-head and roller-containing slots, of a guard or guide ring in which said head is rotatively mounted, and a member secured directly to said ring and cooperating therewith to retain said stock in said ring and said rollers in said slots.

6. In a tube-expander, the combination, with a stock provided with slots and rollers in said slots, of a bearing member within which said stock is rotatively mounted, and a cap secured directly to said member which at the same time retains said stock in said member and said rollers in said slots.

7. In a tube-expander, the combination, with a stock provided with a bearing-head and roller-containing slots, of a guard or guide ring in which said head is rotatively mounted, and a cap screwed into said ring which at the same time retains said stock in said ring and said rollers in said slots.

In testimony of the foregoing I have hereunto set my hand in the presence of two witnesses.

WILLIAM H. MATHERS.

Witnesses:

JAMES W. NELSON,
JAS. MOORE.