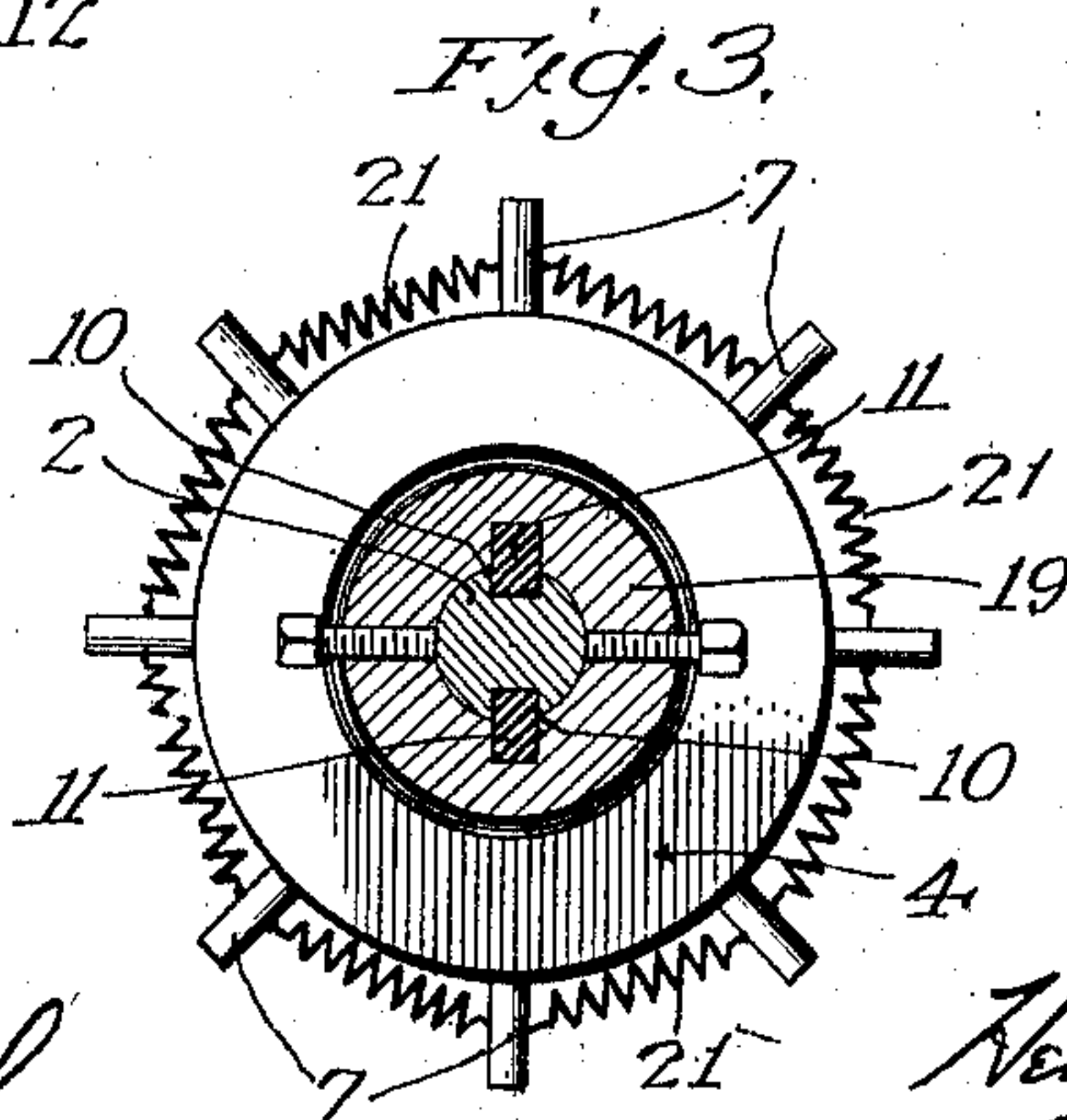
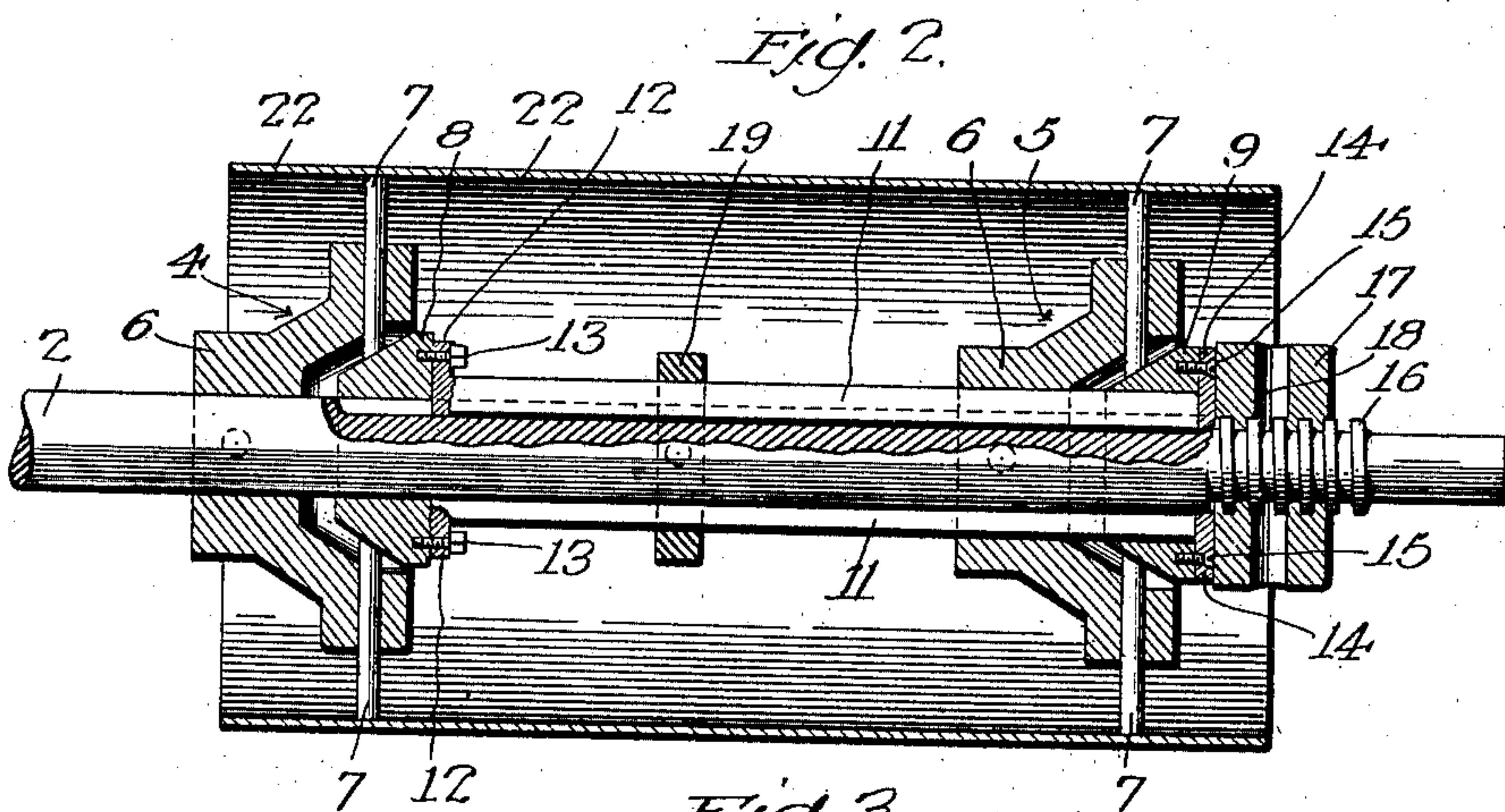
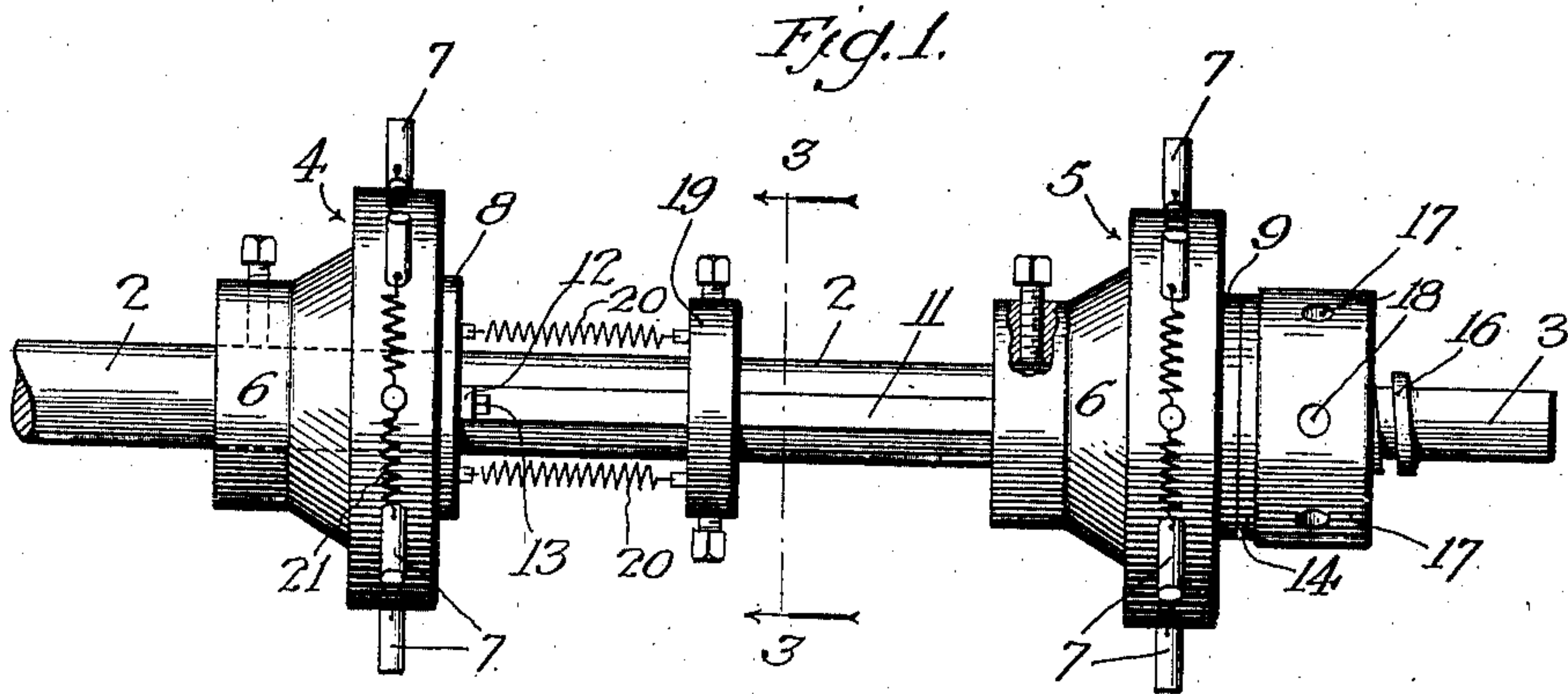


H. W. LUNCEFORD.
EXPANDING MANDREL.
APPLICATION FILED MAY 24, 1909.

963,603.

Patented July 5, 1910.



Witnesses:

Lute S. Altor,

Harry L. Leather

Inventor:

Henry W. Lunceford.

By Brooks & Ridders
Attorneys

UNITED STATES PATENT OFFICE.

HENRY W. LUNCEFORD, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO
WESTERN PIPE AND STEEL CO., OF LOS ANGELES, CALIFORNIA, A CORPORATION
OF CALIFORNIA.

EXPANDING MANDREL.

963,603.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed May 24, 1909. Serial No. 498,073.

To all whom it may concern:

Be it known that I, HENRY W. LUNCEFORD, a citizen of the United States of America, residing at Los Angeles, in the county of Los Angeles, State of California, have invented a certain new and useful Expanding Mandrel; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a mandrel, more particularly to one provided with expanding members.

One object of the invention is to provide a construction in which a plurality of expanding members are simultaneously actuated to expand them to hold work.

Other objects and the advantages of the invention will be apparent to those skilled in the art from a consideration of the following description of one form of construction in which the invention may be embodied, taken in connection with the accompanying drawings, in which—

Figure 1 is an elevation of the mandrel; Fig. 2 is a longitudinal section of the same, and Fig. 3 is a section taken on the line 3—3 of Fig. 1.

The shaft 2 of the mandrel may be held and rotated in a lathe or the like (not shown), and it is provided with a reduced cylindrical portion 3 which may be steadied by the tail-stock of the lathe. Mounted upon the shaft are recessed expanding members 4 and 5, each of which may comprise a hub 6 rigidly secured to the shaft and an integral enlarged portion having radial openings therein in which are disposed pieces 7. The radial openings in each member communicate with the recess therein; the recess being preferably frusto-conical in form. The ends of pieces 7 normally extend into the recess and next to the shaft are beveled. Each expanding member is provided with a movable part adapted to fit the recess therein for projecting the pieces 7 outwardly therefrom. The part pertaining to member 4 will be designated by the numeral 8, while that of member 5 will be designated by numeral 9. Shaft 2 may have longitudinal channels 10 in which are disposed bars 11, said bars having upturned ends 12 through which pass capscrews 13 by which said bars are affixed to part 8. The portions of bars 11

contiguous to expanding member 5 pass through the hub of said member and through part 9, and the bars at each of their ends contact with a washer 14 secured to part 9 by screws 15. Shaft 2 has a threaded portion 16 upon which is mounted a capstan nut 17, having therein openings 18 in which a bar may be inserted for turning said nut. Upon shaft 2 between the expanding members 4 and 5 is mounted a collar 19 which forms a guide for bars 11, preventing them from springing outwardly from channels 10. Attached at one of their ends to collar 19 and at their other ends to part 8, are springs 20, serving to retract bars 11, parts 8 and 9 and washer 14, when nut 17 is turned to move in a direction away from member 5. Pieces 7 are provided with springs 21 to press them toward shaft 2 when the parts 8 and 9 are moved by springs 20.

The mode of operation of this invention may be as follows: A hollow cylindrical piece of work 22 such as, for instance, a length of pipe or tubing, is slipped over the mandrel. Nut 17 is then turned to expand members 4 and 5, the mechanical interconnection between the members causing them to be simultaneously actuated.

While one form of apparatus in which the invention may be embodied has been illustrated and described, it is obvious that various modifications and changes may be made, and the right is reserved to all such modifications and changes as do not depart from the spirit and scope of the invention.

I claim:

1. In an expanding mandrel, in combination, a shaft, expanding members spaced longitudinally of said shaft, said members including parts movable relatively to said shaft, channels in said shaft, rods in said channels, said rods interconnecting said movable parts, a collar upon said shaft for holding said rods in place in said channels, and means for actuating the parts.

2. In an expanding mandrel, the combination of a shaft, a member fixed thereon, said member provided with a frusto-conical recess and having pieces in openings communicating with said recess, said pieces normally extending into said recess and having the ends in the recess beveled, a part mounted on said shaft, said part adapted to fit in said recess and slidably movable thereinto for projecting said pieces outwardly from

the member, and means to retract said part from said recess.

3. In an expanding mandrel, in combination, a shaft, expanding members spaced longitudinally of said shaft, said members including parts carried by said shaft and movable relatively thereto, channels in said shaft, rods in said channels, said rods interposed between said parts, a collar for holding said rods in place in said channels, and springs secured to said collar and one of said parts.

4. In an expanding mandrel, in combination, a shaft, expanding members spaced longitudinally of the shaft, each provided with a recess and having pieces normally extending into the recess and each including a

part movably mounted on the shaft adapted to fit in the recess for projecting the pieces outwardly therefrom, bars slidably interposed between the parts, means associated therewith for normally retracting the parts from the recesses, and a nut on the shaft for moving the parts into the recesses.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses at Los Angeles, county of Los Angeles, State of California, this 15th day of May A. D. 1909.

HENRY W. LUNCEFORD.

Witnesses:

JOHN MURRAY MARSHALL,
HARRY A. BROOKS.