

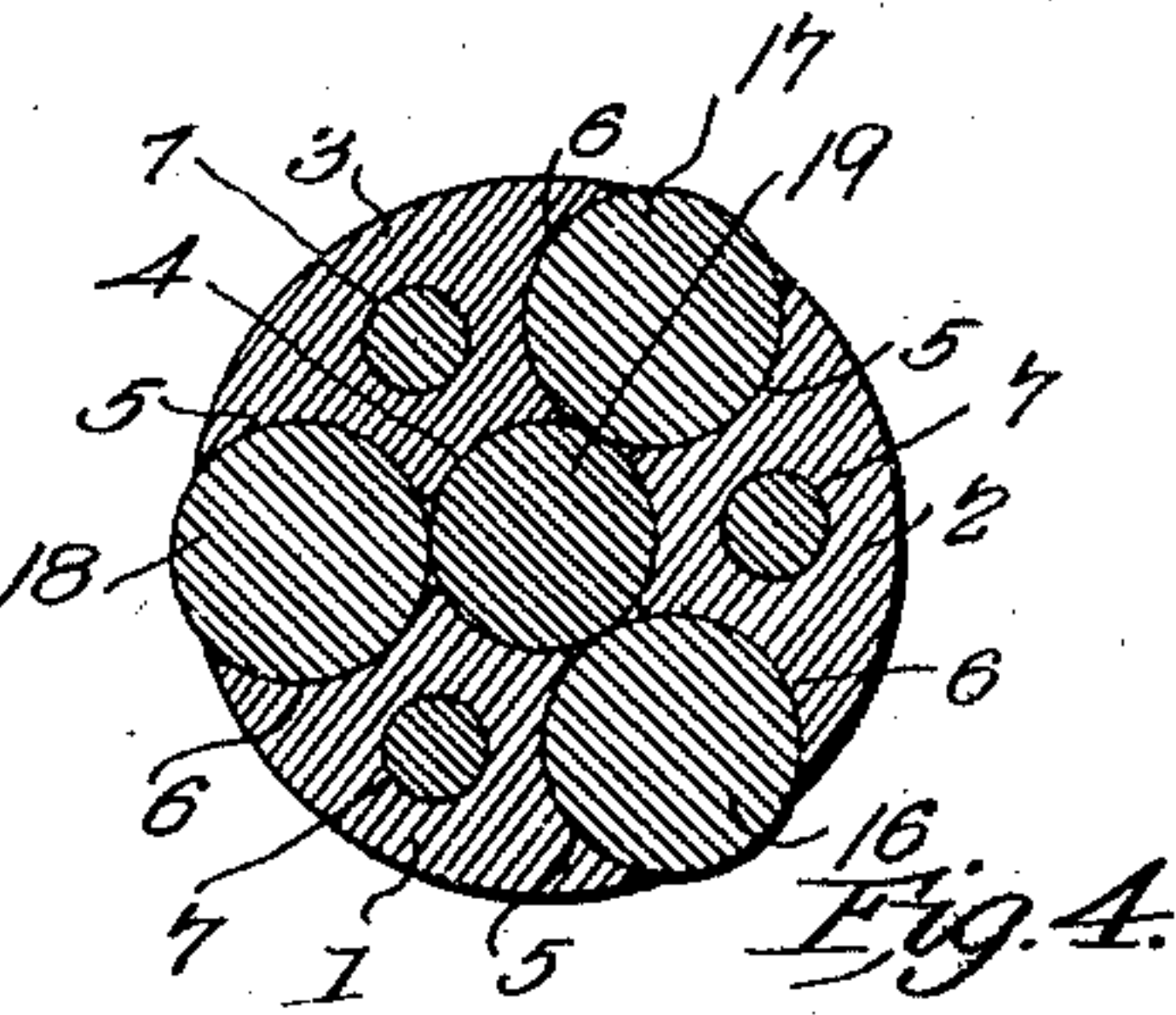
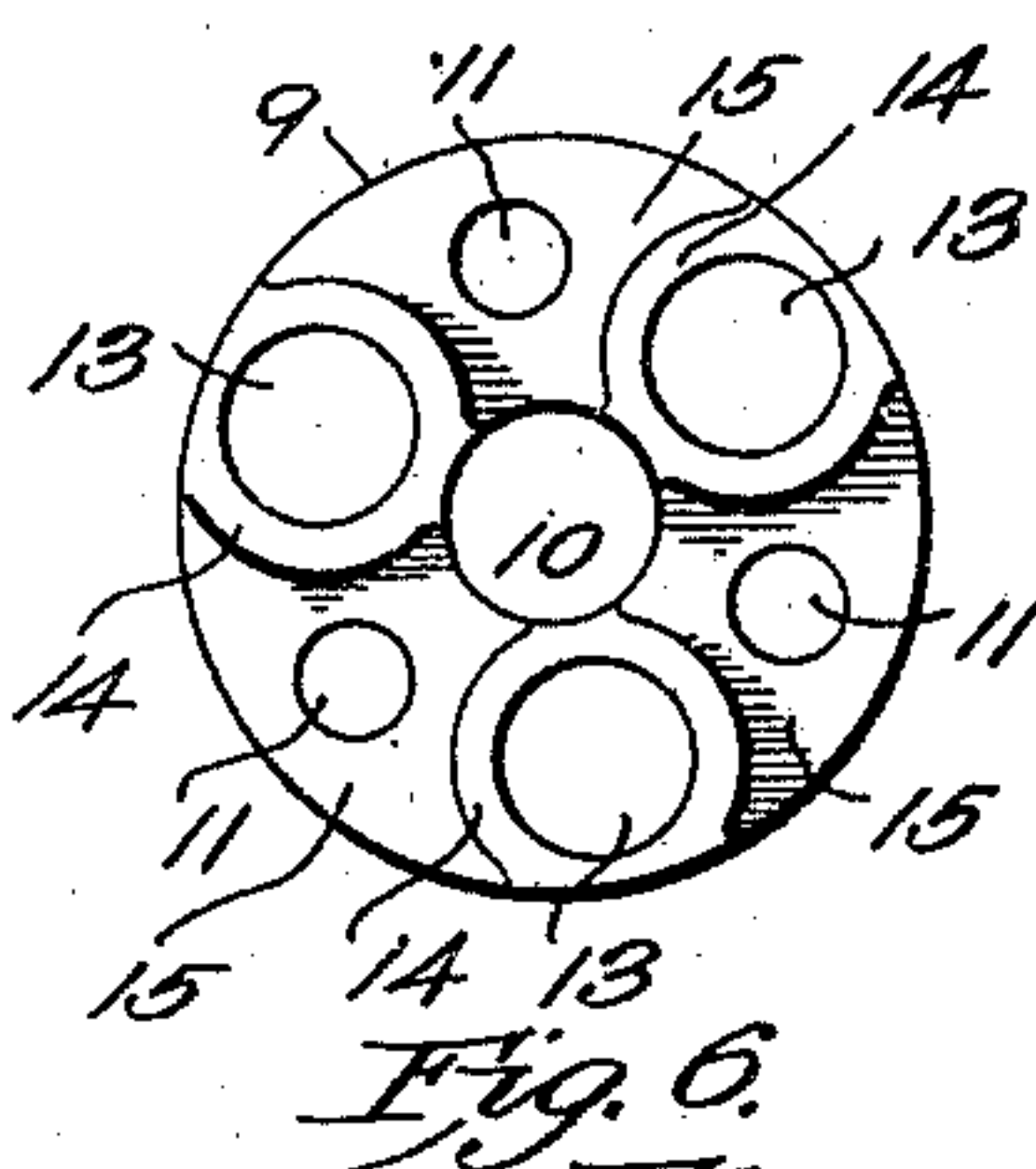
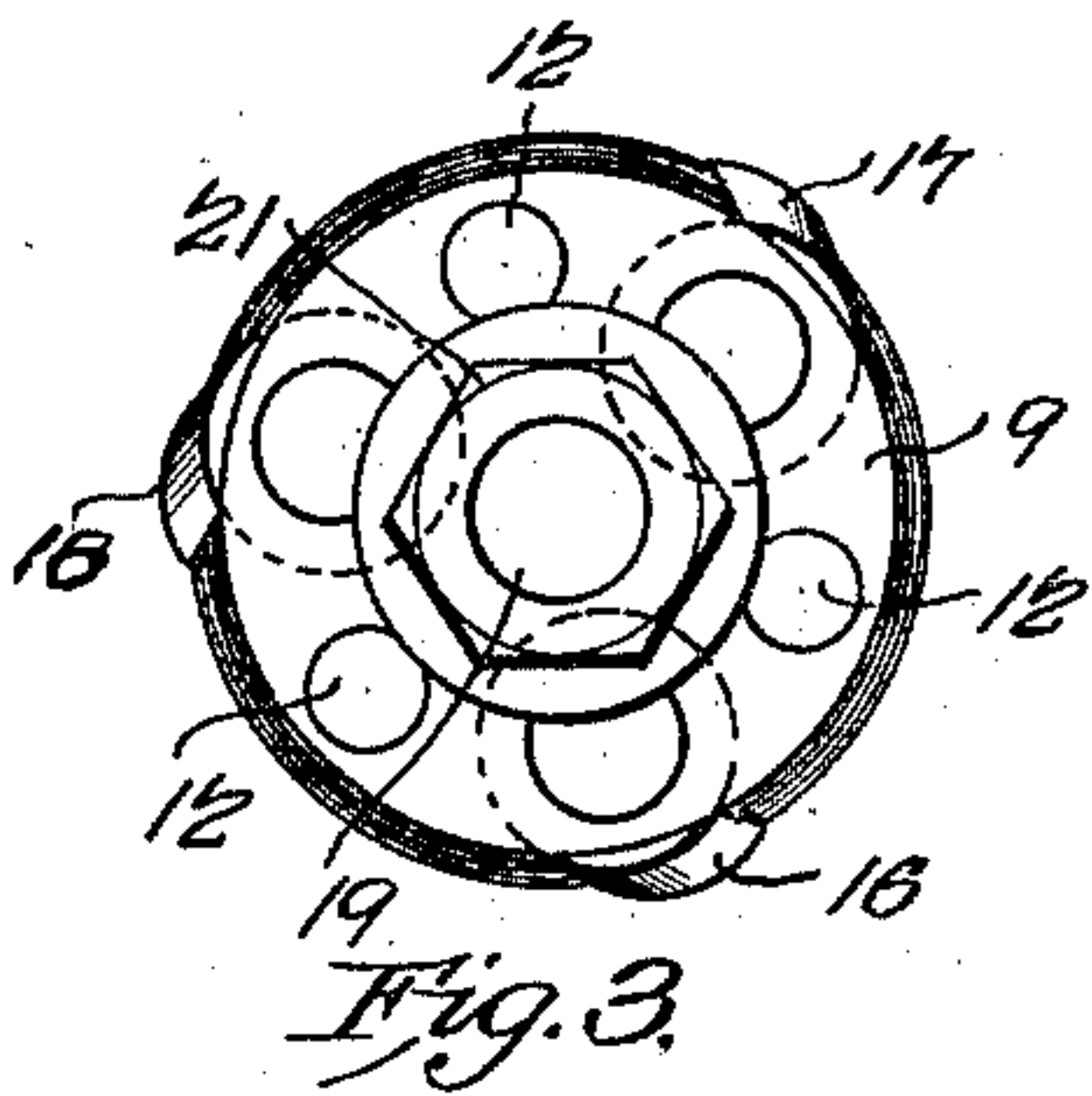
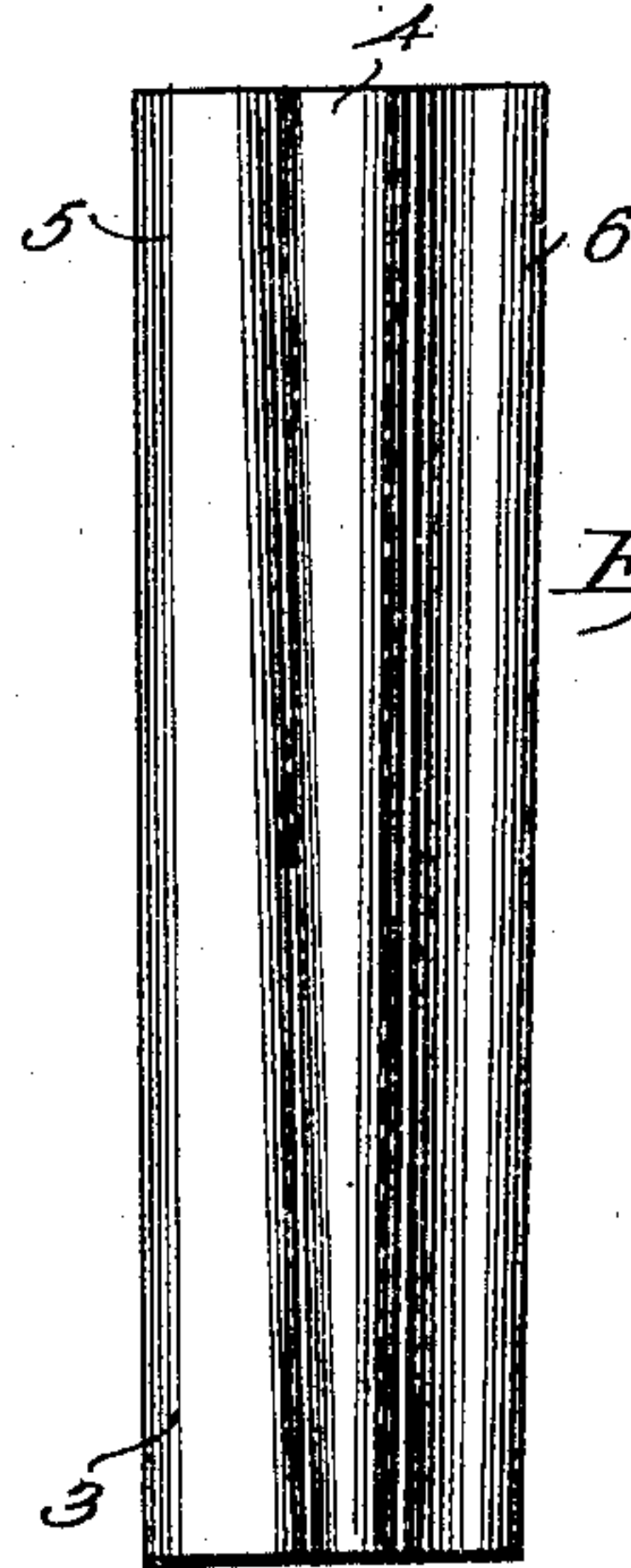
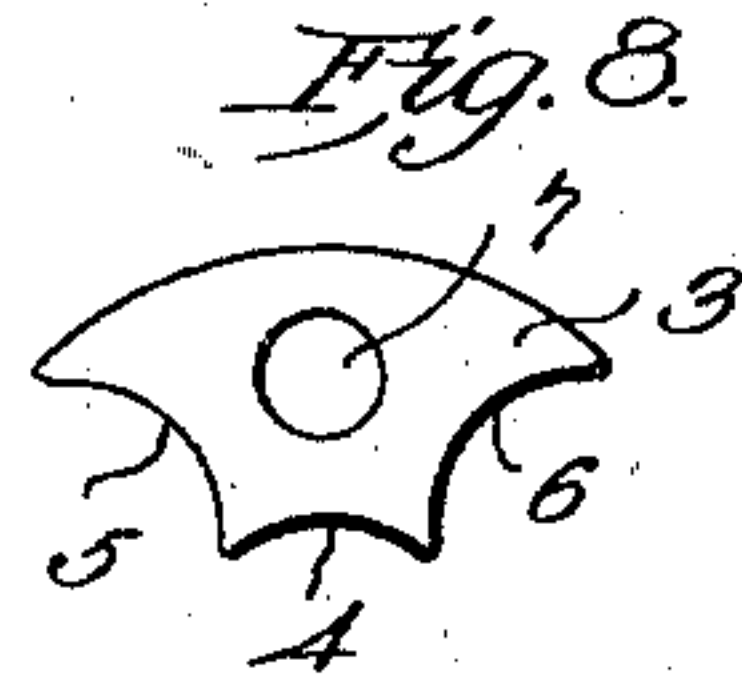
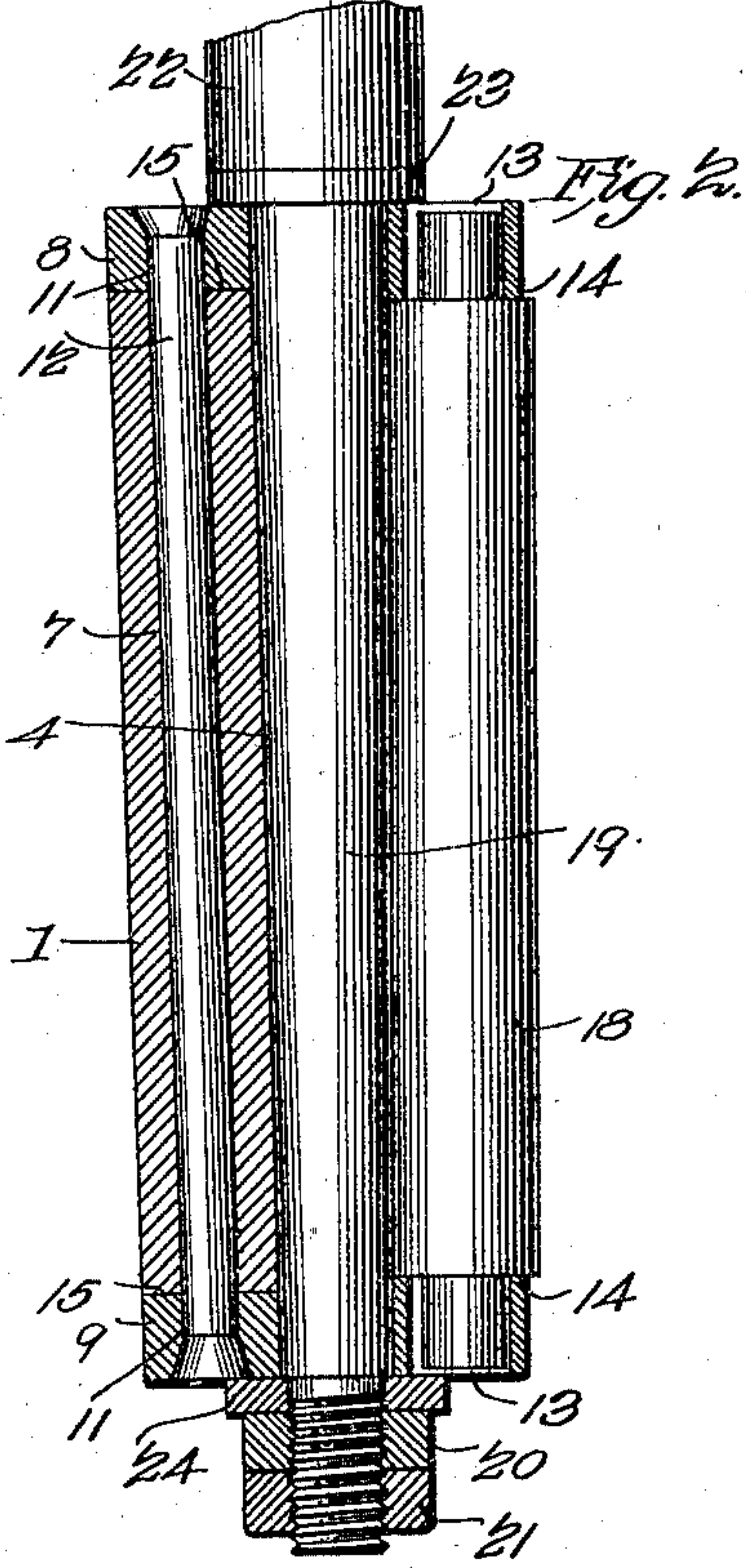
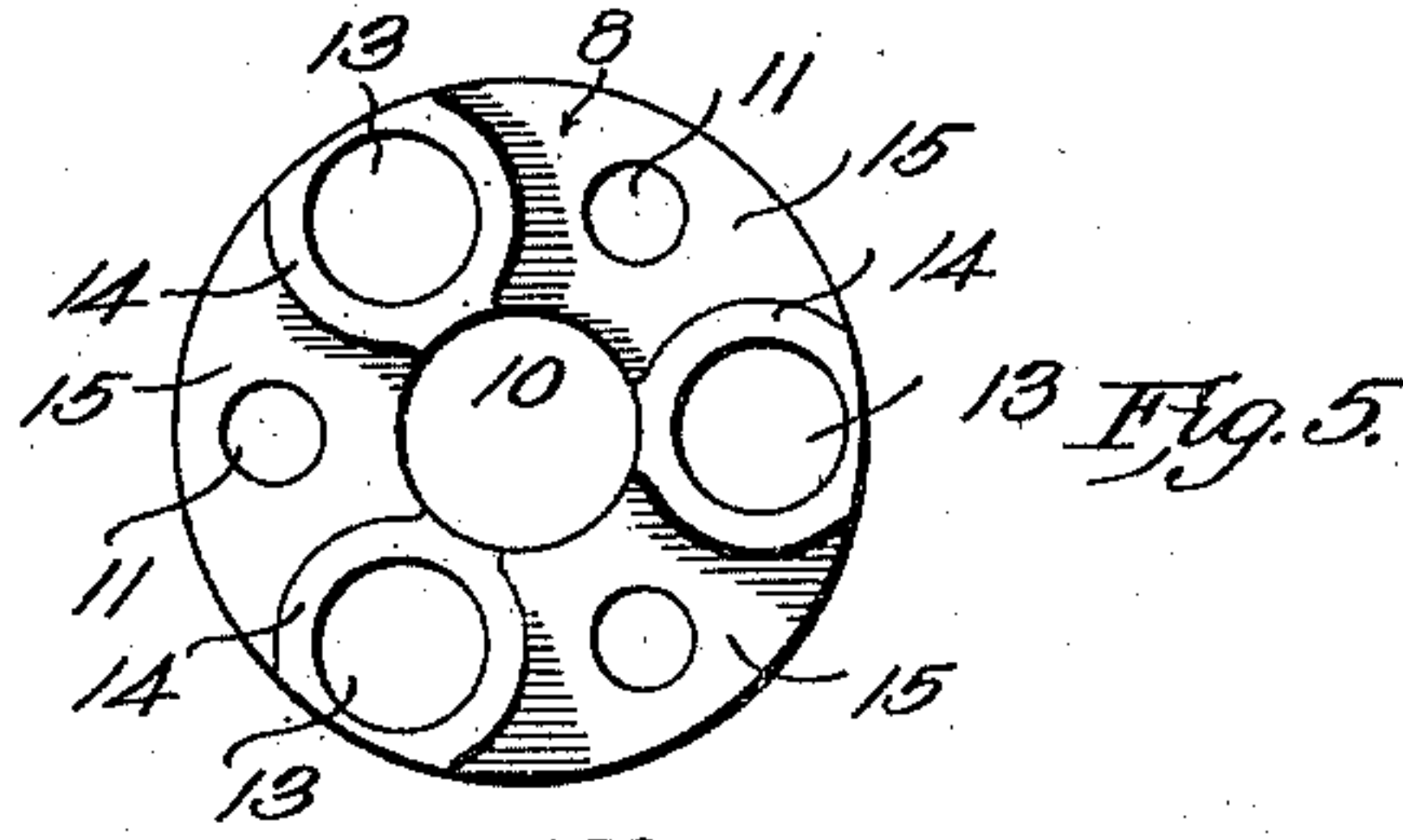
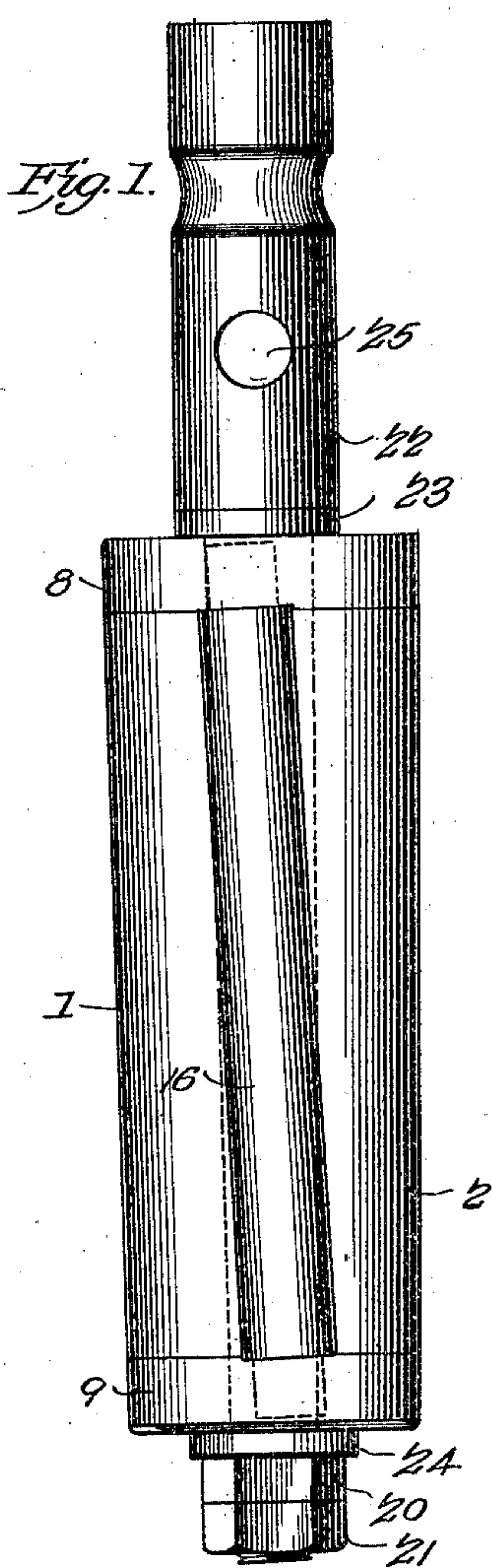
No. 683,291.

Patented Sept. 24, 1901.

T. R. JOHNSON.  
TUBE EXPANDER.

(Application filed May 24, 1901.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

THOMAS R. JOHNSON, OF JOPLIN, MISSOURI.

## TUBE-EXPANDER.

SPECIFICATION forming part of Letters Patent No. 683,291, dated September 24, 1901.

Application filed May 24, 1901. Serial No. 61,752. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS R. JOHNSON, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented a new and useful Tube-Expander, of which the following is a specification.

This invention relates to tube-expanders, and has for its object to provide an improved device of this character which is arranged for convenient and effective operation and also to facilitate the entrance and removal of the implement.

It is furthermore designed to provide for the convenient assemblage of the parts of the device and to maintain the same in their proper operative relation, thereby to render the implement strong and durable.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation of a tube-expander embodying the present invention. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a plan view looking at the smaller end of the implement. Fig. 4 is a transverse sectional view. Figs. 5 and 6 are detail plan views of the inner sides of the respective terminal heads of the implement. Fig. 7 is a detail view of one of the body-sections of the device. Fig. 8 is an end view thereof.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

In carrying out the present invention there is provided a tapered cylindrical body formed in three duplicate longitudinal sections 1, 2, and 3, which are segmental in cross-section. Each section is provided in its inner face with a central longitudinal groove 4, which tapers from the larger end of the section, and the opposite longitudinal grooves 5 and 6, of which the groove 5 increases in width from

the larger end of the section, while the other groove decreases in the same direction. The back of the central groove is parallel with the outer face of the section. There is also a longitudinal bolt-opening 7, formed centrally of the section and extending entirely through the same. When these sections are assembled to form a tapered cylinder, the several central grooves 4 combine to form a central longitudinal opening or bore throughout the length of the body, and the opposite registering grooves of adjacent sections being inclined in the same direction they combine to form longitudinal seats inclined at an acute angle with respect to the longitudinal axis of the body.

For connecting the body-sections there are provided the opposite circular heads or plates 8 and 9, which correspond in size to the respective ends of the body and are otherwise duplicates. Each head has a central opening 10, corresponding to the bore of the body, and a plurality of openings 11 to register with the adjacent ends of the bolt-openings of the sections for the reception of the ends of the fastening bolts or rivets 12, one of which is shown in Fig. 2 of the drawings. Situated between the bolt-openings are larger openings 13 to correspond to the ends of the respective seats formed by the registering grooves of the body-sections, said openings being surrounded by the respective marginal flanges 14, thereby producing depressions or segmental seats 15 between the flanged openings corresponding to and for the snug reception of the respective ends of the body-sections, thereby forming a strong and durable connection between the sections and the heads and preventing looseness of any of the parts.

When the body-sections are being assembled, the three rollers 16, 17, and 18 are fitted into the corresponding seats produced between the sides of the sections with their opposite reduced journal portions received in the corresponding bearing-openings 13 in the opposite circular heads, as best indicated in Fig. 2. Thus the rollers are inclined with the seats at an acute angle with respect to the longitudinal axis of the body and are of a diameter to project outwardly through the open sides of the seats and also inwardly a slight



distance into the longitudinal bore. A tapered mandrel 19 is then thrust into the bore of the body from the larger end thereof, so as to lie in frictional contact with the inner sides of the respective rollers. The smaller end of the mandrel projects through the opening in the smaller head and is screw-threaded for the reception of a nut 20 and a jam-nut 21 to prevent endwise displacement of the mandrel and at the same time permit of rotation thereof within the body. The opposite projected end of the mandrel is enlarged to form a head 22, that produces a marginal shoulder to lie across the larger head, and thereby hold the mandrel against endwise movement in opposite directions. Suitable case-hardened washers 23 and 24 are employed at the opposite ends of the body to prevent wear thereon. One or more openings 25 are formed transversely through the head end of the mandrel and designed for the reception of a bar, (not shown,) whereby the mandrel may be rotated, or other rotating means may be employed, as may be desired. When the implement is forced into a tube and the mandrel is rotated, the rollers are also rotated through frictional contact therewith, so as to travel upon the inner side of the tube, and by reason of the inclination of the rollers the latter act in the capacity of a screw to feed the body into the tube, as will be apparent by reference to Fig. 3 of the drawings, wherein the relatively-inclined positions of the rollers is shown. Upon a reverse rotation of the mandrel the body will of course be fed out of the tube.

What is claimed is—

1. A tube-expander, comprising a plurality of longitudinal segmental tapered body-sections which are assembled to form a tapered cylindrical body, the inner face of each section having a longitudinal groove, and opposite longitudinal side grooves, one of which increases in width from the larger end of the section and the other decreases in width in the same direction, the registered central grooves forming a tapered longitudinal bore for the body, and the registering side grooves forming longitudinal seats which are inclined at acute angles to the longitudinal axis of the body, the edges of the sections being separated to form outer open sides for the seats, rollers received within the respective seats and projected outwardly through the open sides thereof and also into the bore of the body, opposite circular heads applied to the corresponding ends of the body-sections and secured thereto, there being a central opening in each head to correspond with the bore of the body, and a rotatable tapered mandrel journaled in the bore and in frictional engagement with the rollers, one end of the

mandrel being projected to form an operating part therefor.

2. A tube-expander, comprising a plurality of longitudinal segmental tapered body-sections which are assembled to form a tapered cylindrical body, each section having a central longitudinal groove in its inner face, and opposite longitudinal side grooves, the registering central grooves of the sections forming a longitudinal bore, and the registering side grooves forming seats, the longitudinal edges of the sections being separated to form outer open sides for the seats, rollers mounted in the respective seats and projected laterally in opposite directions outwardly through the open sides of the seats and inwardly into the bore, opposite circular heads applied to the corresponding ends of the body-sections, the inner side of each head having a plurality of seats corresponding to and snugly receiving the adjacent ends of the respective body-sections, fastenings connecting the heads to the body-sections, and a rotatable spindle mounted in the bore, in frictional engagement with the rollers and projected at the larger end of the body.

3. A tube-expander, comprising a plurality of longitudinal tapered segmental body-sections, which are assembled to form a tapered cylindrical body, each section having its inner face provided with a central longitudinal groove, and opposite longitudinal side grooves that extend to the outer edges of the section, the registered central grooves forming a longitudinal bore for the body, and the registered side grooves forming roller-seats, the edges of the sections being separated to form open outer sides for the seats, opposite circular heads applied to the respective ends of the body, and each head having openings to correspond with the ends of the respective seats, with inner marginal flanges surrounding the said openings, whereby depressed seats are formed for the snug reception of the adjacent ends of the corresponding body-sections, the body-sections and the heads having corresponding openings located between the seats, fastenings received in said openings, rollers mounted in the respective seats, and having terminal journals mounted in the flanged openings of the heads, and a mandrel rotatably mounted in the bore and in frictional engagement with the rollers, one end of the mandrel being projected to form an operating part.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS R. JOHNSON.

Witnesses:

JAMES P. MEAD,  
H. J. MEAD.