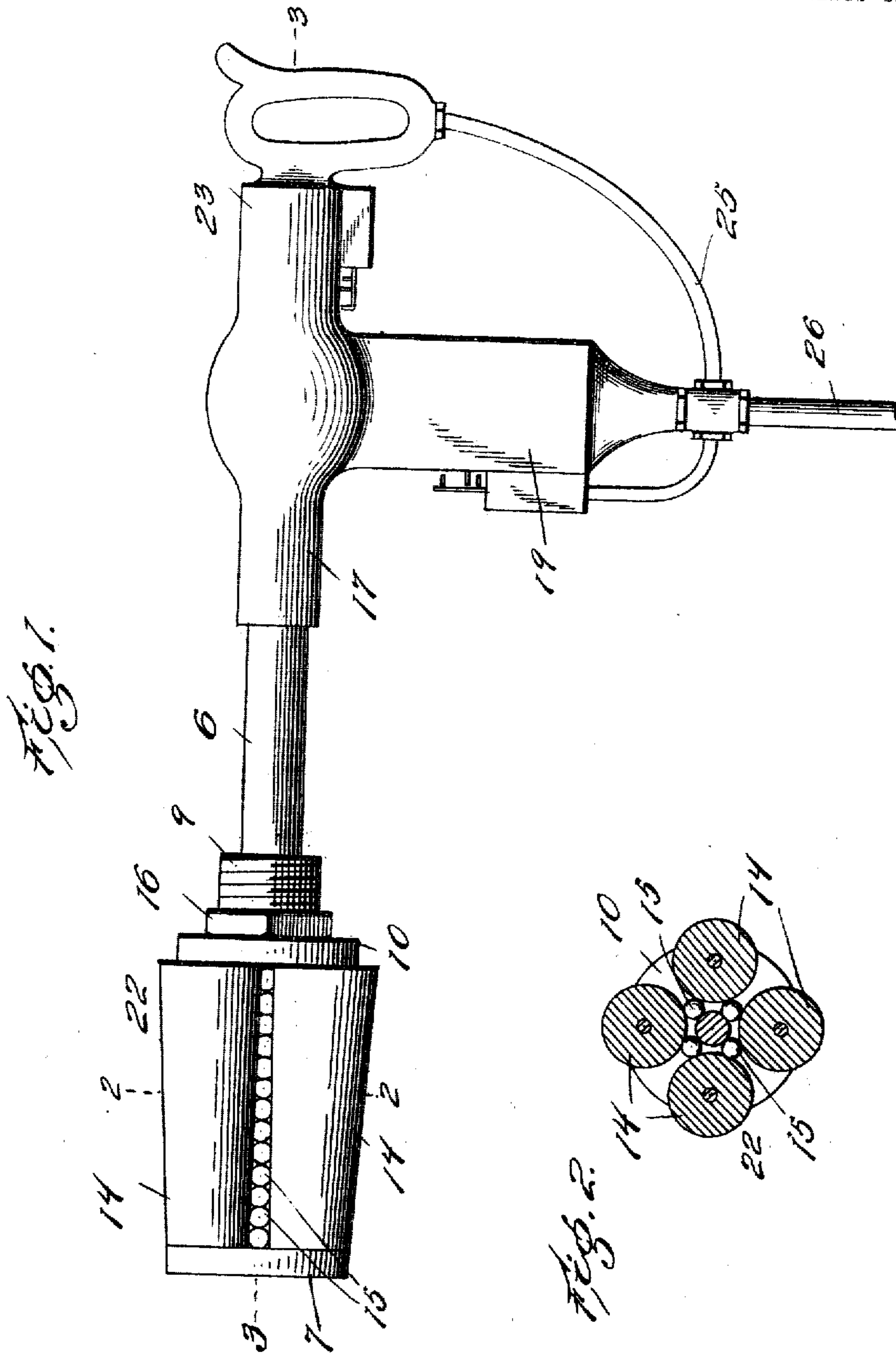


No. 814,300.

PATENTED MAR. 6, 1906.

F. H. KNEE.
PIPE EXPANDER.
APPLICATION FILED OCT. 27, 1905.

2 SHEETS—SHEET 1.



Witnesses

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J. C. Jones

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Inventor

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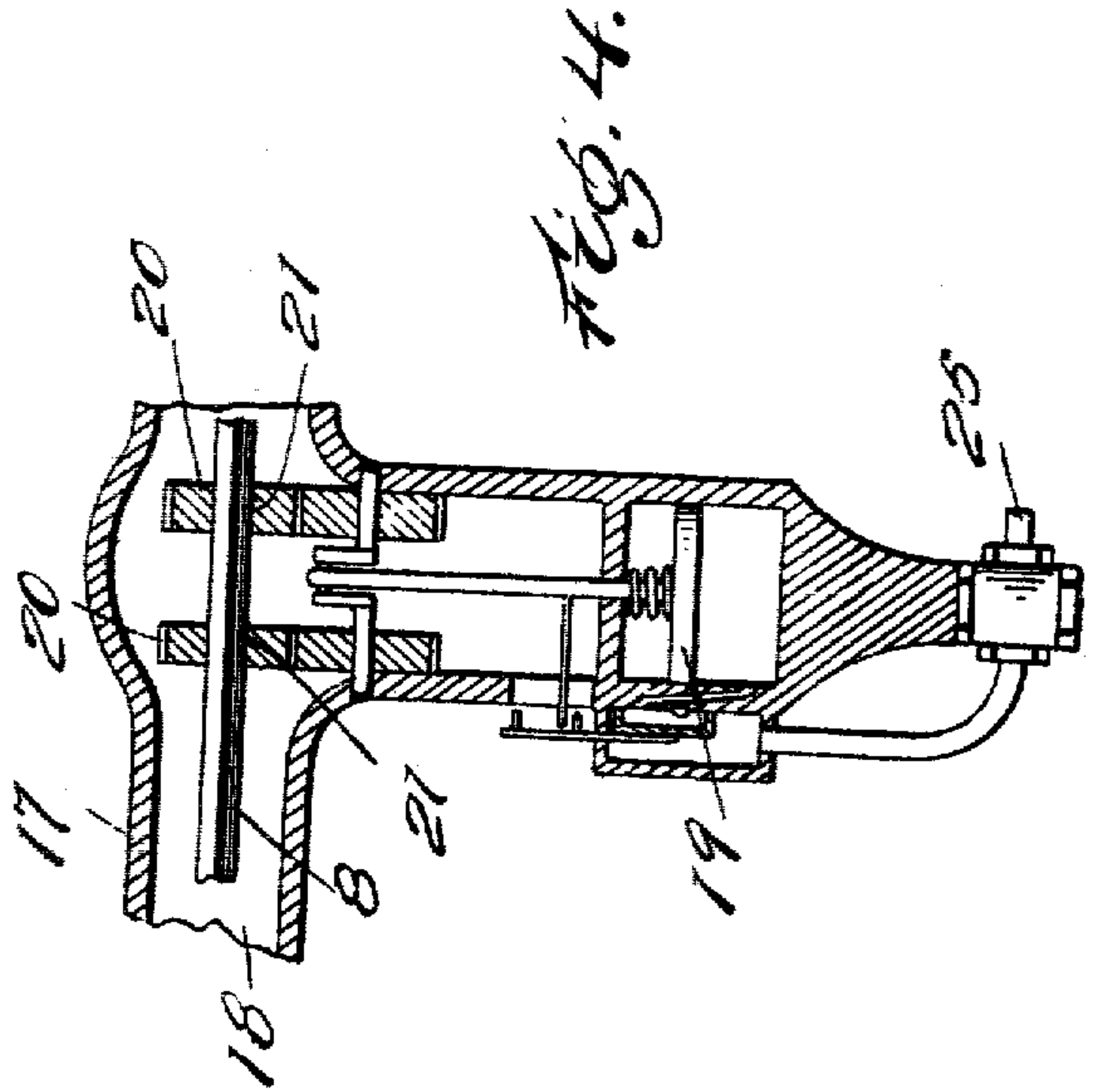
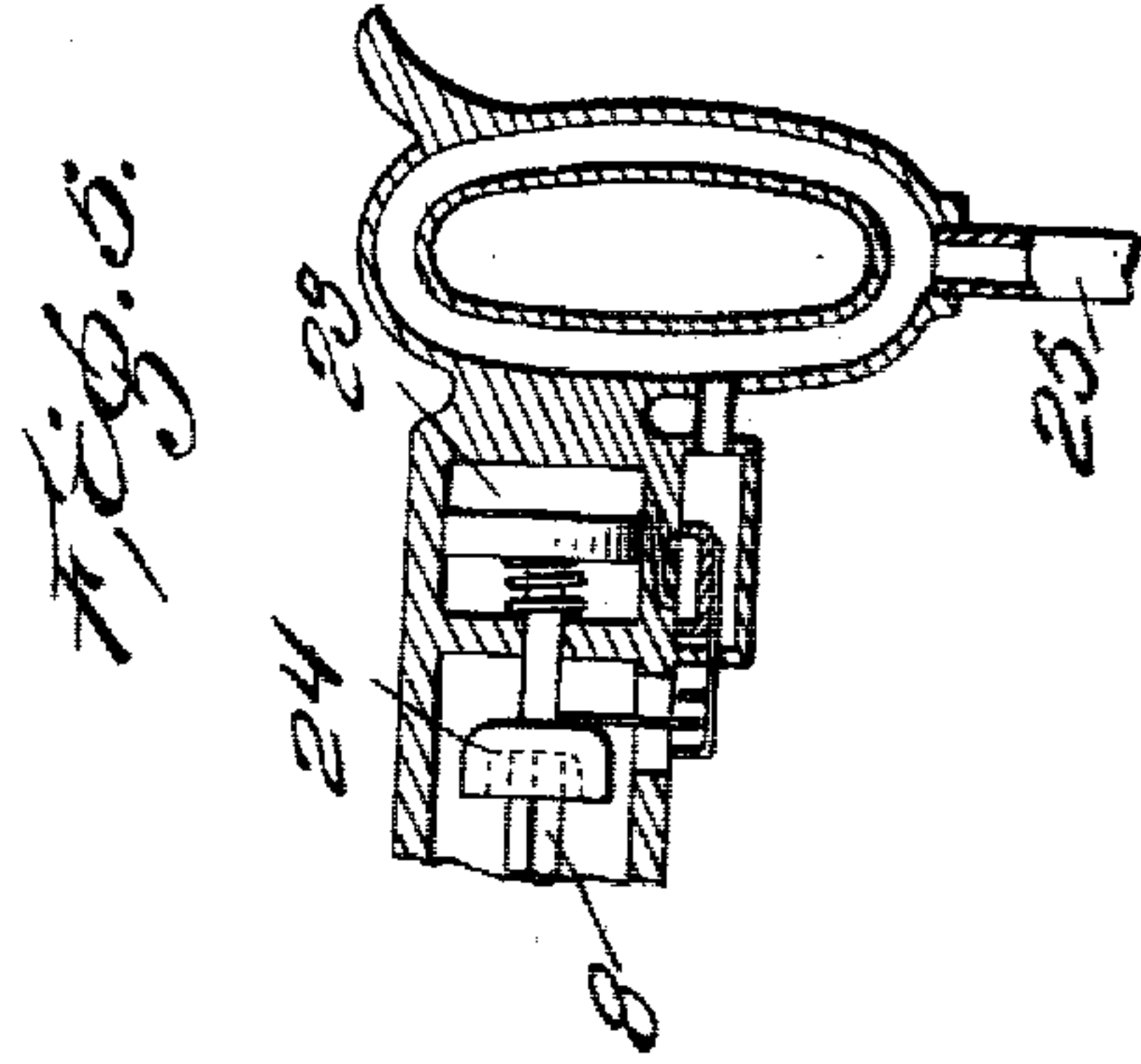
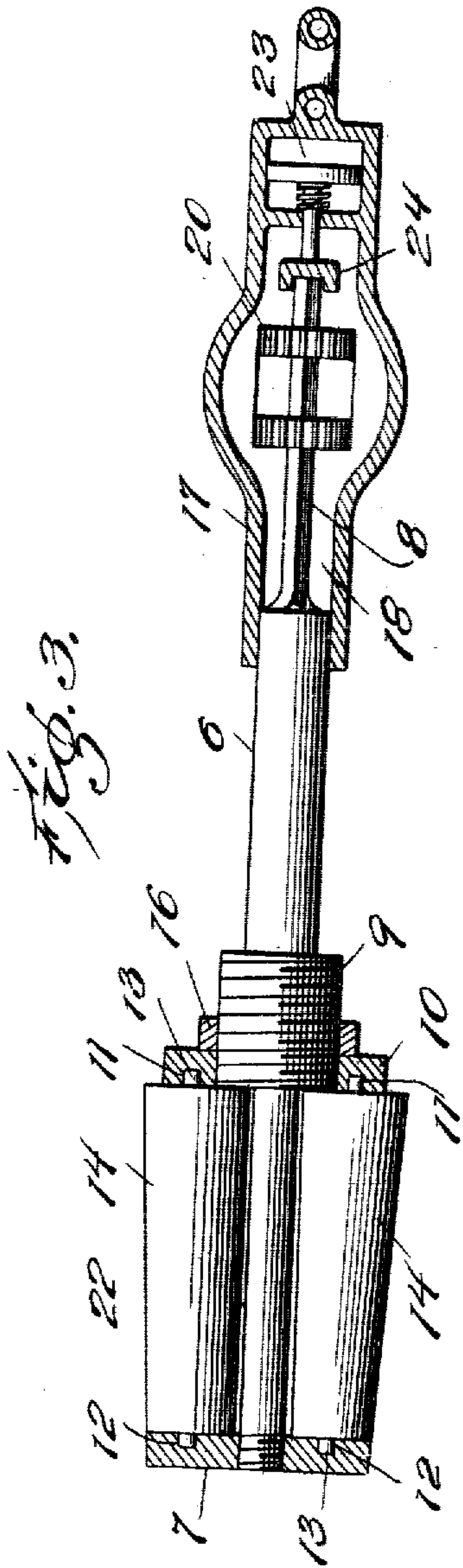
Attorney

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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANK H. KNEE, OF NEW CASTLE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO AGNES L. LONG, OF NEW CASTLE, PENNSYLVANIA.

PIPE-EXPANDER.

No. 814,300.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed October 27, 1905. Serial No. 284,682.

To all whom it may concern:

Be it known that I, FRANK H. KNEE, a citizen of the United States, residing at New Castle, in the county of Lawrence, State of Pennsylvania, have invented certain new and useful Improvements in Pipe-Expanders; 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 metal-working tools, and more particularly to pipe-expanders, and has for its object to provide a tool of this kind with which boiler-tubes or other pipes may be expanded and which will include a novel arrangement of parts.

Another object is to provide an expander including a revoluble expanding-head and means for revolving the head, as well as means for driving the head into a pipe.

Other objects and advantages will be apparent from the following description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a side elevation of the present tool. Fig. 2 is a cross-section of the expanding-head, taken on line 2 2 of Fig. 1. Fig. 3 is a central longitudinal section taken on line 3 3 of Fig. 1. Fig. 4 is a sectional view of the motor, taken longitudinally thereof. Fig. 5 is a detail view showing the mechanism of the hammer.

Referring now to the drawings, the present invention comprises a mandrel 6, having a concentrically-disposed disk-shaped head 7 at its forward end and having its rearward end portion reduced and squared, as shown at 8, for a purpose presently described. Between its ends the mandrel has a threaded enlargement 9, and engaged with this enlargement there is an annular plate 10, having a plurality of bearing-recesses 11 in its forward face which aline with recesses 12 in the rearward face of the head 7 for the reception of the trunnion 13 of pipe-engaging rollers 14, the latter being arranged around the mandrel 6 between the enlargement and the head and are closer together at their forward ends than at their rearward ends. These rollers bear against balls 15, which lie between the rollers and the mandrel, the easy rotation of the rollers being thus facilitated. A lock-nut 16 is engaged with the present enlargement 9 and rests against the annular plate 10 to hold it against movement upon the

enlargement, although it will be seen that this plate may be adjusted toward and away from the head.

A stock 17 is provided and has a socket 18, in which the rearward portion of the mandrel is received and carried by this stock. There is a fluid-motor 19, having gears 20 arranged for rotation by the motor and which has central angular openings 21, disposed to receive the squared portion 8 of the mandrel when the latter is engaged in the stock. It will thus be seen that operation of the motor will result in rotation of the mandrel and the expanding-head 22, which is formed by the rollers 14 and their mountings at the forward end of the mandrel. In the rearward end of the stock there is a fluid-operated hammer 23, having a socket 24, in which is received the rearward end of the mandrel, and a fluid-supply pipe 25 communicates with the hammer and with the supply-pipe 26 of the fluid-motor 19. It will thus be seen that if the expanding-head 22 be inserted in a pipe and fluid admitted to the motor and to the hammer the mandrel will be simultaneously rotated and driven into the pipe to expand the latter, the expanding-head having a forward taper, as shown.

What is claimed is—

1. A pipe-expander comprising a stock having a socket therein, a motor connected with the stock and including a revoluble gear, said gear having an angular passage registering with the socket of the stock, a mandrel having a squared portion engaged in the socket and in the opening of the gear for rotation with the gear and in the socket, a hammer in the stock disposed in operative relation to the rearward end of the mandrel for the application of force thereto, means for conducting an actuating agent to the hammer and to the motor, a head carried by the forward end of the mandrel, said mandrel having an enlargement lying in spaced relation to the head and having exterior threads, an annular plate engaged with the threaded enlargement, said plate and the head having alining recesses therein, rollers having trunnions engaged with recesses and surrounding the forward portion of the mandrel, friction-reducing devices disposed between the rollers and the mandrel, and a jam-nut upon the enlargement in operative relation to the annular plate.

2. A pipe-expander comprising a mandrel, means for rotating the mandrel, means for

driving the mandrel into a pipe, a disk-shaped head carried by the forward end of the mandrel, said mandrel having an enlargement spaced from the head, an annular plate having interior threads mounted upon the enlargement said enlargement having threads meshing with those of the annular plate, said plate and the head having alining bearing-recesses therein, rollers having trunnions
5 revolvably engaged in the bearing-recesses, said rollers being closer together at their for-

ward ends than at their rearward ends, friction-reducing devices located between the rollers and the adjacent portion of the mandrel, and a jam-nut upon the enlargement in operative relation to the annular plate. 15

In testimony whereof I affix my signature in presence of two witnesses.

FRANK H. KNEE.

Witnesses:

ROBT. WALLACE,
WM. W. SMEAL.