No. 887,595. PATENTED MAY 12, 1908.

P. J. DARLINGTON.

ROTARY MOTOR.

APPLICATION FILED FEB. 10, 1908.

2 SHEETS—SHEET 1.

FIG. 1

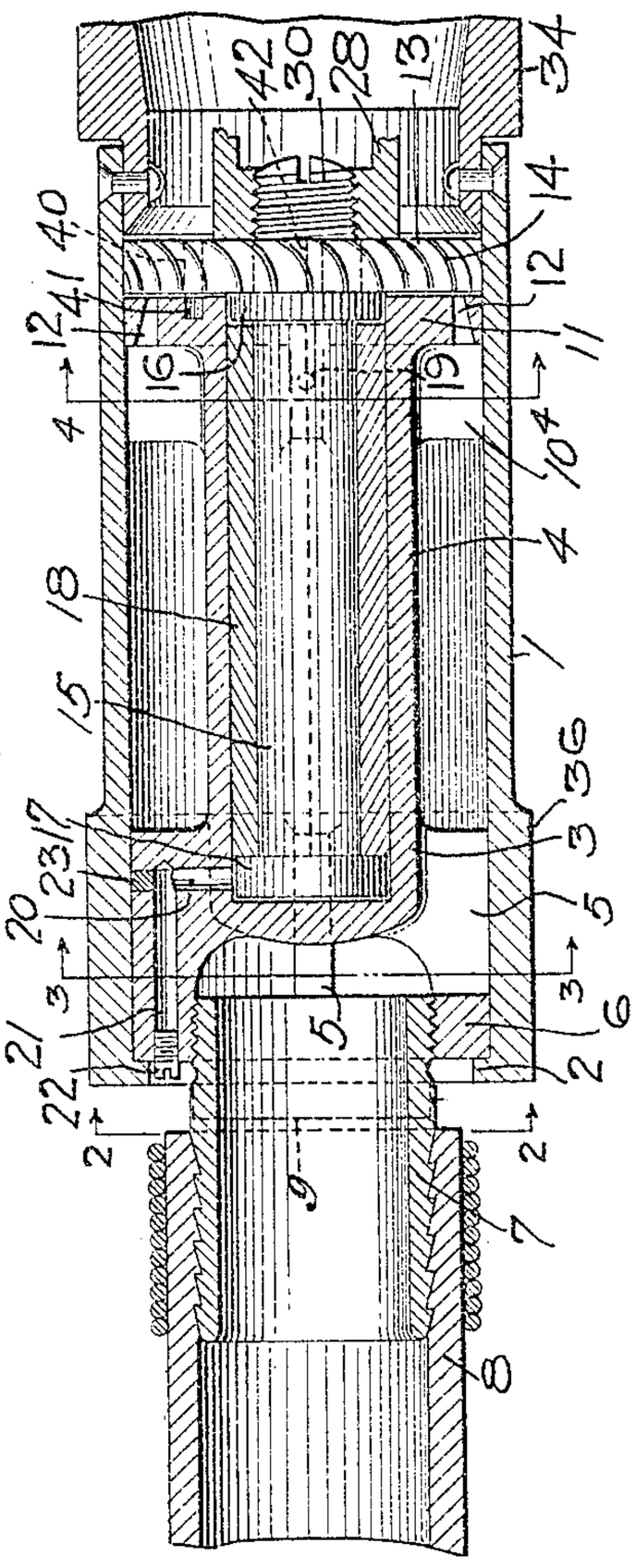


FIG. 5

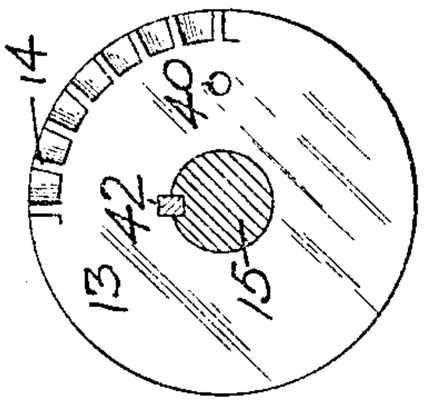


FIG. 4

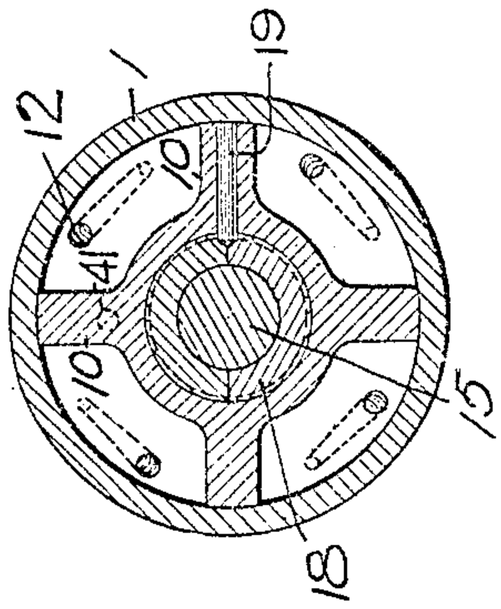


FIG. 3

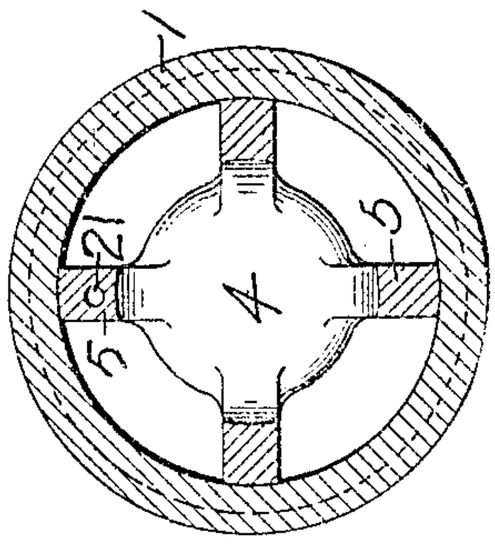
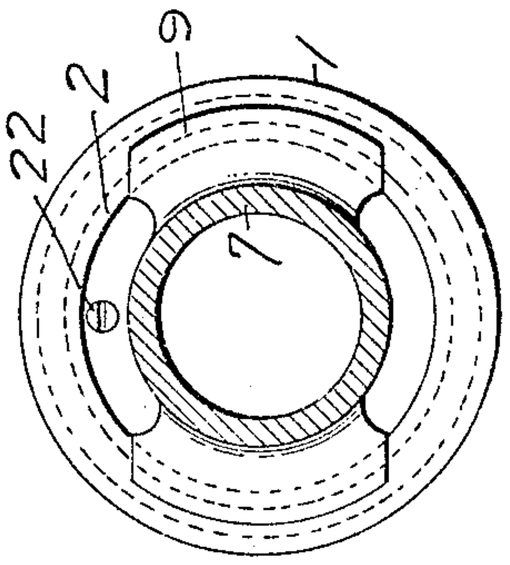


FIG. 2



WITNESSES.

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2 SHEETS—SHEET 2.

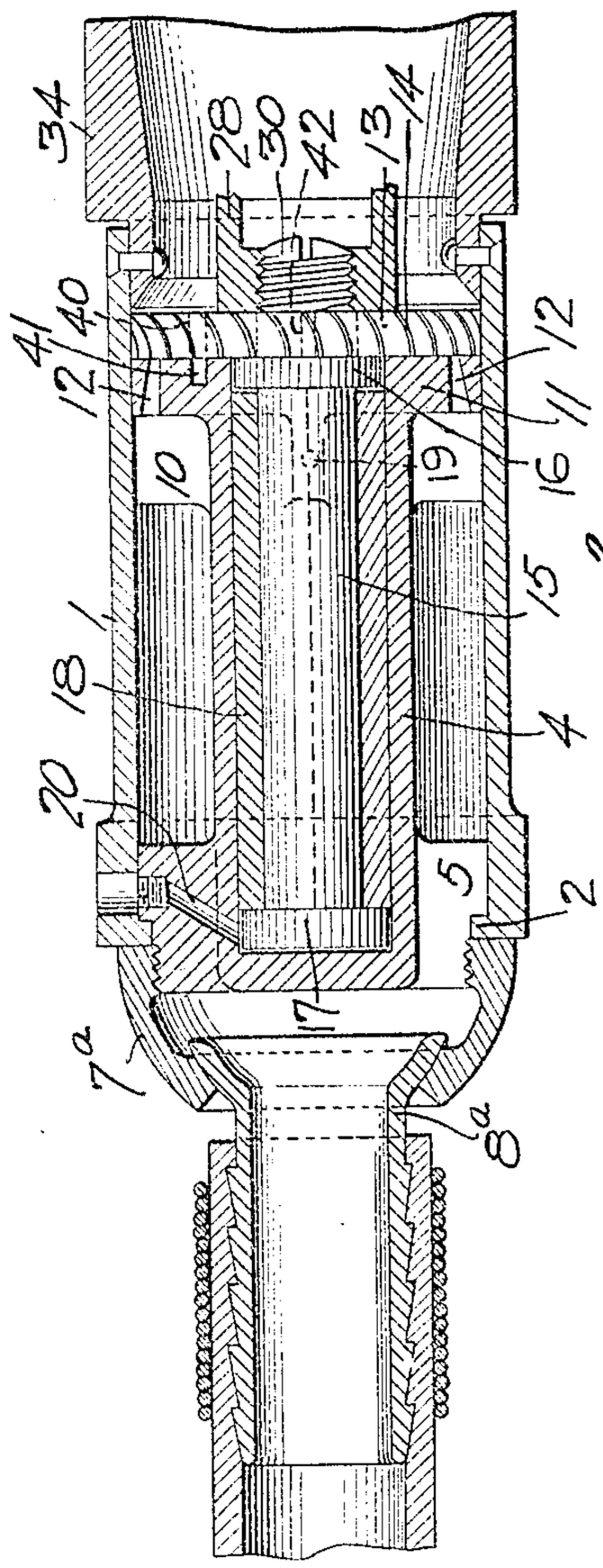

FIG. 6.

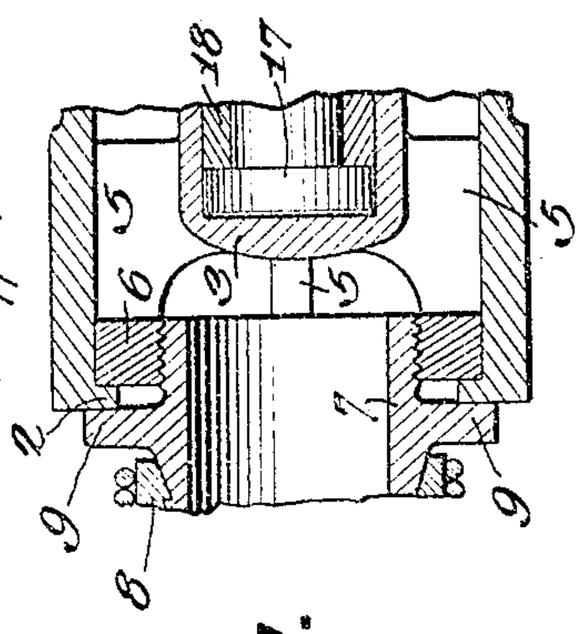

FIG. 7.

WITNESSES.

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UNITED STATES PATENT OFFICE.

PHILIP J. DARLINGTON, OF PITTSBURG, PENNSYLVANIA.

ROTARY MOTOR.

No. 887,595. Specification of Letters Patent. Patented May 12, 1908.

Original application filed December 2, 1907, Serial No. 404,680. Divided and this application filed February 10, 1908. Serial No. 415,119.

To all whom it may concern:

Be it known that I, PHILIP J. DARLINGTON, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rotary Motors; and I do hereby declare the following to be a full, clear, and exact description thereof.

This invention relates to rotary motors, and more especially to water motors for use in cleaning boiler tubes.

The object of the invention is to improve motors of this character in details of construction whereby they are rendered more durable, cheaper to manufacture, and easier to repair.

The invention comprises the construction and arrangement of parts hereinafter described and claimed.

This application is a division of my application for rotary tube cleaners filed December 2, 1907, Serial No. 404,680.

In the accompanying drawings Figure 1 is a longitudinal section through a motor constructed according to my invention; Figs. 2, 3 and 4 are transverse sections taken respectively on the lines 2—2, 3—3, and 4—4, Fig. 1; Fig. 5 is a face view of the turbine wheel with the shaft in section; Fig. 6 is a longitudinal section showing a modification for use in bent tubes, and Fig. 7 is a fragment of a horizontal section taken on a plane at right angles to that of Fig. 1.

The tube cleaner includes a suitable outer shell 1, preferably steel, provided at its rear end with an internal flange 2. In the shell is the frame 3 comprising a hollow cylindrical tube or hub 4 closed at its rear end and provided at its forward end with an integral external flange 11, and at its rear end with an integral flange 6, the latter abutting against the internal flange 2 of the shell. The hollow shank 7 of the hose 8 is screwed through the flange 6 and is provided with external wings or flanges 9 (Figs. 2 and 7) bearing against the rear face of the flange 2, thereby holding the shell 1 on the frame 3. The flange 6 is joined to the hub 4 by radial arms 5, thereby allowing free passage of fluid from the inside of the hose shank 7 to the rear face of the flange 11. The threads connecting the hose shank 7 to the ring 6 run in the direction of rotation of the tool, so that the working reaction of the tool causes the casing to tend to rotate in a direction to clamp the flange of the shell more tightly to the end of the frame.

Flange 11 is strengthened by ribs 10 and is pierced by inclined nozzle ports 12 through which the motive fluid, such as air, water or steam, passes to the turbine. A shaft 15 with a front collar 16 and a rear collar 17 is fitted in a split bushing 18 which is forced tightly into the tube or hub 4, and fits loosely around and forms a bearing for the shaft 15 between the collars 16 and 17 for which its end faces form thrust bearings. A pin 19 passes radially through one rib 10 into the bushing 18, thereby holding the latter in position with the rear end of the shaft 15 in contact with, and having a thrust bearing on, the forward face of the transverse wall closing the rear end of the tube or hub 4. Communicating with the interior of the tube or hub 4 is a transverse lubricant passage 20 permanently closed at its outer end by a soldered plug 23, or otherwise, and connecting the interior of hub 4 with a longitudinal lubricant passage 21 which is normally closed by a screw plug 22 removable for putting in lubricant.

On the outer end of shaft 15 is a turbine wheel 13 provided with inclined blades 14 arranged to receive fluid jets from the nozzles 12 and be rotated thereby. This wheel 13 is fitted upon a cylindrical section of shaft 15 in front of collar 16 and is held from turning thereon by key 42 set into the shaft 15 and projecting into a key-way in the wheel 13. A hole 40 is provided through wheel 13 and a hole 41 is drilled into flange 11, both holes being at the same radius so they can be brought into alinement to allow a bar to be entered through wheel 13 into flange 11, thereby locking these parts together for screwing the tool holder on or off. 28 indicates a portion of the tool holder which is screwed to the end 30 of the shaft 15 and serves as a nut to clamp the wheel 13 against the collar 16 of the shaft 15.

The rear end of the shell 1 may be enlarged, as at 36, to serve as a guide in the tube, or the shell may be shaped as in Fig. 6 with the rounded rear portion 7^a so as to enable the same to pass more readily through curved tubes. A flexible or ball and socket hose connection 8^a is shown in Fig. 6. The forward end of the shell may likewise be enlarged or may have an enlarged guide member attached thereto, a portion being shown at 34.

What I claim is:

1. In a rotary motor, a casing provided with an inwardly projecting flange, a frame in said casing abutting against said flange, and a pipe section connected to said frame and provided with an outwardly projecting part or parts bearing against the outer face of the flange in the casing.

2. In a rotary motor, a casing provided with an inwardly projecting flange, a frame in said casing provided with a ring abutting against the inner face of said flange, and a pipe section having a threaded connection with the frame and provided with an outwardly projecting part or parts bearing against the outer face of the casing flange.

3. In a rotary motor, a casing provided with an inwardly projecting flange, a spider in said casing provided with a ring abutting against the annular face of said flange, a rotor mounted in said spider, and a pipe section having a threaded connection with said ring and provided with outwardly projecting flanges or wings bearing against the outer face of said casing flange.

4. In a rotary motor, an inner frame, an outer cylindrical shell flanged over a shoulder of said frame, a hose connecting member externally flanged over the end of the shell and threaded axially to the frame in the direction of rotation of the tool, whereby the working reaction of the cleaner causes the hose connecting member to clamp the flange of said shell tightly to the end of said frame.

5. In a rotary motor, a casing, a frame therein provided with an axial opening, a rotor shaft provided with an integral collar or shoulder at each end, and a bushing around said shaft between said collars or shoulders and fitted in the opening in the frame.

6. In a rotary motor, a frame provided with an axial opening closed at its rear end by an integral end wall, a rotor shaft provided with a collar or shoulder at each end, and a bushing around said shaft between said collars or shoulders and fitted in the opening in the frame.

7. In a rotary motor, a frame provided with an axial barrel, a rotor shaft provided with an integral collar or shoulder at each end, a bushing around said shaft between said collars or shoulders and fitted in the barrel, and a pin entering through a radial opening in the frame and projecting into an opening in said bushing.

In testimony whereof, I the said PHILIP J. DARLINGTON, have hereunto set my hand.

PHILIP J. DARLINGTON.

Witnesses:
JOHN H. VOORHEES,
HATTIE CLEAVES.