

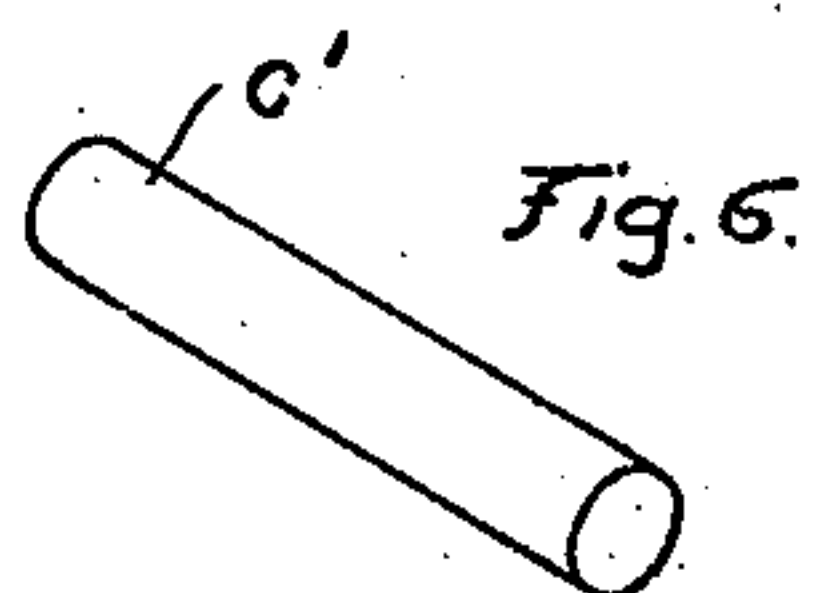
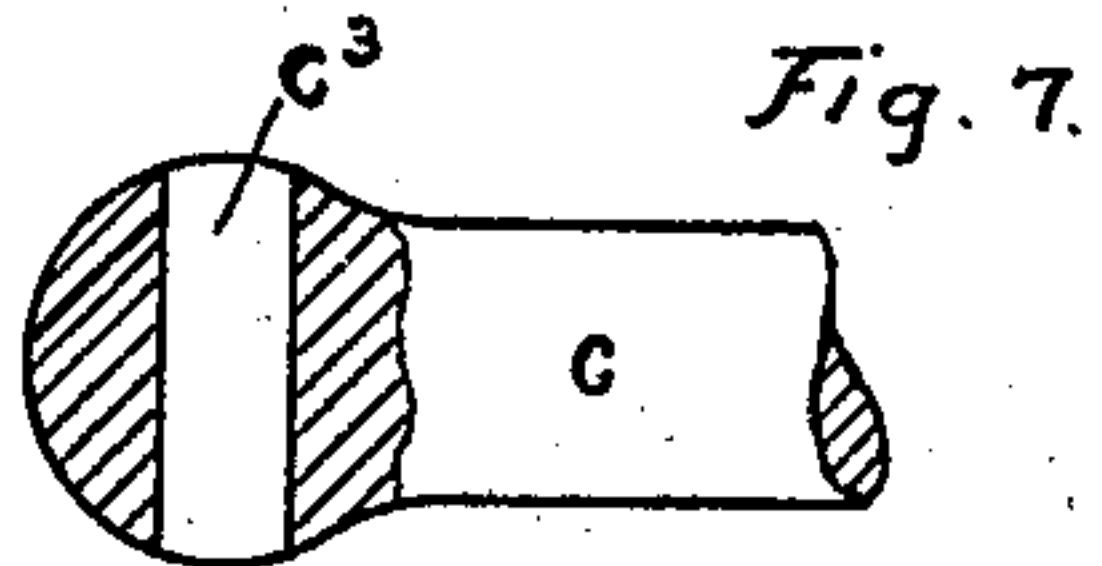
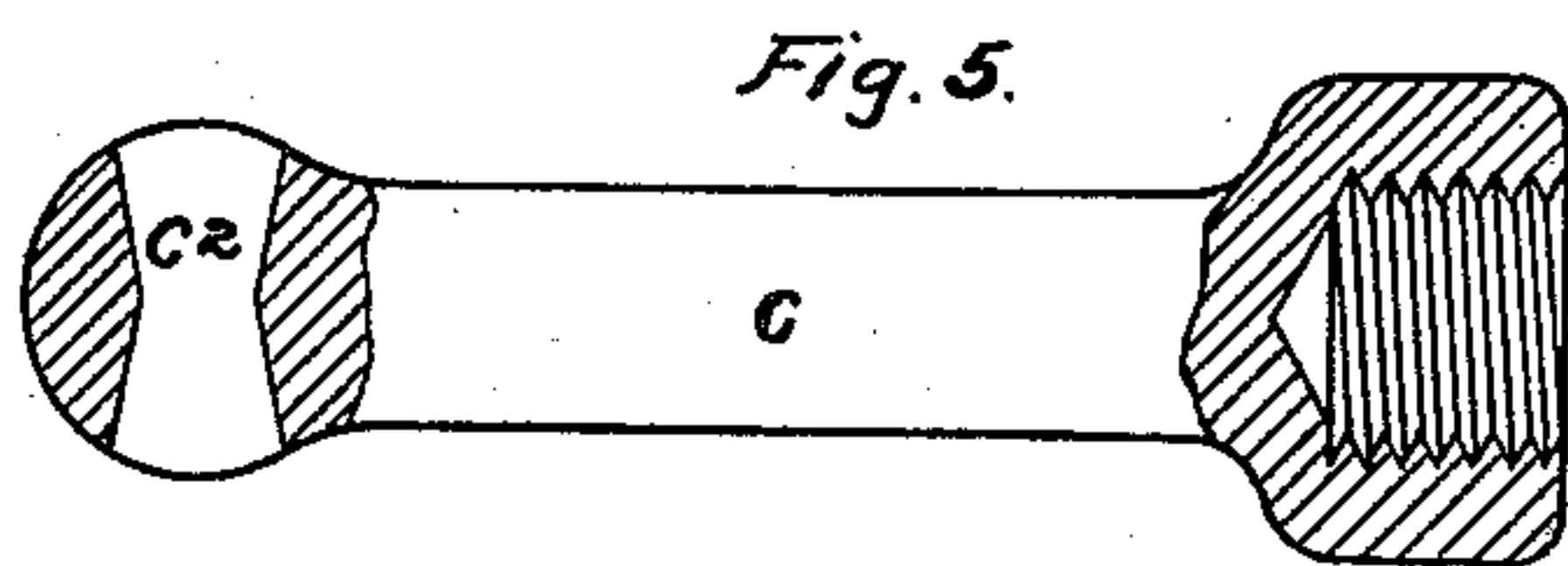
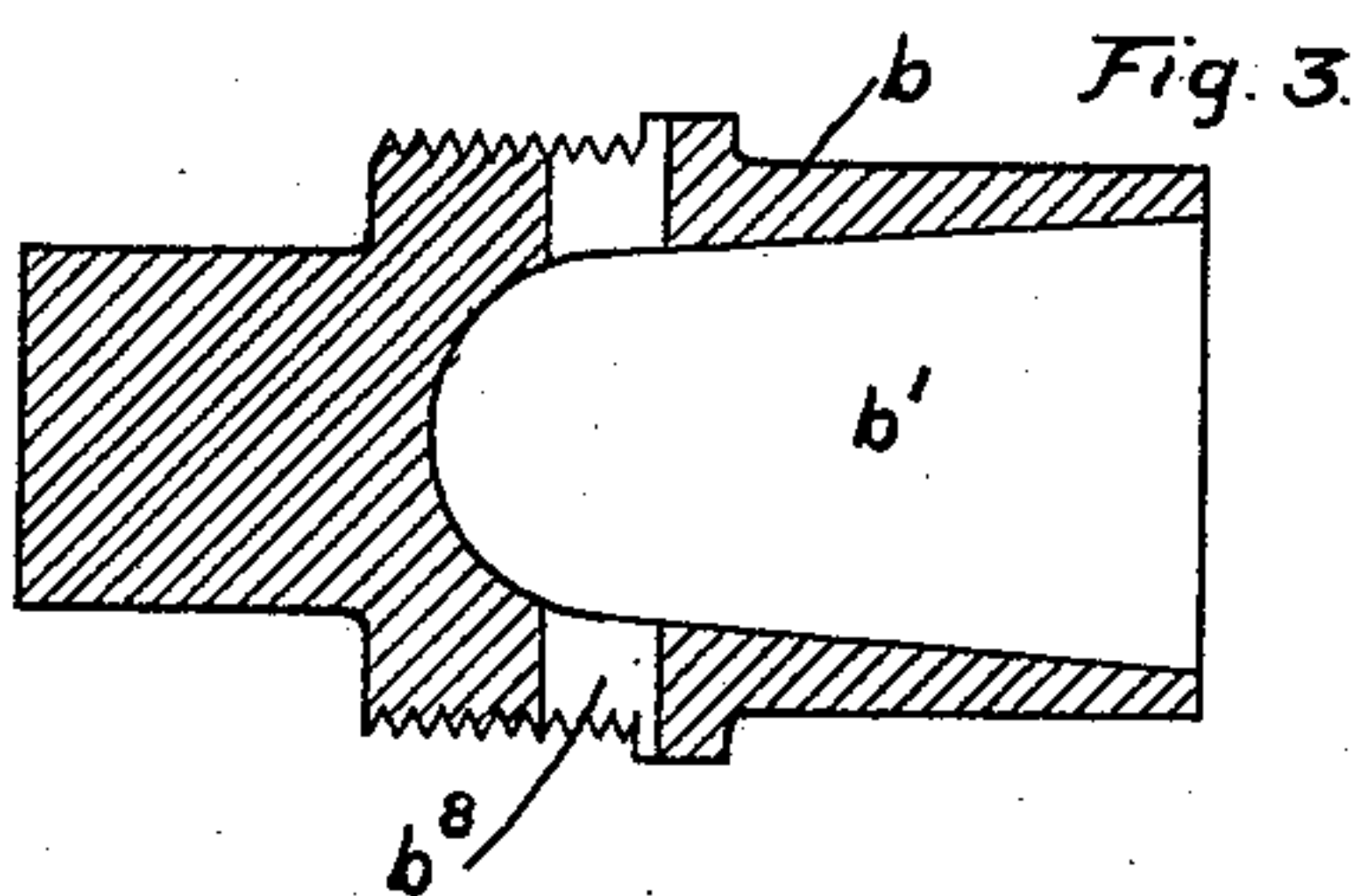
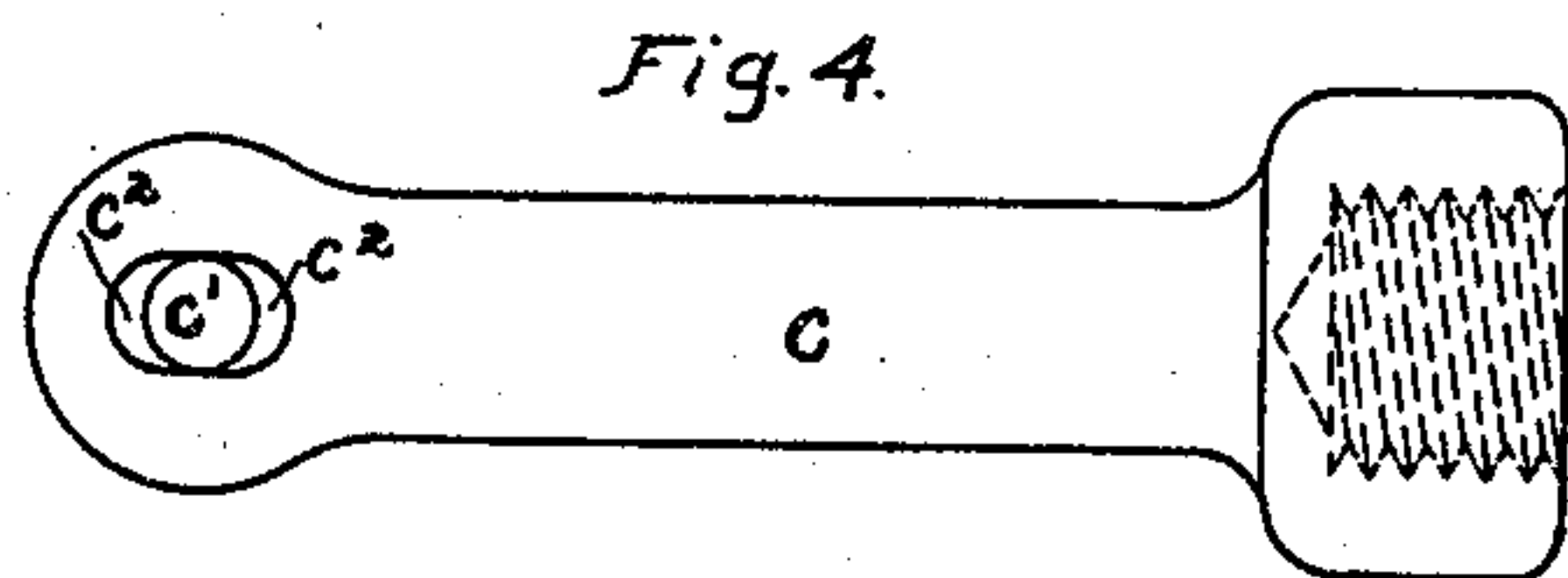
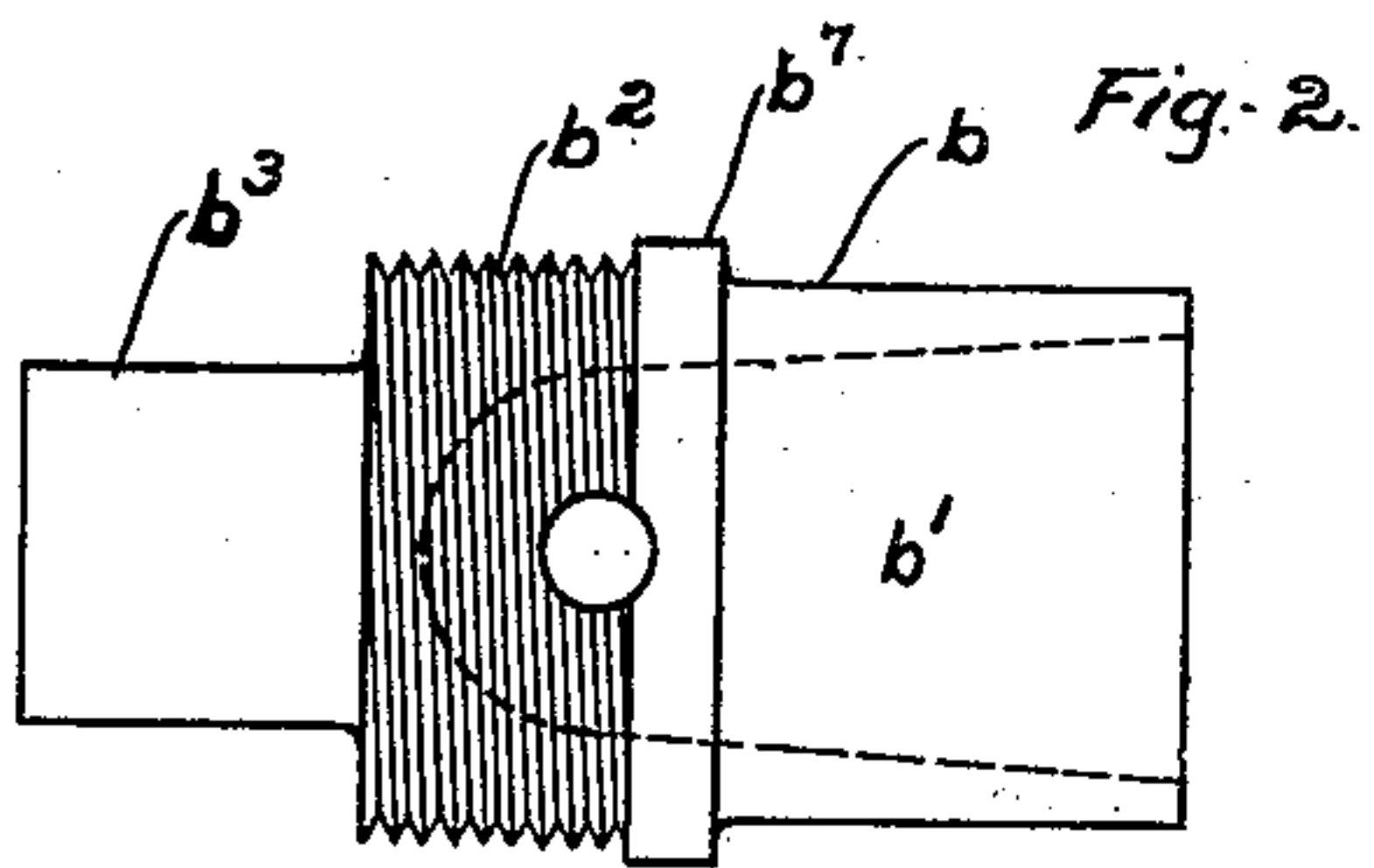
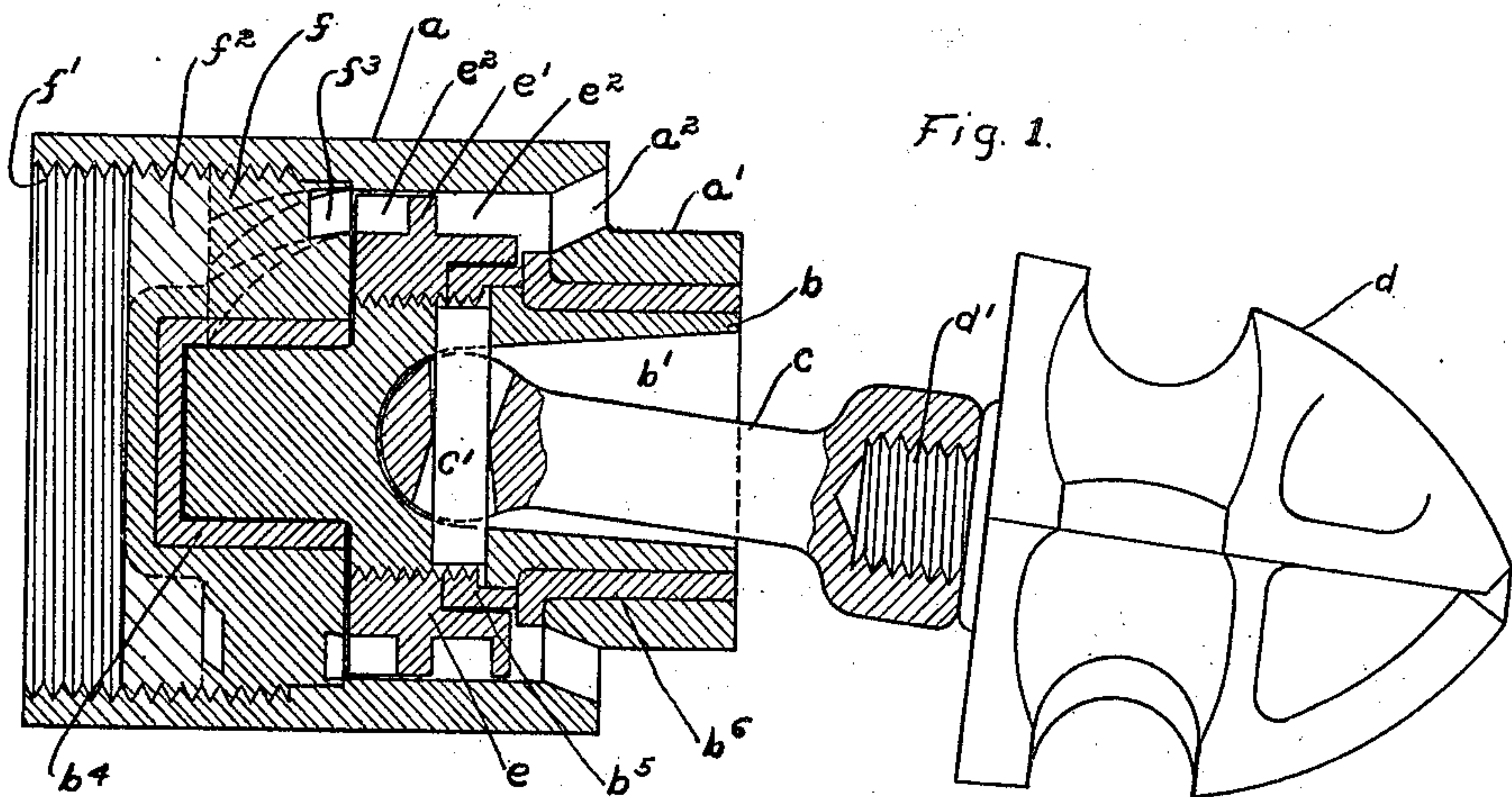
H. F. WEINLAND.

FLUE CLEANER.

APPLICATION FILED DEC. 12, 1907.

917,211.

Patented Apr. 6, 1909.



WITNESSES:

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HENRY F. WEINLAND, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE LAGONDA MANUFACTURING COMPANY, OF SPRINGFIELD, OHIO, A CORPORATION OF OHIO.

FLUE-CLEANER.

No. 917,211.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed December 12, 1907. Serial No. 406,152.

To all whom it may concern:

Be it known that I, HENRY F. WEINLAND, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Boiler-Flue Cleaners, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to flue cleaners, and more particularly to a cleaning device in which the cleaner is driven by a motor, carried through the tube with the cleaner.

The object of my invention is to provide an improved connection between the motor and cleaner, whereby the power of the motor is transmitted to the cleaner, with greater efficiency.

A further object is to so construct the motor in its relation to the cleaner, that undue strain and loss of power through friction are avoided, and the combined mechanism can be built in a more compact and durable manner, to withstand the shocks and jars incident to the hammering and picking action of the cleaner.

While my invention is particularly adapted for the use of a water motor, it will be seen that in so far as the transmission of the power from the motor to the cleaner is concerned, air, steam or other suitable means are used to actuate the motor.

With these and other objects in view, my invention consists of the constructions and combinations hereinafter described and set forth in the claims.

In the accompanying drawings, forming a part of this specification, and on which like reference letters indicate corresponding parts, Figure 1 is a longitudinal sectional view of a motor with a cleaner carrying arm, shown partly in section, and a cleaner head thereon in elevation, the construction shown, embodying my invention. Fig. 2 is a turbine shaft or body-carrier. Fig. 3 is a longitudinal sectional view taken at right angles to Fig. 2. Fig. 4 is an outline of the cleaner carrying arm and the pin on which it pivots. Fig. 5 is a driving shaft partly in section, taken at right angles to Fig. 4. Fig. 6 is the pin on which said arm is pivoted, and Fig. 7 is a modification of the pivoted end of the arm.

The letter *a*, designates the outer case of

a motor of suitable size, for passage through a boiler tube, and having a forwardly extending reduced portion *a*¹. Around said reduced portion on the shoulder *a*³ formed thereby, are a series of outlets *a*² to pass the water from the turbine. A turbine shaft *b*, has a recess *b*¹ opening at its front end, and extending rearwardly, in which an arm *c* is pivoted on a pin *c*¹, said recess and arm being of such relative dimensions, that the free end of said arm will swing outwardly from the axis of the motor, giving the cleaner *d*, screw threaded at *d*¹ on the forward end of the shaft, sufficient play to do its work.

A turbine wheel or runner *e* is mounted on the screw threaded portion *b*² of the shaft *b*, the turbine wheel or runner having formed on its periphery, a series of inclined buckets as seen in section at *e*¹, the openings through the buckets showing at *e*². A feed head *f* is screwed into the casing, to the screw threaded rear end *f*¹, of which casing any suitable coupling may be attached to connect a supply hose. The motor actuating fluid is received from the supply hose into a chamber *f*² and thence passes through the head to the buckets of the turbine wheel or runner through ports *f*³ in the head *f* said ports being curved in a well-known manner, as indicated by the dotted lines in Fig. 1. The head *f* is recessed at *f*⁴ in its central portion, to receive the rear end *b*³ of the shaft *b*. This construction forms a rear bearing for the motor shaft, against both longitudinal and lateral movements, and an intervening bushing *b*⁴ made of hardened material, is preferably used, so that when worn, it may be replaced. The forward end of the turbine wheel has a central recess to receive a hardened ring *b*⁵, which is screwed to the shaft *b* and bears against the shoulder of a bushing *b*⁶ which intervenes between the shoulder *a*³ of the casing, and the shoulder *b*⁷ of the shaft *b*, said construction forming a front bearing against the longitudinal and lateral movement. It will be seen that said ring and bushing when worn, may be replaced.

The arm *c* is ball shaped at its rear end, and has a transverse opening *c*², the longitudinal center of which is of such diameter, as to fit the pin *c*¹ which extends longitudinally there through, said opening being

gradually enlarged from said center to each end thereof, as particularly shown in Figs. 1, 4 and 5.

The pin c^1 is held in an opening b^8 extending transversely through the shaft b , by the motor e and ring b^5 , mounted on the shaft over the ends of said pin.

It will be seen that by pivoting the arm c on the pin as described, the arm is not only rotated and permitted to swing outwardly, from the axis of the motor, but further is given such flexibility, that it is always free to change direction in its forward movement, to follow through a bent or curved tube, and I have found this additional universal freedom of action, gives greater efficiency to the cleaner in its hammering and picking action. The joint described is the form I prefer, but I do not limit myself to this construction. Any coupling, whether universally acting or otherwise, when pivoted within a motor, the wheel or runner of which is protected by a casing and is adapted to rotate and swing the cleaner outwardly from the axis of the motor as described, I claim as my invention. In Fig. 7, I have shown a modification in which an opening c^3 through the ball shaped end of the arm c is of uniform diameter, throughout its length to fit the pin c^1 whereby the arm c is limited in its movement to swing outwardly from the axis of the motor in one direction only.

It will be seen that by providing a recess in the motor to permit the free end of the arm c to swing outwardly from the axis of the motor, I am enabled to pivot it at its rear end within the body of the motor, thus transmitting the power at the point of greatest efficiency and avoiding the strain, wear and loss of power by friction, that occurs when the joint or coupling is made forward of the motor. The pivoting of the arm c in the rear of the front bearing of the motor, and especially between the two, when both front and rear bearings are provided is especially desirable, giving strength, firmness and durability at the point of transmission of power.

I have shown a cleaner having a fixed head of special design (heretofore patented by me) on the free end of the driving shaft, but I do not want to be understood as limiting myself to this head. Any style of a cleaner, whether with a fixed or rotating head, and whether having a single arm or a plurality of swinging arms carrying cutters or cleaners of any kind, may be used by attaching the same to the forward or free end of the arm c in any suitable manner.

The operation of my device is as follows: Having secured a cleaner to the forward or free end of the driving shaft, and attached a supply hose to the motor, the motor with its cleaner is inserted in and pushed through

the tube to be cleaned, the actuating fluid driving the cleaner in the manner described to remove the scale from the tube.

Having thus described my invention, I claim:

1. In a boiler tube cleaning device, a rotatable motor comprising a runner, a casing therefor adapted to protect the runner and stationary in its relation thereto, front and rear bearings for the runner, a cleaner carrying member pivoted within the motor between said bearings and rotated thereby and adapted to swing outwardly from the axis of the motor, said cleaner carrying member being driven solely by the rotation of the runner, substantially as described.

2. In a boiler tube cleaning device, a rotatable motor comprising a runner, a driving shaft upon which said runner is mounted, said shaft having a recess opening from its forward end extending rearwardly, a casing inclosing said runner and shaft and stationary in its relation thereto, a bearing for the shaft, a forwardly extending freely swinging arm pivoted at its rear end within said recess and bearing, driven by the rotation of the runner and a cleaner on the free end of said arm, substantially as described.

3. In a boiler tube cleaning device, a rotatable motor comprising a runner, a driving shaft upon which said runner is mounted, said shaft having a recess opening from its forward end extending rearwardly, a casing inclosing said runner having front and rear bearings to carry the shaft, said bearings being adapted to take the end thrust in both directions, a forwardly extending uninterrupted freely swinging arm pivoted at its rear end within said recess between said bearings, and driven by the rotation of the runner and a cleaner on the free end of said arm, substantially as described.

4. In a boiler tube cleaning device, the combination with a central shaft having a recess opening from its forward end, extending rearwardly, and a motor with its casing mounted on said shaft having removable front and rear bearings for the motor, adapted to resist the end thrust in both directions, of a forwardly extending arm having its rear end pivoted within said recess and bearings and a cleaner on the other end of said arm, the recess being of sufficient size to permit the free end of the arm to swing outwardly from the axis of the motor, substantially as described.

5. In a boiler tube cleaning device, the combination with a central shaft having a recess opening from its forward end, extending rearwardly, and a motor with its casing mounted on said shaft having removable front and rear bearings for the motor and adapted to resist the end thrust in both directions, of a forwardly extending driving

5 shaft, having its rear end pivoted within said recess, and between said bearings, and a cleaner on the other end of said arm, the recess being of sufficient size to permit the free end of said arm to swing outwardly from the axis of the motor, substantially as described.

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

HENRY F. WEINLAND.

Witnesses:

C. A. McCORMICK,
CLIFTON P. GRANT.