

G. H. AINGE.
BOILER TUBE CLEANER.
APPLICATION FILED FEB. 1, 1908.

958,205.

Patented May 17, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

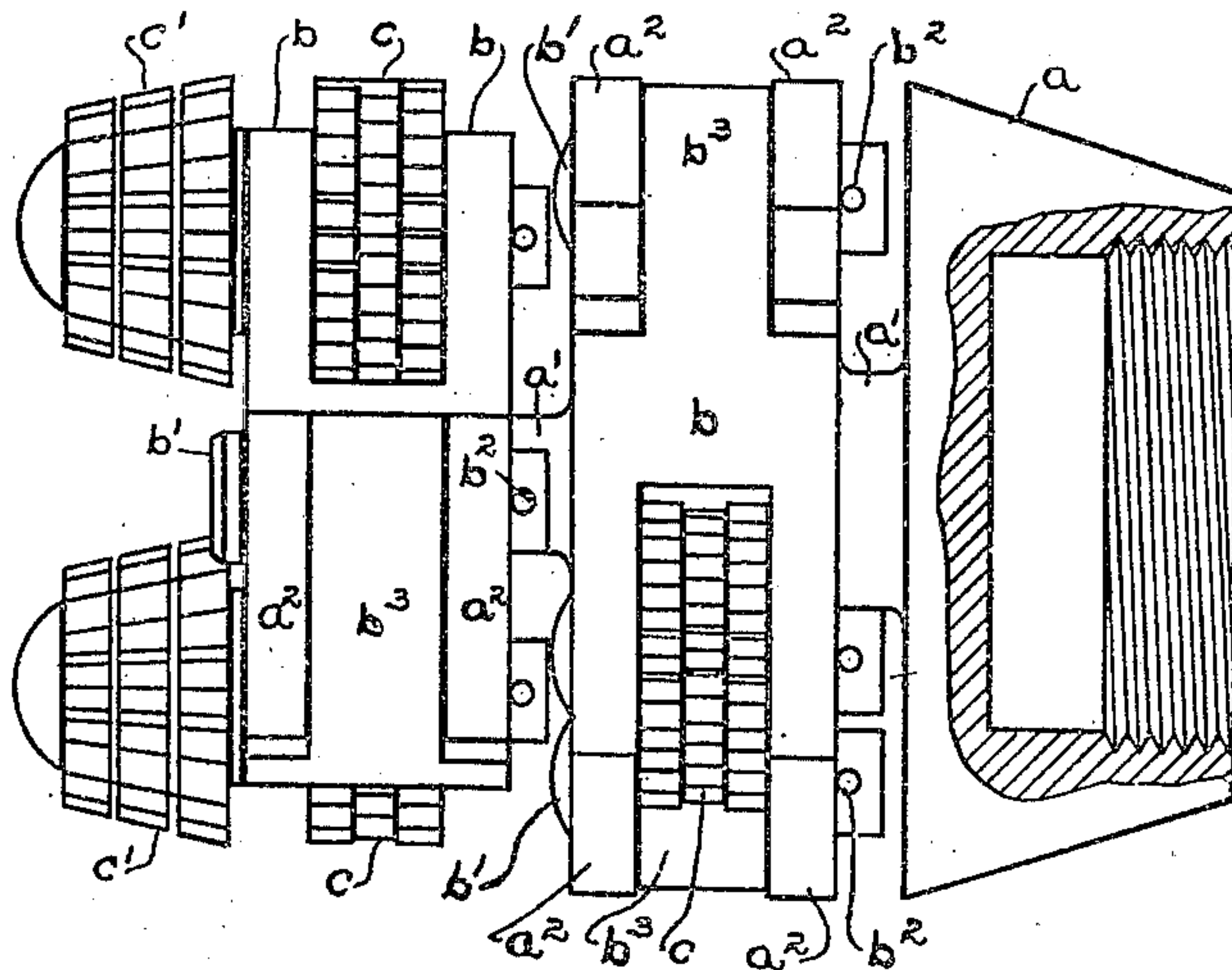
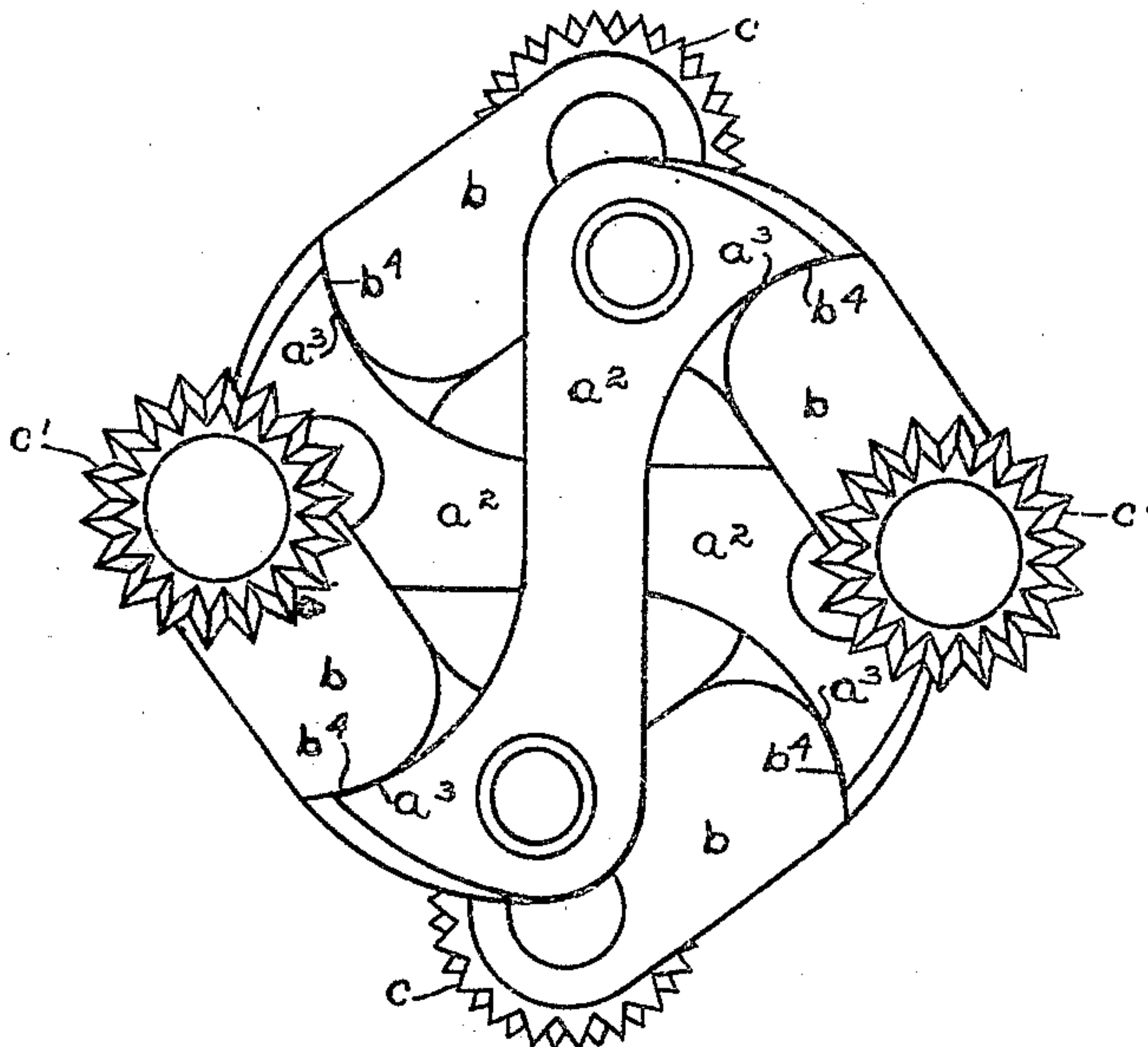


Fig. 2.



Inventor

Witnesses
H. M. M. M. M. M.
J. Grover

George H. Ainge

By

Percy Norton

Attorney

G. H. AINGE.
BOILER TUBE CLEANER.
APPLICATION FILED FEB. 1, 1908.

958,205.

Patented May 17, 1910.

3 SHEETS—SHEET 2.

Fig. 3.

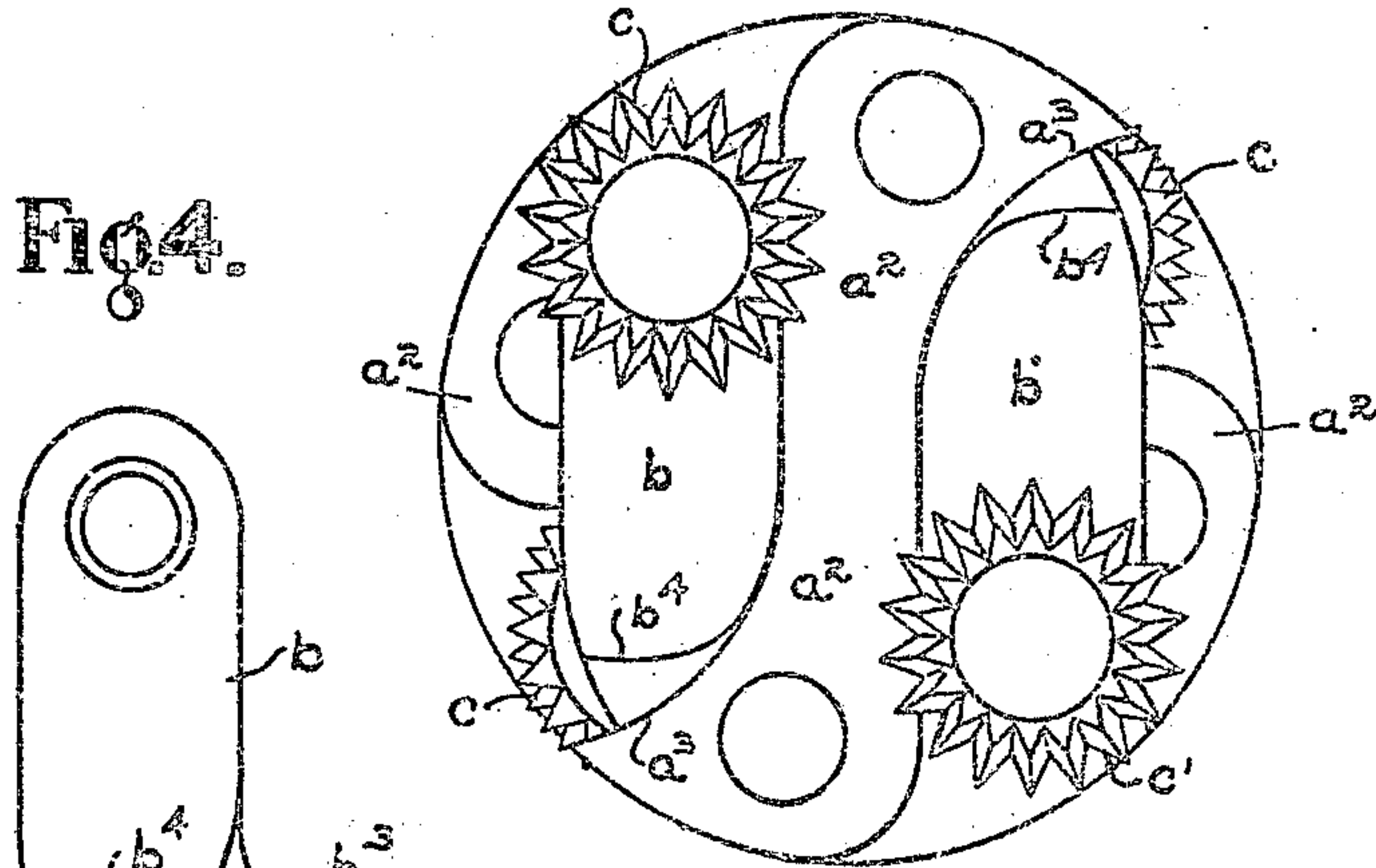


Fig. 4.

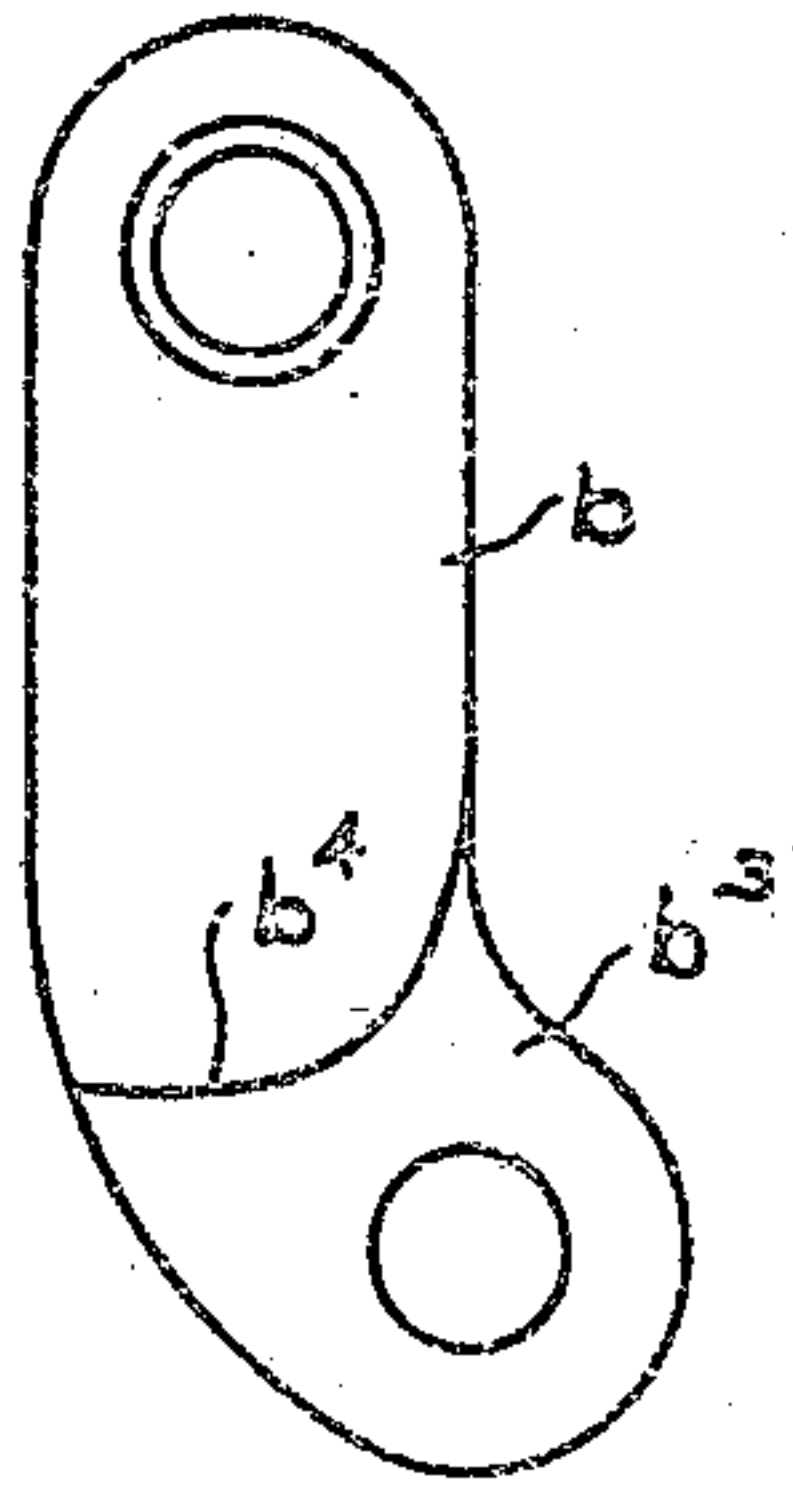


Fig. 5.

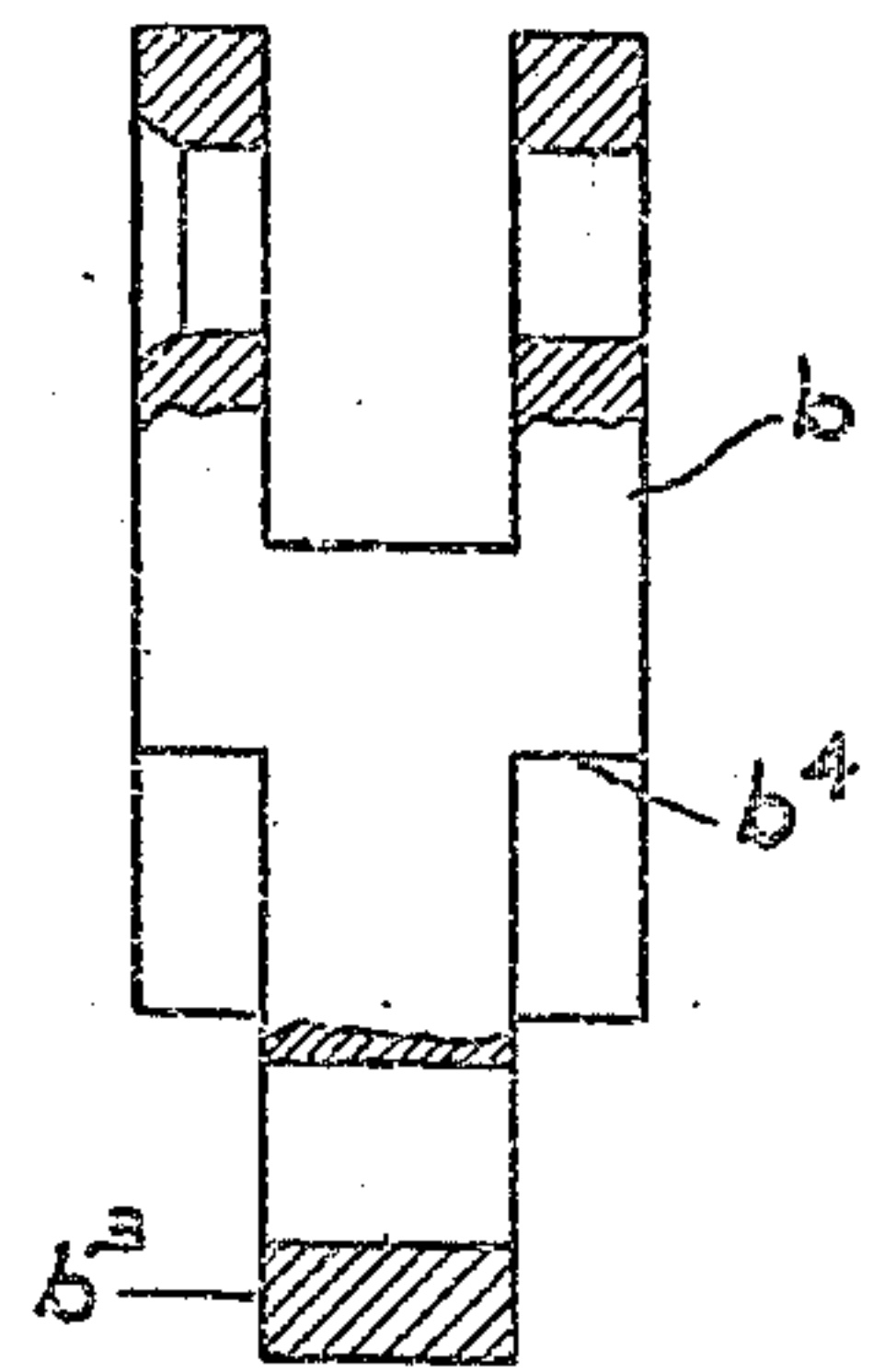


Fig. 6.

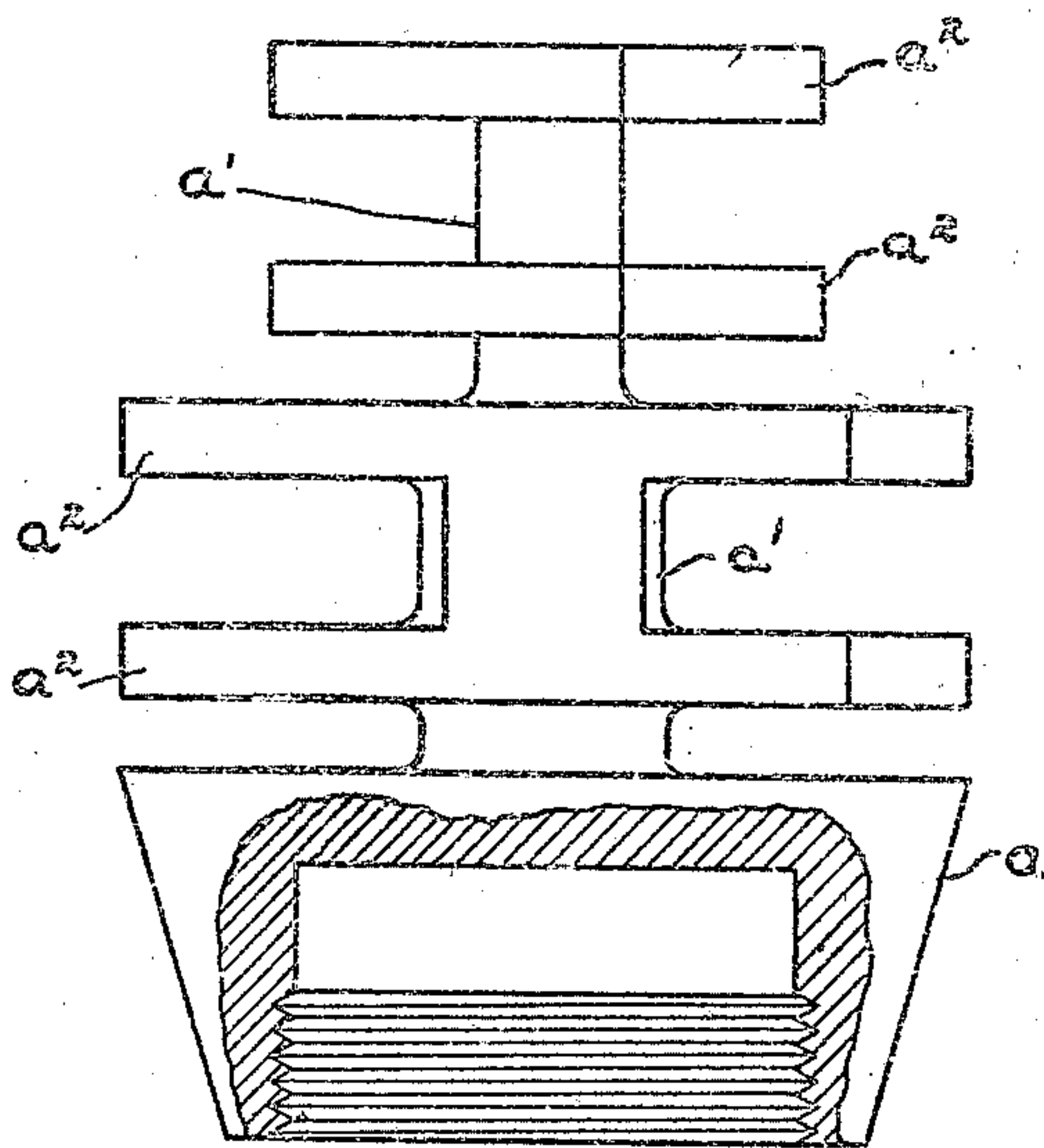
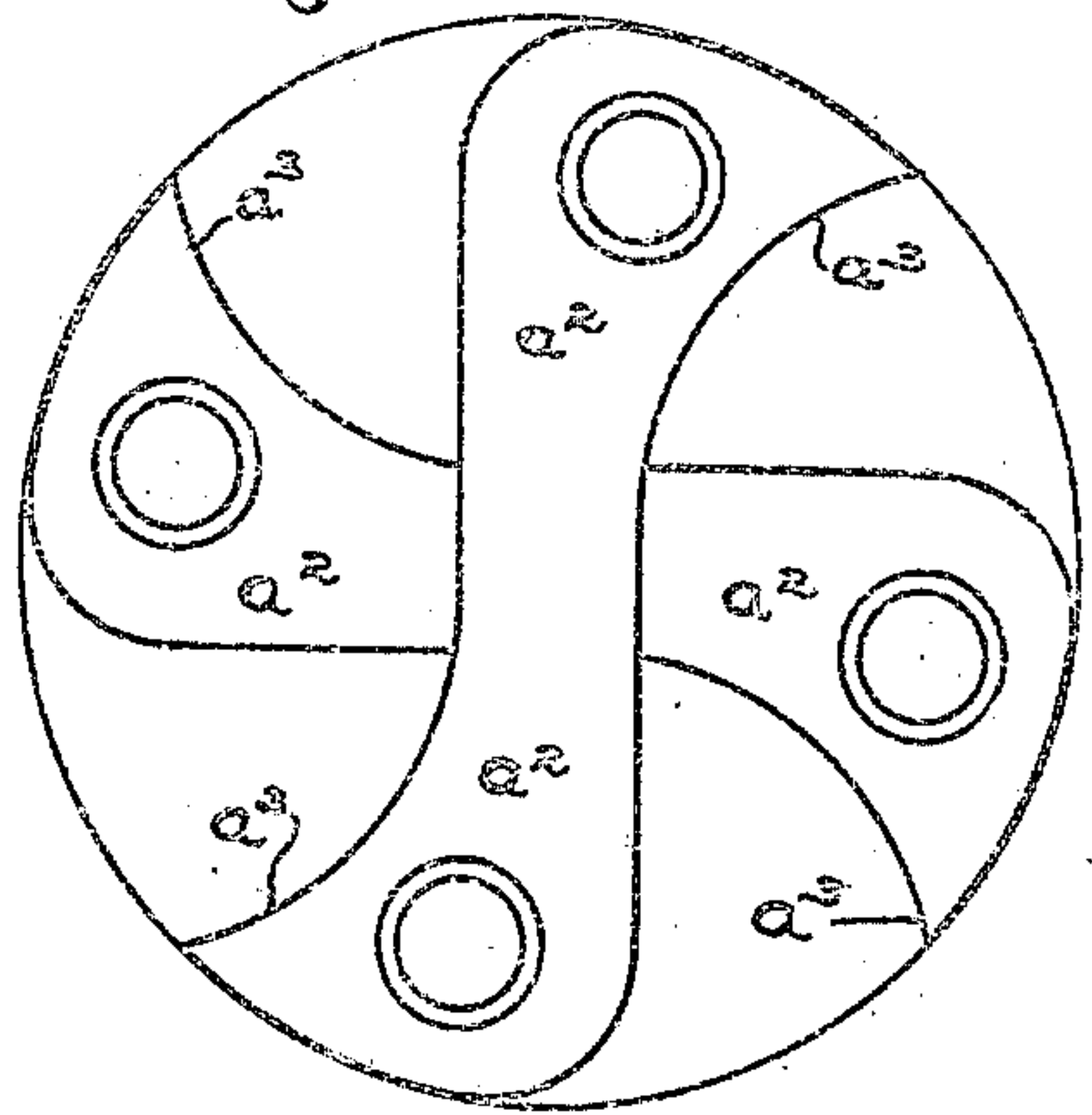


Fig. 7.



WITNESSES:

H. Weinland
Ernest L. G. L.

INVENTOR.

George H. Ainge
BY *Percy Norton*
ATTORNEY.

G. H. AINGE.
BOILER TUBE CLEANER.
APPLICATION FILED FEB. 1, 1908.

958,205.

Patented May 17, 1910.
3 SHEETS—SHEET 3.

FIG. 2.

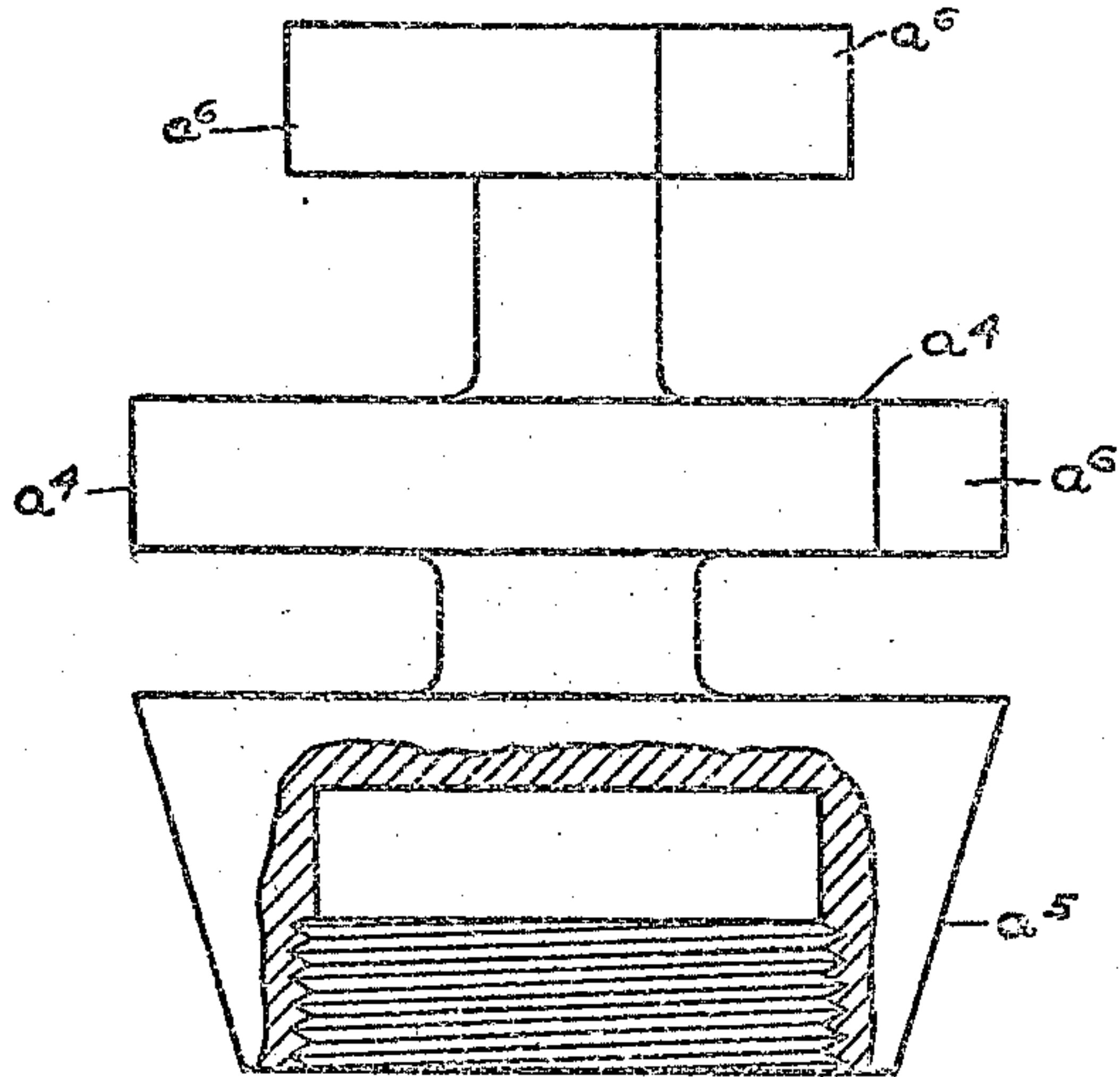


FIG. 3.

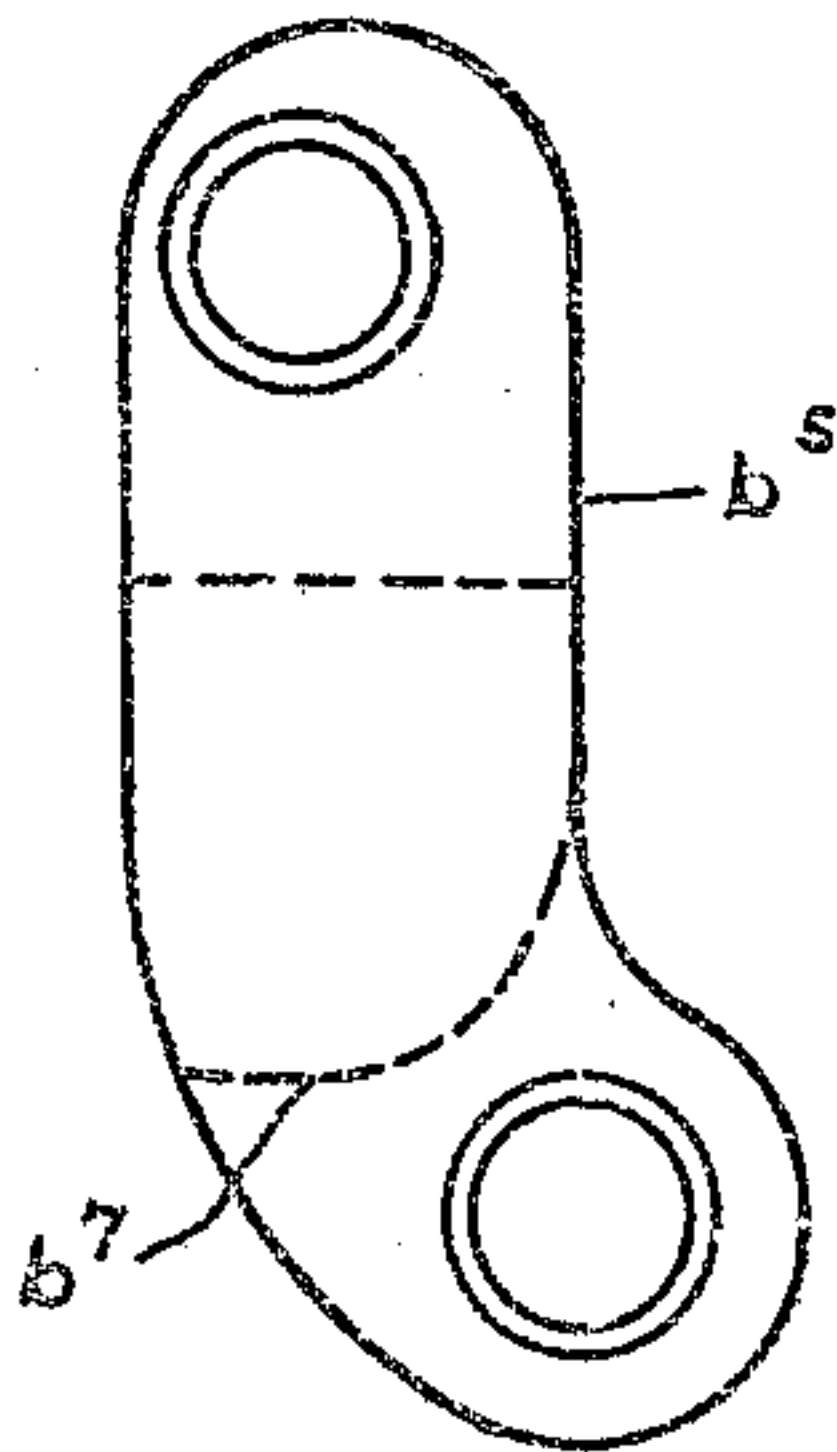


FIG. 11.

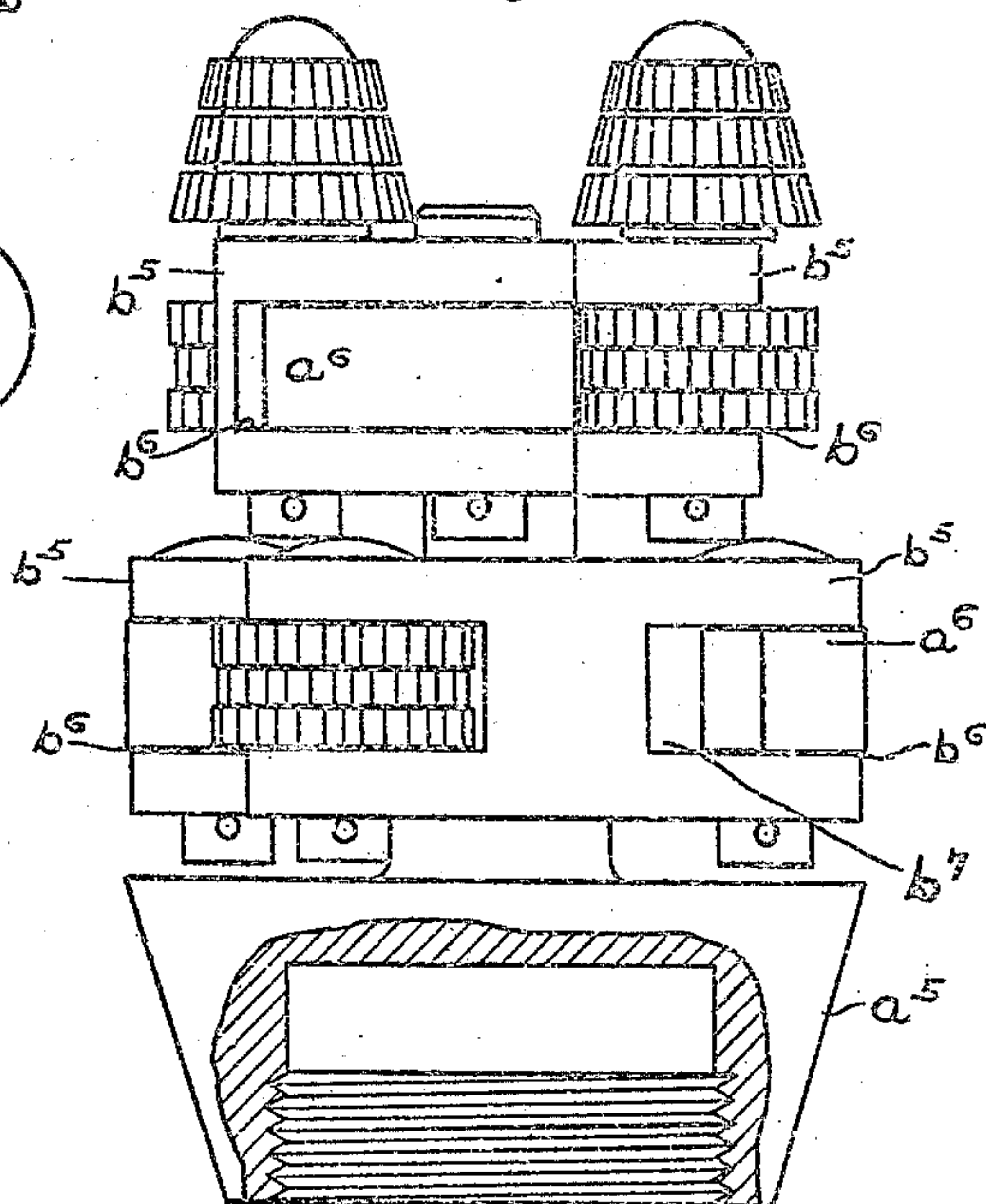
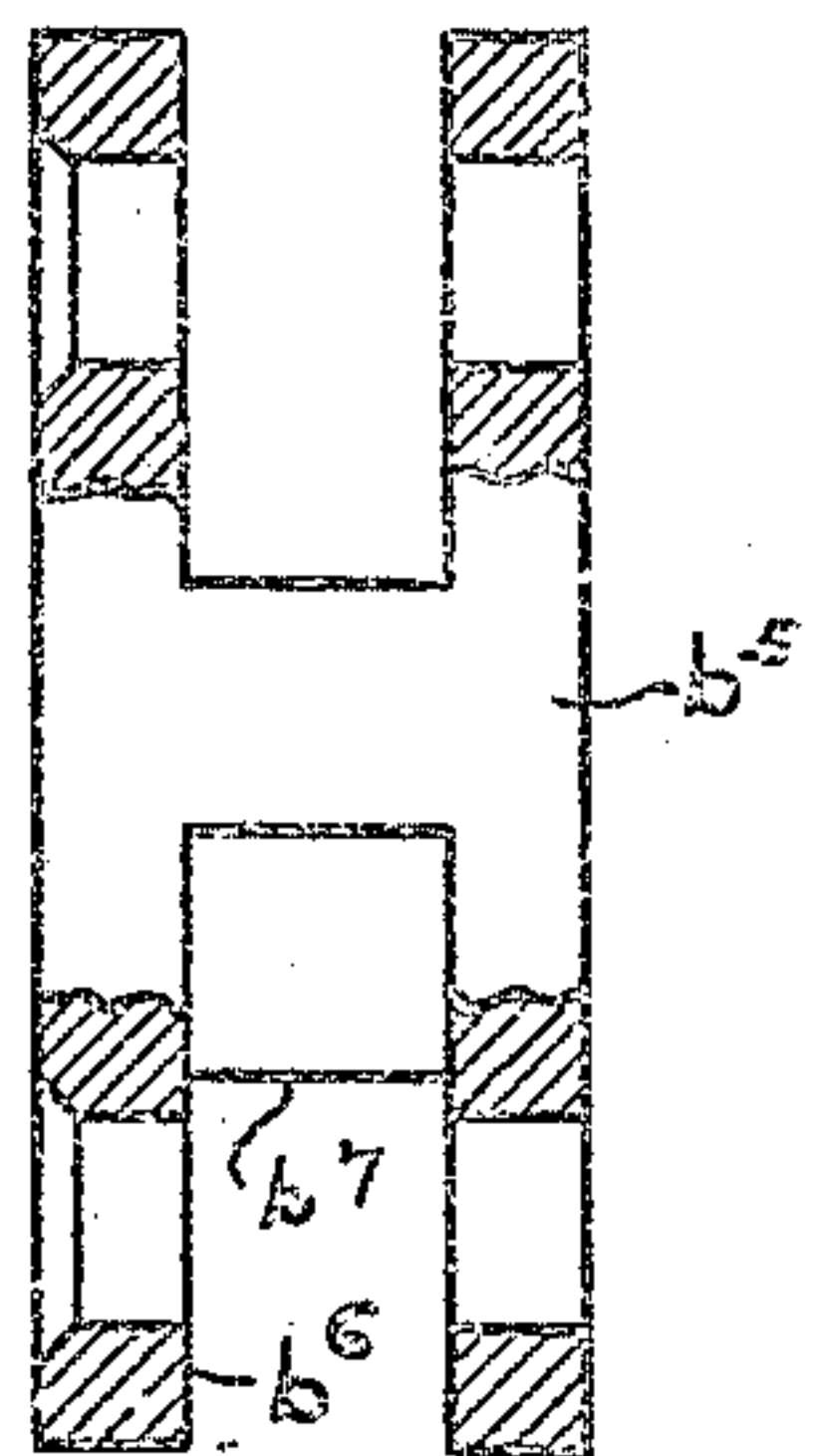


FIG. 10.



Inventor

Witnesses
H. H. Ainge
George H. Ainge

By

George H. Ainge
Percy Horton

Attorney

UNITED STATES PATENT OFFICE.

GEORGE H. AINGE, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE LAGONDA MANUFACTURING COMPANY, OF SPRINGFIELD, OHIO, A CORPORATION OF OHIO.

BOILER-TUBE CLEANER.

958,205.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed February 1, 1908. Serial No. 413,801.

To all whom it may concern:

Be it known that I, GEORGE H. AINGE, 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-Tube Cleaners, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to tube cleaners and more particularly to cleaners for water tubes of steam boilers.

The object of my invention is to provide an improved cleaner that will be more efficient in operation and with this end in view I have arranged to give the greatest possible length to the cutter carrying arms consistent with operating two of them in the same plane. This increased length of the arms gives them greater force in their hammering and picking action to disintegrate and remove the scale; and by arranging two of them in the same plane, when more than one pair are used, I keep the length of the head within proper limit for efficient work in bent tubes.

A further object is to simplify the construction making the several parts stronger and more durable and so arranging them in their relation to each other that they can be readily removed.

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

In the accompanying drawings which form a part of this specification Figure 1. is the side elevation of a cleaner head embodying my invention, Fig. 2. is an end view of same with the cutter carrying arms shown at the extreme limit of their outward radial movement, Fig. 3. is same view showing the cutter carrying arms at the extreme limit of their inward radial movement, Figs. 4. and 5. give two views of the cutter carrying arms, Fig. 6. is a side elevation of the support, Fig. 7, is an end view of same and Figs. 8, 9, 10 and 11 show a modified form of the cleaner, Fig. 8 being the support, Figs. 9 and 10 views of the cutter carrying arms and Fig. 11 the complete head of the modified form.

In the drawings a represents a support

having a central post a^1 with two pairs of oppositely extending ears a^2 thereon. To each pair of the ears a^2 and preferably at the outer ends thereof as shown I pivot on pins b^1 extending through perforations in the ears and held in place by cotters b^2 , a pair of cutter carrying arms b the pivoted ends b^3 being reduced in width to fit between the ears to which they are pivoted forming a strong and durable construction. The arms a^2 are formed with a projection a^3 at their outer ends against which the shoulder b^4 on the cutter carrying arms in their outward movement bear forming a stop to limit the movement to the size of the tube in which the head is operated. The head may be formed with a single or a series of pairs of cutter carrying arms in like manner; but I have shown two pairs in the drawings as preferable for general purposes.

It will be seen the respective members of each pair of cutter carrying arms are pivoted on opposite sides of the head and when in their closed position as shown in Fig. 3, extend across the head parallel with each other on opposite sides of the central post and abutting the oppositely extending ears. This particular construction and arrangement of the arms I have found in practice to give very much improved results. In Fig. 2. the arms are shown at the limit of their outward movement with the shoulder b^4 of the arm bearing against the stop a^3 of the ears.

I have shown rotary cutters c pivoted within the bifurcated free end of the arms, the front arms also preferably carrying upon their forward sides rotary cutters c^1 arranged in cone shape, said cutters being pivoted on pins with heads and cutters on the opposite ends of the pins to hold them in place as shown.

The rear end of the support a is screw threaded as shown to attach the head to the motor shaft but the head may be connected with the motor or driving shaft in any suitable manner.

In Figs. 8, 9, 10 and 11, I have shown a modification in which the cutter carrying arms b^5 are bifurcated at b^6 and are pivoted to the ears a^4 of the support a^5 , the ears being pivoted within the bifurcations as shown; and a shoulder b^7 formed on the

arms contacts with a projection a^6 of the ears to form a stop to limit the radial movement of the arms.

Having thus described my invention, I
5 claim;

A cleaner head comprising a series of freely swinging pairs of arms, a support having a central post with oppositely extending ears formed integrally therewith
10 for each pair of arms, the respective members of each pair of arms being pivoted at one end to the outer ends of the ears, each arm and the ear to which it is pivoted being
15 arranged to operate one within a bifurcation of the other for a portion of their

length the arms being adapted to swing transversely to the axis of the head in the same plane with and on opposite sides of the ears, the free ends of the arms being bifurcated and provided with cutters pivoted
20 therein and cutters on the front side of the forward pair of arms substantially as described.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses. 25

GEORGE H. AINGE.

Witnesses:

WM. GUGENHEIM,
CARL CASKEY.