

No. 798,468.

PATENTED AUG. 29, 1905.

M. H. THOMPSON.
BOILER TUBE CLEANER.
APPLICATION FILED NOV. 26, 1904.

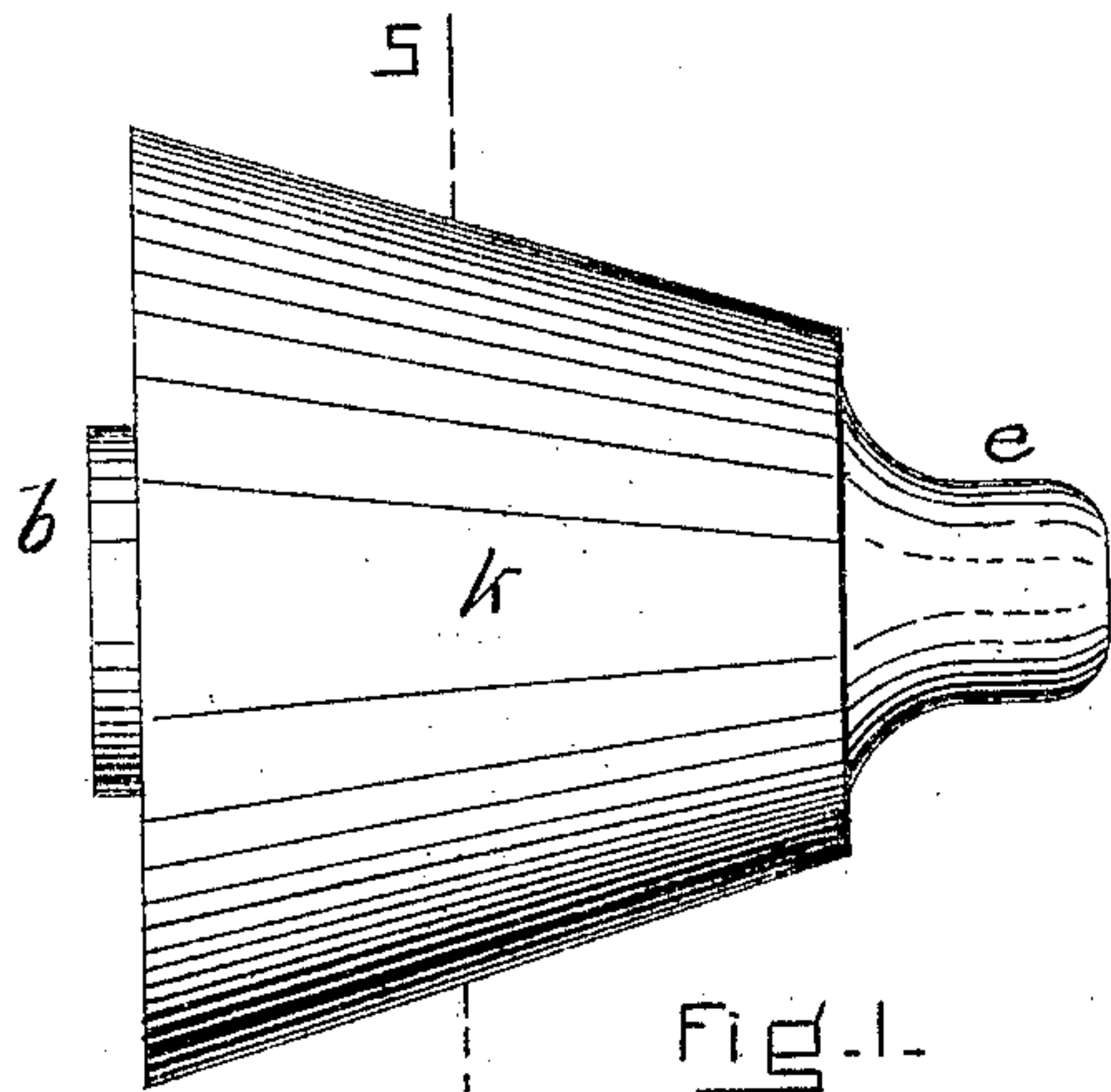


Fig. 1.

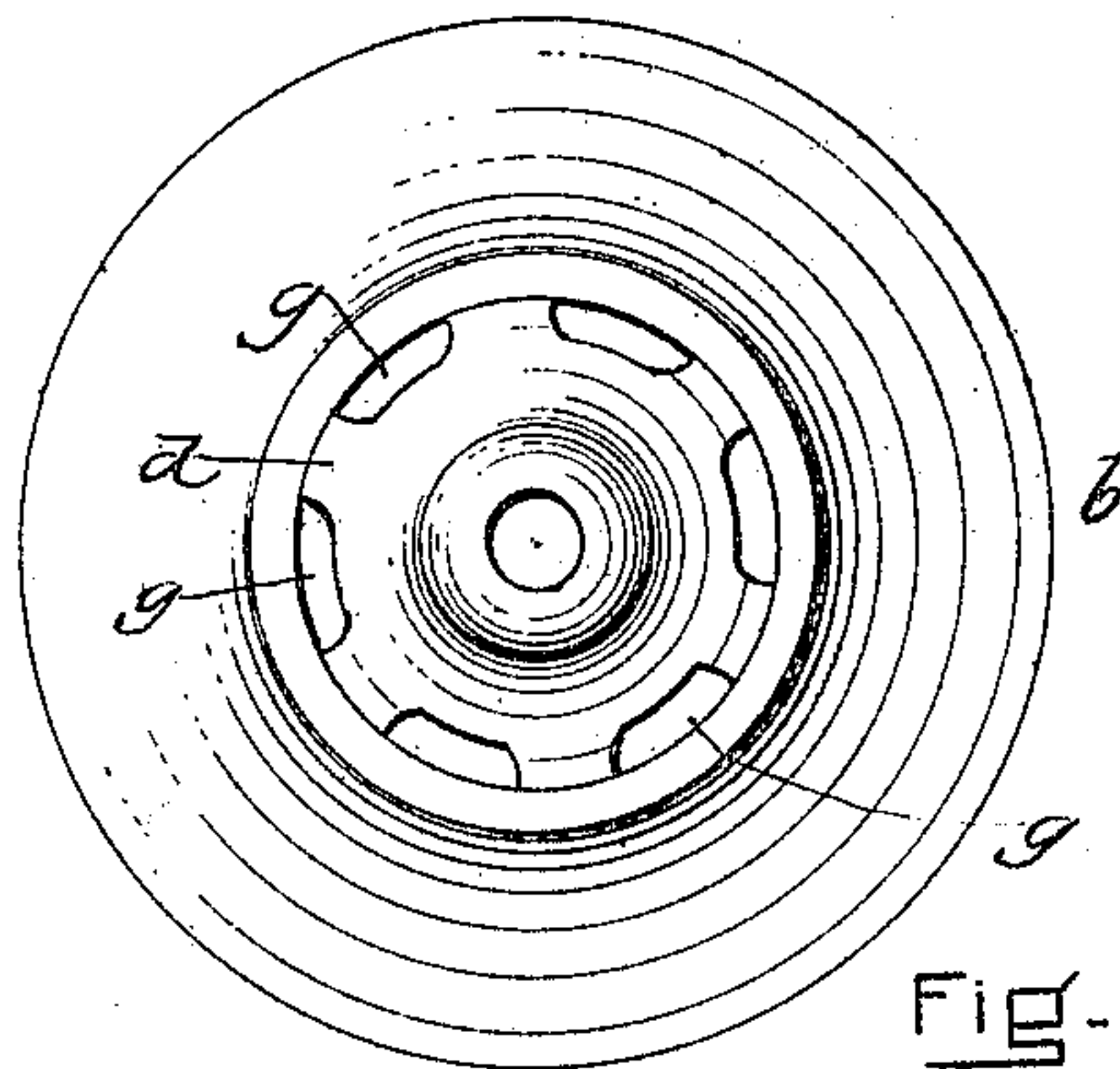


Fig. 2.

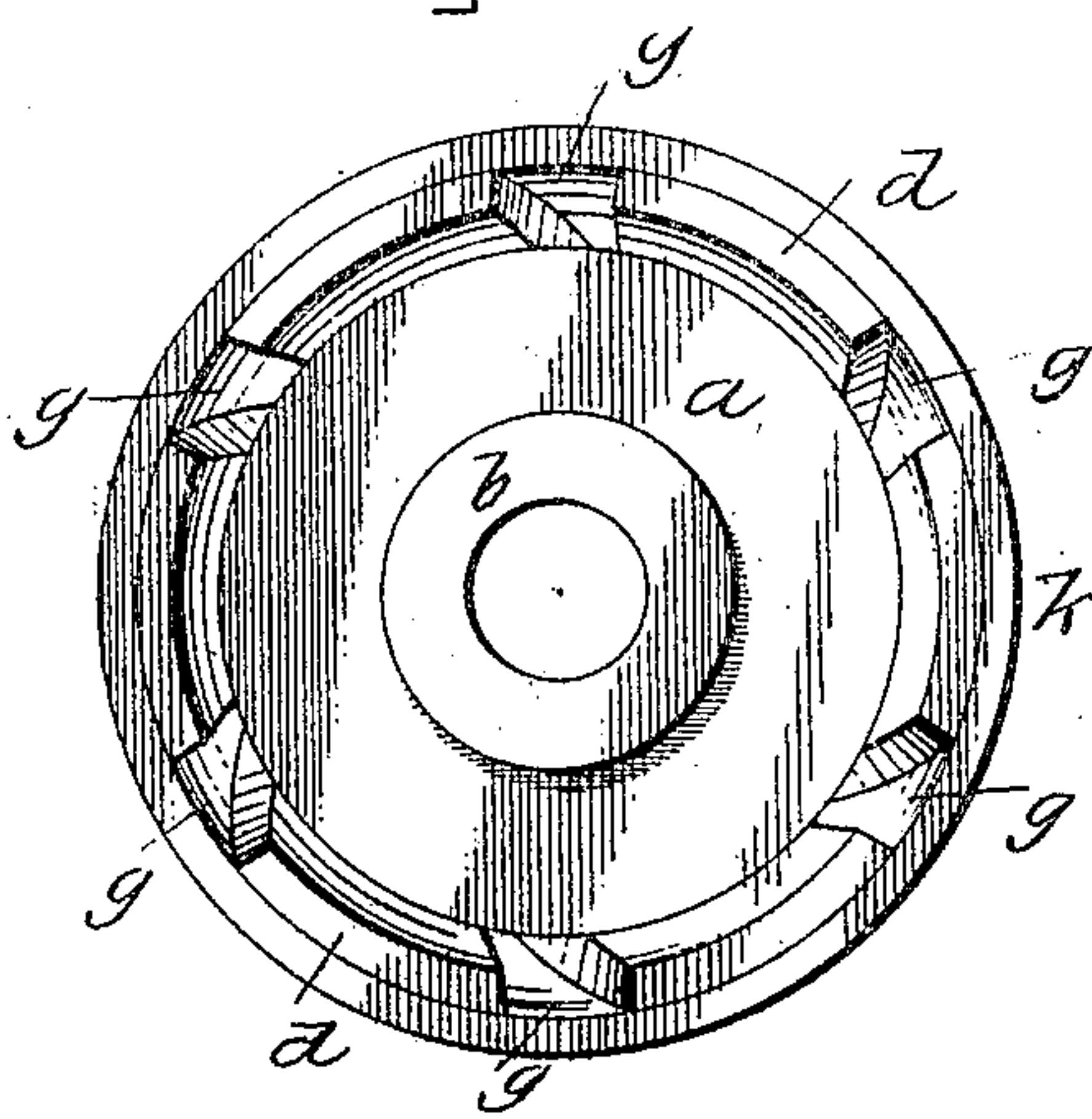


Fig. 3.

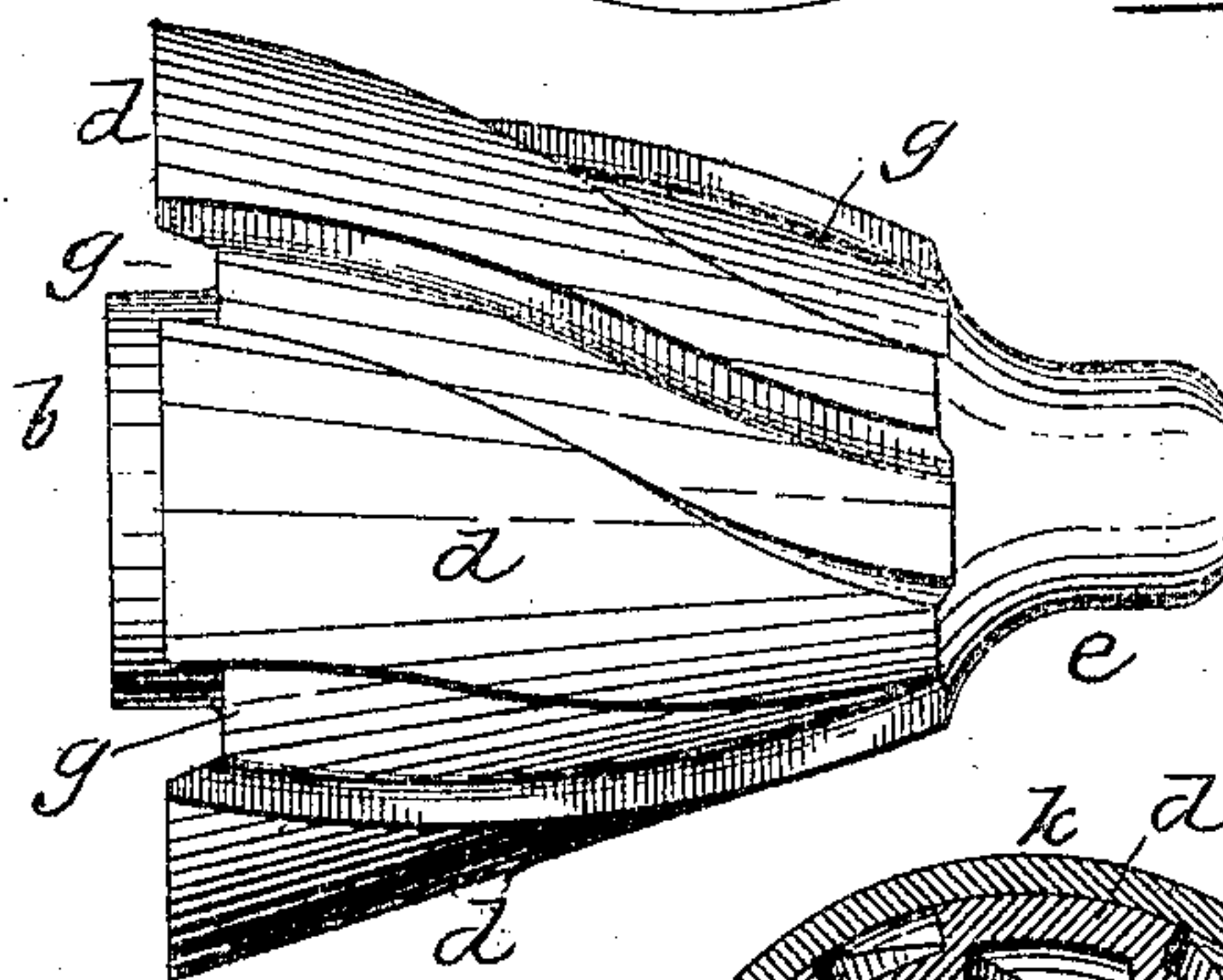


Fig. 4.

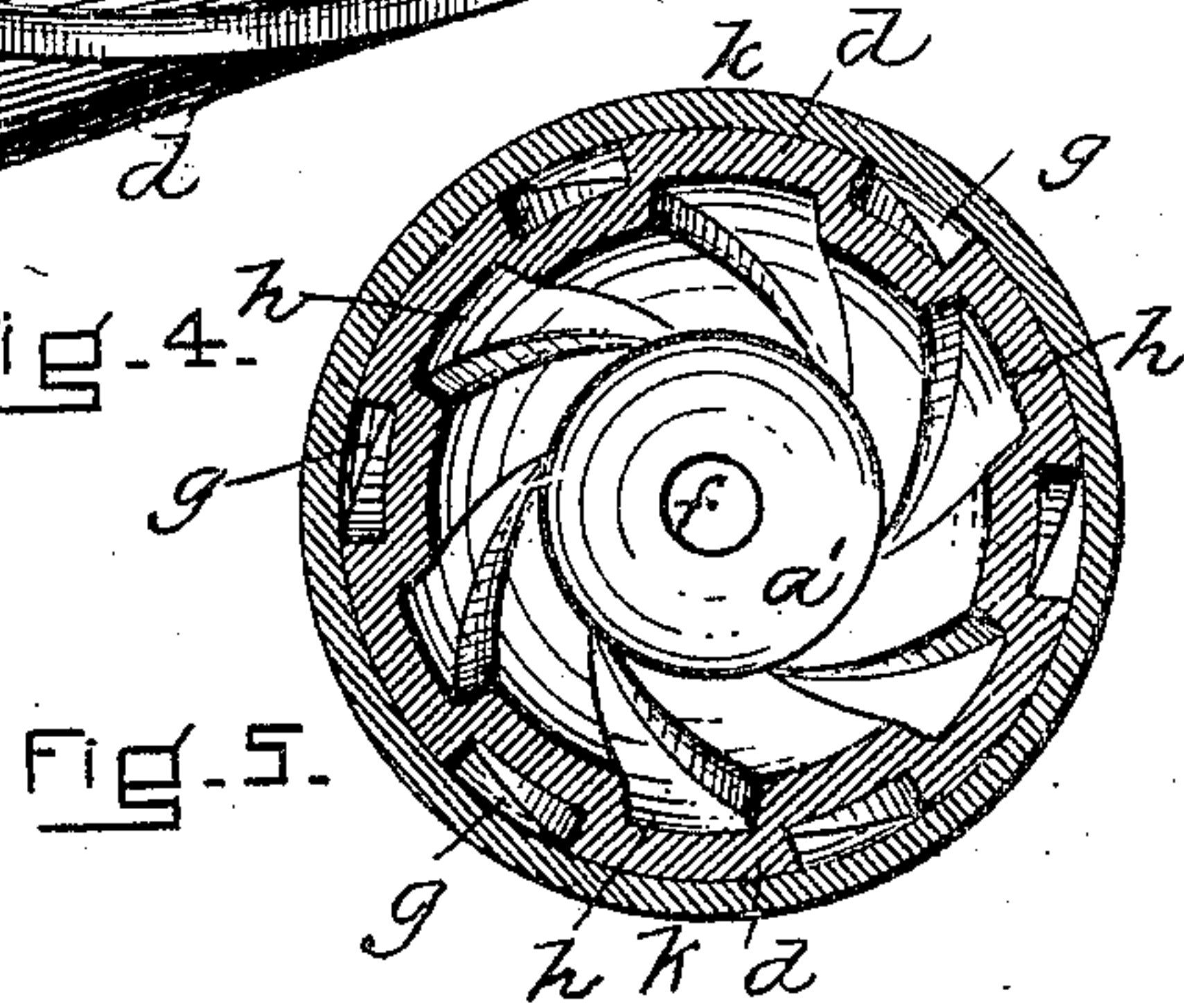


Fig. 5.

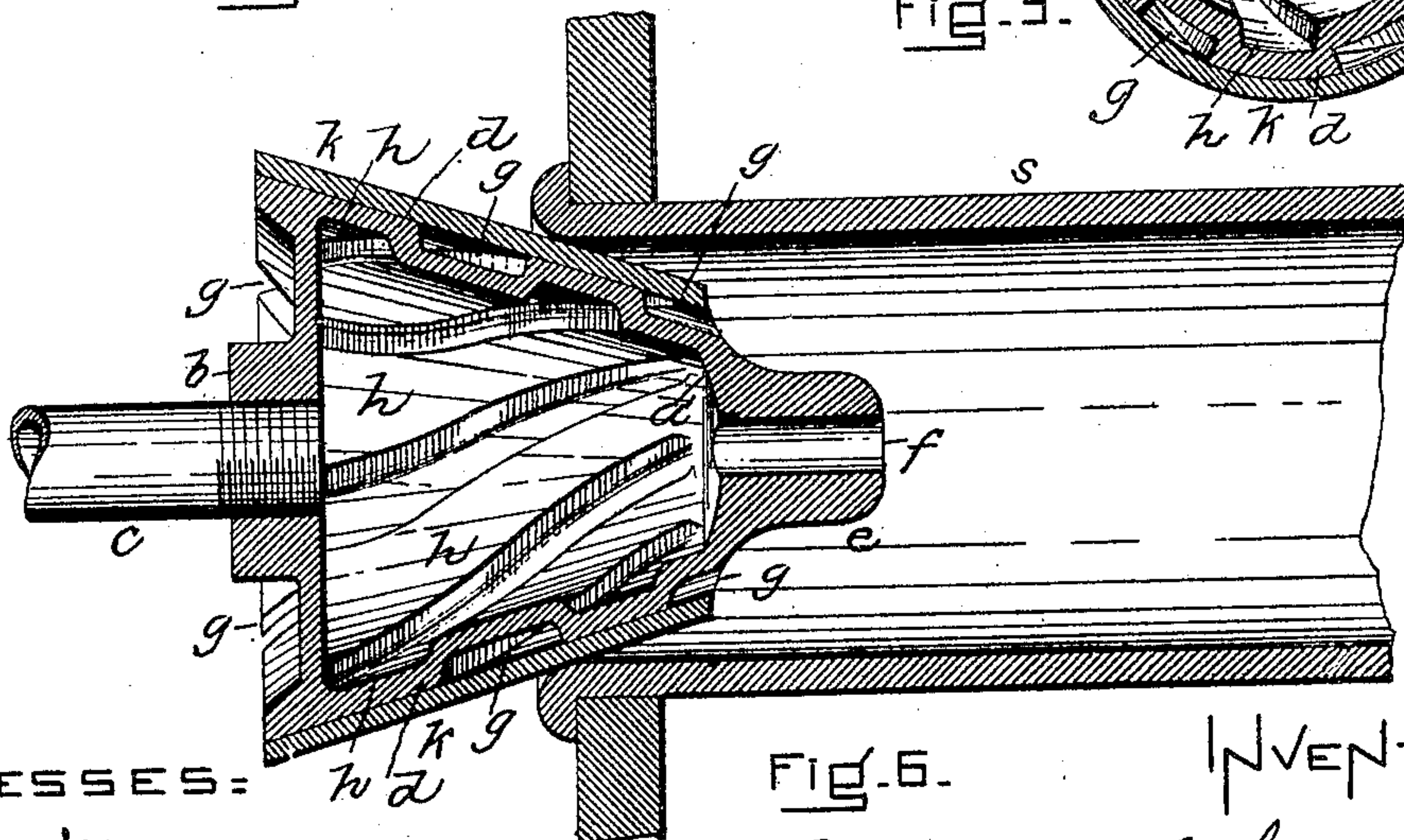


Fig. 6.

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UNITED STATES PATENT OFFICE.

MARTIN H. THOMPSON, OF PORTLAND, MAINE, ASSIGNOR TO M. H. THOMPSON MANUFACTURING COMPANY, A CORPORATION OF MAINE.

BOILER-TUBE CLEANER.

No. 798,468.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed November 26, 1904. Serial No. 234,380.

To all whom it may concern:

Be it known that I, MARTIN H. THOMPSON, a citizen of the United States, residing in Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Boiler-Tube Cleaners, of which the following is a specification.

In operating my invention I introduce into my improved tube-cleaner a jet of steam taken from the boiler, the construction of the cleaner being such that when said steam enters the tube through the nozzle of the cleaner it introduces a volume of hot air spirally into the tube. It has been found in practice that when air is forced into a tube in a straight line it is apt to remove little but dust, requiring the tube to be afterward scraped. Moreover, the air being of a comparatively low temperature causes the tube to contract and leak. In my improvement the jet of steam draws the air through the tube spirally, whereby it strikes the scales from one side, (instead of "head on," as the steam has been striking them,) working under and dislodging them and then driving them through to the end of the tube, where they can be dropped into any convenient space, and the air thus introduced spirally into the tube enters it in a heated condition, thus preventing the tube from contracting and leaking.

The nature of the invention is fully described in detail below and illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation of my boiler-tube cleaner. Fig. 2 is an end view of the same looking toward the left. Fig. 3 is an end view looking toward the right. Fig. 4 is a side elevation with the conical case removed. Fig. 5 is a section taken on line 5 5, Fig. 1. Fig. 6 is a longitudinal section of the device in position, the boiler-tube being also shown in section and the end of a pipe through which steam may be conducted to the cleaner being shown in elevation.

Similar letters of reference indicate corresponding parts.

The device comprises two parts—viz., an internal cone and an external cone, the latter fitting over the former. The internal cone consists of the substantially flat rear wall *a*, formed up and screw-threaded at *b* to receive an inlet-tube *c*, which may be connected in any manner to the boiler, the conical wall *d*, the opposite end wall *a'*, and the nozzle *e*,

provided with a substantially straight and smooth passage *f*. The conical wall *d* is formed externally into spiral grooves *g* and internally into spiral grooves or recesses *h*, the internal grooves or recesses being non-coincident with the external grooves, but alternating with them, whereby as the internal grooves are between the external grooves the thickness of the conical wall *d* is substantially or nearly even, as illustrated in Figs. 5 and 6. *k* represents a plain conical case fitting over the conical wall *d*. It will be seen, therefore, that when the two parts of the device are assembled the spiral grooves *g* become spiral passages.

In operation when a jet of steam is introduced through the tube *c* it first enters the conical chamber in the internal cone, filling all the grooves *h* and heating the wall *d* of said chamber, and also the outer cone *k*, through its contact with said wall *d*. The jet of steam then passes quickly through the nozzle *e* into the boiler-tube *s*, and as each of the spiral passages *g* connects at its inner end with the interior of the boiler-tube and at its outer end with the external air the steam-jet draws the air through each passage *g* into the boiler-tube. As each of these passages *g* is spiral in the cleaner and as there are a number—say six—of said passages, the jet of steam draws six currents of hot air spirally through the tube, so that each spirally-moving current of hot air approaches and impinges on the scales sidewise, not head on, as the steam approached them, and dislodges them quickly and efficiently. Moreover, as the air in these passages *g* has become heated by its contact with the cones *d* and *k* it enters the boiler-tube in a heated condition and does not contract the metal and produce leakage.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A boiler-tube cleaner adapted to be applied to the end of a boiler-tube, comprising a hollow structure the wall of which is provided with spiral passages whose opposite ends connect with the interior of the boiler-tube and with the external air and is formed on its inner surface with spiral grooves non-coincident with and alternating with said spiral passages, a nozzle extending into the boiler-tube, and means for allowing the admission of steam into the structure, whereby

a jet of steam passing through said structure draws air through said passages spirally into the boiler-tube.

2. The herein-described boiler-tube cleaner,
5 comprising the inner hollow cone α formed on its outer surface with spiral grooves γ whose opposite ends are adapted to connect with the interior of a boiler-tube and the external air and formed on its inner surface
10 with the spiral grooves λ non-coincident with and alternating with said spiral passages, a nozzle extending from said cone into the

boiler-tube, means for allowing the admission of steam into the larger end of the cone, and the external cone λ fitting over said cone λ , 15 for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARTIN H. THOMPSON.

Witnesses:

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H. P. SWEETSER.