

No. 618,693.

Patented Jan. 31, 1899.

A. LANGTON.
WATER TUBE STEAM GENERATOR.

(Application filed July 6, 1898.)

(No Model.)

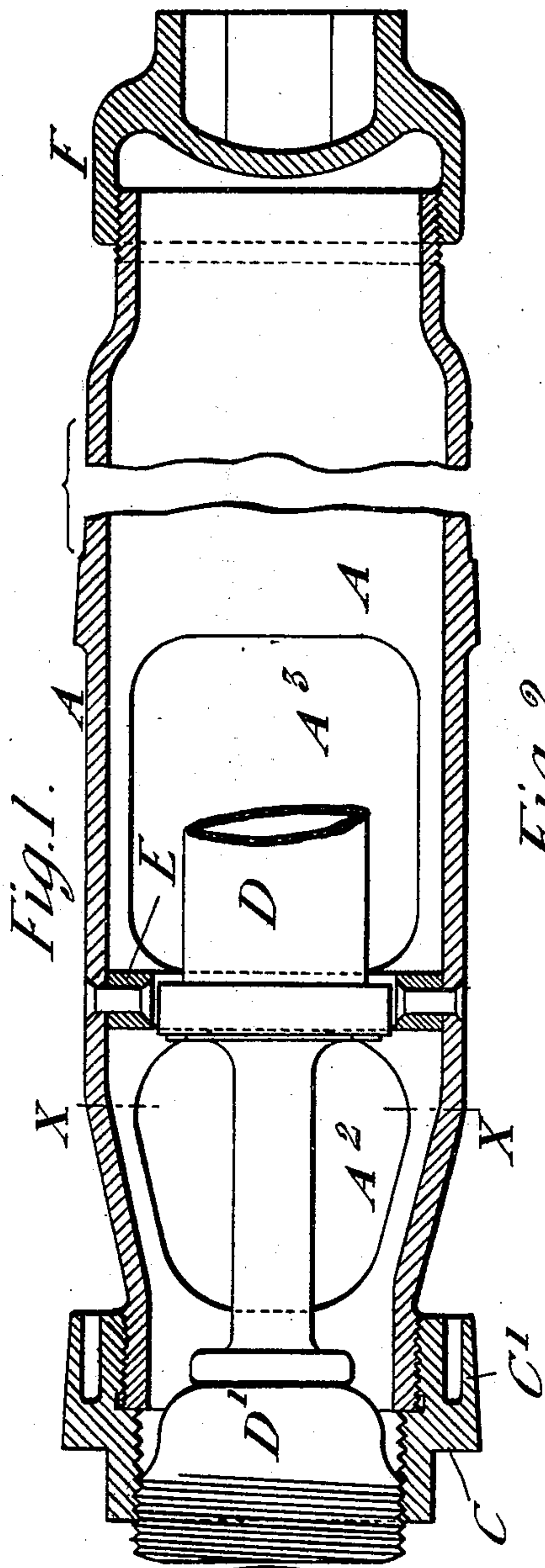


Fig. 1.

Witnesses
J. B. Keefe
Alfred Langton

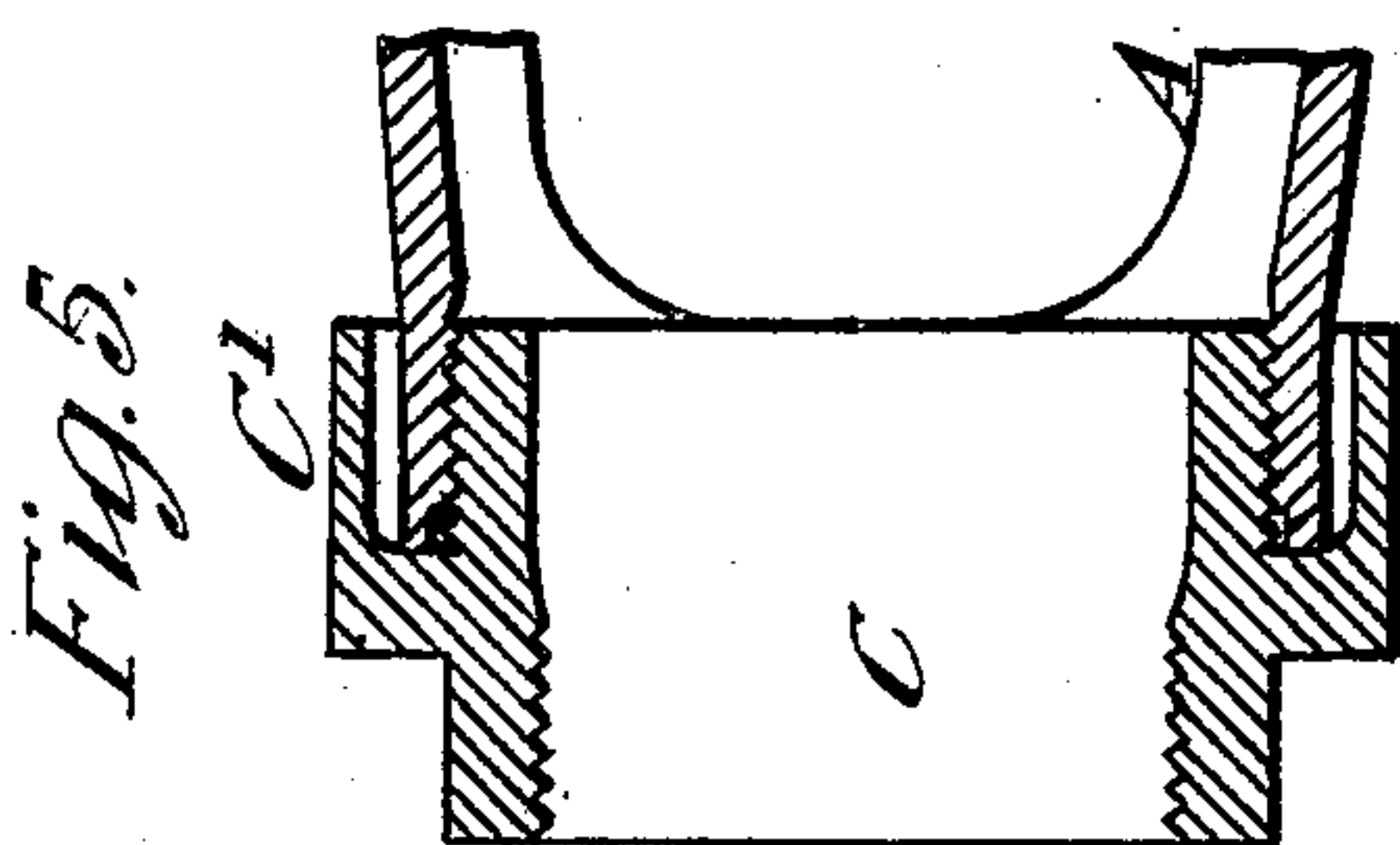


Fig. 5.

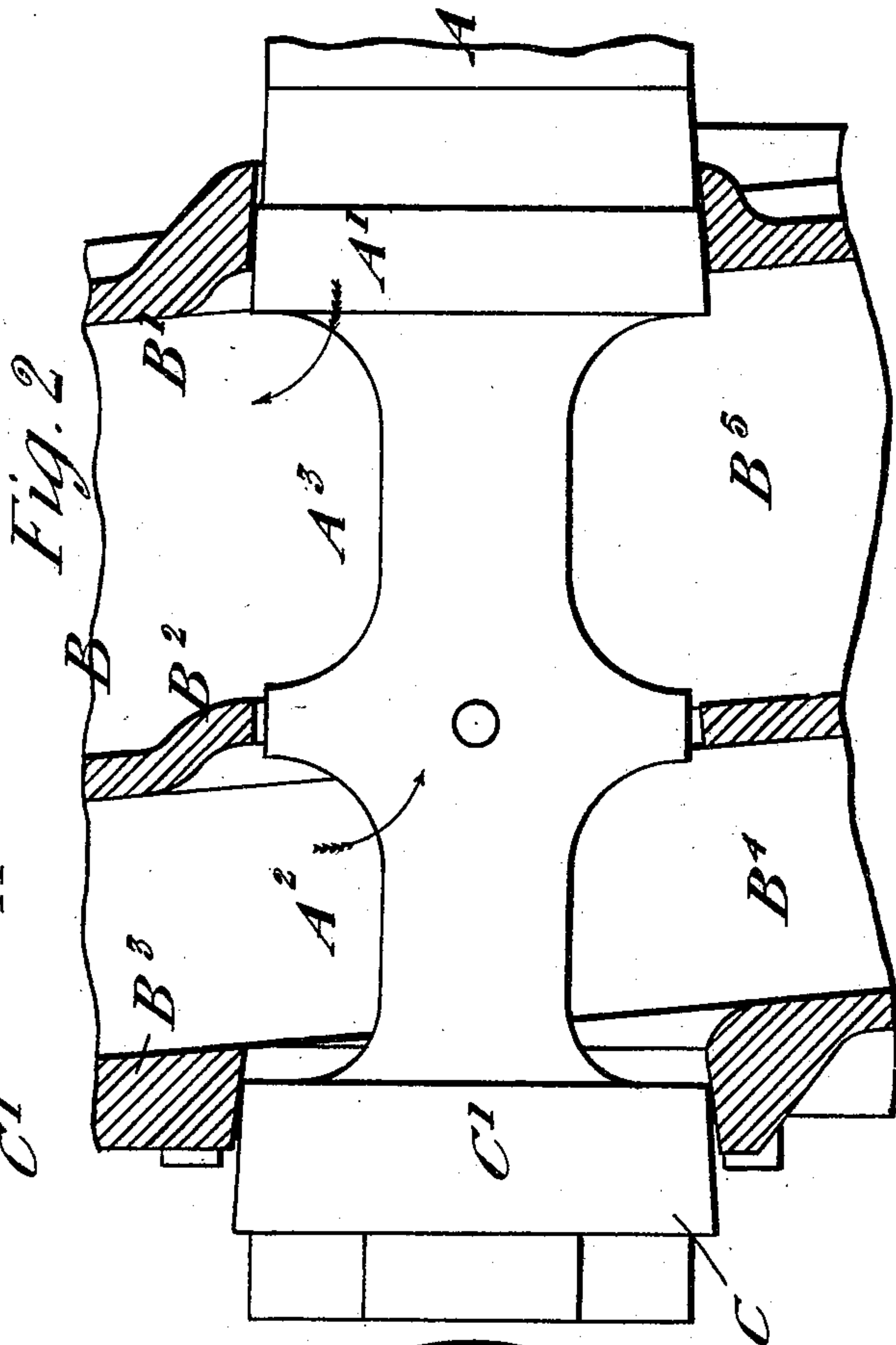
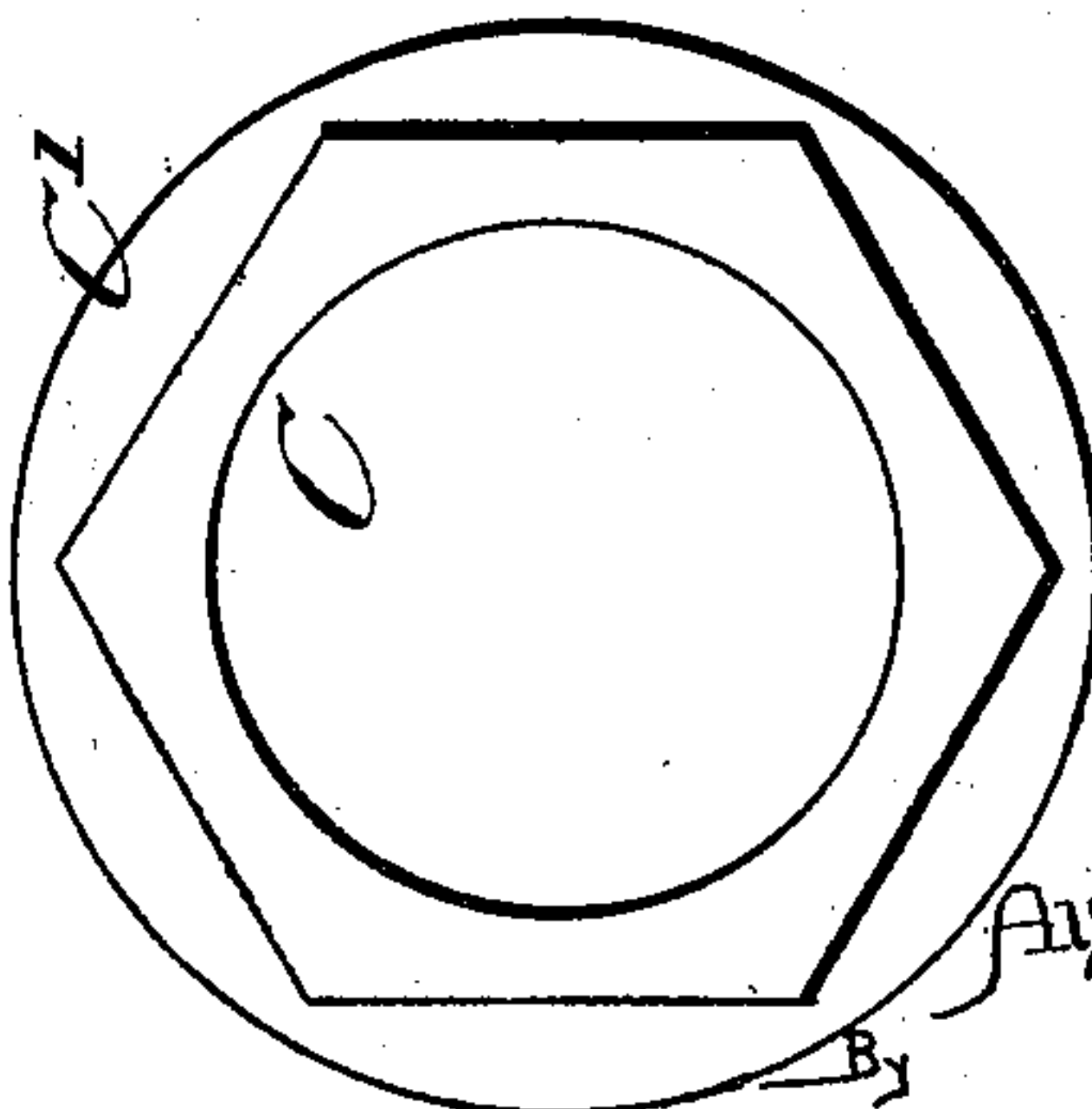


Fig. 2.

Fig. 3.



Inventor
Alfred Langton
By
James L. Norris
Atty.

UNITED STATES PATENT OFFICE.

ALFRED LANGTON, OF LONDON, ENGLAND.

WATER-TUBE STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 618,693, dated January 31, 1899.

Application filed July 6, 1898. Serial No. 685,274. (No model.)

To all whom it may concern:

Be it known that I, ALFRED LANGTON, engineer, a citizen of England, residing at Deptford Pier, Deptford, London, in the county of Kent, England, have invented certain new and useful Improvements in Water-Tube Steam-Generators, (for which I have made an application for a patent in Great Britain, dated June 10, 1898, No. 13,031,) of which the following is a specification.

My invention relates to the construction of water-tube steam-generators of the kind described in the specification to Niclausses' English Patent No. 1,052 of 1891, in which a water chamber or "collector" divided by a longitudinal partition into two compartments has projecting from it outer steam-generating tubes communicating at one end with the one compartment of the collector and closed at the other end, within which tubes were inner feed-tubes communicating with the other compartment of the collector, so that the water was made to flow from the latter through the inner tubes into the generating-tubes, from which the steam and water passed back into the first compartment, whence the generated steam was led into a steam-chamber.

In the arrangement described in Niclausses' specification, No. 1,052 of 1891, the part of the outer tube which was fixed in the collector was formed separate from the other part and was constructed of malleable cast-iron with lateral openings for the entrance of the water and escape of steam, such casting, which is called the "lantern," extending transversely through both compartments of the collector, the generating-tubes being screwed into the one end thereof, while the other end was closed by a screw-cap, which also supported the inner water-tube. This construction suffered from the disadvantages, first, that the necessarily very fine screw-threads of the joint between the tube and the lantern were liable to give way under the longitudinal strain to which they were subjected when withdrawing the tubes, and, secondly, that the comparatively weak parts of the malleable cast-iron lantern between the lateral openings were liable to fracture. According to my present invention I obviate the above defects and at the same time simplify the con-

struction by entirely dispensing with the said malleable cast-iron lantern and in lieu thereof extending the generating-tube right through the two compartments of the collector and providing lateral openings in both compartments, respectively, for the entrance of water into the inner tube and for the escape of steam and water from the generating-tube.

My said improved construction of the generating-tubes is shown on the accompanying drawings, in which—

Figure 1 shows a part horizontal longitudinal section through one of the generating-tubes. Fig. 2 shows an elevation of the front end of the generating-tube and vertical section of part of the collector. Fig. 3 shows an end view of the same. Fig. 4 shows a cross-section at X X, Fig. 1. Fig. 5 shows a modified arrangement of the cap fixed on the front end of the tube.

The steam-generating tube A instead of stopping short at the inner wall B' of the collector B and being there screwed into the malleable cast-iron lantern, as in Niclausses' patent, is extended right through the collector B and has a coned collar formed on it at A' by staving, by means of which it is fixed in the hole of the plate B'. It passes loose through a hole in the partition B² of the collector and has screwed on its front end a cap C with coned shoulder at C', by which it is fixed in the hole of the front plate B³. This cap has an external hexagonal surface for enabling it to be screwed onto the tube A, and into it is screwed the plug D', that carries the inner tube D in the same manner as described in Niclausses' patent.

In the upper and lower sides of the tube A are cut openings at A² and A³, which serve, respectively, to give entrance to the feed-water into the inner tube D from the chamber B⁴ of the collector and to allow the steam and water to pass from the generating-tube A into the chamber B⁵ of the collector. A ring E is fixed inside the tube A at the mouth of the tube D, so as to close the annular space between this and the tube A, and thus insure the circulation of the water and steam in the above-described manner.

The inner end of the tube A is closed by a screwed plug F, as in Niclausses' construction,

and the steam-generator is also otherwise the same as that construction and need therefore not be further described.

In the modification shown at Fig. 5 the cap
5 C is screwed into the interior of the mouth of A instead of on the exterior thereof.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

10 1. In a water-tube steam-generator, the combination with a steam-collecting chamber divided into two compartments, of a steam-generating tube communicating with one compartment and provided with a conical enlargement
15 to fit a conical opening in the inner wall of the collecting-chamber, an inner tube passing through the generating-tube and communicating with the other compartment, said steam-generating tube having a part formed
20 integral therewith which passes through the collector and is there provided with two sets of lateral holes, the one set serving for the entrance of feed-water into the inner tube and the other set serving for the escape of
25 steam from the generating-tube, and a cap screwed upon the front end of the said latter-named tube and having a coned shoulder fitting into a correspondingly-coned hole in the

outer wall of the collector, the parts being combined, substantially as described. 30

2. In a water-tube steam-generator, the combination with a steam-collecting chamber divided into two compartments, of a steam-generating tube communicating with one of said compartments and having a threaded outer
35 end, an inner tube passing through the generating-tube and communicating with the other compartment, said generating-tube being provided with two sets of lateral openings, the one set serving for the entrance of
40 feed-water into the inner tube and the other set serving for the escape of steam from the generating-tube, and a cap screwed upon the ends of the generating-tube and inner tube respectively and provided with a coned shoulder
45 which fits into a correspondingly-coned hole in the outer wall of the collector whereby the said tubes are firmly supported in position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 50

ALFRED LANGTON.

Witnesses:

OLIVER IMRAY,
G. LAYTON SMITH.