

No. 728,548.

PATENTED MAY 19, 1903.

C. CRETORS.
STEAM BOILER.

APPLICATION FILED AUG. 28, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 2.

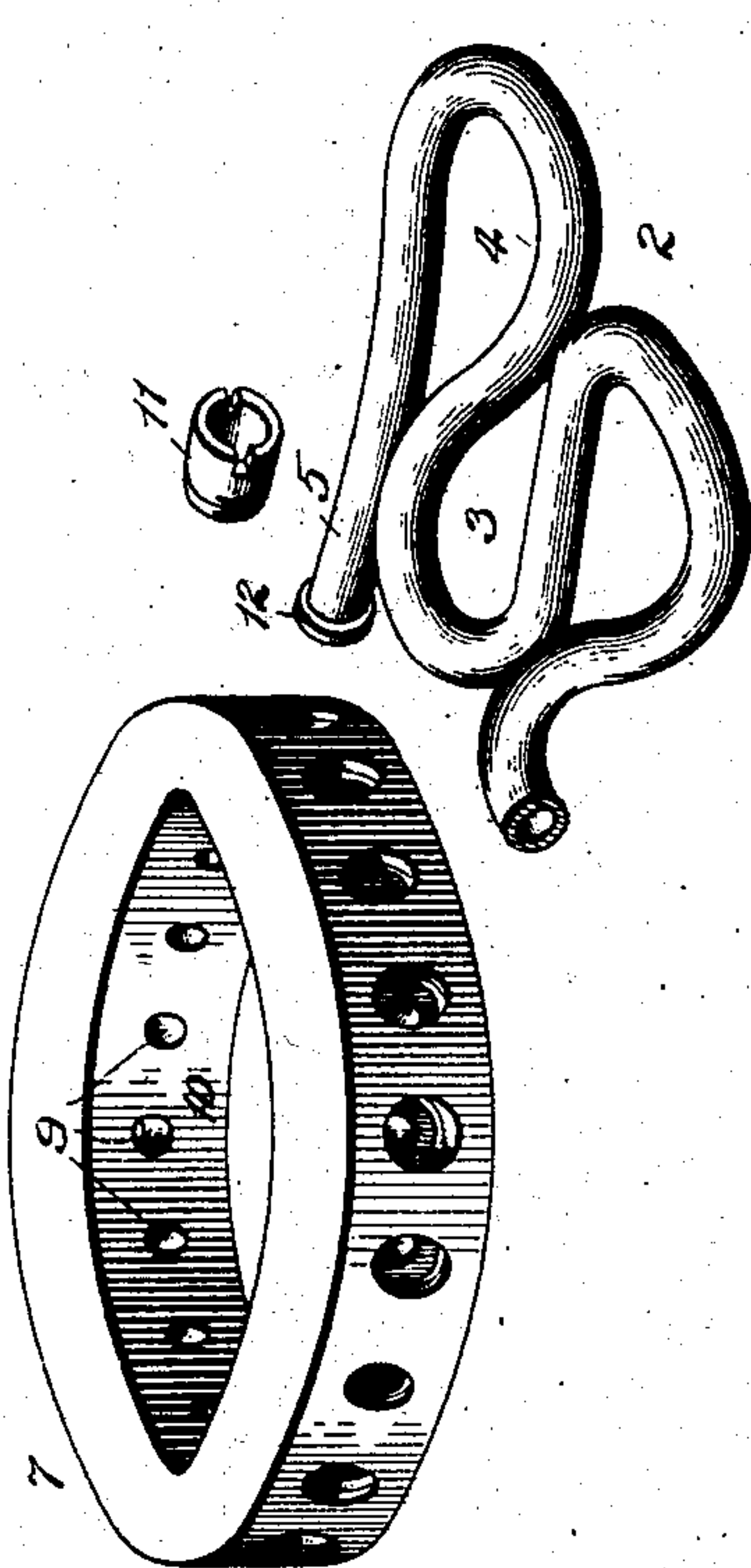


Fig. 3.

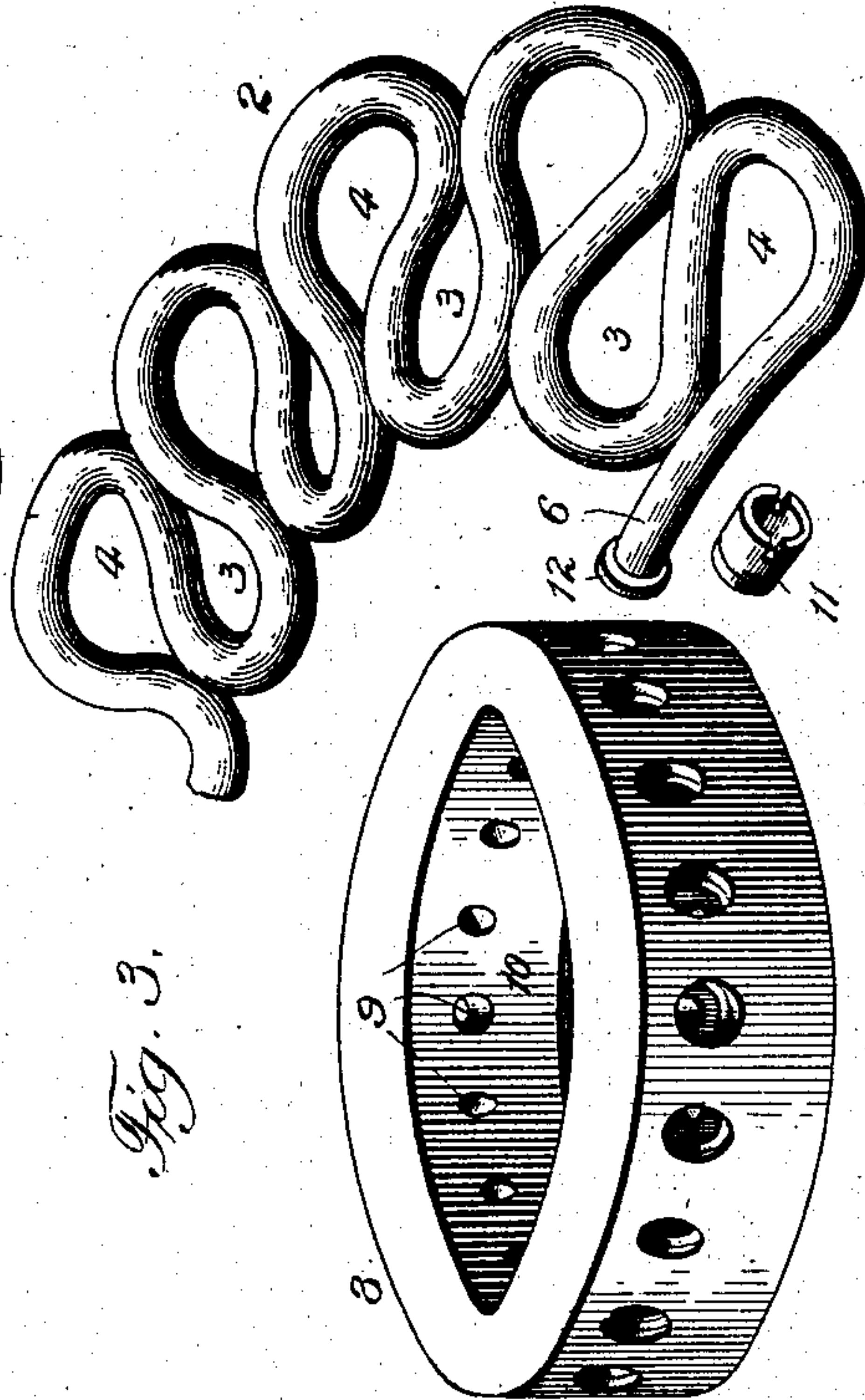
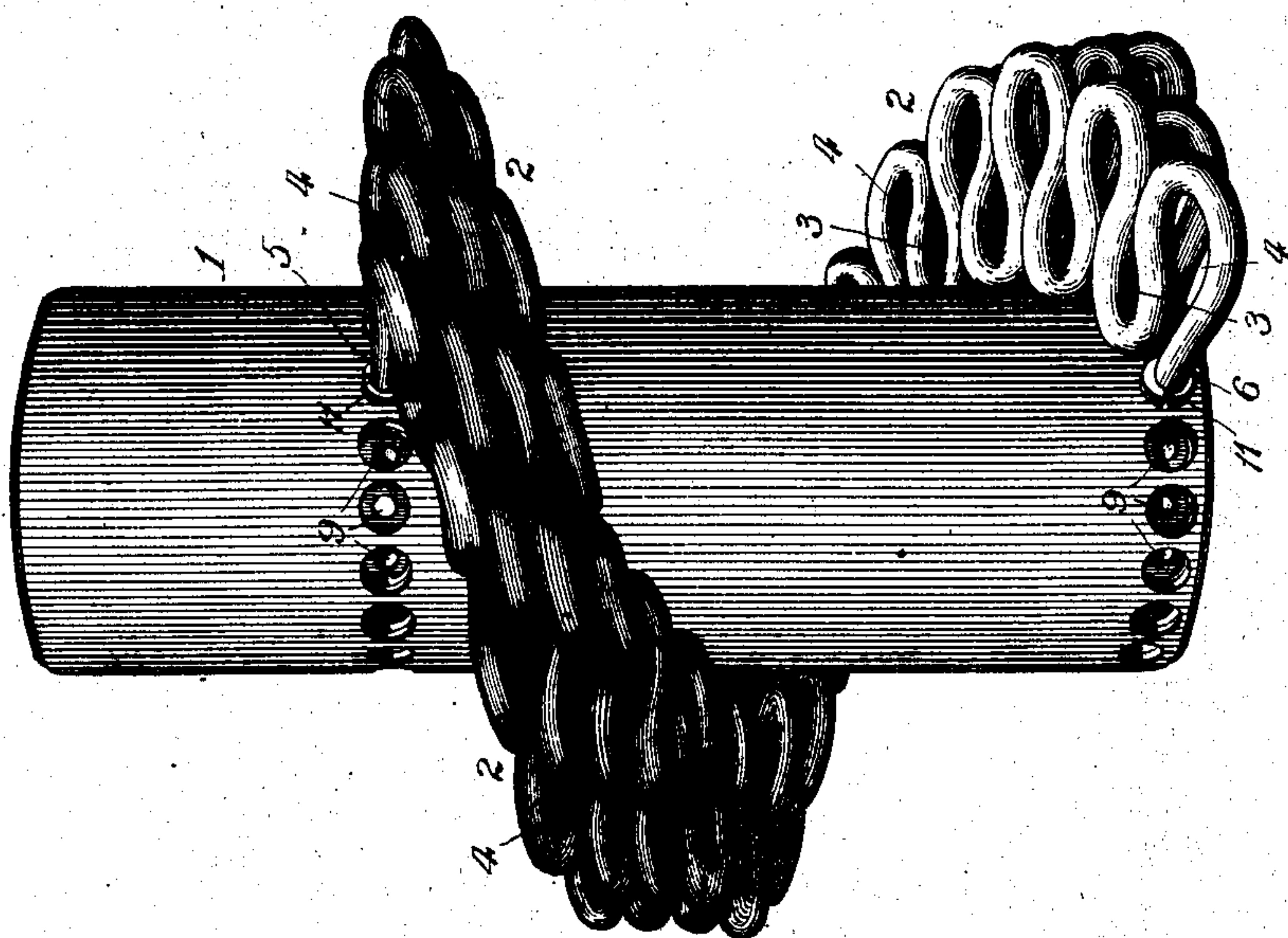


Fig. 1.



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2 SHEETS—SHEET 2.

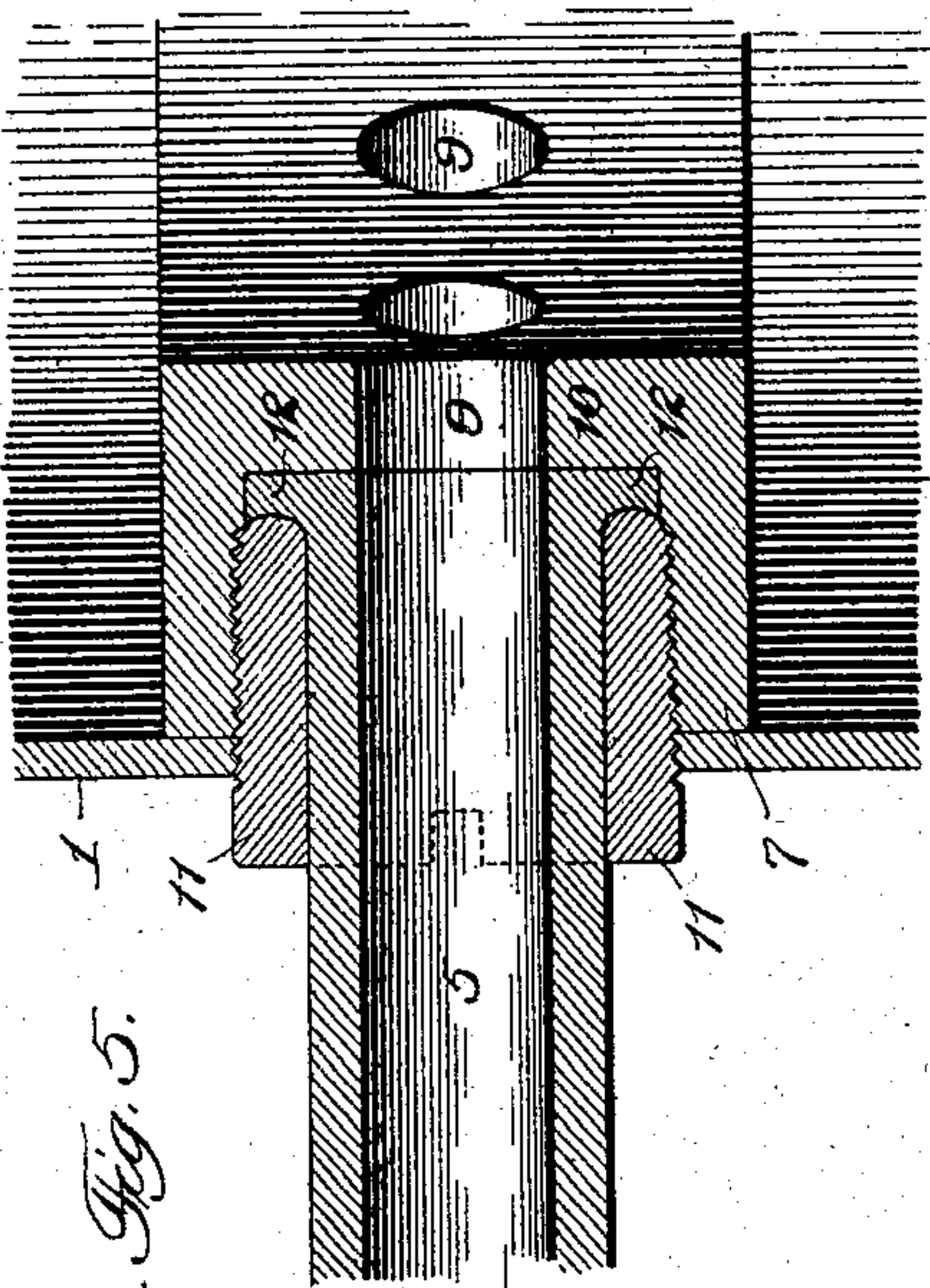


Fig. 5.

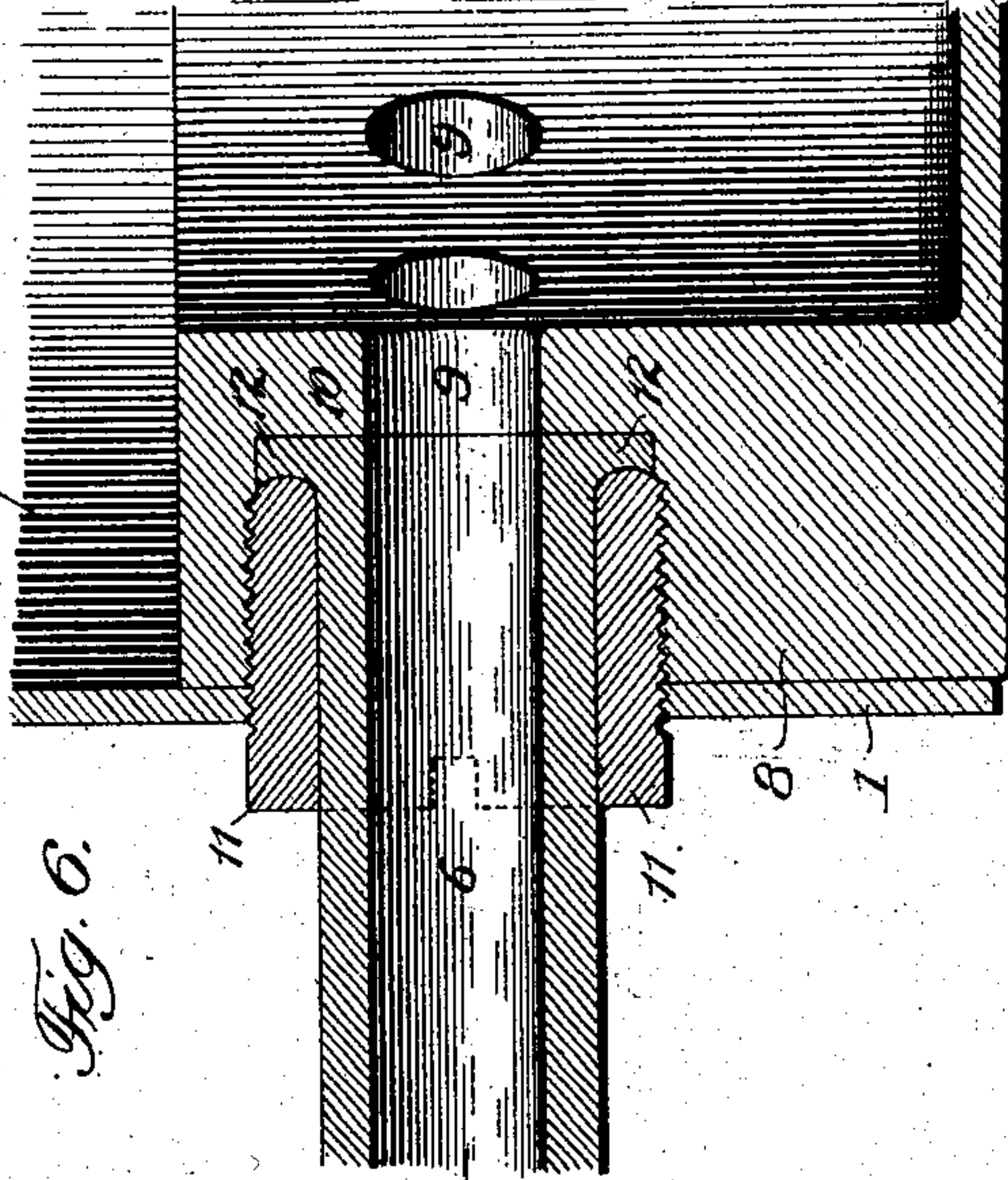


Fig. 6.

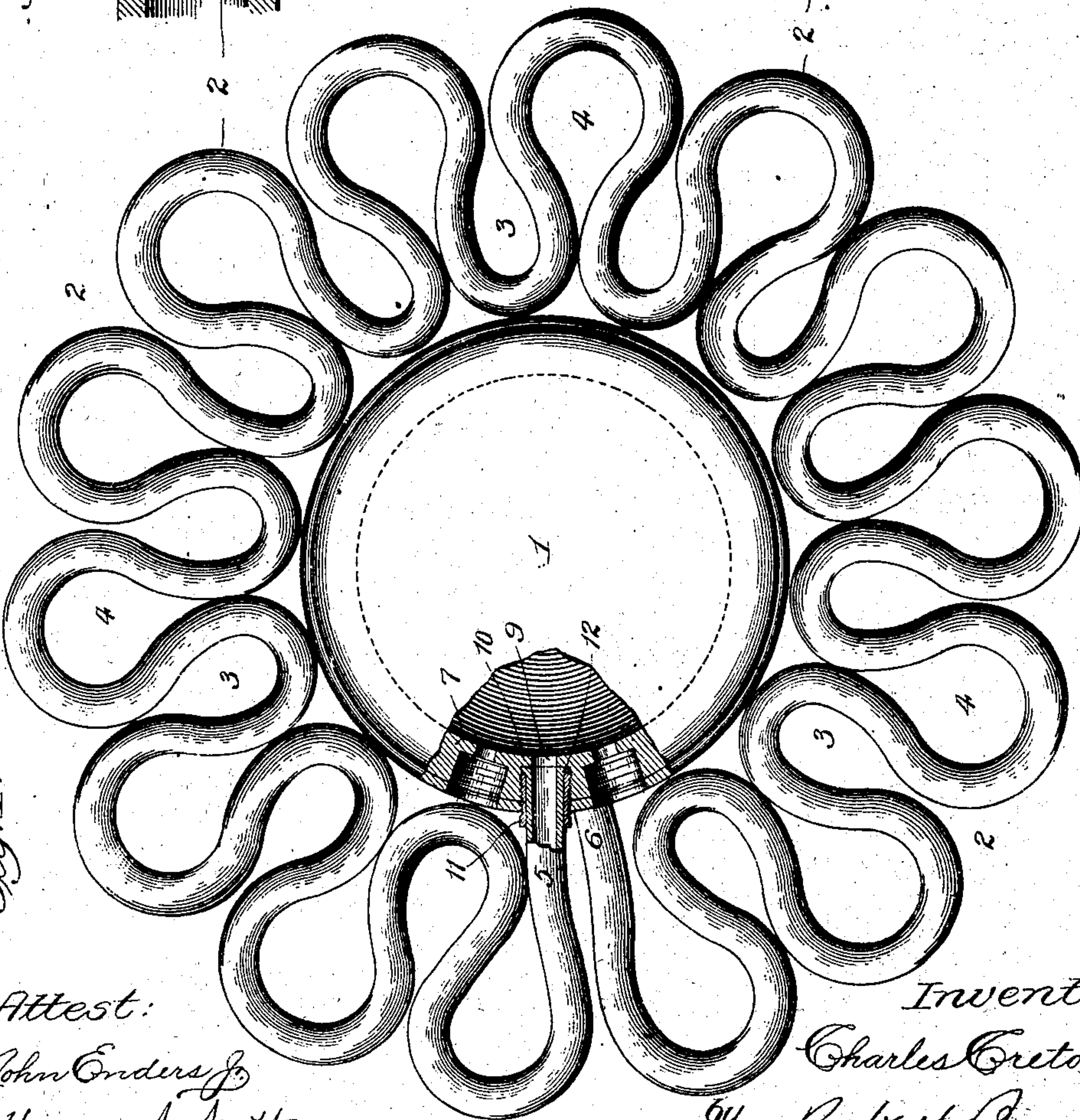


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES CRETORS, OF CHICAGO, ILLINOIS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 728,548, dated May 19, 1903.

Application filed August 28, 1902. Serial No. 121,313. (No model.)

To all whom it may concern:

Be it known that I, CHARLES CRETORS, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

The present invention relates to that class of steam-boilers and the like in which a series of tubes constitutes in the main the heating-surface of the steam-boiler; and the objects of the present improvements are to provide a simple and efficient construction of parts, whereby a very extended heating-surface is attained within a defined area and to afford a very durable and effective means for securing the respective ends of the heating-coils to the boiler body or drum, all as will hereinafter more fully appear and be more particularly pointed out in the claims.

In the accompanying drawings, illustrative of the present invention, Figure 1 is a perspective view illustrating the general arrangement of the present invention with a series of four heating-coils in position; Fig. 2, a detail perspective view of the upper attaching-annulus, the upper portion of a heating-tube, and attaching-nipple in a detached condition; Fig. 3, a similar view of the lower attaching-annulus, the lower portion of a heating-tube, and attaching-nipple in a detached condition; Fig. 4, a general plan view, with parts in section, along the line of attachment of the upper ends of the heating-tubes; Fig. 5, an enlarged detail sectional elevation illustrating the means for attaching the upper ends of the heating-tubes to the shell of the boiler or drum; Fig. 6, a similar view illustrating the attachment for the lower ends of said tubes.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents the main boiler or drum of any usual size and shape, but preferably of the elongated cylindrical form shown, and arranged vertically.

2 represents the series of heating-tubes, secured at their upper and lower ends to the main boiler or drum by means hereinafter described and having communication with the interior of such boiler or drum. In the present invention each tube of the series will

have a main spiral form extending around the boiler or drum 1, with such spiral formed in turn into a series of substantially close serpentine bends or loops 3 and 4, having a reversed arrangement to constitute an inner series of loops 3 of a smaller radius and an outer series of loops 4 of a larger radius, as shown in the drawings, which arrangement is adapted to afford a very extensive heating-surface in a given space within a fire-chamber surrounding the present boiler.

In the preferred form of the present invention as illustrated in the drawings the series of tubes formed as above described when assembled to form a complete boiler or like appliance will lie closely together, one below the other, with their individual loops 3 or 4 staggered or out of vertical alinement with the individual loops 3 or 4 of the next adjacent tube above and below. Such staggering of the loops as above described is very effectively attained by the present mode of attaching the respective ends of the heating-tubes to the main central boiler or drum 1 in common horizontal planes at top and bottom with the respective ends of the respective tubes having attaching extensions 5 and 6, that are substantially radial to the axis of the central drum or boiler 1 and are connected to the periphery thereof in spaced relation to each other, as shown.

7 is the upper attaching ring or annulus for the series of heating-tubes, which is of a diametric equal to the inner diameter of the boiler or drum 1 and brazed or otherwise connected thereto in a substantial and steam-tight manner.

8 is the lower attaching ring or annulus of a counterpart construction to that of the annulus 7 above described, and secured to the lower end of the boiler or drum 1 in a like manner.

9 represents a series of radial orifices formed in the rings or annulus 7 and 8 and having screw-threaded counterbores forming the inner abutment-shoulders 10, as shown in Figs. 5 and 6.

11 represents a series of screw-threaded nipples fitting the attaching extensions 5 and 6 of the series of heating-tubes and adapted to screw into the screw-threaded counterbores of the rings 7 and 8.

12 represents outturned flanges on the ends of the attaching extensions 5 and 6 aforesaid, against which the ends of the nipples 11 are adapted to have bearing, so as to force said flanges against the abutment-shoulders 10 aforesaid to form a substantial and steam-tight attachment of the series of heating-tubes to the central boiler or drum 1.

While I have shown and described my invention as applied to a boiler for generating steam, it is evident that the same can be applied with equal advantage to steam or other condensers, radiators, and the like, and the scope of the present invention is intended to embrace such applications of the present construction and arrangement of parts.

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

1. In a steam-boiler or other like appliance, the combination of a central drum, and a series of tubes connected thereto at top and bottom, each tube consisting of a series of substantially close serpentine inner and outer loops, the inner loops having a smaller radius than the outer loops, substantially as set forth.

2. In a steam-boiler or other like appliance, the combination of a central drum, and a series of serpentine tubes extending in a spiral direction around said drum and connected thereto at top and bottom at common horizontal planes, each serpentine tube consisting of substantially close inner and outer loops, the inner loops having a smaller radius than the outer loops, substantially as set forth.

3. In a steam-boiler or other like appliance, the combination of a central drum, and a series of serpentine tubes extending in a spiral direction around said drum and connected

thereto at top and bottom at common horizontal planes, the individual loops of one serpentine tube having a staggered relation to the individual loops of the next adjacent tubes, substantially as set forth.

4. In a steam-boiler or other like appliance, the combination of a central drum, a pair of annular rings secured in separated relation to said drum and formed with a series of orifices having screw-threaded counterbores with abutment-shoulders at their inner ends, a series of tubes extending spirally around said drum and provided with flanged end extensions, and screw-threaded nipples fitting over said extensions and adapted to engage in the screw-threaded counterbores aforesaid to secure the tubes in place, substantially as set forth.

5. In a steam-boiler or other like appliance, the combination of a central drum, a pair of annular rings secured in separated relation to said drums and formed with a series of radial orifices having screw-threaded counterbores with abutment-shoulders at their inner ends, a series of serpentine tubes extending in a spiral direction around said drum and provided with radial and flanged end extensions, and screw-threaded nipples fitting over said extensions and adapted to engage in the screw-threaded counterbores aforesaid to secure the tubes in place, substantially as set forth.

Signed at Chicago, Illinois, this 26th day of August, 1902.

CHARLES CRETORS.

Witnesses:

ROBERT BURNS,
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