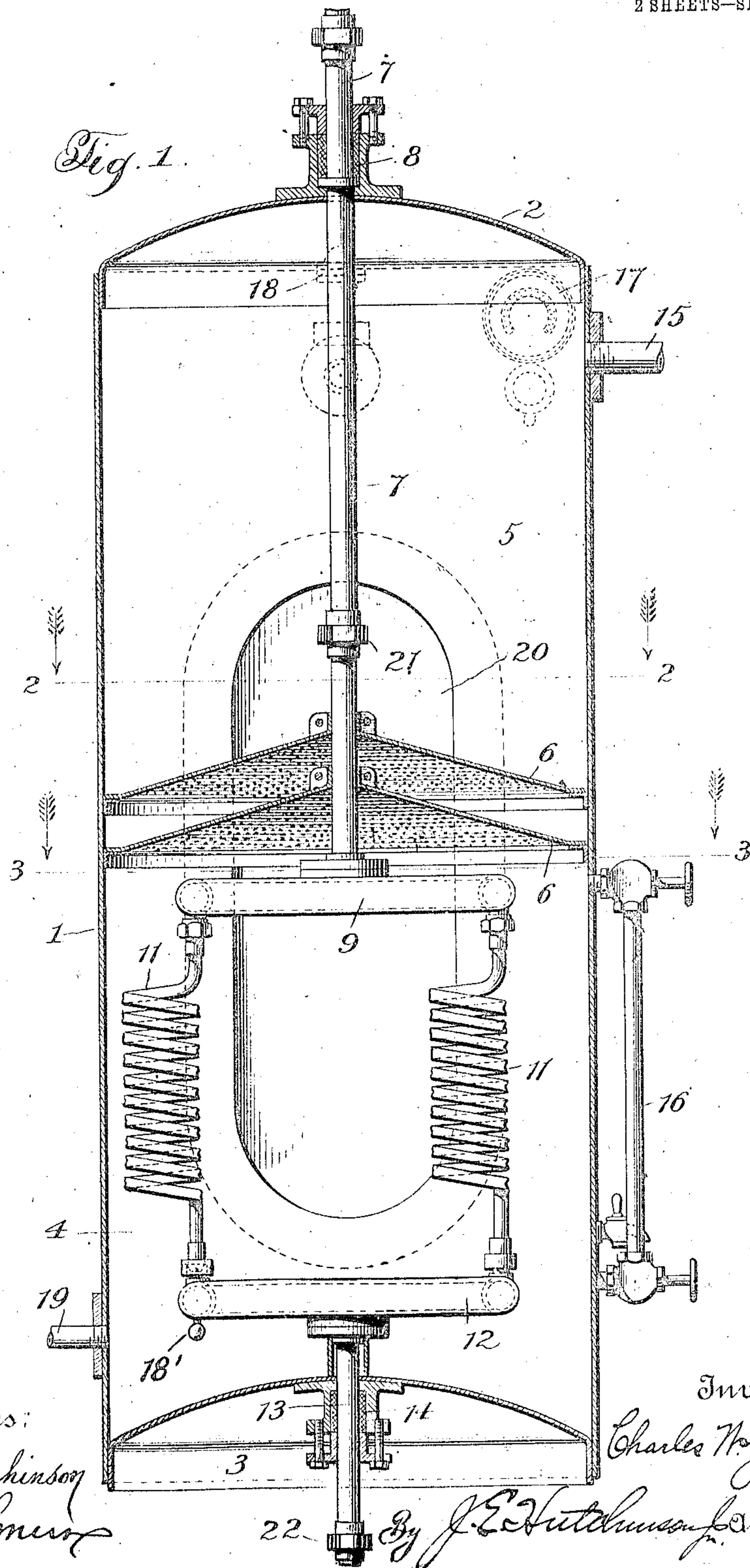


C. W. ZASTROW.  
EVAPORATING APPARATUS.  
APPLICATION FILED SEPT. 22, 1908.

964,359.

Patented July 12, 1910.

2 SHEETS—SHEET 1.



Witnesses:  
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Fig. 2.

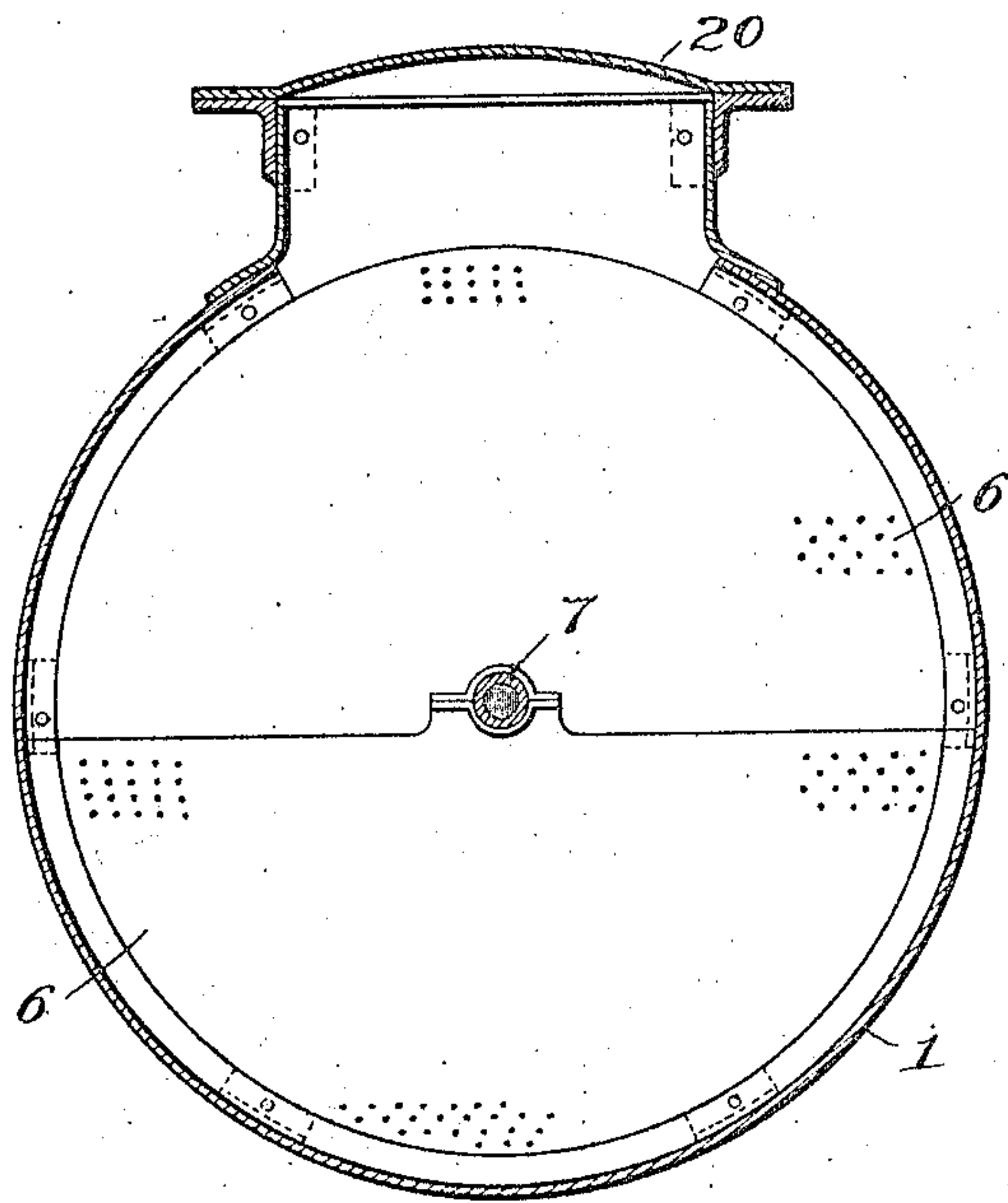
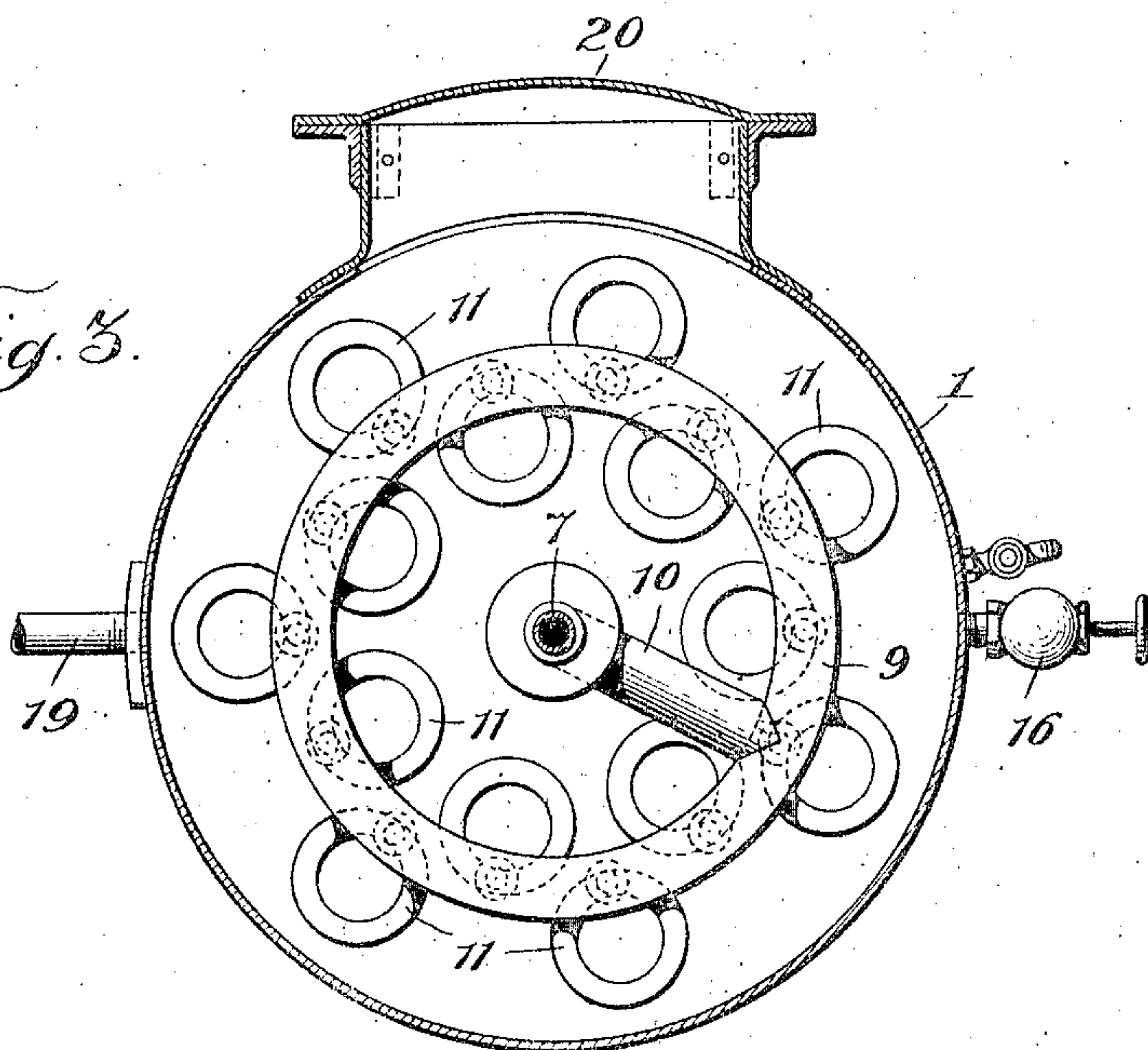


Fig. 3.



Witnesses:

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Charles W. Zastrow.  
By J. E. Hutchinson, Attorney.



# UNITED STATES PATENT OFFICE.

CHARLES WILLIAM ZASTROW, OF ARUNDEL COVE, MARYLAND.

## EVAPORATING APPARATUS.

964,359.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed September 22, 1908. Serial No. 454,157.

*To all whom it may concern:*

Be it known that I, CHARLES WILLIAM ZASTROW, a citizen of the United States, residing at Arundel Cove, in the county of Anne Arundel and State of Maryland, have invented certain new and useful Improvements in Evaporating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to certain new and useful improvements in apparatus for evaporating or distilling water or other liquids, and has for its principal object to provide an apparatus which is particularly adapted to be used at sea for evaporating salt water.

A further object of the invention is the provision of an apparatus which will be simple in construction, and one which may be easily cleaned and readily accessible in case of repairs.

A still further object of the invention is the provision of an apparatus which will effectually prevent any traces of salt water being carried into the upper part of the evaporating still.

With these and other objects in view, the invention consists of the novel construction and combination of parts hereinafter described and claimed.

In the drawings:—Figure 1 is a vertical section through an apparatus embodying my present invention, some of the steam coils being removed. Fig. 2 is a cross sectional view thereof taken on the line 2—2 of Fig. 1, and Fig. 3 is a similar view taken on the line 3—3 of Fig. 1.

In carrying this invention into practice I preferably make use of a casing or receptacle 1, which in the present instance is in the form of a vertically arranged cylinder, the same being closed at its top and bottom by the heads 2 and 3 respectively, thus making the casing or receptacle perfectly water tight. The cylindrical casing is divided into two compartments, a water compartment, which is the lower one and indicated at 4, and a steam or vapor compartment, which is the upper one, indicated at 5. These two compartments are separated one from the other by a plurality of perforated metal plates 6, or if desired fine wire gauze baffle plates may be used, the same serving to absolutely prevent any of the salt water being carried with the steam into the steam space or compartment. In this connection it is

to be noted that in devices of this character where the heating coils are immersed, foaming is liable to occur in the evaporator, and if such does occur, the baffle plates will break up the globules of steam and water and the liberated steam may then pass to the steam space above the plates and then to the condenser without carrying traces of salt water.

The heating medium used in connection with this apparatus is preferably steam, the same being fed through a pipe 7, passing through a suitable stuffing box 8 centrally arranged upon the head 2 of the cylindrical casing. This pipe is arranged longitudinally of the casing and is centrally located therein, the same extending through the perforated baffle plates and into the water compartment, and being connected to an upper manifold 9 by a pipe 10 which is arranged at a right angle to the inlet pipe. A series of coils 11 connect the upper manifold 9 with a lower manifold 12, which manifold 12 is connected in any suitable manner to an outlet pipe 13. The outlet pipe 13 is also arranged longitudinally of the cylindrical casing and centrally located with regard thereto, the same passing from the water compartment through a stuffing box 14 on the casing. In this manner live steam is fed from a suitable generator to the steam heating coils 11, which coils serve to thoroughly heat the water within the compartment 4 and generate steam, which steam rises and passes through the perforations in the baffle plates and is collected within the compartment 5 from which it escapes through the outlet pipe 15 and is led away to any suitable form of condenser in which it is condensed into purified water or other liquid, according to the class of work which is being performed.

A suitable gage 16 is provided for the purpose of determining at any time the amount of water in the casing, and a steam gage 17 is shown in dotted lines and serves to indicate the steam pressure occasioned by the steam generated in the casing. I also provide a suitable safety or blow-off valve for the steam compartment, the same being indicated at 18 in dotted lines, and a blow-off valve 18' arranged in the lower manifold for a purpose which will be obvious.

In the practice of my invention the water or other liquid to be purified or evaporated is carried into the water compartment through a pipe 19, and the same is converted



into steam in the manner heretofore described whereupon said steam is conveyed from the casing and condensed into purified liquid. The heating apparatus used for generating this steam, as will be noted, has an inlet pipe and an outlet pipe which are centrally located within the casing, said pipes passing through the upper and lower stuffing boxes as heretofore described and being adapted to turn within the same, so that the heating apparatus as a whole may be revolved upon its vertical axis to facilitate the cleaning and scaling of the salt and other defects which have been deposited on the heating surface. A suitable door is indicated at 20 which closes the opening in the side of the casing, and it will be readily understood that any one of the heating coils 11 may be brought opposite the opening when it is desired to clean the same, thus obviating the necessity of removing the coils from the apparatus. It is also to be noted that any one of the coils may be taken out through this opening and another set up in its place without the necessity of disturbing any other coil. Furthermore, suitable connections between all of the parts contained within the casing are provided, which will permit the entire apparatus being taken apart within the casing and removed therefrom through the opening in the side of said casing. This will be perfectly obvious upon an examination of the drawing, it only being necessary to state that a coupling 21 in the inlet pipe is used so that the upper section of the inlet pipe may be disconnected and withdrawn through the top of the casing; and a coupling 22 is used for the outlet pipe which allows the upper section thereof to be lifted within the casing and withdrawn through the opening in the casing.

It will therefore be understood that I accomplish the object of my invention by means of an apparatus which is simple in construction and operation and well adapted to accomplish the result for which it is intended, and furthermore, the parts are so connected that they may be easily disconnected and taken from the apparatus when necessary, and may also be easily cleaned without taking them from the apparatus.

What I claim is:—

1. An evaporating apparatus, comprising a casing or receptacle having liquid and steam spaces therein, an opening within said casing, a steam inlet pipe centrally located therein and journaled upon said casing, a steam outlet pipe also journaled upon the casing in line with the inlet pipe, stuffing

boxes for both of said journals, and steam heating coils connecting the inlet with the outlet pipe, said coils adapted to be revolved as the inlet and outlet pipes are rotated within their respective bearings without releasing any of the parts or connections of the inlet and outlet pipes.

2. An evaporating apparatus comprising a vertically arranged casing having liquid and steam spaces therein, an opening in said casing, a sectional steam inlet pipe entering the casing at the upper end thereof, the same being journaled upon the casing, a detachable coupling for the sections of said inlet pipe located within the casing and adjacent the opening therein, a circular manifold connected to said inlet pipe, a plurality of steam heating coils depending from said circular manifold and connecting the same with a similar manifold, and an outlet pipe connected with said second mentioned manifold and journaled upon the casing in line with the inlet pipe, stuffing boxes for both of said journals, the entire steam apparatus adapted to be revolved without releasing any of its parts or connections as the inlet and outlet pipes are rotated within their respective bearings, substantially as and for the purpose specified.

3. An evaporating apparatus, comprising a vertically arranged casing having liquid and steam spaces therein, an opening in said casing, a sectional steam inlet pipe entering the casing at the upper end thereof, the same being journaled upon the casing, a detachable coupling for the sections of said inlet pipe located within the casing and adjacent the opening therein, a circular manifold connected to said inlet pipe, a plurality of steam heating coils depending from said circular manifold and connecting the same with a similar manifold, a sectional outlet pipe connected with said second mentioned manifold and journaled upon the casing in line with the inlet pipe, stuffing boxes for both of said journals and a detachable coupling for the sections of said outlet pipe located outside the casing, the entire steam apparatus adapted to be revolved without releasing any of its parts or connections as the inlet and outlet pipes are rotated within their respective bearings, substantially as and for the purpose specified.

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

CHARLES WILLIAM ZASTROW.

Witnesses:

A. MARIE FITZBERGER,  
W. T. WILLIAMS.