

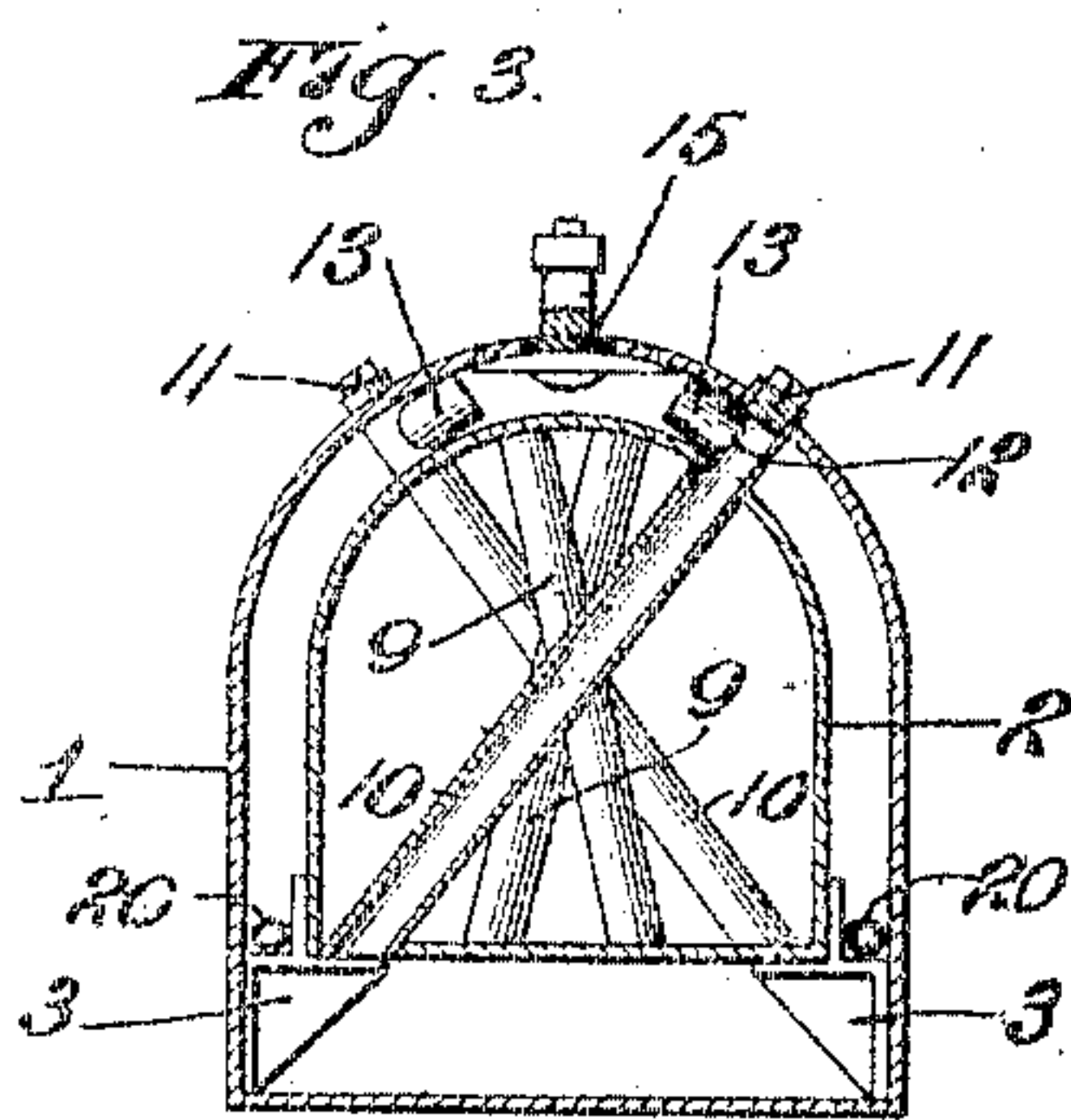
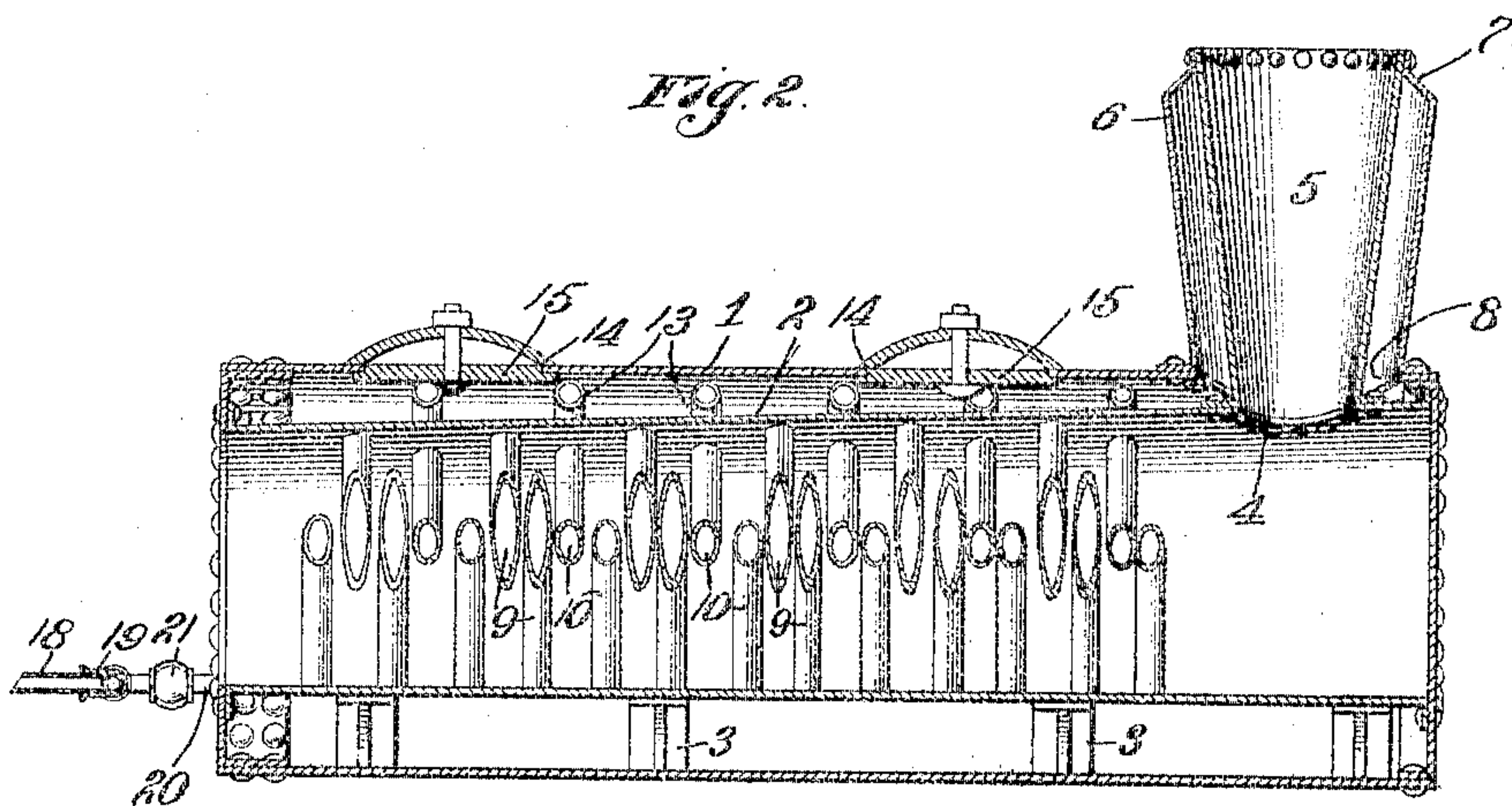
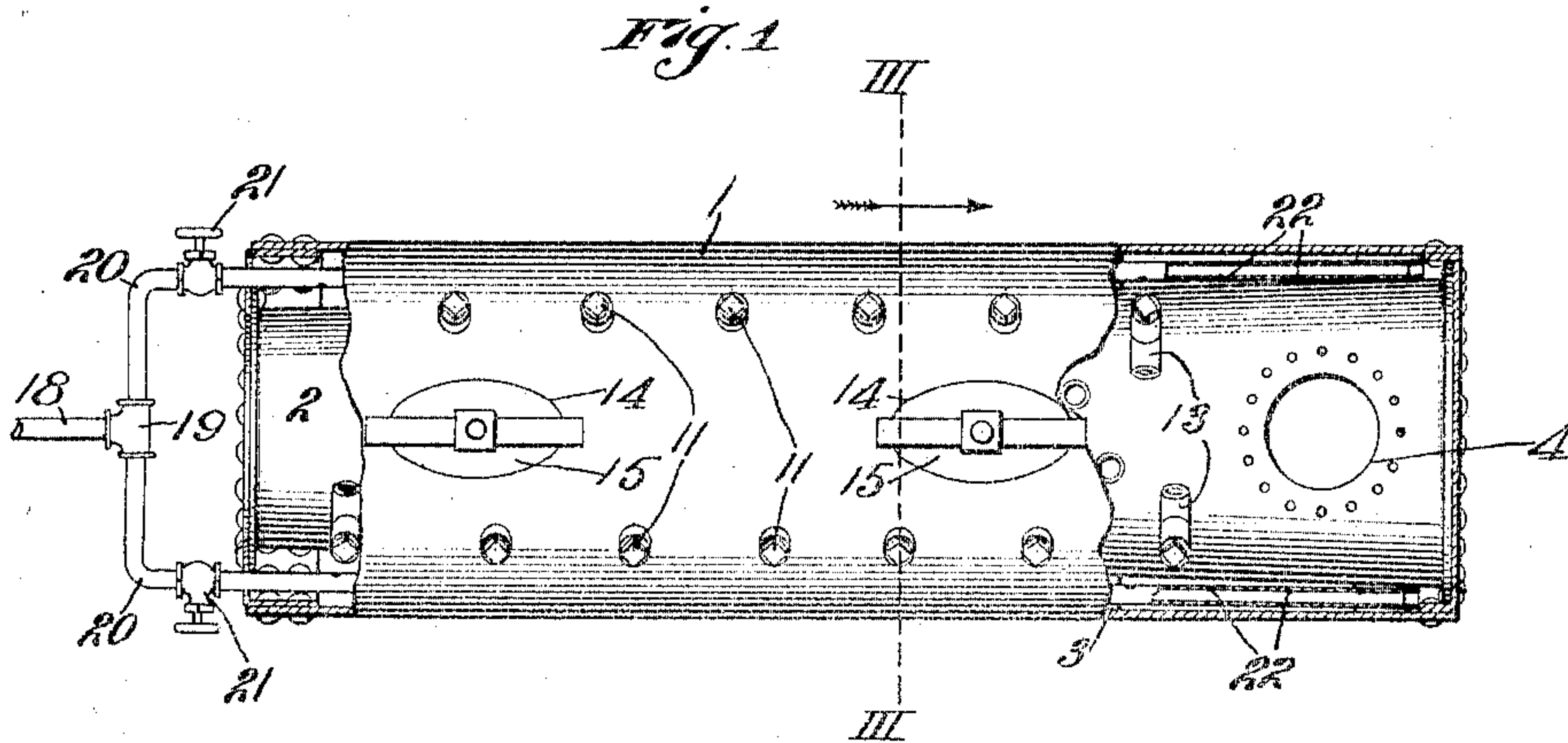
No. 776,664.

PATENTED DEC. 6, 1904.

E. LANE.
STEAM BOILER.

APPLICATION FILED JULY 5, 1904.

NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD LANE, OF KANSAS CITY, MISSOURI.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 776,664, dated December 6, 1904.

Application filed July 5, 1904. Serial No. 215,229. (No model.)

To all whom it may concern:

Be it known that I, EDWARD LANE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

This invention relates to steam-boilers; and my object is to produce a boiler for stationary or locomotive engines whereby the water can be transformed into steam quickly and with a comparatively small consumption of fuel.

A further object is to produce a boiler of such character that practically all of the mud and scale-forming elements from the water shall be caused to settle upon the bottom.

A still further object is to produce a boiler having tubes so disposed that they are readily accessible for cleaning or repairing purposes.

With these and other objects in view the invention consists in certain novel and peculiar features of construction and organization, as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 represents a top plan view of a boiler embodying my invention, the same being shown broken away at its ends. Fig. 2 is a central vertical longitudinal section of the same. Fig. 3 is a transverse section taken on the line III III of Fig. 1, but omitting therefrom the smoke-stack.

In carrying out my invention I provide a double-shell boiler of the form shown or of any other suitable or preferred form. 1 designates the outer shell, and 2 the inner shell, arranged about centrally of the outer one and supported in such position in any suitable manner, the support shown being a series of angle-brackets 3. The inner shell by preference is of gradually-increasing cross-sectional area, as shown clearly in Figs. 1 and 2, from its receiving to its delivery end and near the last-named end and in its upper side is provided with an opening 4, registering with the lower and contracted end of the smoke-stack 5, secured rigidly to said inner shell and rising vertically therefrom, said stack, like the

inner shell, being of gradually-expanding diameter.

6 designates the steam-dome, concentrically surrounding the smoke-stack and having its upper end closed by the flange 7, secured with a steam-tight joint to the stack, and its lower end secured to the outer shell of the boiler and registering with an opening 8 therein.

For the purpose of more quickly generating steam in the boiler and also for the purpose of precipitating mud and the scale-forming elements held in suspension in the water to the bottom of the boiler the passage of the inner shell of the boiler is intercepted by tubes 9, occupying intersecting planes, said tubes opening into the space between the inner and outer shells at the upper and lower sides of the former. 10 designates other cross-tubes of the boiler, said tubes 10 occupying planes which intersect each other and those of the first-named tubes, the lower ends of tubes 10 opening into the space below the inner shell and their upper ends bridging the space above said shell and extending through the outer shell, their upper ends being closed by suitable plugs 11 or their equivalents. The inner faces of tubes 10 between the inner and outer shells are provided with openings 12 to establish communication with the space between the shells, and projecting upwardly and inwardly from said openings are nozzles 13 for the purpose of causing the water as it rises through said tubes 10 to be discharged upon the arch of the inner shell, and thus act to dislodge any mud or other foreign matter collected thereon.

To give convenient access to tubes 9 for the purpose of cleaning or repairing the same, the upper portion of the outer shell is provided with one or more manholes 14, normally closed by the plates or covers 15 of the usual or any desired type.

For the purpose of supplying the boiler with water, from any source of supply, I provide pipe 18 and connect with the same by T-coupling 19, the branch pipes 20, said pipes extending in the boiler for approximately its whole length at opposite sides of the inner shell and upon the brackets 3, or said pipes may be otherwise supported. Externally of the boiler

said branch pipes are equipped with controlling-valves 21 and internally of the boiler and in the sides adjacent to the inner shell are provided at suitable intervals with discharge-orifices 22, adapted to discharge the water in limited volume and at different points along the length of the boiler in order to avoid agitating the water therein to any great extent, and thus avoid stirring up the mud or other foreign matter which has settled or been precipitated on the bottom of the boiler. Furthermore, the provision of valve-controlled branch pipes permits the engineer to discharge the water into the boiler at one side or the other, as circumstances may arise which will render it advisable that the water be discharged into the boiler through one branch pipe at a time.

Assuming that the boiler is charged with water to about the plane represented by the nozzles 13 and the heat is passing through the inner shell and impinging successively upon the cross-tubes thereof, it will be seen that the water will be quickly raised to the proper temperature and that the steam thus generated will pass up into the steam-dome. During this process of steam generation the water will obviously circulate up through the tubes, because it becomes heated therein, and down by the side of the inner shell, the upwardly-passing water welling up through tubes 9, so as to tend to wash the top of the inner shell, and being discharged with some degree of force toward the top of said shell from the nozzles of tubes 10, these jets of water from nozzles 13 tending to dislodge any mud or other matter accumulated on the top of the inner shell.

From the above description it will be apparent that I have produced a steam-boiler which embodies the features of advantage enumerated as desirable in the statement of the object of the invention, and while I have illustrated and described the preferred embodiment of the same it is to be understood that I reserve the right to make such changes in the form, detail construction, proportion, and arrangement of the parts as shall properly fall within the spirit and scope of the appended claims.

Having thus described the invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. A steam-boiler, comprising a pair of shells one within the other, the inner one being open at one end and closed at its other end and the outer one closed at both ends, tubes extending across the inner shell from a point above to a point below its center and opening into the space between the shells, and provided with nozzles projecting upwardly and inwardly above the inner shell and with closure-plugs at their upper ends.

2. A steam-boiler, comprising a shell closed at both ends and provided with a steam-dome, a forwardly-flaring shell within the first-named shell, provided with a smoke-stack and having its rear end open and registering with an opening in the corresponding end of the outer shell, tubes extending crosswise through the flaring shell and communicating with the space between the shells, tubes extending across the flaring shell from a point above to a point below its center, and opening at their lower ends into the space between the shells, and projecting at their upper ends through the outer shell, plugs closing the upper ends of the last-named tubes, and nozzles projecting upwardly and inwardly from the last-named tubes above the flaring shell.

3. A steam-boiler, comprising a shell closed at both ends and provided with a steam-dome, a forwardly-flaring shell within the first-named shell, provided with a smoke-stack and having its rear end open and registering with an opening in the corresponding end of the outer shell, tubes extending crosswise through the flaring shell and communicating with the space between the shells, a water-supply pipe, branch pipes connected thereto and extending into the space between the shells at opposite sides of the inner shell and provided with perforations disposed toward the last-named shell, and a controlling-valve for each branch pipe.

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

EDWARD LANE.

Witnesses:

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G. Y. THORPE.