

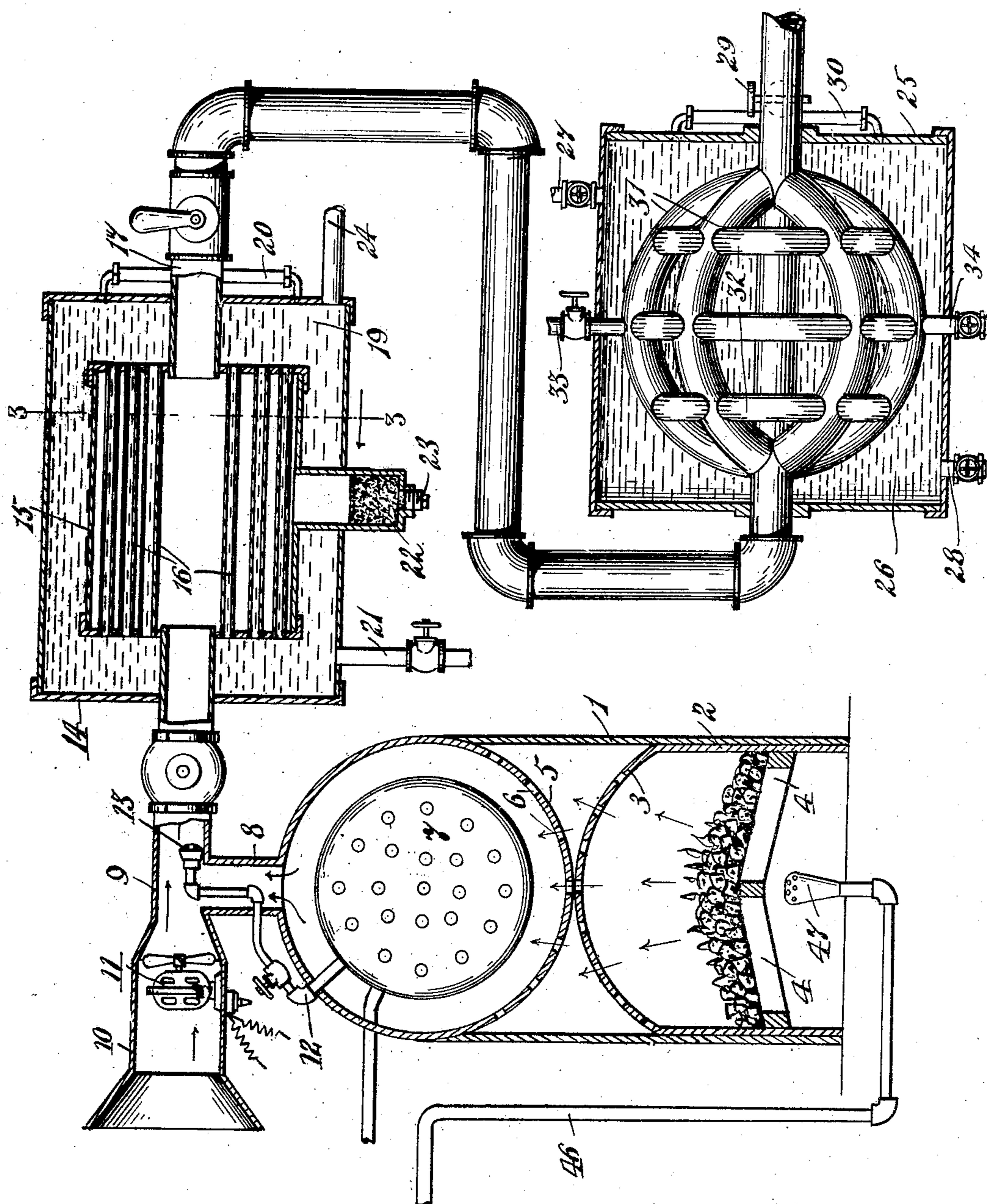
No. 896,805.

PATENTED AUG. 25, 1908.

W. CYR.

SMOKE PURIFYING AND CONSUMING APPARATUS.

APPLICATION FILED JUNE 28, 1907.



Witnesses:

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# UNITED STATES PATENT OFFICE.

WILFRID CYR, OF NOTRE DAME DE GRACE, QUEBEC, CANADA, ASSIGNOR OF ONE-THIRD TO ADELARD DUMONT AND ONE-THIRD TO RAPHAEL DESFORGES, OF MOUNT ROYAL VALE, CANADA.

## SMOKE PURIFYING AND CONSUMING APPARATUS.

No. 896,805.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed June 28, 1907. Serial No. 381,222.

*To all whom it may concern:*

Be it known that I, WILFRID CYR, a subject of the King of Great Britain, residing at Notre Dame de Grace, county of Hochelaga, Province of Quebec, Canada, have invented certain new and useful Improvements in Smoke Purifying and Consuming Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to smoke purifying and consuming apparatus.

The objects of my invention are, first, to prevent the escape of smoke through the stack or chimney of a boiler or other coal burning apparatus; second, to condense the smoke and the gaseous products of combustion as they leave the boiler to remove the heavy products; third, to separate the gas from the remaining heavy products and to conduct them back beneath the furnace or grate bars; and, fourth, to utilize all the heat from the products of combustion by heating water thereby and returning the heated water to the boiler.

My invention consists of the construction, combination, and arrangement of parts, as herein illustrated, described, and claimed.

In the accompanying drawings, forming part of this application, I have illustrated one form of embodiment of my invention, in which drawings similar reference characters designate corresponding parts, and in which:

Figure 1 is a vertical section taken vertically of a boiler and longitudinally through the apparatus of my invention, the front end of the boiler being shown in elevation, and some of the parts of a condenser being shown also in elevation.

Referring to the drawings, 1 designates the sides of a boiler casing against the inner faces of which are placed the side members 2 of a grate supporting member, the upper ends of which members are connected by the perforated arch 3. The grate bars 4 are supported by the side members 2.

A circular shell 5 is provided with perforations 6 in its under side and is adapted to surround the boiler 7 of ordinary construction, and the shell 5 is supported by the side members 2.

The shell 5 is provided with an outlet 8 communicating with a horizontal pipe 9.

The pipe 9 is provided with an open enlarged end 10 in which is disposed a fan 11 for the purpose of forcing the heated products of combustion along the pipe 9 after they have passed the boiler. To further accelerate the movement of the heated products of combustion and to add moisture thereto, a pipe 12 has one end connected with the boiler and has its free end terminating in a nozzle 13 which is disposed in the pipe 9. As the heated products of combustion rise through the outlet 8 they are forced in the direction indicated by the arrows by means of the fan 11 and steam escaping through the nozzle 13. The end of the pipe 9 opposite its enlarged end 10 is connected to the casing 14.

Disposed in the casing 14 is a cylinder 15 provided with the longitudinal tubes 16 communicating with the interior of the casing 14. A pipe 17 leads from the casing 14. The casing 14 is filled with a suitable liquid cooling medium 19, the height of which is indicated by the gage 20 carried by the casing 14. The heated products of combustion passing into the cylinder 15 circulate therethrough and are cooled so that the heavier products drop into the pocket 22 connected to the cylinder 15 and may be removed therefrom by removing the screw-threaded closure 23. The liquid medium 19 which surrounds the cylinder 15 becomes heated to a certain extent and is conducted through the pipe 21 back to the boiler 7. A suitable inlet pipe 24 is connected with the casing 14 and to a suitable source of liquid supply.

The pipe 17 after leaving the casing 14 is passed through a casing 25 having therein the cooling medium 26 and provided with an inlet and outlet pipes 27 and 28. After passing through the casing 25 the pipe 17 is provided with a damper 29 and from this leads to the chimney or stack so that when the damper 29 is closed the heated products of combustion and smoke will not be permitted to escape through the chimney. A suitable gage 30 is carried by the casing 25 to indicate the height of the cooling medium therein.

Disposed longitudinally within the casing 25 is a plurality of curved pipes 31 having their ends connected to the pipe 17 within the casing 25. Connecting the pipes 31 is a plurality of cross pipes 32. Extending through the casing and connected to one of the pipes 31 at its junction with the pipes 32 is a steam supply pipe 33, having its opposite end con-

connected to a suitable source of steam supply. Steam being admitted through the pipe 33 the heated products of combustion are forced to circulate through the pipes 31 and 32, as they cannot pass the damper 29 which is then closed, and these products are forced to pass through the discharge pipe 34, being condensed to a certain extent by the cooling medium 26 within the casing 25. The product which passes through the pipe 34 is practically a warm gas almost free from heavy or solid matter.

A pipe 46 may be connected to the pipe 34 and carry at its outer end a nozzle 47 disposed below the grate bars 4, so that when the gas, resulting from the heated products of combustion and smoke being passed through the other parts of the apparatus may be burned by introducing the same through the fuel on the grate bars 4.

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

1. A smoke purifier comprising a casing adapted to contain a cooling medium, a plurality of curved pipes extending longitudinally within said casing, a plurality of curved pipes extending laterally within said casing and interconnecting said longitudinally extending pipes, a single pipe communicating with all of the aforesaid longitudinally extending pipes and adapted to deliver smoke to the same, and means for causing the smoke to circulate through said pipes.

2. A smoke purifier comprising a casing adapted to contain a cooling medium, a plurality of curved pipes extending longitudinally within said casing, a plurality of curved pipes extending laterally within said casing and interconnecting said longitudinally extending pipes, means for delivering smoke to

said pipes, a single outlet pipe connected to all of said longitudinally extending pipes, and a damper adapted to close said pipe to cause the smoke to circulate.

3. A smoke purifier comprising a casing adapted to contain a cooling medium, a plurality of curved pipes extending longitudinally within said casing, a plurality of curved pipes extending laterally within said casing and interconnecting said longitudinally extending pipes, a single pipe communicating with all of the aforesaid longitudinally extending pipes and adapted to deliver smoke to the same, and a single outlet pipe communicating with all of said longitudinally extending pipes and provided with a damper adapted to close the same and cause the smoke to circulate through the pipes.

4. A smoke purifier comprising a casing adapted to contain a cooling medium, a plurality of curved pipes extending longitudinally within said casing, a plurality of curved pipes extending laterally within said casing and interconnecting said longitudinally extending pipes, a single pipe communicating with all of the said longitudinally extending pipes and adapted to deliver smoke to the same, a single outlet pipe communicating with all of said longitudinally extending pipes and provided with a damper adapted to close the same and cause the smoke to circulate through the pipes, and means for delivering steam to said longitudinally extending and laterally extending pipes.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WILFRID CYR.

Witnesses:

C. C. COUSINS,  
E. M. SLINNEY.