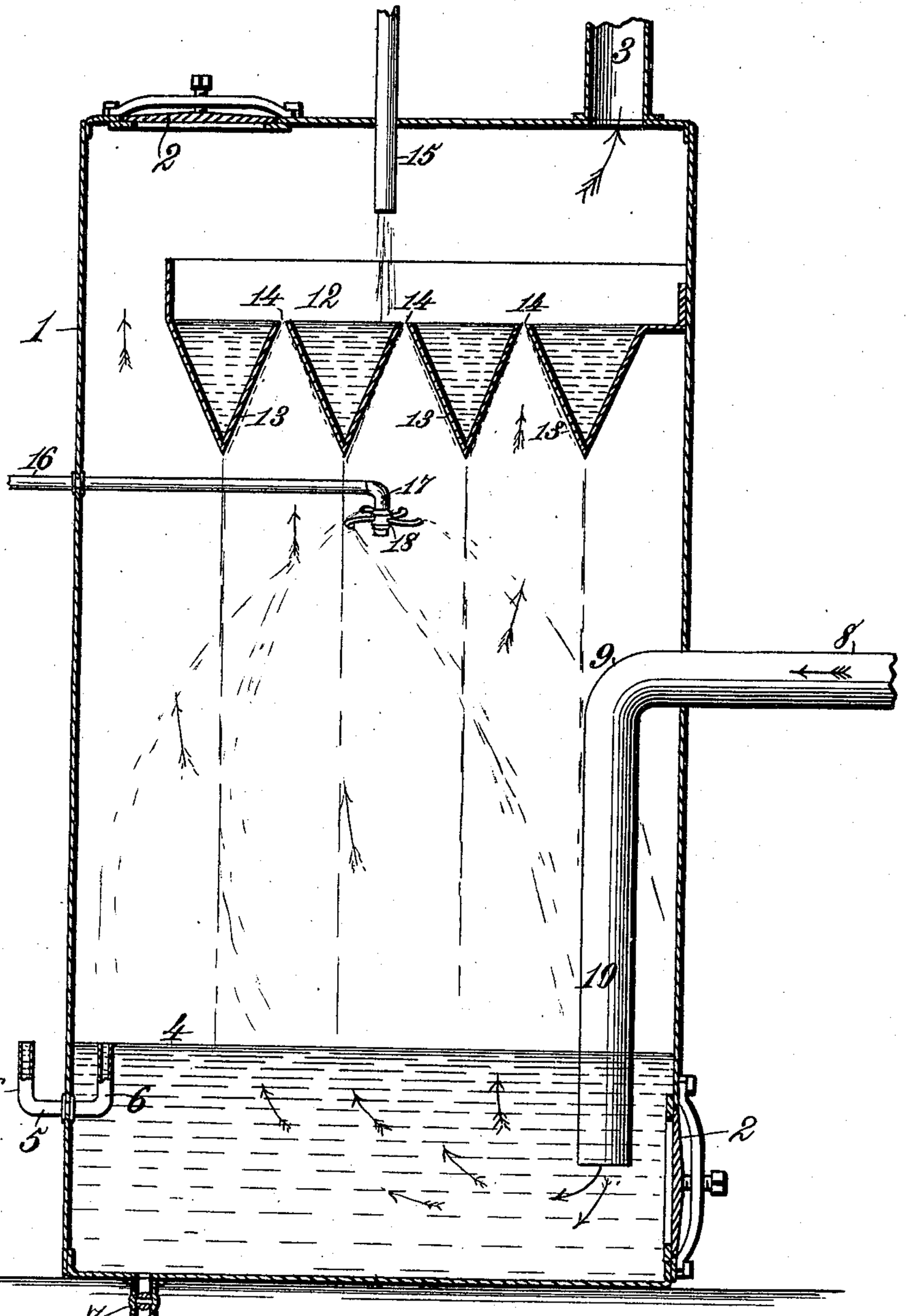
(No Model.)

# C. H. WILDER.

## APPARATUS FOR COOLING AND WASHING GAS.

No. 486,150. Patented Nov. 15, 1892.




Witnesses.
Robert Ewett.
J. A. Rutherford.

Inventor.
Charles H. Wilder.
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Atty.

# UNITED STATES PATENT OFFICE.

CHARLES HENRY WILDER, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO LUKE A. WILDER, OF CHICAGO, ILLINOIS.

## APPARATUS FOR COOLING AND WASHING GAS.

SPECIFICATION forming part of Letters Patent No. 486,150, dated November 15, 1892.

Application filed January 7, 1892. Serial No. 417,299. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES HENRY WILDER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Apparatus for Cooling and Washing Gas, of which the following is a specification.

This invention has for its object to provide a novel, simple, efficient, and economical apparatus for rapidly and perfectly cooling and washing large volumes of gas in transit from the gas-producer to the gas-holder without reducing the candle-power of the gas, all in such manner that it is impossible for sparks or flame to be carried to the gas-holder, and the regurgitation of gas from the cooling-tank to the gas-producer is effectually prevented if the pipes should become choked or stopped up at any time.

To such end the invention consists in the combination of a tank having a hydraulic seal at its bottom, an overflow-trap for preserving the seal at a uniform level, a gas-inlet pipe entering the tank above the water seal and provided with an elbow which extends downward and dips into the seal, a water-containing vessel located in the upper portion of the tank and having its bottom composed of a series of troughs separated at their top edges and each formed by two inclined plates connected at their lower ends and inclining toward each other to produce a thin longitudinal water-delivery edge at the bottom of the trough, whereby the water flowing over the top edges of and down the pairs of inclined plates is discharged in thin sheets, and a water-supply pipe for delivering water into the water-containing vessel.

The invention is illustrated by the accompanying drawing, in which the figure is a vertical sectional view of a gas cooling and washing apparatus constructed in accordance with my invention.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawing, wherein—

The numeral 1 indicates a tank, preferably composed of sheet-iron, but which may be made of any material suitable for the conditions required. The shape of the tank in cross-section can be variously modified, and at its upper and lower ends is provided with manholes having suitable covers 2 for the purpose of conveniently gaining access to the interior of the tank. The gas-outlet pipe 3 extends from the top portion of the tank, and the bottom portion of the latter is supplied with water to constitute a hydraulic seal, the level of which is indicated by the numeral 4. The depth of the seal in practice is preferably about one inch, and it is maintained at a uniform level through the medium of a trap, which, as here shown, is composed of a horizontal tube 5, having upright limbs 6 at its extremities, one arranged inside the tank and the other arranged outside thereof, the construction being such that the water cannot rise above a certain level. The bottom portion of the tank is provided with a draw-off pipe 7 for discharging the water from the tank when occasion demands.

The gas-inlet pipe 8 is in practice connected with the retort or retorts of a gas-producer and enters the tank 1 above the hydraulic seal, where this pipe is constructed with an elbow 9, having its vertical limb 10 extending downward into the hydraulic seal, with the lower extremity of the limb 10 constantly immersed in the seal, so that regurgitation of gas from the cooling-tank to the gas-producing retort or retorts is effectually prevented if the pipe or pipes leading from the tank to the gas-holder should become choked or stopped up at any time.

In the top portion of the tank is arranged a water-containing vessel 12, suitably bolted or otherwise attached to the side wall of the tank and having its bottom portion constructed as a series of parallel troughs, which are formed by zigzag plates 13, slightly separated at their upper edges to provide passages 14 for the overflow of water from the insides of the troughs to the outer surfaces thereof. The troughs are V-shaped in cross-section, and consequently the water which overflows through the passages 14 will be discharged from the lower edges of the troughs in the form of thin sheets, by which means I am enabled to effectually cool and wash the gas without liability of depleting it, and thereby reducing its

candle-power. A continuous supply of water is delivered to the water-vessel 12 by means of a water-supply pipe 15.

A water-pipe 16, entering the water-tank, is constructed at its inner end with a depending portion 17, carrying at its lower extremity a revolving water-sprinkler 18, which operates to distribute water at a point beneath the troughs. The object of this construction is to enable the gas to be cooled and washed by the conjoint action of water from the revolving sprinkler and the thin sheets of water delivered by the troughs, or if from any cause it is desired to use either the troughs or the revolving sprinkler alone this may be accomplished. For instance, if the supply of water from the troughs were to cease from any cause the revolving sprinkler could be brought into action, and thus the gas could be cooled and washed without interruption.

If tar or other objectionable matter is carried over from the gas-producer to the cooling and washing tank, such matter will settle to the bottom of the tank or will discharge with the water through the overflow-trap. The tar or other objectionable matter may be collected in a receptacle outside the tank, and consequently is prevented from passing into any of the pipes or into the gas-holder.

An important feature of my invention resides in the peculiar construction of the troughs, whereby the water is delivered therefrom in thin sheets, as this enables me to effectually cool and wash the gas without depleting it and reducing its candle-power, while the construction to attain this object is simple and economical.

Having thus described my invention, what I claim is—

An apparatus for cooling and washing gas, consisting of a tank having a hydraulic seal at its bottom, an overflow-trap for preserving the seal at a uniform level, a gas-inlet pipe entering the tank above the water seal and provided with an elbow which extends downward and dips into the seal, a water-containing vessel located in the upper portion of the tank and having its bottom composed of a series of troughs separated at their adjacent top edges and each formed by two inclined plates connected at their lower ends and inclining toward each other to produce a thin longitudinal water-delivery edge at the bottom of the trough, whereby the water flowing over the top edges of and down the pairs of inclined plates is discharged in thin sheets, and a water-supply pipe for delivering water into the water-containing vessel, substantially as described.

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

CHARLES HENRY WILDER. [L. S.]

Witnesses:
LUKE A. WILDER,
GEO. T. LINCOLN.