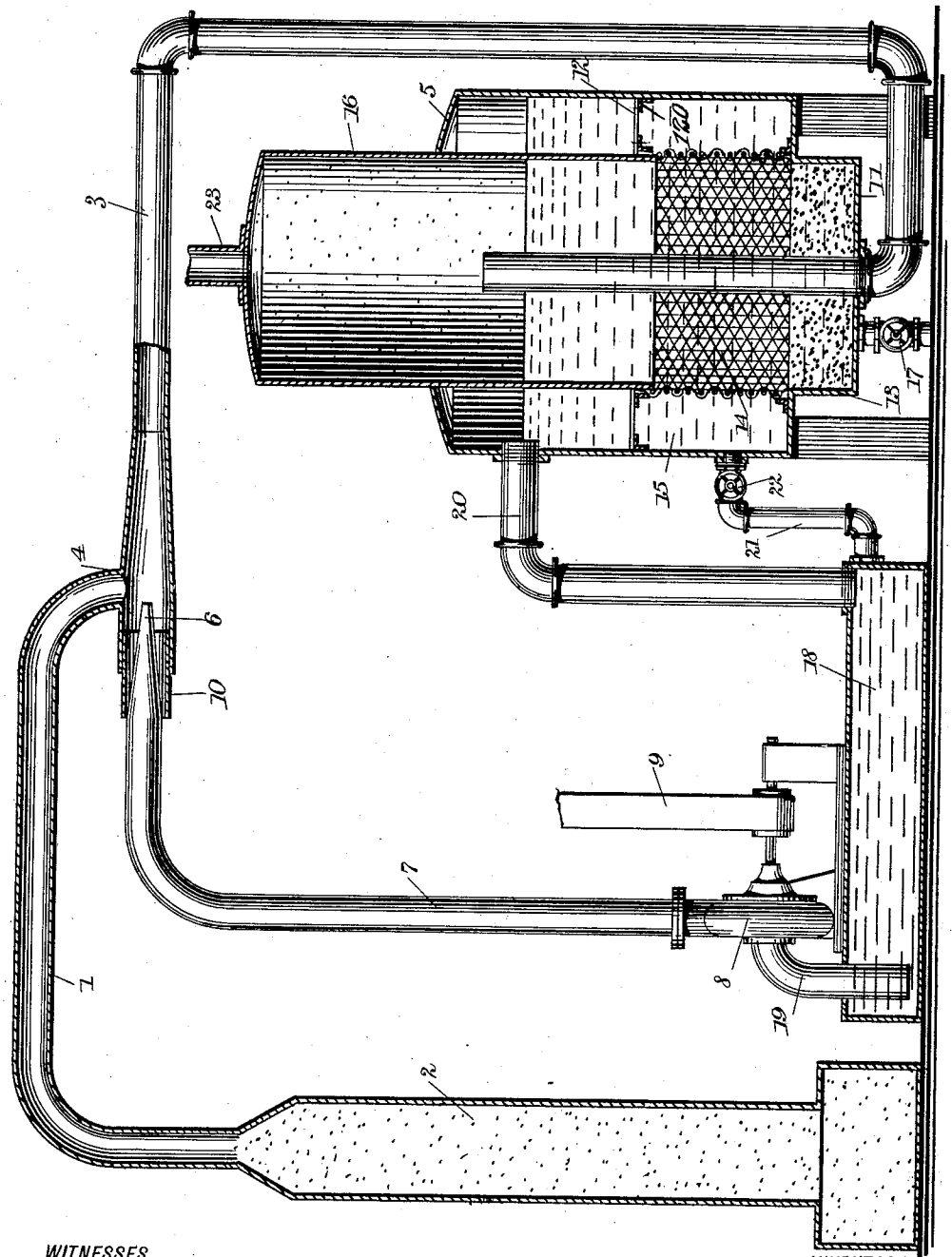
G. E. WAGGONER.

MEANS FOR CONTROLLING FUMES OR SMOKE.

APPLICATION FILED MAY 3, 1911.

1,077,771. **Patented Nov. 4, 1913.**



WITNESSES

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GEORGE ELLIS WAGGONER, OF VACAVILLE, CALIFORNIA.

MEANS FOR CONTROLLING FUMES OR SMOKE.

1,077,771. Specification of Letters Patent. Patented Nov. 4, 1913.

Application filed May 3, 1911. Serial No. 624,690.

To all whom it may concern:

Be it known that I, GEORGE E. WAGGONER, a citizen of the United States, and a resident of Vacaville, in the county of Solano and State of California, have invented a new and Improved Means for Controlling Fumes or Smoke, of which the following is a full, clear, and exact description.

My invention relates generally to means for controlling fumes or smoke, and more particularly it is adapted for coöperation with a smelter whereby gas, fumes, and smoke emitted by the smelter may be controlled.

The principal object of my invention is to provide a construction of the class described wherein the gas, smoke, or fumes emitted by smelters or other furnaces may be brought under control, means being provided to conserve the gas, if desirable, other means being provided whereby the particles present in the smoke and fumes may be collected, thereby preventing the damage which is incident to the poisonous products of smelters or other furnaces.

Another object of my invention is to provide a construction of the class described in which the gas, fumes, or smoke emitted by furnaces may be kept under control, suitable means being provided whereby a draft from the outlet of the furnace is maintained, the construction thereby not preventing the necessary draft for combustion.

A further object of the invention is the provision of a construction which is adapted to be used with smelters or other furnaces wherein the gas emitted may be conserved whereby it may be put to further use, if desired, the particles of the smoke or the particles emitted by the furnace, may be collected and disposed of as desired, use being made of a pump whereby a forced draft is maintained in order to provide for the combustion in the furnace.

Reference is to be had to the accompanying drawings forming a part of this specification, in which the figure is a partial vertical sectional view of my invention connected with the stack containing the fumes or smoke to be controlled.

A suitable flue 1 is connected to the outlet of a stack 2, this flue being connected to a pipe 3 by means of an elbow 4, the pipe 3 leading into a suitable tank 5. Closely adjacent the elbow 4, the nozzle 6 at one end of a pipe 7 is suitably positioned, this pipe being connected to a suitable water pump 8 driven by any suitable motor by means of a belt 9. The nozzle 6 may be adjusted with respect to the elbow 4 by movement of the nozzle longitudinally of the pipe whereby the draft in the pipe 1 leading from the flue 2 may be varied, thereby varying the rate of combustion in the furnace; the sleeve 10 surrounding the nozzle 6 may be moved backwardly and forwardly within the pipe 3 in order to regulate the opening between the elbow 4 and the pipe 3 thereby regulating the draft on the furnace.

The bottom 11 of the tank 5 is provided with a suitable opening through which the end of the pipe 3 extends, this pipe terminating at approximately the upper portion of this tank, the tank being further provided with a gas holder 16 fixedly positioned therein and spaced therefrom by means of suitable angle-irons 120 secured to the inside of the tank 5 and engaging the rods 12 extending from the outside of the holder. The lower portion of this tank is provided with a depressed central portion 13 which may be termed a pocket, the purpose of this pocket being to collect the sediment contained in the smoke or fumes entering the tank. Between the bottom of the gas holder 16 and the pocket 13 a screen 14 is suitably positioned in order to prevent the passage of the sediment contained in the pocket 13 into the annular part 15 of the tank 5. The screen is substantially of the same diameter as the bottom member 11 of the tank, this diameter being also substantially equal to the diameter of the lower end of the holder 16 so that the pocket 13 is positioned directly under the holder 16 and communicates therewith, it being particularly noted, however, that the only way any material contained within or deposited within the holder or pocket can enter the annular part 15 is through the screen 14. The bottom member 11 of the tank is provided with a suitable valve 17 communicating with the pocket 13 whereby the sediment may be drawn off when desired. The pump 8 is in communication with a suitable water supply 18 through a suction pipe 19, this water supply also being in communication with the upper portion of the tank 5 by means of a suitable pipe 20, an auxiliary pipe 21 with a valve 22 being provided between

this water supply and the lower portion of the tank 5.

The gases, smoke, and fumes issuing from the stack 2 pass along the flue 1 and through the elbow 4 into the pipe 3 whence they are led through this pipe into the gas holder 16; the pump 8 maintains a jet of water from the nozzle 6 into the pipe 3 whereby a reduction of pressure within the flue 1 is maintained, thereby providing a suitable draft for the furnace connected to the stack 2; this water passes on to the pipe 3, carrying the smoke, gases, vapors, and particles present with it, to later issue from the open end of the pipe 3 within the gas holder, the water being contained within the tank 5, at approximately the level shown. The gas carried on by the water will be collected within the gas holder 16 while the particles which go to make up the smoke will be absorbed by the water and the metallic or other particles present will fall down through the tank 5 into the pocket 13 where they will be collected as a sediment. As the water collects in the tank 5 to the height of the pipe 20 opening therein, the water will begin to leave the tank through this pipe 20, passing back into the water supply 18, to be again forced into circuit by the pump 8. When desired to run off the water in the tank, the valve 22 may be opened whereby the water is conducted through the pipe 21 into the supply 18.

It will be noted that the bottom of the gas holder 16 terminates below the level of the water shown whereby the water which has entered the gas holder through the open end of the pipe can leave the tank through the pipe 20 only by passing through the screen 14, which screen prevents the further passage of the particles present whereby the water may be used over again.

The upper portion of the gas holder 16 is provided with a suitable outlet 23 which may conduct the gas to any suitable holder where it may be stored, or may conduct it to burners where it may be consumed.

While I have especially in mind the application of my construction for use with smelter furnaces wherein poisonous gases and vapors are emitted, it is obvious that it may be used as well with any other form of furnace, the purpose of the invention being to control the products of combustion so that the gas, if possessing any calorific values, may be conserved and the smoke and metallic or other particles collected, the operation of the whole device not involving any waste of water by which the draft is maintained.

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

The combination of a pipe connected to a furnace stack, a nozzle within the pipe, a pipe extending from the said nozzle and connected to a pump, a water supply, the pump being connected to the water supply, the first pipe to which the said nozzle is connected extending into the interior of and terminating within a suitable tank, a gas holder within the tank, a pocket at the bottom of the tank, a pipe leading from the top portion of the tank to the water supply whereby the pump may maintain a continuous flow of water through the said pipes and tank, thereby providing a continuous draft for the said furnace, the products of combustion of the furnace being carried on by the said water into the said tank, the gases being collected in the said gas holder, and the particles being allowed to collect in the said pocket.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE ELLIS WAGGONER.

Witnesses:

GEORGE P. AKERLY,

S. F. ELLISON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."