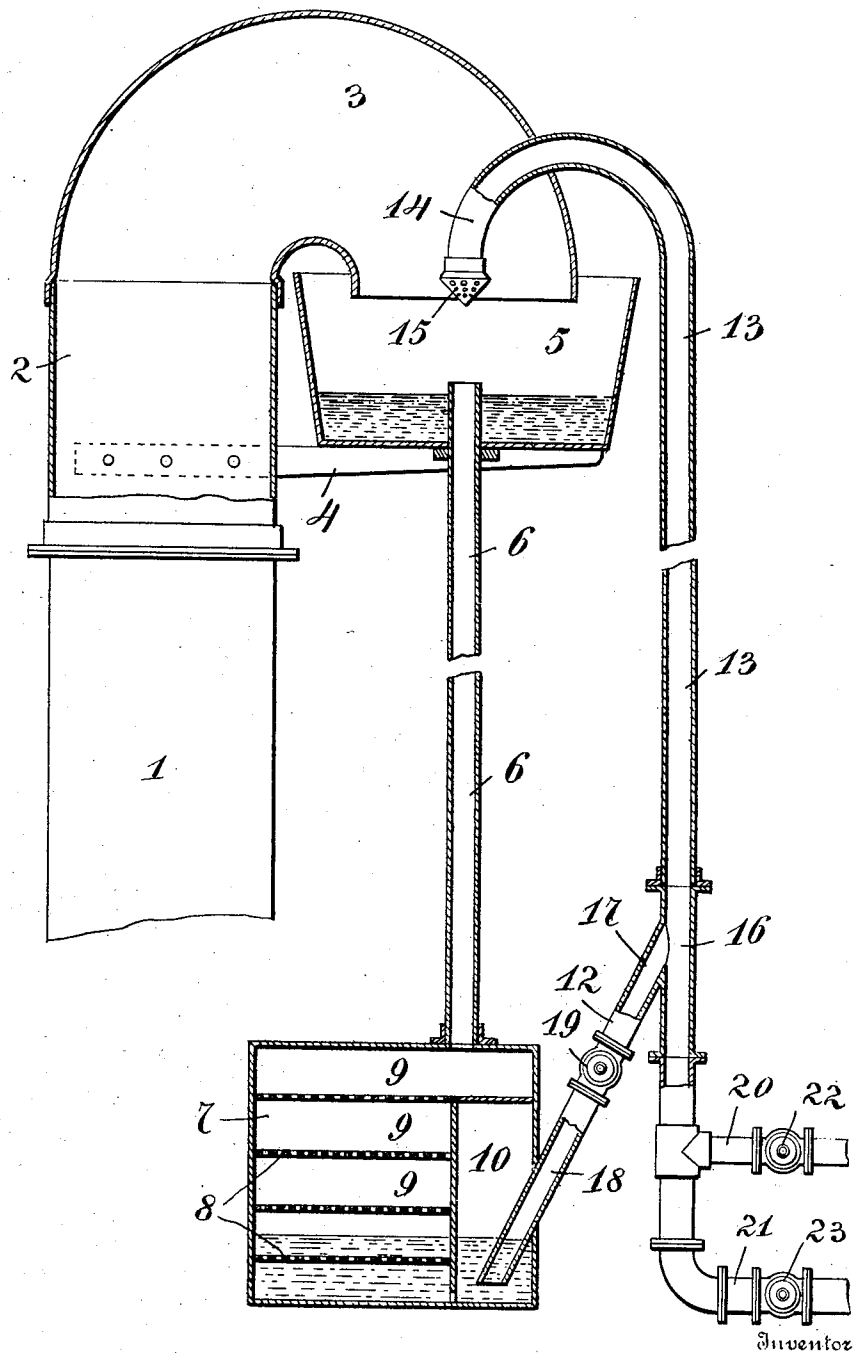


No. 771,406.

PATENTED OCT. 4, 1904.

G. WILLETT.
SMOKE CONSUMER AND SPARK ARRESTER.
APPLICATION FILED JULY 1, 1904.

NO MODEL.



Witnesses

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SMOKE-CONSUMER AND SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 771,406, dated October 4, 1904.

Application filed July 1, 1904. Serial No. 214,889. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WILLETT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Smoke-Consumers and Spark-Arresters; and I do declare the following to be 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.

This invention relates to improvements in smoke-consuming and spark-arresting devices.

The object of the invention is to provide a device or attachment for smoke-stacks whereby the sparks, soot, and heavier products of combustion which pass through the stack are removed from the smoke and caught in a suitable receptacle and the sparks extinguished.

A further object is to provide a device of this character which will be simple in construction, efficient in operation, and readily applied to any form of stack.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawing is shown a diagrammatical sectional view of the device applied to the upper end of a smoke-stack.

Referring more particularly to the drawing, 1 denotes a smoke-stack, to the upper end of which is attached an upwardly-projecting extension 2, to which is connected a downwardly-opening elbow 3. To the extension 2 is secured a laterally-projecting bracket 4, on the outer end of which is supported an open tank or receptacle 5, which is adapted to contain water. The downwardly-projecting open end of the elbow 3 is adapted to extend into the tank a short distance, so that the soot and sparks passing through the stack will be conducted into the tank and deposited into the water contained therein.

Through the bottom of the tank projects the upper end of an overflow or drain pipe 6, said end extending a short distance above the

bottom of the tank, as shown, thereby allowing some water to stand in the tank at all times. The lower end of the pipe 6 is connected with and opens into the upper side of a filter-tank 7, in which is arranged a series of filtering devices or screens 8, through which the dirty water from the tank 2 passes. The filtering devices are preferably arranged in a horizontal series one above the other, forming compartments 9 between the same. In one side of the tank is formed a clear-water compartment 10, with which the lowermost filter-compartment is connected and into which the filtered water passes.

Connected with the clear-water compartment 10 is a water-elevating device 12, by which the filtered water may be raised and deposited in the tank 5, thereby repeatedly using the same water. The elevating device 12 consists of an upright return-pipe 13, the upper end of which is bent laterally and downwardly, as at 14, and enters the downwardly-extending end of the smoke-pipe elbow and is provided with a spray-nozzle 15. Near its lower end the pipe 13 is connected with a section of pipe 16, having a branch 17, and with said branch 17 is connected the upper end of pipe 18, the lower end of which is connected with the clear-water compartment 10. The pipe 18 is provided with a valve 19, whereby the flow of water from said compartment may be cut off.

With the lower end of the pipe 13 below the branched section 17 are connected a steam-pipe 20 and a compressed-air pipe 21, by which either steam or compressed air may be supplied to the pipe 13 separately or together. The pipes 20 and 21 are respectively provided with valves 22 and 23, whereby one or both may be turned on or off from communication with the pipe 13.

While the stack 1 is described as being provided with an upwardly-projecting extension 2, having a downwardly-opening elbow 3, it is obvious that the extension and elbow may be dispensed with and the open end of the stack curved downwardly or formed in any manner to direct the products of combustion into the tank of water.

In operation the valves of one or the other, or both, the steam and compressed-air pipes are turned on, thereby allowing steam or air, or both, to pass upwardly through the pipe 13, thus creating a suction and drawing the water from the clear-water compartment up through the pipe 13, from which it is discharged through the nozzle 15 in the form of a spray, which draws or forces the smoke, soot, and sparks from the smoke-pipe down into the water in the tank 5, where they will be absorbed by said water and pass off with the same through the drain-pipe 6 to the filtering-tank, where they are again separated from the water by the screens or filters 8 and from which they are removed.

A device constructed as herein shown and described will be particularly adapted for catching and extinguishing hot cinders and sparks which may come through the smoke-stack and which would otherwise pass out of the stack and possibly fall upon inflammable material, igniting the same, thereby causing a serious fire. With the use of a device as shown and described in the invention dangers of this kind would be obviated and the smoke would be relieved of soot and other products which cause the dense blackness so much objected to in smoke arising from the burning of soft coal or fuel of any kind.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a device of the character described, the combination with a smoke-stack having a downwardly-opening upper end, of a tank or receptacle arranged beneath said open end, an overflow-pipe arranged in said tank, means whereby the water passing through said pipe will be filtered, and means for returning said filtered water to said tank, substantially as described.

2. In a device of the character described, the combination with a smoke-stack, of a downwardly-opening elbow secured to the upper end of the same, a tank or receptacle arranged beneath the open end of said elbow, an over-

flow-pipe arranged in said tank, a filtering-tank arranged at the lower end of said pipe, screens or filters arranged in said tank, and having compartments or spaces formed between the same, a clear-water compartment also arranged in said tank and in communication with the last filter-compartment to receive the water after passing through said filters, and means connected with said clear-water compartment for returning said clear water to said tank, substantially as described.

3. In a device of the character described, the combination with a smoke-stack, of a downwardly-opening elbow secured to the upper end of the same, a tank or receptacle arranged beneath the open end of said elbow, an overflow-pipe arranged in said tank, a filtering-tank arranged at the end of said pipe a branched return-pipe connected with said filtering-tank whereby the filter-water therein may be returned to said tank or receptacle at the upper end of said overflow-pipe, a spray-nozzle arranged on the upper end of said return-pipe and within and above the open end of said elbow, and means whereby said clear water may be forced up said return-pipe, substantially as described.

4. In a device of the character described, the combination with a smoke-stack, of a downwardly-opening elbow secured to the upper end of the same, a tank or receptacle arranged beneath the open end of said elbow, an overflow-pipe having its upper end projecting up into said tank or receptacle, a filtering-tank arranged at the lower end of said pipe, horizontally-disposed screens or filters spaced apart and arranged in said tank to form compartments between the former, a clear-water compartment also arranged in said tank, a return-pipe having a curved upper end opening into the discharge end of said smoke-pipe elbow, a spray-nozzle secured to said end of the return-pipe, a valved branch pipe connecting said return-pipe with said clear-water compartment, and valved steam and compressed-air pipes connected with the lower end of said return-pipe whereby either or both compressed air or steam may be turned into said pipe, substantially as described.

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

GEORGE WILLETT.

Witnesses:

S. A. LAHLUM,
ELIZABETH DAVEY.