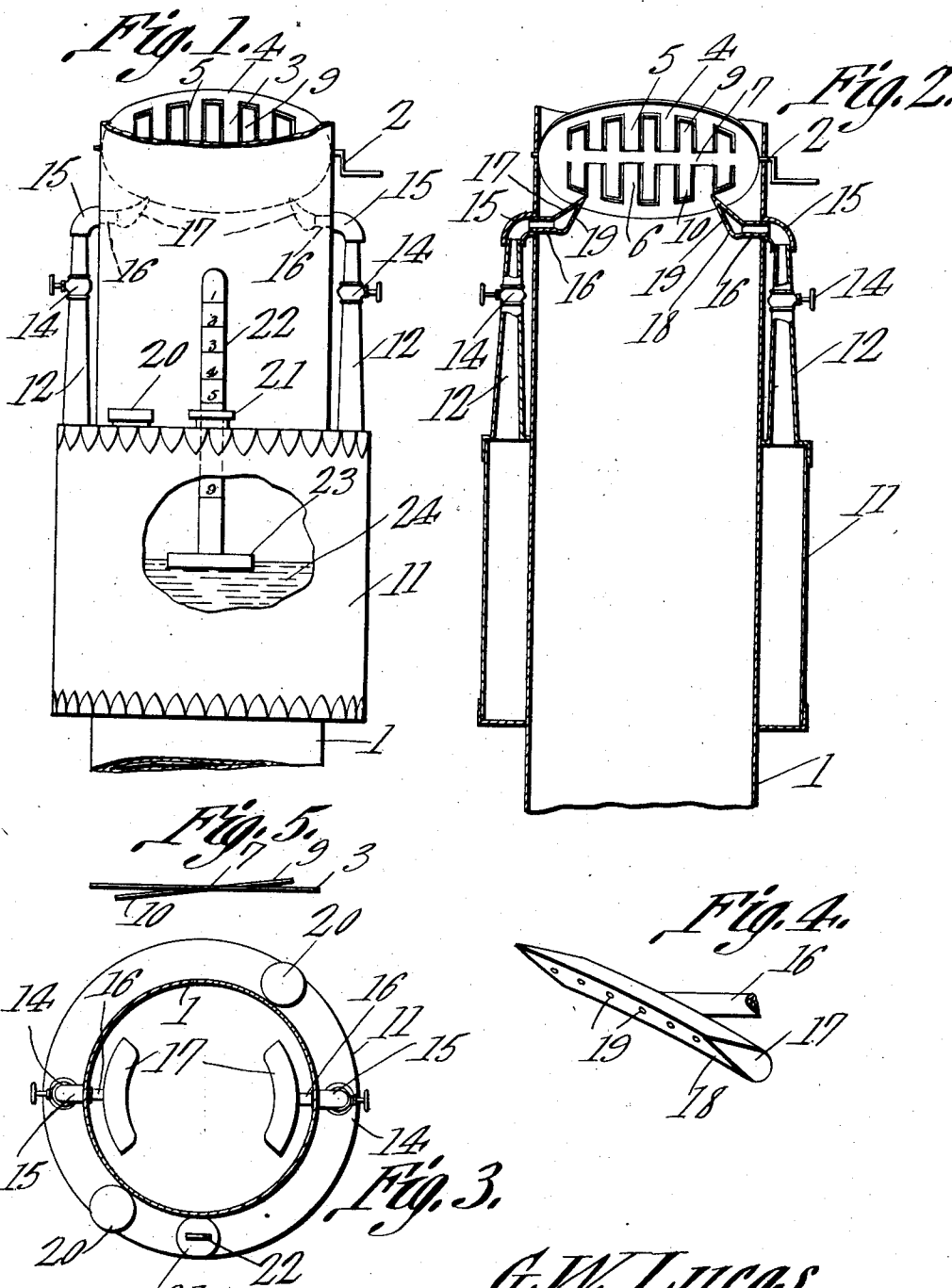


G. W. LUCAS.
 WATER JACKET SPARK FINDER AND EXTINGUISHER.
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Patented Sept. 10, 1912.



Witnesses
J. P. Martin
 W. H. Martin

G. W. Lucas,
 Inventor
 by *C. A. Snow & Co.*
 Attorneys

UNITED STATES PATENT OFFICE.

GEORGE W. LUCAS, OF NEWPORT, ARKANSAS.

WATER-JACKET SPARK FINDER AND EXTINGUISHER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE W. LUCAS, a citizen of the United States, residing at Newport, in the county of Jackson and State of Arkansas, have invented a new and useful Water-Jacket Spark Finder and Extinguisher, of which the following is a specification.

It is the object of the present invention to provide a water jacket, adapted to be applied to a flue, means being provided whereby the contents of the water jacket may be projected, under pressure, into the flue, to extinguish the sparks therein.

A further object of the invention is to devise a novel form of damper adapted peculiarly for use in connection with a spark extinguisher of the type hereinbefore described.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings,—Figure 1 shows the invention in side elevation; Fig. 2 is a vertical longitudinal section; Fig. 3 is a top plan of the structure shown in Fig. 2, the damper being removed; Fig. 4 is a perspective of one of the discharge heads which are located within the flue; and Fig. 5 is an end elevation of the damper.

In the drawings, the numeral 1 denotes a flue of any desired form, the flue 1 being fashioned in any number of sections, as may be convenient. Journaled for rotation in the flue, is a shaft 2, to which is secured a damper, denoted generally in Fig. 1, by the numeral 3. The damper 3 comprises a rim 4 having oppositely disposed sets of primary tongues 5 and 6, the tongues 5 and the tongues 6 projecting toward each other. Located between the inner ends of the tongues 5 and 6, and terminally connected with the rim 4, is a rib 7. The rib 7 is provided upon its opposite edges, with auxiliary tongues 9 and 10, the tongues 9 alining with the spaces between the tongues 5, and the tongues 10 alining with the spaces between the tongues 6. The tongues 5 and

6 lie in a common plane with the rim 3, while the auxiliary tongues 9 and 10 lie in a common plane, which plane is inclined with respect to the plane of the tongues 5 and 6, as clearly indicated in Fig. 5.

The invention further includes an annular jacket 11, surrounding the flue 1 closely, well below the damper 3. The jacket 11 is equipped, at oppositely disposed points, with tapering nozzles 12, in which there are cut-off valves 14. To the upper ends of the nozzles 12, elbows 15 are secured, the inner ends of the elbows 15 being engaged within the flue 1. Mounted in the inner ends of the elbows 15, are stub pipes 16, projecting toward each other, and toward the axis of the flue 1. Secured to the inner ends of the stub pipes 16, are discharge heads 17. The discharge heads 17 are curved longitudinally and are disposed transversely of the stub pipes 16. The lower faces 18 of the discharge heads 17 are provided with outlets 19. The discharge heads 17 are located below, and in close proximity to, the damper 3.

In the upper end of the water jacket 11, is a closure plug 20, whereby the jacket 11 may be filled with water. Mounted for vertical sliding movement in a packing gland 21, carried by the upper end of the water jacket 11, is a graduated rod 22, having a float 23 at its lower end, adapted to rest upon the upper surface of the liquid 24 in the jacket 11, to indicate the height of the liquid in the jacket.

In order that the device may be efficient as a means for quenching the sparks, it is necessary that the sparks should at all times be held back. The damper 3 is so mounted that it may have a sufficient pivotal movement to regulate the draft. However, it is impossible to swing the damper 3 into a common plane with the axis of the flue 1, by reason of the fact that, when the damper 3 is tilted, the damper will come into contact with the ends of the discharge heads 17, the heads 17 thus limiting the swinging of the damper, and making the damper at all times efficient as a means for holding back the sparks. In the device as herein disclosed, it is impossible to impair the utility of the structure as a spark-extinguishing means, merely for the purpose of greatly increasing the draft.

The operation of the device is as follows: The products of combustion, passing upwardly through the flue 1, will raise the

temperature of the liquid in the water jacket 11, converting the same into vapor, the vapor passing upwardly through the tapered nozzles 12, into the discharge heads 17, and thence, out of the discharge heads, through the openings 19. The sparks which are carried upwardly by the products of combustion, will thus be quenched and precipitated.

10 The specific form of damper shown and described, and denoted generally by the numeral 3, is peculiarly adapted for use in connection with a spark extinguisher. Owing to the relative positions of the tongues 15 6, 10, 5 and 9, the damper, although thoroughly effective to permit the upward passage of the products of combustion, will tend, nevertheless, to hold back the sparks, so that the same may be subjected to the extinguishing streams of vapor, proceeding through the outlet openings 19 in the discharge heads 17.

One of the most fruitful sources of difficulty, in the operation of spark extinguishers, of the general type shown herein, arises from the fact that the elbows 15 clog up to a considerable extent. In order to clear the elbows 15 when they are thus clogged, the check valves 14 are closed, and the vapor is permitted to accumulate, under great pressure, and in a superheated condition, within the water jacket 11. When the desired pressure has been attained in the water jacket 11, the check valves 14 are opened. The tapering nozzles 12 will discharge this mass of vapor, under high pressure, into the elbows 15, and free them of any sediment which they may contain, the discharge heads 17 being, at the same time, cleared out.

Having thus described the invention, 40 what is claimed is:—

1. A device of the class described comprising a flue; a water jacket mounted upon the flue; a nozzle communicating with the water jacket; a pipe projecting from the nozzle and entering the flue; a discharge 45 head located at right angles to the axis of the flue and connected with the pipe; and a damper rotatable in the pipe above the discharge head, the discharge head being positioned to engage the damper, to prevent the damper from being swung into a common plane with the axis of the flue. 50

2. A device of the class described comprising a flue; a water jacket surrounding the flue; oppositely disposed nozzles located upon the outside of the flue, approximately parallel thereto, the lower ends of the nozzles opening into the top of the water jacket; pipes entering the flue at right angles thereto; discharge heads carried by the pipes within the flue; elbows connecting the pipes with the nozzles; and cut-off valves in the nozzles; the valve in each nozzle being separably manipulable to direct all of the fluid 55 pressure through the other nozzle, and each nozzle being tapered toward the respective elbow, whereby to increase the speed of the discharge of the entire fluid pressure within the water jacket into one elbow, to effect a 60 cleaning of the same. 65 70

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE W. LUCAS.

Witnesses:

W. T. PARISH,
G. L. SMITH.