

Aug. 21, 1923.

F. T. HOPE

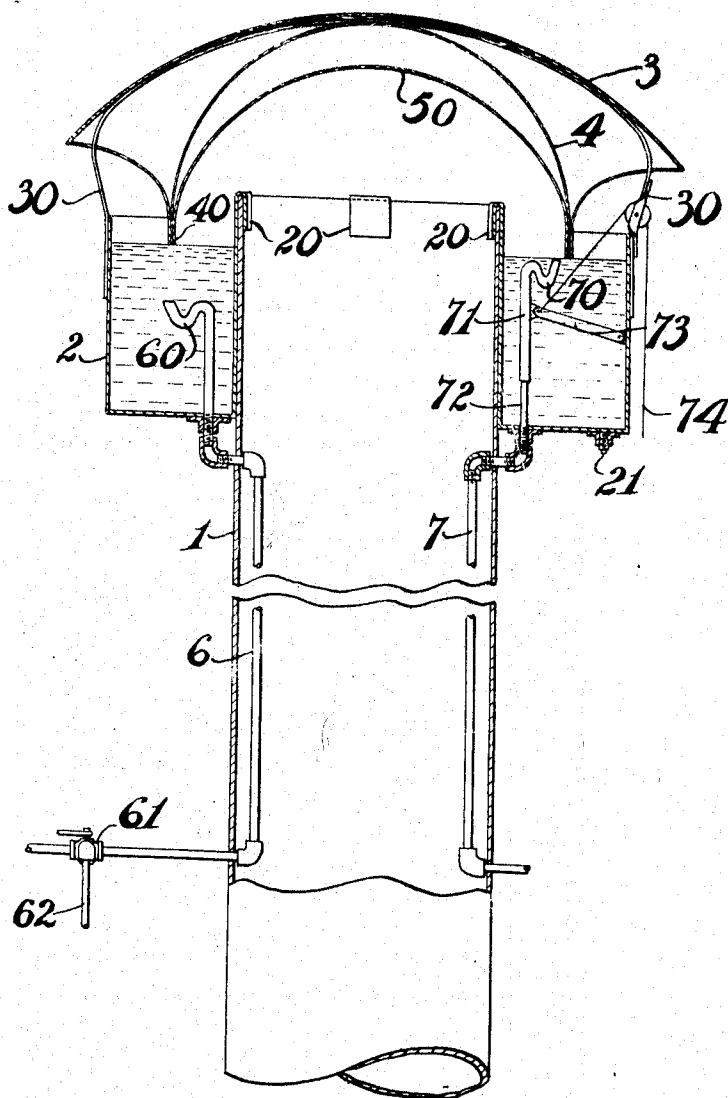
1,465,475

DRAFT CONTROLLING DEVICE

Filed Dec. 12, 1921

2 Sheets-Sheet 1

FIG. 1



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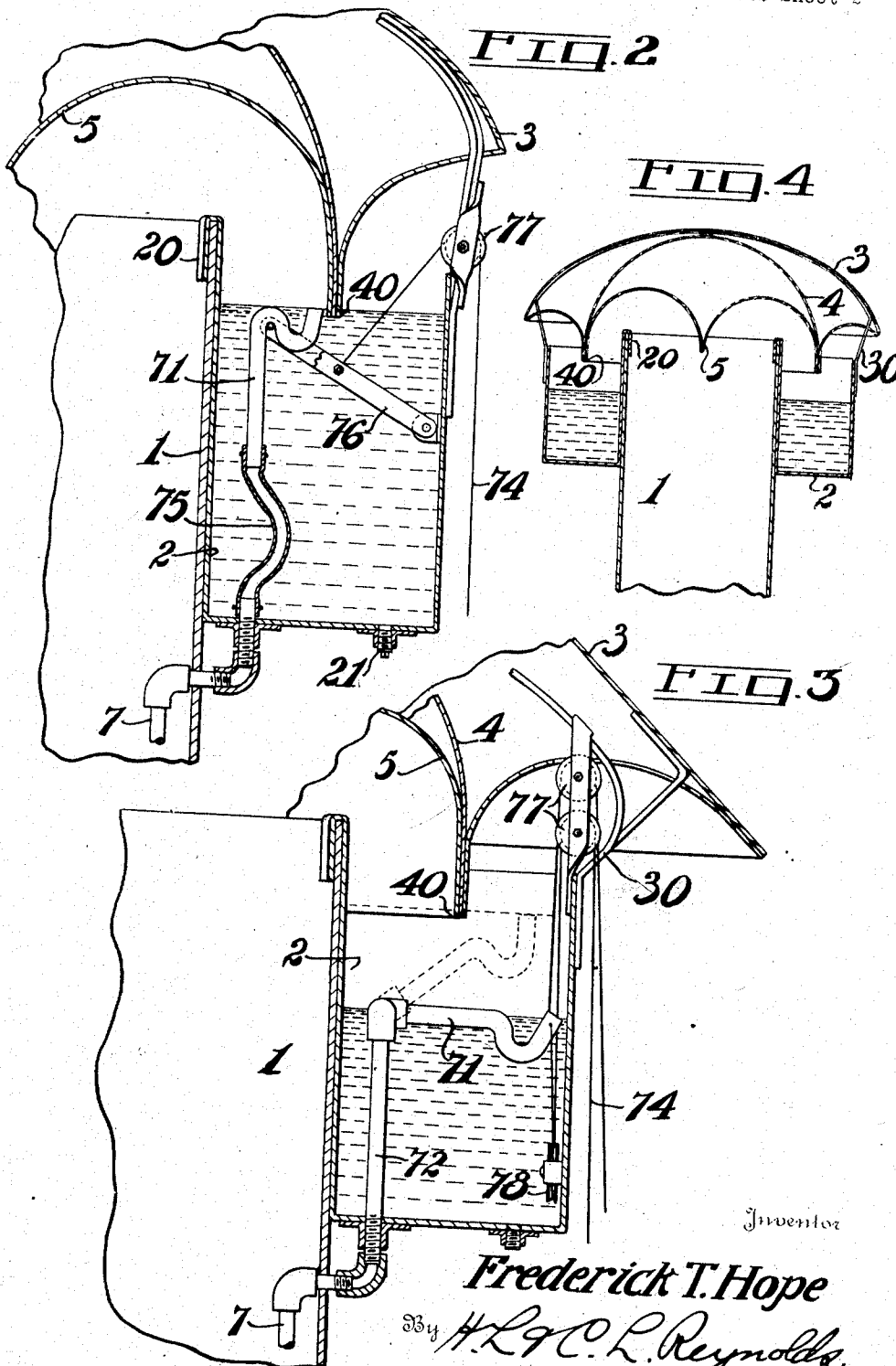
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DRAFT CONTROLLING DEVICE

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Patented Aug. 21, 1923.

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UNITED STATES PATENT OFFICE.

FREDERICK T. HOPE, OF SEATTLE, WASHINGTON, ASSIGNOR OF ONE-SIXTH TO PAUL ISEMAN, ONE-SIXTH TO GEORGE A. MEAGHER, AND ONE-SIXTH TO J. A. CALDWELL, ALL OF SEATTLE, WASHINGTON.

DRAFT-CONTROLLING DEVICE.

Application filed December 12, 1921. Serial No. 521,792.

To all whom it may concern:

Be it known that I, FREDERICK T. HOPE, a citizen of the United States of America, and resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Draft-Controlling Devices, of which the following is a specification.

My invention relates to devices which are intended for controlling draft and also for arresting sparks and preventing their being spread broadcast from stacks and chimneys.

The object of my invention is primarily to apply a device to the tops of stacks or chimneys to thereby control the draft in said stacks and chimneys and to catch the cinders and sparks and prevent their escape in such way as to cause any danger. While the device has been primarily designed for application to the control of escaping gases from chimneys and stacks, it is evident that it may be employed for the control of the flow of air or gases at other places than in chimneys. It is, therefore, a means for controlling ventilation as well as gases escaping from chimneys.

My invention consists of an apparatus which is to be applied to flues carrying air or gases whereby their escape may be controlled as desired. It consists of the peculiar constructions and combinations of parts which will be hereinafter described and then specifically defined in the claims terminating this specification.

In the accompanying drawings I have shown my invention embodied in constructions which differ slightly in details but in all of which the principles of my invention are embodied.

Figure 1 is a vertical section through the top of a stack having my invention applied thereto.

Figure 2 is a similar section showing, however, only one side of the apparatus and one side of the stack.

Figure 3 is a fragmentary sectional view similar to that of Figure 2, but showing a slightly different construction.

Figure 4 is a vertical section through the top of the stack and a still further modified type of construction.

In carrying out my invention I apply to the top of the stack a water holding tank which surrounds the stack and in connection

therewith I mount a hood which covers the discharge end of the stack and has its outer edges depending as a petticoat over the tank so as to force the gases to pass between the outer periphery of the stack and the lower depending edge of the hood, under the latter and then upward and outward. The control of the area for the escape of the gases is secured by varying the level of water contained in the tank. If the level of water in the tank be raised to the lower edge of the hood which covers the stack, the escape of the gases will be prevented. If the level of the water in the tank be lowered sufficiently, the discharge area of the stack beneath the hood is not decreased and there is a free escape passage for the gases.

Referring to Figure 1, a stack 1 is shown, this being illustrated as of metal construction. The construction of the stack, whether of metal, brick, or concrete, is immaterial. My invention may be applied to stacks constructed of any type of material and whether round, square, or any other cross sectional shape. The tank, hood, and other parts of my invention would be modified in construction to conform to the size and cross sectional shape of the stack. While the device has been shown only as applied to metal stacks, it is evident that it may be applied to chimneys of any type of construction.

A tank 2 is supported about the upper end of the stack. As illustrated this is shown as carried by the stack itself through the use of ears or flanges as 20 which extend over the upper end of the stack. The manner of supporting this tank is, however, immaterial and it may be supported independently of the stack if this be found feasible and is desired. It is preferred that the tank be placed close to the stack so that there be no appreciable draft between the tank and the stack.

A hood or dome 3 which may be of conical, rounded, or any other suitable contour, is placed over the stack and preferably so as to cover a portion or possibly all of the tank 2. This is shown as supported by means of arms or bars 30 from the outer wall of the tank. The manner of support may, however, be anything found suitable. In conjunction with this outer dome 3 is placed an inner deflecting dome or petticoat 4.

which has its lower edge of sufficient size to fit down over the top of the stack and spaced away therefrom a sufficient distance to furnish ample discharge area for the gases carried by the stack. The lower edge 5 40 of this inner dome preferably extends somewhat below the top edge of the stack and slightly into the tank 2. The tank is also of such width that a sufficient area is left between the bottom edge of the inner 10 dome or petticoat at 40 and the outer wall of the tank to furnish ample discharge area for the gases.

It is also desirable at times that a deflecting cone as 5 be placed inside of the hood. This as shown in Figures 2 and 3 is in the nature of an inverted cone having its center over the center of the stack. It acts to deflect the gases outwardly and then into 20 the space between the petticoat 40 and the stack. In Figure 1 this central deflecting cone has been omitted, the inverted bowl shaped plate 50 forming an inner lining for the domes 3 and 4. The air spaces between 25 these plates form insulation which results in maintaining the inner dome or lining plate 5 at such a temperature as will prevent collecting a layer of soot thereon. Without such heat insulating construction a heavy 30 layer of soot may form thereon which will interfere with the circulation and proper working of the device.

The tank 2 is supplied with water and means are also provided whereby the level 35 of this water may be varied. A pipe 6 is connected with some source of supply of water under sufficient pressure to cause it to flow upward and discharge into the tank. This pipe 6 is preferably placed inside of 40 the stack, this being done because usually it may be so placed more conveniently than otherwise, it being unnecessary to cut any holes in the roof of a building to pass the pipe through. Another reason is that a pipe 45 so placed is heated sufficiently by the gases to prevent freezing of the water in cold weather. The pipe 6 enters the bottom of the tank and is preferably terminated by a bend, as 60, which forms a water seal. 50 The discharge end of this pipe is also preferably placed below the bottom edge 40 of the deflecting petticoat and not higher than the minimum water level which it may be desired to carry in the tank. It may, 55 however, if desired terminate at the bottom of the tank.

At the lower end of the stack, at such point as to be easily accessible, is placed a 60 valve 61, preferably a three-way valve, so that when desired water may be discharged from the pipe 6 through pipe 62 and also from the tank. If this pipe terminates at a level above the bottom of the tank, the tank cannot be drawn below this level 65 through the use of this pipe. It therefore

forms an automatic level controlling feature.

Water is drained from the tank while the device is in use through a pipe 7 which extends upward within the tank and is provided with means so that the water surface 70 may be varied in elevation. It is also preferably provided with a return bend, as 70. As contemplated in Figure 1 the pipe section 71 is mounted as a sleeve sliding either over or within the lower pipe section 72. It is 75 carried by a lever 73 or in some other suitable manner, which lever is connected with any suitable means whereby it may be operated from a lower level such, for instance, as chains or wires 74. By such means the 80 pipe section 71 may be raised or lowered and thereby control the surface level of the water in the tank.

In Figure 2 the pipe section 71 is shown as connected with the main body of the pipe 85 7 through a short section 75 of flexible hose. The pipe section 71 is suspended upon a lever as 76 pivoted at its outer end to the body of the tank and raised and lowered through the operation of a cord or chain as 90 74 which passes over a pulley as 77. In Figure 3 the terminal section 71 of the drainage pipe is mounted upon the pipe 72 so that it may be swung as upon a hinge 95 and its position is controlled by means of the cords or chains 74, one of which passes over a pulley 78 located towards the bottom of the tank, by means of which this pipe section 71 may positively be pulled down- 100 ward when it is desired to lower the water level. The other cord extends upwardly and both pass over pulleys as 77, mounted over the upper edge of the tank.

Gases passing up the stack 1 will be deflected outward and down by the inner hood 105 4. The level of water in the tank will be lower than the lower edge 40 of this hood. The gases being deflected downward, all cinders and sparks carried thereby will be caused to strike the water in the tank and 110 will be caught and held thereby. The gases will pass upward outside of the hood 4 and be discharged. It is contemplated that the dimensions of the hood 4 and the tank 2 will be such as to furnish ample discharge capacity. This should at no time be less than 115 the cross sectional area of the stack itself. If, however, it be desired to choke the draft this may be done by raising the level of water in the tank thereby decreasing the 120 cross sectional discharge area beneath the hood 4. This action may be carried to any extent desired, even to entire stoppage of the draft, if the construction of the device be designed for such use. 125

It is preferred that the outer edge of the tank 2 at its top be located slightly below the top of the stack so that in case there be for any reason an overflow of water from the tank over its sides, this will not be dis- 130

charged into the stack. I have shown the tank as being provided with the drainage outlet 21 which has been shown as being closed by the insertion of a plug. This may, of course, be provided with a pipe extending to a convenient level if desired. By this means the tank may be entirely drained, as when the stack is to be put out of operation for any considerable time during cold weather.

What I claim as my invention is:

1. A draft controller for stacks comprising a liquid containing tank surrounding the stack just below its upper discharge end, a hood covering the stack discharge and having its lower edge depending above said tank, said hood being composed of a plurality of plates connected in spaced-apart relation to form a heat insulating cellular structure and means for controlling the gas discharge area beneath the lower edge of the hood.

2. A draft controller for stacks comprising a liquid containing tank surrounding the stack just below its upper discharge end and a hood covering the stack discharge and having its lower edge depending above said tank, said hood being composed of a plurality of plates connected in spaced-apart relation to form a heat insulating cellular structure, and means for supplying water to and discharging it from said tank.

3. A draft controller for stacks comprising a water tank surrounding the stack, an inverted hood covering the stack and having its edges depending into the tank, said hood being composed of separated plates secured together to enclose heat insulating air layers between them, and water supply and discharge pipes for the tank, the latter pipe having a vertically adjustable intake.

Signed at Seattle, King County, Washington, this 6th day of December, 1921.

FRÉDERICK T. HOPE.