

Improvements in apparatus for generating and applying fumes, smoke or vapours for disinfecting, deodorizing or fumigating purposes, or for the testing of pipes or passages by what is known as the smoke test, or for analogous purposes / [John Watts].

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PROVISIONAL SPECIFICATION.

Improvements in Apparatus for Generating and Applying Fumes, Smoke, or Vapours for Disinfecting, Deodorizing, or Fumigating Purposes, or for the Testing of Pipes or Passages by what is known as the Smoke Test, or for analogous purposes.

I JOHN WATTS of Broad Weir Engine Works in the City and County of Bristol Engineer do hereby declare the nature of the said invention to be as follows :—

My invention relates to apparatus for generating, and applying, fumes, smoke, or vapours, for disinfecting, deodorising, or fumigating purposes. It is intended more especially however for testing pipes, or passages, by the smoke test; that is, by forcing smoke thereinto so that its escape reveals any leakage therefrom. My said invention has for its object to provide an apparatus in which the matter from which the fumes, smoke, or vapours, is, or are, generated can be ignited and got ready for use without escape of smoke, fumes, or vapour, from the apparatus (when taken into the place where it is to be used) except when and where desired. The apparatus is provided with a pump, or air forcing device, by which, when the apparatus is in use, air is forced into a chamber from which sufficient of the said air to support combustion passes through a small opening, or small openings, to the smouldering material, air also passing from the said chamber through another opening controlled by a weighted, or equivalent, valve, so that when the air in the said chamber has attained a sufficient pressure it opens the said valve and passes from the said chamber to meet the smoke, fumes, or vapours, passing from the combustion chamber and carry it, or them, down, through a space, to the outlet, to which a hose and nozzle, or other suitable device, may be attached for leading the smoke or the like, to the place where it is to be ejected the outlet being provided with a valve which is closed when the apparatus is not in use. The combustion chamber and air and smoke passages, which are arranged around it, are all covered in by a cover having a rim which enters a groove at the top of the outer casing so as to form a liquid seal for the said cover. In order to explain more clearly the nature of my invention I will describe more particularly an arrangement according thereto; premising however, that I do not limit myself to the precise details which I shall describe.

The apparatus consists of an outer casing separated into compartments by a diaphragm the lower compartment constituting a compressed air chamber, and the upper compartment containing the combustion chamber in which is the smouldering material. This chamber is supported upon a tray which forms its bottom, the said tray having in it a conical orifice, or short pipe, which fits over a conical piece at the upper end of a pipe which opens into the compressed air chamber, the top of the last named pipe being closed except for a small opening, or openings, of such size as to pass enough air to supply the smouldering material in the combustion chamber. The last named pipe, at the portion between the bottom of the combustion chamber, and the top of the compressed air chamber, acts as a guide for a weighted ring-valve, which normally covers an opening, or openings, in the diaphragm, which when the air in the compressed air chamber reaches a sufficient pressure to raise the valve affords or afford a passage for air which passes up outside the combustion chamber and then, meeting the smoke, or the like, therefrom carries it down to the outlet from the casing to the hose and thence to the place where the smoke, or the like, is to be used. To enable this to be done the outer casing, which encloses the space in which the combustion chamber is placed, is covered by a cover with a water seal joint as before explained. A cylinder extends from the

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diaphragm which forms the top of the compressed air chamber and this cylinder and the combustion chamber each leave a space between themselves and the cover. The distance between the sides of the combustion chamber and the inside of the said cylinder, and between the outside of the said cylinder and the inside of the casing are sufficient to form passages for the passage of the air, and the air and smoke, or the like, to the outlet, which opens into the lower part of the space between the aforesaid cylinder and the outer casing. The outlet is provided with a valve to be closed when the apparatus is not in use. The air is supplied to the compressed air chamber by means of a pump, which I prefer to make of a barrel situated at the side of, and connected to, the casing of the apparatus, the lower end of this barrel, above the outlet therefrom to the air compression chamber, is perforated and provided with a disc valve, which, when the pump is making its stroke in one direction, closes, the said perforations, to prevent air passing back from the compression chamber, but opens to allow air to pass from the pump when the piston is making its compressing stroke. The piston may be of a cup-leather shape and air may be admitted to beneath it, by the said piston, on its up-stroke, passing beyond air openings in the barrel but any other suitable construction of pump may be used. In using the apparatus the matter from which the fumes are to be generated is lighted and placed in the combustion chamber and the cover is put in place; the pump is then worked and the outlet being opened, air passes through the perforations in the conical piece upon which the tray of the combustion chamber is supported and as the working of the pump is continued, the pressure of air in the compressed air chamber accumulates, until the pressure is sufficient to open the valve so that air under pressure passes upwards between the combustion chamber and the surrounding cylinder and meets the smoke, or the like, arising therefrom and then passes over the top of the cylinder and down the space between it and the outer casing and thence out by the outlet at the lower part of the said space.

Dated this 13th day of October 1892.

J. H. JOHNSON & Co.,
47, Lincoln's Inn Fields, London, W.C., Agents.

COMPLETE SPECIFICATION.

Improvements in Apparatus for Generating and Applying Fumes, Smoke, or Vapours for Disinfecting, Deodorizing, or Fumigating Purposes, or for the Testing of Pipes or Passages by what is known as the Smoke Test, or for analogous purposes.

I, JOHN WATTS of Broad Weir Engine Works in the City and County of Bristol, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

My invention relates to apparatus for generating, and applying fumes, smoke, or vapours, for disinfecting, deodorizing, or fumigating purposes. It is intended more especially however for testing pipes, or passages, by the smoke test; that is, by forcing smoke thereinto so that its escape reveals any leakage therefrom. My said invention has for its object to provide an apparatus in which the matter from which the fumes, smoke, or vapours, is, or are generated can be ignited and got ready for use without escape of smoke, fumes, or vapour, from the apparatus (when taken into the place where it is to be used) except when and where desired.

The apparatus is provided with a pump, or air forcing device, by which, when the apparatus is in use, air is forced into a chamber from which sufficient of the said air to support combustion passes through a small opening, or small openings, to the smouldering material, air also passing from the said chamber through another opening which may be controlled by a weighted, or equivalent, valve, so that when the air in the said chamber has attained a sufficient pressure it opens the said valve

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- and passes from the said chamber to meet the smoke, fumes, or vapours, passing from the combustion chamber and carry it, or them down, through a space to the outlet, to which a hose and nozzle, or other suitable device may be attached for leading the smoke, or the like, to the place where it is to be ejected the outlet being
- 5 provided with a valve which is closed when the apparatus is not in use. The combustion chamber, and air and smoke passages, which are arranged around it, are all covered in by a cover secured in any suitable way for example it may be secured by screws and nuts or for light pressures it may have a rim which enters a groove at the top of the outer casing so as to form a liquid seal for the said cover.
- 10 In order to explain more clearly the nature of my invention I will describe more particularly with reference to the vertical section shewn in the accompanying drawing an arrangement according thereto; premising however, that I do not limit myself to the precise details which I have shewn.
- The apparatus consists of an outer casing A separated into compartments by a
- 15 diaphragm B the lower compartment C constituting a compressed air chamber, and the upper compartment containing the combustion chamber D in which is the smouldering material. This chamber D is supported upon a tray E which forms its bottom, the said tray having in it a conical orifice, or short pipe E² which fits over a conical piece F² at the upper end of a pipe F which passes through the
- 20 diaphragm B and opens into the compressed air chamber C the top of the last pipe F being closed except for a small opening, or openings *f* of such size as to pass enough air to supply the smouldering material in the combustion chamber D. The pipe F is secured to the diaphragm B by means of the nut *f*² and plate or valve seating *f*³ above. The pipe F at the portion between the bottom of the
- 25 combustion chamber D and the top of the compressed air chamber C acts as a guide for a weighted ring-valve G which normally covers an opening *f*⁴ (or openings), in the diaphragm B and plate or valve seating *f*³ which, when the air in the compressed air chamber C reaches a sufficient pressure to raise the valve G affords or afford a passage for air which passes up outside the combustion chamber D
- 30 and then, meeting the smoke, or the like therefrom carries it down to the outlet *a* from the casing A to the hose A² and thence to the place where the smoke, or the like, is to be used. To enable this to be done the outer casing A which encloses the space in which the combustion chamber is placed, is covered by a cover A³ which may be provided with a water seal joint A⁴ as before explained or the cover
- 35 may be secured in any other way for example by wing nuts and screws. A cylinder H extends from the diaphragm B which forms the top of the compressed air chamber C and this cylinder and the combustion chamber each leave a space between their tops and the cover. The distance between the sides of the combustion chamber D and the inside of the said cylinder H, and between
- 40 the outside of the said cylinder H and the inside of the casing A are sufficient to form passages for the passage of the air, and the air and smoke or the like to the outlet *a* which opens into the lower part of the space between the afore-said cylinder H and the outer casing A. The outlet *a* is provided with a valve *a*² to be closed or to automatically close when the apparatus is not in use.
- 45 The air is supplied to the compressed air chamber by means of a fan, bellows, pump, or other air forcing device. I have shewn a pump consisting of a barrel I situated at the side of and connected to the casing A of the apparatus the lower end of this barrel, above the outlet *i* therefrom to the air compression chamber C is perforated at *i*² and provided with a disc valve *i*³ which, when the piston I² of
- 50 the pump is making its stroke in one direction (its upstroke) closes the said perforations *i*² to prevent air passing back from the compression chamber C but opens to allow air to pass from the pump when the piston I² is making its compressing (downward) stroke. The piston may be of a cup leather shape as shewn and air may be admitted to beneath it by the said piston, on its up-stroke, passing
- 55 beyond air openings *i*⁴ in the barrel I but any other suitable construction of pump or air forcing device may be used. In using the apparatus the matter from which the fumes are to be generated is lighted and placed in the combustion chamber D

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upon the perforated false bottom J supported on the tray E and the cover A³ is put (and if necessary secured) in place; the pump or other air forcing device is then worked and the outlet being opened (or opening) air passes through the perforations *f* in the conical piece F² and as the working of the pump is continued, the pressure of air in the compressed air chamber C accumulates, until the pressure is sufficient to open the valve G so that air under pressure passes upwards between the combustion chamber D and the surrounding cylinder H and meets and mixes with the smoke or the like, arising therefrom and passes therewith over the top of the cylinder H and down the space between it and the outer casing A and thence out by the outlet *a* at the lower part of the said space to the place of utilization. 5 10

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:—

1. The arrangement and combination of parts constituting the apparatus for generating and applying fumes smoke or vapours substantially as hereinbefore described and illustrated in the accompanying drawings. 15

2. In apparatus for the purposes described the combination with an air forcing device and a chamber containing the matter from which the fumes or the like are generated of an air chamber from which sufficient air passes to support combustion and a valve controlled opening or openings from which air passes to carry the fumes or the like to the place of utilization when the pressure has risen sufficiently in the said chamber to open the said valve substantially as hereinbefore described. 20

3. In apparatus for the purposes described the combination with an inlet for air sufficient to support combustion of the materials in the combustion chamber and a passage for air external to the combustion chamber to supply air to meet the fumes or the like and mix therewith of an outlet passage controlled by a valve which is opened or opens to allow the passage of the fumes or the like when the apparatus is at work and which closes automatically or can be closed when the apparatus ceases to work so as to constitute an apparatus from which fumes do not escape when the apparatus is out of operation substantially as hereinbefore described. 25 30

4. In apparatus for the purposes described the combination with an air forcing device and a combustion chamber of an air passage surrounding it and a surrounding casing constituting a passage for the fumes or the like and the air so that the air forced in passes up the first passage and meeting the fumes or the like mingles and passes therewith down through the second passage to the outlet substantially as hereinbefore described. 35

5. In apparatus for the purposes described the combination with a combustion chamber and an air chamber of an inlet nozzle perforated to supply sufficient air to support combustion and coned to form a seat to support a tray for carrying the combustion chamber the said tray also supporting the false bottom of the combustion chamber above the said nozzle substantially as hereinbefore described. 40

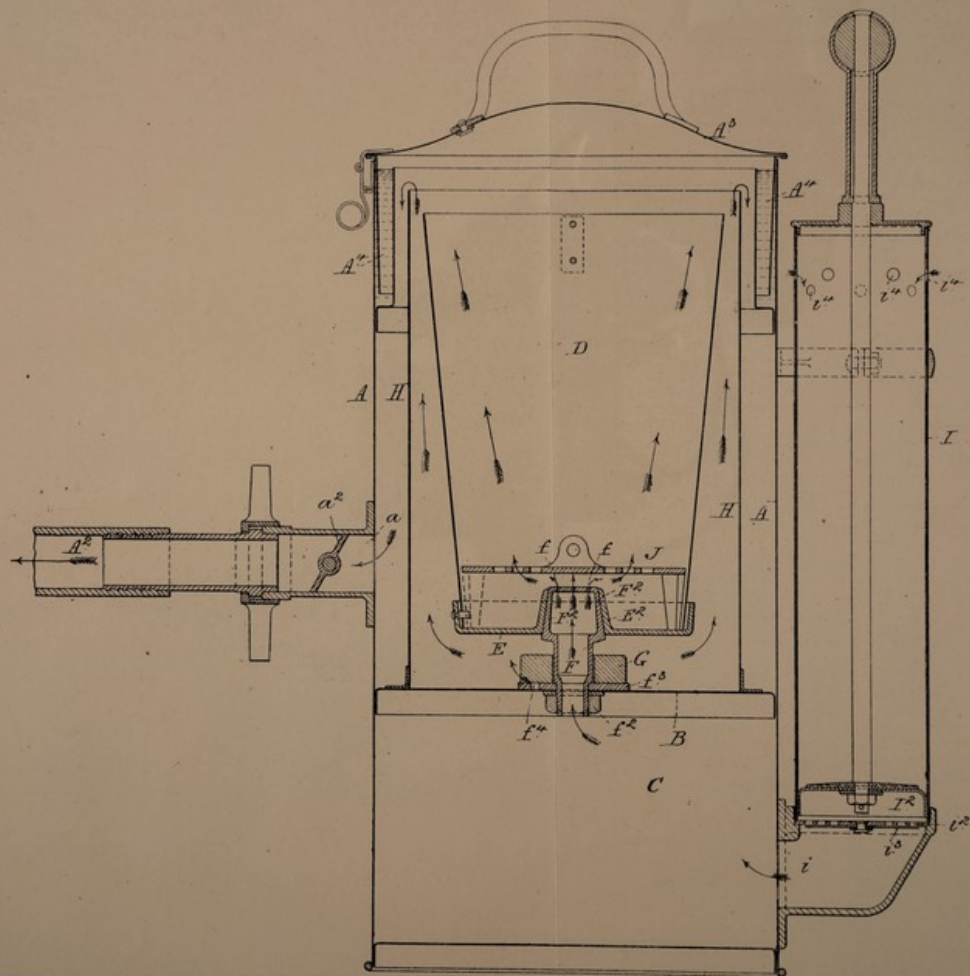
6. In apparatus for the purposes described the combination with an air forcing device and the nozzle which admits air to support combustion of a weighted valve sliding upon the said nozzle and controlling an air inlet from an air chamber so that air passes when a pressure in the said chamber is attained sufficient to lift the said valve substantially as hereinbefore described. 45

Dated this 13th day of July 1893.

J. H. JOHNSON & Co.,
47, Lincoln's Inn Fields, London, W.C., Agents.

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[This Drawing is a reproduction of the Original on a reduced scale.]

