

June 2, 1936.

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2,043,002

APPARATUS FOR NEUTRALIZING NOXIOUS ORGANISMS

Filed Feb. 6, 1935

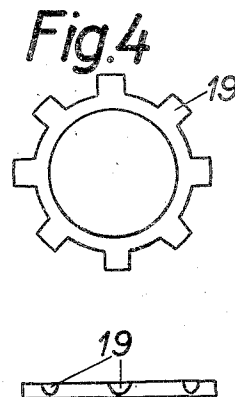
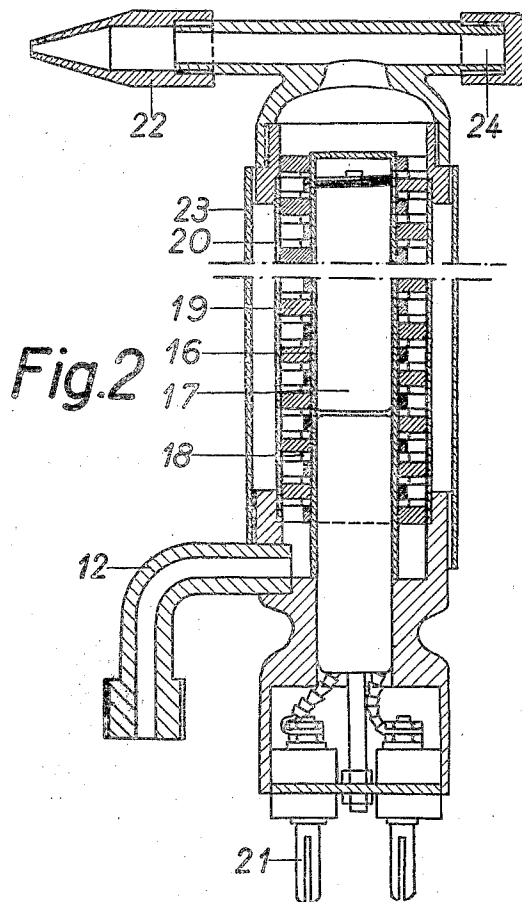
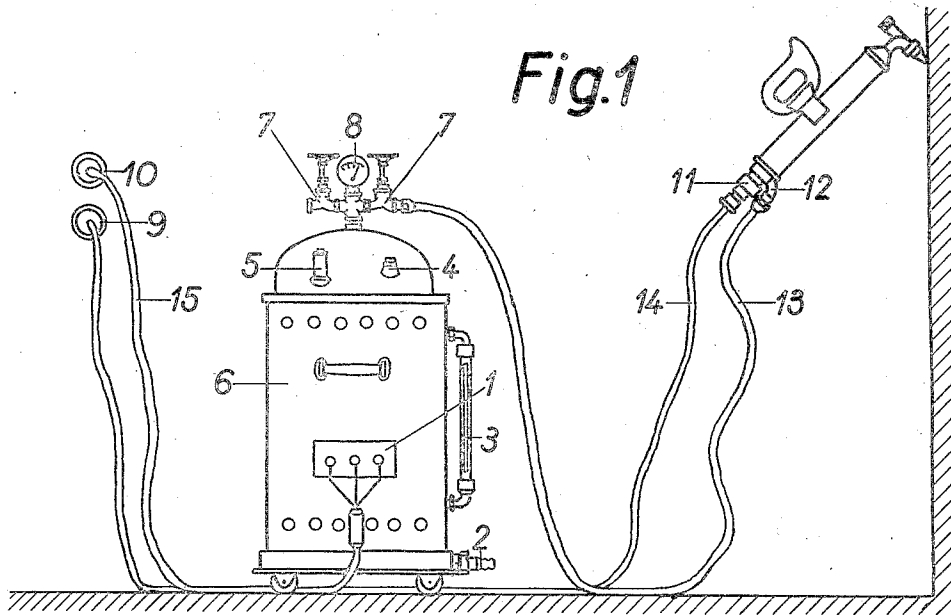


**Fig.3**

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## UNITED STATES PATENT OFFICE

2,043,002

## APPARATUS FOR NEUTRALIZING NOXIOUS ORGANISMS

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Application February 6, 1935, Serial No. 5,296  
In Switzerland July 14, 1934

4 Claims. (Cl. 219—39)

The present invention relates to an apparatus which out of fluids generates vapours serving as a means for disinfection. Some devices used for this purpose are already known, which however have the disadvantage of only compensating a loss of temperature, whereas my invention makes it possible to superheat the steam by forcing it through a long passage provided with suitable arrangements and to allow mixing up vapours of different temperature at the outlet of the nozzle. The apparatus hitherto known were by no means universal apparatus and could only be used for one distinct kind of disinfection. It must be remembered that, as experience has shown, the struggle against vermin and bacteria must be conducted in different manners in each case according to circumstances and depending upon the place where the organisms to be destroyed are living. Against one class of such animals it is necessary to use hot but wet vapours, against another class dry vapours are required, and against still another class the proportion between air and vapour must be strictly adhered to. Further it is necessary to take into account in what condition the objects to be disinfected are at the time of action. Up to now these varied modes of operation could only be attained by using separate apparatus specially designed for the purpose required, and it was not possible to obtain all these effects by one and the same apparatus.

This inconvenience is removed by the objects specified in the present claims. The apparatus consists of a tank which can work both as a steam generator and as a pressure receiver and which may be arranged so as to be transportable on the back by means of carrying straps. If it is to work as a pressure receiver without heating the fluid in the receiver, a pump can be combined with it which will produce the necessary pressure within the receiver. From this receiver a hose pipe leads to the handpiece, the so-called pistol. This pistol is constructed in such a way as to work either with pure unmixed vapours either in a cold condition or with supplementary superheating, or else to permit mixing up in it vapour and compressed air, in which case beside the evaporator a second receiver is used, serving as an air vessel wherein the air pump may be in the well-known way, just as in the vessels used for the distinction of phylloxera.

Further the object of this invention makes it possible to work two separate gas jets so that two different gases which are mixed up with each other only at the outlet of the nozzle act

against the organisms to be neutralized. All these features were not known up to now. Practice and experience have proved that such an apparatus attains the neutralization of every sort of noxious organisms in an excellent way.

The object of the present invention is shown on the annexed drawing in a construction given as one specimen, there showing

Fig. 1: general arrangement of a complete equipment

Fig. 2: section through the superheating pistol

Fig. 3: side view of a particular part

Fig. 4: plan of this particular part.

The vapour disinfection apparatus principally consists of two main parts: a tank which can work as a steam generator and also as a pressure receiver, and a superheating pistol connected to the above-mentioned tank by means of a hose pipe.

Inside the tank 6 there is a heating arrangement which may be constructed in different ways. Its terminals 1 are connected to the electric power supply 10 by means of a cable 15. The tank 6 may as well be heated by gas or any other fuel. For connection with a gas supply a pipe 2 is provided. The tank 6 is further fitted with a water gauge 3, a pressure gauge 8, a safety valve 5, a feed hole 4, and steam supply valves 7. The pistol consists of an inner tube 16 containing the electric heating units 17 which by contacts 21, cable 14 and plugs 11 are connected to the electric light supply 9. On the inner tube 16 a number of star-shaped discs 19 in combination with distance rings 18 are fitted which will impart the heat received from the heater 17 to the space between the outer tube 20 and the inner tube 16. Through this space flows the medium delivered by the hose pipe 13. Thus the medium entering the pistol by the connecting tube 12 and flowing to the nozzle 22 is on its way dried, heated, or superheated, according to requirements, whereas the medium entering through the connection 24 passes through the nozzle in a straight jet. The space between the shell 23 and the pipe 20 serves as an insulation against losses of heat. The star-shaped discs 19 are shown in Fig. 3 in side view and in Fig. 4 in a plan view. Their cogs are rounded off as shown in Fig. 3 in the direction of the flow of the medium in order to obtain a passage as much as possible free from resistance. The discs with the distance rings 18 between them are placed upon each other in such a manner, that opposite to each groove a cog is

placed and vice versa. Thus the medium passing through a groove flows against a cog and is forcibly heated. The transmission of heat can also be obtained by other constructions, for instance by increasing the thickness of the tube 5 16 and cutting passages in it similar to grooves.

What I claim is:

1. In an apparatus of the character described, a mixing pistol comprising a housing having a 10 central chamber for a heating element, superposed members surrounding the chamber having rib-like projections in staggered relation, a nozzle on the upper end of the housing communicating with a chamber which surrounds the 15 central chamber, and a steam inlet communicating with the surrounding chamber at the lower end of the housing.

2. In an apparatus of the character described, a mixing pistol, comprising an inner tube, a 20 heating element therein, superposed rings mounted on the inner tube and having rib-like projections in spaced and staggered relation, an outer tube surrounding the superposed rings, a nozzle on the upper ends of the tubes communicating with the chamber formed between the 25 inner and outer tubes, and a steam inlet com-

municating with said chamber at the bottom thereof.

3. In an apparatus of the character described, a mixing pistol comprising a housing having a central chamber for a heating element, superposed members surrounding the chamber having 5 rib-like projections in staggered relation, distance rings between the superposed members, a nozzle on the upper end of the housing communicating with a chamber which surrounds 10 the central chamber, and a steam inlet communicating with the surrounding chamber at the lower end of the housing.

4. In an apparatus of the character described, a mixing pistol comprising a housing having a 15 central chamber for a heating element, superposed members surrounding the chamber having rib-like projections in staggered relation, a nozzle on the upper end of the housing communicating with a chamber which surrounds the 20 central chamber, a steam inlet communicating with the surrounding chamber at the lower end of the housing and a fluid supply connected to the end of the nozzle opposite its discharge opening. 25

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