

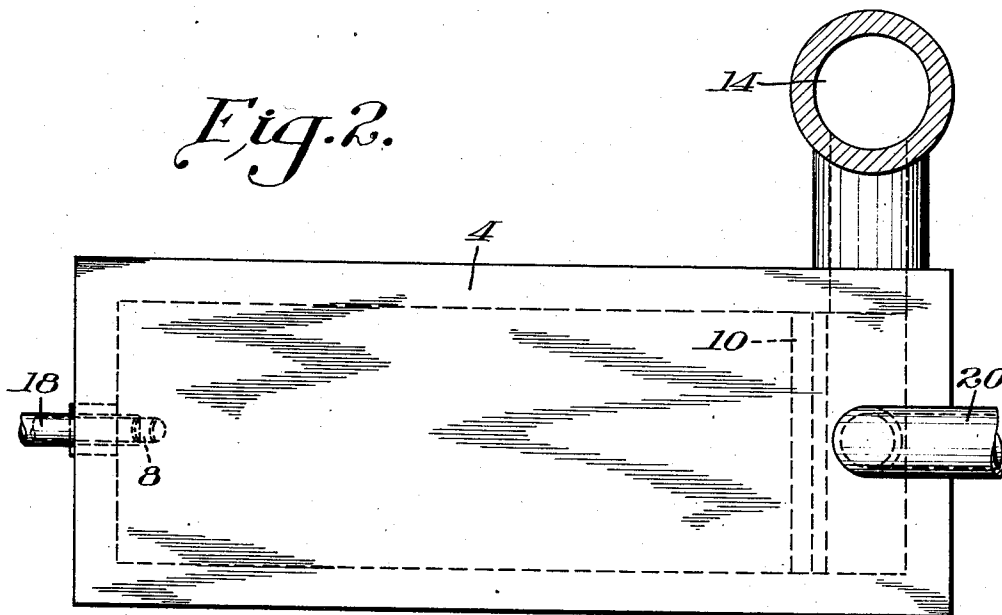
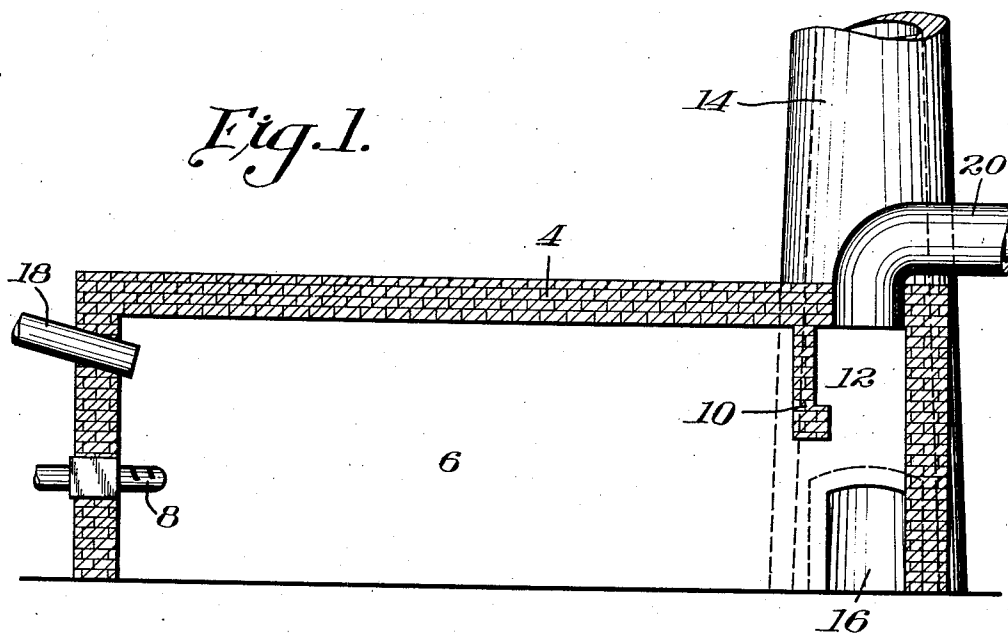
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METHOD OF CONSUMING FUMES

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METHOD OF CONSUMING FUMES

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This invention relates to a new and improved method of consuming objectionable fumes and vapors.

It is the main object of the invention to provide a method of this type which will result in the complete destruction of objectionable fumes and which will accommodate a greater quantity of such fumes than the present types of furnaces, without unnecessarily increasing the fuel consumption or the size of the furnace and without cooling the combustion space thereof to such an extent that the stronger malodorants would not be completely consumed.

The above and other objects will appear more fully from the following description when considered in connection with the drawing in which:

Fig. 1 is a longitudinal vertical sectional view of the furnace.

Fig. 2 is a plan view thereof.

Fume eliminating furnaces which have particularly objectionable fumes to be disposed of usually admit all of the fumes to the combustion space in the vicinity of the burner. This practice has certain objectionable features in that a furnace of a given capacity can accommodate only a given quantity of malodorants without so reducing the temperature in the combustion chamber that it is no longer effective for its intended purpose.

The objectionable features of the prior constructions are completely eliminated in the method disclosed herein.

In the drawing there is illustrated a furnace 4 having a combustion space 6 and provided at its forward end with any usual type of burner 8, preferably designed to burn some type of vaporous or atomized fuel, such as gas or fuel oil. The rearward portion of the combustion chamber is formed with a transverse wall 10 extending downwardly from the ceiling and spaced from the rearward wall and base of the furnace to form a partially enclosed chamber 12 subjected to the heat condition obtaining in the rearward portion of the combustion chamber. The combustion chamber communicates with the stack 14 through the stack passage 16 adjacent chamber 12.

The furnace is designed for complete consumption of particularly objectionable fumes and to this end these fumes are introduced into the combustion space through the conducting pipe 18 which opens into the combustion space adjacent the burner 8. The pipe 18 is preferably located above the burner and is inclined downwardly so that the fumes are forced directly into the flames issuing from the burner. These fumes are ac-

cordingly subjected to substantially the maximum heat of the furnace and pass entirely through the combustion chamber with the heated gases in their passage to the stack.

Furnaces of the above type usually have a maximum temperature in the combustion chamber adjacent the burner of from 1800° F. to 2300° F., this temperature being sufficient in the furnace disclosed herein to completely consume the most objectionable malodorants. The passage 18 is particularly useful, for example, for disposing of malodorants from acid sludge tanks and separators wherein the acid laden vapors must be subjected to relatively high temperature in order to be rendered harmless.

Milder fumes which require less severe treatment are introduced through a separate passage 20 used, for example, for disposing of the fumes from weak acid concentrators, which fumes require less severe heat conditions for their disposal. The passage 20 opens into the chamber 12 wherein the fumes are subjected to a fairly high temperature, the fumes introduced through the passage 20 being subjected to a temperature of substantially 150° F. to 250° F. as they enter the chamber 12. The fumes admitted through the passage 20 pass from the chamber 12 into the body of heated gases as they pass from the combustion chamber to the stack opening 16. These vapors attain a temperature of from 1000° F. to 1100° F. as they pass with the furnace gases through the opening 16 and into the stack 14, this temperature being sufficient in the case of milder fumes of the type referred to for rendering them harmless prior to their discharge from the stack 12.

The operation of the furnace will be readily understood from the above description. The stronger malodorants are continuously introduced into the combustion chamber through the passage 18 and, since these vapors are subjected to the maximum heat of the furnace, they are completely consumed and rendered harmless before reaching the stack opening 16. The less harmful fumes, introduced through the passage 20, are subjected to the heat condition obtaining in the rearward portion of the combustion space and are comingled with the heated gases constituting the production of combustion in their passage to the stack opening 16. These vapors are subjected to a less severe heat as these fumes do not require the maximum temperature of the furnace for their effective disposal. Since the milder fumes are introduced into the body of heated gases just prior to the passage of these

gases to the stack, the heat absorbed by these fumes has little or no effect upon the temperature in the main body of the combustion chamber. Instead the gases constituting the products of the combustion in the furnace are merely cooled immediately prior to their discharge into the stack, this cooling of the vapors being advantageous rather than otherwise. There is accordingly provided a furnace wherein substantially twice the quantity of objectionable fumes can be disposed of with no increase in the size of the combustion space or in the quantity of heat supplied and without decreasing the effectiveness of the furnace for consuming the most objectionable fumes.

While there is shown and described herein a specific embodiment of the invention showing the best mode of applying my invention, it is to be understood that this is merely illustrative and that the scope of the invention is to be determined from the appended claims.

I claim as my invention:

1. The method of consuming fumes comprising introducing strong fumes into the combustion space of a furnace at a forward point for subjecting them to the maximum heat of the furnace and introducing weaker fumes into the gases passing from said combustion space for subjecting said weaker fumes to less than the maximum temperature of said furnace.

2. The method of consuming objectionable fumes in a furnace provided with a combustion space which attains a temperature of over 1800° F., comprising introducing strong fumes into said combustion space for being subjected to substantially the maximum temperature of said combustion space and introducing other fumes into said combustion space for being subjected to less than said maximum temperature and conducting all of said products of combustion to a stack.

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