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April 10, 1956 R. F. TIBBETTS 2,741,317

METHOD OF EXTINGUISHING FIRES

Filed May 2, 1950 2 Sheets-Sheet 1

Fig. 1

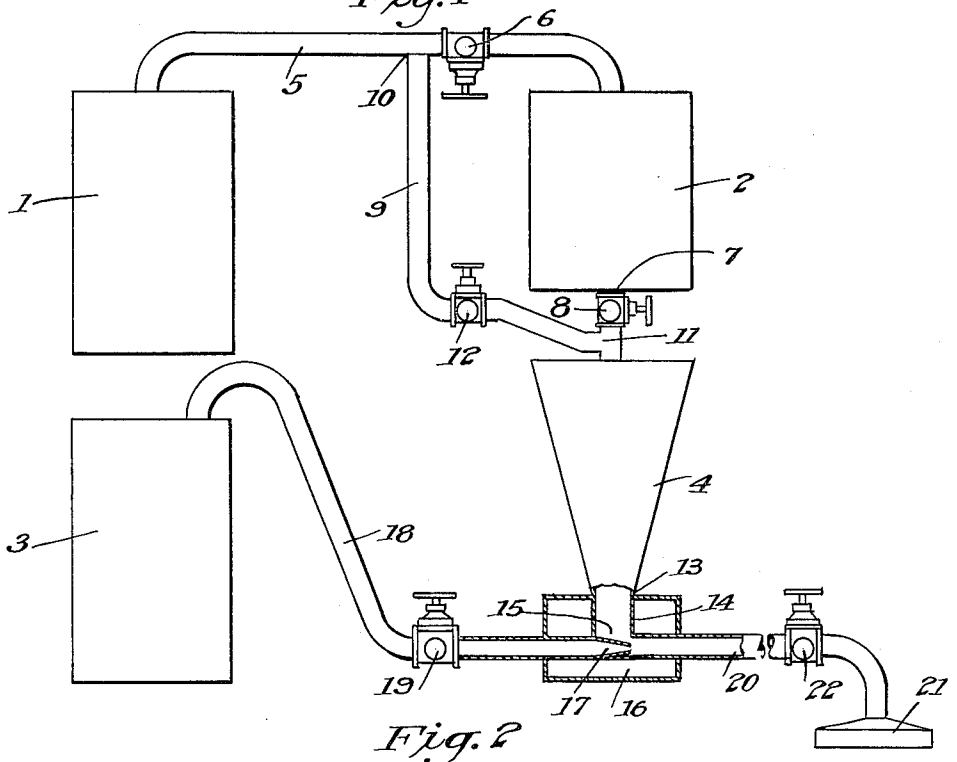
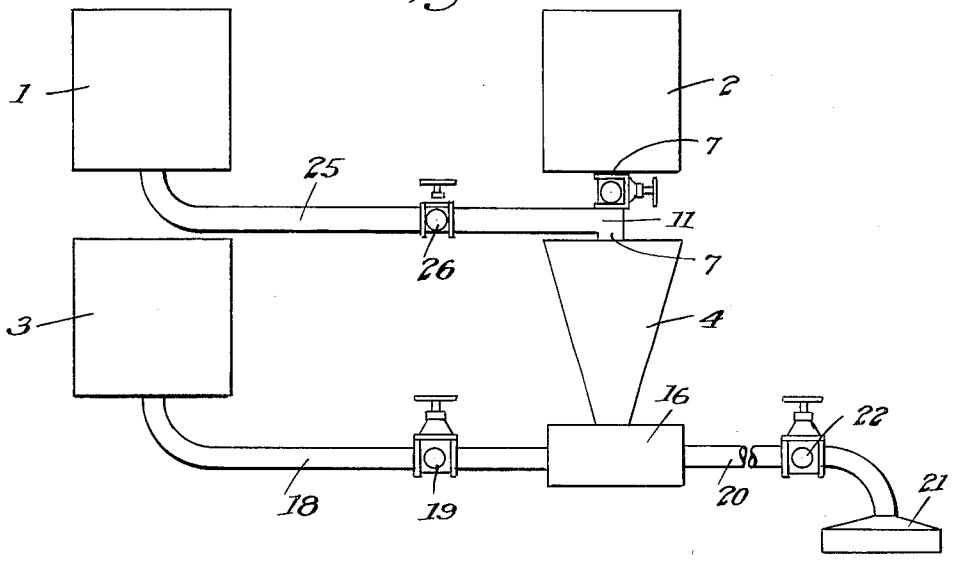


Fig. 2



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Filed May 2, 1950 2 Sheets-Sheet 2

Fig. 3

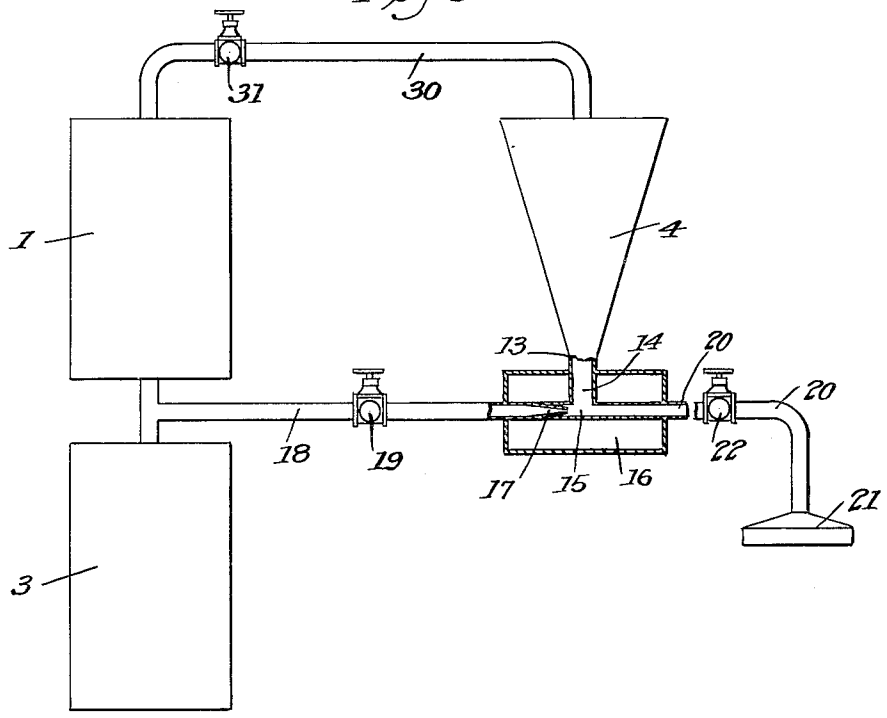
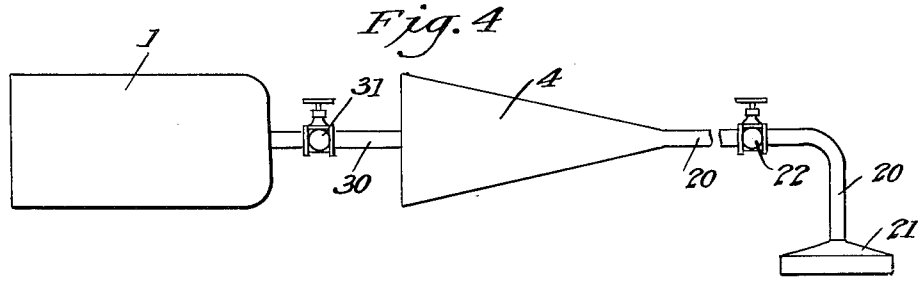


Fig. 4



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METHOD OF EXTINGUISHING FIRES

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5 Claims. (Cl. 169—1)

This invention relates to fire extinguishers and methods of fighting fires, and more particularly to a new method for extinguishing magnesium, aluminum powder and liquid oil and gas fires.

One of the objects of the invention is to provide a method for lowering the temperature of burning materials and liquids below the flash point, or burning temperature of said materials and liquids.

Another object is to provide a method for smothering out fires by shutting off the oxygen so that the fire will be kept confined and the fire and oil or combustible materials will not be allowed to spread to other containers or tanks.

Another object is to provide a fire extinguishing mixture, for use in my method, that has no flash point, projected on a fire in a zero minus temperature or frozen condition, regardless of the location or temperature of the weather.

Another object is to provide a method which utilizes the power of expansion of carbon dioxide as a means of forcing an extinguishable mixture on a fire.

Another object is to utilize a jet of carbon dioxide which has a ratio of expansion of 800 or 900 to 1, as a power to force a fire extinguishing mixture out of a nozzle and at the same time freeze the mixture of carbon tetrachloride mixed with diatomaceous earth, or expanded pearlite or similar materials, which have a melting point of 3000° F. or more. Carbon tetrachloride freezes at 23° F. and a jetted carbon dioxide (Dry Ice) has a temperature of 120° below zero. Expanded pearlite is a stone formation and is made by placing the stone in revolving ovens under 1,800 to 2,000 degrees F., which expands the formation into a very light-weight material, which floats on gasoline. Said pearlite impregnated with carbon tetrachloride, is jetted with CO_2, the expansion of which freezes the mixture and/or lowers the temperature to 120 degrees below zero F., which in turn lowers the temperature of the gasoline below burning temperature, which puts out fire immediately.

Another object is to provide a method of the character as above stated in which H_2O is substituted for CCl_4 for wood fires such as in furniture factories.

Other objects and advantages will appear hereinafter as this specification progresses.

My invention is illustrated in the annexed drawings, which form a part of this specification and in which:

Fig. 1 is an elevation of my invention.

Fig. 2 is an elevation of a modification of my invention for extinguishing only wood fires.

Fig. 3 is a side elevation of another modification of my invention.

Fig. 4 is an elevation of another modification of my invention which is portable.

Referring more particularly to the annexed drawings, in which the same parts are designated by the same reference numerals in all of the figures, I have illustrated apparatus for practicing my novel method of extinguishing fire, which apparatus, as illustrated in Fig. 1, includes

a container 1 for containing carbon dioxide; a container 2 for containing carbon tetrachloride; a container 3 for containing carbon dioxide; and a container 4 for containing expanded pearlite and/or diatomaceous earth, 600 mesh High Flow Super Sell (HFSS). A pipe 5 leads from the top of container 1 into the top of container 2, and said pipe is controlled by a valve 6 interposed therein. A pipe 7 leads from the bottom of container 2 into the top of container 4, and said pipe 7 is controlled by a valve 8 interposed between said containers 2 and 4. A pipe 9 extends from the pipe 5 at a point between the container 1 and the valve 6, to the pipe 7 at a point 11 between the valve 8 and the container 4, there being a valve 12 interposed in said pipe 9 for controlling passage of fluid therethrough. The container 4 is of inverted conical form and its lower and smaller end 13 is connected by a short duct 14 to the upper side of a freezing and expulsion chamber 15 which is surrounded by a cooling or vacuum jacket 16, through the upper side of which jacket extends the short duct 14 from the lower smaller end of the container 4 into the upper side of said freezing and expulsion chamber. Into the inlet end of the freezing and expulsion chamber 15 extends a jet 17 on the remote end of a pipe 18 leading from the container 3, there being a valve 19 interposed in said pipe for controlling passage of carbon dioxide from said container 3 through said pipe 18 and said jet 17 into the inlet end of the freezing and expulsion chamber 15. From the outlet end of said freezing and expulsion chamber 15 extends a discharge pipe 20, on the remote end of which pipe is coned a nozzle 21, there being a valve 22 interposed in said discharge pipe 20 for controlling passage of fire extinguishing fluid from the freezing and expulsion chamber 15 through said nozzle 21.

The operation of my invention as disclosed in the above described apparatus is as follows:

The valves 6 and 8 being open, carbon dioxide passes from container 1 through pipe 5 into and through the carbon tetrachloride in the container 2, from which container 2 the mixture of carbon dioxide and carbon tetrachloride passes through pipe 7 into and through the diatomaceous earth in the chamber 4, from which chamber a mixture of carbon dioxide, carbon tetrachloride and diatomaceous earth passes from said chamber 4 through duct 14 into the freezing and expulsion chamber 15, where said mixture is subjected to a jet of carbon dioxide from the jet 17 from the chamber 3 through the pipe 18 and valve 19, which is opened, and said mixture in the freezing and expulsion chamber is frozen below the flash point and burning temperature of metals and liquids, such as oil, and said frozen mixture is expelled from said chamber 15 by the jet of carbon dioxide from the jet 17 into said chamber, and the expelled mixture is discharged from said chamber through discharge pipe 20 and nozzle 21 onto a fire, which is extinguished by said mixture. This apparatus may be used for extinguishing magnesium, aluminum powder, liquid oil and gas fire.

In the modification of my invention shown in Fig. 2 of the drawing, the apparatus is the same as that shown in Fig. 1, with the exception that the pipes 5 and 9 are eliminated and a single pipe 25 is substituted for said two pipes 5 and 9, while water (H_2O) is substituted for carbon tetrachloride in the container 2. The pipe 25 leads from the bottom of the container 1 to the pipe 7 at point 11, and a valve 26 in pipe 25 is substituted for valve 12. This apparatus is used for extinguishing wood fires only.

In the modification of the apparatus of my invention shown in Fig. 3, the container 2, pipes 5 and 9, and valves 6 and 12, are eliminated and a pipe 30 leads from the top of the container 1 into the top of the container 4 and said pipe 30 is controlled by a valve 31, while diatomaceous earth or expanded pearlite or similar materials

which have a melting point of 3000° F. or more are placed in the container **4**.

In the modification of my invention shown in Fig. 4 the apparatus is small and portable for hand use, in which the containers **2** and **3** are eliminated, the larger end of the container **4** is connected by the pipe **30** controlled by the valve **31**, while the discharge pipe **20** controlled by valve **22** extends from the smaller end of the conical container **4** and the nozzle **21** is connected to the outer end of said pipe **20**. Both carbon tetrachloride and diatomaceous earth or other fire extinguishing material are placed in the container **4**.

I claim:

1. The method of extinguishing fire which comprises mixing carbon tetrachloride and another fire-extinguishing material comprising diatomaceous earth, freezing said mixed materials and projecting said frozen materials upon a fire.

2. The method of extinguishing fire which comprises mixing carbon tetrachloride and expanded pearlite, freezing said mixed materials and projecting said frozen materials upon a fire.

3. The method of extinguishing fire which comprises mixing carbon tetrachloride and diatomaceous earth, 600 mesh, freezing said mixed materials, and projecting said frozen materials upon a fire.

4. The method of extinguishing fire which comprises mixing carbon tetrachloride and another fire extinguishing material such as expanded pearlite, freezing said mixed materials, and projecting said frozen materials under pressure of carbon dioxide upon a fire.

5. The method of extinguishing fire which comprises mixing carbon tetrachloride and another fire-extinguishing material such as expanded pearlite having a melting point of substantially 3000° F., freezing said mixed materials and projecting said frozen materials upon a fire.

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