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Aug. 11, 1942. R. P. PARADISE 2,292,794

METHOD OF FIRE EXTINGUISHING

Filed April 29, 1940

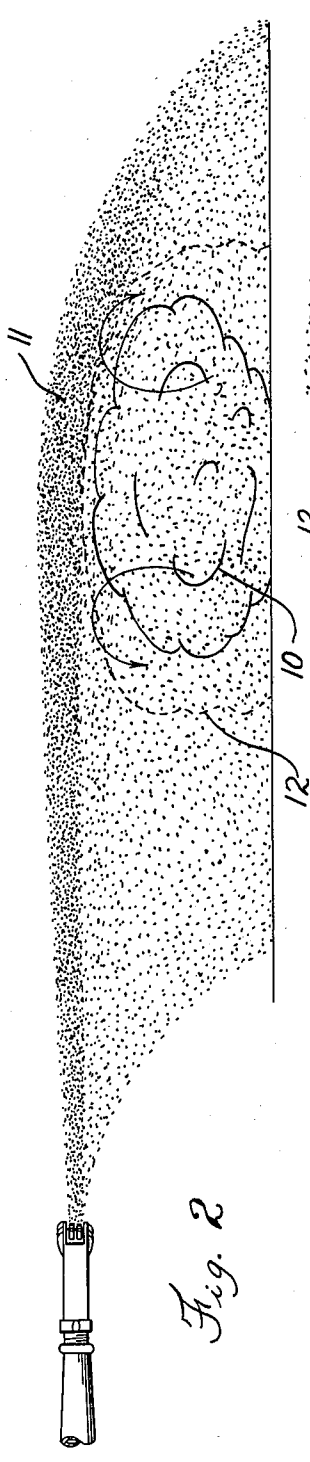


Fig. 2

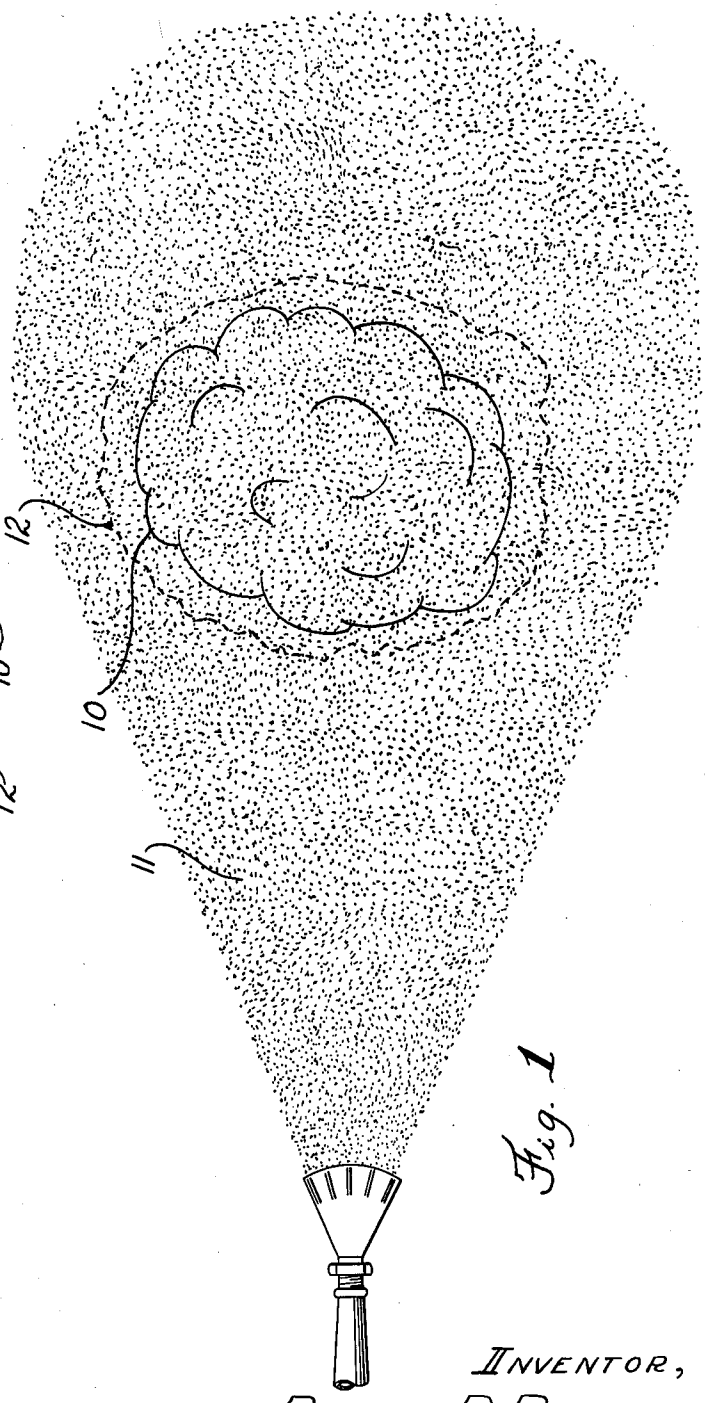


Fig. 1

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169, FIRE EXTINGUISHERS,

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METHOD OF FIRE EXTINGUISHING

Raymond P. Paradise, Indianapolis, Ind.

Original application July 5, 1938, Serial No. 217,328. Divided and this application April 29, 1940, Serial No. 332,167

5 Claims. (Cl. 169—2)

This invention relates to a method of extinguishing fires resulting from burning gasoline, oil, tar, and the like which preclude the use of a stream of water directly onto the burning material. This application is a division from my co-pending application, Serial No. 217,328, filed July 5, 1938, for a Head for fire hoses and the like.

It is a primary object of this invention to create and maintain a bank or cloud of moisture immediately above the blaze or flame in such a manner that the heat therefrom may vaporize the moisture from the underside of that bank to produce a sufficient cloud of moisture that will extend down and completely surround the blaze or flame to create a complete encircling wall around the blaze of sufficient thickness and density that the supply of oxygen from the atmosphere will be cut off and the blaze thereby extinguished by reason of the absence of oxygen to support combustion. The invention contemplates creating that upper bank of moisture of appreciable thickness over a substantially horizontal area so that the bank will very effectively prevent the heat arising from the fire from creating upwardly rising currents through that bank, the bank being of sufficient density created by finely atomized water so as to cause increase in vaporization thereof with increase in heat of the flame to further aid in cutting off or rather preventing upwardly rising currents in that top enclosing bank.

Other objects and advantages of the invention will become apparent to those versed in the art in the following description of the invention as illustrated by the accompanying drawing, in which

Fig. 1 is a diagram in top plan view of the applied bank of moisture; and

Fig. 2, is a side elevation thereof.

Like characters of reference indicate like parts in the two views in the drawing.

Referring to the drawing, assuming that the blaze 10 is rising from an oil or gasoline fire, a bank of moisture is placed horizontally across the upper end of the blaze. This bank may be created a number of ways, one such way being fully described in my U. S. patent application to which reference is above made. In any event it is necessary that this bank be formed of very finely divided particles of moisture or water in the nature of a fog rather than by comparatively large drops or solid streams of water. In other words, the bank is composed of innumerable microscopic particles of water very closely spaced one from another. Another important feature of the bank is that it have a considerable vertical thickness, at least a foot or more directly over the blaze, and a still further important feature is that this bank be preferably in horizontal motion.

The bank, of course, must have a horizontal area considerably greater than that of the blaze. Now when such a bank or fog stream as it might be called is placed over the flame as above indicated, under particles of that bank will be continuously settled down from the underside of the heavy moving body of the fog so that the atmosphere all around the blaze 10 becomes charged with moisture but at the same time does not have solid streams or visible drops of water in that zone.

By reason of the fact that this bank or body of the fog has an appreciable thickness above the blaze 10, the first noticeable result upon positioning that bank over the blaze is that the upper ends of the tongues of the blaze will tend to turn and spread outwardly along the underside of the heavy top zone of that bank, as indicated by the arrows in the drawing. As before indicated, this heavy top zone of the bank is in motion across the flame and by reason of that fact in conjunction with the thickness of the bank, the up-draft tended to be produced by the heat of the blaze is cut off and as the blaze tends to spread out laterally under this bank, designated by the numeral 11, the heat will tend to vaporize the particles of moisture and convert them into steam which will flow and billow outwardly and downwardly around the periphery of the blaze in sufficient quantities to form quickly a wall between the bank 11 and the ground or floor on which the blaze has originated. This encircling side wall, indicated in the drawing by the numeral 12, although being of a less dense nature than that of the bank 11, will most effectively wall off the atmosphere from the zone within that wall so that very quickly the oxygen within that zone will be used up, leaving a substantial equalization of pressure within the zone as compared to the atmosphere on the outside of the enclosing wall and thereby preventing any new supply of oxygen reaching the fire zone.

It is to be noted that at no time is there a possibility of water or such reaching the source of the fire. This is highly important in that any water played directly on the burning material would tend to float that material when it is in the nature of gasoline or oil and thereby tend to spread the fire. The bank, as above indicated, when applied over the blaze must have sufficient

lateral coverage to prevent the heat of the blaze causing an up-draft to shoot around the outer edges thereof before sufficient water may be vaporized to create the encircling wall under that bank. The water particles in the bank must be sufficiently fine to be substantially instantaneously converted into steam, this fact in itself causing a reduction in the temperature of the water at the underside of the heavy fog layer or bank which is a further important factor aiding in reducing tendency of the up-draft.

It is to be noted that this bank of moisture has no intervening gaps or openings therethrough that are commonly created in using the types of nozzles that give a cone-shape spray. As suggested in Fig. 1 of the drawing, the bank is directed across the upper portion of the blaze and given sufficient velocity to maintain that bank in its required thickness substantially horizontal thereover and at the same time permit those normally dropping particles from the underside of that bank to fall on the near and far sides of the fire. These particles referred to as normally dropping are, of course, those finely divided particles that appear on the underside of the bank and lose their velocity first to come under the influence of gravity and float toward the ground. This bank of moisture, as indicated in Fig. 2, when applied from a suitable nozzle will generally be fan-shaped to have a uniform thickness throughout its major area.

While I have above referred to the bank as being formed of moisture or water, the usual fire fighting solutions and chemicals may be employed if desired although water alone is extremely effective by reason of the blocking off of the oxygen supply as above indicated. The jets of water sprayed from nozzles heretofore have generally taken a hollow conical pattern which is useless in combating oil and the like fires since the under upwardly curving face of the jet allows the heat to create up drafts on each side, and most importantly, the water particles of the jet are not atomized.

In summary, my method of extinguishing fires of the nature referred to consists primarily of delivering at high speed a dense body of highly atomized water, substantially in vapor form, whereby the atomized particles readily and quickly absorb heat and travel at a high enough horizontal velocity to prevent break-through of an up draft current, the volume or thickness of the body cooperating in this respect. Of course, for fires covering large areas, the stream is started at one side and swept around over the fire area blanking out the fire as the stream is shifted.

I claim:

1. That method of extinguishing a fire resulting from burning fluid which comprises forming a water spray of divided droplets moving at high velocity within a substantially horizontally disposed fan-shaped bank of uniform and substantial vertical thickness and having dropping under its bank a fog of atomized water with substantially no horizontal travel, and then bringing that spray horizontally across said fire to have the bank portion spaced above the burning liquid with said fog between the bank and the liquid thereby removing heat from the combustion zone by direct cooling and by the fog and underside of the bank being converted into steam for oxygen elimination, the thickness of said bank and the velocity of the droplets therein being set up to cut off up-drafts tended to be induced by the fire while the bank is maintained thereover.

2. That method of extinguishing a fire resulting from burning fluid which comprises forming a water spray of divided droplets moving at high velocity within a substantially horizontally disposed fan-shaped bank of uniform and substantial vertical thickness and having dropping under its bank a fog of atomized water with substantially no horizontal travel, and then bringing that spray horizontally across said fire to have the bank portion spaced above the burning liquid with said fog between the bank and the liquid thereby removing heat from the combustion zone by direct cooling and by the fog and underside of the bank being converted into steam for oxygen elimination, the thickness of said bank and the velocity of the droplets therein being set up to cut off up-drafts tended to be induced by the fire while the bank is maintained thereover, said bank thickness being approximately one foot.

3. That method of extinguishing a fire resulting from a burning fluid which consists of setting up a water spray of dispersed droplets of high velocity diverging in fan shape in the form of a thick, continuous bank whose principal underside area is substantially horizontally disposed and from which bank falls water in atomized form with substantially no horizontal travel, sweeping that spray across the zone of said fire with said bank underside in substantial parallelism with the area of the fluid and at a distance thereabove to have said atomized water therebetween, and holding said spray in that position until said fire is extinguished thereunder.

4. That method of extinguishing a fire resulting from a burning fluid which consists of setting up a water spray of dispersed droplets of high velocity diverging in fan shape in the form of a thick, continuous bank whose principal underside area is substantially horizontally disposed and from which bank falls water in atomized form with substantially no horizontal travel, sweeping that spray across the zone of said fire with said bank underside in substantial parallelism with the area of the fluid and at a distance thereabove to have said atomized water therebetween, and holding said spray in that position until said fire is extinguished thereunder, said spray forming a carrier for a fire extinguishing chemical, and said spray being formed to have the divergent end spaced from the initiating end thereof a distance exceeding that across the zone of said fire.

5. That method of extinguishing a fire resulting from a burning fluid which consists of setting up a water spray of dispersed droplets of high velocity diverging in fan shape in the form of a thick, continuous bank whose principal underside area is substantially horizontally disposed and from which bank falls water in atomized form with substantially no horizontal travel, sweeping that spray across the zone of said fire with said bank underside in substantial parallelism with the area of the fluid and at a distance thereabove to have said atomized water therebetween, and holding said spray in that position until said fire is extinguished thereunder, droplet velocity and said bank depth being sufficiently great to cut off up-drafts therethrough induced by said fire.

RAYMOND P. PARADISE.