

Nov. 2, 1937.

S. E. ALLEN

2,097,908

FIRE EXTINGUISHING SYSTEM

Filed Jan. 10, 1936

Fig. 1.

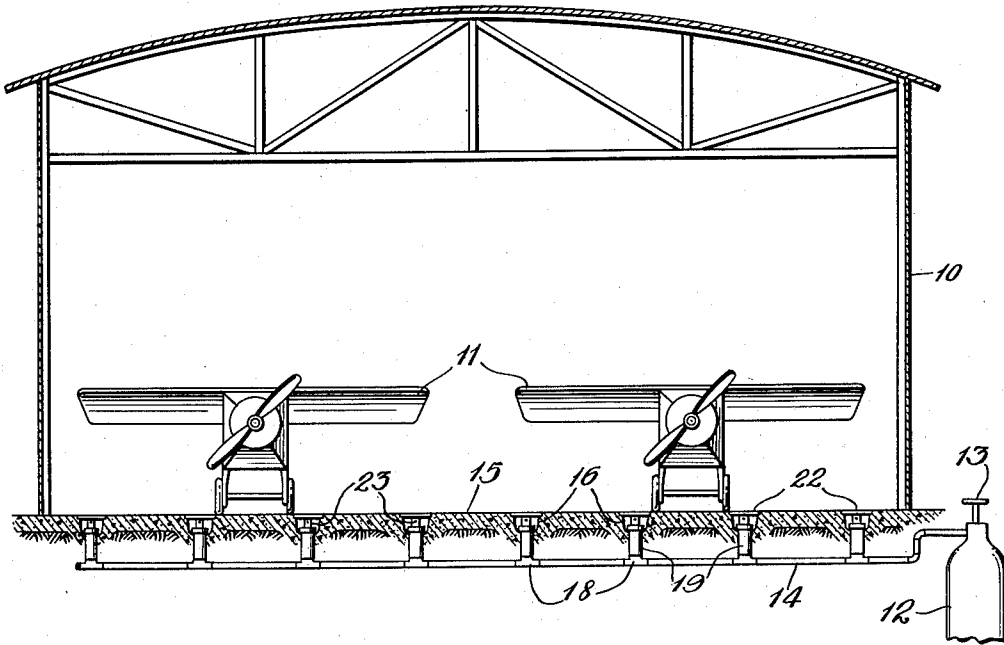
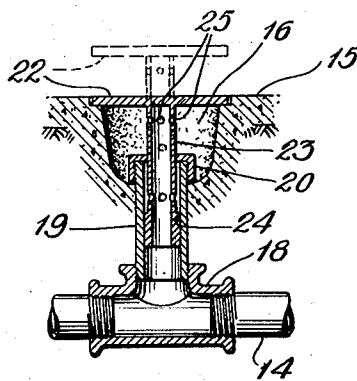


Fig. 2.



INVENTOR
SCOTT E. ALLEN

BY
Frederick S. Wines
ATTORNEY

Patented Nov. 2, 1937

2,097,908

2,097,908

UNITED STATES PATENT OFFICE

2,097,908

FIRE EXTINGUISHING SYSTEM

Scott E. Allen, Glen Ridge, N. J., assignor to
C-O-Two Fire Equipment Company, Newark,
N. J., a corporation of Delaware

Application January 10, 1936, Serial No. 58,446

4 Claims. (Cl. 169—11)

My invention relates to fire extinguishing methods and apparatus in which carbon dioxide or other highly compressed fluid extinguisher is employed and the present application is a continuation in part of my copending application Serial No. 638,286, filed October 18, 1932, and issued August 11, 1936, as Patent No. 2,050,687.

An object of the invention is to provide a fire extinguishing system particularly adapted for the protection of airplane and airship hangars, or for a deck on which aircraft are supported. Owing to the highly combustible nature of the materials of which aircraft are usually built, it is essential that the fire be extinguished immediately. In the case of airplanes, for instance, the wings, fuselage, rudders, elevators, etc. are often made merely of wood covered with linen, silk, cotton fabric or the like, treated with lacquer to present a smooth surface to the air currents, and for protecting such highly combustible material distributed about a hangar which in some cases is very large, the ordinary fire extinguishing systems are entirely inadequate. It is impracticable to attempt to protect the aircraft by discharge of fire extinguishing fluid from the walls of the hangar since such protection could not be extended more than a few feet from the walls. On the other hand, if the fire extinguishing fluid were discharged from the rafters or ceiling of the building it would have to oppose the air currents set up by the fire and before sufficient of the extinguisher could be introduced in the hangar to smother out the flames, the damage would have been accomplished.

In the case of an airplane afire, the blaze may be shielded by the wings so that a gaseous extinguisher discharged from above would not reach the blaze and would not prevent the latter from being fed with air sucked up by the fire. Since the air currents usually rise to the fire, it is preferable to discharge the extinguisher from beneath so that the gas will be carried up to the blaze by the natural draft produced by the fire.

An object of my invention, therefore, is to provide a system employing carbon dioxide or other highly compressed extinguishing fluid in which the fluid is discharged in the form of a gas from outlets in the floor of the hangar or other enclosure.

Another object of the invention is to provide for horizontal spread of the fire extinguisher along the floor.

Another object of the invention is to provide means for raising a cover bodily to such position

that it will not interfere with the lateral spread of extinguisher.

Other objects and advantages of my invention will appear in the following description of an embodiment thereof and thereafter the novelty and scope of the invention will be pointed out in the claims.

In the accompanying drawing;

Figure 1 is a view in cross-section of a hangar equipped with my improved fire extinguishing apparatus, showing a plurality of floor outlets adapted to be connected with a source of extinguishing fluid; and

Fig. 2 is a detail view in vertical section and on a larger scale of one of the floor outlets.

A hangar protected by my improved fire extinguishing apparatus is indicated in Fig. 1 by the numeral 10. In this hangar are shown a plurality of airplanes 11. At a suitable point outside of the hangar there is a supply of fire extinguishing fluid preferably stored in a battery of containers. However, only one of the containers is shown at 12 in the drawing. A suitable discharge mechanism 13 is provided for releasing the fluid from the containers and discharging it into a pipe system 14. This pipe system passes under the floor 15 of the hangar and is provided with a plurality of outlets 16 that open respectively into recessed expansion chambers formed in said floor.

At each outlet the pipe is provided with a T-fitting 18. An upwardly extending tubular member or cylinder 19 is screwed into the fitting and at its upper end is provided with an annular cap 20. The expansion chamber is normally closed by a cover or lid 22 which when in closed position lies flush with the floor 15. This cover is provided with a downwardly extending stem 23 which passes through the cap 20 and into the cylinder 19. The stem 23 has a flange or collar 24 secured to its lower end which has a running fit within the cylinder 19. The stem 23 is formed with a central bore, open at the bottom and closed at the top, and lateral ports 25 open outwardly from the bore.

In operation, when extinguishing fluid under pressure is introduced into the pipe 14, it lifts the cover 22 to the position shown by broken lines in Fig. 2 and discharges in all directions through the ports 25. The jets of extinguishing fluid issuing from the lower ports 25 strike against the side wall of the expansion chamber 16 and there is considerable expansion of the fluid before it rises out of the chamber. This fluid, as it issues from the chamber is baffled by the lid 22 and is

projected substantially horizontally by the jets from the ports 25 that have risen above the floor level. The fluid is thus widely expanded and forms billows of gas that may be picked up by suction of the fire. The lid 22 serves the dual purpose of closing the recess 23 and baffling the discharge. The velocity of the gas is reduced to such an extent as substantially to preclude the entrainment of air.

The cap 20 coacts with the flange 24 to limit the rise of the cover. When the supply of extinguishing fluid nears depletion and the pressure falls the cover will drop by gravity to closed position. The outlets are therefore self-closing as well as self-opening so that after a fire or a test operation of the extinguishing system the floor will be restored automatically to normal condition with no projecting lids or open cavities to trip the attendants.

My invention is peculiarly adapted for the protection of hangars, but it is equally applicable to other enclosures and also to open areas, such as the decks of ships, air-craft carriers, etc., on which highly inflammable cargo or apparatus is stored. The term "floor" as used in the claims is to be interpreted as comprising any supporting surface.

I wish it to be understood that the embodiment described above is to be taken as illustrative and not limitative of my invention and that I reserve the right to make such changes in form, construction, and arrangement of parts as fall within the spirit and scope of the following claims.

I claim:

1. A method of extinguishing fire in a space having a floor which consists in discharging below the floor level jets of fire extinguishing fluid liquefied under pressure, expanding the liquid into a gas, discharging the expanding gas through the floor, and with other jets of the extinguishing fluid discharging above the floor level spreading the expanding gas horizontally along the floor whence the expanded fluid may be drawn into the fire by suction produced by the fire.

2. The method of extinguishing a fire in a space having a floor which consists in discharging below the floor level and at a plurality of points distributed throughout the floor jets of fire extinguishing fluid liquefied under pressure, expanding the liquid into a gas, discharging the same through the floor, baffling the expanding gas against vertical rise at a predetermined height above the floor level, and with other jets of the extinguishing fluid discharging above the floor level spreading the gas horizontally along the floor, whence the expanded fluid may be drawn into the fire by suction produced by the fire.

3. In a fire extinguishing system a floor outlet for a fire extinguishing fluid liquefied under pressure, said outlet comprising an expansion chamber, a lid normally closing the top of the chamber, a cylinder, a tubular plunger slidable in the cylinder and secured at its upper end to the lid but open at its lower end to the cylinder, means for leading the extinguishing fluid under pressure to the cylinder to raise the lid, and means for limiting the rise of the lid, the plunger being formed with lateral discharge ports in position to discharge the fluid laterally into the expansion chamber when the plunger is in raised position.

4. In a fire extinguishing system a floor outlet for a fire extinguishing fluid liquefied under pressure, said outlet comprising an expansion chamber, a lid normally closing the top of the chamber, a cylinder, a tubular plunger slidable in the cylinder and secured at its upper end to the lid the plunger being open at its lower end to the cylinder, means for leading the extinguishing fluid under pressure to the cylinder to raise the lid, and means for limiting the rise of the lid, the plunger being formed with lateral discharge ports, certain of which, when the plunger is raised, will be in position to discharge part of the fluid laterally into the expansion chamber and others of which will be above the chamber in position to spread horizontally the fluid discharging from the chamber.

SCOTT E. ALLEN.