Nov. 13, 1962 J. LAKIND 3,063,502

AIRPLANE RUNWAY WITH FIRE-FIGHTING UNITS

Filed March 1, 1960 2 Sheets-Sheet 1

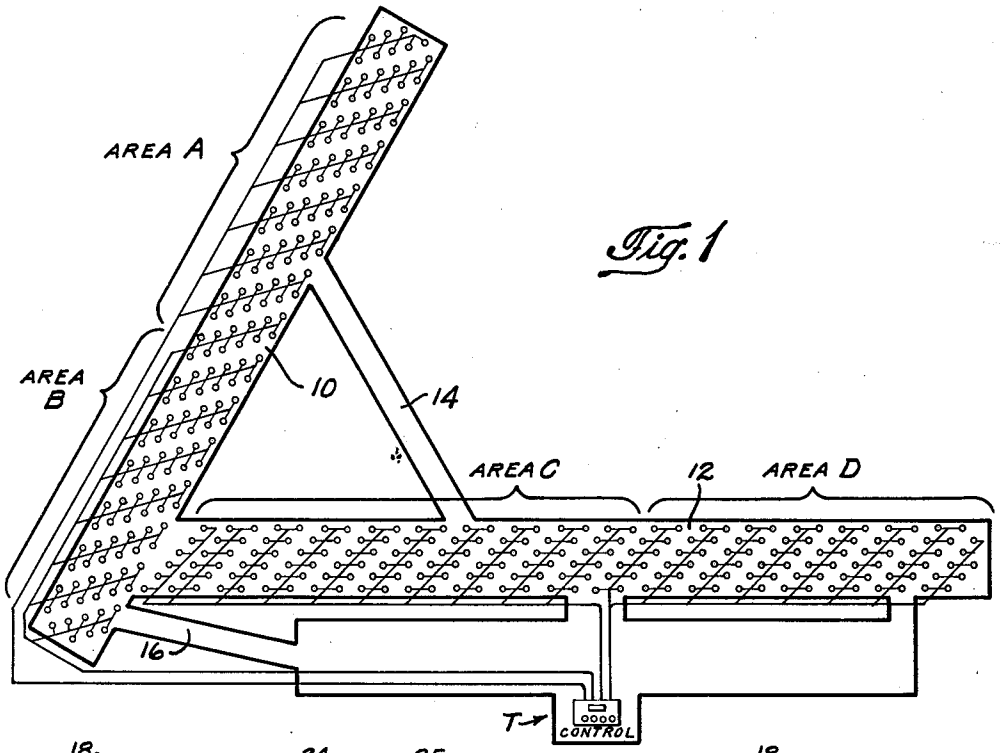


Fig. 1

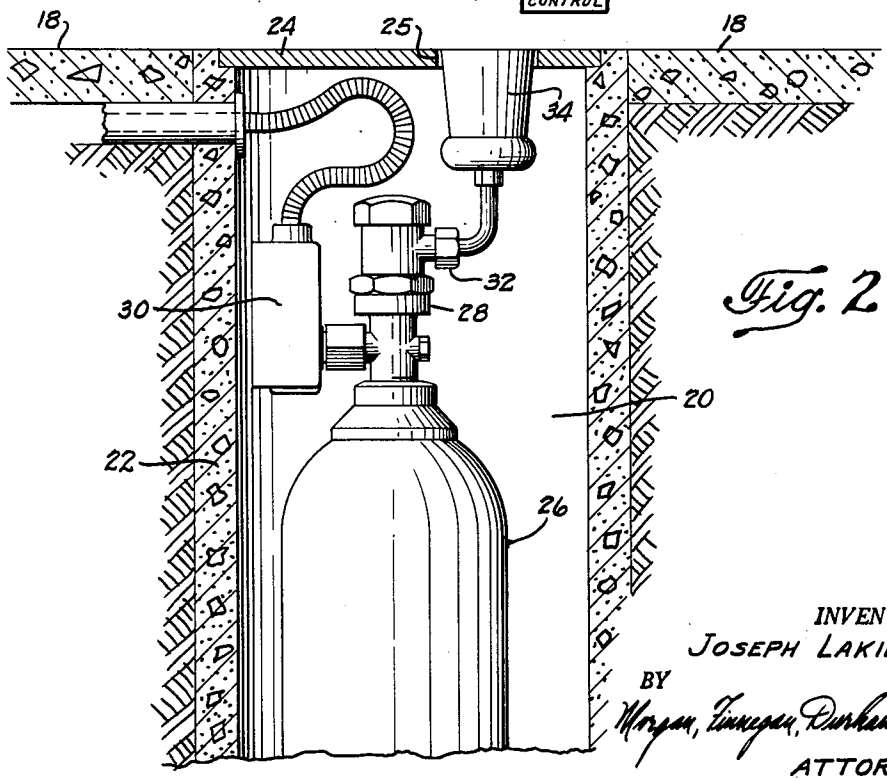


Fig. 2

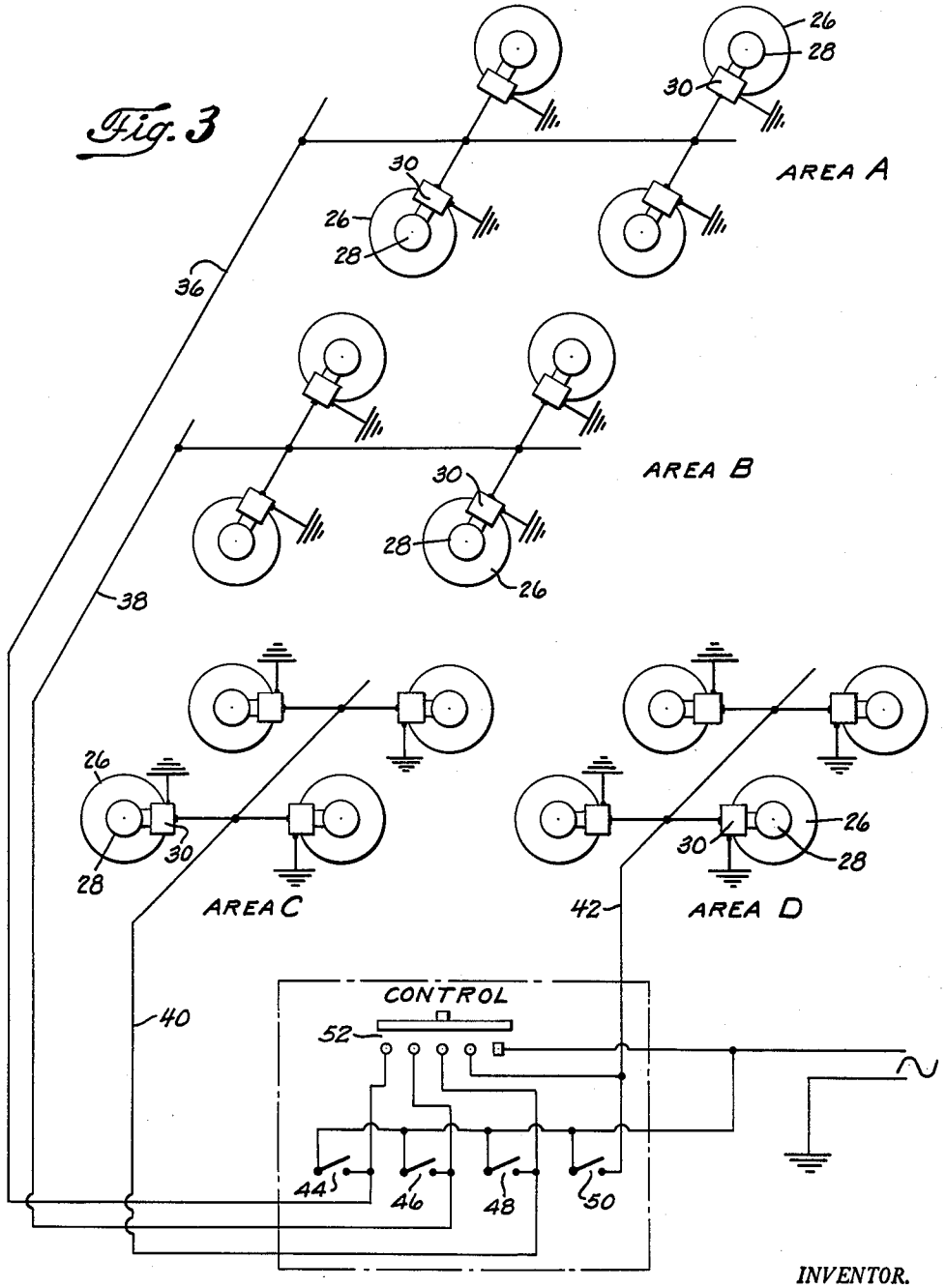
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Filed March 1, 1960 2 Sheets-Sheet 2

Fig. 3



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AIRPLANE RUNWAY WITH FIRE-FIGHTING UNITS

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The present invention relates to improvements in airplane runways and more particularly to airplane runways provided with self-contained fire extinguishing apparatus.

Objects and advantages of the invention will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

Heretofore in the event that a disabled aircraft posed the threat of fire upon landing, it was necessary before clearing such aircraft for landing to spread carbon dioxide foam or other suitable fire extinguishing materials on the runway. This foam was generally spread from trucks through pressure hoses and was necessarily time consuming, often requiring considerable delay in landing of such disabled aircraft. Further, this arrangement required a certain amount of forewarning of the impending perilous situation in order to effect the spreading of the fire extinguishing material on the runway.

The present invention is characterized by the provision of a plurality of spaced pressurized fire extinguishing units positioned beneath the runway. The units are provided with electrically responsive valves operable preferably from a common control system to effect either simultaneous or selective release of the fire extinguishing material upwardly through apertures in the runway, the units being spaced to provide complete coverage of the runway. In such an arrangement the fire extinguishing material can be released immediately prior to the landing of a disabled aircraft without delay thereof. Likewise, in the event circumstances arose, without prior warning, which require instant application of fire extinguishing material, the control system preferably operative from a central control location; such as, the flight control tower, can be actuated to effect immediate application of the fire extinguishing medium at the desired location.

It is therefore an object of the present invention to provide a novel aircraft runway having a plurality of pressurized fire extinguishing units positioned below the upper level of the runway for effecting dispersion of the fire extinguishing medium onto said runway.

It is another object of the present invention to provide a novel aircraft runway having a plurality of pressurized fire extinguishing units and a control system for said units selectively actuating a predetermined number of said units.

It is likewise an object of this invention to provide, in an airplane runway, a plurality of spaced excavations each accommodating a pressurized fire extinguishing unit and a control system for selectively actuating said units.

Another object of the preesnt invention is to provide an airplane runway having a plurality of spaced apertures therethrough, a manhole associated with each of said apertures and a pressurized fire extinguishing unit accommodated in each manhole with the nozzle thereof directing the flow from the unit upwardly of the runway surface.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention and together with the description, serve to explain the principles of the invention.

FIGURE 1 is a plan view of an airport having a pair of airplane runways provided with the present invention.

FIGURE 2 is a side elevation, partly in section, illustrating a portion of the present invention in operative position.

FIGURE 3 is a schematic wiring diagram of a suitable control system for the present invention.

Referring to the drawings, FIGURE 1 illustrates an airport having a pair of airplane runways 10 and 12 divided for convenient reference into areas A, B, C, D, respectively. The runways 10 and 12 are interconnected by suitable taxi strips 14 and 16 and include a control tower section, generally designated T. Each runway 10 and 12 includes a landing apron 18 preferably of concrete, bituminous asphalt, macadam, or other hard surface. Each apron 18 is provided with a plurality of excavated sections 20, accommodating a preferably circular manhole 22. Manhole 22 may be formed of brick or steel, but is preferably of concrete as shown in FIGURE 2. A cover plate or grating 24, preferably of steel, is positioned over manhole 22 and flush with the upper surface of apron 18. Manholes 22 may be formed when runways 10 and 12 are being constructed, or manholes 22 may be formed therein in existing runways.

In each manhole 22 is positioned a pressurized fire extinguishing unit 26. Unit 26 may be a conventional carbon dioxide pressurized cylinder such as is commercially available from Walter Kidde and Co., Belleville, New Jersey. Each pressurized unit 26 is provided with a discharge head 28 which is, in turn, provided preferably with a swivel adapter 32 and is operatively connected to a discharge nozzle 34 positioned in opening 25 in grating 24 and oriented for upward dispersion of the fire extinguishing medium from unit 26. The spacing of manholes 22 is determined by the range of their associated units 26. Manholes 22 are spaced so far apart as possible while still permitting units 26 to effect substantially complete coverages of fire extinguishing medium on runways 10 and 12.

Each head 28 is individually controlled by a solenoid 30. Solenoids 30 are, in turn, interconnected in four operating circuits 36, 38, 40, and 42 for effecting discharge of the fire extinguishing medium from units 26. Circuits 36, 38, 40, and 42 are each associated with a separate area A,B, C or D and each include separate normally-open switches 44, 46, 48 and 50. Likewise, each circuit 36—42 is interconnected to a common element 52; such as a pushbutton.

In operation, each pressurized unit 26 is positioned in its manhole 22 with the nozzle 34 thereof disposed in opening as shown in FIGURE 2. When it is necessary to release fire extinguishing medium onto runway 10 or 12, an operator in control tower T presses one or more of the switches 44—50, each of which associated with area A, B, C, or D, respectively. Closing its associated switch 44—50 completes one of the 36—42 circuits energizing the solenoids 30 associated therewith. Upon actuation, solenoid 30 releases the normally closed valve (not shown) of discharge head 28, effecting immediate release of the pressurized fire extinguishing medium from unit 26.

In the event it becomes necessary to release such medium over the entire runways 10 and 12 simultaneously, pushbutton control 52 is depressed which immediately energizes each of the circuits 36—42, releasing the fire extinguishing medium over the entire runways 10 and 12 at once.

Discharge head 28 and solenoid 30 may be similar in construction and operation to those commercially available under the name "discharge head" and "electrical control head," respectively, from Walter Kidde & Co., Inc., Belleville, New Jersey.

It should should be understood that the above description has been made with reference to the preferred em-

bodiment illustrated in the drawings and that modifications and alterations can be made therein without departing from the invention, except as expressly limited hereinafter in the claims.

I claim:

1. An aircraft runway comprising a landing strip having a plurality of spaced apertures extending through the upper surface of said strip, a plurality of individual pressurized fire extinguishing units, each having a nozzle for directing flow of the fire extinguishing medium from its associated unit onto said strip, means positioning said units in spaced relationship with each other below said landing strip with one of said apertures associated with each of said units and accommodating its associated nozzle, a valve for each of said units for controlling the emission of said fire extinguishing medium therefrom and a control system interconnecting each of said valves for selectively actuating a pre-determined number thereof for effecting distribution of said fire extinguishing medium on pre-selected portions of said runway.

2. An aircraft runway comprising a landing strip having a plurality of spaced apertures therethrough, a plurality of individual pressurized fire extinguishing units, each having a nozzle for directing the flow of the fire extinguishing medium from said units, means positioning said units in spaced relationship beneath said landing strip with one of said apertures accommodating one of said nozzles below the upper surface of said landing strip in vertical disposition for upward dispersion of said fire extinguishing medium from its associated unit directly onto said strip, adjacent units being spaced apart a distance to effect overlapping dispersion of their associated medium, valves, means operatively connecting one of said valves to each of said fire extinguishing units for controlling the emission of said medium through its associated nozzle and an electrical control system interconnecting each of said valves for selectively actuating a predetermined number thereof.

3. An invention as defined in claim 2 wherein said control system includes an electrical operating circuit, a plurality of solenoids in said circuit, means operatively associating one of said solenoids with each of said valves, and a selector element in said circuit for effecting selective actuation of all or a pre-determined number of said solenoids whereby the entire strip or selected portions thereof are covered by said fire-extinguishing medium.

4. In a pair of aircraft runways, the combination of a landing strip for each of said runways, spaced pits beneath each of said landing strips, an integral pressurized fire extinguishing unit for each of said pits, a cover plate having an aperture therein for covering each of said pits coplanar with the surface of said strips, a nozzle for directing flow from each of said units, means mounting said nozzle in the aperture of its associated cover plate in vertical disposition for upward dispersion of said fire extinguishing medium onto said strip, said pits being spaced apart a distance to effect overlapping dispersion of medium from their associated units, a valve connected to each of said units for controlling the emission of medium therefrom, a solenoid operatively connected to each of said valves for actuating said valves, a plurality of operating circuits for said solenoids, one of said circuits operatively associated with the units positioned in a selected area of said strips and means for completing a predetermined number of said circuits for releasing fire extinguishing medium on said selective portions of said runways whereby the entire strip or selected portions thereof are covered by said fire-extinguishing medium.

5. The invention as defined in claim 4 in which each of said pits includes a manhole peripherally positioned in said pit.

6. The invention as defined in claim 4 including four operating circuits, each circuit being operative to selectively energize the solenoids under generally one half of each of said landing strips, an individual control switch for completing each circuit, a common control switch for completing all four circuits, means for by-passing said individual control switches upon actuation of said common control switch and other means for by-passing said common control switch upon actuation of any of said individual control switches whereby an or all of said circuits may be selectively completed.

References Cited in the file of this patent

UNITED STATES PATENTS

1,826,072	Hamilton	Oct. 6, 1931
2,050,687	Allen	Aug. 11, 1936
2,059,190	Allen	Nov. 3, 1936
2,274,784	Geertz	Mar. 3, 1942
2,385,825	Mathisen	Oct. 2, 1945
2,399,553	Lindsay et al.	Apr. 30, 1946
2,510,118	Kooistra	June 6, 1950