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COMBINATION SPEAKER AND HEATER FOR OUTDOOR THEATERS

Filed Jan. 10, 1951

2 Sheets-Sheet 1

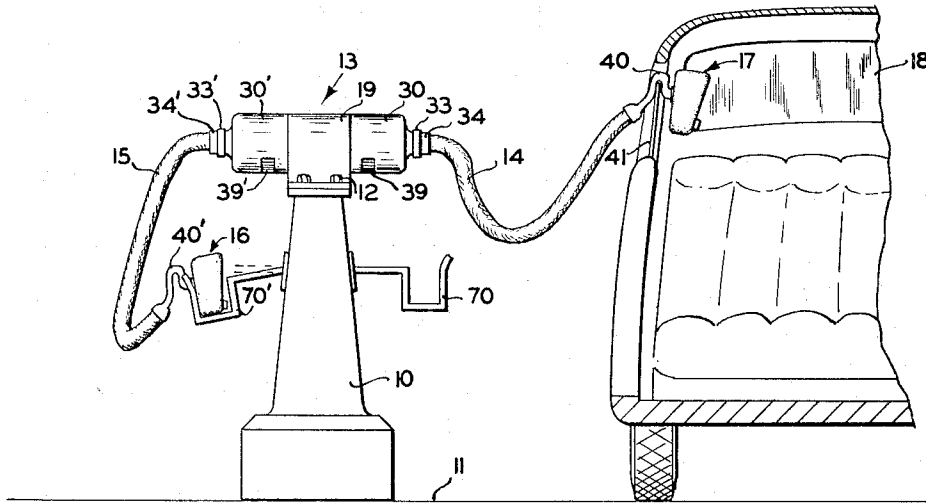


Fig. 1

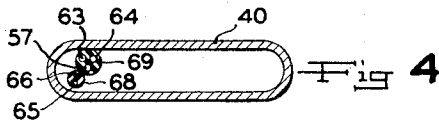


Fig. 4

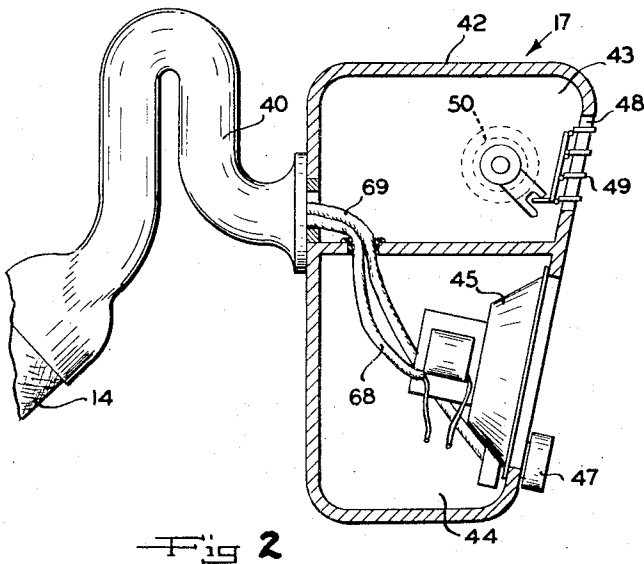


Fig. 2

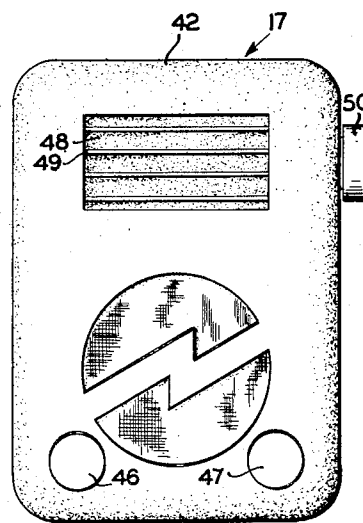


Fig. 3

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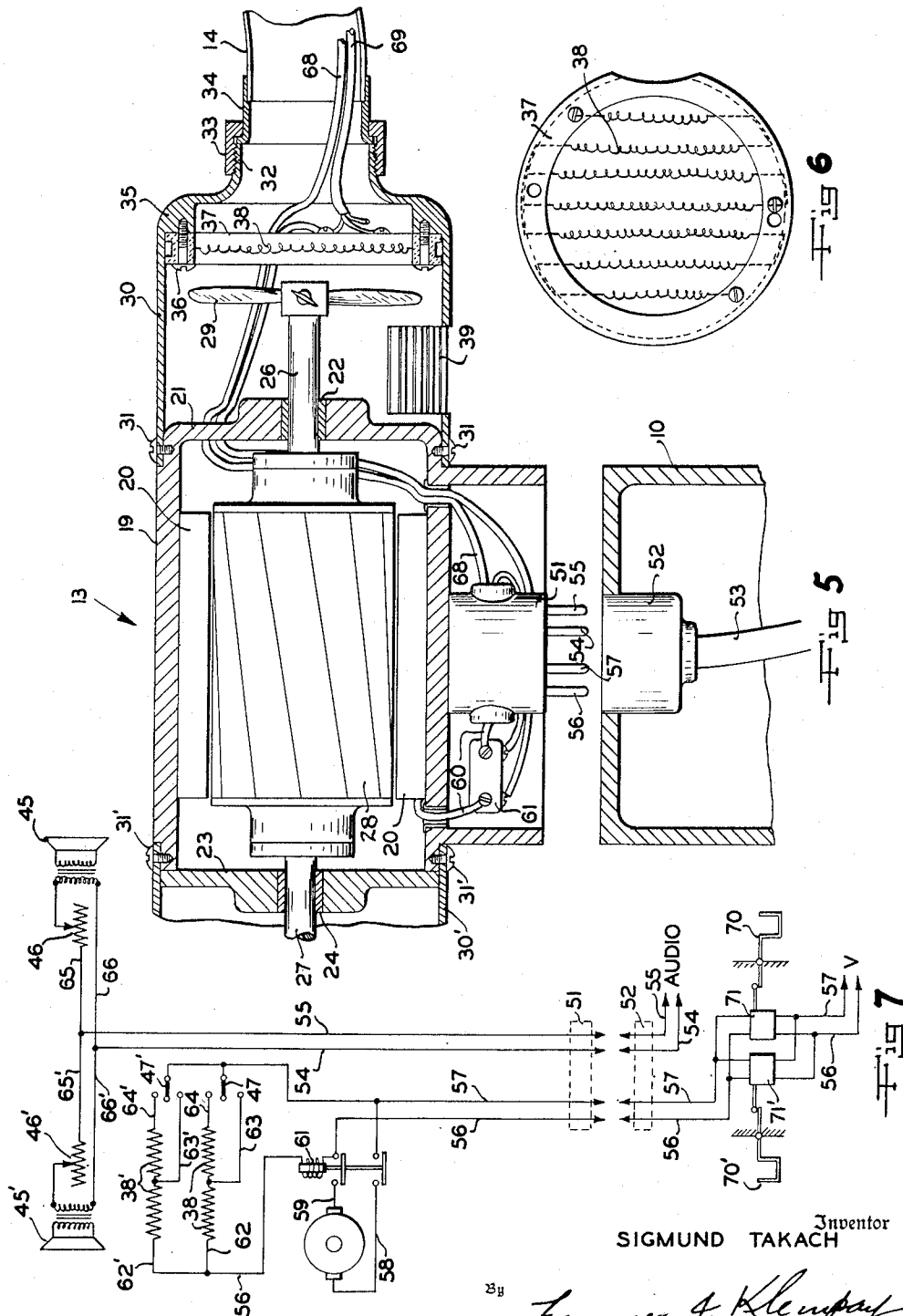
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2 Sheets-Sheet 2



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COMBINATION SPEAKER AND HEATER FOR
OUTDOOR THEATERS

Sigmund Takach, Youngstown, Ohio

Application January 10, 1951, Serial No. 205,319

3 Claims. (Cl. 219-39)

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This invention relates to automobile heaters for use at outdoor or drive-in theaters and more particularly to the combining of such a heater with a conventional speaker to form a single speaker-heater unit.

As is commonly known, outdoor theater trade is extremely seasonal and is dependent principally upon outdoor temperature condition. In an attempt to lengthen the trade season a few proprietors of outdoor theaters have provided electric heating units which are adapted to be put into the patrons' cars to provide additional warmth to the occupants.

This method has been quite successful inasmuch as it has extended the profitable trade season as much as several months in some climate zones. It is therefore the primary object of this invention to provide a novel and improved means of heating automobiles at outdoor theaters.

Another object of this invention is the provision of a novel heater of this type wherein the heater and speaker may effectively be combined as a single unit, thus eliminating the need for placing two independent units in the patrons' cars.

A further object of this invention is the provision of a novel heater of this type wherein the blower and heating element therefor are permanently positioned outside the automobile. It has been found in using prior heating devices of this type, wherein the entire unit is placed inside the car, connected only by an electrical cable to the outside, that certain acquisitive patrons would sever the connecting cable and leave the heater, which could thus be reconnected by them for their own use. By providing that the essential elements of the unit be permanently affixed outside the car such patrons are for all practical purposes unable to remove them. And, since the average person has little or no use for a speaker alone, acts of theft such as described above would be largely eliminated. Further, positioning of the electrically powered elements outside the car largely eliminates the possibility of accidents resulting from worn cables, loose connections or the like.

Yet another object of this invention is the provision of a novel heating arrangement whereby two cars may be supplied with warm air from a single blower, thus reducing by half the number of blowing units necessary for a theater installation.

Other objects and advantages of the invention will become apparent upon full consideration of

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the following detailed specification and accompanying drawings wherein there is disclosed a certain preferred embodiment of my invention.

In the drawing:

Figure 1 is a front elevation of a combination heater and speaker installation for outdoor theaters as constructed according to the principles of my invention, showing a method of positioning the speaker unit in an automobile;

Figure 2 is a fragmentary cross sectional view of the apparatus of Figure 1 showing in detail the speaker box and warm air outlet;

Figure 3 is a front elevation of the speaker box of Figure 2 showing the general arrangement of the controls;

Figure 4 is a cross section of the warm air duct leading into the speaker box;

Figure 5 is a fragmentary cross sectional view of the apparatus of Figure 1 showing in particular the arrangement of the blower and heating element;

Figure 6 is a front elevation of the heating element shown in Figure 5; and

Figure 7 is a schematic diagram of the electrical system utilized in the apparatus of my invention.

Referring to Figure 1 of the drawings, the reference numeral 10 denotes a stand, preferably of metal or concrete, which is mounted firmly in the ground 11 and upon which is secured, by means of bolts 12, a heater and blower unit 13. Flexible hoses or ducts 14 and 15 extend from each end of the heater and blower unit 13 and connect, at their outer ends, speaker boxes 16 and 17 respectively. According to the principles of the invention the speaker boxes 16 and 17 are so constructed as to allow the passage of air from the boxes or ducts 14 and 15, through the boxes 16 and 17 and into a space to be heated, as for example, an automobile 18.

To provide circulation of warm air through the ducts 14 and 15 I provide the heating and blower unit 13 which may be regulated and controlled by occupants of the car 18. The said unit 13 includes a frame member 19 which is generally cylindrical in shape and which retains a plurality of circumferentially spaced induction coils 20 to thus serve as the stator member of a conventional induction type electric motor. A squirrel cage type rotor 21 is rotatably retained in concentric relation to the frame member 19 by means of shafts 22 and 23 which extend outwardly from each end of the rotor 21 and which are rotatably journaled in anti-friction bearings 24 and 25 respectively. As shown, the bear-

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ings 22 and 24 are retained in end caps 21 and 23, at least one of which is removable to facilitate removal of the rotor 28 for maintenance and repair operations. The removable end cap 23 is secured to the frame 19 by any suitable means such as cap screws, not shown.

Since I have provided that the heater and blower unit 13 be a duplex unit, the description will generally be confined to those elements of the apparatus necessary to serve speaker box 17 through duct 14, it being, of course, understood that identical elements are utilized to serve speaker 16 through duct 15. Corresponding duplicate elements, where shown in the drawings will be referred to by primed numerals corresponding to those of the elements described.

Secured to the end of shaft 26 I have provided a fan 29 which is adapted to force air axially outward of the frame 19. To enclose the fan 29 I provide a cylindrical casing 30 which is adapted to fit intimately into a circular recess provided therefor at the end of the frame 19 to provide a substantially air tight union therewith. Suitable screws 31 engage the frame 19 to rigidly secure the casing 30 in position. The outer portion of the casing 30 is reduced in diameter and threaded externally at 32 to engage a nut 33, as shown.

The flexible duct 14 is terminated at its inner end by a flanged adapter 34 which is engaged by a shoulder provided therefor on the nut 33 and is thereby rigidly retained in contact with the reduced end portion of the casing 30 in a substantially air-tight manner.

As shown in Figure 5, the casing 30 is provided with an internal shoulder 35 near its outer end. Retained against the shoulder 35 by means of screws 36 is a porcelain ring 37 which supports and retains a plurality of series connected heating coils 38 which form the heating element of my invention.

A fresh air intake is provided in the casing 30 by means of a grated opening 39 which is positioned in the bottom portion of the casing 30 and behind the fan 29. As may be observed, rotation of the rotor 28 and fan 29 will draw fresh air through the grated opening 39 and force it over the heating coils 38 and subsequently to the speaker box 17 through the duct 14. As shown in Figure 2, the heated air circulating through the duct 14 is discharged into the speaker box through an essentially U-shaped fitting 40 of flattened cross section. The fitting 40 is adapted to be retained upon the upper edge of a window 41, to thereby support the speaker box in the desired position, and is of flattened cross section to permit the window 41 to remain substantially closed, to thus avoid excessive drafts of low temperature outside air.

The speaker box 17 of my apparatus comprises a casing 42 having therein two independent and isolated chambers 43 and 44. The lower chamber 44 serves as a resonant cavity for a speaker 45 and further houses audio volume and air heat controls 46 and 47 respectively. The upper of the two chambers, 43, has an outlet opening 48 through which air received through the fitting 40 is discharged into the car 18. To control the amount of air discharged through the opening 48 I provide a plurality of adjustable louvers 49 which may be set in any desired position through manipulation of control knob 50 which is positioned at the side of the casing 42.

In order to facilitate removal of my apparatus, when such is desired, I provide electrical connection between the stand 10 and my apparatus by

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means of a pair of separable plug members 51 and 52, the male member 51 of which is preferably positioned at the bottom of the frame member 19 as shown in Figure 5. The female member 52 is positioned in flush relation with the top of the stand 10 in order to present a flat surface which is easily cleaned and which is less apt to become damaged through accident or through vandalism which may occur during the off season when outdoor theaters are generally left unattended. A cable 53, which enters inside the stand 10, connects the female plug member 52 with an underground power network, not shown, and carries a pair of audio signal conductors 54 and 55 and a pair of power conductors 56 and 57 to energize the induction coils 29 and heating coils 38. The induction coils 29 connect conductors 58 and 59 which are carried in cable 30 and which are connected to the power conductors 56 and 57 at the plug 51. A sensitive relay 61, which operates in response to current flow to the heating coils 38 controls the operation of the induction motor by opening and closing contacts connected in series with conductors 53 and 59. The series connected heating coils 38 are connected at one end by conductor 62 which is in turn connected to the power conductor 56. A second conductor 64 connects the other end of the heating coils 38 to heat control switch 47, and a third conductor 63 connects the mid-point of the coils 38 to the said switch 47. The other side of the switch 47 is connected directly to power conductor 57. It may thus be seen that by appropriate setting of the switch 47 the heat emitted by coils 38 may be varied to suit the patrons' comfort. In the proposed embodiment I contemplate utilizing a coil of approximately 400 watts maximum output, since tests have shown this to be more than sufficient for use in temperate climates. It should be noted that current flow to either of the heating elements 38 or 38' will energize relay 61 to operate the fan 29 to pass fresh air over the coils and to the speakers 16 and 17.

The audio signal is carried to the speaker 45 through conductors 65 and 66 which comprise cable 68 and which are connected to conductors 55 and 54 respectively. A potentiometer 43 is placed in series with conductor 65 to provide volume regulation. I have provided that cable 68 pass from the heater and blower unit 13 into the speaker box 17 through the air duct 14 in order that it may be protected from weather and from malicious tampering. Likewise cable 68 which carries conductors 62, 64 and 57 to the heat regulating switch 47 passes through the duct 14.

In order to insure that the motor and heating units are shut off as the patrons leave the theater I have a pair of carrier hooks 70 and 70' which extend from the stand 10 and which support the speaker boxes 17 and 18 when not in use. As shown the hooks 70 and 70' are pivotally mounted and serve as operators for switches 71 and 71', to open said switches when the speaker box is returned to the hook after use. In the arrangement shown the switches 71 and 71' are connected in parallel so that both units must be in their carriers before power is shut off at the stand. This is of course a matter of preference and individual control may be effected by merely utilizing individual power lines for each heater unit.

It should now be apparent that I have provided an improved speaker and heater assembly for outdoor theater use which accomplishes the objects initially set forth. My invention effec-

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tively combines the heat outlet with speaker box so that but a single unit is placed in the car rather than two individual units as was necessary with prior heating devices of this type. I have further provided a means of supplying two adjacent cars with air circulation from a single motor, thus substantially lowering the cost of installing heater units for theater service.

By placing the essential elements of the unit at a permanent position outside and between the cars I have been able to incorporate several advantageous features into my apparatus. For example, there is less opportunity for theft of the valuable equipment; there is a lesser possibility of shock or injury caused by worn or weather deteriorated electrical equipment; and further, any hum or vibratory noise, caused by the motor or by the heating coils is effectively isolated from the patrons. This last feature is obviously of particular importance in a theater installation such as is contemplated.

It should be understood, however, that the embodiment of the invention herein illustrated and specifically described is intended to be illustrative only as many obvious changes may be made therein without departing from the spirit or scope of the invention. Reference should therefore be had to the appended claims in determining the true scope of the invention.

I claim:

1. Apparatus for supplying conditioned air to parked automobiles comprising a source of conditioned air, a flat tubular fitting adapted to be retained upon a window of an automobile while permitting the window to remain substantially closed, duct means connecting said source of conditioned air with said fitting whereby air may be discharged into said automobile, said source of conditioned air comprising a blower positioned externally of said automobile, a heating unit positioned adjacent said blower and adapted to transmit heat to air moved by said blower, and means controllable from within said automobile for controlling the amount of heat transmitted by said heating unit.

2. In apparatus for supplying conditioned air to parked automobiles the combination with a pair of adjacent parking stalls for automobiles of a motor positioned between said stalls, a pair

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of separate blower devices operated by said motor, said blower devices being mounted adjacent said motor and being arranged to supply air independently to a pair of automobiles parked in said stalls, separate duct means leading from said blower devices to said automobiles, said duct means including separate outlet boxes, each adapted to be positioned within the interior of an automobile, electrically energized heating elements positioned in said duct means closely adjacent said blower devices, control means mounted on said outlet boxes remotely of said elements for independently regulating from within said automobiles the energization of said heating elements, and second control means at each of said outlet boxes for regulating the flow of air therethrough.

3. In apparatus for supplying conditioned air to parked automobiles the combination with a pair of adjacent parking stalls for automobiles of a motor positioned between said stalls, blower means mounted adjacent said motor and arranged to be operated thereby, separate duct means leading from said blower means to said adjacent stalls, said duct means each including an outlet box adapted to be positioned within the interior of an automobile, separate electrically energized heating elements positioned in each of said separate duct means closely adjacent said blower means, first control means on each of said outlet boxes for regulating the energization of said heating elements from within said automobiles, and second control means on said outlet boxes for regulating the flow of air therethrough.

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