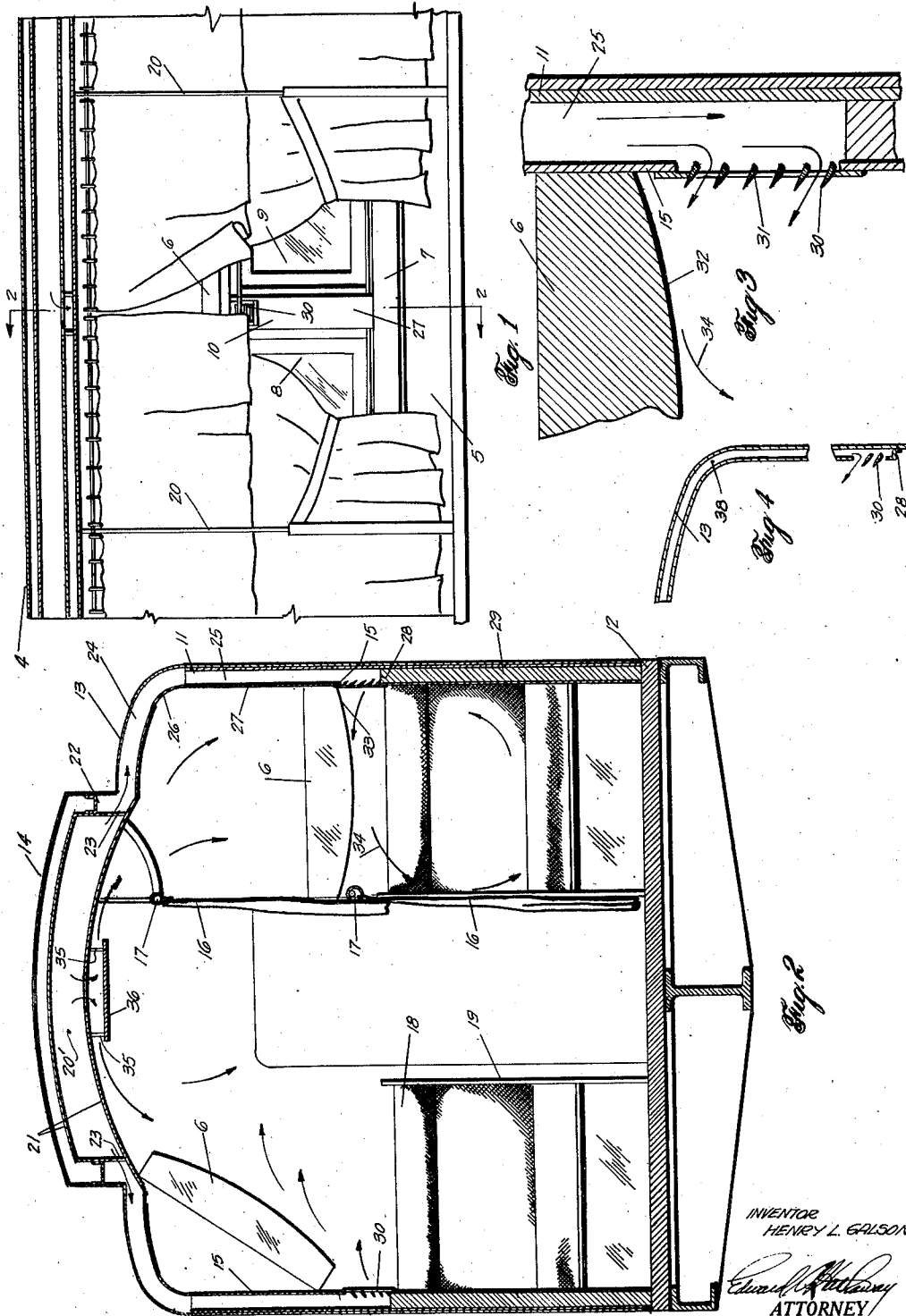


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H. L. GALSON  
AIR DISTRIBUTING SYSTEM

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## AIR DISTRIBUTING SYSTEM

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This invention relates generally to an improved system for cooling railroad cars especially Pullman sleeping cars and more particularly to an improved system for distributing air in a sleeping car, the air being preferably cooled by refrigeration apparatus operated during travel of the car.

Proper air conditioning and cooling of sleeping cars is highly desirable not only for the comfort of passengers when the berths are made up for sleeping but also when closed so as to be used for seating as during day travelling. Proper cooling of the car is rendered difficult due to the usual side curtains and end walls enclosing the individual upper and lower berths. It is desired that air distributed to the individual berths should not cause a draft or conscious flow of cool air over a passenger as he is unable when asleep to adequately protect himself in case he is susceptible to drafts. It is therefore desirable to have a uniformly distributed and a continuous circulating gentle or filtering flow of air within the sleeping space with minimum possibility of dead air pockets and to accomplish this with an economical and simple arrangement which will allow the air cooling and distributing system to be efficiently operated from a mechanical standpoint. In providing a system whereby the cool air will flow gently over sleeping passengers it is also necessary to insure uniform flow and mixture of air when the berths are closed and the car used for seating.

It is one object of my invention to provide an improved air distributing system for sleeping cars whereby the individual berths or spaces may be substantially uniformly cooled and in a further aspect of the invention it is an object to provide such a system which will be equally effective in producing uniform circulation of cool air when the berths are arranged for seating. A more specific object of the invention is to utilize the usual upper berth as one element in my improved combination for assisting in the proper distribution of air either when the upper berth is down or up.

In the particular embodiment of the invention as shown herein the air is admitted to the space of the lower berth by first being directed upwardly against the under surface of the upper berth which preferably has a convex surface in transverse section with the air preferably impinging against the slightly downwardly extending portion of said surface adjacent the car wall thus giving the air a slight initial downward component of flow with the result that the air

then flows against the side curtains and is efficiently curled down over the berth in a substantially circular motion thus insuring a long continuous path of the air within the berth space before coming into contact with the passenger or bedding and also substantially eliminating any dead air pockets while continued incoming air will flow into the aisle through the opening in the curtains. The upper berth has a similar cooperating relation to another outlet of the distributing system so that the cool air will flow an appreciable distance before passing over the passenger or berth thereby causing the flowing air to be in the nature of a gentle circulation and yet, like the lower berth, the air will have an unobstructed path from the outlet to the berth.

In one specific aspect of the invention I provide two outlets, one for the upper and lower berths respectively, in such cooperating relation that when the berths are arranged for seating the air flow from each outlet will commingle so as to break up any direct draft effect, thus allowing the mixed flows to filter through the car space in a gentle manner and yet insure proper circulation of the air.

The foregoing and other objects and advantages will be more apparent to those skilled in the art from the following description of the accompanying drawing in which:

Fig. 1 is a vertical longitudinal section through a car showing one section of berths made up with the side curtains for the lower berth pulled back;

Fig. 2 is a vertical transverse section taken substantially on the line 2-2 of Fig. 1;

Fig. 3 is an enlarged fragmentary vertical transverse section of the air outlet for the lower berth; and

Fig. 4 is a view showing a modified arrangement for providing a lower berth duct.

In the illustrated embodiment of my invention I have shown in Fig. 1 a fragmentary portion of a standard railroad car 4 having a section generally indicated at 5 provided with upper and lower berths 6 and 7 respectively. As is usual in one form of standard car construction, windows 8 and 9 are located on each side of a main stanchion section 10 which comprises a member 11 of channel or other suitable form extending vertically from the car side sills 12 to the lower edge of the half decks 13. The half decks are connected by a usual roof 14. The upper berth 6 as is customary is hinged horizontally adjacent the car sides 15 to be swung

upwardly into position as shown at the left side of Fig. 2 to effect the necessary seating arrangement of the car or it is swung to its horizontal position as shown at the right side of Fig. 2 when the berths are made up for sleeping. It will of course be understood that the berths may be maintained fixed in their sleeping position at all times such as in steamship state rooms or possibly in future types of sleeping cars. As is usual in the general type of sleeping car, herein specifically considered, side curtains 16 are hung upon suitable longitudinal rods 17. The backs 18 of seats 19, in conjunction with the removable or stationary upper partitions 20 resting upon the upper edge of backs 18, provide the necessary end walls of each section, thus insuring the desired degree of enclosure and privacy for the respective berths or spaces. The structural details of the car and berths are not disclosed as such do not constitute part of the present invention which only involves the general arrangement of the car and berths.

To provide the necessary distributing ducts to the berths and car it is preferable that a main central supply passage or chamber 20' extending preferably the full length of the car shall be formed by walls 21 separate from the car roof, the walls 21 being supported by the roof through suitable longitudinal structural members 22. A series of lateral openings 23 are arranged preferably in alignment with each of the stanchion sections 10 so that cooled air, or warm air if such should be desired, may flow downwardly through outlets 23 and passage 24 to the hollow portion 25 of channel 11, it being noted that an inner wall 26 provides the necessary continuation of the walls 21 while the inner side of the channel is covered by a usual wall plate 27 which maintains not only the usual interior appearance of the car but also provides a definite passageway 25. The lower end of channel 11 may be suitably filled or blocked off at 28 as by filling material 29.

To accomplish the results previously mentioned as to gentle circulation of air within the berth space there is provided an outlet 30 from passage 25, this outlet having suitable louvers 31 inclined so as to direct the outflowing air upwardly, as shown in Figs. 2 and 3, against the transversely convexed under surface 32 of lower berth 6 when in its down position. This air is preferably directed against the slightly downward inclined portion 33 adjacent the car wall 15, thus insuring an initial downward component of the air flow generally indicated by arrows 34. Hence the air will tend to continue in a rotary path as shown in Fig. 2 although of course the continued incoming air will cause a certain amount to flow outwardly through openings between the side curtains.

To provide cooled air individually to the upper berths a series of openings or a single continuous longitudinal opening 35 is provided in the lower wall 21 while a horizontal baffle 36, extending lengthwise of the car and supported below this opening by suitable brackets, diverts the cooled air laterally over the top of the upper curtain 16 and into the spaces of the upper berths. From the arrangements described, it is seen that the berths when made up for sleeping will be insured of a uniform gentle air flow and each berth will receive its allotted volume of cooled air thus eliminating the possibility of the upper berths being overcooled and the lower berths insufficiently cooler or not cooled at all.

It is essential not only to cool the car when used for sleeping but also to be able to effectively and efficiently cool the same when used for seating and to this end it will be noted that the upper and lower outlets 30 and 35 are arranged for cooperation so that when the upper berth is closed the air flow from the upper outlet 35 and lower outlets 30 will, as shown at the left side of Fig. 2, cause the two sources of air to counteract each other and commingle at an area adjacent the side of the upper berth 6 whereupon this air will filter or circulate down to insure complete uniform coolness of the car without drafts. In this arrangement, air flowing through openings 30 is in a direction preferably substantially parallel to the under or normally exposed surface of the upper berth 6 or at least the air flows from opening 30 in the same general direction as the berth 6 in closed position.

If a duct cannot be provided conveniently within either the stanchion section or the usual smaller stanchion between main stanchions then a relatively thin duct 38 of large rectangular cross section may be added to the car leading from openings 23 or passage 24 and down along the wall so as to terminate in openings 30. By having such a relatively thin duct it will not obstruct or inconvenience the passenger using the upper berth and it will also be completely out of sight when the berth is folded up, thus leaving the openings 30 to be the only visible portion of the duct when the car is used for seating, it being understood that the duct would stop at the point 28 the same as in the preferred form.

Hence it is seen that my improved system not only has simplicity and economy of operation but insures uniform circulation and coolness both when the car is used for sleeping and seating.

It will of course be understood that various changes may be made in the construction and arrangement of parts and details of designs without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. An air distributing system for a railway car comprising a passageway extending longitudinally of the car, and ducts leading laterally and downwardly from said passageway and vertically along the side of the car with outlets communicating with the interior thereof, said outlets being provided with vanes for directing the air upwardly into the car.

2. A system for distributing air in railway cars comprising, in combination, means for directing a supply of air upwardly into the car from an intermediate position at the sides of the car, and means for directing a countercurrent of air into the car from near the top thereof.

3. A system for distributing air to a room having superimposed upper and lower berths, comprising a passageway for supplying air to the space of the lower berth by directing the air upwardly toward the under surface of the upper berth, and means for supplying air in a downward and outward direction into the upper berth space.

4. A system for distributing air in a railway car having arrangements for a lower convertible berth and seat and an upper berth adapted to be positioned horizontally for sleeping purposes and to be folded up when the lower berth is used for seating, comprising, in combination, means for supplying air to the lower berth space in an upward direction from one side thereof, and means

for supplying air to the upper berth space from the upper portion of the opposite side of said berths, each of said supplying means being so relatively arranged that when the upper berth is  
5 folded up, the respective supplies of air are substantially opposed.

5. A system for distributing air in a railway sleeping car having arrangements for a lower convertible berth and seat, an upper berth provided with a convex under surface and extending  
10 in a horizontal position from the side of the car when used as a berth and disposed in an upwardly inclined position when the car is used for seating, comprising, in combination, a passage-  
15 way for supplying air to the lower berth space and having provision for initially directing air upwardly against a downwardly extending por-

tion of said convex surface whereby the air for the lower berth space is given a downward component, of motion thus insuring an indirect air circulation over a sleeping passenger.

6. A system for distributing air in a railway  
5 sleeping car having a lower convertible berth and seating arrangement and an upper foldable berth, said berths being provided with curtains at one side and the car wall at the other side, comprising, in combination, means for supplying  
10 air upwardly into the lower berth space from the car wall, and means for supplying air from a central upper portion of the car to the upper berth space by directing said air over the top of  
15 the curtain for said upper berth.

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