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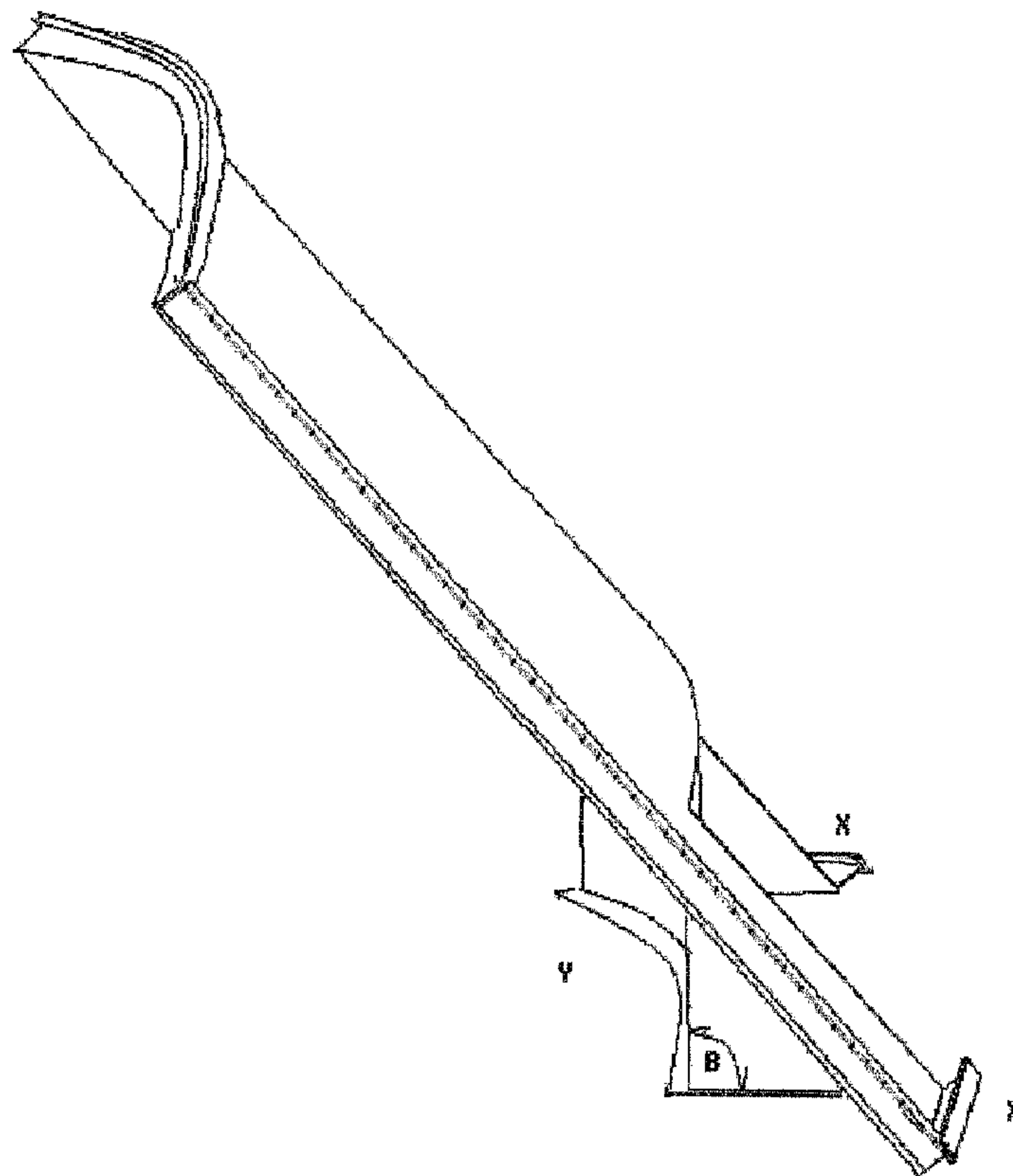
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(54) Titre : APPAREIL DE RECHAUFFEMENT DE L'AIR DU PARE-BRISE

(54) Title: THE WINDSHIELD HEATING AIR APPLIANCE



An isometric view of the first windshield heating air appliance.

(57) Abrégé/Abstract:

The windshield heating air appliances are designed to keep heated air in an isolated area referred as controlled heating air space that is formed by a windshield heating air appliance, windshield and either dashboard or dashboard air vent cover. The controlled heating air space consumes less than 2% of the automobile passenger compartment; thus air in the controlled heating air space

(57) Abrégé(suite)/Abstract(continued):

can be quickly heated up, and the windshield surface can be maintained at an optimal temperature to prevent fogging of the windshield and reduce the time melting ice on the windshield. An additional insulation layer, formed by an automobile front side window cover and air inside front side window cover, significantly reduces fogging of the automobile side window cover in a wet or cold climate.

THE WINDSHIELD HEATING AIR APPLIANCE

ABSTRACT OF THE DISCLOSURE

- [1] The windshield heating air appliances are designed to keep heated air in an isolated area referred as controlled heating air space that is formed by a windshield heating air appliance, windshield and either dashboard or dashboard air vent cover. The controlled heating air space consumes less than 2% of the automobile passenger compartment; thus air in the controlled heating air space can be quickly heated up, and the windshield surface can be maintained at an optimal temperature to prevent fogging of the windshield and reduce the time melting ice on the windshield.
- [2] An additional insulation layer, formed by an automobile front side window cover and air inside front side window cover, significantly reduces fogging of the automobile side window cover in a wet or cold climate.

CROSS-REFERENCE TO RELATED APPLICATIONS

U.S. Application No: 10/761,504 (Title: Windshield Heating Air Appliance)

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX

Not Applicable

BACKGROUND OF THE INVENTION

1. Field of the Invention

- [3] The present invention is directed to devices designed to accomplish the following tasks: (1). To prevent fogging of the automobile windshield. (2). To enhance thawing of accumulated ice on the automobile windshield. (3). To reduce fogging of the automobile front side windows

2. Prior Art

- [4] Fogging is caused by condensed water vapor collecting on a glass surface due to the difference in temperature between the glass surface and the adjacent air. Warmer air inside an automobile in contact with the windshield and side window surfaces will be cooled down, the cooling of this air reduces its ability to retain moisture, and thus the moisture that is released condenses on the inside windshield and side window surfaces. There are two different climate conditions in which fogging of the windshield and side windows occur even though the automobile have a ventilation system. First, in a cold climate, it occurs when the temperature inside the automobile differs significantly from the temperature outside. Secondly, in a wet climate such as a rainy day, it occurs when air humidity inside the automobile is very high and the rain and wind keep the windshield and side windows cooler than air inside the automobile. When fogging of the windshield and side windows occurs, it significantly reduces the driver visibility through the windshield and front side windows, greatly increases the risk of traffic accidents.

- [5] Also, in a cold climate, an automobile cannot be operated until ice accumulated on the windshield is melted and removed. To melt the ice, it requires time to preheat the automobile passenger compartment.
- [6] Currently, there is not a simple, economic approach that can effectively address the driving safety concern related to fogging of the windshield and front side windows in a wet or cold climate. On the other hand, there is not a simple, economic and effective way to quickly melt ice accumulated on the windshield in a cold climate. Therefore, it is the objective of the present invention to create a simple and economic solution to address the above issues effectively so that automobile industry will adapt the solution to make driving safer and easier in a wet or cold climate. The characteristics of the present invention will become apparent in light of the present specification, including claims, and drawings.

BRIEF SUMMARY OF THE INVENTION

- [7] It is an object of the present invention to prevent fogging of the windshield in a wet or cold climate, thereby to improve driving safety in a wet or cold climate.
- [8] Another object of the present invention is to speed up melting ice accumulated on the windshield in a cold climate so that an automobile can be operated soon after its engine warmed up.
- [9] Still another object of the present invention is to reduce fogging of the front side windows in a wet or cold climate to enhance driving safety.
- [10] According to the present invention, the windshield heating air appliances and the air vent cover are made of transparent plastic or other transparent material as Figure 1, Figure 12, and Figure 14 illustrated. The windshield heating air appliance, windshield and either dashboard or dashboard air vent cover form a complete assembly henceforth referred as controlled heating air space that is shown in Figure 7 and Figure 15. The controlled heating air space can be quickly heated, the windshield surface can be maintained at an optimal temperature to prevent fogging of the windshield in a wet or cold climate, reducing the time required to melt the ice accumulated on the windshield in a cold climate.
- [11] According to the present invention, the front side window cover is made of transparent plastic or other transparent material as Figure 18 and Figure 19 illustrate; since air is a poor thermal conductor, an additional insulation layer, formed by the front side window cover and air inside of the front side window cover, keeps the front side window cover

temperature close to the internal automobile passenger compartment temperature; therefore, effectively reduces fogging of the front side windows in a wet or cold climate.

[12] The present invention has the following major advantages:

- It provides a single solution to address multiple issues, which includes preventing fogging of the windshield, reducing fogging of the front side windows, and reducing time required to melt ice accumulated on the windshield.
- the windshield heating air appliance and front side window covers are inexpensive.
- It does not require any change in the automobile design.
- It does not consume automobile passenger compartment usable room.
- Its installation is simple and easy.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[13] The foregoing summary and the following detailed description may be better understood when read in conjunction with the accompanying drawings. Various embodiments are shown for the purpose of illustrating the invention. It is understood, however, that this invention is not limited to the precise arrangements shown.

[14] Figure 1 shows a front view of the first windshield heating air appliance; Angle B of the dashboard support and the length of edges X and Y may vary based on size and position of the air vents. The windshield heating air appliance is attached to the windshield surface through the top, left, right, and bottom edges.

[15] Figure 2 shows a back view of the first windshield heating air appliance; the dashboard support edges are attached to the dashboard surface.

[16] Figure 3 shows a front view of the windshield heating air appliance, dashboard, and dashboard air vents; the dashboard air vents are located between the windshield and windshield heating air appliance.

[17] Figure 4 shows a back view of the windshield heating air appliance, dashboard, and dashboard air vents; the air vents are located between the windshield and windshield heating air appliance.

[18] Figure 5 shows shaded surfaces of the first windshield heating air appliance which are designed to be attached to the windshield surface.

Amendments to the Specification:

Please use the following amended paragraph to replace the paragraph [12] in the specification:

[12] The present invention has the following major advantages:

- It provides a single solution to address multiple issues, which includes preventing fogging of the windshield, reducing fogging of the front side windows, and reducing time required to melt ice accumulated on the windshield.
- ~~the~~ The windshield heating air appliance and front side window covers are inexpensive.
- ~~It does not require any change in the automobile design.~~
- It does not consume automobile passenger compartment usable room.
- Its installation is simple and easy.

- [19] Figure 6 shows shaded dashboard support edge surfaces which are designed to be attached to the dashboard surface.
- [20] Figure 7 shows that the windshield surface is represented by the solid thick line, the first windshield heating air appliance surface is represented by the thin dashed line, the dashboard surface is represented by hatched lines at the bottom of the figure; this completes an assembly referred as controlled heating air space which consumes less than 2% of the entire automobile passenger compartment.
- [21] Figure 8 shows a front view of the first windshield heating air appliance with a rear view mirror base path on the top.
- [22] Figure 9 shows a back view of the first windshield heating air appliance with a rear view mirror base path on the top.
- [23] Figure 10 shows a view of the first windshield heating air appliance with L edges.
- [24] Figure 11 shows that the first windshield heating air appliance composed of two symmetric parts, which are joined together during the installation, to facilitate shipping.
- [25] Figure 12 shows a front view of the second windshield heating air appliance design, which has L edges on all four sides and a pipe connector on its bottom.
- [26] Figure 13 shows a back view of the second windshield heating air appliance design, which has L edges on all four sides and a pipe connector on its bottom.
- [27] Figure 14 shows a view of the dashboard air vent cover with a male pipe connector; the dashboard air vent cover is a part of the second windshield heating air appliance, its male pipe connector joins the female pipe connector from the windshield heating air appliance to supply heated air for the controlled heating air space.
- [28] Figure 15 shows that the windshield and second windshield heating air appliance together assemble a controlled heating air space which consumes less than 1% of the entire automobile passenger compartment; thin dashed lines represent the windshield heating air appliance surface, thick dashed lines represent the windshield surface; the female pipe connector from the second windshield heating air appliance joins the male pipe connector from the dashboard air vent cover to provide heated air for the controlled heating air space.
- [29] Figure 16 shows T edge sizes for the first windshield heating air appliance, where T edge height is 1.5 inches and T edge width is 1.0 inches, the dashboard support edge size is 0.8 inches wide.

- [30] Figure 17 shows L edge sizes for both windshield heating air appliances, where the height is 1.5 inches and the width is 0.8 inches.
- [31] Figure 18 shows a view of the front side window cover.
- [32] Figure 19 shows an isometric view of the front side window cover.
- [33] Figure 20 shows edge sizes of the front side window cover.
- [34] Figure 21 shows an isometric view of the windshield heating air appliance.

DETAILED DESCRIPTION OF THE INVENTION

- [35] According to the present invention, the windshield heating air appliances are made of the transparent plastic or other transparent materials. For the windshield heating air appliance in Figure 1, its top, left, right and bottom shaded edges in Figure 5 are designed to be attached to the windshield, the shaded dashboard support edges in Figure 6 are designed to be attached to the dashboard; the dashboard air vents in Figure 3 and Figure 4 are located between the windshield and the first windshield heating air appliance; the windshield heating air appliance, windshield, and dashboard form a complete assembly henceforth referred as controlled heating air space. For the windshield heating air appliance in Figure 12, its top, bottom, left and right L edges are designed to be attached to the windshield; its female connector is designed to join the male connector on the dashboard air vent cover to obtain hot air supplied; the windshield, windshield heating air appliance, and dashboard air vent cover assemble a controlled heating air space. Utilizing heated air supply from the dashboard air vents, air in the controlled heating air space can be quickly heated up, and the internal windshield surface can be maintained at an optimal temperature; thus the heated windshield surface no longer causes the adjacent air reducing ability to retain moisture, prevents fogging of windshield, ensures the best driving visibility in a wet or cold climate.
- [36] Furthermore, the controlled heating air space can maintain the windshield surface at a relatively high temperature in a very cold climate, this can prevent the windshield from a dangerous "flash freeze" situation which may occur when water at or near freezing point strikes a relatively cool windshield while it is in motion, such as when cold water is splashed up onto a car windshield by a passing tractor-trailer.

- [37] According to the present invention, the front side window cover is made of transparent plastic or other transparent material; since air is a poor thermal conductor, the air temperature between the front side window and the front side window cover is always higher than the front side window temperature in a wet or cold climate; therefore an additional insulation layer, formed by the front side window cover and the air inside the front side window cover, enhances the front side window insulation, keeps the front side window cover temperature close to the inside passenger compartment temperature; therefore significantly reduces fogging of the front side window in a wet or cold climate.
- [38] When an automobile is parked in a parking lot or on the street in a cold climate, the normal practice to melt ice on the windshield is to preheat the automobile passenger compartment. Since the controlled heating air space consumes less than 2% of an automobile passenger compartment, it takes much less time to heat up the controlled heating air space compared to the entire automobile passenger compartment; thus much shorter time to melt ice on the windshield saves time and reduces pollution.
- [39] Some automobile models have the rear view mirror base attached to the ceiling. Other automobiles have the rear view mirror base attached to the windshield. To accommodate the rear view mirror base attached to the windshield, the windshield heating air appliance shown in Figure 8 and Figure 9 has an open path to fit the rear view mirror.

WHAT I CLAIM MY INVENTION IS:

- [40] 1. Controlled heating air space is designed to retain heated air in an isolated area adjacent to an automobile windshield; thus said temperature of said controlled heating air space can be maintained independently without interfering normal temperature inside automobile passenger compartment.
- [41] 2. Windshield heating air appliances and dashboard air vent cover are made of transparent plastic or other transparent materials; said windshield heating air appliance can be consisted of two symmetric parts which are joined together during the installation to facilitate shipping; said windshield heating air appliance, said windshield and either said dashboard or said dashboard air vent cover assemble said controlled heating air space in accordance with claim 1.
- [42] 3. Utilizing heated air supply from said dashboard air vents, said controlled heating air space in accordance with claim 1 maintains said windshield surface at an optimal temperature, adjacent air in contact with said heated windshield surface no longer reduces its ability to retain moisture; thus prevents fogging of said windshield, guarantees an excellent driving visibility through said windshield, reduces traffic accidents in a wet or cold climate.
- [43] 4. Said controlled heating air space in accordance with claim 1 consumes less than 2% of said automobile passenger compartment, melting ice accumulated on said windshield requires only to heat up said controlled heating air space instead of said entire automobile passenger compartment; thus significantly increases the heating efficiency, speeds up ice melting, saves energy and reduces pollution.
- [44] 5. A side window cover is made of transparent plastic or other transparent material; since air is a poor thermal conductor, air temperature between a side window and side window cover is higher than said side window temperature in a wet or cold climate; thus, an additional insulation layer, formed by said side window cover and air between said side window and side window cover, enhances said side window insulation, keeps said side window cover temperature close to an automobile internal air temperature, therefore, significantly reduces fogging of said side window, enhances driving safety in a wet or cold climate.

Amendment to claims:

Please add the following new claim as the sixth claim after the paragraph [44]:

[45] 6. Totally separate automobile windshield heating supply from all other heating supply; replace windshield heating supply related dashboard air vents with a simple heating pipe; said heating pipe is located in the center of the dashboard and right at the dashboard edge next to the windshield; said heating pipe is connected with said windshield heating air appliance to form a separate heating system; therefore, provide better control to automobile passenger compartment temperature.

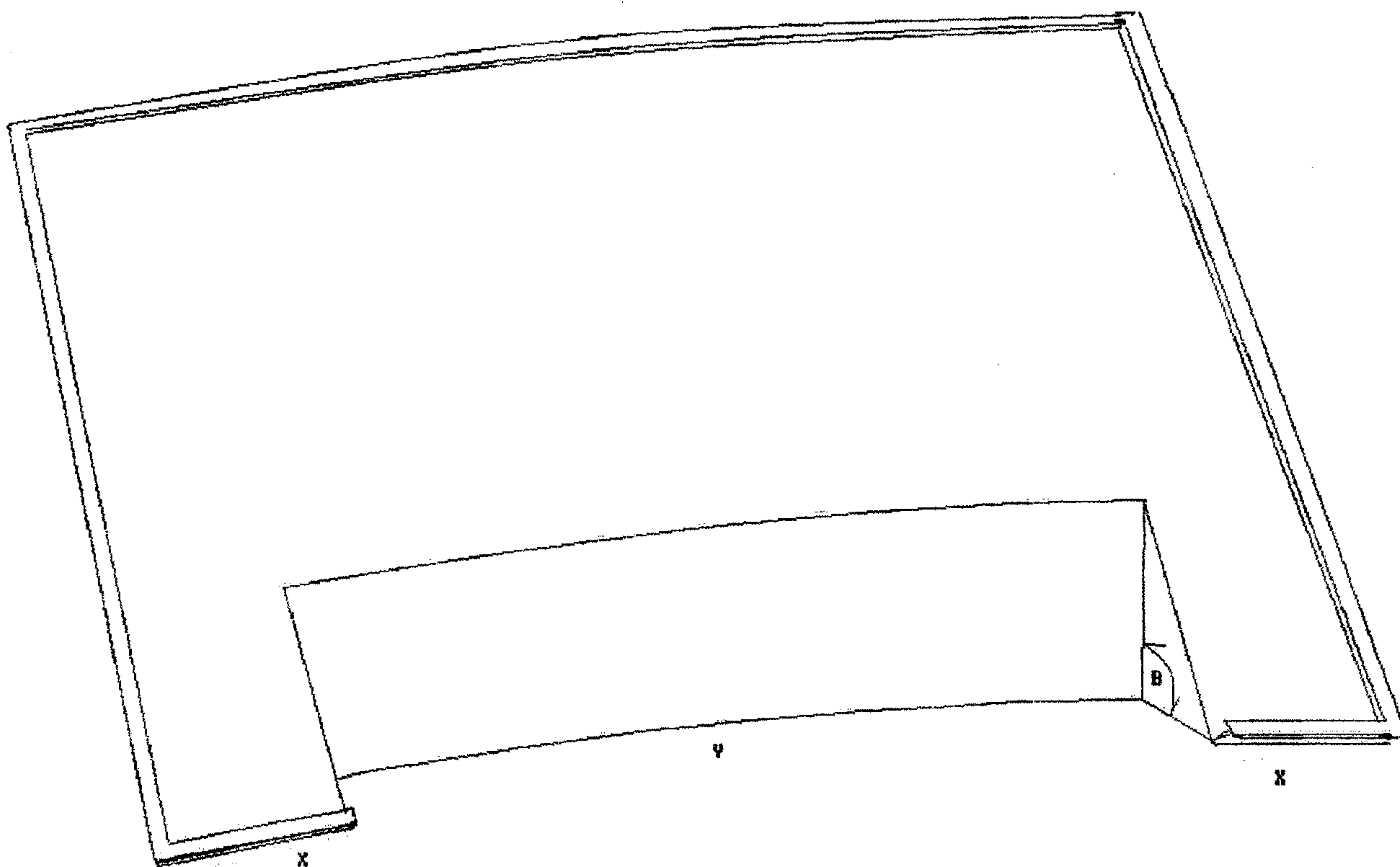


FIG. 1: A front view of the first windshield heating air appliance design.

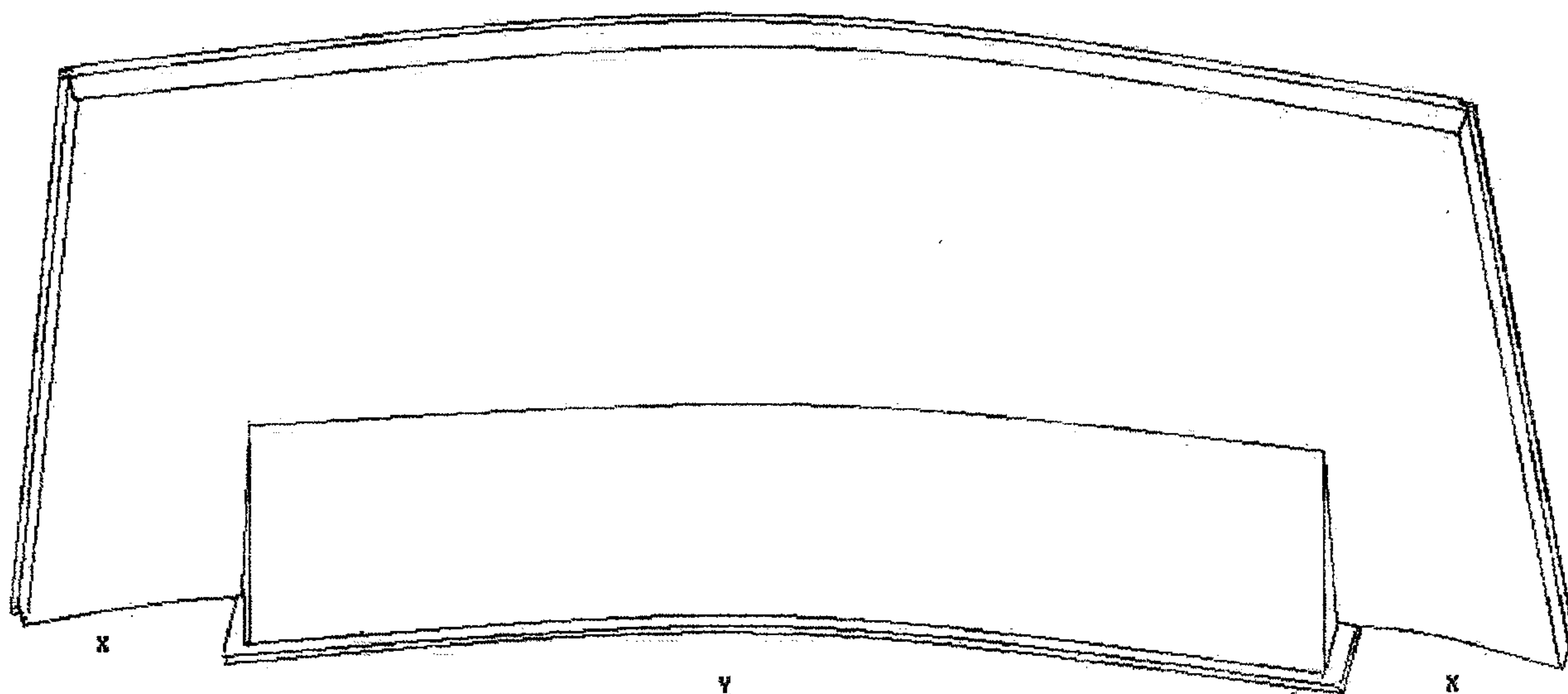


FIG. 2: A back view of the first windshield heating air appliance design.

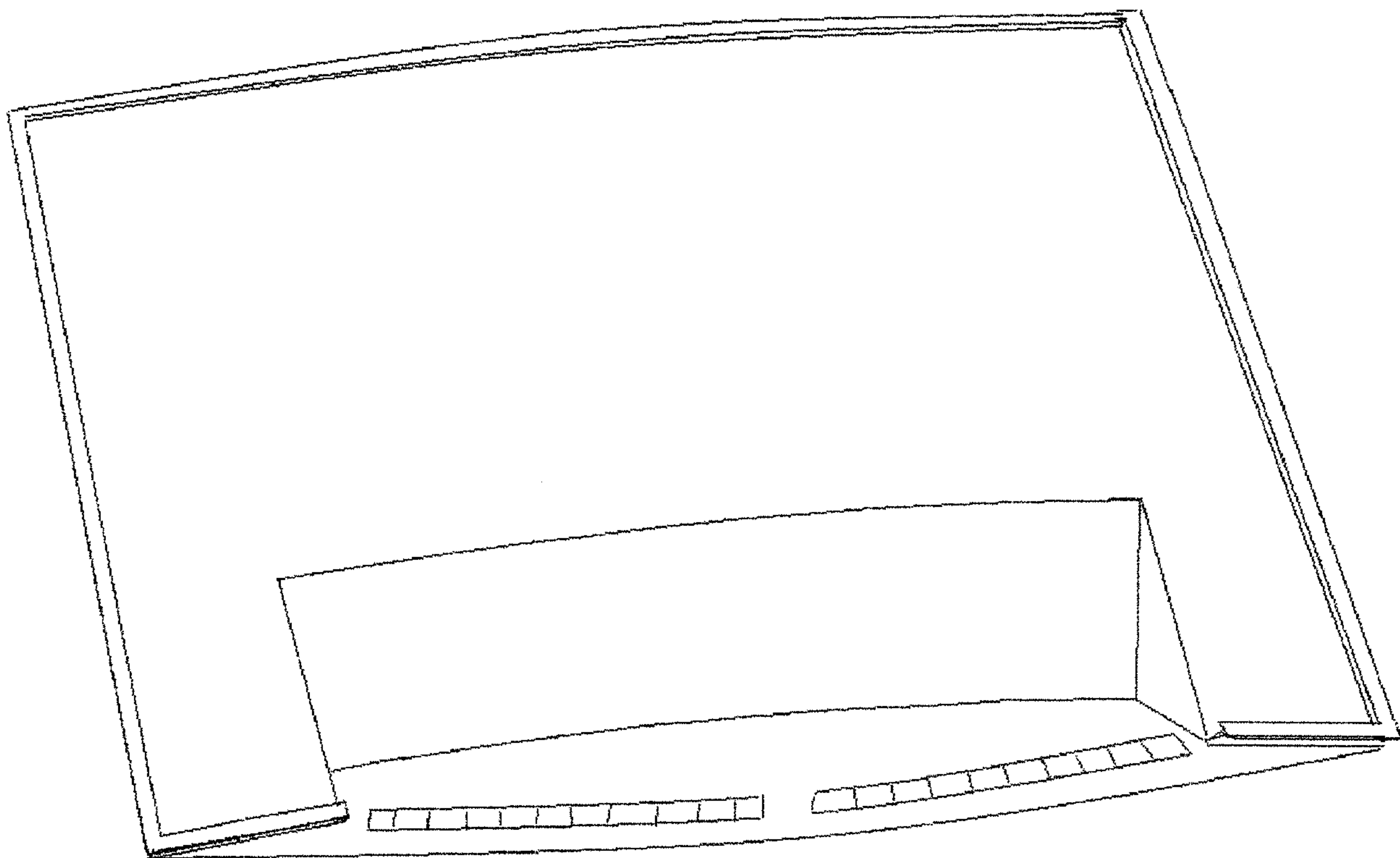


FIG. 3: A front view of the first windshield heating air appliance, dashboard and air vents.

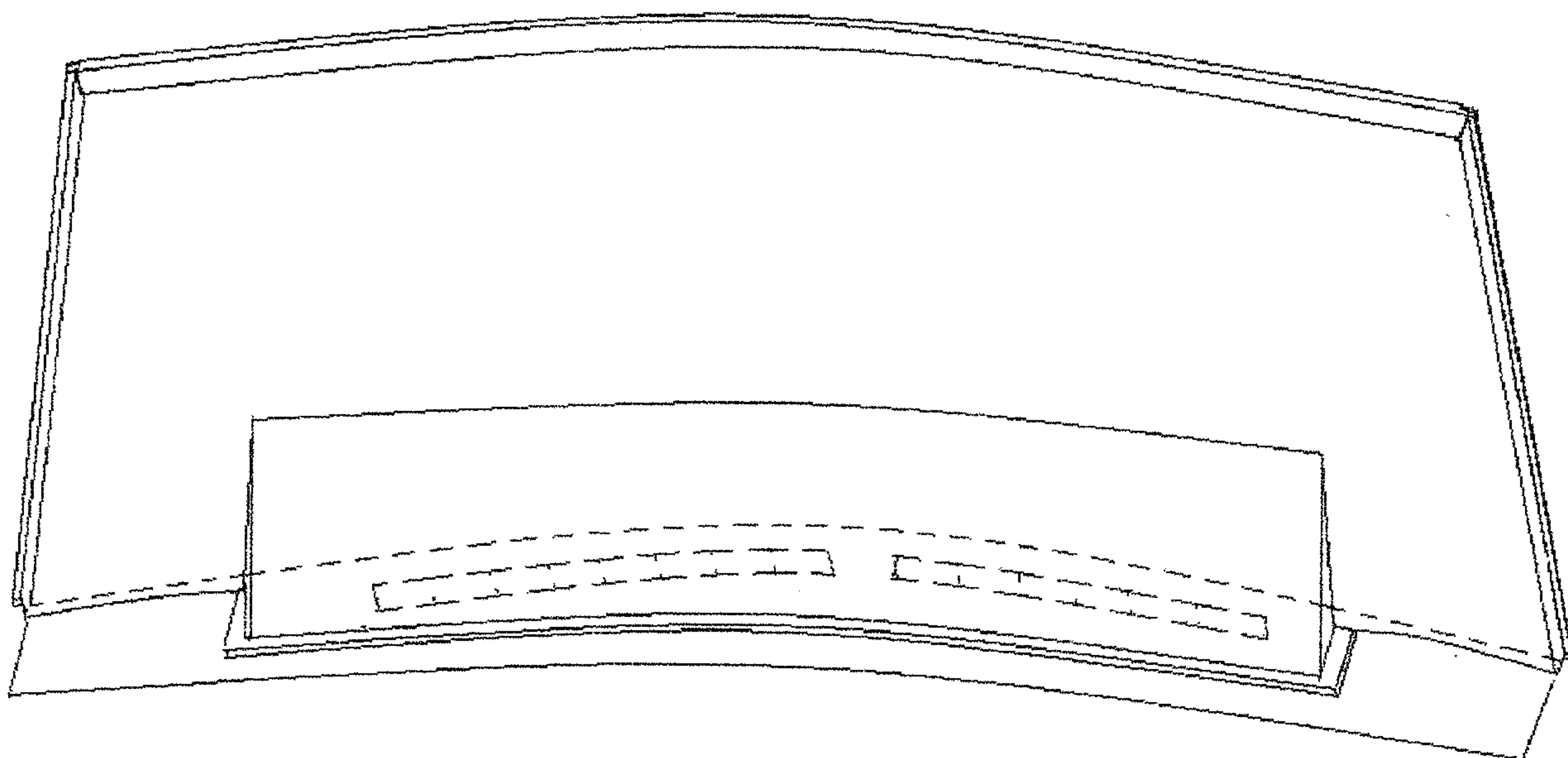


FIG. 4: A back view of the first windshield heating air appliance, dashboard and air vents.

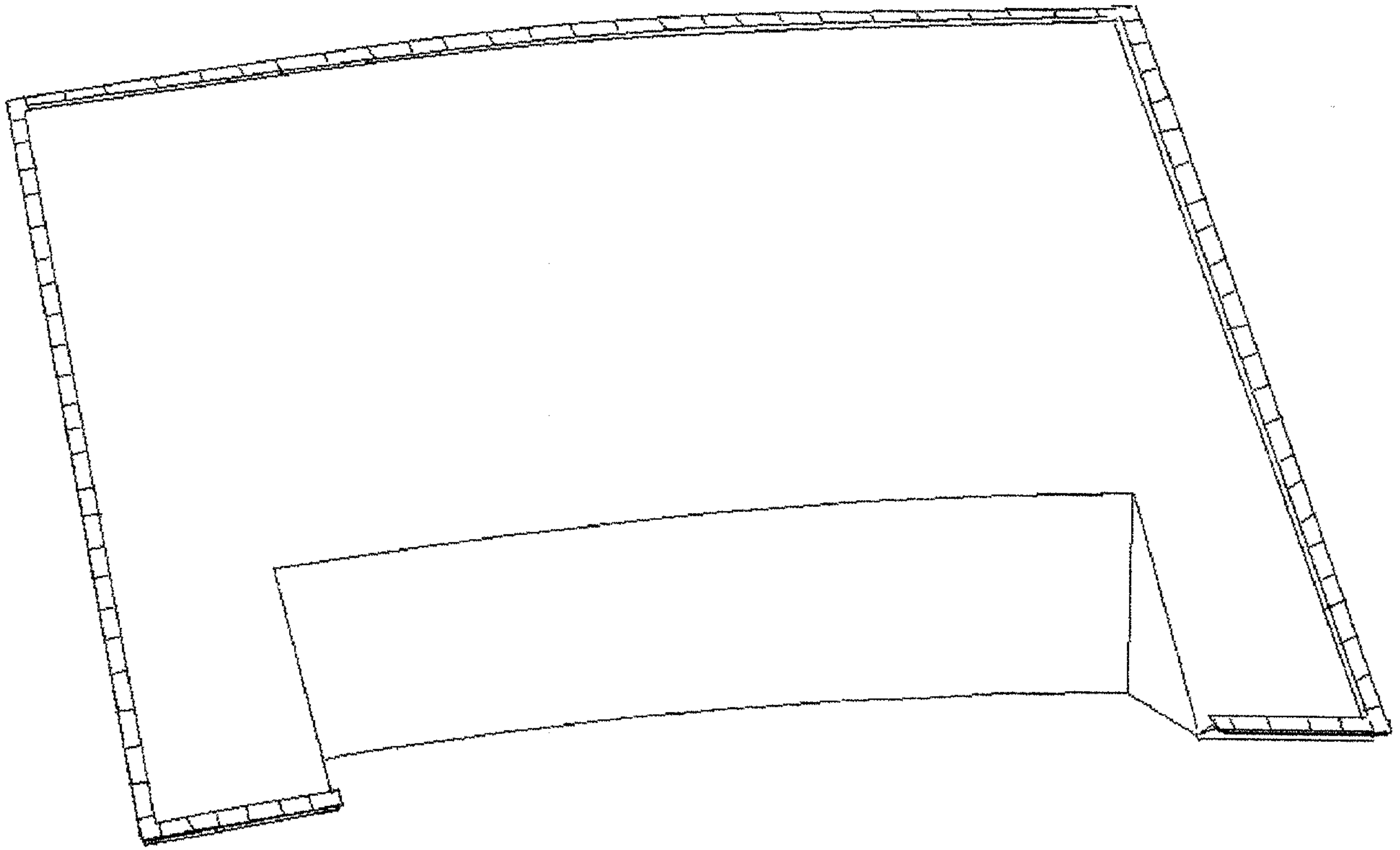


FIG. 5: The shaded T edge surface of the first windshield heating air appliance.

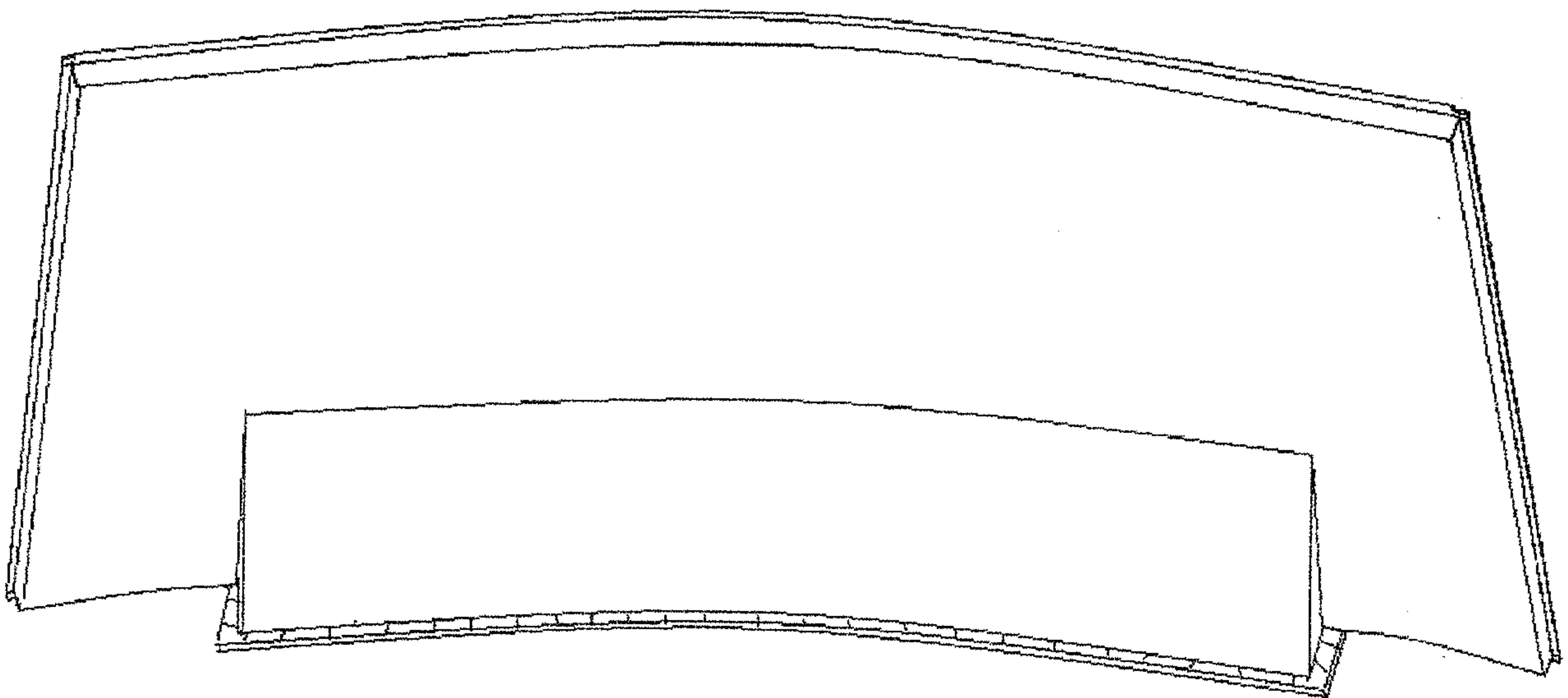


FIG. 6: The shaded dashboard support edge surface.

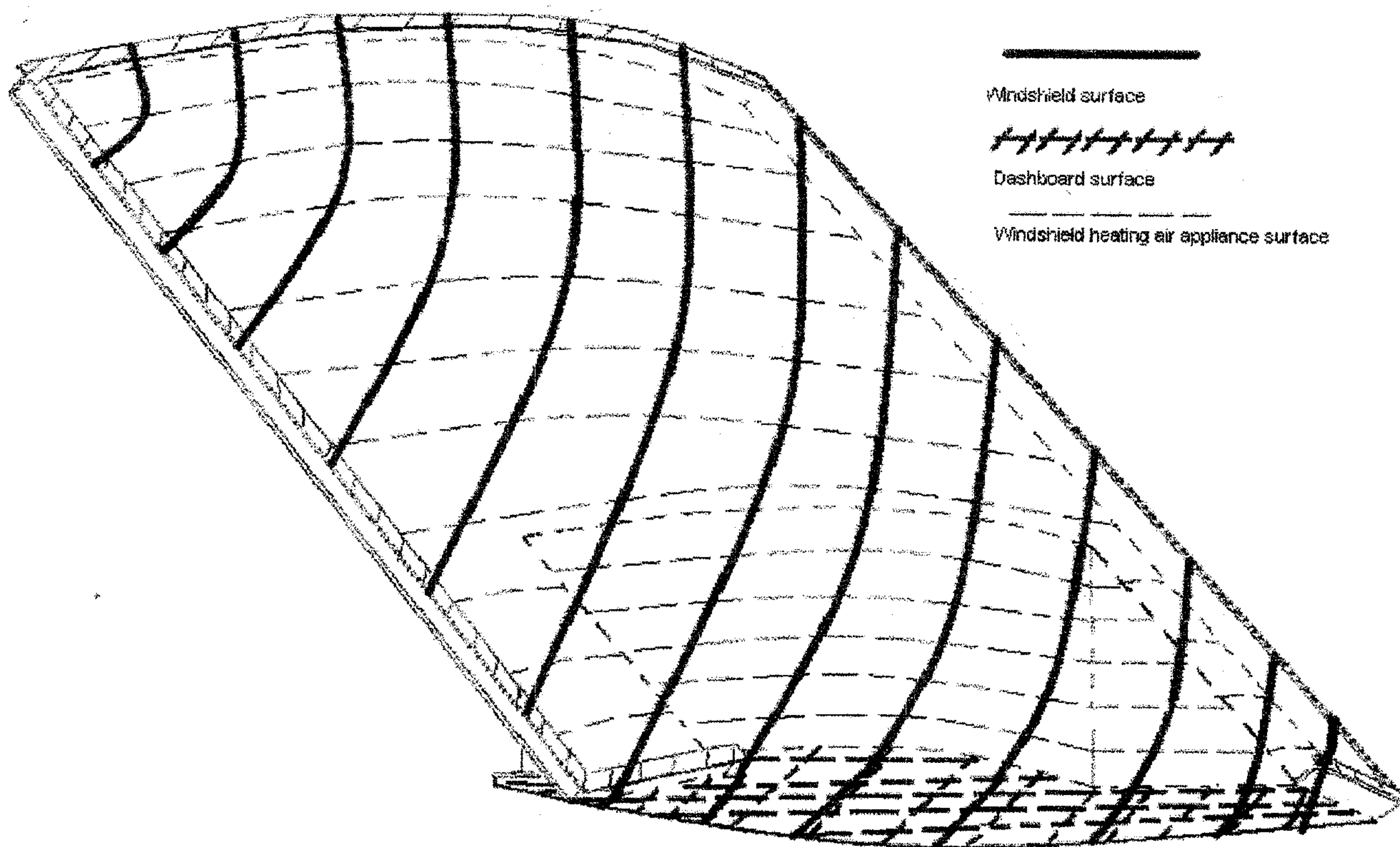


FIG. 7: A view of the first controlled heating air space.

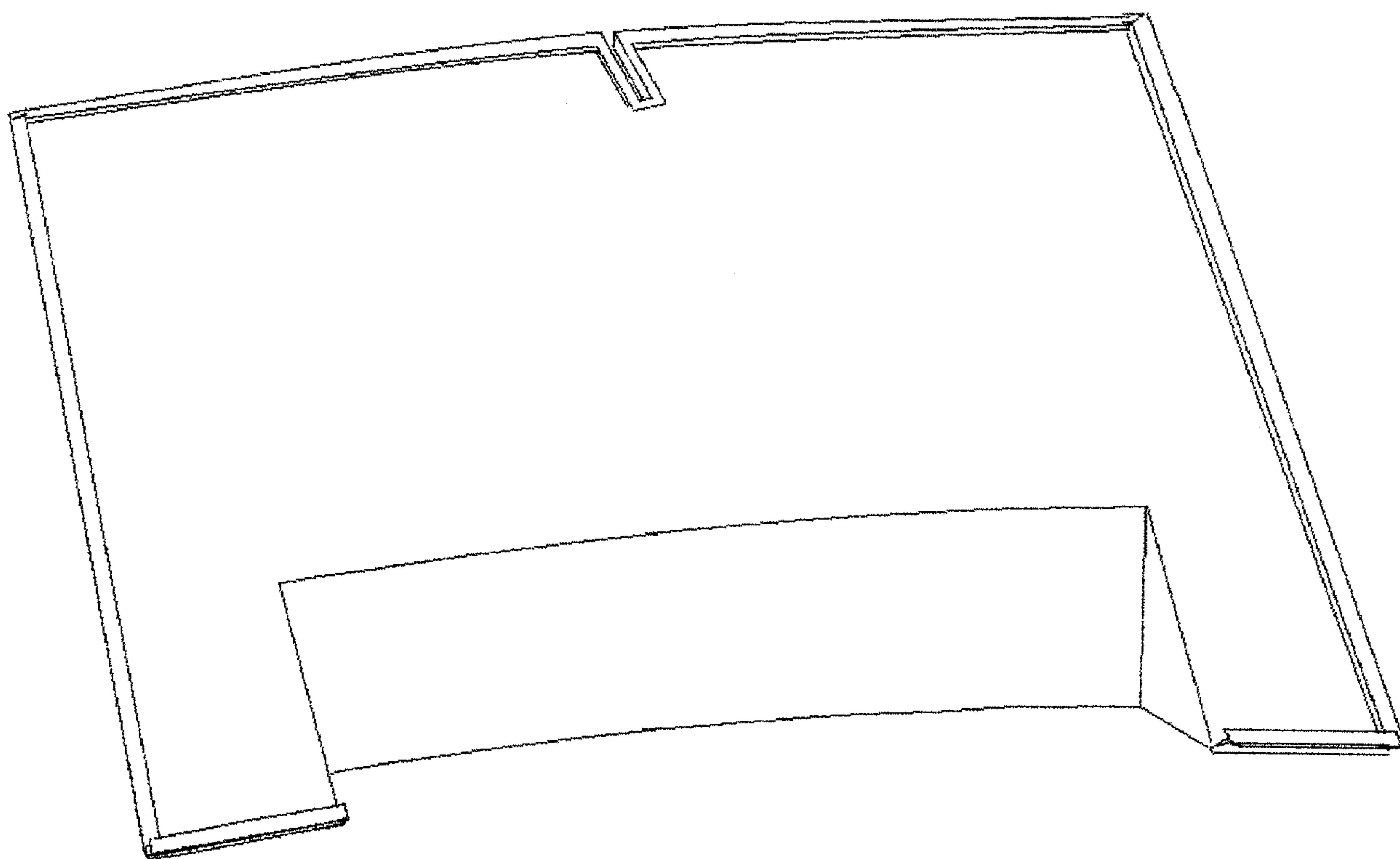


FIG. 8: A front view of the first appliance with an open rear view mirror base path.

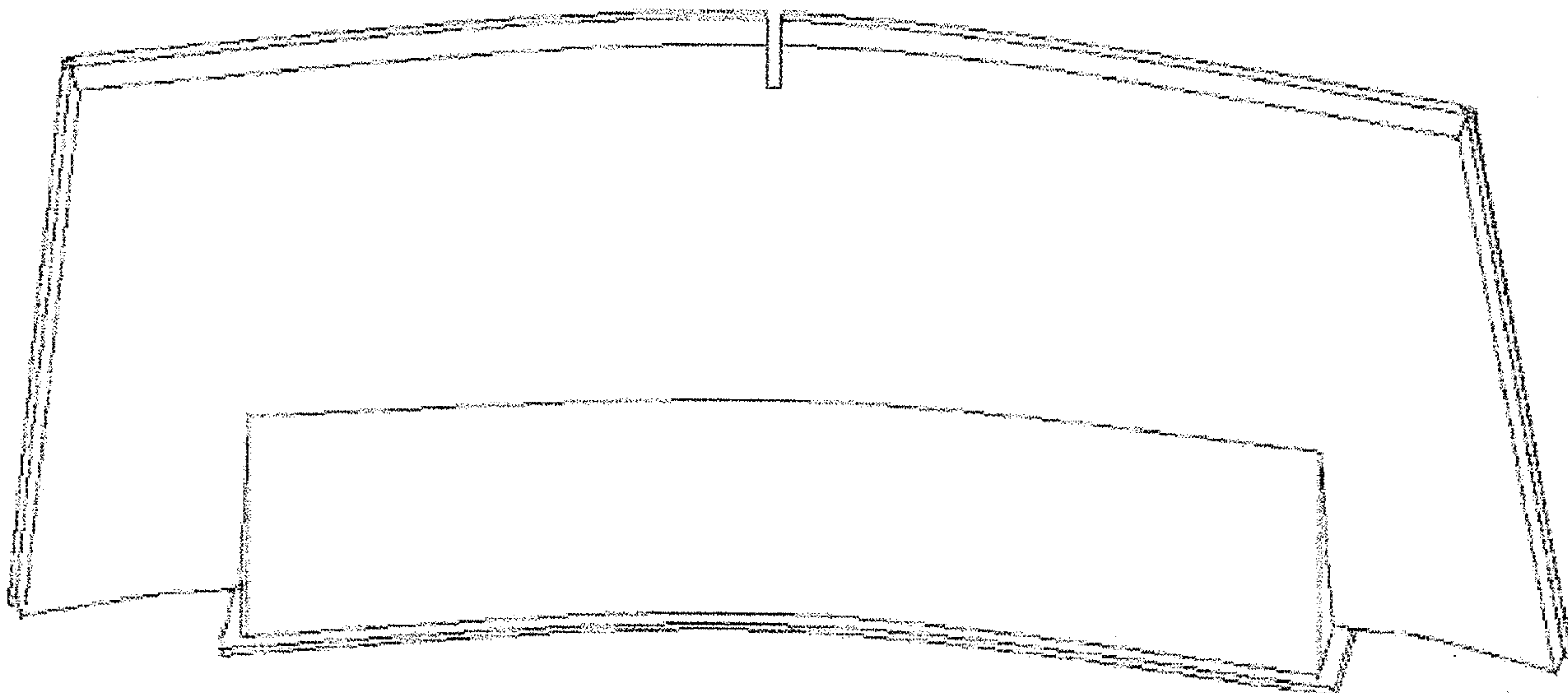


FIG. 9: A back view of the appliance with an open rear view mirror base path.

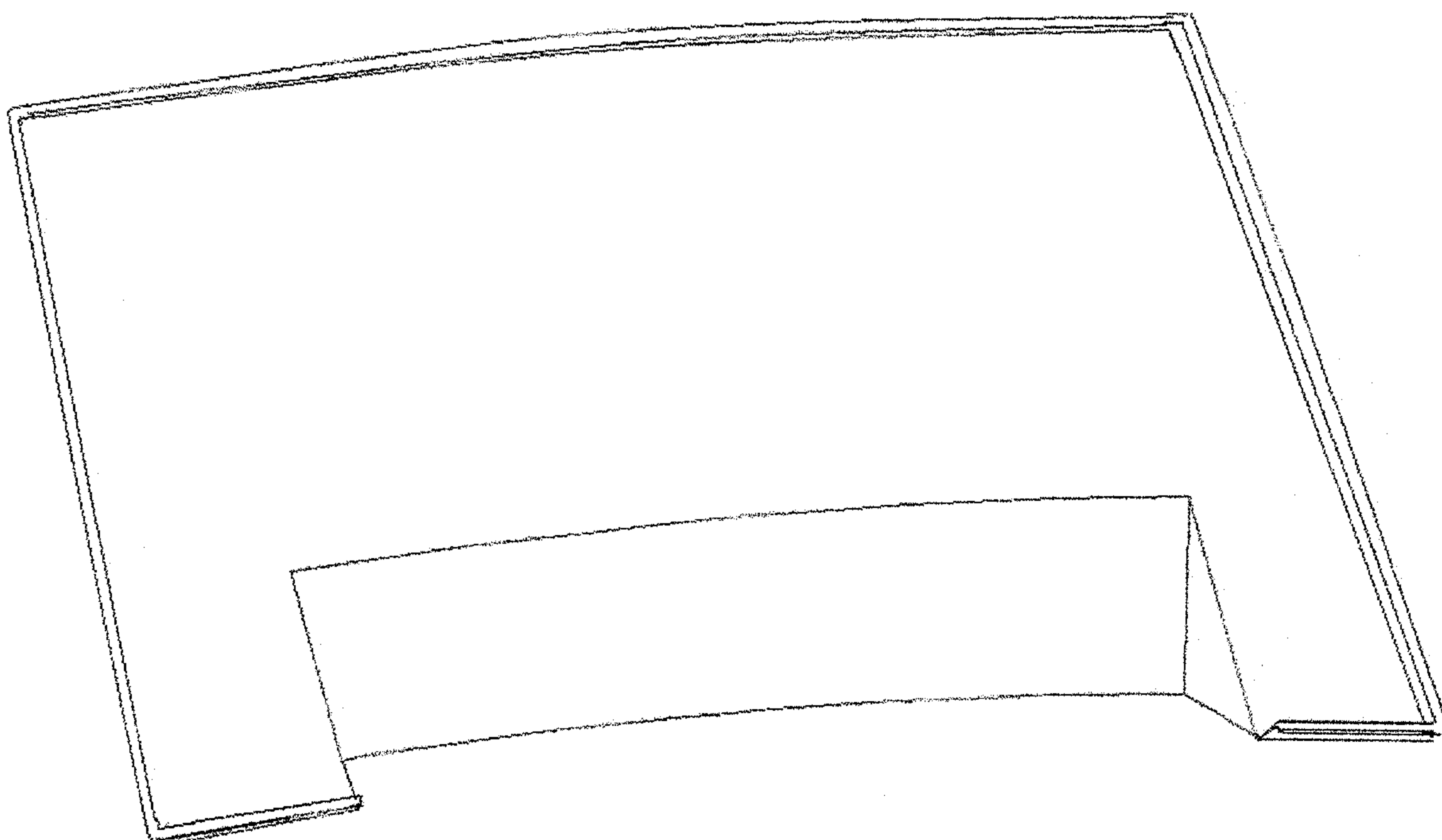


FIG. 10: A front view of the first windshield heating air appliance with L edges.

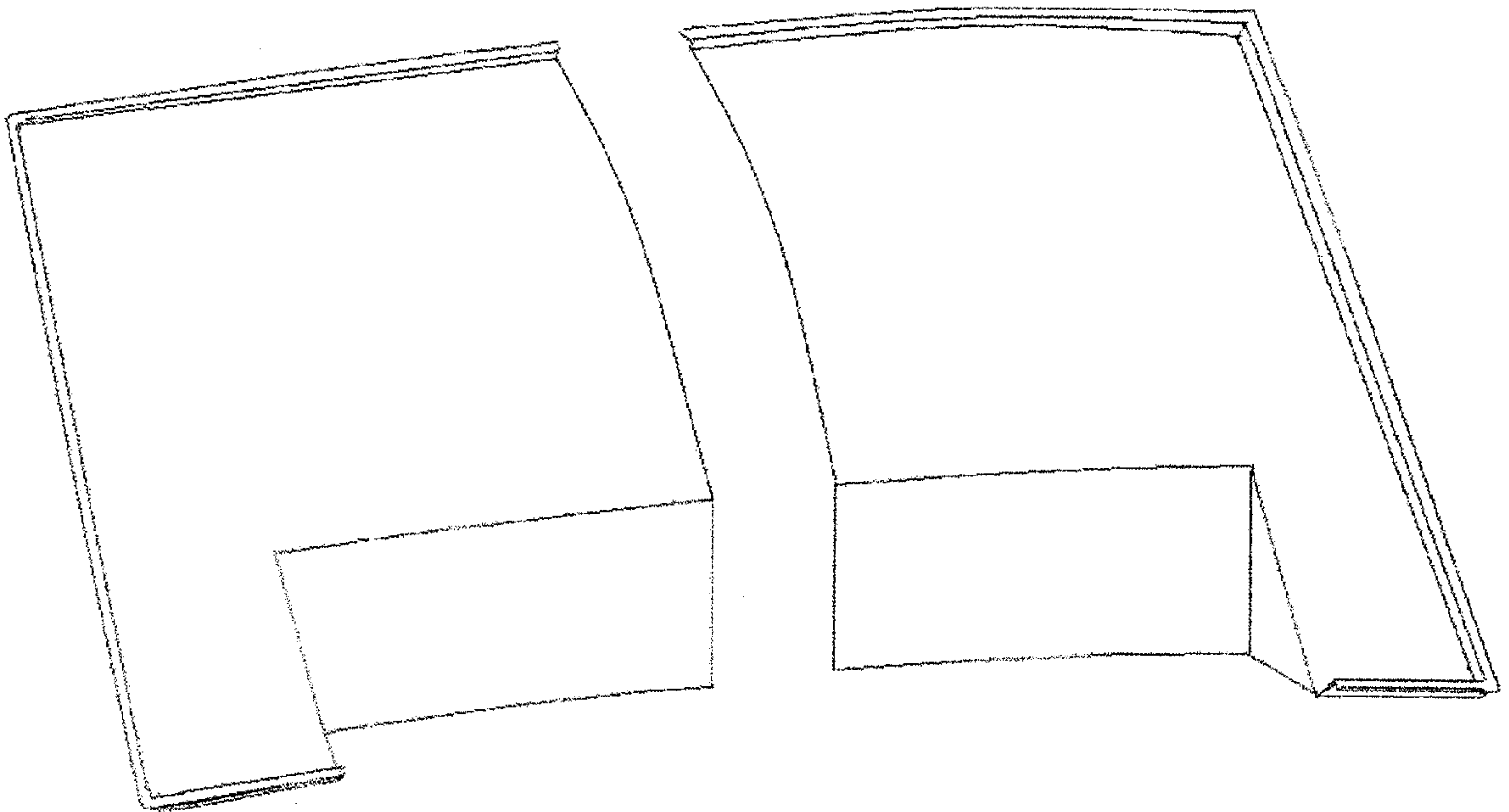


FIG. 11: A front view of the first windshield heating air appliance composed of two symmetric parts.

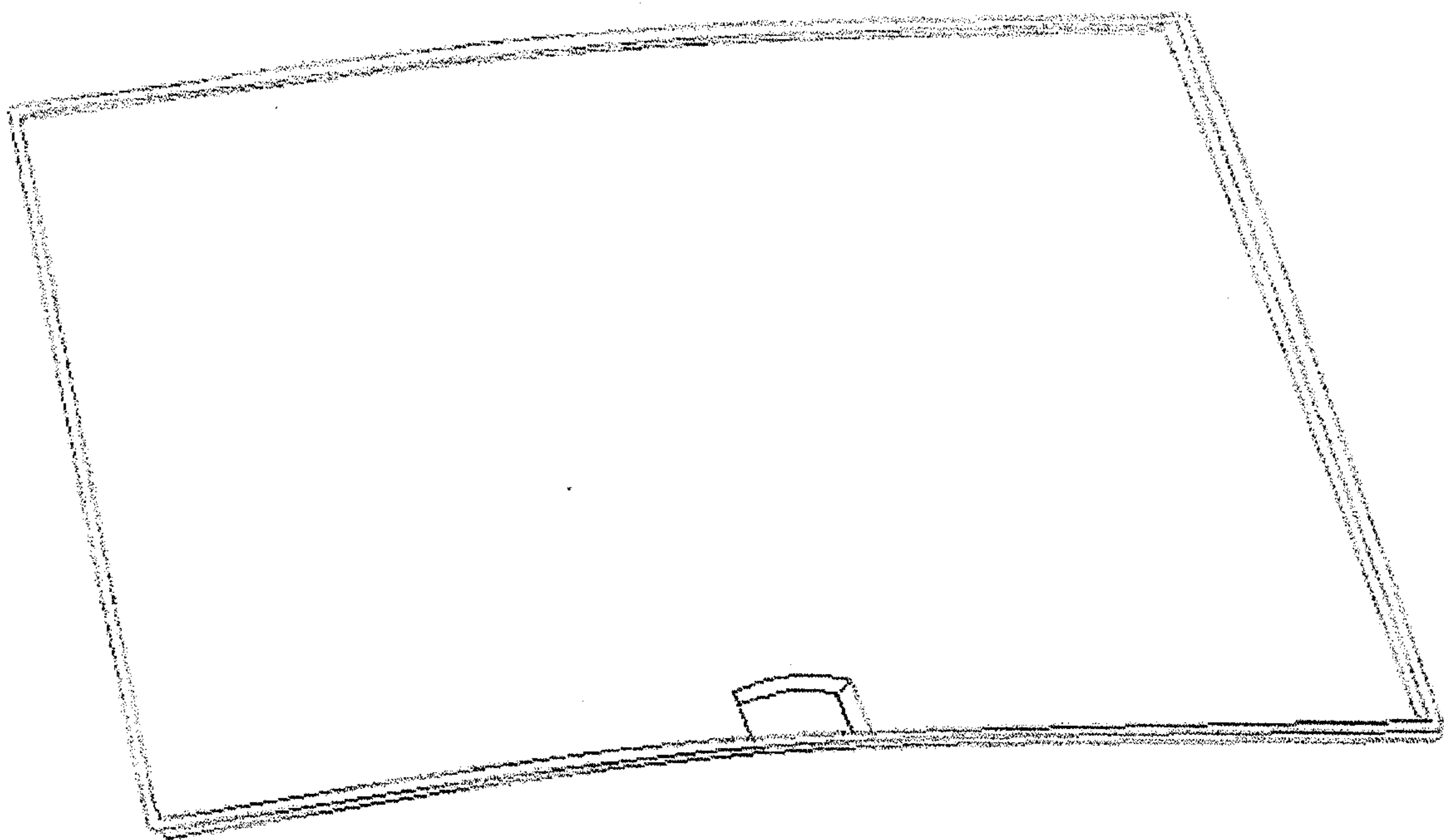


FIG. 12: A front view of the second windshield heating air appliance design.

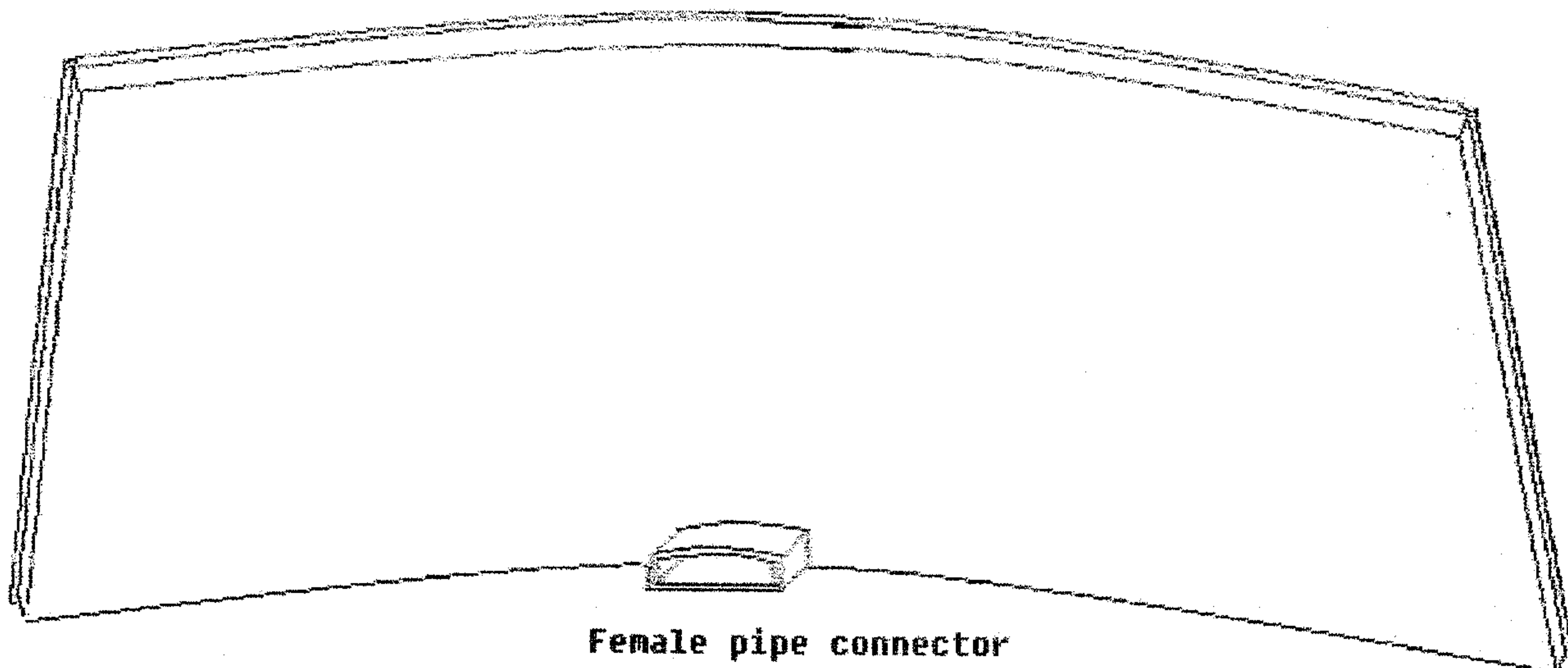


FIG. 13: A back view of the second windshield heating air appliance design.

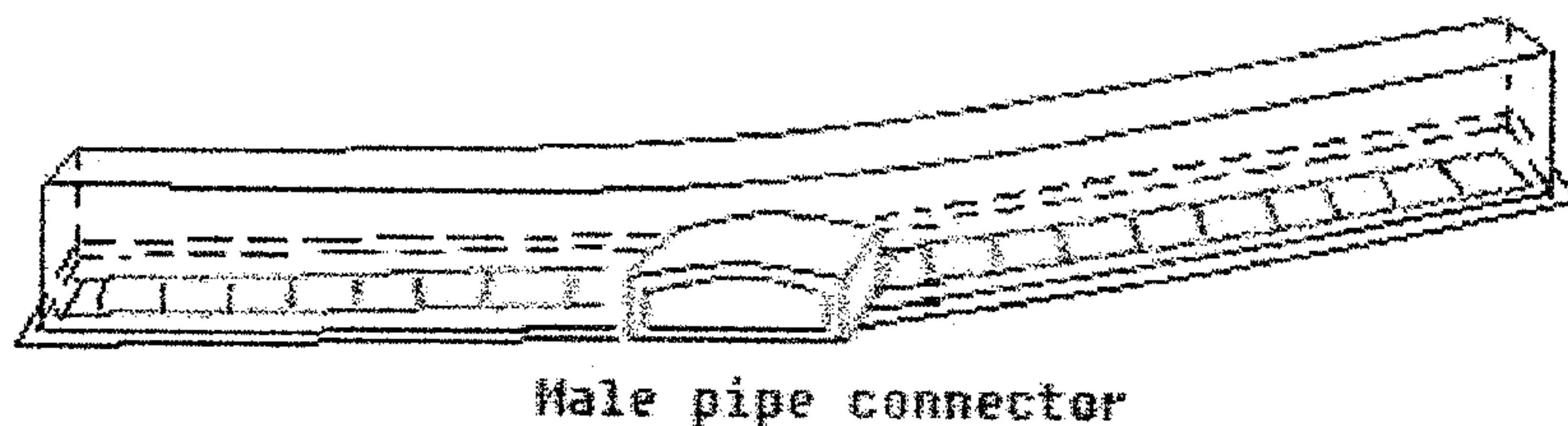


FIG. 14: A front view of the dashboard air vent cover design.

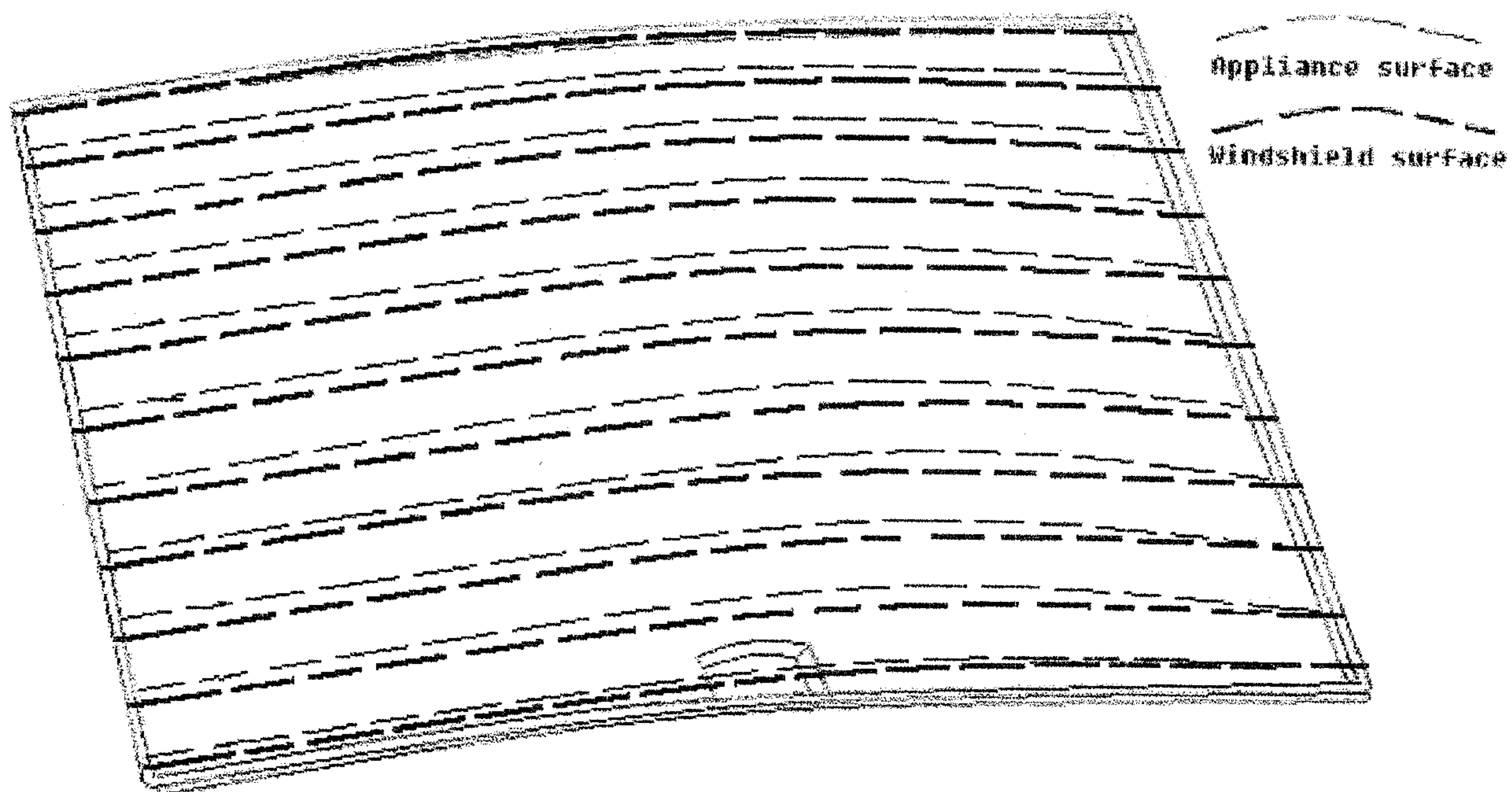


FIG. 15: A view of the second controlled heating air space.

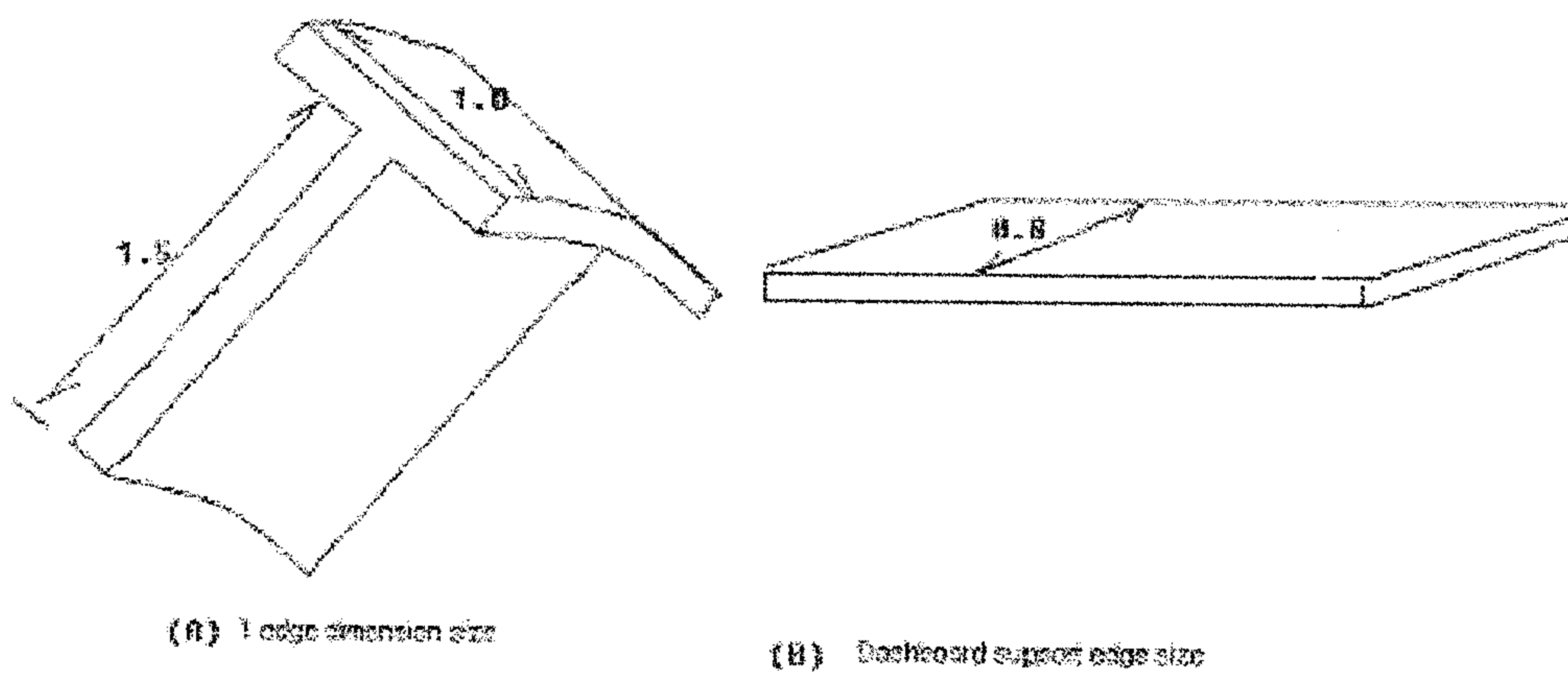


FIG. 16: T edge sizes.

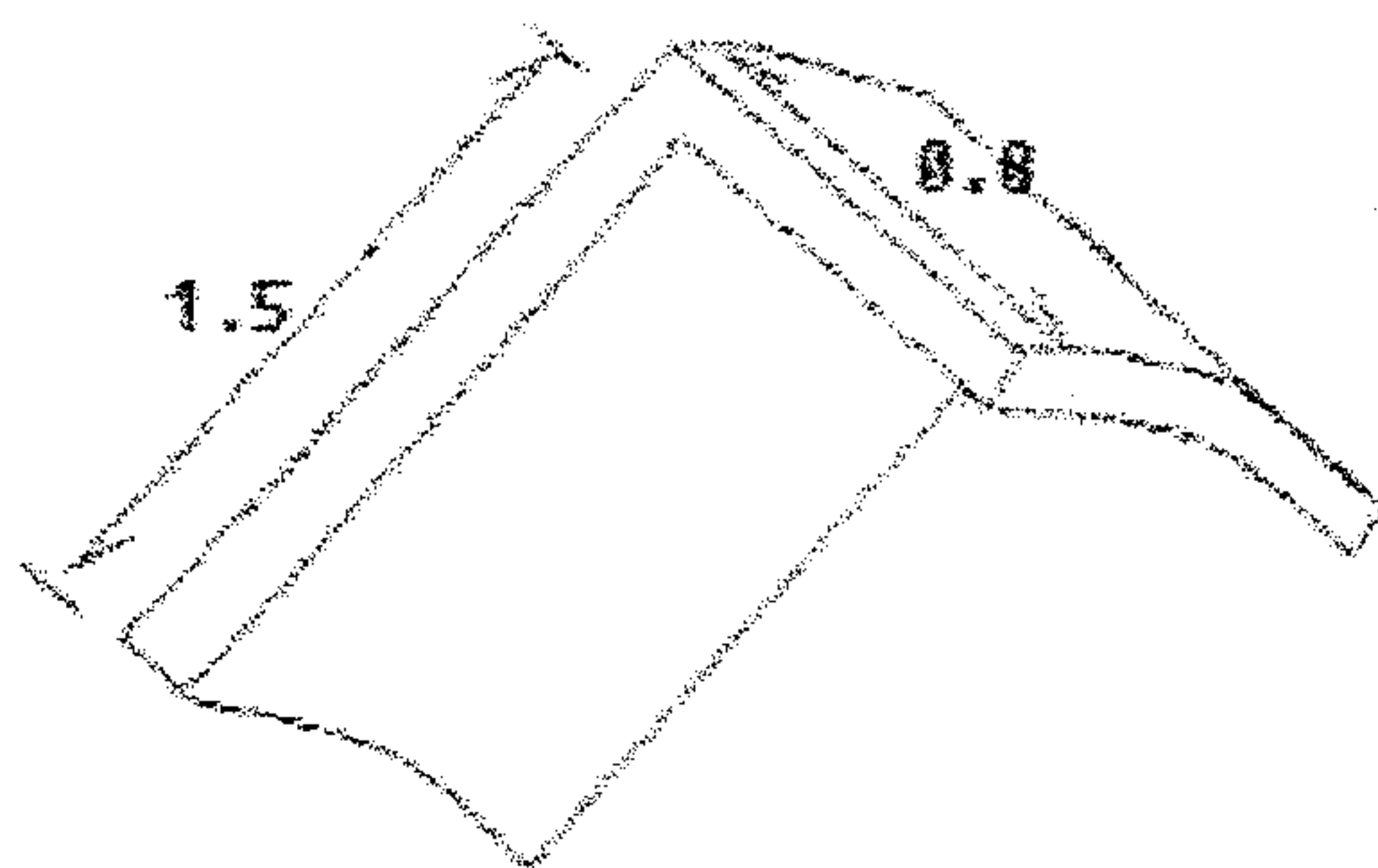


FIG. 17: L edge sizes.

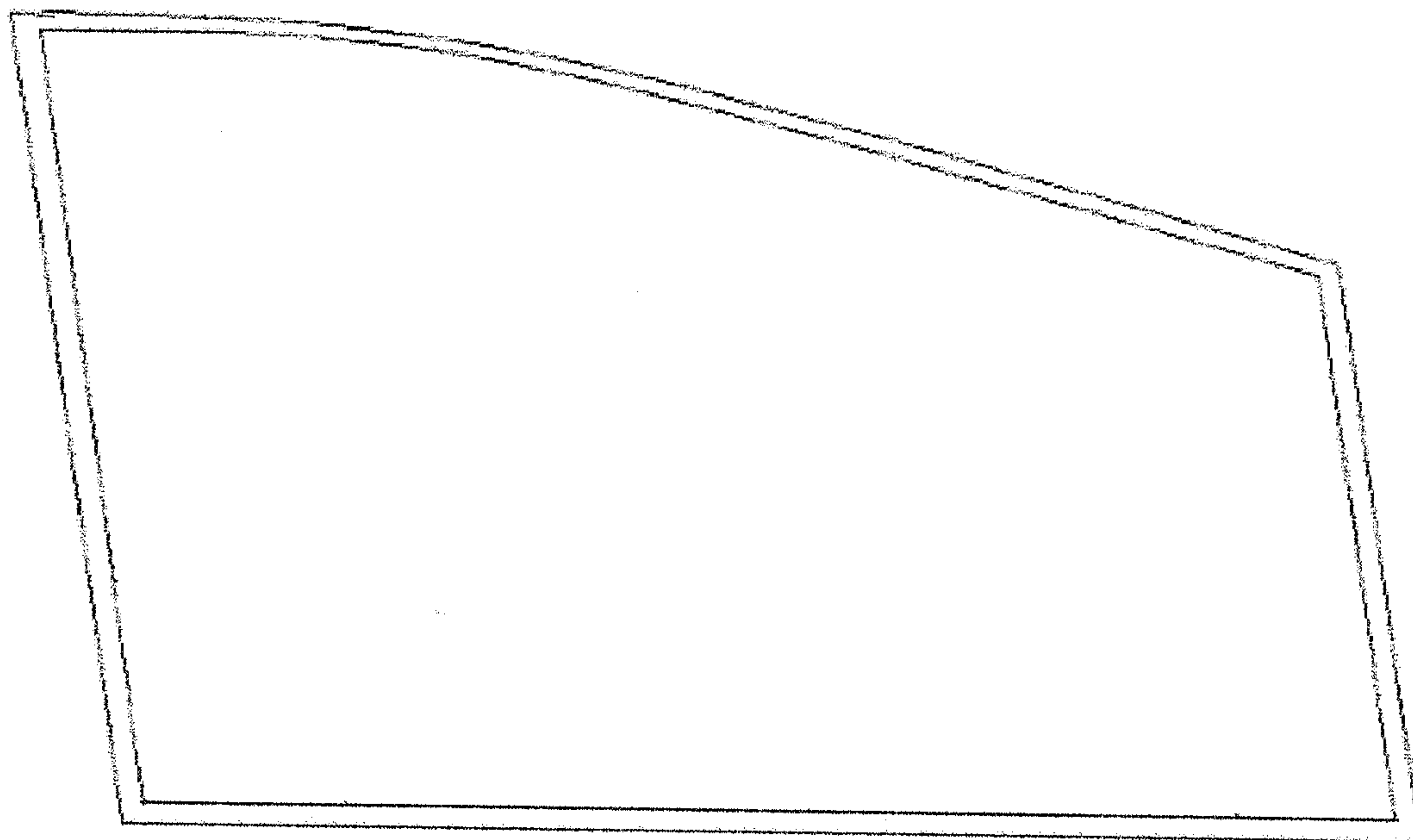


FIG. 18: A front view of the front side window cover.

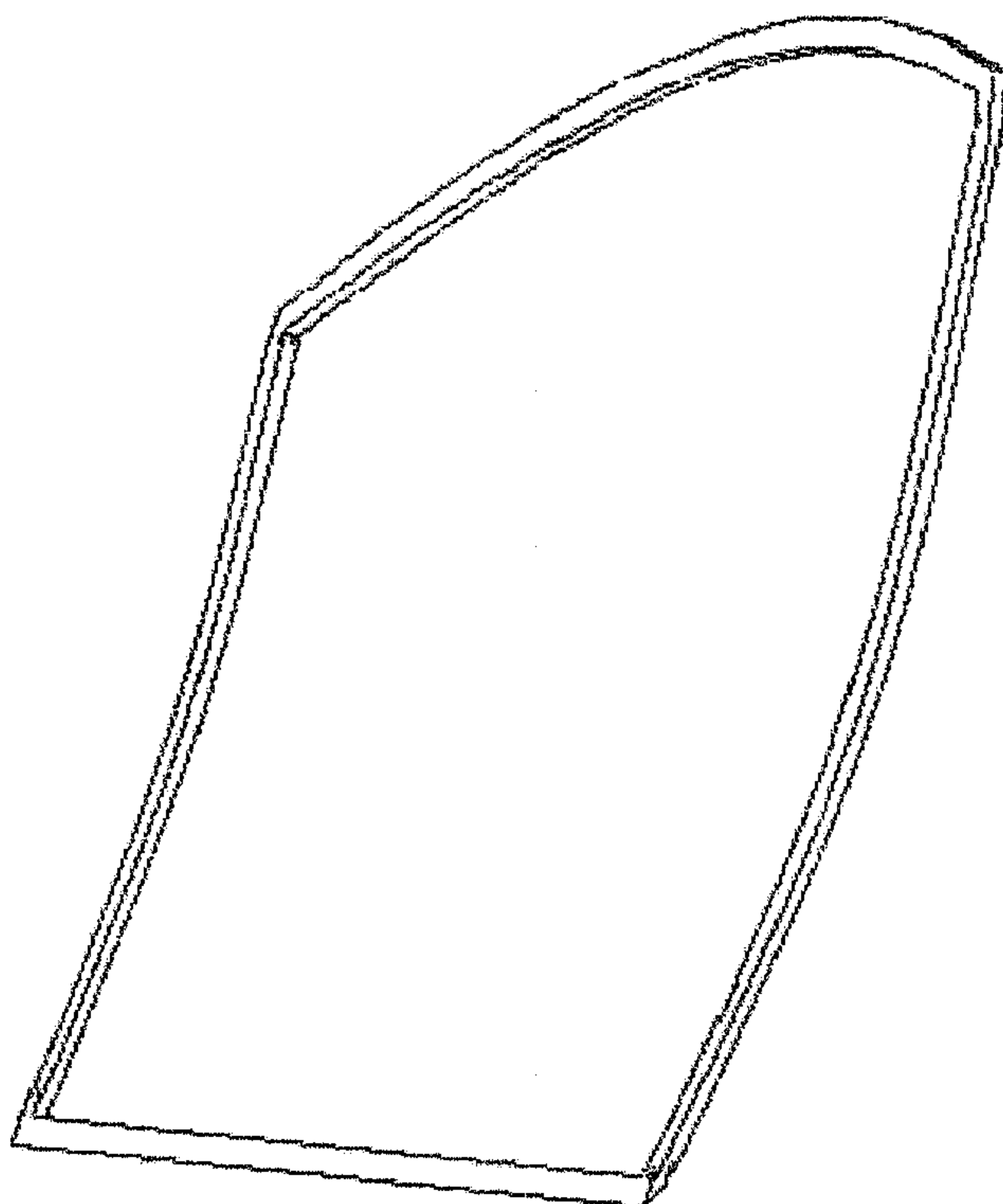


FIG. 19: An isometric view of the front side window cover.

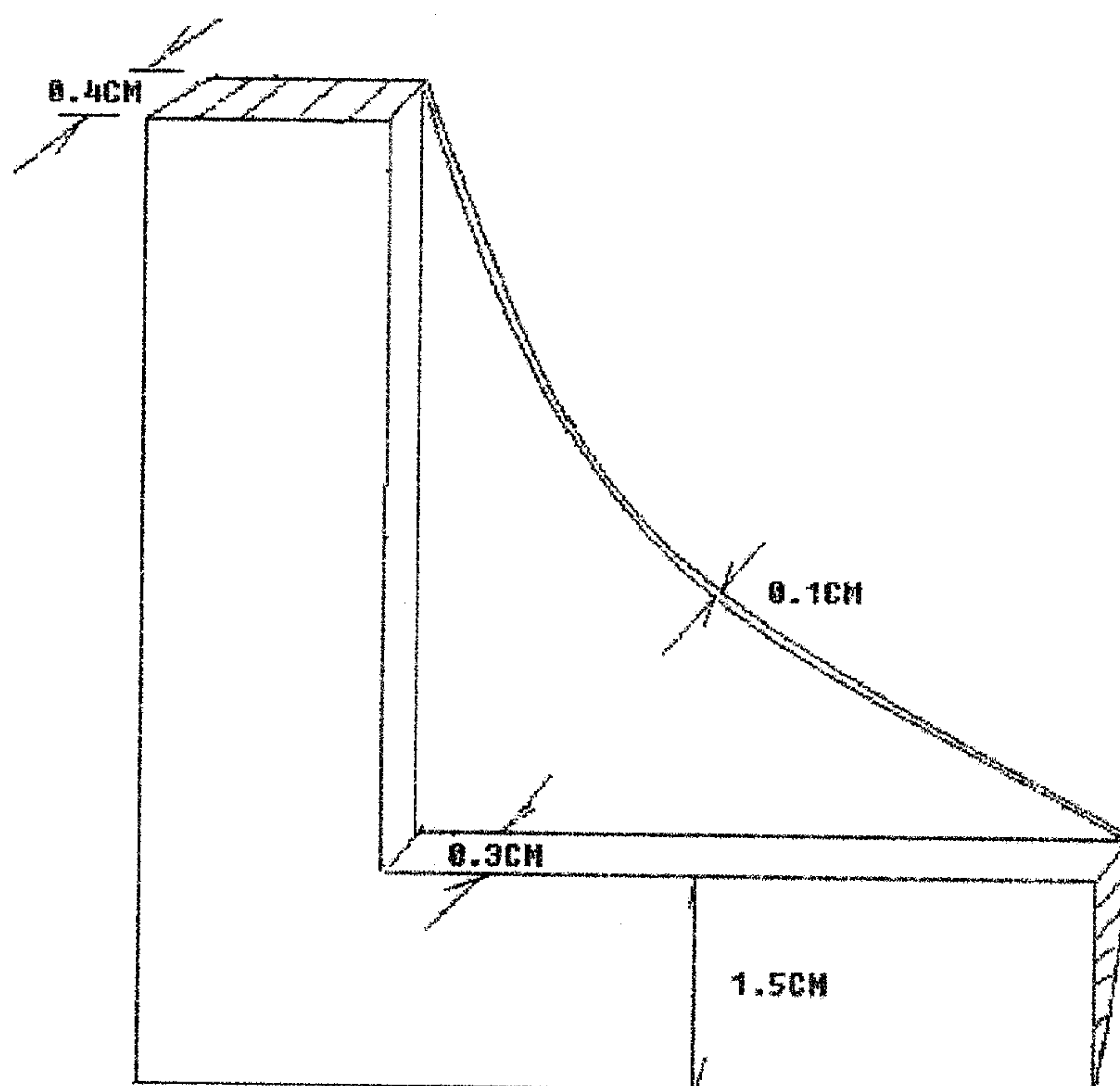


FIG. 20: An isometric view of front side window cover edge sizes.

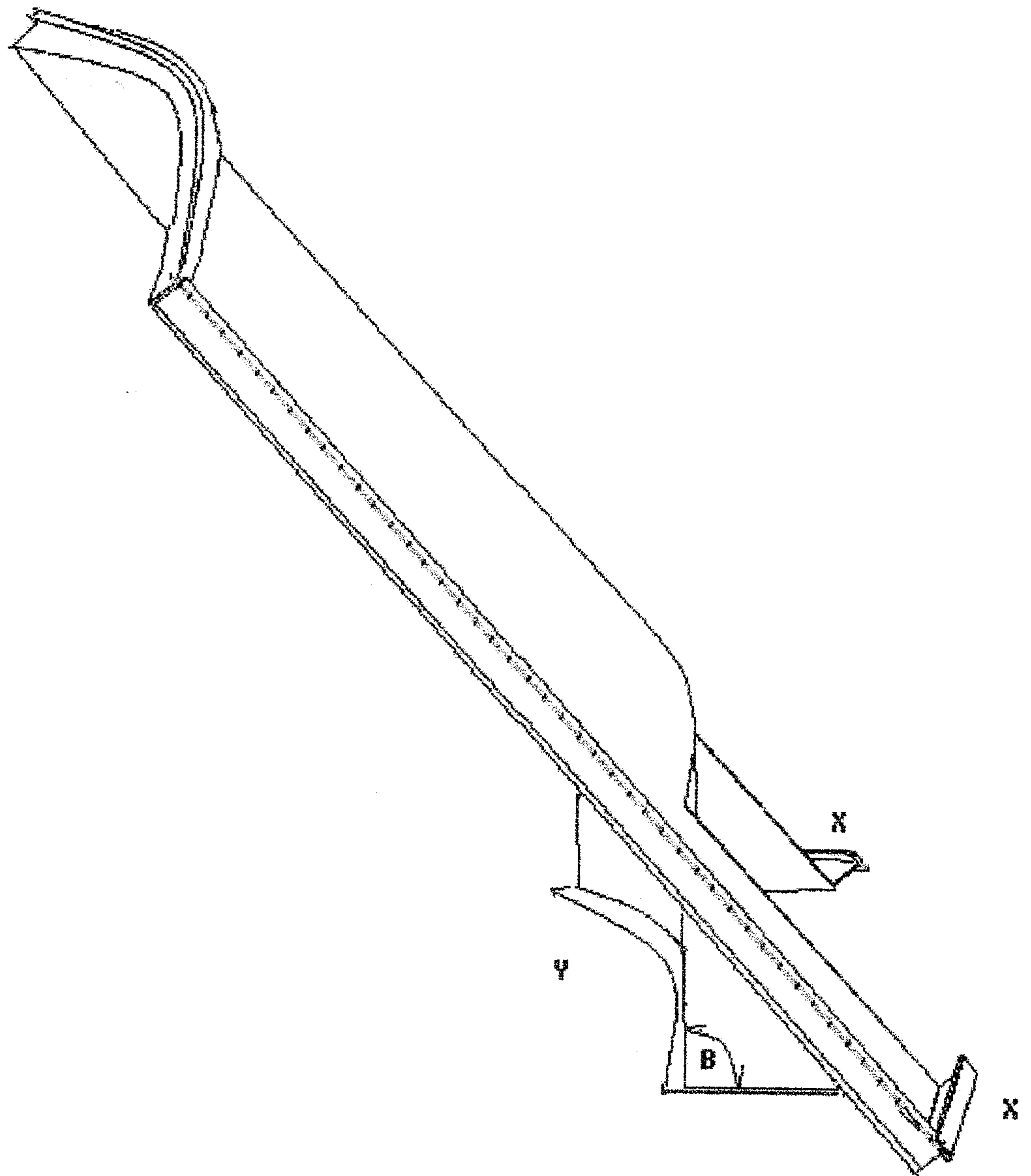
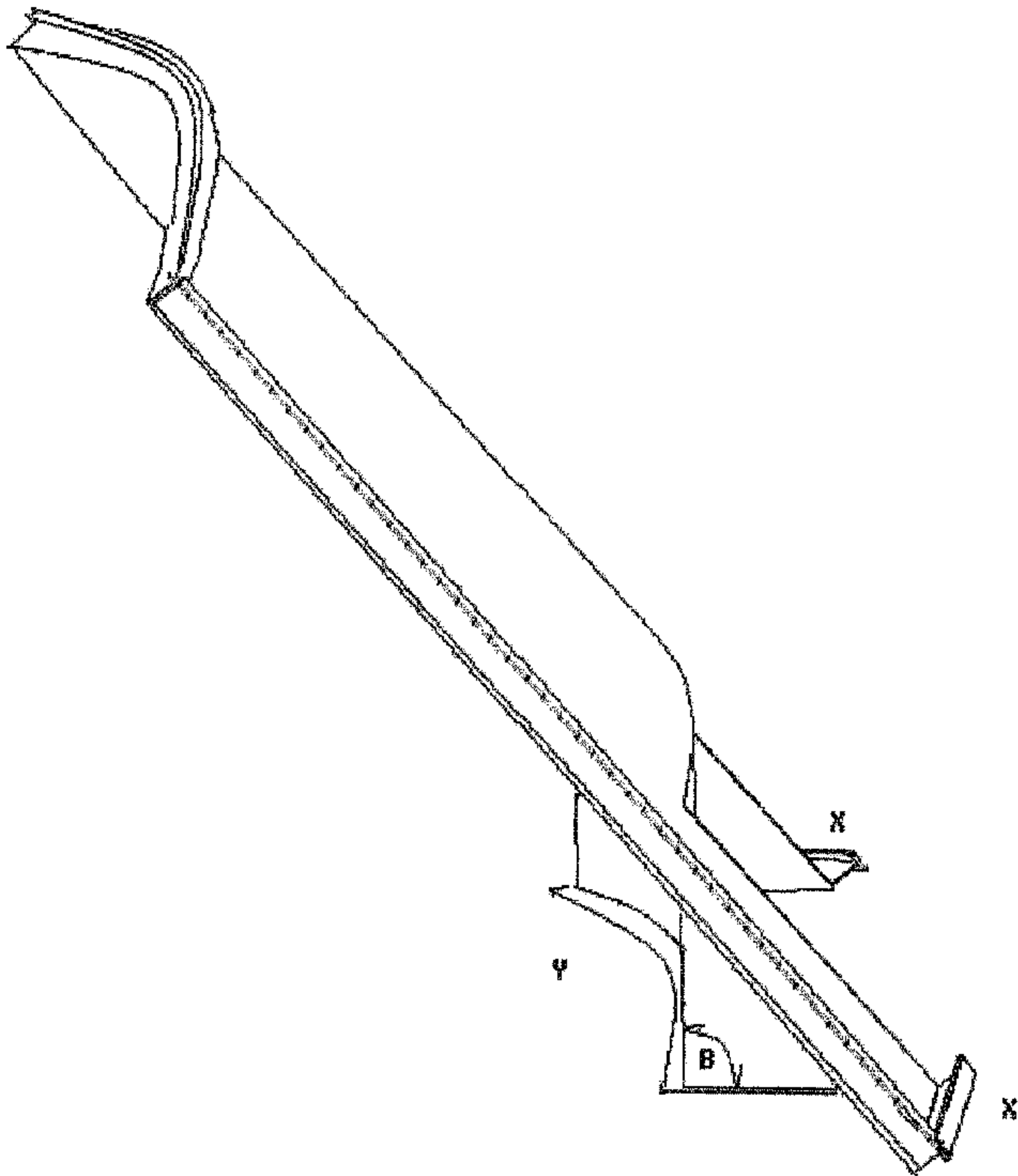


FIG. 21: An isometric view of the first windshield heating air appliance.



An isometric view of the first windshield heating air appliance.