March 4, 1947. C. E. STROUD ET AL 2,416,778

HEATED WINDOW PANEL

Filed Feb. 7, 1945

Fig. 1.

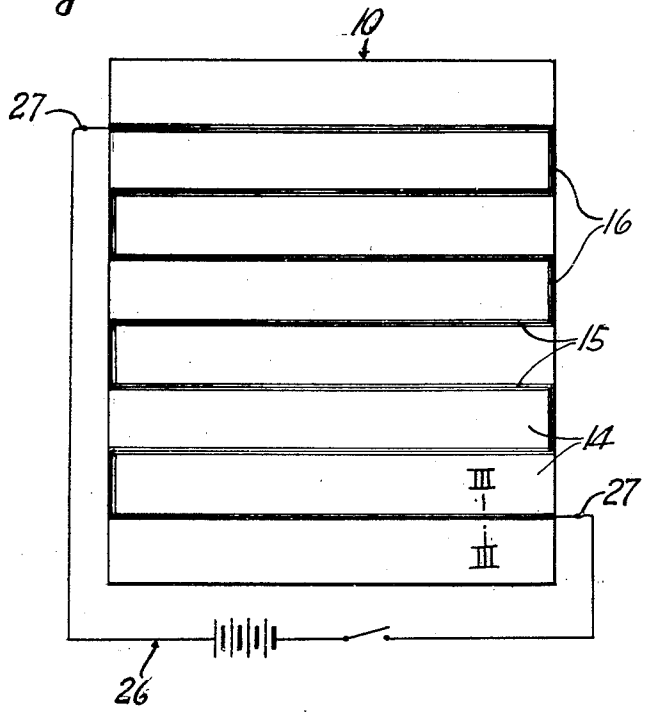


Fig. 2.

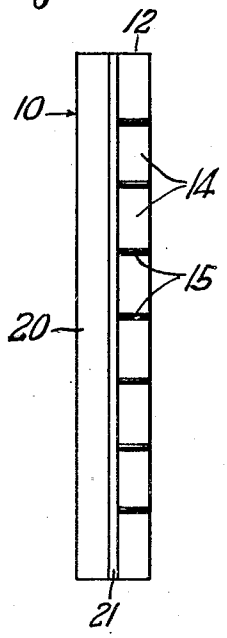
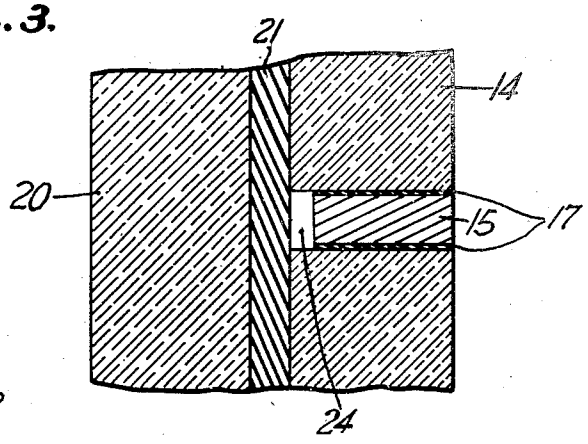


Fig. 3.



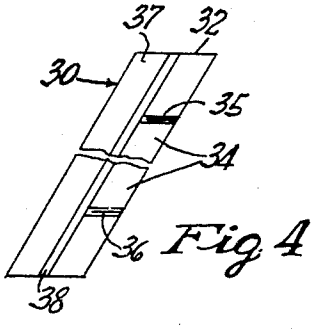


Fig 4

Inventors
CHARLES E. STROUD AND
HERMAN MARINI

By

Olen E. Bee
Attorney

Patented Mar. 4, 1947

2,416,778

UNITED STATES PATENT OFFICE

2,416,778

HEATED WINDOW PANEL

Charles E. Stroud, Ford City, and Herman Marini, New Kensington, Pa., assignors to Pittsburgh Plate Glass Company, a corporation of Pennsylvania

Application February 7, 1945, Serial No. 576,566

3 Claims. (Cl. 219—19)

1

This invention relates to window units and it has particular relation to an arrangement of sectional windows and heating elements designed to maintain the window unit clear of ice, snow, or products of condensation.

One object of the invention is to provide an improved sectional window adapted to be heated by elements passing between adjacent sectional portions thereof.

Another object of the invention is to provide an improved laminated sectional window between adjacent sectional portions of which electric heating elements are so disposed as to insure heating of the unit without materially obscuring vision therethrough.

In one form of the invention a series of window sections are built up in successive edge to edge relation and a continuous electric conductor is disposed between adjacent edges of the sections. Terminals of the conductors are adapted to be connected to a conventional electric heating means. In one example of the invention it is proposed to use a conductor composed of thin strip material which can be effectively laminated between adjacent sections of the window and which provides considerable surface area for heating purposes. The sectional panel can be laminated with one or more unbroken sheets of glass.

In the drawing:

Fig. 1 is a side elevation of a sectional window in which the invention has been included; Fig. 2 is an edge elevation of the window; Fig. 3 is a fragmentary vertical section, on a larger scale, taken substantially along the line III—III of Fig. 1; and Fig. 4 is a fragmentary edge elevation of a sloping window in which the invention has been included.

Referring to Figs. 1 to 3 a sectional window 10 comprises a sectional panel 12 which is built up by arranging a series of parallel sections 14 in substantially the same plane and in edge to edge relation. Metal strip material 15, such as copper, tin, aluminum, lead, etc., is disposed between the adjacent edges of the sections 14. It has been found that metal of approximately .005 inch thickness is satisfactory for the purposes of this invention. The strip constituting this conductor can be in the form of metal foil and is trained back and forth alternately around the ends of the sections, as indicated at 16, to form a continuous member from section to section of the panel 12. Since the conductor is in tape or strip form considerable surface area for heating purposes is available along the adjacent edges of

2

the sections. Opposite sides of the conductor are coated with a suitable adhesive 17 which is of such character as to serve efficiently in laminating glass articles.

A backing panel of glass 20 is laminated with the sectional panel 12 by means of an adhesive interlayer 21 composed of transparent substance such as vinyl acetal resin. It will be observed that the width of the conductor 15 and the adhesive thereon is slightly less than the thickness of the sections 14 (Fig. 3) thereby leaving a small space 24 between the conductor and the interlayer 21. Heat from the conductor 15 is therefore concentrated on the edges of the sections 14 and the space 24 prevents direct transfer of heat from the conductor to the interlayer 21.

In the completed window unit vision through it is directed substantially toward the edges of the thin conductor and hence the latter does not offer appreciable obstruction while, at the same time, the conductor includes considerable heating area along the edges of the sections 14. An electric heating unit 26 diagrammatically illustrated in Fig. 1 is connected, as indicated, at 27 to the terminal portions of the conductor.

In certain types of constructions, such as those designed for land vehicles and airplanes, windows or windshields are usually disposed in sloping position. An example of a window unit 30 of this kind is shown in Fig. 4. In such example a sectional panel 32 is composed of sections 34 having beveled edges 35 in order that the surfaces of these edges can be arranged in horizontal planes while the sections themselves are properly aligned in a common sloping plane. Strip material 36 of the same form as the conductor 15 also serves the same purpose in this arrangement. Likewise the sloping window unit 30 includes an unbroken panel 37 laminated with the sectional panel 32 by means of an interlayer 38 and in the same manner as the panels 12 and 20 are laminated.

From the foregoing description it will be apparent that the conductor or heating elements 15 and 36 are adapted to transmit heat to the window in such manner as to distribute it uniformly and to maintain the window clear of ice, fog, frost, or snow. Since the conductor is thin and is viewed edgewise by an operator of a vehicle, it is not a material obstruction to clear vision.

Although illustrative forms of the invention have been shown and described in detail, it will be apparent to those skilled in the art that the invention is not specifically limited to such forms but various changes can be made therein with-

out departing from the spirit of the invention or from the scope of the appended claims.

We claim:

1. In a laminated window, a sectional glass panel including a series of glass sections aligned in substantially edge to edge relation, a conductor of strip metal foil disposed between adjacent sections and passing about alternate ends of such sections to form a continuous member, a plate of glass laminated with the sectional panel and having an adhesive interlayer securing said plate and panel in face to face relation, said strip material being disposed edgewise with respect to the plane of the glass plate to offer minimum obstruction to vision through the window and having terminals for connection to an electric heating unit.

2. In a laminated window, an adhesive resinous interlayer, a solid glass panel and a sectional glass panel adhered to opposite sides of the interlayer, said sectional panel including sections arranged substantially in edge to edge relation and having opposed edge surfaces disposed substantially parallel, and an electric conductor of metallic tape form disposed parallel to and between adjacent edges of the sections and having terminals for connection to an electric heating unit, the inner edge of said conductor being spaced from said interlayer.

3. In a window construction adapted for vision therethrough along substantially horizontal lines, a series of glass sections aligned in substantially the same plane and having opposed edges of adjacent sections disposed in substantially horizontal planes, a metal conductor in strip foil form disposed between adjacent edges of the sections and trained around extremities of the sections beyond the opposed edges to define a continuous electric conductor, and adhesive material bonding adjacent edges of the sections to opposite sides of the foil conductor, the sides of the metal foil being disposed substantially flatwise with respect to the edge surfaces of the sections and also being substantially parallel to horizontal lines of vision through said sections.

CHARLES E. STROUD.
HERMAN MARINI.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,803,787	Bour	May 5, 1931
2,222,742	Ducret et al.	Nov. 26, 1940