June 19, 1923. 1,459,318

E. H. BIRDSALL

RADIATOR AIR CIRCULATION CONTROL DEVICE

Filed May 1, 1922

Fig. 1

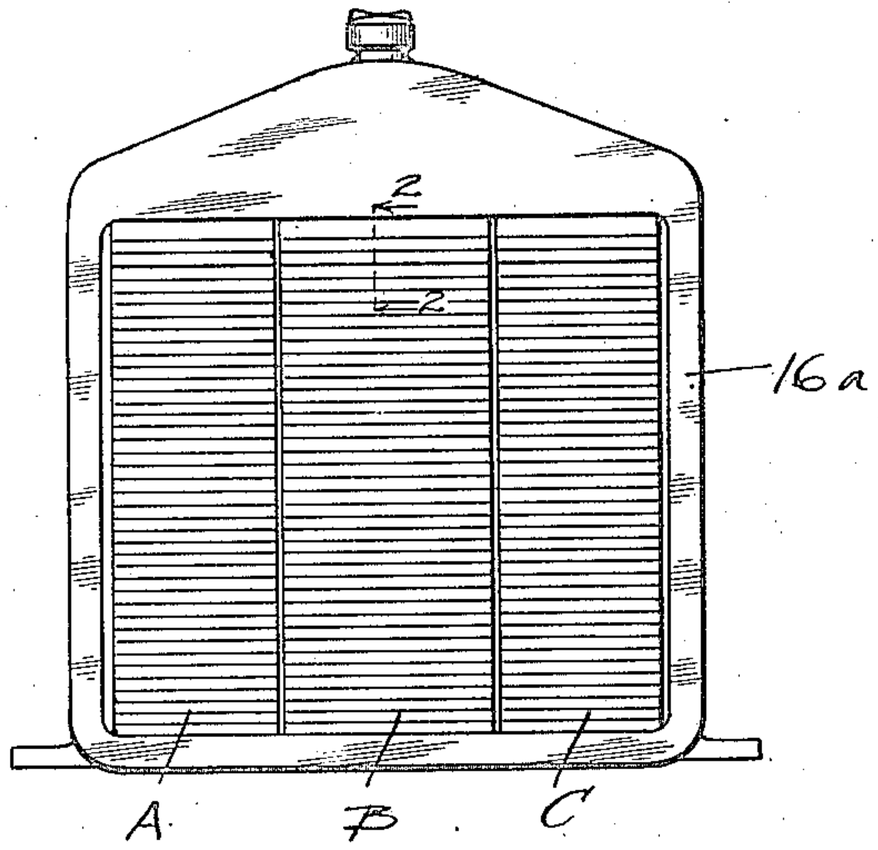


Fig. 2

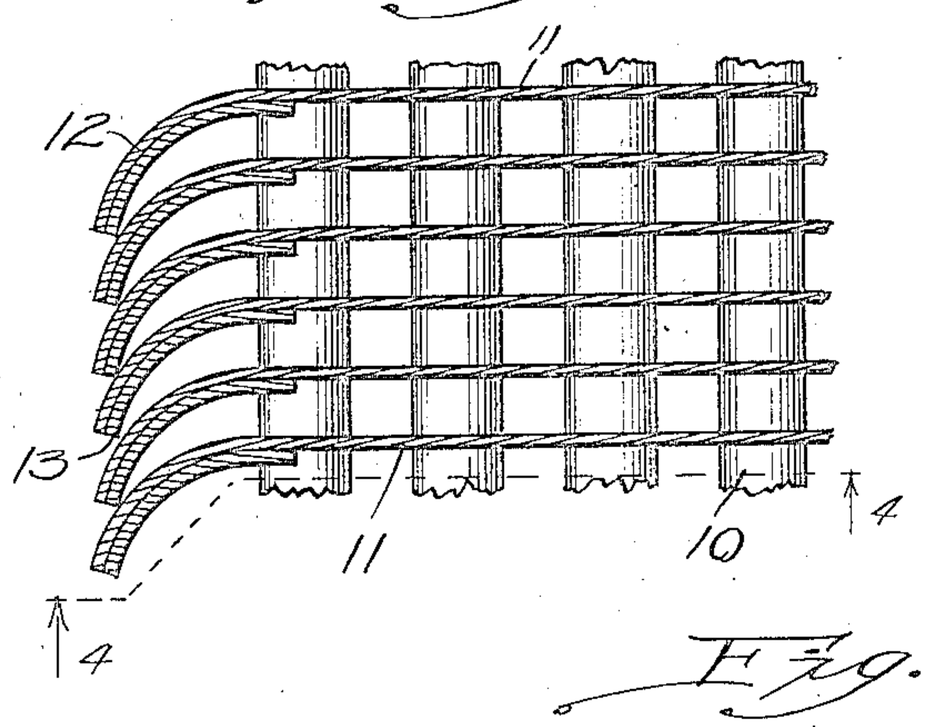


Fig. 3

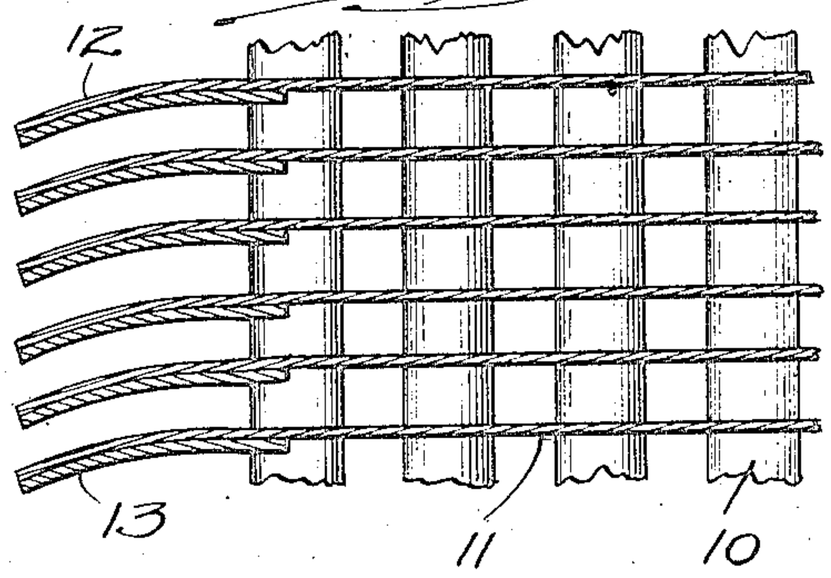


Fig. 4

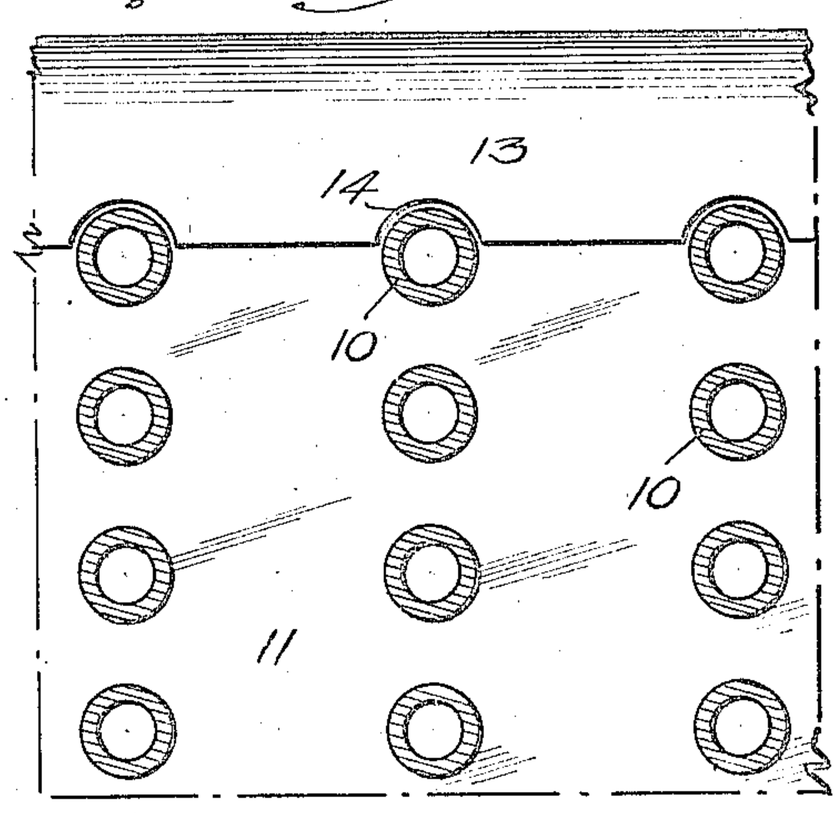
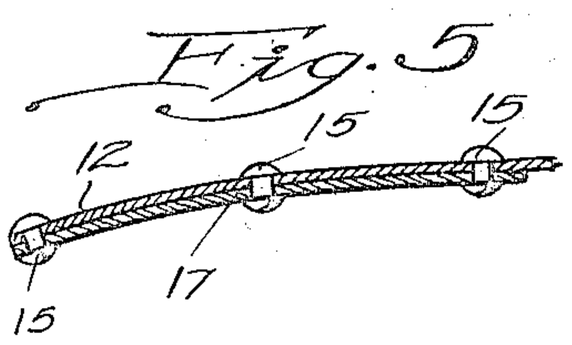


Fig. 5



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UNITED STATES PATENT OFFICE.

EDWIN H. BIRDSALL, OF THORNTON, IOWA.

RADIATOR AIR-CIRCULATION-CONTROL DEVICE.

Application filed May 1, 1922. Serial No. 557,579.

To all whom it may concern:

Be it known that I, EDWIN H. BIRDSALL, a citizen of the United States, and a resident of Thornton, in the county of Cerro Gordo and State of Iowa, have invented a certain new and useful Radiator Air-Circulation-Control Device, of which the following is a specification.

The object of my invention is to provide a radiator air circulation control device, comprising a part of a radiator of the kind used on motor vehicles and the like.

More particularly, it is my object to provide a radiator used for motor vehicles, having as a part of its structure, front means for automatically opening or closing, depending upon the temperature, such structure, for thereby controlling the passage of air through the radiator.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a front elevation of a radiator having as a part thereof, an air control device embodying my invention.

Figure 2 shows a vertical, sectional view taken on the line 2—2 of Figure 1, illustrating the air control device in one of its positions.

Figure 3 is a similar view, showing the air control device open.

Figure 4 shows a horizontal, sectional view taken on the line 4—4 of Figure 2; and

Figure 5 shows a detailed, vertical, sectional view somewhat enlarged of a slightly modified portion of the structure, as shown in Figure 2.

It is well-known that in climates where there is considerable variation in temperature, it is desirable to be able to regulate the amount of cold air that is admitted at the front of a radiator so that in cold weather, the amount of air drawn through a radiator and between the tubes thereof may be reduced, while in warmer weather, the free circulation of air may be permitted.

In some instances, automobiles and similar vehicles are provided with shutter structures mounted in front of the radiator and adapted to be mechanically operated.

It is my purpose to mount on the radiator as a part thereof, a device, which will automatically open and close for regulating the admission of air according to variations in temperature.

In the accompanying drawings, I have shown a radiator of the type having the water conducting tubes, indicated by the reference character 10. These tubes are spaced and held in position by means of the so-called fins or thin plates 11.

In the type of radiator now under consideration, the fins 11 are made to project forwardly a substantial distance from the front of the radiator, and the projecting portions, I have indicated by the numeral 12.

I preferably divide these projecting portions 12 into three sections along vertical lines, as indicated in Figure 1 at A, B and C.

Underneath the projecting members 12 of the respective sections, I mount plates 13 of a metal having a different and great coefficient of expansion than that of the projecting portions 12.

The plates 13 are preferably provided at their rearward edges with notches 14 to partially receive the forward tubes 10, as shown for instance in Figures 2 and 4.

The plates 13 and extensions 12 are soldered or otherwise secured together along their entire length. The plates 13 may be secured to the extensions 12 by means of a suitable number of rivets or the like 15, as shown in Figure 5.

The parts are so connected and arranged and originally installed, that the plates 13 will never straighten out to horizontal, but will always be curved slightly downwardly and forwardly. The curvature, however, need be very slight, when the radiator is very hot.

It will be seen that with the arrangement just described, when the radiator cools off, the extensions 12 and plates 13 will contract.

Insomuch as the plates 13 contract to a greater degree than the extensions 12, said plates and extensions will be forced into downwardly extending curves, as shown in Figure 2.

The forward edges of the respective pairs of plates and extensions will be thrown together, as shown in said figure, thus shutting off the access of air from the front to the radiator.

However, when the radiator warms up, the plates 13 and extensions 12 will expand, and on account of the greater expansion of the plates 13, they will tend to straighten out, toward the position shown in Figure 3.

It will be noticed that the arrangement is such that the operation of the device is automatic according to the temperature of the radiator and the temperature outside, so that the device needs no attention after it is installed, and requires no repairs.

The entire device is preferably protected by an ordinary surrounding frame 16, which may extend ordinarily as far as the forward edges of the plates 13 and the extensions 12.

It is a matter of common knowledge that radiators ordinarily freeze near their lower portions. It will be noted that with the device herein shown, these plates 13 and extensions 12, which are nearest the coldest part of the radiator will close up first, and this feature distinguishes my construction from any other radiator shutter device, of which I have knowledge.

It will also be noted that if the radiator is colder at the center and lower part, then at the sides, the lower plates 13 of the central section B may close up, even though the other plates do not close.

It therefore follows that my device is not only automatic, but that it operates to shut off the air in cold weather from that part of the radiator, which is most likely to freeze first, while permitting air circulation to the parts of the radiator, which remain hot.

Some changes may be made in the construction and arrangement of my improved radiator air circulation control device, without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within the scope of said claims.

I claim as my invention:

1. In a radiator having water conducting tubes, pairs of plates projecting forwardly from the tubes, said pairs being fixed together at their forward and rearward ends, and being connected against spreading between their ends and being made of material having different coefficients of expansion.

2. In a radiator having water conducting tubes, pairs of plates projecting forwardly from the tubes, said pairs being fixed together at their forward and rearward ends, and being connected against spreading between their ends and being made of material having different coefficients of expansion, said pairs of plates being normally spaced from each other vertically.

3. In a radiator having water conducting tubes, pairs of plates projecting forwardly from the tubes, said pairs being fixed together at their forward and rearward ends, and being connected against spreading between their ends and being made of material having different coefficients of expansion, said pairs of plates being normally spaced from each other vertically and divided into sections laterally of the radiator.

4. In a radiator having water conducting tubes, pairs of plates projecting forwardly from the tubes, said pairs being fixed together at their forward and rearward ends, and being connected against spreading between their ends and being made of material having different coefficients of expansion, said pairs of plates being divided into sections laterally of the radiator.

Des Moines, Iowa, April 28, 1922.

EDWIN H. BIRDSALL.