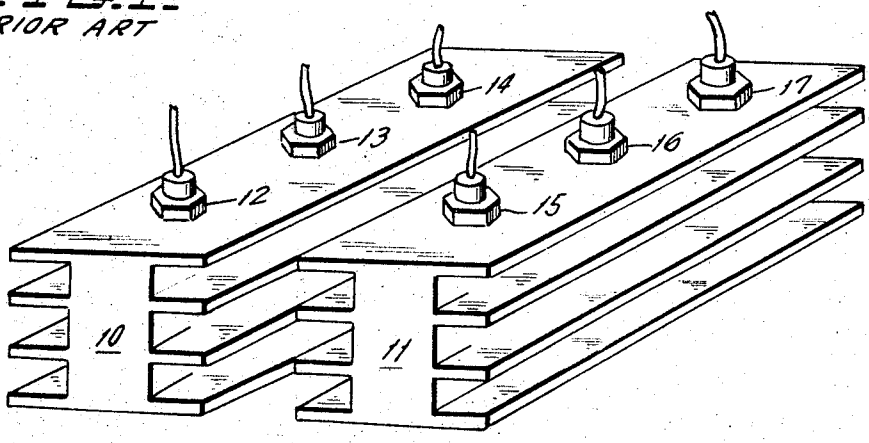
April 1, 1969 F. W. PARRISH 3,435,891

AIR FLOW BAFFLE FOR RECTIFIER HEAT EXCHANGER

Filed March 23, 1967 Sheet 1 of 2

FIG. 1
PRIOR ART



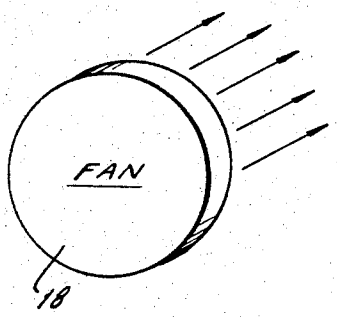


FIG. 2

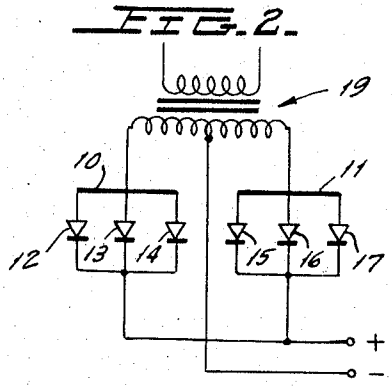
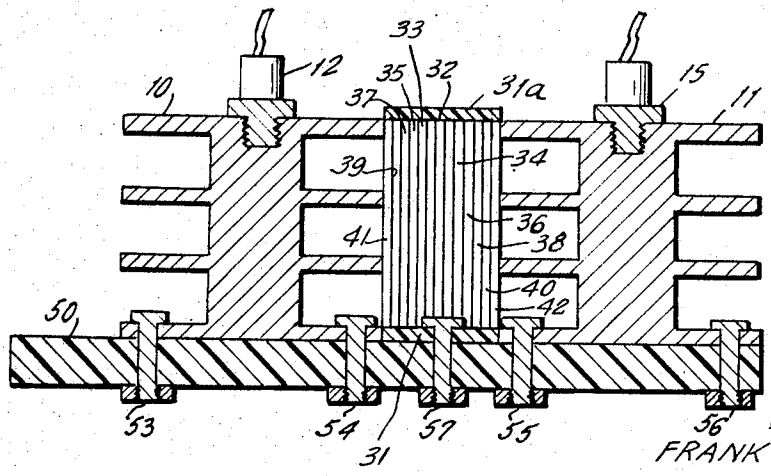


FIG. 5



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Filed March 23, 1967 Sheet 2 of 2

FIG. 4

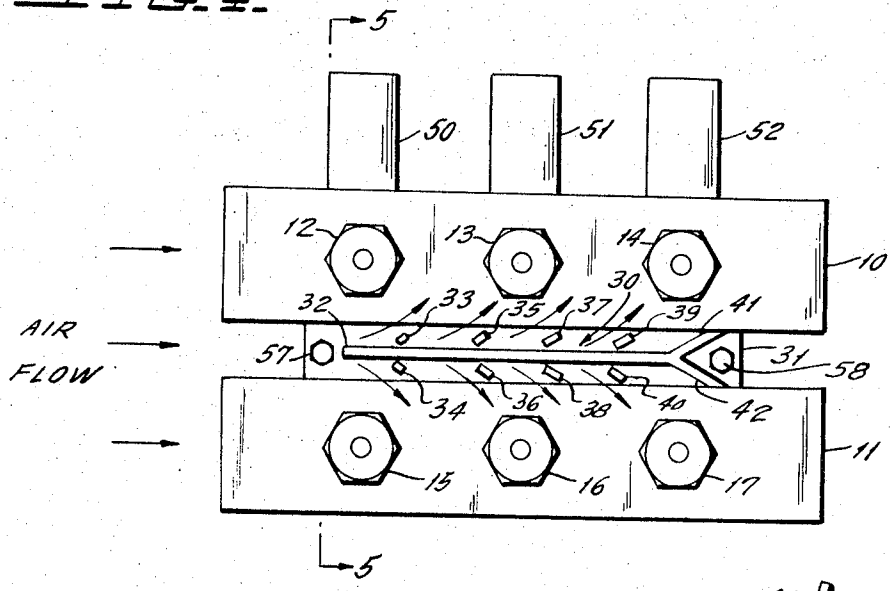
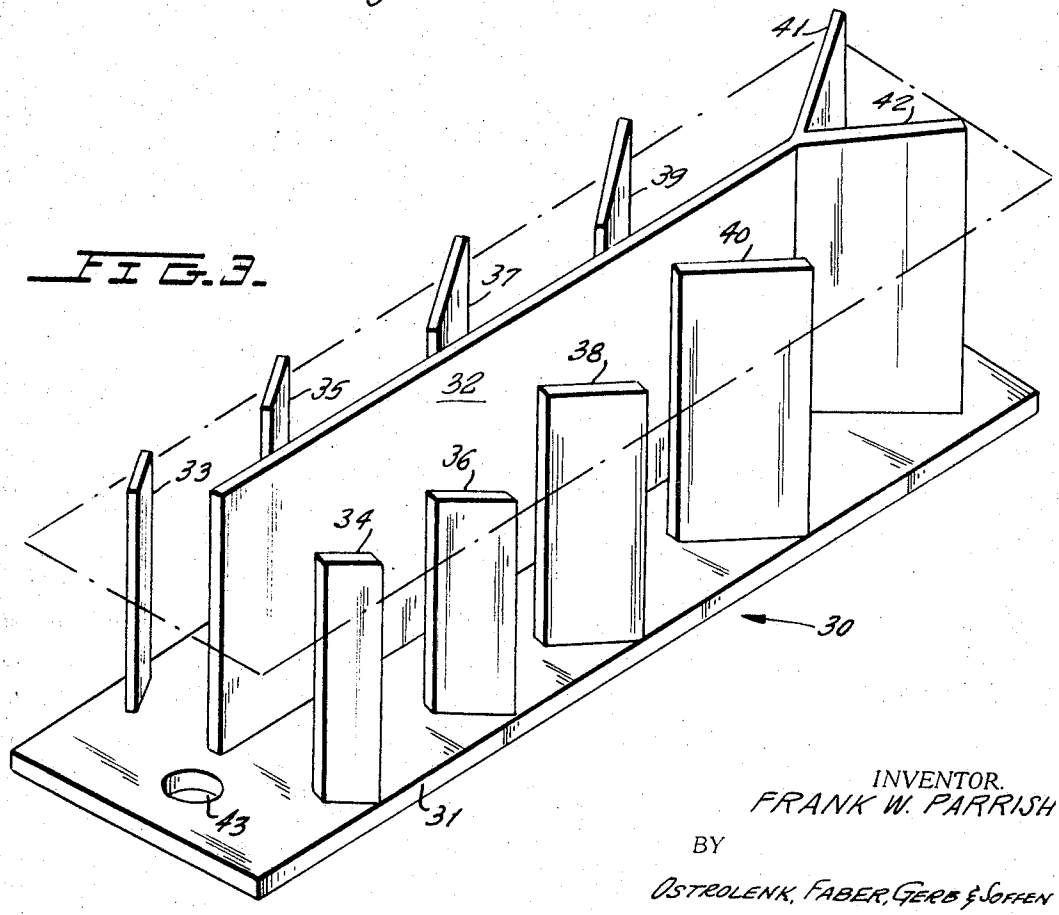


FIG. 3



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AIR FLOW BAFFLE FOR RECTIFIER HEAT EXCHANGER

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U.S. Cl. 165—121 3 Claims

ABSTRACT OF THE DISCLOSURE

An air baffle positioned in the "air shunt" space between two forced cooled heat exchangers has baffles which direct air away from the path between the heat exchangers and into the surfaces of the heat exchangers. The baffle is made of insulation material and has baffles of progressively longer lengths to redirect air from the air shunt path over the full length of the heat exchangers.

This invention relates to forced air cooling and more particularly relates to a novel air baffle located in the "air shunt" space between two forced air heat exchangers for distributing the air from the air shunt region into the surfaces of the heat exchangers along their full length.

It is, therefore, a primary object of this invention to improve the efficiency of the cooling medium in a forced cooled pair of spaced heat exchangers.

Another object of this invention is to utilize, for cooling, the air or gas which normally flows through the space between spaced heat exchangers which have fins to increase their surface areas.

These and other objects of the invention will become readily apparent upon a consideration of the following descriptions and drawings in which:

FIGURE 1 shows in perspective two spaced heat exchangers for receiving diodes in connection with a cooling fan for directing cooling air along the finned surface of the heat exchangers.

FIGURE 2 shows an electrical circuit diagram of a circuit which incorporates the structure of FIGURE 1.

FIGURE 3 is a perspective view of the air baffle of the present invention.

FIGURE 4 is a top view of the heat exchangers of FIGURE 1 with the air baffle of FIGURE 3 disposed in the "air shunt" between the two heat exchangers.

FIGURE 5 is a cross-sectional view of FIGURE 4 taken across the section line 5—5 in FIGURE 4.

Referring first to FIGURE 1, there is illustrated a typical arrangement of forced cooled heat exchangers, which are conductive buses **10** and **11** having suitable elongated cooling fins of the usual type. Buses **10** and **11** have suitable threaded openings which threadably receive the threaded studs of parallel connected diodes **12**, **13**, **14** and **15**, **16**, **17** respectively. Buses **10** and **11** are closely spaced, but are insulated from one another when they are operated at different potentials. A common source of forced air or gas, such as fan **18** then directs air along the length of buses **10** and **11** and their respective fins.

FIGURE 2 is a typical circuit application for the arrangement of FIGURE 1 as a single phase-full wave rectifier including a suitable transformer **19**, the diodes **12** to **17**. For purposes of illustration, buses **10** and **11** are considered connected to the anodes of diodes **12** to **17**, thus requiring electrical insulation between buses **10** and **11**. Obviously numerous circuit applications would require such insulation.

Since the ends of the adjacent fins of buses **10** and **11** must be spaced from one another an air space, or "air shunt" exists between the buses. This space offers less impedance to air flow than do the fins, so an appreciable amount of cooling air flows directly through this air shunt without contributing to the cooling of buses **10** and **11**.

In accordance with the invention, a novel baffle is located in this air space and contains a plurality of spaced vanes of increasing length for diverting air passing down the air shunt laterally from the shunt and toward the adjacent surfaces of the shunt.

FIGURE 3 shows the novel baffle **30** in perspective view as comprising a molded unitary body having a base **31** which has a central vane **32**, and laterally directed vanes **33** to **40** extending therefrom. The rear of central vane **32** spreads into end vanes **41** and **42**. A top section **31***a* similar to base **31** is also provided but is removed in FIGURE 3 in the interest of clarity. Each of the vanes **33** to **42** form the same angle to central vane **32**, of about 45°, but the vanes become progressively longer to successively pick off a more interiorly disposed section of air in the air shunt. As will be seen, this permits the air of the air shunt to be uniformly distributed along the full length of the heat exchangers, or buses **10** and **11**, forming the air shunt. Convenient mounting openings such as opening **43** are provided in base **31**. Baffle **30** is made of material which has high dielectric strength, is resistant to arcing, is stable at high temperatures, presents a smooth surface to prevent adherence of dust, resistance to chemical attack, good dimensional stability and low to moderate flexibility. Typically, the baffle could be made of polyvinylchloride.

While FIGURE 3 shows the vanes extending inwardly from the lateral sides of the base **31**, it is clear that other vane arrangements could be used to break up the laminar flow of air in the "air shunt" and to induce turbulence into the air and cause impingement of the air on the heat exchangers. Moreover, other vane shapes with various air foils could also be used.

FIGURES 4 and 5 show how the baffle of FIGURE 3 can be inserted into the "air shunt" between buses **10** and **11** of FIGURE 1.

FIGURES 4 and 5 illustrate insulation support base members **50**, **51** and **52**. Buses **10** and **11** are bolted to supports **50**, **51**, and **52**, as illustrated in FIGURE 5 by bolts **53–54** and **55–56** for the case of support **50**. The baffle **30** is thus bolted into the free air space between the ends of the adjacent fins of buses as by bolts **57** and **58** which pass through openings in base **31** and into openings in supports **50** and **52** resectively. Air flow will then be diverted as shown by the arrows in FIGURE 4 with the progressively longer vanes diverting the air in the air shunt laterally toward one or the other of the buses **10** and **11**.

Although there has been described a preferred embodiment of this novel invention, many variations and modifications will now be apparent to those skilled in the art. Therefore, this invention is to be limited, not by the specific disclosure herein, but only by the appending claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. In combination, a first elongated heat exchanger; a second elongated heat exchanger parallel to and spaced from said first heat exchanger; a source of forced gas for moving gas along the direction of elongation of said first and second heat exchangers; and elongated baffle means positioned in the space between said first and second heat exchangers; and elongated baffle means positioned in the space between said first and second heat exchangers and extending parallel to said first and second heat exchangers; said elongated baffle means comprising a base section having a central vane extending longitudi-

nally along said base section and a plurality of vanes perpendicular from said base section and positioned alternately on opposite sides of said central vanes; said plurality of vanes longitudinally spaced along the length of said base section and extending generally perpendicular to the plane including said first and second heat exchangers and said baffle means; said plurality of vanes having generally plane surfaces forming acute angles to the direction of elongation of said baffle means to divert air flow along the space between said first and second heat exchangers toward the adjacent surfaces of said first and second heat exchangers; the adjacent surfaces of said first and second heat exchangers having longitudinally extending fins; and a central vane extending longitudinally along said base section; said plurality of vanes positioned alternately on opposite sides of said central vane.

2. The combination as set forth in claim 1, wherein said plurality of vanes have a progressively increased length in direction of air flow.

3. The combination as set forth in claim 1, wherein

said plurality of vanes extend inwardly from the lateral sides of said base section and fall short of said central vane.

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U.S. Cl. X.R.

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