Jan. 12, 1932. E. M. BASSLER 1,840,651

HEAT TRANSFER UNIT

Filed Oct. 21, 1929

Fig. 1

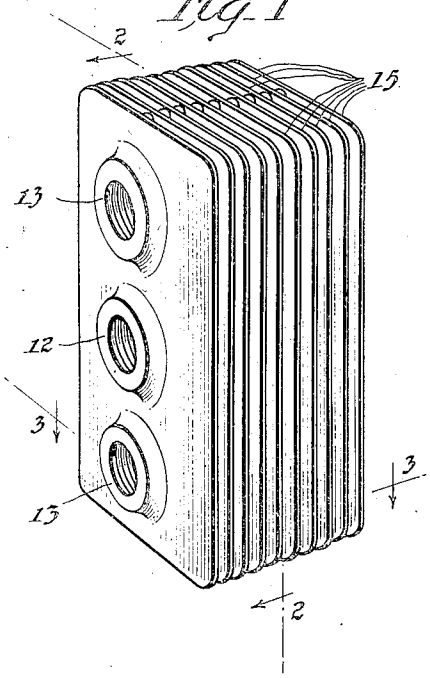



Fig. 2

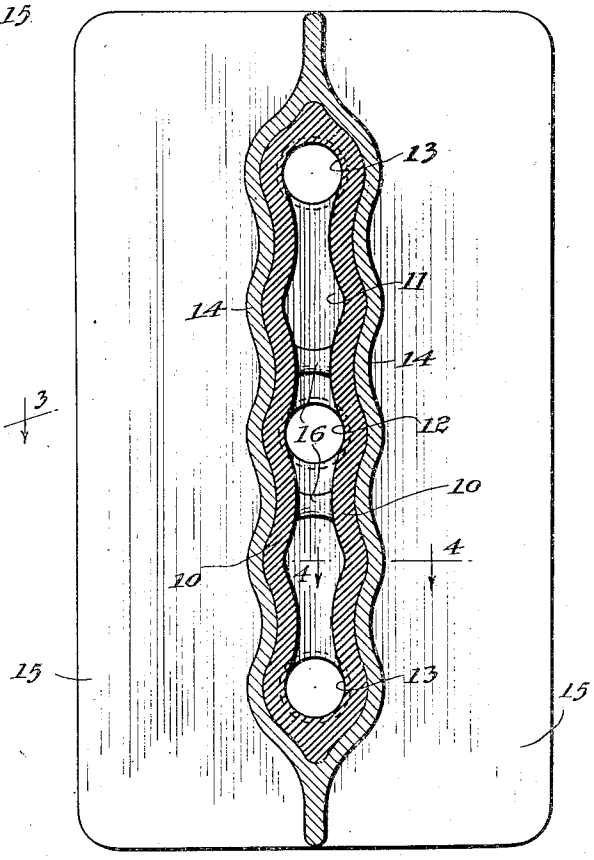



Fig. 3

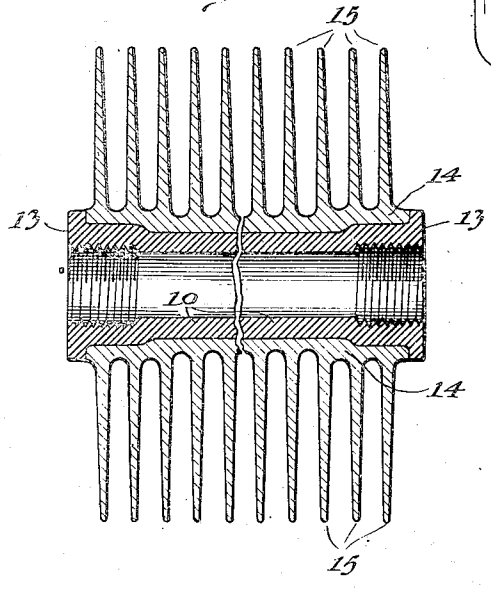
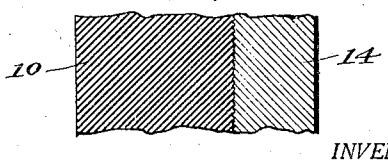



Fig. 4




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# UNITED STATES PATENT OFFICE

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## HEAT TRANSFER UNIT

Application filed October 21, 1929. Serial No. 401,321.

The invention relates to an improved heat transfer unit.

The primary object of the invention is to provide an improved unit of the character indicated, which is capable of economical manufacture and highly efficient in use.

Another object of the invention is the provision of an improved unit of the character indicated, having a header especially constructed for containing and resisting fluids of various kinds, and an outer finned shell or jacket especially adapted and constructed to facilitate the ready transfer of heat to or from the fluid in the header.

Other objects will appear hereinafter.

The invention consists in the combinations and arrangements of parts and associating the same hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification and in which—

Fig. 1 is a perspective view of a heat transfer unit embodying the invention;

Fig. 2 is a section taken substantially on the plane indicated by the lines 2—2 on Fig. 1;

Fig. 3 is a section taken substantially on the plane indicated by the lines 3—3 on Fig. 1; and

Fig. 4 is an enlarged, fragmentary section taken substantially on line 4—4 of Fig. 2.

The embodiment of the invention illustrated in the drawings comprises a hollow header 10 made of suitable cast metal, preferably cast iron, providing a closed chamber 11 adapted for containing steam, ammonia, or other fluid from or to which it is desired to transfer heat. The header 10 is cast by ordinary methods, the surfaces thereof being left rough and unfinished, just as they come from the mold, the general form thereof being wavy, pitted and irregular, as shown. Formed at each end of the header 10 are centrally arranged bosses 12 provided with threaded holes, as shown, and formed on each side of said central bosses are bosses 13, likewise provided with threaded holes, thus providing for making pipe connections thereto for circulating fluids through the same for heating or cooling purposes, as the case may be.

Surrounding the header 10 is an outer shell or jacket 14 of aluminum or, preferably, an aluminum alloy having relatively greater strength than pure aluminum, formed on and integral with which are a plurality of outwardly projecting fins 15. The outer shell or jacket 14 is applied to the header 10 by casting the same directly thereon in a suitable mold, whereby said shell or jacket will be formed in such intimate contact with the header 10 as to be practically integral therewith, thus greatly facilitating the transfer of heat units to or from the fluid within the header 10 and correspondingly increasing the effectiveness of the unit in operation. As has been previously indicated, the outer surface of the header 10 is left rough or unfinished, thereby increasing the strength of the connection between said shell or jacket and the inner header 10 in the casting or molding process.

In Fig. 4, I have illustrated, on an enlarged scale, the character of the joint which is thus formed between the outer jacket 14 and the inner header 10. Obviously, as shown, the roughness of the outer surface of the header 10 will be duplicated in the inner surface of the shell or jacket 14 so that said surface will thereby become interlocked, as indicated, thus insuring close contact of the surfaces of said header and said shell or jacket under all conditions of expansion and contraction in operation.

In the preferable construction shown, the header 10 is corrugated lengthwise, both inside and outside, the shell or jacket 14 being correspondingly corrugated, thus increasing the superficial contact of said shell or jacket and header, making a stronger connection between the same and promoting the transfer of heat from one to the other.

Also, to reinforce and strengthen the header from stresses, either interior stresses tending to bulge the same or exterior stresses tending to collapse the same, which might impair the close contact of said header and shell or jacket necessary to produce the best results in operation, opposite sides of the header are

preferably tied together or connected at spaced intervals by integral bridge pieces 16.

The unit thus provided may be used for a wide variety of purposes where it is desired to transfer heat from one medium to another. Thus the unit is well adapted for use as a steam radiator, in which event the steam pipes for circulating the steam through the unit would be connected with threaded openings at opposite ends of the unit, the other threaded openings being closed by threaded plugs. Likewise, the unit may be readily utilized as a cooling unit for the cooling medium of refrigerating plants, in which event suitable connections would be made for circulating said medium through the unit. In the last mentioned use, the cast iron header 10 is admirably adapted to resist the action of the ammonia, and the aluminum fins of the shell or jacket 14 are well adapted to dissipate the heat units from the contained cooling medium. Obviously, the unit is well adapted to use wherever and whenever the transfer of heat units from one medium or fluid to another is desired.

The specific form and arrangement of parts is a simple and effective one for the purpose.

While I have illustrated and described the preferred form of construction and method of procedure for producing the same, these are capable of variation and modification without departing from the spirit of the invention. I therefore do not wish to be limited to the precise details disclosed but desire to avail myself of such variations and modifications as fall within the scope of the appended claims.

I claim:

1. A heat transfer unit comprising a hollow header of one metal having its opposite ends closed and there provided with outwardly projecting perforated and threaded bosses adapted to facilitate circulation connections therewith; and an outer jacket of another metal surrounding and closely associated with said header and provided with projecting fins.

2. A heat transfer unit comprising a hollow header of one metal having its opposite ends closed and there provided with outwardly projecting perforated and threaded bosses adapted to facilitate circulation connections therewith, said header being relatively wide and thin and the opposite sides thereof being corrugated; and an outer jacket of another metal surrounding and closely associated with said header and provided with projecting fins.

In witness that I claim the foregoing as my invention, I affix my signature this 16th day of October, 1929.

EDWIN M. BASSLER.