Dec. 13, 1938. E. L. BAUER 2,140,125

BAFFLE FOR HEATERS

Filed Dec. 3, 1936 2 Sheets-Sheet 1

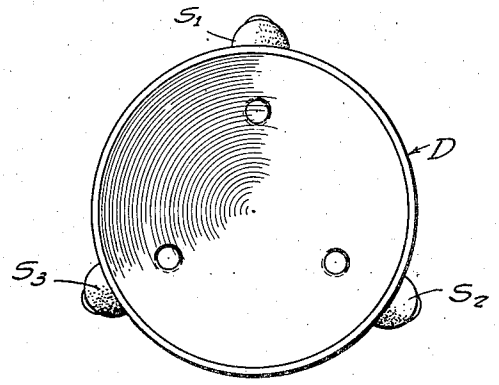


FIG. 1

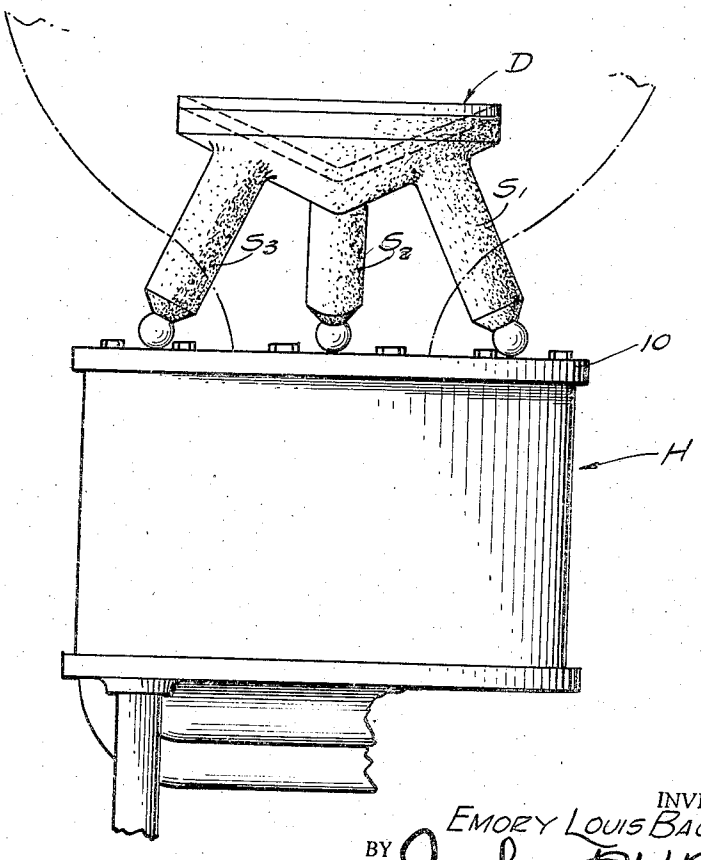


FIG. 2

INVENTOR.
EMORY LOUIS BAUER.
BY Joshua R. H. Potts
ATTORNEY.

Dec. 13, 1938. E. L. BAUER 2,140,125

BAFFLE FOR HEATERS

Filed Dec. 3, 1936 2 Sheets-Sheet 2

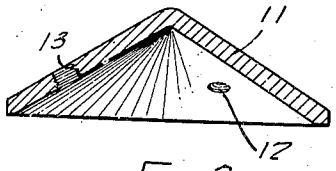


FIG. 3

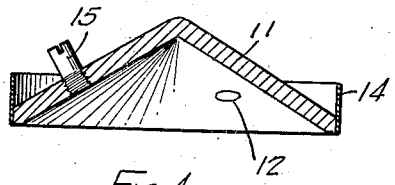


FIG. 4

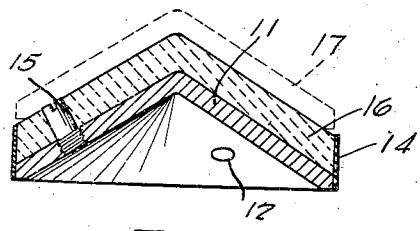


FIG. 5

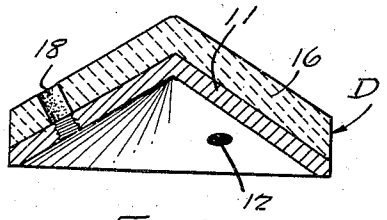


FIG. 6



FIG. 7

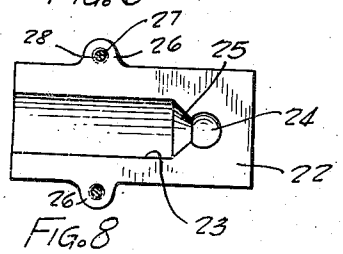


FIG. 8

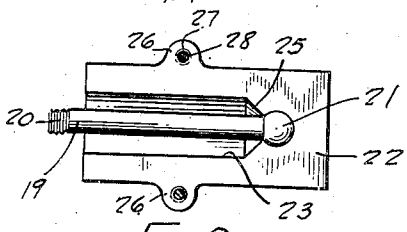


FIG. 9

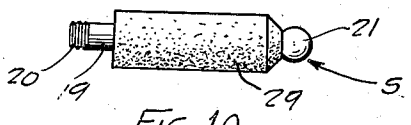


FIG. 10

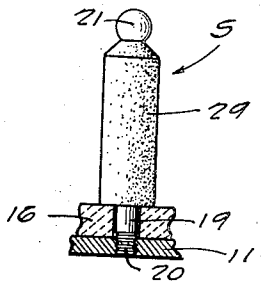


FIG. 11

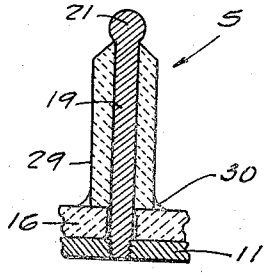


FIG. 12

INVENTOR.
EMORY LOUIS BAUER
BY Joshua R. H. Potts
ATTORNEY.

Patented Dec. 13, 1938 2,140,125

UNITED STATES PATENT OFFICE

2,140,125

BAFFLE FOR HEATERS

Emory Louis Bauer, Wilmington, Del., assignor to Emory L. Bauer, Inc., Wilmington, Del., a corporation of Delaware

Application December 3, 1936, Serial No. 113,996

1 Claim. (Cl. 158—7)

This invention relates to baffles such as are commonly employed in conjunction with heaters for the purpose of diffusing a flame which ordinarily would be concentrated over a wider area. Baffles of this type are ordinarily included as essential elements of oil heater assemblies in a large number of cases.

From the very nature of the use to which the baffle is put, it is necessary that the baffle contact the flame generated by the heater so as to properly disperse and diffuse the same. Due to this contact, however, a highly undesirable condition has arisen in those cases in which the baffles are made from a metal such as cast iron. This undesirable condition lies in the condensation of the vaporous fuel incident to turning off of the heater and which condensation is caused by the cooling effects of the metallic baffle. Later on, when the heater is again started in use, the condensed vapors which have collected on the baffle as a black soot come loose in places with accompanying annoying results.

To the end of avoiding the condition above noted, it has been proposed to avail of a refractory material as a substance from which the baffles are made. However, efforts directed along this line have not been successful in providing a commercially practical baffle which is capable of standing up under actual service conditions due to the fact that the baffle is necessarily located at a point of intense heat and the effect of this high temperature is to render the refractory baffle brittle and subject to crumbling and disintegration if it is touched over any appreciable periods of usage.

With the foregoing in mind, this invention has in view, as its foremost objective, the provision of a baffle which is designed for use with oil heaters and which baffle embodies structural characteristics which impart thereto all the advantages which are attributed to the refractory baffle. In attaining this end, the invention contemplates availing of a metallic body structure as the backbone of the baffle so as to impart thereto the necessary rigidity and strength, and this metallic body structure is coated with an appropriate refractory cement at the points where it is exposed to the flame from the heater.

Inasmuch as any metallic material which is practically available for use as the body structure of the baffle has a higher coefficient of expansion than any refractory material which is available for construction purposes, and in view of the ever present condition of changing temperatures incident to starting and stopping of the heater, the invention has in view, as a further objective, the provision of a baffle of the character described which includes a metallic body structure, the exposed surfaces of which are covered with a refractory with the entire structure so designed as to accommodate expansion and contraction of the metallic body structure incident to temperature changes.

An important detailed object associated with this phase of the invention is the provision of a deflecting element which has the surface which is disposed towards the flame coated with the refractory, and the peripheral edge of which deflecting element is left free and uncovered to permit of any differential in expansion between the deflecting element itself and the refractory coating.

Still another important detailed object is the provision, in a baffle of the character above noted, of supporting legs which are secured to the baffle, and which supporting legs are partially coated with refractory, leaving, on each leg, an uncovered portion at the free extremity which engages the supporting surface.

Another particular object is the provision, in a baffle of the character above noted, of a metallic supporting leg, the free or lower extremity of which takes the form of an enlargement as compared to the remainder of the metallic leg structure and which enlargement functions to maintain the refractory coating assembled on the metallic leg structure.

Another important object of the present invention is the provision of a method of assembling a baffle in accordance with the above noted precepts. A baffle of the type with which this invention is concerned ordinarily includes a conical deflecting element which is supported in position by a plurality of legs. Due to the conditions attending the service use of this baffle, it is important that the refractory coating for the exposed surface of the conical deflecting element have a separate identity from the refractory coating of the supporting legs and this invention includes the provision of a method by which the conical deflecting element and supporting legs are individually coated with the refractory material and then assembled to provide a unitary structure.

Various other more detailed objects and advantages will in part become apparent and in part be hereinafter stated as the description of the invention proceeds.

The invention, therefore, comprises a baffle intended for use with oil heaters which consists of a

conical deflecting element and supporting legs, each of which includes a metallic body structure which is covered with a refractory material. Important phases of the invention are the particular manner in which the metallic deflecting element is coated with refractory, and the leg structure and manner of coating the legs with refractory.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawings, wherein:

Figure 1 is a top plan view of a baffle made following the dictates of this invention,

Figure 2 is a side elevational showing of the baffle of this invention as applied in effective position on an oil burner,

Figure 3 is a cross-sectional showing bringing out one of the first steps in the method of assembling the baffle,

Figure 4 is a view similar to Figure 3 bringing out the next step in the process of assembly,

Figure 5 is another sectional showing similar to Figures 3 and 4, bringing out the next step, while Figure 6 is still another view bringing out the next step of assembling the baffle.

Figure 7 is a plan view of one of the supporting legs prior to application of the refractory material,

Figure 8 is an elevational showing of one of the mold elements used in applying the refractory material to the supporting legs,

Figure 9 shows the metal leg, of Figure 7, in position in the mold in Figure 8,

Figure 10 develops a supporting leg with refractory material applied,

Figure 11 shows how this leg is applied to the deflecting element, and

Figure 12 develops the final step of cementing the leg to the deflecting element.

Referring now to the drawings, wherein like reference characters denote corresponding parts, and more particularly to Figures 1 and 2, an oil heater such as ordinarily generates a flame which is necessary to be diffused is shown at H. This oil heater H includes an upper flange 10 on which the baffle of this invention is intended to rest. This baffle is shown as comprising a conical deflecting element which is referred to in its entirety by the reference character D, and supporting legs referred to as S1, S2 and S3.

The method of assembling the baffle comprising the deflecting element D, legs S1, S2, and S3, will now be described by reference to Figures 3 to 12, inclusive.

Figure 3 develops a conical metallic member 11 which is cast as such at a foundry or other equivalent place. This conical element 11 is formed with a plurality of openings 12, which correspond in number to the number of legs S which are to be attached thereto. After the conical members 11 have been cast, the holes at 12 are tapped to provide threads 13.

Referring now to Figure 4, a ring mold element 14 is shown as positioned about the peripheral edge of the metallic conical element 11. At this point it might be well to note that a preferred material to be used in the manufacture of the conical metallic element 11 is cast iron.

The mold ring 14 projects above the edge of the conical element 11 a distance which is intended to define the thickness of the refractory coating which is to be applied thereto. A plurality of plug members 15 are then threaded into the holes 12 and they project above the surface of the conical element 11 a distance corresponding to the relationship of the mold ring 13 with respect to the conical deflecting element. It is the mold ring 14 and plugs 15 which control the thickness of the refractory which is applied to the conical metallic member 11.

Referring now more particularly to Figure 5, a layer of the refractory material, such as an asbestos cement, is designated 16. This layer is applied in a plastic state and surrounds the plugs 15 but is contained within the mold ring 14. The dotted lines of Figure 5, at 17, develop a second conical metallic member which may be availed of in smoothing the refractory layer 16 while the latter is in a plastic state so as to insure of it acquiring an even thickness as determined by the plugs 15 and mold ring 14.

After the layer 16 of refractory material has acquired a set sufficient to permit it to retain its shape and form but before hardening of the same, the plugs 15 are removed, leaving the conical deflecting element, which is identified as D, in the condition shown in Figure 6. It is notable that the refractory layer 16 has the openings 18 which are formed by the plugs 15 and which constitute continuations of the threaded openings 12. After hardening of the layer 16, the mold ring 14 is removed. Also the peripheral edge of the conical deflecting element 11 is left free and uncovered.

The metallic body structure of one of the supporting legs S is shown in Figure 7 as comprising a shank 19 which is threaded at one end to 20 and which is formed with an enlarged ball 21 at its opposite end.

Figure 8 develops one-half of a mold which is to be used in casting a refractory coating about the shank 19. This mold half comprises a body portion 22 which is formed with one-half of a cylindrical bore 23. A recess is shown at 24 which is intended to receive the ball 21 and a conical recess 25 connects the recess 24 with the cylindrical bore 23.

Figure 9 develops the metallic shank 19 as positioned in the mold element 22. It is notable that the ball 21 is received in the recess 24 and the shank 19 is disposed centrally in the bore 23. The mold portions 22 are formed with ears 26 having openings 27 through which pass fastening elements 28 in clamping complemental mold parts 22 together.

With the shank member 19 positioned in the mold as shown in Figure 9, the refractory material which is identified above as an asbestos cement, is introduced through the open end of the bore 23 and after sufficient time has elapsed for this cement to harden, the mold parts are removed, leaving the leg S in a condition shown in Figure 10. It is notable that the ball element 21 remains uncoated, as does the threaded extremity 20, and a portion of the shank 19 adjacent thereto, which is equivalent to the thickness of the layer 16.

The supporting leg S is now assembled with the conical deflecting element D by screwing the threads 20 in the threads 13 of the openings 12, with the extremity of the shank 19 being received in the opening 18.

A pipe wrench may be availed of and applied around the ball 21 to securely screw the shank home and assure of a tight joint.

At this point it is well to note that the refractory layer which is applied over the shank 19 and which is identified as 29, extends beyond the

edges of the hole **18** and, as a result, constitutes a means for maintaining the refractory layer **16** in position on the conical metallic element **11** even though the bond between the latter two should be broken incident to expansion or contraction of the metal of the member **11**.

As a final step of assembling the leg S with the deflecting element D, a filet of cement shown at **30** in Figure 12, may be applied around the line where each of the legs S contact the layer **16**.

This filet **30** may be incorporated into the structure by first partially threading the legs home and inserting a small amount of the asbestos cement between the refractory casing **29** and the layer **16**. The legs may then be finally screwed home with a firm bond between the legs and layer **16** resulting.

While a preferred specific embodiment of the invention is hereinbefore set forth, it is to be clearly understood that I am not to be limited to the exact constructions illustrated and described because various modifications of these details may be provided in putting the invention into practice within the purview of the appended claim.

I claim:—

A baffle of the character described comprising a deflecting element having a surface intended to be disposed towards the flames of a heater, a coating of refractory material on said surface, the peripheral edge of said element being free and uncovered, legs secured to the deflecting element, and an individual coating of refractory material covering each of said legs except the lower extremities thereof, the refractory coating on said legs being in underlying and supporting engagement with the refractory coating on said surface of said deflecting element, and an exposed enlargement on each of said legs adjacent its lower extremity supporting the refractory coating on said legs.

EMORY LOUIS BAUER.