

May 29, 1956

L. S. KOZBELT
INFRARED DEVICE

2,748,247

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2 Sheets-Sheet 1

Fig. 1

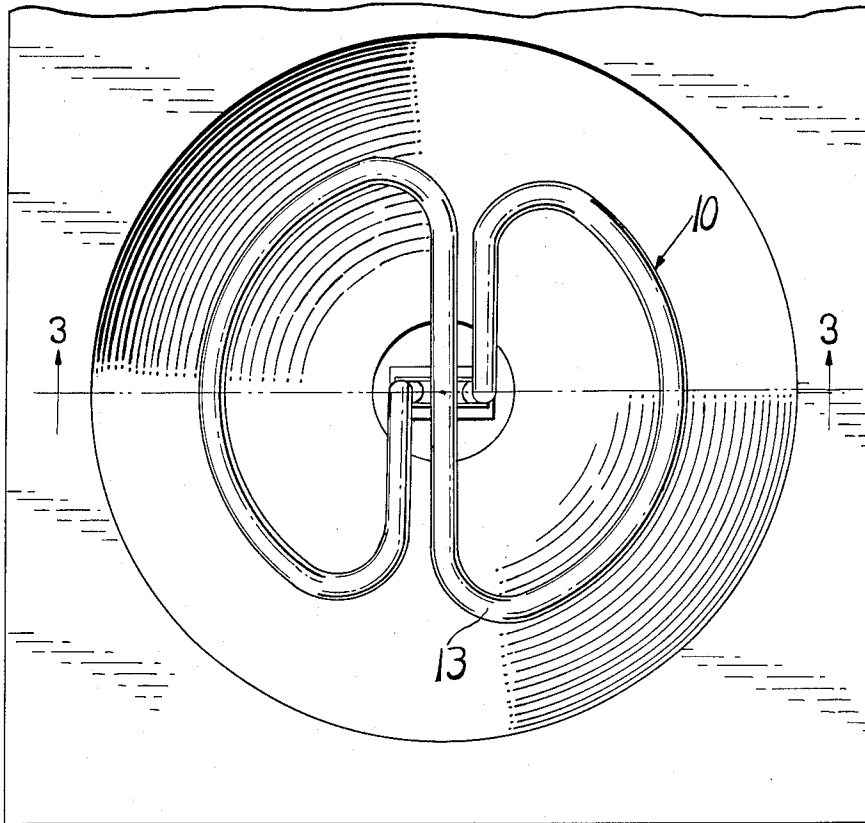
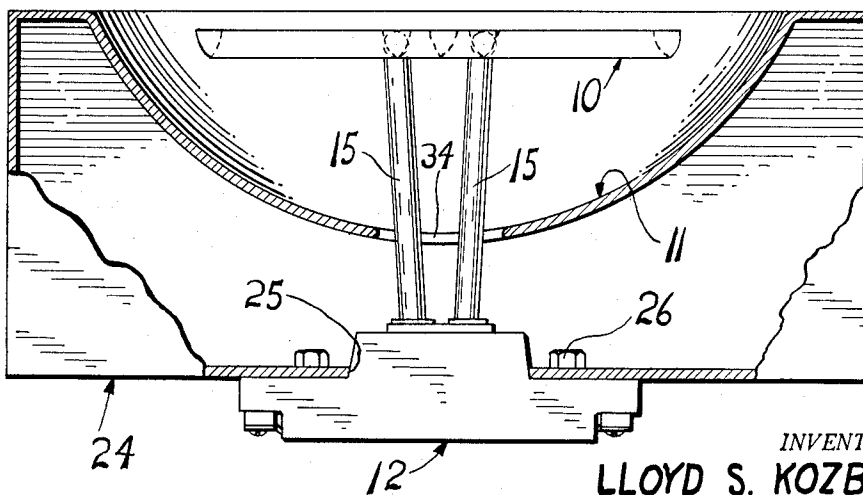


Fig. 2



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2 Sheets-Sheet 2

Fig. 3

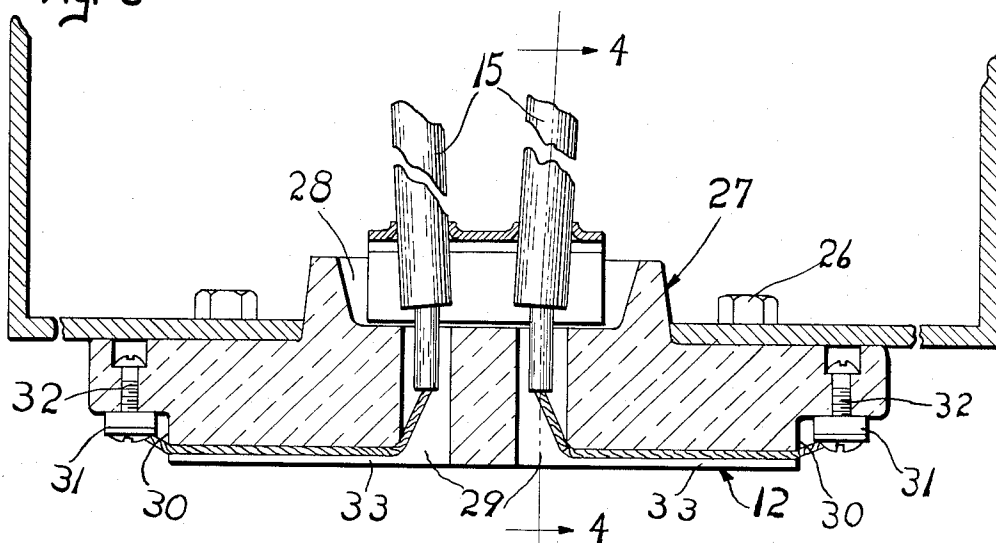
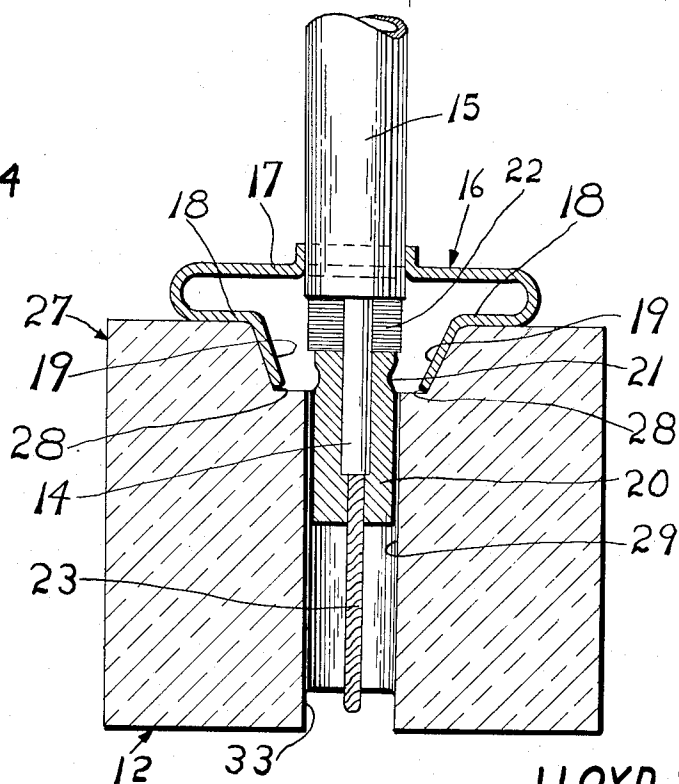


Fig. 4



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1

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1 Claim. (Cl. 219—34)

My invention relates to an infrared device, more particularly to an infrared device having a sheathed-type electric resistance element, and the principal object of my invention is to provide new and improved devices of the character described.

The wide usage of electric infrared devices in modern day industries is well known. These devices find application wherever it is desirable to employ a concentrated, clean, easily regulated source of heat for purposes such as drying and the like. In the past, glass infrared lamps have been employed; however, these lamps have not been entirely satisfactory.

Some of the disadvantages of the commonly used infrared lamps are as follows: Since infrared lamps are constructed of glass, they are easily broken if they are struck by an object or if they are splashed with water or other liquid when hot. Infrared lamps also have a relatively short life which will be further materially reduced if the lamps are subjected to shock or vibration.

In contrast, an infrared device constructed in accordance with my invention possesses none of the disadvantages possessed by prior art devices. Other advantages of my invention will be understood from a study of the following description and of the drawings appended hereto.

In the drawings accompanying this specification and forming a part of this application there is shown, for purpose of illustration, an embodiment which my invention may assume, and in these drawings:

Figure 1 is a fragmentary plan view of an infrared device embodying my invention,

Figure 2 is an elevational view of the embodiment shown in Figure 1, certain parts being broken away to better illustrate interior construction,

Figure 3 is an enlarged fragmentary sectional view generally corresponding to the line 3—3 of Figure 1, and

Figure 4 is a further enlarged fragmentary sectional view generally corresponding to the line 4—4 of Figure 3.

As illustrated, my improved infrared device comprises a sheathed electric resistance element 10 in combination with a reflector 11 and a terminal mounting block 12. The element 10 is constructed in accordance with well-known principles and comprises a tubular sheath 13 filled with compacted refractory material in which is imbedded the usual coiled resistance wire. In the present embodiment, the coiled resistance wire terminates short of respective ends of the sheath and each end of the resistance wire is secured to a respective terminal pin 14 that extends from a respective end of the sheath 13 to provide for a terminal connection later to be described.

As will be understood, the portion of the sheathed element 10 intermediate the ends and containing the coiled resistance wire is commonly known as the active or heat generating portion. In the presently disclosed embodiment, this active portion is formed to provide a generally rectilinear portion having a pair of arcuate portions disposed in the plane of the rectilinear portion, each arcuate portion extending from a respective end of the rectilinear

2

portion and curving back toward the opposite end of the rectilinear portion. As shown, this construction provides a compact ray-generating area having a configuration substantially that of the figure 8 and which is substantially flat and which will radiate infrared rays in a uniform pattern that is devoid of "dead" spots.

As illustrated, leg portions 15 extend from the active portion of the element 10 and the leg portions are adapted to be secured together by means of a clip 16. In the presently disclosed embodiment, the clip 16 is formed of sheet metal or the like to provide a generally plane portion 17 having spaced-apart apertures each adapted to receive a respective leg 15. As best seen in Figure 4, each leg portion extends through a respective aperture in the clip 16 and is secured thereto, as by brazing or any other suitable means.

With reference to the position of parts shown in Figure 4, opposite portions 18 of the clip 16 are each bent to a position underlying the portion 17 and generally parallel therewith, each portion 18 being further bent downwardly to provide portions 19 which lie in respective planes that are angled toward the axes of the leg portions 15 as shown. As will be clear, the clip 16 serves to secure the leg portions 15 together and also serves other purposes which will later be shown.

As illustrated in Figure 4 and as previously mentioned, each terminal pin 14 extends beyond the end of its respective leg portion 15. A coupling sleeve 20 is disposed about each pin 14 and each sleeve is secured to its respective pin 14 in spaced relation to a respective leg 15 by any suitable means such as, for example, by crimping the sleeve at 21. Dielectric means such as a plurality of mica washers 22 are interposed between each sleeve 20 and its respective leg 15 in order to space the sleeve from the leg.

Each sleeve 20 extends beyond the end of its terminal pin 14 to form a pocket for receiving an elongated flexible electrical conductor or pig-tail lead 23. Each lead 23 is adapted to be disposed in its respective pocket and each may be secured in place by silver solder or other suitable means.

As previously mentioned, and as shown in Figures 1 and 2, the element 10 is adapted to be used in combination with a reflector 11 and a terminal mounting block 12. The presently disclosed embodiment illustrates the reflector 11 as formed integrally with a sheet-metal, box-like reflector housing 24. It will be apparent that a plurality of reflectors could be formed in a single housing or that any other suitable construction could be employed.

The housing 24 is apertured at 25 (see Figure 2) to receive the block 12, the block being secured to the under surface of the housing as shown, by means of screws 26 which pass through apertures in the housing and are threaded into the block.

The block 12 is provided with a boss portion 27 intermediate its ends (see Figures 2 and 3) and such portion extends through the aperture 25 in the housing 24. As best seen in Figures 3 and 4, the portion 27 is recessed to provide opposed inclined walls 28, and the block is provided with spaced-apart apertures 29 for a purpose to be disclosed. Opposite ends of the block 12 are recessed at 30 to receive terminal clips 31 that are secured to the block by means of screws 32. Channels 33 are formed in the lower surface of the block 12 and each channel extends from one of the apertures 29 to an adjoining recess 30.

The element 10 is adapted to be supported by the block 12 in fixed relation with the reflector 11 in the following manner: The legs 15 of the element 10 will first be inserted through an aperture 34 in the reflector 11 so that the sleeves 20 and the leads 23 are disposed within re-

spective apertures 29 and whereby the portions 18 and 19 of the clip 16 respectively abut the upper surface of the block portion 27 and the inclined walls 23 of the recess formed in the portion 27. As will be clear, the active or heat generating portion 13 of the element 10 will thus be correctly positioned with respect to the reflector 11, and particularly, the active portion will be maintained in predetermined spaced relation with the plane of the outer surface of the reflector.

As clearly shown in Figure 3, the element is adapted to be secured in position to the block 12 by fastening the free end of each of the leads 23 to a respective terminal clip 31 by any suitable means, each lead 23 lying in a respective channel 33 of mounting block 12 as shown. The electric powerline may then be connected to the terminal clips 31 in order to effect operation of my improved infrared device.

In view of the foregoing it will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention and it will also be apparent to those skilled in the art that the embodiment herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described, hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

An infra-red device for use in heating by radiation, comprising a bowl-like reflector having a central aperture, an elongated metallic-sheathed electrical resistance element disposed in fixed position within the reflector bowl, said element having an intermediate heat generating portion of configuration like the figure 8 including a rectilinear central portion and two oppositely disposed arcuate portions disposed in a common plane and respectively continuing from opposite ends of said rectilinear portion and curving back to the ends of the latter opposite to the

ends from which the respective opposite arcuate portions originate, said rectilinear portion being disposed between and connecting said arcuate portions in the plane thereof, said resistance element further including a pair of coplanar straight non-heat generating sections respectively continuing from said arcuate portions and disposed in spaced parallel relation to and on opposite sides of said rectilinear portion, the free ends of said straight sections being bent into a plane normal to the plane of said heating portion of the element and disposed in spaced proximity to constitute terminal portions extending through said reflector aperture for connection to a source of electrical energy, whereby said intermediate radiant heating portion of said resistance element is co-extensive only with said rectilinear central portion and the opposed connected arcuate portions, said straight sections and said terminal portions of the element being relatively free of heat to minimize mutual heating between adjacent parts of said resistance element.

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