April 27, 1965

D. W. COVAULT

3,180,972

END TABLE HEATER

Filed March 8, 1962

2 Sheets-Sheet 1

Fig. 1

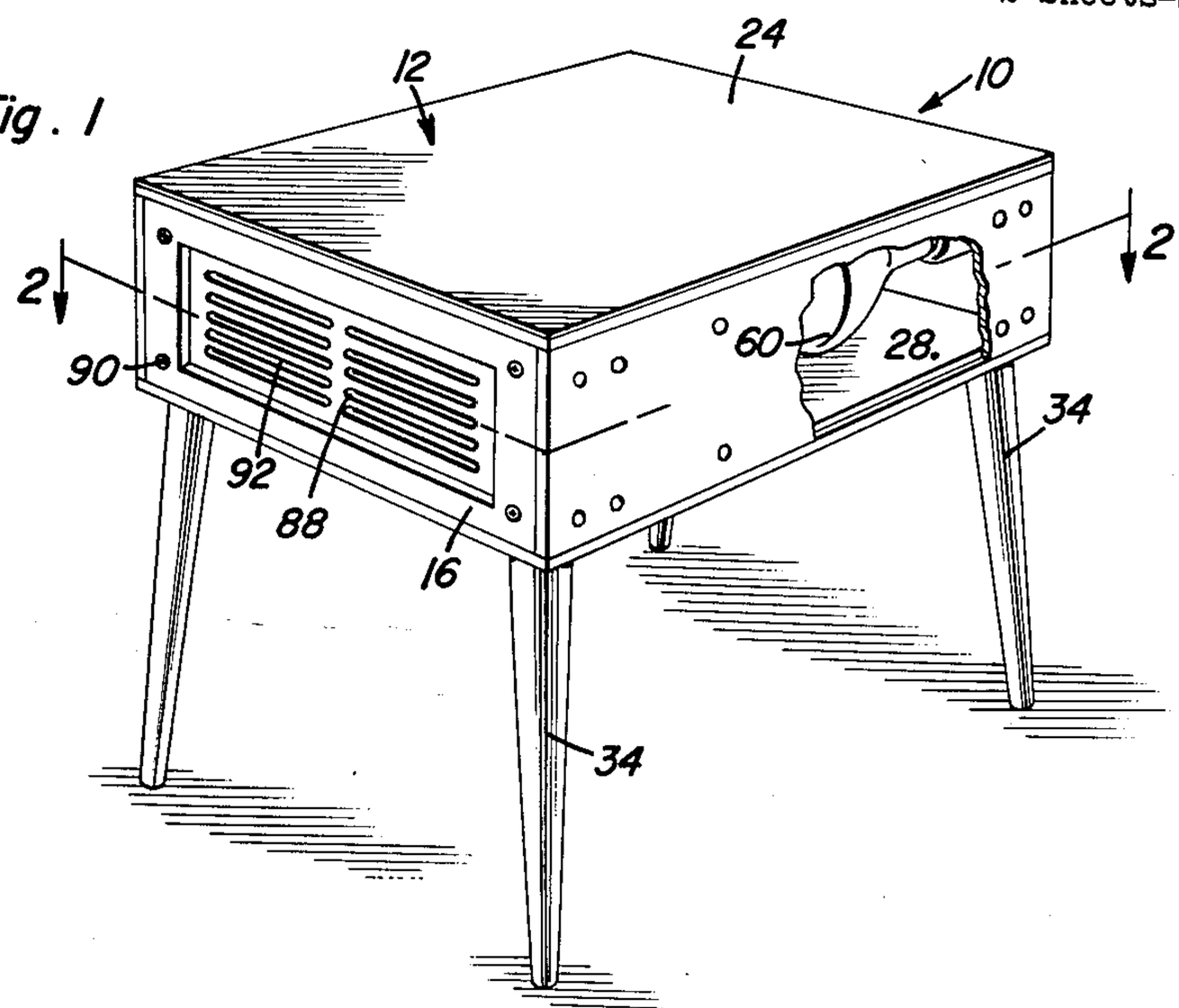


Fig. 4

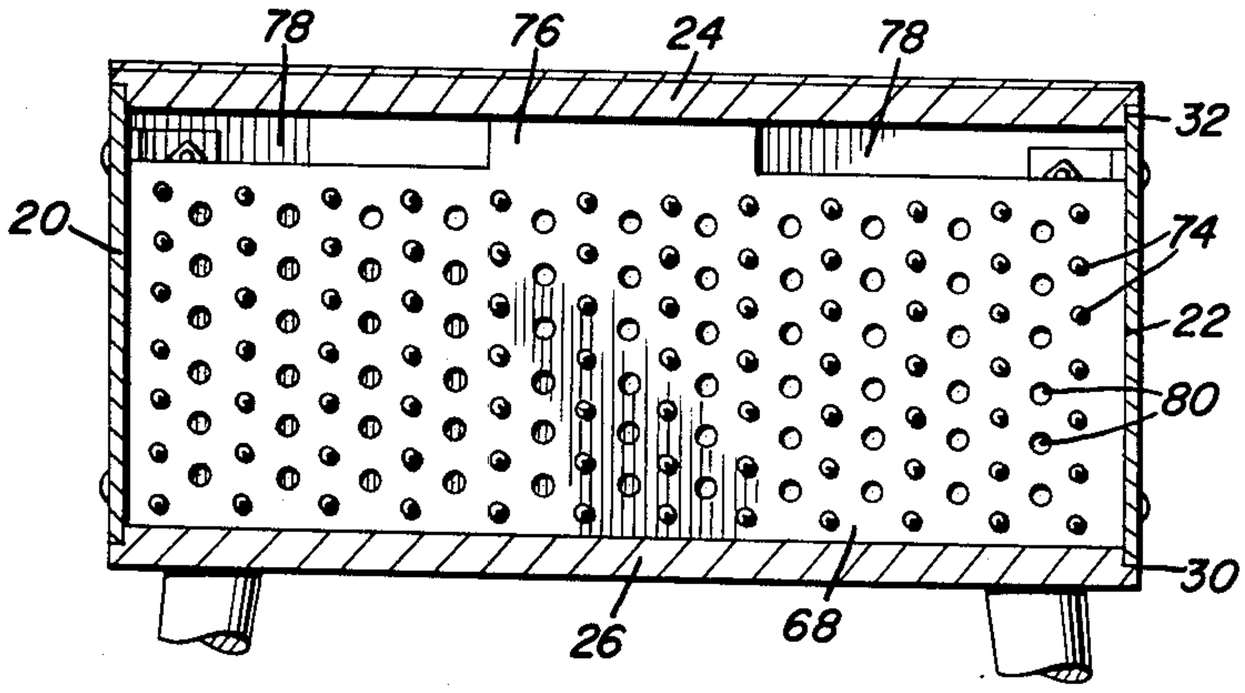
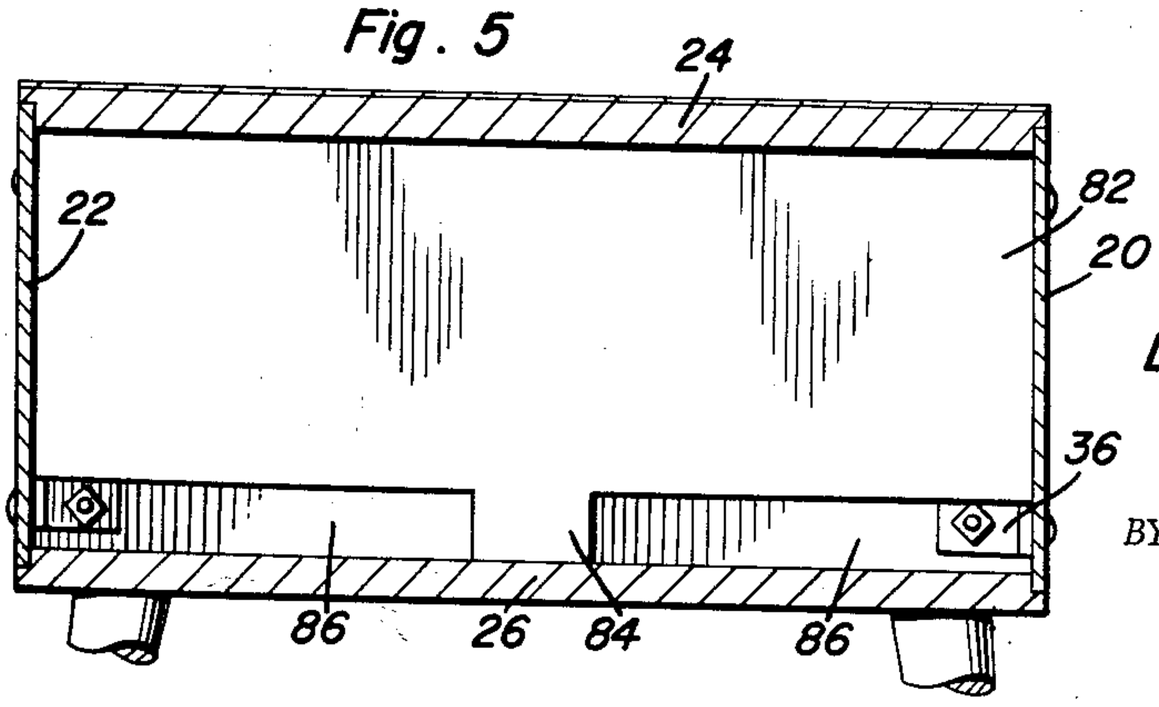


Fig. 5



Darrell W. Covault

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

April 27, 1965

D. W. COVAULT

3,180,972

END TABLE HEATER

Filed March 8, 1962

2 Sheets-Sheet 2

Fig. 2

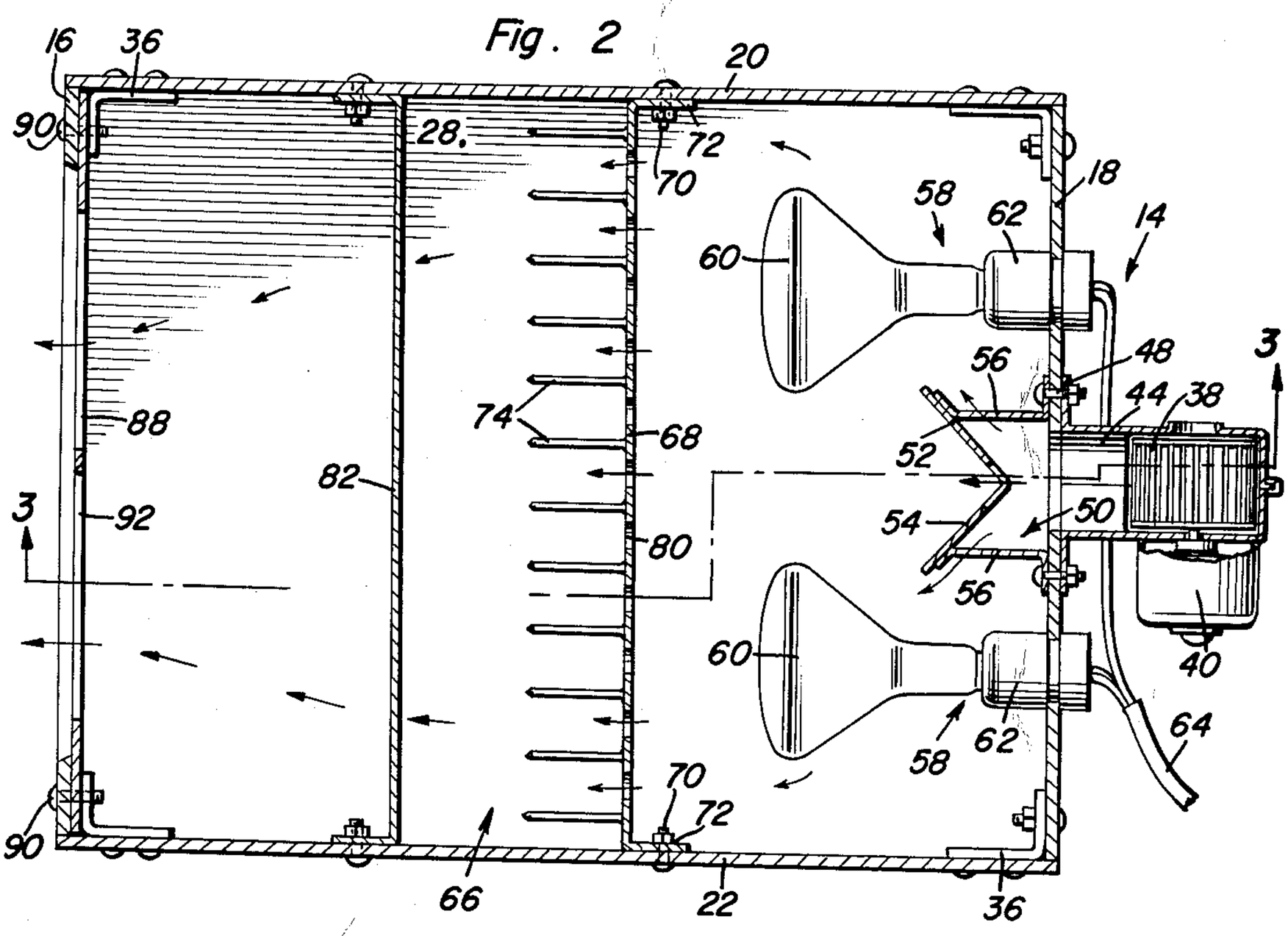
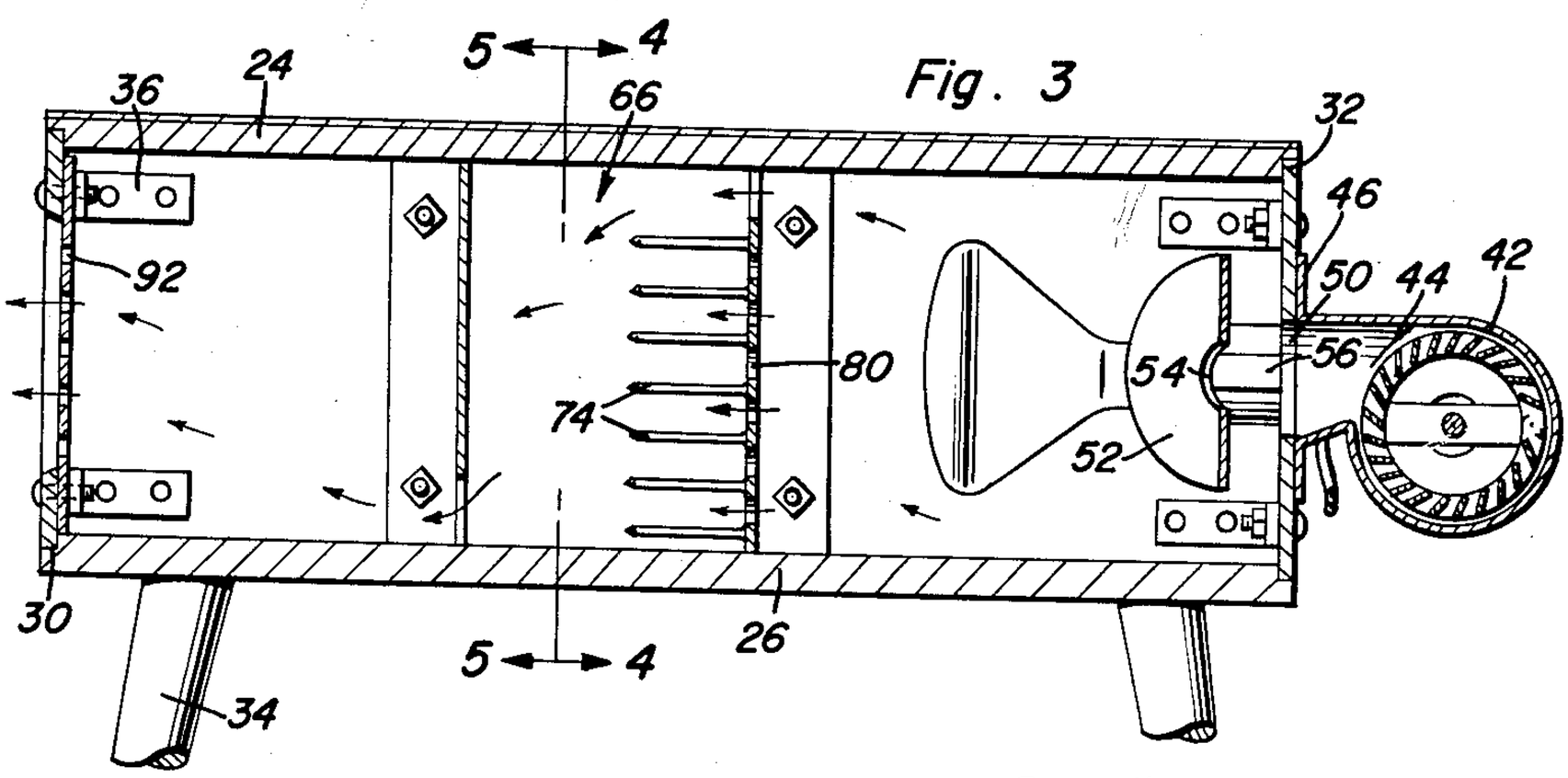


Fig. 3



Darrell W. Covault

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

United States Patent Office

3,180,972
Patented Apr. 27, 1965

3,180,972
END TABLE HEATER

Darrell W. Covault, Veedersburg, Ind.
(R.R. 1, Kingman, Ind.)

Filed Mar. 8, 1962, Ser. No. 178,376
6 Claims. (Cl. 219—365)

The present invention generally relates to heaters, and more particularly to a table and heater combination wherein the heat is supplied by electrical energy.

One of the major problems involved in the use of a portable or substantially portable electric heater, either as an auxiliary source of heat or as the primary source of heat, arises from the fact that the heater in most instances has no part in the esthetic ararngement of the furniture in a room, but rather, is a foreign object generally located in any convenient position regardless of appearance and performing no other function than the production of heat. This problem is particularly acute in comparatively small rooms which can only conveniently accommodate the basic minimum of furniture required.

Accordingly, one of the primary objects of the present invention is the provision of a heater in combination with a table so as to provide, in addition to the heater, an attractive and useful piece of furniture.

Another object of the present invention is the provision of a heater which can remain in place and be used as either a table or a heater, or both, thus avoiding the necessity of removing and storing the heater during the warmer seasons of the year during which a heater would not normally be needed.

An additional significant object of the present invention is the provision of a compact highly efficient heater capable of being located within a minimum of space.

Also, an object of the present invention is the provision of a device which is relatively inexpensive to manufacture and can be easily serviced for any necessary repairs or replacements of the heat lamps which function as the heat source.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the table heater of the present invention with a portion broken away so as to illustrate one of the lamps;

FIGURE 2 is a cross sectional view taken substantially on a plane passing along line 2—2 in FIGURE 1;

FIGURE 3 is a cross-sectional view taken substantially on a plane passing along line 3—3 in FIGURE 2;

FIGURE 4 is a cross-sectional view taken substantially on a plane passing through line 4—4 in FIGURE 3; and

FIGURE 5 is a cross-sectional view taken substantially on a plane passing along the line 5—5 in FIGURE 3.

Referring now more particularly to the drawings, reference numeral 10 generally designates the table heater comprising the present invention. The table heater of the present invention consists basically of a table structure 12 and a heater assembly 14.

The table structure consists of a front panel 16, a rear panel 18, two side panels 20 and 22, a top panel 24 and a bottom panel 26. These panels form an enclosure 28 for the reception of the heater assembly 14. Both the

top and bottom panels 24 and 26 are provided with peripheral notches 30 and 32 so as to accommodate the front, rear and side panels. These panels are preferably formed of wood, but can obviously be formed of any suitable material so as to present an attractive outer surface. The legs 34 are also preferably formed of wood but not specifically limited thereto. These legs 34 may be of any desirable length depending upon the use to which the table is to be put, however, the preferred form involves the use of the table structure 12 as an end table. The various panels comprising the enclosure 28 are secured together by the use of angle irons fastened to the panels in any conventional manner such as by the use of rivets or threaded bolts and nuts, however, it is highly desirable that both the front and the rear panels 16 and 18 be removable so as to allow access to the heater assembly 14. Additionally, it will be noted that the top panel 24 is also removable so as to allow access to the enclosure 28 containing the heater assembly 14.

The heater assembly 14 of the present invention comprises a fan 38, a fan motor 40, and a fan casing 42. The fan casing 42 is provided with a forward extending duct 44 which terminates in outwardly bent flanges 46 secured to the rear panel 18 of the table structure 12 by means of a plurality of bolts 48. The rear panel 18 is provided with an aperture 50 so as to allow for the introduction of air into the enclosure 28. A deflector plate 52 is positioned inwardly of the rear panel 18 and in alignment with the aperture 50. This deflector plate 52, as seen in FIGURES 2 and 3, consists of a circular plate bent at approximately a 45° angle and having a central aperture 54 therein. This aperture 54 is slightly smaller than the aperture 50 in the rear panel 18, and the deflector plate is secured to the rear panel 18 by two straps 56 in a manner so as to position the aperture 54 on a line with the aperture 50. It will be noted that the bolts 48 used to secure the duct 44 to the rear panel 18 can also be used to secure the straps 56 to the rear panel 18. The other end of the straps 56 can be secured to the deflector plate 52 in any convenient manner such as by welding.

The heater assembly 14 further includes a heat source 58 comprising two lamps 60 secured in a conventional manner within sockets 62 secured to the rear panel 18. An electrical conduit 64 provides the necessary power to operate both the heat lamps and the fan motor. A conventional switch means, not shown, is provided for the regulation of the electrical power.

The heater assembly 14 further includes a heat exchange assembly 66 which is effective to transfer the heat generated by the heat lamps 60 to the air flowing through the enclosure 28. The heat exchange assembly 66 includes a first baffle plate 68 secured between the sides 20 and 22 of the table structure 12 by means of a fastening means 70 extending through the sides 20 and 22 and through perpendicular flanges 72 formed on the ends of the first baffle plate 68. The baffle plate 68 is provided with a plurality of extended conductor rods 74 which are of significance in increasing the heat transfer qualities of the heat exchange assembly 66. An upwardly extending central portion 76 is provided on the first baffle plate 68 so as to space the upper edge of the baffle plate 68 from the top plate 24 thus providing two elongated grooves 78 to allow for the flow of air. It will be noted that the extending central portion can, if so desired, form an additional support for the top plate 24. The first baffle plate

68 is additionally provided with a plurality of apertures 80 which allow both the heat and light rays to go through the first baffle 68 and come in contact with a second baffle plate 82. This passage of the heat rays through the first baffle plate 68 and into contact with the second baffle plate 82 greatly increases the effective heat transmitting areas of the exchange assembly 66.

The second baffle plate 82 is positioned forward of the first baffle plate 68 and is secured between the sides 20 and 22 in the same maner as the first baffle plate 68, this second baffle plate 82 being spaced from the bottom panel 26 by means of an extending central portion 84 which results in the provision of two elongated openings 86. The openings 86 are provided to accommodate the flow of air through the enclosure 28. As noted in regard to the first baffle plate 68, the upper edge of the second baffle plate 82 can also be used to support the top panel 24. Aside from the two elongated openings 86, the second baffle plate 82 is imperforate.

From the foregoing, it is apparent that the heat exchange assembly 66 of the present invention employs conduction, absorption, radiation and convection in the transfer of the heat to the air flow through the enclosure 28. The specific arrangement of the baffles 68 and 82, as set forth supra, insures the proper heating of the air before its discharge from the heater assembly 14 through the egress grille 88 formed in the front panel 16.

The egress grille 88 is secured to the front panel 16 by means of fasteners 90 or in any other conventional manner. Further, if so desired the grille 88 can be formed integral with the front panel 16. While a plurality of elongated slots 92 have been illustrated, it is readily apparent that any suitable types of perforations may be used. Attention is specifically directed to FIGURES 2 and 3 wherein the flow of air through the enclosure 28 and out of the egress grille 88 is shown by arrows, whereby the heat dissipation of the rods 74 and baffles 68 and 82 combined with the heat dissipation into the air by the lamps 60 provide an efficient transfer of heat to the air passing through the table enclosure.

Accordingly, the heater of the present invention respectively converts electrical power into heat by the use of heat lamps and transfers this heat through an exchange assembly to a current of air flowing through a table structure and induced by a fan located rearwardly of the table and heat source. This flow of air continues past the heat source, through the exchange assembly and out through an egress grill provided at the forward end of the table structure. While no particular insulation has been illustrated, such insulation can be applied as needed and still fall within the scope of the present invention.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. An article of furniture comprising a top, a bottom, a front panel, a rear panel, and two side panels forming an enclosure, a slotted grille positioned within the front panel forming an egress means from the interior of the enclosure, heat source means located within the enclosure adjacent the rear panel, an air directing means located behind the heat source means directing air past the heat source means, through the enclosure and out the slotted grille, said air directing means including a fan mounted on the exterior of the rear panel, a duct secured between the fan and the rear panel directing the flow of air toward the rear panel, an aperture formed in the rear panel in alignment with the duct so as to provide an entrance means for the flow of air into the enclosure and past the heat source means, a plate, bent at approximately

45°, positioned within the enclosure in alignment with the aperture in the rear panel and spaced slightly therefrom with its apex directed toward said aperture, said plate having a central aperture therein smaller than the aperture in the rear panel and in alignment therewith so as to direct the air flow forward as well as toward each side, said heat source means comprising a pair of heat lamps secured to the rear panel and extending into the interior of the enclosure on both sides of the air entrance aperture in the rear panel, and a heat exchange assembly positioned between the heat source means and the egress means, said heat exchange assembly including a first baffle plate positioned between the sides of the enclosure at a point forward of the heat source means, said first baffle plate provided with a plurality of holes so as to allow for the flow of air therethrough.

2. The combination of claim 1 including a plurality of heat transmitting rods extending from the first baffle plate on the side directed away from the heat source and toward the egress means.

3. The combination of claim 2 wherein the heat exchange assembly includes a second baffle plate positioned forward of the first baffle plate, said second baffle plate spaced from the bottom of the enclosure along a major portion of its length so as to accommodate the flow of air.

4. A heater consisting of an enclosure, an egress grille at one end of the enclosure, an air flow inducing means located adjacent the opposite end of the enclosure and directing an air flow through the enclosure and out the egress grille, heat source means mounted within the enclosure between the air flow inducing means and the egress means and in the path of the air flow, and a heat exchange assembly mounted within the enclosure between the heat source means and the egress means, said assembly including a baffle plate extending transversely across the flow path, said baffle plate being provided with a plurality of holes so as to allow for a flow of air therethrough, and a plurality of heat transmitting rods extending from the baffle plate on the side directed away from the heat source and toward the egress grille, said heat source means consisting of heat lamps located laterally of the air flow inducing means, and a deflector plate in the enclosure positioned so as to direct a portion of the air flow laterally past the heat lamps.

5. A heater consisting of an enclosure, an egress grille at one end of the enclosure, an air flow inducing means located adjacent the opposite end of the enclosure and directing an air flow through the enclosure and out the egress grille, heat source means mounted within the enclosure between the air flow inducing means and the egress means and in the path of the air flow, and a heat exchange assembly mounted within the enclosure between the heat source means and the egress means, said assembly including a baffle plate extending transversely across the flow path, said baffle plate being provided with a plurality of holes so as to allow for a flow of air therethrough, and a plurality of heat transmitting rods extending from the baffle plate on the side directed away from the heat source and toward the egress grille, said heat exchange assembly also including a second baffle plate positioned in spaced relation between the first mentioned baffle plate and the egress grille, said second baffle plate being imperforate and having one edge spaced from the adjoining wall of the enclosure along a major portion of its length so as to accommodate the flow of air.

6. A heater consisting of an enclosure, an egress grille at one end of the enclosure, an air flow inducing means located adjacent the opposite end of the enclosure and directing an air flow through the enclosure and out the egress grille, heat source means mounted within the enclosure between the air flow inducing means and the egress means and in the path of the air flow, and a heat exchange assembly mounted within the enclosure between the heat source means and the egress means, said assembly including a baffle plate extending transversely across the flow

path, said baffle plate being provided with a plurality of holes so as to allow for a flow of air therethrough, and a second baffle plate positioned in spaced relation between the first mentioned baffle plate and the egress grille, said second baffle plate being imperforate and having one edge spaced from the adjoining wall of the enclosure along a major portion of its length so as to accommodate the flow of air.

References Cited by the Examiner

UNITED STATES PATENTS

1,660,052	2/28	Shepherd	219—368
1,705,812	3/29	Fisher.	
1,706,846	3/29	Fisher.	
1,875,752	9/32	Montero	219—362
2,278,180	3/42	Lewis	219—380
2,379,705	7/45	Graves	219—370
2,470,181	5/49	McIntyre	219—370 X
2,520,830	8/50	Borzner	219—365
2,919,338	12/59	Covault et al.	219—365

FOREIGN PATENTS

872,747	7/61	Great Britain.

RICHARD M. WOOD, *Primary Examiner.*

ANTHONY BARTIS, *Examiner.*