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F. RYAN

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DEHUMIDIFIER

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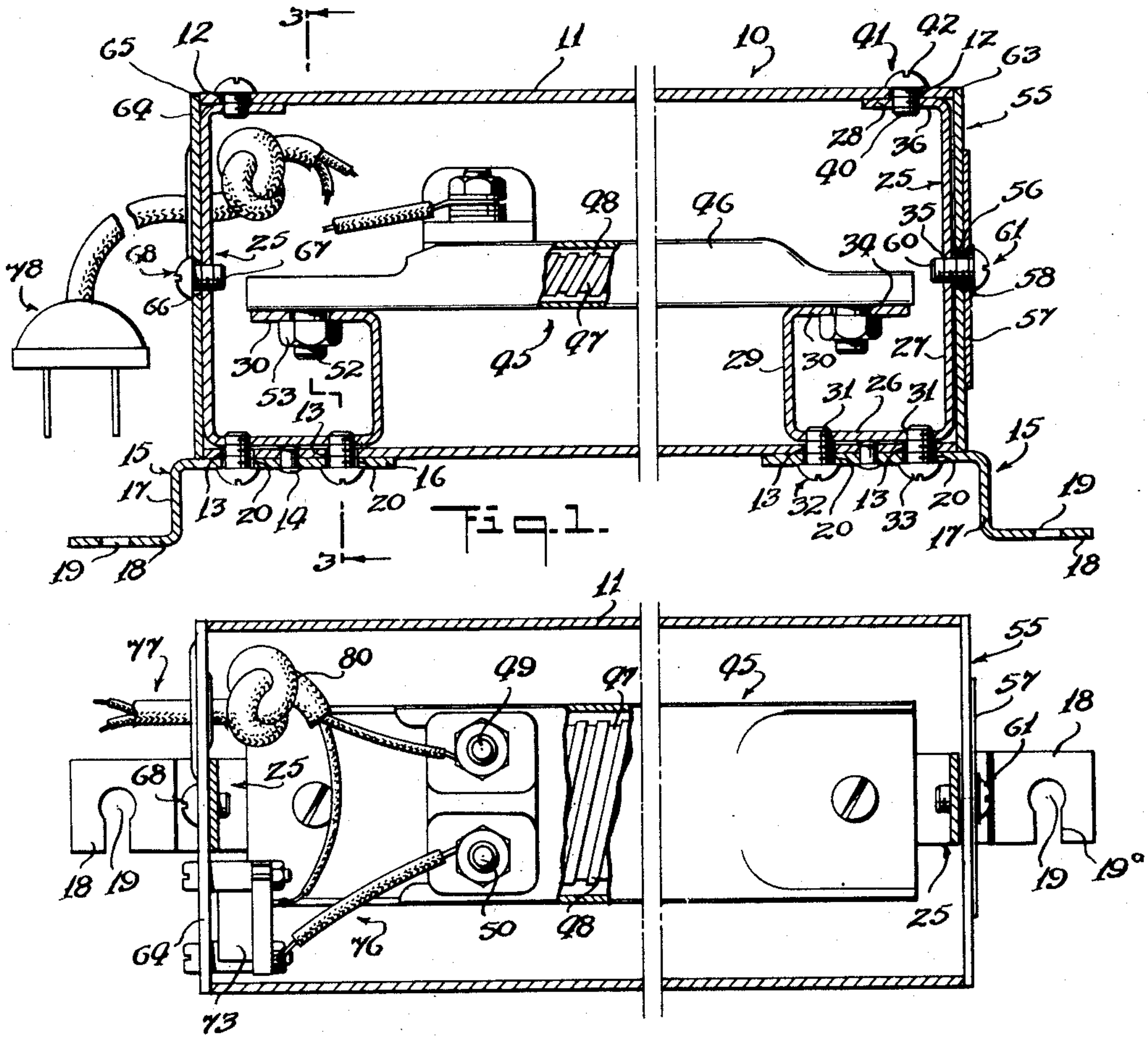


Fig. 1.

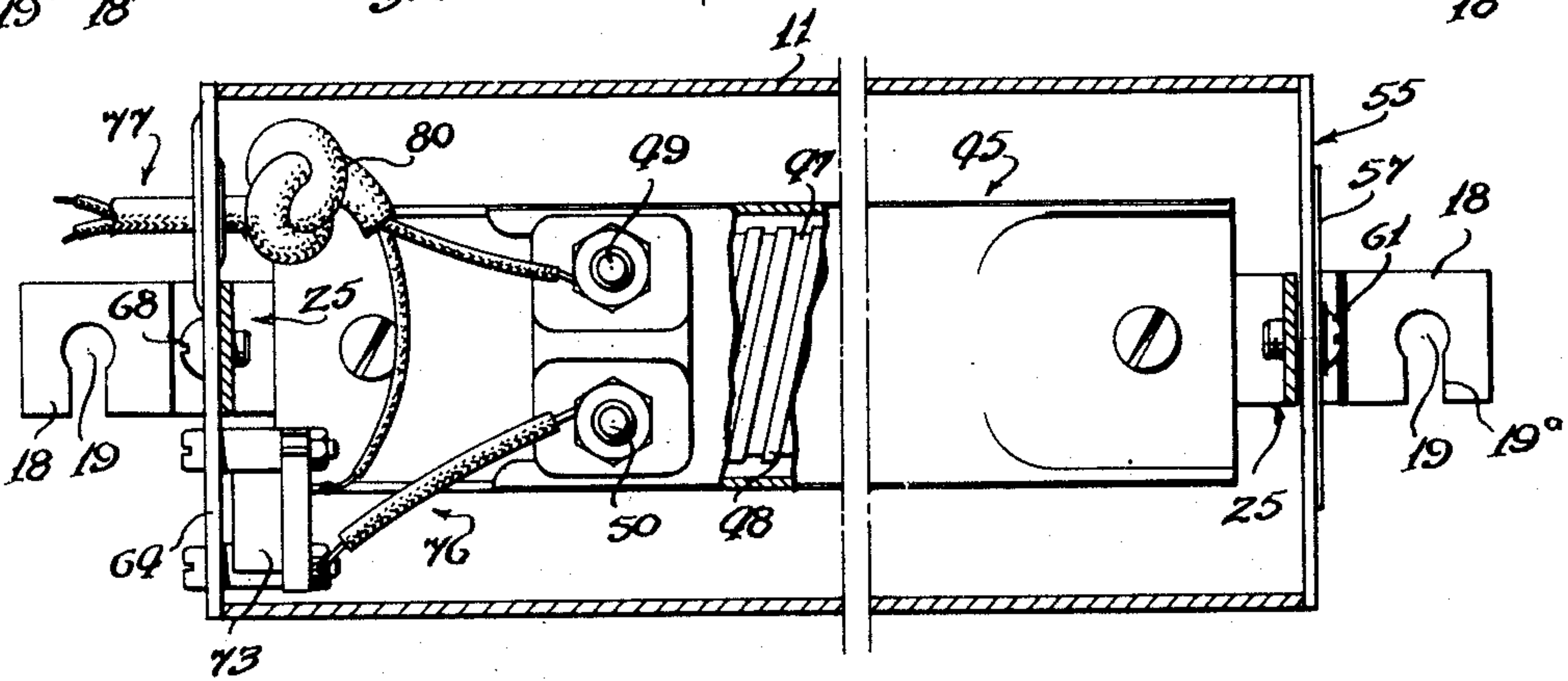


Fig. 2.

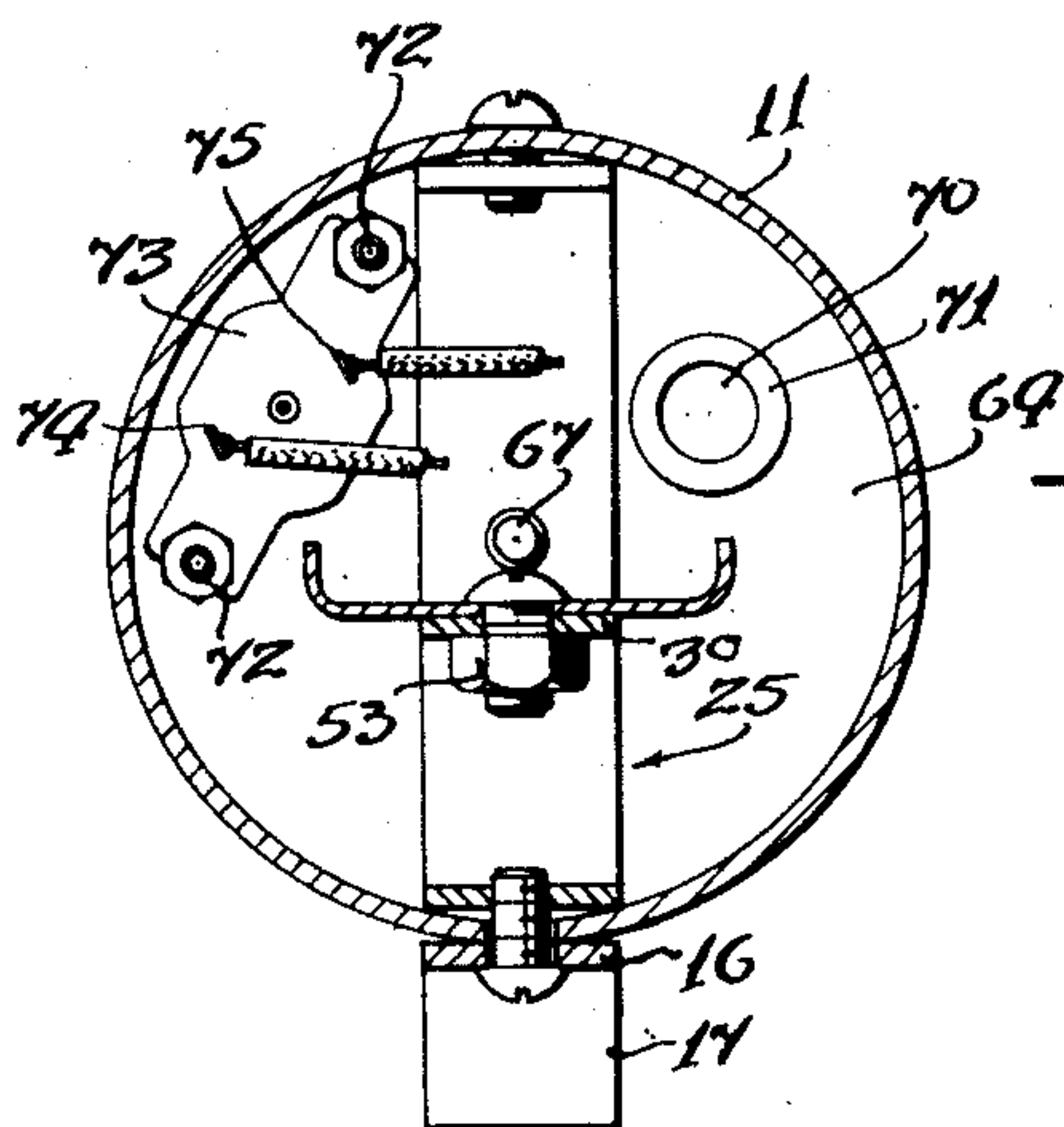


Fig. 3.

INVENTOR.  
FRANK RYAN

BY

J. B. Felsch  
ATTORNEY



## UNITED STATES PATENT OFFICE

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## DEHUMIDIFIER

Frank Ryan, New York, N. Y.

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2 Claims. (Cl. 219—34)

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This invention relates to dehumidifiers. It is particularly directed to dehumidifiers which may be placed in a closet for keeping the closet dry and to prevent mildew. This application is a continuation in part of my copending application Serial No. 39,041, filed July 16, 1948, now abandoned.

An object of this invention is to provide a dehumidifier of the character described which operates at a relatively low heat for drying out the air, the construction being such as to cause air to rise in the closet and hence circulate therein.

Another object of this invention is to provide a dehumidifier of the character described in which the heating element is fully enclosed so that no particles can touch the heater. The heating element is in the form of a strip heater, the heating wires being enclosed in a flattened tube and said tube being enclosed within a cylindrical casing. The strip heater is of a type which does not burn out so that no replacements are necessary. The device may be attached to the baseboard of the closet six inches above the floor and includes a bracket which spaces the cylindrical casing about one-half inch from the wall. The construction is such that the casing gets warm but will not scorch cotton fiber or clothing, even if the cylindrical casing contacts the clothing.

Another object of this invention is to provide a dehumidifier of the character described which is provided with a thermostatic switch which turns off the power when the heat rises above a predetermined temperature and turns the power on again when the heat goes down below a predetermined temperature. With such construction, if the line gets shorted or overloaded the switch turns off and will not scorch clothing in contact with the cylindrical casing.

Still another object of this invention is to provide in a dehumidifier of the character described, a bracket attached to the cylindrical casing, and provided with notches, so that they may be clipped onto screws or other fastening means attached to a wall.

Still another object of this invention is to provide in a dehumidifier of the character described a cylindrical casing comprising a cylindrical tube and end plates at the ends of the tube and a hollow rivet or grommet being attached to one end plate, and serving to attach a name plate to said end plate and leaving a hole for a screw which attaches the end plate to a bracket fixed within the tube.

Yet a further object of this invention is to provide a dehumidifier of the character described

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which is so constructed that upon removing some screws the entire inner assembly, including brackets and the strip heater may be pulled out of one end of the tube.

Still a further object of this invention is to provide a device of the character described comprising a cylindrical tube, a pair of brackets attached within the ends of said tube, a strip heater attached to said inner brackets and extending coaxially of the tube, end plates attached to said inner brackets and outer brackets for attaching the tube to a wall, said outer brackets being riveted to the tube and being attached by screws to the inner brackets through openings in said outer brackets and in said tube.

Still a further object of this invention is to provide a device of the character described in which the end brackets within the ends of the tube serve to hold the strip heater at the middle of the tube and coaxially thereon, and further serve to attach the strip heater to the tube and further serve to attach the end plates in place and further serve to receive screws which attach the outer brackets to the tube.

Yet a further object of this invention is to provide a device of the character described in which one end plate serves to mount a thermostatic switch in place within the tube.

Yet a further object of this invention is to provide a strong, rugged and durable device of the character described which is inexpensive to manufacture, safe in operation, and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter described, and of which the scope of invention will be indicated in the following claims.

In the accompanying drawings in which is shown various illustrative embodiments of this invention,

Fig. 1 is a longitudinal cross-sectional view of a dehumidifier embodying the invention with parts broken away and in cross-section;

Fig. 2 is a horizontal longitudinal cross sectional view of the device shown in Fig. 1; and

Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 1.

Referring now in detail to the drawing, 10 designates a dehumidifier embodying the invention. The same comprises a metal tubular member 11, open at both ends. Said tubular member



11 may be coated if desired. It is formed with a pair of longitudinally aligned through openings 12, adjacent the ends thereof. It is also formed adjacent each end with a pair of through openings 13. The openings 13 are in a plane passing through the axis of the tube and through the axis of the openings 12. In other words, the openings 13 are diametrically opposed to the openings 12.

Riveted to the tube 11 by rivets 14 are a pair of similar symetrically disposed outer brackets 15. Each bracket 15 comprises an arm 16 contacting the tube and extending longitudinally thereof and extending beyond the end thereof. The arm 16 has a web 17 disposed radially of the tube and extending outwardly from said web is an arm 18 formed with an opening 19. In attaching the tube to the wall, the arms 18 contact the wall and screws or nails, or other fastening means are passed through the openings 19 for attaching the device to the wall.

The holes 19 may be connected to edges of the arms 18 by notches 19a so that the brackets may be clipped on to the screws or other attaching means on the wall.

Each arm 16 is formed with a pair of through openings 20 registering with the openings 13 in the tube.

Within the ends of the tube 11 are a pair of similar, symetrically disposed inner brackets 25. Each bracket 25 comprises a portion 26 contacting the inner side of the tube 11 and extending longitudinally thereof, and being substantially coextensive with the arm 16 of bracket 15. Extending from portion 26 is a portion 27 which extends diametrically across one open side of the tube 11. The outer surface of portion 27 is substantially in the plane of one outer end of the tube. Extending from portion 27 is a flange 28 parallel to portion 26 and contacting the inner surface of tube 11, and being diametrically opposed to portion 26. Extending from the inner end of portion 26 is a radial portion 29 of a length somewhat less than the radius of the tube 11. Extending outwardly from portion 29 is a flange 30 parallel to the axis of the tube 11 and somewhat spaced therefrom.

The portion 26 is formed with a pair of screw threaded openings 31 to receive the screw threaded ends of a pair of screws 32 having shanks passing through the registering openings 13 and 20 and heads 33 which contact the underside of arm 16 of the brackets 25 and to the tube 11. The flange 30 is formed with an opening 34 for the purpose hereinafter appearing.

The portion 27 is formed with a central screw threaded opening 35. Arm or flange 28 is formed with a screw threaded opening 36 registering with the opening 12. Extending from the opening 12 is a shank 40 of a screw 41. The screw 40 is screwed into the opening 36. The head 42 of the screw contacts the outer side of the tube 11. Since the members 25 are similar and symmetrically disposed only one of them has been described, it being understood that both are the same in construction and in the way they are attached to the tube and to the brackets 15.

Mounted on and between portions 30 of the brackets 25 is a strip heater 45. The strip heater 45 may be of any suitable construction, for example of the type described in Patent No. 1,705,696, issued March 19, 1929, to J. C. Woodson or Patent No. 1,693,421, issued on November 27, 1928, to J. C. Woodson, or of any other suitable type.

Generally, the strip heater 45 comprises a flattened tubular casing 46 within which is an insulating pad 47 on which is wrapped a heating wire or element 48. Attached to the flattened tubular casing 46 are the terminals 49 and 50. The ends of the strip heater 45 terminate short of the ends of the tube 11. The strip heater 45 extends longitudinally of the tube substantially at the axis thereof. It does not contact the tube at all. Fixed to the underside of the flattened tubular casing 46 are studs 52 passing downwardly through the openings 34 of the flanges 30. Nuts 53 screwed to the studs 52 serve to fix the strip heater to the flanges 30.

Attached to the portion 26 on one of the brackets 25 is a circular end plate 55. Said circular end plate 55 is formed with a central opening 56. Contacting the outer side of the end plate 55 is a name plate 57 formed with a central opening registering with the central opening in the end plate 55. The name plate 57 is of smaller diameter than the end plate 55. Said plates are connected and held together by a hollow grommet or rivet 58 which forms an opening through the end plate. Extending through said grommet or rivet 58 is a shank 60 of a screw 61. Said shank is threaded to the screw threaded opening 35. The head of the screw contacts the outer side of the grommet and serves to fix the end plate to the bracket 25. The end plate 55 contacts the adjacent end edge 63 of the tube 11.

To close the opposite end of the tube 11 is a second end plate 64, the same being circular and contacting the other end edge 65 of the tube 11. Plate 64 is formed with a central opening 66. Extending therefrom is a shank 67 of a screw 68, said shank being screwed into the opening 35 of the adjacent bracket 25. The head of the screw contacts the outer side of the end plate. Thus the end plate 64 closes one end of the tube 11. Said end plate 64 is formed with a through opening 70 offset from the center of said plate. Attached to the end plate 64 is a grommet 71 at said opening.

Fixed to the end plate 64 at its inner surface by means of screws or bolts 72, in any suitable manner, is a thermostatic switch 73. Said thermostatic switch may be of any suitable construction, for example such as shown in Patent No. 1,697,886 and Patent No. 2,317,830. Said thermostatic switch has terminals 74 and 75 and is connected in series circuit with the heating element 48 by means of wiring 76. The wiring 76 includes a cord 77 which may have heat resistant insulation and which is connected to a plug 78 which may be connected to any suitable house outlet.

The thermostatic element is selected for low heat. It may have a 37.5 watt, 115 volt rating. The heat caused by the heater rises and hence circulates in the closet. It will be noted that the strip heater is fully enclosed so that no particle can touch the heater and burn. The safety heating element or strip heater 45 is fully enclosed by tube 11 and its end walls. The heating element does not burn out and no replacements are necessary. The wiring 77 passes through the openings 70 in the end wall 64. The heater wires 48 are fully enclosed by the protective flattened tube 46.

The device may be attached to the baseboard of a closet about six inches from the floor and the brackets 15 space the heater about one-half inch from the wall. The casing gets warm but will not scorch cotton fibers or clothing even if it



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contacts it. The rivets 14 hold the brackets 15 to the tube and the brackets serve as reinforcement for the screws.

It will be noted that the end brackets 25 serve to hold the strip heater at the middle of the tube, serve to attach the strip heater to the tube, serve to attach the end plates to the tube, and furthermore receive screws for attaching the brackets 15 to the tube.

The thermostatic switch will turn power "off" when the heat rises above a predetermined temperature, such as 190 degrees Fahrenheit. When the temperature goes below said predetermined temperature, the thermostatic switch will again turn the power "on." Thus, if the line should get shorted or overloaded, the switch will turn the power "off" so as not to scorch clothing in contact with the tube. The notches 19a serve to permit the bracket to be clipped on to screws or attaching device. The hollow rivet or grommet 56 serves to attach the name plate to the end plate and also leaves a hole for the screw 61 for attaching the end plate to one of the brackets 25.

The assembly of the device allows the strip heater to be pulled out as a unit upon removing all of the screw except screw 68. It will be noted that one end plate serves to mount the thermostatic switch within the device. It will now be understood that the device is safe and efficient to use and is easy to assemble and disassemble.

The cord 77 may be knotted as at 80, just inside the end wall 64 so as to prevent pull on the terminals of the strip heater or thermostatic unit.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention I claim as new and desire to secure by Letters Patent:

1. A dehumidifier comprising a tube, an inner bracket within each end of the tube, each inner bracket having a portion contacting the inner surface of the tube, a portion extending from the first portion and disposed diametrically across the open end of said tube, a portion extending from said diametric portion and contacting the inner surface of the tube at a point diametrically opposed to the first portion, a ra-

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dial portion extending from the inner end of the first portion parallel to said diametric portion and a portion extending outwardly from said radial portion parallel to the axis of the tube toward said diametric portion, and disposed adjacent the axis of the tube, a strip heater mounted on and between said outwardly extending portions of said brackets, means to attach said brackets to said tube, and end plates attached to said diametric portions of said brackets for closing the ends of said tube.

2. A dehumidifier comprising a tube, an inner bracket within each end of the tube, each inner bracket having a portion contacting the inner surface of the tube, a portion extending from the first portion and disposed diametrically across the open end of said tube, a portion extending from said diametric portion and contacting the inner surface of the tube at a point diametrically opposed to the first portion, a radial portion extending from the inner end of the first portion parallel to said diametric portion and a portion extending outwardly from said radial portion parallel to the axis of the tube toward said diametric portion, and disposed adjacent the axis of the tube, a strip heater mounted on and between said outwardly extending portions of said brackets, means to attach said brackets to said tube, and end plates attached to said diametric portions of said brackets for closing the ends of said tube, a pair of outer brackets riveted to said tube, said outer brackets being similar and symmetrically disposed, said tube and outer brackets having registering openings, screws extending through said registering openings and screwed within threaded openings in said first portions of said inner brackets, said outer brackets having outwardly offset arms formed with cut-outs to receive fastening means for attaching said outer brackets to a wall.

FRANK RYAN.

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