April 18, 1939. G. E. ATKINSON ET AL 2,155,289

ELECTRIC HEATER

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Fig. 1.

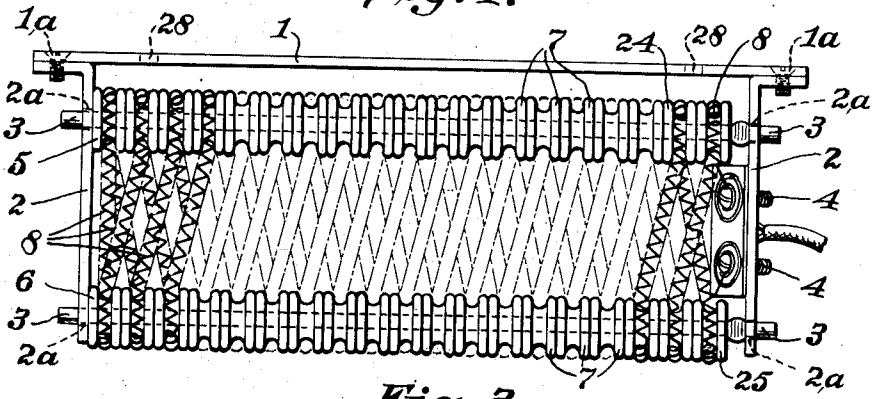


Fig. 3.

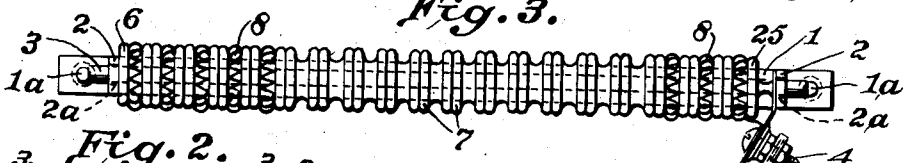


Fig. 2.

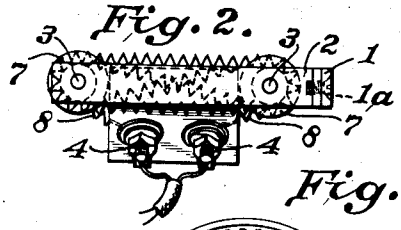


Fig. 8.

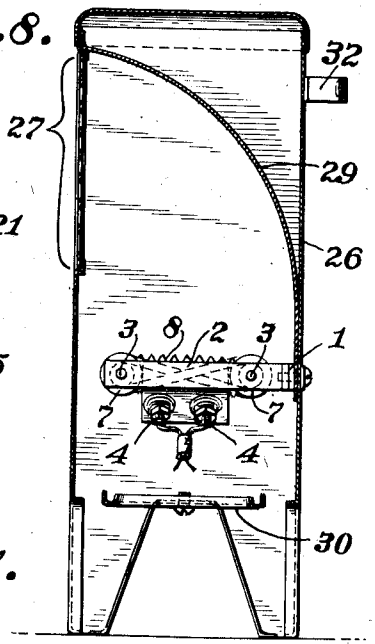


Fig. 6.

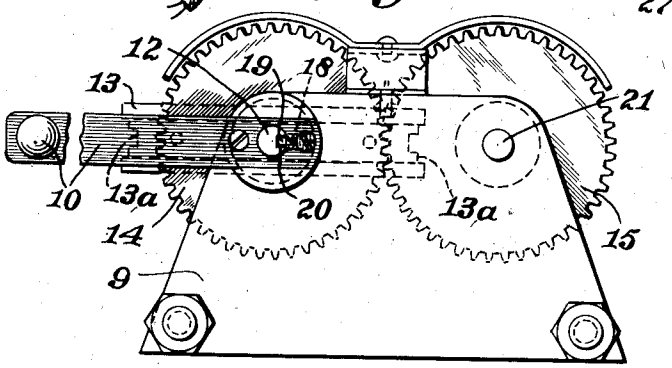
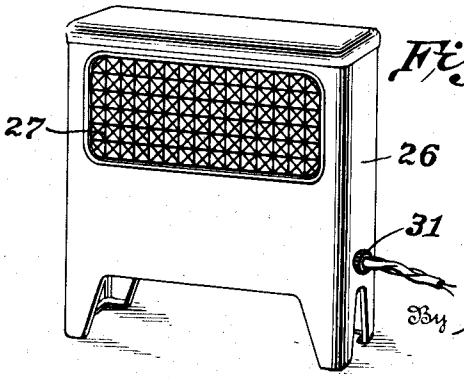


Fig. 7.



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ELECTRIC HEATER

Filed April 16, 1936 2 Sheets-Sheet 2

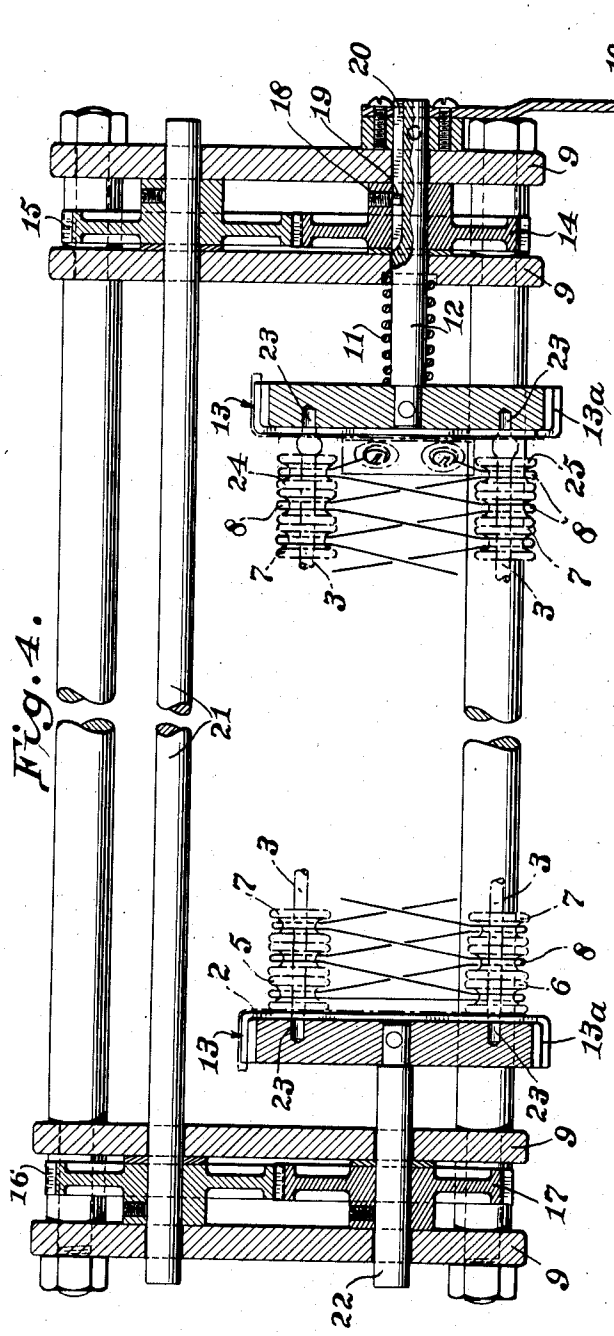


Fig. 4.

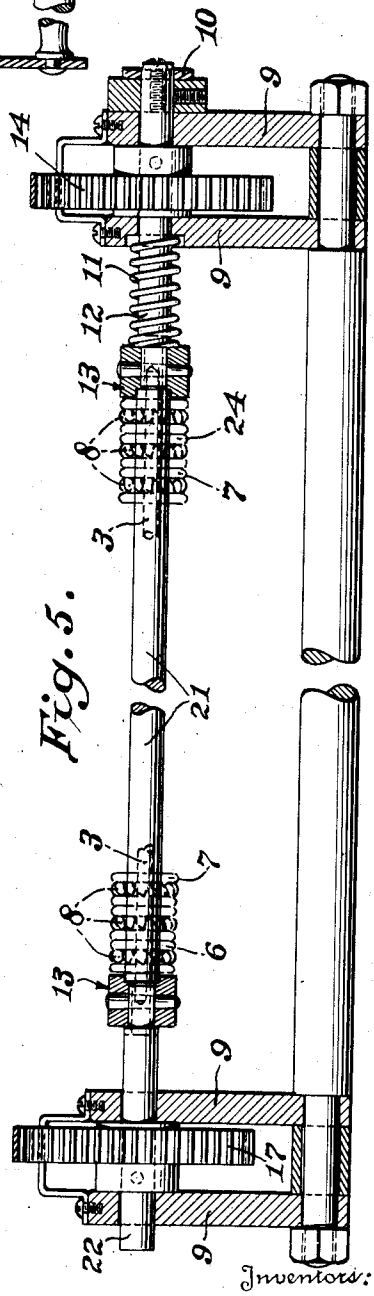


Fig. 5.

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UNITED STATES PATENT OFFICE

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ELECTRIC HEATER

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Application April 16, 1936, Serial No. 74,762

3 Claims. (Cl. 201—71)

The invention relates to an electric space heater with method and means for constructing the same to efficiently provide a simple and durable device.

An object of the invention is to provide a heater coil and assembly of simple and novel construction and method and means for forming the same.

Other objects will appear hereinafter.

The invention consists in the features, combination, and arrangement of parts hereinafter described and particularly pointed out in the claims.

In the drawings:

Fig. 1 is a plan view of the heating coil assembly. Figs. 2 and 3 are end and edge views of the same.

Figs. 4, 5 and 6 are partly sectional, plan, elevation, and end views of the winding device.

Fig. 7 is a front view on a reduced scale of the heater, with parts broken away.

Fig. 8 is a sectional view of the heater taken on line 8—8 of Fig. 7.

Referring to the drawings, the heating element or coil assembly shown in Figs. 1 to 3 is made up of two rods 3 carrying grooved insulator spools 7 for receiving and positioning the resistance or heating coil 8, the rods being held in spaced apart relation by means of the two end brackets 2 having holes 2a to receive the ends of the rods 3. This assembly, consisting of the two rods 3 with the porcelain spools 7 threaded thereon, and the two brackets 2, is then placed in a rotatable fixture or device 9 arranged to engage the two brackets 2 and to maintain a slight pressure for holding the assembly together. The resistance coil 8 may then be attached at one end to one of the terminal posts 4, and the assembly is rotated by means of a suitable handle 10 on the fixture until the coil is half wound, having reached the opposite end of the assembly. The remainder of the coil is then passed between the spools 5 and 6 and the winding completed by rotating the fixture in the opposite direction until the remaining end of the coil arrives adjacent the remaining terminal post 4 and is fastened thereto. The spreader 1 is then fastened to the brackets 2 by screws 1a completing the assembly. End tension of the fixture on the assembly is released and the completed assembly is removed from the fixture ready for installation in the heater casing. A spring 11 may be employed to apply the desired pressure to the assembly, the spring being mounted on the slidable crank-shaft 12 of one of the arms 13 of the winding device which engage the brackets 2 for driving the assembly by simultaneous rotation of the arms. The simultaneous rotation of the arms is effected by gears 14, 15, 16 and 17. Gear 14 is secured to the slidable stubshaft 12 by means of a setscrew 18 having a pin 19 operating in slot 20 in the shaft 12. Gear 14 meshes with gear 15 mounted on the secondary shaft 21 on the other end of which is mounted gear 16 which drives gear 17 mounted on the stubshaft 22 of the other arm 13. The shafts are mounted in the frame 9 of the winding device. The arms 13 are provided with recesses 23 to receive the ends of the rods 3 of the assembly to rotate the same therewith.

An alternative method of winding the coil is to first pass approximately one half of its length between the spools 5 and 6 and then to wind the two halves or stretches of the coil at the same time, which results in bringing both ends of the coil to the proper place for attaching them to the terminal bolts 4.

In either method of winding, the coil is guided during the winding and preferably and for ready disposal of the ends of the coil, one of the ends may be passed between its last two spools 24 and 25 before attaching to its terminal post 4, as shown. However, this is not essential, as the ends can be brought to the terminal posts after winding over the last spools, in any way, as by threading through the assembly to reach the terminal posts where the terminal posts are disposed to one side of the assembly as shown.

The arms 13 may be shaped at the ends as shown at 13a to receive the turned ends of the brackets 2.

The heating coil assembly may be fastened to the back wall of the casing 26 by means of suitable fastenings such as screws passing through suitable holes in the casing wall and engaging threaded holes 28 in the spreader bar 1.

The heating coil assembly is thus securely mounted in the casing while being readily removable therefrom when necessary.

We claim:

1. In an electric heater assembly, a frame comprising insulators on spaced rods, said rods extending between and received in openings in end bracket members of the frame, said rods being of substantially equal length and extending outwardly beyond said end bracket members providing pin means on said frame for mounting it for rotation, a heating coil having terminal connections at the same end of the assembly and being wound over the insulators on the frame in two winding stretches, each extending from one end of the frame to the other, the insulators on

each rod being engaged in alternation by said winding stretches passing thereover, each of said insulators having one winding stretch passing thereover, and the next adjacent insulator having the other winding stretch passing thereover, said insulators supporting said winding stretches in coiled condition providing a continuous coil readily formed by rotation of the frame in winding the coil thereon.

2. In an electric heater assembly, a frame comprising insulators on spaced rods, said rods extending between and received in openings in end bracket members of the frame, said rods being of substantially equal length and extending outwardly beyond said end bracket members providing pin means on said frame for mounting it for rotation, a heating coil having terminal connections at the same end of the assembly and being wound over the insulators on the frame in two winding stretches, each extending from one end of the frame to the other, the insulators on each rod being engaged in alternation by said winding stretches passing thereover, each of said insulators having one winding stretch passing thereover, and the next adjacent insulator having the other winding stretch passing thereover, said insulators supporting said winding stretches in coiled condition, said coil at the end of the frame opposite to the terminal end, passing between the end insulators of the spaced rods by passing over one side of the end insulator of one rod and then through the frame and over the opposite side of the end insulator of the other rod, to form a continuous coil supported in coiled condition by said insulators and readily formed by rotation of the frame starting the winding at either the terminal end of the frame, or at the opposite end of the frame by initially passing the coil between the end insulators as stated.

3. Apparatus according to claim 1 in which said frame includes a spreader bar detachably connected to and extending between corresponding ends of the end bracket members.

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