H. F. STRATTON.
RESISTANCE UNIT.
APPLICATION FILED NOV. 9, 1915

1,275,785. Patented Aug. 13, 1918.

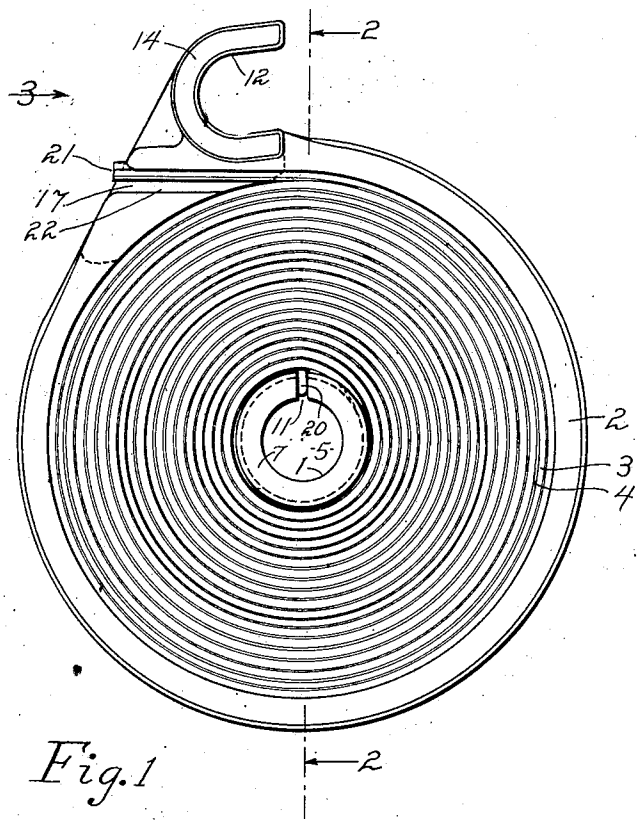


Fig. 1

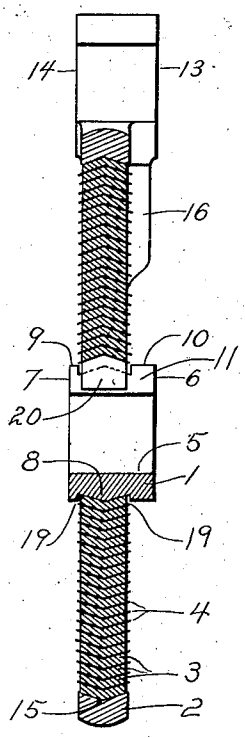


Fig. 2

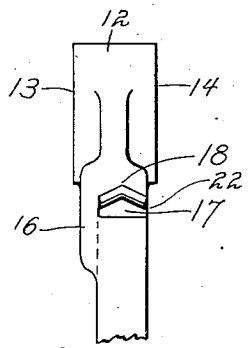


Fig. 3

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UNITED STATES PATENT OFFICE.

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RESISTANCE UNIT.

1,275,785. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed November 9, 1915. Serial No. 60,514.

To all whom it may concern:

Be it known that I, HARRY F. STRATTON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Resistance Units, of which the following is a specification.

This invention relates to electrical resistance for motor starting, heating, etc., and relates particularly to what is known as unit-type resistance.

One well-known resistance unit is made by winding a flat strip or ribbon of resistance material into a disk or flat spiral, the convolutions thereof being insulated from each other. The convolutions of such a resistance become loose, and sometimes slip over each other axially, so that the unit becomes dished or conical in shape.

One object of my invention is to provide a resistance unit of the spiral disk form, which retains its disk shape under all conditions of service. Another object is to provide a spirally wound resistance unit in which the ends of the resistance material are held without the aid of screws, nuts, or other additional parts.

Referring to the accompanying drawings, Figure 1 is an elevation of a complete resistance unit embodying the principles of my invention; Fig. 2, a cross-section taken on the line 2 of Fig. 1; and Fig. 3, a fragmentary view showing an elevation of the upper portion of Fig. 1, looking in the direction of the arrow 3.

On the drawing, I show the spool 1, preferably of iron, the outer ring 2, also preferably of iron, the strip of resistance material 3, and the strip of insulating material 4.

The spool 1 has the central opening 5, the parallel ends 6 and 7, and the peripheral rib 8 preferably V-shaped in cross-section. This rib may be variously formed but I prefer to form it by cutting an annular groove 19 out of the spool at each side of the annular line which is to constitute the outermost portion of the rib. I have shown the rib 8 nearer the end 7 than the end 6 of the spool, whereby the rim 9 left at the end 7 of the spool is narrower than the rim 10 left at the end 6. 11 is a slot cut entirely through one side of the spool, preferably from end to end.

The ring 2 has the hook 12 to receive a supporting rod, not shown. The sides 13 and 14 of the nook are parallel and lie on the same planes, respectively, as the ends 6 and 7 of the spool. The inner wall of the ring 2 has the groove 15 which corresponds to the shape of the rib 8. The ring is thickened at 16 near the hook 12 where it is provided with the slot 17 open at one side, as shown at 22, and having its wall nearest the hook grooved to correspond to the groove 15, as shown at 18. The slot 17 extends from the interior of the ring to the exterior thereof, the groove 18 being a continuation of the groove 15.

In assembling one of my resistance units I proceed preferably as follows: I mount the spool 1 on a rotary spindle with the spindle in the bore 5. The ring 2 is fixed in position concentric with the spool. One end of a resistance strip, or ribbon 3, bent longitudinally, in any approved manner, as by a pair of rolls, to correspond to the shape of the rib 8 and the groove 15, is inserted in the slot 11 in the spool, as shown at 20. The strip of resistance is also positioned in the slot 17. The spindle is then rotated approximately one revolution which winds one layer of the resistance strip 3 on the spool 1. Then the insulating strip 4 is fed through the slot 17 along with the resistance strip 3 and thereafter wound simultaneously around the spool with the resistance strip. The spool is continuously rotated, the two strips 3 and 4 being wound in a double spiral, one closely fitting the other all the way outwardly from the end of the first convolution of the resistance strip. The winding of the strips 3 and 4 is continued until they compactly fill the entire space between the spool and the ring; whereupon the strips are cut off at the outer end of the slot 17, no binding or clamping means being necessary.

The unit described may be used alone, or assembled side by side with similar units on rods, which extend through the bore 5 and hook 12 of each unit, in a manner well known.

By reason of the interlocking or equitant connections between the consecutive layers of the strips 3 and 4 and of the said layers with the said rib 8 and groove 15, a unit, wound so that the consecutive layers fit tightly on each other and so that the inner and outer portions are wedged tightly on the rib 8 and in the groove 15, will not be-

come dished, even when jarred in a horizontal position.

I claim—

1. A resistance unit containing a spirally-wound insulated resistance strip, the convolutions thereof resting one on another in an equitant manner and thereby preventing the convolutions from dishing.

2. A resistance unit containing a spirally-wound insulated resistance strip, the convolutions thereof resting one on another in an equitant manner and thereby preventing the convolutions from dishing, a spool in the center of the unit and a ring within which the periphery of the wound strip is confined, the inner surface of the ring fitting the shape of the periphery of the wound strip to prevent its lateral movement in the ring.

3. In a resistance unit, an insulated resistance strip, a spool on which the strip is wound to form a flat spiral, and a continuous one-piece ring within which the strip is wound, the spiral being wound to compactly fill the ring, which has a slot through which the strip is fed while being wound.

4. A resistance unit, an insulated resistance strip, a spool on which the strip is wound to form a flat spiral, and a ring within which the strip is wound, the spiral completely filling the ring which has a slot through which the strip is fed while being wound, the strip being angular in cross-section and the spool and ring having the surfaces which contact with the strip shaped to fit the latter.

5. In a resistance unit, an insulated resistance strip, a spool on which the strip is wound to form a flat spiral, and a ring within which the strip is wound, the spiral compactly filling the ring, the frictional engagement of the last convolution with the ring preventing the unwinding of the spiral, the strip being transversely reflexed, and the ring having the surface which contacts with the strip shaped to fit the strip.

6. In a resistance unit, a spool, an insulated resistance strip wound spirally thereon, and a continuous ring within which the spiral is wound, so compactly filling the ring that frictional engagement between the last convolution and the ring prevents the unwinding of the spiral.

7. In a resistance unit, a spool, an insulated resistance strip wound spirally thereon, and a continuous ring within which the spiral is wound, so compactly filling the ring that frictional engagement between the last convolution and the ring prevents the unwinding of the spiral, the ring having an aperture through which the strip is wound.

8. In a resistance unit, a spool, an insulated resistance strip secured thereon, and wound spirally thereon, and a continuous ring within which the spiral is wound, filling the ring so compactly that the frictional engagement between the last convolution and the ring prevents the unwinding of the spiral, and the ring and the spool being adapted by their engagement with the strip to serve as electrical terminals for the unit.

Signed at Cleveland, Ohio, this 5th day of November 1915.

HARRY F. STRATTON.