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J. E. SMITH

1,973,271

TERMINAL CONSTRUCTION

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Fig. 1

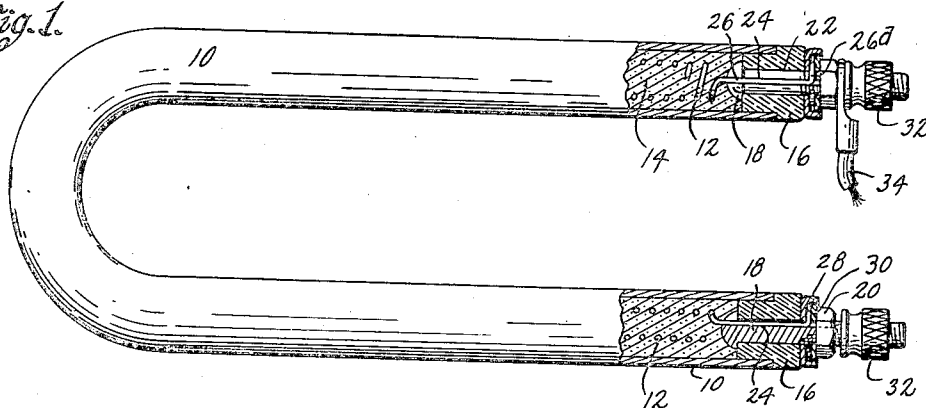


Fig. 2

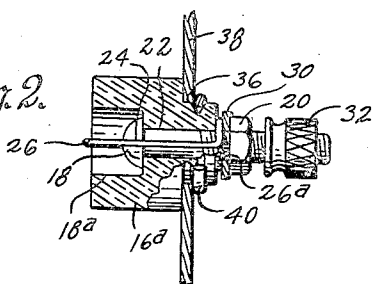


Fig. 3

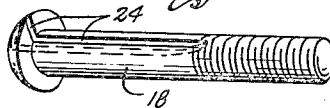


Fig. 4

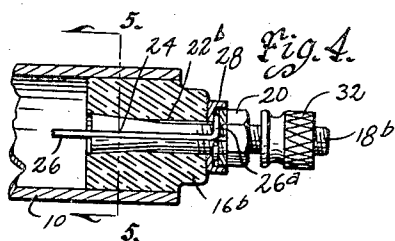


Fig. 5

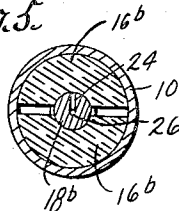


Fig. 6

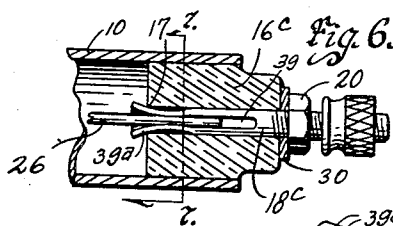


Fig. 7

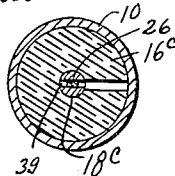
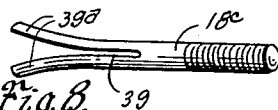


Fig. 8



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TERMINAL CONSTRUCTION

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2 Claims. (Cl. 173-269)

An object of my present invention is to provide a simple and durable terminal construction which is inexpensive to manufacture and assemble and involves a minimum of parts.

A further object is to provide a terminal construction especially adapted for heating elements and which provides an effective electrical connection between the terminal wire of a heating element, or any electric apparatus, and a terminal screw and at the same time provides an insulated mounting for the terminal screw which is especially adapted for connection with a tubular casing or for positioning in an opening of a supporting element.

Still a further object is to provide an insulated terminal construction, which, besides providing an electrical connection between a terminal wire and a terminal screw, effects a tightening action of a bushing within a tubular casing or opening so that the terminal construction is retained relative to its support.

A further object is to provide a combination bushing tightening and terminal screw with means to grip an electric terminal wire and effect a substantial electrical connection therewith.

Still a further object is to provide a terminal construction including a longitudinally slotted screw for a terminal wire to extend through, the wire extending out of the slot and encircling the screw and a nut being provided for engaging the encircling part of the wire to make electrical connection therewith.

Still another object is to provide a tapered screw associated with a split bushing for expanding the bushing in its mounting when the screw is tightened, thus causing it to be frictionally retained relative to the mounting.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawing, in which:

Figure 1 is an enlarged view partly in longitudinal cross section of a heating element with a pair of my terminal constructions applied thereto.

Figure 2 is a sectional view of a terminal construction having additional features.

Figure 3 is a perspective view of a terminal screw used in my construction.

Figure 4 is a sectional view showing a modified form of terminal construction.

Figure 5 is a sectional view on the line 5-5 of Figure 4.

Figure 6 is a sectional view showing the construction of Figure 4 in a slightly modified shape.

Figure 7 is a sectional view on the line 7-7 of Figure 6; and

Figure 8 is a side elevation of the terminal screw shown in Figure 6 illustrating it in the shape it is formed before it is used.

On the accompanying drawing, I have used the reference numeral 10 to indicate a tubular casing. Within the tubular casing, a heating element 12 is shown, the space between the heating element and the casing being filled with insulating material 14 so as to insulate the heating element relative to the casing.

My terminal construction includes a bushing 16 adapted to fit into the end of the tubular casing 10, a terminal screw 18 and a draw nut 20. The bushing 16 may be of shouldered construction as illustrated so as to limit its inward movement relative to the casing 10.

The bushing 16 has a bore 22 through which the terminal screw 18 extends. The terminal screw is longitudinally slotted, as indicated at 24, the slot extending through the head of the screw and into the shank thereof at least past the outer end of the bushing 16.

The heating element 12 has a terminal wire 26 adapted to extend through the slot 24 and then encircle the screw 18 as indicated at 26a. A cup washer 28 is preferably provided to receive the encircling portion 26a of the terminal wire 26.

The nut 20 is adapted to be tightened against the encircling portion 26a of the terminal wire 26 and if desired, a washer 30 may be interposed between the nut 20 and the encircling portion of the wire. In addition to the nut 20, a terminal nut 32 may be provided for tightening against a supply wire 34. The slot 24 provides a convenient passageway for the terminal wire 26 to the nut 20 where it is secured. Thus the nut 20 serves the combination purpose of tightening the screw 18 relative to the bushing 16 and engaging the terminal wire 26 to clamp it between the bushing and the nut and thus provides an efficient electrical connection between the terminal wire and the terminal screw.

As shown in Figure 2, the bushing 16 is replaced by a bushing 16a which is shown as being of slightly different shape. It is countersunk as indicated at 18a to receive the head of the screw 18. This bushing is adapted for mounting in an opening 36 of a supporting member 38, a retainer

40 being provided to retain the bushing relative to the support.

The cup washer 28 has been omitted inasmuch as this is not a necessary part of the construction although it is desirable to prevent any accidental unwinding of the encircling portion 26a of the terminal wire 26. It can be provided or not, as desired, but Figure 2 omits it merely to show that it can be omitted if desired.

10 In Figure 4, I have shown a bushing 16b which differs from the bushing 16 in having a bore 22b which is tapered. Furthermore, the bushing 16b is a split bushing, it being made of two parts as shown in Figure 5.

15 The terminal screw 18b is tapered to fit the tapered bore 22b of the bushing 16b.

The construction shown in Figures 4 and 5 provides means for the nut 20 to serve the combination purpose of engaging the terminal wire 26 and tightening the bushing 16b relative to the tubular casing 10 by expanding the two parts thereof when the draw nut 20 pulls the tapered screw 18b into the tapered bore 22b.

25 In Figures 6, 7 and 8, I have shown another way of providing a bushing tightening means operable by tightening the terminal screw. In these figures, a terminal screw 18c is shown having a transverse slot 39. The ends, as indicated at 39a, are flared.

30 When the draw nut 20 is tightened, the flared ends 39a will engage the corners 17 of a split bushing 16c and will both tend to spread the split bushing and contract the slot 39 to the position shown in Figure 6.

35 With the terminal wire 26 extending into the slot, it is thereby tightly clamped and frictionally held relative to the terminal screw without extending to the exterior of the bushing 16c and there encircling the screw. As shown in Figure 40 7, the bushing 16c may be merely split on one side instead of being split completely transversely as the bushing 16b in Figure 5. In either case, there will be an expanding tendency for the bushing to tighten then relative to its support which in Figures 6 and 7 is shown as a tube.

45 It has always been a problem to provide a good electrical connection between a heating or electrical resistance wire and a terminal. By extending the wire longitudinally through the slot, it contacts with the screw throughout the length 50 of the slot so that there is electrical transfer of

energy throughout the slot which prevents the encircling end 26a from becoming red hot like the heating portion of the heating element. Also the cup washer 28, the washer 30 and the nut 20 carry part of the current so as to keep the terminal comparatively cool instead of permitting it to become excessively hot due to high resistance. The tapered construction of the terminal screw even further enhances the efficiency of the connection between the terminal screw and the terminal wire.

Such changes as suggested and others might be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a terminal construction, a tubular bushing of insulating material, a terminal screw there-through having a head on one end and threaded on its other end, said terminal screw being longitudinally slotted to receive a current carrying wire through said head and through said bushing when said screw is assembled relative thereto, a nut on the threaded portion of said terminal screw for drawing said terminal screw longitudinally through said bushing with said head engaging one end thereof and a wire in said slot of said terminal screw and having its terminal end extending out of said slot, around said screw and interposed between said nut and said bushing.

2. In combination with a casing having an opening therein, a terminal construction comprising a tubular bushing of insulating material in said opening, a terminal screw through said bushing having a head on one end and threaded on its other end, said terminal screw being longitudinally slotted to receive a current carrying wire through said head and through said bushing when said screw is assembled relative thereto, a nut on the threaded portion of said terminal screw for drawing said terminal screw longitudinally through said bushing with said head engaging one end thereof and a wire in said slot of said terminal screw and having its terminal end extending out of said slot, around said screw and interposed between said nut and said bushing.

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