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SPRING TYPE STRAIN-RELIEF BUSHING

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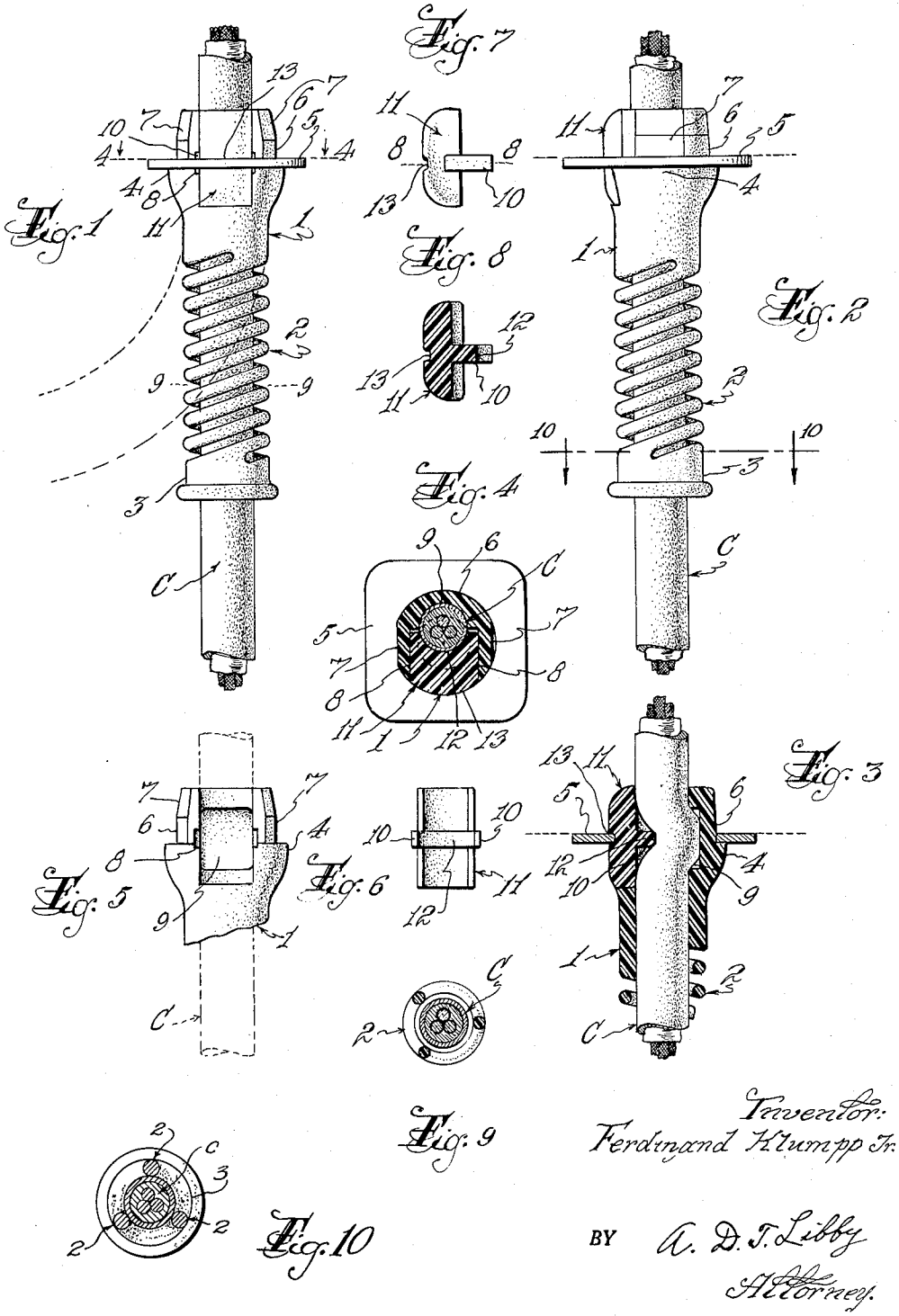


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 10

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SPRING TYPE STRAIN-RELIEF BUSHING

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7 Claims. (Cl. 174—153)

In my Patent 2,424,758, July 29, 1947, I have shown and described a self-locking strain-relief bushing for the purpose of securing an electrical conductor or cable in the bushing when the same is moved into position into a support of the plate type. I have also made a strain-relief device in which one end of a circular elongated metal spring is mounted. The spring embraces a cable or conductor coming to the strain-relief device for the purpose of taking much of the strain off the cable or conductor if the same is bent at a substantial angle closely adjacent the strain-relief device. It has been found from practice that in some uses the metallic spring will wear into the insulation around the cable or conductor and may cause trouble such as a short circuit.

To overcome this trouble I have developed a strain-relief structure in which the main body thereof is formed with an elongated integral part formed like a spring, it being understood that this main part of the strain-relief device is made of suitable insulating material such as nylon.

By the construction to be hereinafter described I have eliminated the metal spring entirely and have simplified the key used for locking the cable or conductor in place within the holder or body portion of the strain-relief device.

In the drawing:

Figure 1 is a plan view of the strain-relief device applied to a cable and showing one position in broken lines which the spring end may take during its use.

Figure 2 is a side view of Figure 1.

Figure 3 is a part sectional and part elevational view on the center line of Figure 1.

Figure 4 is a sectional view on the line **4—4** of Figure 1.

Figure 5 is a view of the main part of the strain-relief device without the grip lock, the position of the cable being indicated in broken lines.

Figure 6 is a plan view of the inner portion of the grip lock.

Figure 7 is a side view of the grip lock.

Figure 8 is a section on the line **8—8** of Figure 7.

Figure 9 is a view on the line **9—9** of Figure 1.

Figure 10 is a view on the line **10—10** of Figure 2.

In the drawing the various views are made full size of the working device or model. In drawings **1** is the body or main part of the strain-relief structure. Extending longitudinally from the body portion **1** are a plurality of spaced parts **2** corresponding to the convolutions of a spring. These convolutions terminate in a circular flange **3**. I have found that where the convolutions **2** are arranged in three parts resembling screw threads, the flexibility of a suitable molded material, such as nylon, will give excellent flexibility so that the cable may be bent at a considerable angle without injuring it or the turns **2**. The body portion **1** has a flange **4** which is adapted to engage a mounting plate **5** as shown in Figures 1 and 2. Projecting from the flange **4** is a hub **6** having flat surfaces on opposite sides ending in tapered surfaces **7** on

each side for assistance in assembling the strain-relief device into its mounting plate **5**. The interior part of hub **6** has grooves **8** extending downwardly toward a bottom recess **9**. These grooves **8** are adapted to receive fingers **10** which project from the key member **11**. Between the fingers **10** is a circular portion **12** that is adapted to engage the cable C when the key **11** is forced into locking position by pushing the strain-relief device into a cooperating hole in the mounting plate **5**. The key has an arcuately shaped groove **13** on its outer surface to engage the mounting plate **5** and to hold the key in its locking position, forcing the cable into the recess **9** as shown in Figure 3. After the cable or conductor has been inserted through the spaced parts **2** into the body portion **1**, the key member **11** is placed into position and then the assembled device is forced into the support plate **5** which causes the key **11** to move into the locking position as shown.

From the foregoing it will be seen that I have provided a two piece strain-relief structure in a new and novel manner.

Having thus described my invention, what I claim is:

1. A strain relief bushing having a main portion to receive a cable or conductor and a locking key slidably carried by the main portion which has an integral extension composed of spaced parts resembling and acting as a spring as and for the purpose described.

2. A strain relief bushing having a main portion and a locking key slidably carried by and at right angles to the horizontal axis of said main portion which has an integral extension composed of spaced parts resembling and acting as a spring and having an interior diameter to receive a cable or conductor.

3. A strain relief bushing of suitable insulating material for holding an electrical conductor in a mounting plate hole, said bushing having a body portion with a flange to engage a mounting plate, said body portion having a hollow integral extension at its other end, said extension being composed of spaced resilient parts resembling a spring and serving as a flexible support for said conductor, said body portion having a transverse opening through one side of its wall at the end opposite said spring portion, the body portion having a recess opposite said opening and below the main hollow part of the bushing and a grip-key positioned in said opening and adapted to be engaged by said plate, when the bushing is forced into the plate hole, to bend the conductor into said recess and lock it securely in the bushing.

4. A strain relief bushing as set forth in claim 3 further defined in that said spring-like end is formed by a plurality of spirally arranged parts terminating in a collar at the outer end for receiving a conductor.

5. A strain relief bushing as set forth in claim 3 further defined in that said spring-like end is formed by three spirally arranged parts which terminate in an integral collar to receive a conductor.

6. The combination of a mounting plate having a hole therein to receive a strain-relief bushing of suitable insulating material, the bushing being composed of two parts to grip an electrical conductor or cable placed between them, one part having a recess therein while the other part is slidable as a whole toward a longitudinal axis of said one part, said slidable part having an arcuately formed projection for engaging said conductor or cable, each part having at least a slight tapered end to assist in entering the parts into said hole, the two parts being forced toward each other by the wall of the hole so said projection will force the conductor or cable downwardly into said recess, both parts having co-operative arcuate grooves to lock the parts to the mounting plate, said part having the recess therein having an integral circular ex-

tension composed of spaced parts resembling and acting as a spring as and for the purpose described.

7. In combination with a mounting plate having a hole therein to non-rotatably receive a strain-relief bushing, a bushing of strong insulating material to fit said hole, the bushing having a transverse side opening at one end with a recess opposite said opening and a passageway spaced longitudinally away from said recess, said passageway terminating in an integral elongated circular spring-like formed section of insulating material through which a cable or conductor may pass through the bushing, a locking key of strong insulating material transversely carried by said bushing opposite said recess and adapted to be moved toward said recess to grip the conductor and force it into said recess and means on the bushing and key to lock the two of them in the plate hole.

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