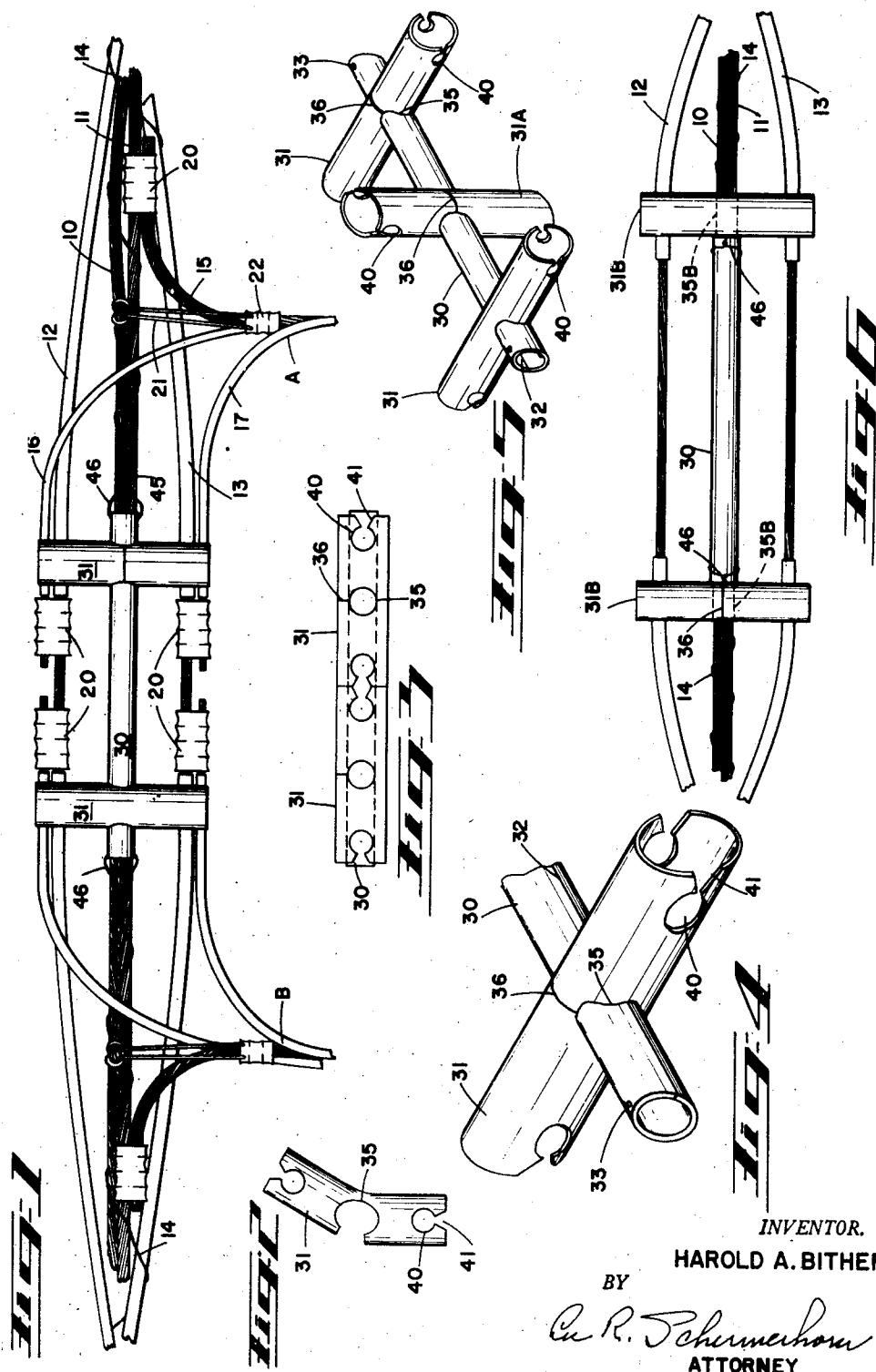


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H. A. BITHER
MULTIPLEX TERMINAL SPREADER

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INVENTOR.

HAROLD A. BITHER

BY

Chas. R. Schermerhorn
ATTORNEY

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MULTIPLEX TERMINAL SPREADER

Harold A. Bither, 3943 SE. 174th Ave.,
Portland 36, Oreg.

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This invention relates to a device for holding a plurality of electric power conductors in spaced apart relation to facilitate making transformer connections and the connection of branch lines such as the service conductors to an individual customer, and for holding the connecting terminals permanently in spaced relation. The invention is especially useful on pole line circuits of the cable type where two or three heavy stiff insulated conductors are bound together in compact relationship about a supporting messenger cable and a bare neutral conductor by a spinner wire.

It has become the practice to make service connections to the power line conductors at the closest mid-span points between the pole supports. In making such connections it is necessary to cut the spinner wire and separate the conductors for a short interval so that they will be spaced several inches apart. The lineman's task is complicated by the fact that the work usually must be done while the power line is energized. The lineman must, therefore, proceed with extreme caution to avoid injury to himself and to avoid creating a short circuit which would produce a power outage in the secondary circuit on which he is working. The device of the present invention has the two-fold purpose of facilitating the work of the linemen under the conditions above described, and of providing an improved and inexpensive terminal spreader for the purpose. The present device is an improvement over that disclosed in my prior Patent No. 2,868,861.

In consideration of the existing problems hereinabove pointed out, the objects of the present invention are to provide an improved multiplex terminal spreader; to provide a terminal spreader of the type described which contains fewer parts, is cheaper to manufacture, and more convenient to install than prior devices for this purpose; to provide a terminal spreader which does not require any fastening elements; to provide a terminal spreader which can be made conveniently from stock material with a minimum of manufacturing operations; and to provide a simplified form of construction which is readily adaptable to use with different numbers of conductors.

The present device is made very simply and inexpensively from two different sizes of plastic tubing, and consists of merely three or four pieces of such tubing, depending upon the number of conductors, fitted together and held in assembled relation by the conductors themselves without the necessity for any fastening elements. A piece of small tubing is split longitudinally to receive the messenger cable and bare conductor. Each spreader arm consists of a piece or larger tubing having a central transverse hole to receive therein the small tube or to fit over the messenger cable and bare conductor abutting the end of the small tube. A transverse slot intersecting such hole allows the tube or cables to be inserted therein. The ends of the spreader tubes are notched to receive the insulated conductors. When there are more than two insulated conductors, a third spreader tube is mounted on the center of the small longitudinal tube. The spread

apart conductors act as bow strings to hold the parts assembled in fixed relation.

The invention will be better understood and additional objects and advantages will become apparent from the following detailed description of certain preferred embodiments illustrated on the accompanying drawing. Various changes may be made, however, in the construction and arrangement of parts, and certain features may be used without others, all such modifications within the scope of the appended claims being included in the invention.

In the drawing:

Figure 1 is a plan view showing the present spreader mounted on a multiple conductor assembly at a point of connection with branch conductors;

Figure 2 shows how the spreader arms may be bent to open the central hole for mounting on the longitudinal spacer tube;

Figure 3 shows how the three parts of the spreader of Figure 1 nest together in a compact package for storage and shipment;

Figure 4 is a fragmentary perspective view of the terminal spreader shown in Figure 1;

Figure 5 is a perspective view of a modified arrangement having a third spreader arm mounted in the center of the longitudinal spacer tube; and

Figure 6 is a plan view of another modification mounted on a secondary circuit preparatory to the connection of branch conductors.

Figure 1 illustrates a typical service connection of the type on which the present device may be used to advantage. Grouped about a bare messenger cable 10 and a bare neutral conductor 11 are a pair of insulated conductors 12 and 13. This assemblage is wrapped by a bare spinner wire 14 which binds all the conductors to the messenger cable. The messenger cable is supported at intervals on poles.

Two service connections A and B are illustrated by way of example, the present device being adapted for use with either one or several such service connections. Each service connection comprises a bare neutral 15, an insulated conductor 16, and an insulated conductor 17. These service conductors are, in the present instance, connected to the respective pole line secondary circuit conductors by conventional compression connectors 20 at a mid-span location between two poles. The service conductors are supported by a bridle 21 looped about the messenger cable 10 and connected with dead end fitting 22 on the service neutral 15. The insulated service conductors 16 and 17 are ordinarily supported on the neutral 15 by being twisted therearound.

The spreader shown in Figure 1 comprises a small diameter longitudinal plastic tube 30 and a pair of larger diameter transverse plastic tubes 31. Suitable stock for these tubular members is provided by cutting off appropriate lengths of Du Pont polyethylene piping but the invention is not limited to this particular material. The plastic material of which this piping is made has excellent properties for the present purpose, being tough and strong, yet sufficiently flexible that it can be bent without breaking or cracking, resistant to deterioration in the weather, and possessed of satisfactory insulating qualities.

The small longitudinal tube 30 is prepared by merely slitting it longitudinally at 32 and making small transverse holes 33 in each end perpendicular to the plane of slit 32. Each larger piece of tubing 31 is prepared by cutting a central transverse circular hole 35 with a communicating slot 36 in one side of the tube. The diameter of hole 35 is of a size to receive the tube 30 with a tight fit. Tube sections 31 are mounted on the tube 30 by bending them back to open up the slot 36 and hole 35, as shown in Figure 2. Preferably, when

the hole 35 is cut, the tube is flattened to some extent as would result by gripping it in a vise whereby, as the tube subsequently returns to its original circular shape, the hole becomes somewhat elliptical giving a greater gripping effect on the longitudinal tube 30.

The ends of the tube sections 31 are notched to support the insulated conductors. Preferably, each notch is formed by cutting transverse conductor holes 40 adjacent each end parallel with the hole 35. Tapered slots 41 in the ends of the tube communicate with holes 40 whereby the conductors may be pressed into these slots to spread the sides thereof apart sufficiently to permit the conductors to pass into the holes 40. After the slots have thus been spread, the walls thereof spring together again by the natural resilience of the material which behaves under distortion in the manner of stiff rubber.

To install the spreader as shown in Figure 1, the spinner wire 14 is first cut and the ends laid back out of the way. The insulated conductors 12 and 13 are then spread away from the messenger cable 10 and bare neutral conductor 11 for a distance sufficient to permit the tube 30 to be slipped over these two cables. The cut ends of spinner wire 14 are then passed through the holes 33 and twisted, as indicated at 45, to form a fairly tight loop 46 which will prevent opening of the slit 32. The tubular arms 31 are then applied to the tube 30 in parallel relation adjacent the opposite ends of the latter. Insulated conductors 12 and 13 are then placed in the holes 40, it being noted that the cable and conductors 10, 11, 12 and 13 are not cut in the process of installing and mounting the spreader device.

The operator is then ready to connect the service line A. The bridle 21 is looped over the messenger cable 10 with the dead end connector 22 secured to the neutral conductor 15 to support the street end of the service conductor assemblage. Compression connector fitting 20 is applied to connect bare neutral conductor 15 with bare neutral conductor 11.

With the insulated conductors 12 and 13 thus held in parallel spaced apart relation between the spreader arms 31, the insulation may be safely removed from portions of these conductors between the spreader arms to receive compression connector fittings 20 on the ends of service conductors 16 and 17. The conductors 16 and 17 are preferably disposed either in the conductor holes 40 or the slot 41 of the spreader arms 31, depending upon the sizes of the secondary circuit and service conductors. The usual tape or other insulation is not required over the connectors 20 or bare ends of conductors 16, 17, since these bare parts are held permanently separated by the spreader arms 31. The spreader shown in Figure 1 is especially adapted for one or two service connections, such as A and B, but will also accommodate a larger number of branch line connections when necessary.

In placing the spreader tubes 31 on the longitudinal tube 30, the slit 32 and slots 36 may be staggered to best advantage to prevent any tendency for them to open. The tension and stiffness of the heavy conductors 12 and 13 places the spreader tubes 31 under longitudinal compression, tending to close the slots 36 and prevent bending of the tubes as shown in Figure 2. In any case where the conductors 12 and 13 are not stiff and heavy, the same result is accomplished by the spinner wire 14 which binds the conductors together at a short distance from each end of the spreader. Thus, the walls of holes 35 are clamped tightly against the tube 30 to prevent any movement of spreader tubes 31 thereon. Additionally, the convergence of conductors 12 and 13 prevents tube 31 from slipping off the end of tube 30 and the connectors 20, which are larger than holes 40, prevent tube 31 from moving away from the end of tube 30.

Figure 3 shows how the three parts may be nested for storage and shipment. The two larger tubes 31 will conveniently receive the smaller tube 30 therewithin to

make a compact package containing all the parts necessary to assemble the spreader. No small parts or fastening devices are used.

Figure 5 shows how a third spreader arm 31 may be mounted on the center of tube 30 in a circuit having additional conductors. In this case, the central arm 31a is mounted at right angles to the end arms 31 to hold a street light wire or another conductor in spaced relation to the plane of conductors 12 and 13 extending between the end arms. This arrangement is suitable for a three phase circuit having three insulated conductors and a bare neutral, the latter being contained within the central tube 30 as in the case of the bare neutral 11 in Figure 1. The other end of arm 31a will then accommodate a street light wire, if desired.

Figure 6 illustrates a modified spreader arrangement for the circuit shown in Figure 1. Here, the tubular spreader arms 31b have transverse central holes 35b corresponding to the inside diameter of the opening in tube 30 whereby the arms are not mounted on the tube 30 but, instead, are mounted on the messenger and neutral cables 10 and 11 abutting the ends of tube 30. This abutting relation is maintained by the convergence of conductors 12 and 13 which are bound to the messenger and neutral cables by the spinner wire 14 at a short distance from the spreader arms as shown in Figure 1. The split 32 in tube 30, which does not appear as the device is viewed in Figure 6, is held closed by the loops 46 in spinner wire 14 which, in this case, passes through central holes 35b in arms 31b and thence through holes 33 whereby the spinner wire is anchored to the ends of tube 30 as explained in connection with Figure 1. Arms 31b are equipped with holes 40 and notches 41 the same as arms 31.

Figure 6 shows the arrangement just described before the service connections have been applied, the insulation having been removed from portions of the conductors 12 and 13 between the arms 31b to receive the connector fittings of the branch conductors. The length of tube 30 provides ample space for three or four branch connections when desired. When only one or two branch connections are to be made, the tube 30 may be somewhat shorter with a resultant saving of material. In any event, in each embodiment herein illustrated the tube 30 may be cut to a suitable length to accommodate the number of branch connections which are to be made.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. A terminal spreader for use in connecting branch wires to a plurality of continuous power supply conductors suspended in a compact group with a supporting messenger cable, comprising a longitudinally split tube adapted to receive a messenger cable extending longitudinally therethrough, and a pair of separate spreader members having detachable engagement with opposite end portions of said tube, each of said spreader members comprising an integral unitary body having a central opening and a plurality of conductor engaging means spaced radially from said central opening, and said body having a slot extending outwardly from said opening providing access thereto.

2. A terminal spreader for use in connecting branch wires to a plurality of continuous power supply conductors suspended in a compact group with a supporting messenger cable, comprising a pair of spreader members, each spreader member comprising an integral unitary body having a central opening and a plurality of conductor engaging notches spaced radially from said central opening, said body having a slot extending outwardly from said opening providing access thereto, and a flexible spacer tube having a single longitudinal slit adapted to receive a messenger cable to extend longitudinally therethrough, said spreader members having detachable engagement with end portions of said tube, and said spread-

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er members being adapted to be held in said detachable engagement with said tube by convergent conductors engaged in said notches whereby said tube maintains said spreader members in spaced apart relation.

3. A terminal spreader as defined in claim 2, said central opening of each spreader member receiving said tube in frictional engagement.

4. A terminal spreader as defined in claim 3 wherein the walls of said central openings are adapted to be pinched against said tube by compressive forces exerted on said spreader members by conductors engaged in said notches.

5. A terminal spreader as defined in claim 2, said central opening in each spreader member being smaller than the outside diameter of said tube and said spreader members having abutting engagement with the ends of said tube.

6. A terminal spreader comprising a longitudinally split tube, a pair of spreader arms having transverse central openings receiving and frictionally engaged with said tube, each arm having a lateral slot communicating with one side of said opening, and said arms being adapted to hinge on the sides opposite said slots to open said slots for receiving said tube into said opening.

7. A terminal spreader comprising a longitudinally split tube, a pair of spreader arms having transverse central openings receiving and frictionally engaged with said tube, each arm having a lateral slot communicating with one side of said opening, said arms being made of flexible

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material to bend on the sides opposite said slots and open said slots for receiving said tube into said opening, and conductor engaging means in the outer end portions of said arms.

8. A terminal spreader comprising a longitudinally split tube of flexible insulating material, and a pair of tubular spreader arms of flexible insulating material at opposite ends of said tube, each arm having a transverse central opening and a slot extending between said opening and one side of the arm, and conductor engaging notches in the outer end portions of said arms.

9. A terminal spreader comprising a longitudinally split tube of flexible insulating material, and a pair of tubular spreader arms of flexible insulating material at opposite ends of said tube, each arm having a transverse central opening and a slot extending between said opening and one side of the arm, said first tube being nestable in said spreader arm tubes.

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