Nov. 15, 1960 F. A. STEARN ET AL 2,960,677

TELESCOPING BINDING POSTS

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FIG. 1

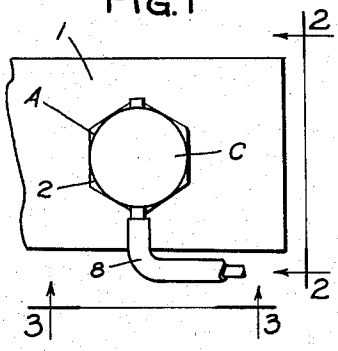

FIG. 2

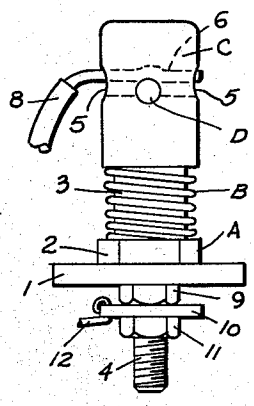

FIG. 3

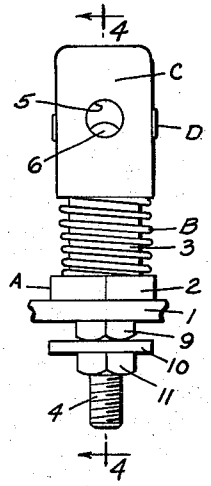

FIG. 4

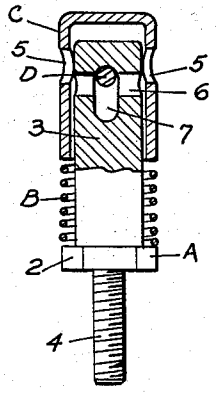

FIG. 4A

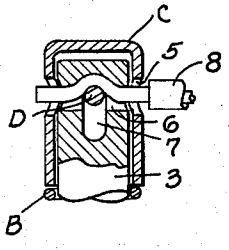

FIG. 3A

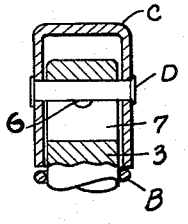

FIG. 5

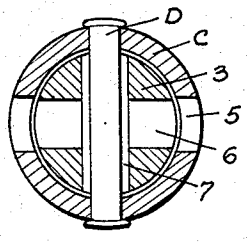

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FIG. 6

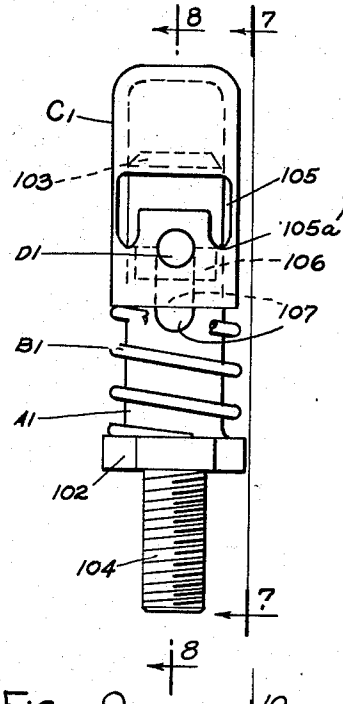


FIG. 7

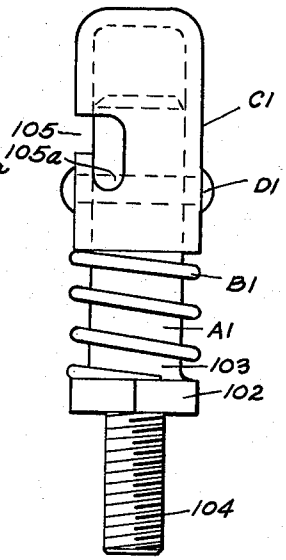


FIG. 8

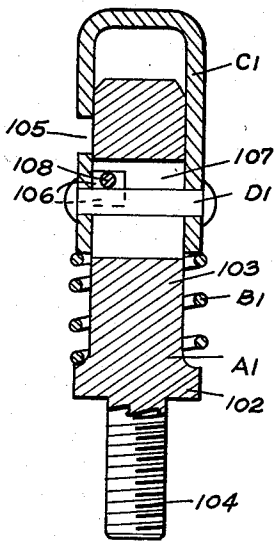


FIG. 9

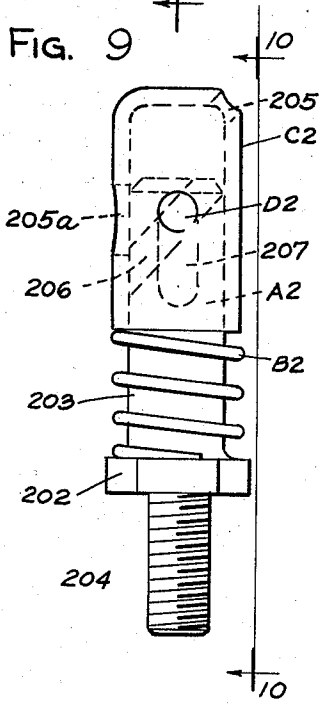


FIG. 10

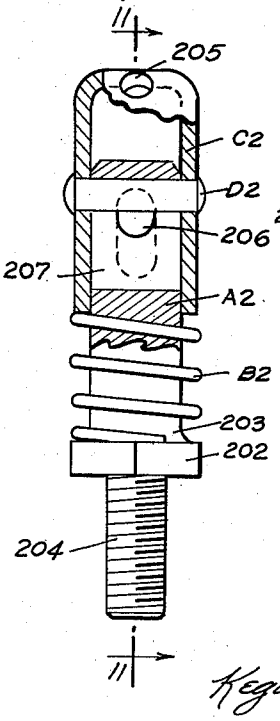
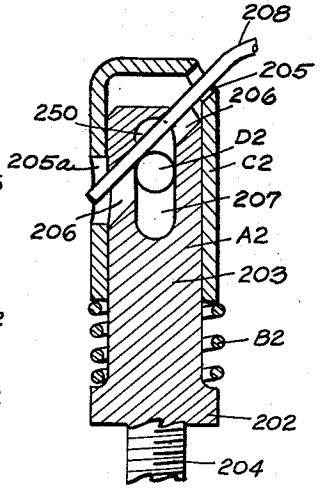


FIG. 11



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TELESCOPING BINDING POSTS

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3 Claims. (Cl. 339—254)

Our invention relates to telescoping binding posts, being those wherein two relatively slidable parts are spring loaded to cause an inserted electrical wire or conductor, to be gripped between them and retained in position. Principal objects of the invention are to provide an improved binding-post construction of the foregoing character which permits a conductor to be readily inserted therein and removed therefrom, and grips the inserted conductor firmly without injury thereto.

In known binding posts of the foregoing telescoping type, it is customary to telescope the parts against the pressure of a loading spring until openings through the parts coincide to permit the insertion of a conductor through both openings. The inserted conductor is gripped between the parts when the initially applied force is removed. A principal disadvantage of this type of structure is that the edges of the openings in the telescoping parts tends to impart a shearing force upon the conductor gripped between them. If the conductor is a wire of a soft metal, such as copper, it is nicked and partly sheared at the points at which it is gripped. As a consequence, relatively slight movements of the ungripped portion of the wire suffice to cause bending and breakage at the nicked or partly sheared location.

According to the invention, the spring-loaded parts are secured together for limited telescoping movement by a pin fixed in one of them and movable in a slot through the other which intersects the conductor-receiving opening therethrough. The inserted conductor is secured in place by being gripped vice-like between the pin and a side wall of the wire-receiving opening and of the slot, or both, whereby undesired nicking and shearing action are avoided.

According to one feature of the invention, the side wall with which the noted pin cooperates in gripping the inserted wire may have a shape departing sufficiently from a flat surface that the gripping action produces a slight bend in an inserted small wire which enhances the gripping action and the conductivity of the connection without substantial nicking.

According to a further feature, the telescoping parts may be of such form that the wire or similar conductor to be inserted may be laid in place sidewise rather than being inserted endwise, facilitating placement and removal.

A still further feature is that a conductor may be inserted at an acute angle to the longitudinal axis of the telescoping parts, which is of distinct advantage in crowded quarters where direct side access to the binding post is difficult.

The foregoing and other objects and features of our invention and the manner of attaining them will become more apparent, and the invention itself will be best understood, by reference to the following description of three embodiments of the invention taken in conjunction with the accompanying drawing, wherein Figs. 1 to 5 show a first embodiment; Figs. 6 to 8 show a second embodiment; and Figs. 9 to 11 show a third embodiment:

Figs. 1 to 4 are respectively a top view, a left side view, a front view, and a side sectional view of a binding post according to the first embodiment, Figs. 3A, 4A, and 5 being two auxiliary views and a top sectional view;

Figs. 6, 7, and 8 are respectively a left-side view, a front view, and a front sectional view of the second embodiment; and

Figs. 9 to 11 are respectively a left-side view, a front view, and a left sectional view of the third embodiment.

First embodiment (Figs. 1 to 5)

Referring to Figs. 1 to 5, along with Figs. 3A and 4A, the binding post of the first embodiment comprises a principal stem-like portion A, loading spring B, thimble-like cup C, and pin D fixed in cup C to hold parts A and C slidingly together, since pin D extends through slot 7 through the upper stem portion 3 of fixed member A.

Fixed member A, consisting of upper stem 3, threaded lower stem 4, and hexagonal base 2, and fastened to insulating panel 1 by nut 9, may conveniently be turned from a section of hexagonal rod.

Clip 10, with soldered local wire 12, is held on lower stem 4 by nut 11.

Compression spring B surrounds upper stem 3 between base 2 and the lower edge of cup C, to hold the cup in its normal uppermost position, wherein riveted pin D carried by cup C engages the top of slot 7 in upper stem 3.

Conductor-receiving hole 6 through upper stem 3 intersects slot 7, conveniently at right angles, near the upper end of the slot. Cup C contains a conductor-receiving hole 5 which exposes hole 6 when cup C is pushed down.

To insert a conductor, such as the uncovered end of wire 8, into the binding post of an electrical connection, cup C is pushed down against the force (say five pounds) of spring B until opening 5 in cup C exposes opening 6 in upper stem 3. Pin D is thereby carried down in slot 7 below hole 6.

The end of a conductor, such as wire 8, may now be inserted through both openings 5 and 6, and above the lowered pin D. Cup C is now released and is moved up by spring B, carrying pin D upwardly within slot 7 into vice-like gripping contact with wire 8, pressing it against the upper side wall of openings 6 and 7. If the wire 8 is relatively small and is of soft copper, it curves, where gripped, into the upper portion of slot 7, as shown best in Fig. 4A. The gripping action and electrical connection are thereby enhanced without the occurrence of nicking or shearing. In this regard, it will be observed that receiving opening 5 of the cup is shown somewhat larger than receiving opening 6 through the stem. This feature cooperates with the location of pin D in the cup, with its top surface higher than the lower limits of opening 5, to insure that the inserted conductor is not gripped by the lower wall of opening 5, thereby assuring the desired absence of shearing tendency.

Second embodiment (Figs. 6 to 8)

Referring to Figs. 6 to 8, the second embodiment of the invention shown therein differs from the first embodiment in that the conductor to be inserted may be laid in from the side or inserted endwise, as desired.

Items A1 to D1 of Figs. 6 to 8 correspond to items A to D of Figs 1 to 5, and items 101 to 108 correspond to items 1 to 8.

In the second embodiment, side introduction is permitted by providing cup C1 with L-shaped wire-receiving

side milling **105**, with an inner downward extension **105***a* in place of opening **5**, and providing upper stem **103** with wire-receiving side milling **106**, in place of through hole **6**. Slot or milling **106** intersects one side of pin slot **107** near its upper end, as seen best in dotted outline in Fig. 6.

When cup C1 is pushed down against the force of spring B1, slot **106** is exposed by **105** and **105***a* as the cup C1 carries pin D1 down in pin slot **107**. A conductor such as **108** (Fig. 8) may now be introduced sideward into slot **106**, through slot **105**, **105***a*. Alternatively, **108** may be inserted endwise to enter **105***a* and **106**.

When cup C1 is then released and is moved upwardly by spring B1, it carries pin D1 into contact with the inserted conductor **108** as shown in Fig. 8, the conductor being gripped between the pin and the upper wall of slot **106**. Since the slots **106** and **107** intersect slightly below the top of **107**, curving of the gripped conductor **108** may occur as described and shown for wire **8**, permitting cup C1 and pin D1 to rise slightly higher than their position shown in Fig. 8.

Third embodiment (Figs. 9 to 11)

Referring to Figs. 9 to 11, the third embodiment of the invention is also generally similar to the first embodiment but differs therefrom in that a wire or other conductor may be inserted downwardly and inwardly into the binding post, to permit use of the binding post in crowded quarters, for example.

Items A2 to D2 and **202** to **208** of Figs. 9 to 11 correspond to items A to D and **2** to **8** of Figs. 1 to 5.

For diagonal insertion, cup C2 has conductor-receiving opening **205** extending through the upper front edge at a desired angle (such as 45 degrees) to its longitudinal axis. For through insertion, where desired, opening **205***a* is provided in the cap aligned generally with **205**. Upper stem **203** has its wire receiving opening **206** inclined to the center line of the upper stem by the noted angle, such as 45 degrees.

When cap C2 is pushed down against the force of spring B2, opening **206** is exposed by openings **205** and **205***a*. A wire such as **208** may now be inserted from the right upper corner into and through openings **205**, **206**, and **205***a* as shown in Fig. 11.

When cup C2 is released, it is moved upward by spring B2, carrying pin D2 into contact with the inserted wire **208** as shown in Fig. 11, the wire being gripped between the pin and the upper wall of opening **206** in the upper stem. Since opening **206** and slot **207** intersect slightly below the top of slot **207** the pin exerts a wedging action on the wire, enhancing both the gripping effect and the electrical contact between wire and stem.

In the case of thin wires there may also be a tendency to a curving of the gripped wire as described and shown for wire **8**.

While we have described above the principles of our invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of our invention.

We claim:

1. A binding post comprising a sleeve and a stem received therein for a relative telescoping movement between a normal position and a conductor-receiving position, a spring biasing the sleeve and stem to stand in and to return to said normal position, the stem having a guide slot extending through its longitudinal axis and elongated in its dimension along the stem axis, a guide pin fixed with the sleeve and slidingly received within the guide slot, the guide pin being engageable with the stem at one end of the guide slot to define said normal position and acting with the guide slot to limit relative rotation of the stem and sleeve, the stem having a conductor-receiving opening which intersects the guide slot, the sleeve having a conductor-receiving opening which aligns with the conductor-receiving opening of the stem, to permit a conductor to be inserted through the conductor-receiving opening of the sleeve into the conductor-receiving opening of the stem, when the stem and sleeve are telescoped against the force of the spring into the said conductor-receiving position, the said opening of the sleeve being so located along the sleeve with respect to said opening of the stem that, on release of the stem and sleeve for said movement thereof by the spring toward the said normal position, the portion of the inserted conductor which intersects the axis of the stem is gripped between the guide pin and the said end of the guide slot, while there is no gripping of the inserted conductor between the stem and the sleeve itself.

2. A binding post comprising a sleeve and a stem received therein for a relative telescoping movement between a normal position and a conductor-receiving position, a spring biasing the sleeve and stem to stand in and to return to said normal position, the stem having a guide slot therein elongated in its dimension along the stem axis, a guide pin fixed with the sleeve and slidingly received within the guide slot, the guide pin being engageable with the stem at one end of the guide slot to define said normal position and acting with the guide slot to limit relative rotation of the stem and sleeve, the stem having a conductor-receiving opening which intersects the guide slot, the sleeve having a conductor-receiving opening which aligns with the conductor-receiving opening of the stem to permit a conductor to be inserted through the conductor-receiving opening of the sleeve into the conductor-receiving opening of the stem, when the stem and sleeve are telescoped against the force of the spring into the said conductor-receiving position, the said opening of the sleeve being so located along the sleeve with respect to said opening of the stem that, on release of the stem and sleeve for said movement thereof by the spring toward the said normal position, the portion of the inserted conductor which intersects the said guide slot is gripped between the guide pin and the said end of the guide slot, while leaving the inserted conductor ungripped by the portion of the sleeve which defines the said conductor-receiving opening thereof.

3. A binding post according to claim 2, wherein the said conductor-receiving opening of the said stem intersects the said guide slot at a location axially displaced from the said end thereof, whereby a bending force is exerted on a said inserted and gripped conductor which tends to produce an offset in the gripped portion thereof.

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