J. S. STEWART.

BRANCH BLOCK FOR SUSPENDED CABLES.

APPLICATION FILED JAN. 27, 1909.

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Fig. 1.

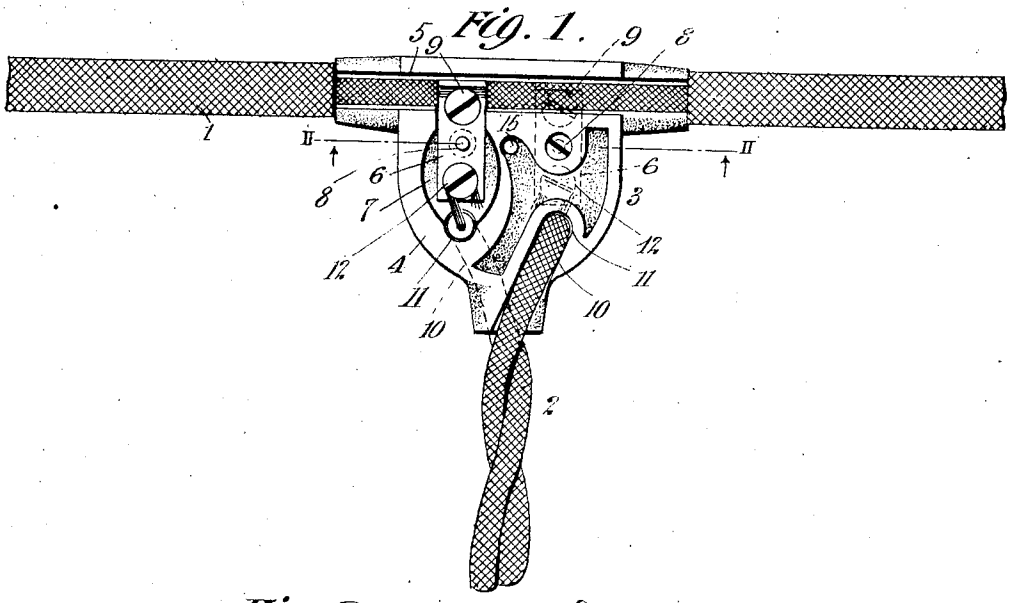



Fig. 2.

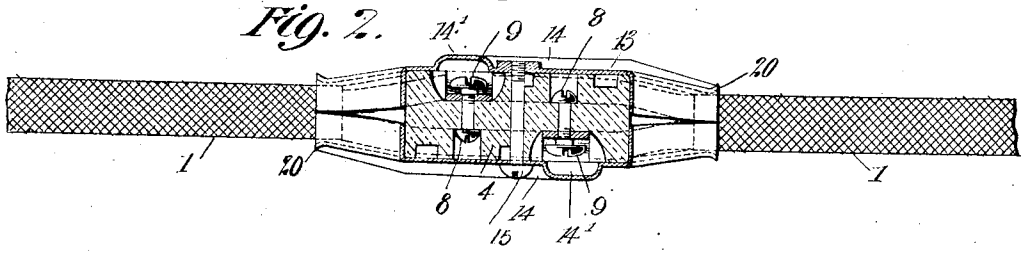
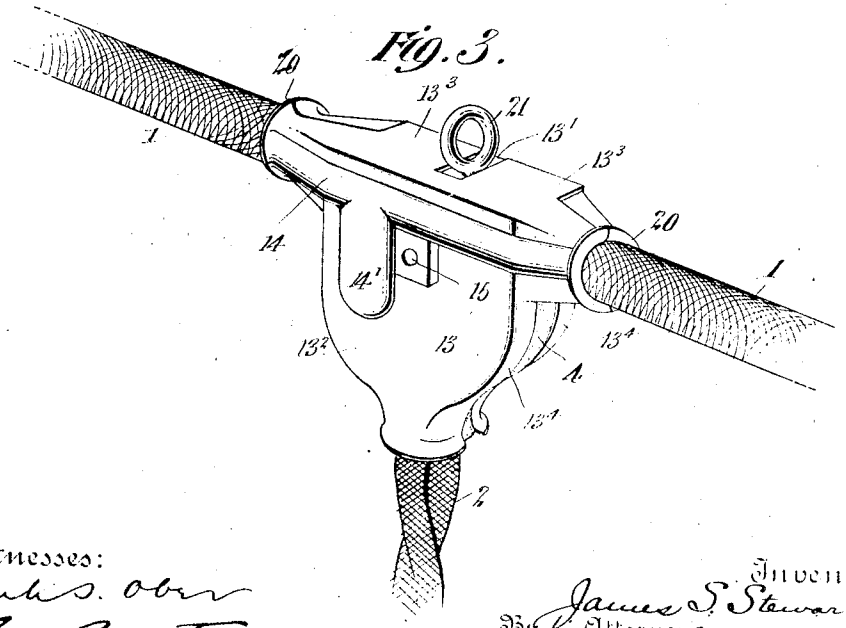



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## BRANCH BLOCK FOR SUSPENDED CABLES.

959,969. Specification of Letters Patent. Patented May 31, 1910.

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*To all whom it may concern:*

Be it known that I, JAMES S. STEWART, a citizen of the United States, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Branch Blocks for Suspended Cables, of which the following is a full, clear, and exact description.

This invention relates to a means for establishing branch circuits or extensions from an electric cable, particularly a suspended cable, where no supporting ceiling, wall or surface is directly available to receive the usual branch connecting means, such as a rosette or outlet box. So far as I am aware, the branch circuit or connection has generally been made under these circumstances by what is known as a "half-splice," being merely a joint in which the cable conductors and the extension circuit conductors are bared and twisted together, the joint being afterward soldered and taped to give it strength and insulation, so far as possible. This procedure is obviously troublesome and time consuming, and unless extraordinary pains are taken, the resultant joint is not up to the standard of the rest of the conducting system, either in matter of strength or insulation. If great strain is put on the extension cord or circuit it becomes necessary to run a tension or guy wire or cord from the joint to some girder or an available supporting point above, but by the usual half-splice method, there is no good point for the attachment of such guy wire to the joint which will not tend to cut into the insulation. On account of these various and manifold difficulties, an improved means for making a connection of this character is evidently desirable.

It is the purpose of my present invention to provide a branch block for use with suspended cables, and which shall overcome the above mentioned difficulties.

In the drawings: Figure 1 is a side view of a branch block embodying the principles of my invention, with one side removed; Fig. 2 is a sectional view on the line II—II of Fig. 1 looking in the direction of the arrows; Fig. 3 is a perspective view of the complete branch block.

Referring to the drawings in which like parts are designated by the same reference sign, 1 denotes an electric cable, and 2 indicates a branch conductor or depending flexible cord of the sort ordinarily used for extension circuits.

3 denotes broadly what I term a branch block, and which serves to accomplish the functions of a half-splice as heretofore employed and above referred to. This branch block comprises essentially an insulating body having terminal clips at each side by which connection is made to the circuit wires, the device including means for giving the requisite strength and insulating qualities to the connection.

In the drawings I have illustrated an insulating body 4 having somewhat the outline of a shield in side elevation, with a pair of grooves 5 extending transversely across the upper part of its opposite side faces, respectively.

6 denotes clips respectively located in depressions 7 on opposite sides of the block 4, which extend into the grooves 5. Each clip has a terminal screw 9 within the corresponding groove 5.

8 denotes screws which pass through the block 4 suitably out of alinement with the terminal screws 9 and which engage the clips 6 to secure them in place within their recesses 7. The block 4 also has a pair of grooves 10 extending downward on opposite sides of its lower portion and terminating in close proximity to one another, as shown in Fig. 1. In an upward direction these grooves 10 extend to points in the general neighborhood of the respective clips 6 on the opposite side of the block, at which points the grooves 10 lead into holes or ducts 11 extending entirely through the body from one side to the other. These holes 11 emerge on the opposite side of the body within the recesses 7 of the respective clips 6, already described. Near these holes 11, within the recesses 7, the clips have terminal screws 12.

13 denotes a casing which is adapted to be fastened around the block or body 4 to cover the various circuit wires and connections and retain them in place, in conjunction with the fastening means already described. I make the casing 13 in two parts applicable and removable from opposite sides of the body 4. These halves of the casing are substantially identical in construction, and embrace the outline of the body 4 closely throughout.

Opposite the grooves 5 and the recesses 7, however, the material is embossed outward, as shown at 14 and 14′, to give sufficient room for the conductors and connections. The casing may be made of stamped sheet metal, but in this case should be lined or coated with an insulating layer.

15 denotes a screw for securing the two halves of the casing together, this screw extending through a central hole of the body 4.

In the foregoing description, I have referred generally to the similarity of the arrangements of the clips, recesses and parts on opposite sides of the connector. It is possible and most convenient in practice to make the two sides of the device exactly identical in the sense of having the same mold or form, although the corresponding parts on opposite sides are in reversed rather than symmetrically opposite relation. With this arrangement the clips 7 and the various screws thereon and the ducts 11, are considerably separated from one another, and the parts of opposite polarity properly insulated. Moreover, portions of the body 4 which are weakened on one side by the recesses, etc., are strongest on the opposite side at this location, because of the absence of any corresponding cavities or depressions on such opposite side. The result is a balanced structure and one in which the highest mechanical strength and insulating efficiency is secured.

In use, the outside covering of the cable 1, is cut away to expose the separate conductors and these are bent apart so as to embrace the upper part of the body 4 of the branch block, lying in the respective grooves 5 thereof. At points opposite the clips 6, the conductors of the cable 1 are bared and engaged beneath the terminal screws 9. The branch conductors or extension circuit wires 2, are placed in the grooves 10 and deflected into the ducts 11. Their extremities are bared at the points of their emergence from said ducts, and engaged beneath the adjacent terminal screw 12 of the corresponding clip 6. In this way the branch conductors 2 are individually connected to the conductors of the cable 1. It is evident that all the metallic parts of opposite polarity are widely separated from one another and effectively insulated by the intervening insulating body 4. Mechanically considered, the connection is also very secure, particularly when the halves of the casing have been secured in place. The walls of the casing closely bind the conductors of the cable 1 in the grooves 5, and the casing is furthermore extended at each end to form a guiding ring or eye 20, with rounded edges embracing the unbroken or unmutilated cover of the cable outside the zone where it is weakened by the removal of the insulation. I regard this as an exceedingly important feature of my invention, it being one of the most prominent characteristics of the device. The eyes 20 being formed directly by the casing and being strongly braced by the nature of the form of the casing, are particularly well adapted to resist vertical or lateral strains, and it is at the location of these eyes that any bending or deflection of the cable occurs when the branch-block is in use. It is evident that a cable loaded at a given point sags in each direction toward such point and is bent more or less sharply thereat. Without the eyes 20 the cable would be bent at its uncovered or mutilated portion and the continual swaying would work the conductors loose from the binding screws 9. But by having the eyes 20 which closely embrace the unmutilated portions of the cable, no bending occurs except in the unmutilated portions of the cable outside the eyes, and the swaying, etc., has no effect to work the conductors loose from the binding screws. Moreover, the cable conductors will not be broken as readily if the deflection due to swaying is within its outside cover since very sharp bends or localized stresses on the conductors are prevented. The conductors 2 are also bound in their grooves by the casing and it will be particularly noted that when these conductors are confined in this way, that they each traverse what is virtually a channel with a right angle bend therein, located where the conductors enter the ducts 11. As is well known, this gives a very great resistance against the conductors yielding or sliding longitudinally in the channels, amounting ordinarily to a force greater than the tensile strength of the conductors, so that no great strain is put on the terminal screws 12 in any case. One or both of the halves of the casing may also have an eye bolt or screw 21 for the attachment of a guy wire or suspension cord in case considerable strain is put on the extension circuit conductors 2. Such additional support is particularly required in stage lighting, etc., where a chandelier is sometimes supported from an overhead suspension cable 1, through the depending circuit wires 2. The nature of the bolt 21 is such that no strain thereon tends to cut the insulation or in any way interfere with the efficiency of the branch block connection.

I prefer to fasten the eye bolt 21 to one of the halves 13′ of the casing 13 and have the other half $13^2$ of the casing with a portion $13^3$ which overlaps the part 13′ having the eye bolt. In this way the strains on the eye bolt are communicated substantially equally to both halves of the casing. As the casing is formed with inturned edges $13^4$ which under-lie the block around its entire lower portion, the block which is ordinarily of brittle porcelain, has only compression stresses imparted to it by the suspension, and

these are distributed throughout its mass in such a way as to almost preclude any possibility of breakage therefrom.

What I claim, is—

1. A branch-block for suspended cables, comprising a body having means for grasping the conductors of the cable, means for grasping the conductors of the extension circuit, means for electrically connecting the conductors of the cable to the conductors of the extension circuit, and a casing having eyes to grasp unmutilated portions of said cable.

2. A branch-block for suspended cables, comprising a body having grooves to receive the conductors of the cable, means for firmly grasping the conductors of the extension circuit, means for electrically connecting the conductors of the cable to the conductors of the extension circuit, and a casing having eyes to grasp unmutilated portions of said cable.

3. A branch-block for suspended cables, comprising a body having means for firmly grasping the conductors of the cable and having grooves to receive the conductors of the extension circuit, means for electrically connecting the conductors of the cable to the conductors of the extension circuit, and a casing having eyes to grasp unmutilated portions of said cable.

4. A branch block for suspended cables, comprising an insulating body having grooves to receive the conductors of the cable and grooves to receive the conductors of the extension circuit, metallic clips on said body each adapted to be connected to a conductor of said cable and of said extension circuit, and a casing having eyes to grasp unmutilated portions of said cable.

5. A branch-block for suspended cables, comprising a body having grooves on opposite sides to receive the conductors of the cable and having grooves on opposite sides to receive the conductors of the extension circuit, metallic clips on opposite sides of said body each adapted to be connected to a conductor of said cable and of said extension circuit, and means having eyes to grasp unmutilated portions of the cable.

6. A branch-block for suspended cables, comprising an insulating body having grooves on opposite sides to receive the conductors of the cable and having grooves on opposite sides terminating in ducts extending through said body to receive the conductors of the extension circuit, metallic clips each adapted to be connected to a conductor of said cable and of said extension circuit, and means having eyes to grasp unmutilated portions of the cable.

7. A branch-block for suspended cables, comprising an insulating body having grooves on opposite sides to receive the conductors of the cable and having grooves on opposite sides terminating in ducts extending through said body to receive the conductors of the extension circuit, metallic clips each adapted to be connected to a conductor of said cable and of said extension circuit, said clips being joined to the conductors of said extension circuit on the opposite side of said body from their respective grooves, and means having eyes to grasp unmutilated portions of the cable.

8. A branch-block for suspended cables, comprising an insulating body having grooves to receive the conductors of the cable and the conductors of the extension circuit, metallic clips adapted to connect said extension circuit conductors to the respective conductors of the cable, and a two-part casing fitting over said body to bind said conductors in place thereon, said casing having means with eyes to grasp unmutilated portions of the cable.

9. A branch-block for suspended cables, comprising a body having grooves to receive the conductors of the cable and of the extension circuit, metallic clips for joining the conductors of the extension circuit to the conductors of the cable, and a casing fitting over said body and embossed outward opposite said clips, said casing having means with eyes to grasp unmutilated portions of the cable.

10. A branch-block for suspended cables, comprising a body having grooves to receive the conductors of said cable and of the extension circuit, and a casing having a part for the attachment of a guy wire and adapted to fit over said body, said casing having means with eyes to grasp unmutilated portions of the cable.

11. A branch-block for suspended cables comprising a body having grooves to receive the conductors of the cable and of the extension circuit, and a casing fitting over said body and having portions coöperating to form rings or eyes embracing said cable beyond the zone of interruption of its insulation.

12. A branch-block for suspended cables, comprising a body having grooves to receive the conductors of said cable and of the extension circuit, and a casing comprising two halves inclosing said body, one of the halves of said casing having an eye bolt, and the other half having a portion extending over the half of said casing which has the eye, as and for the purpose set forth.

In witness whereof I subscribe my signature, in the presence of two witnesses.

JAMES S. STEWART.

Witnesses:
ALFRED WATERS PROCTOR.
WALDO M. CHAPIN.