

(No Model.)

F. E. LEONARD.
CABLE BENDING APPLIANCE.

No. 592,972.

Patented Nov. 2, 1897.

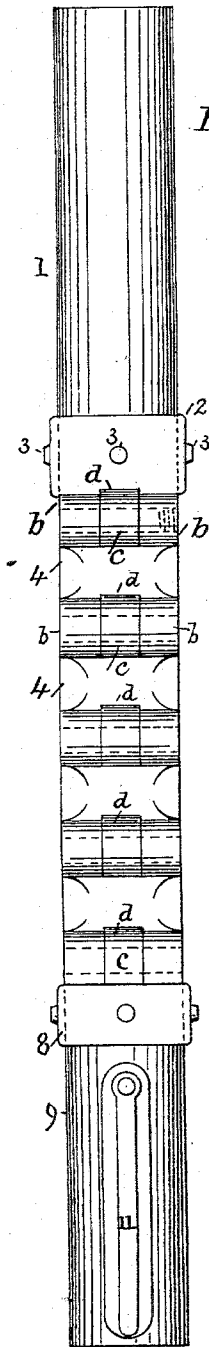
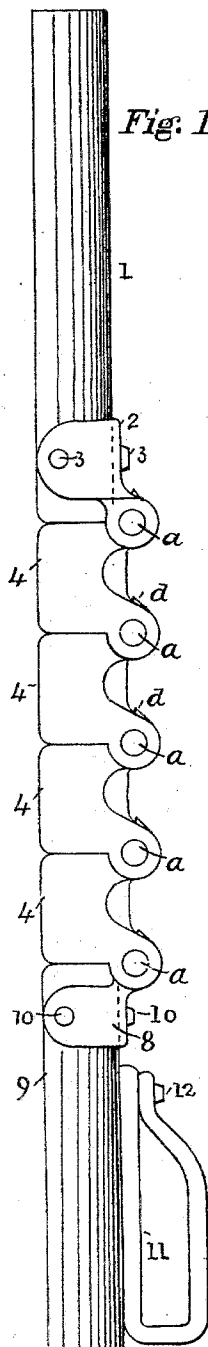


Fig. 3.

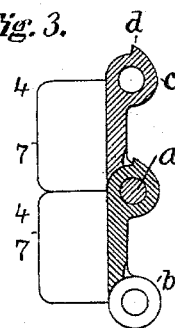


Fig. 5.

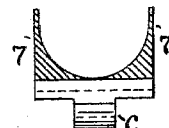


Fig. 4.

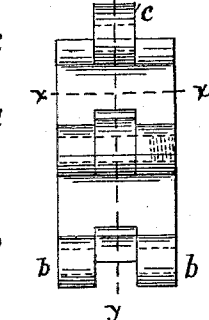
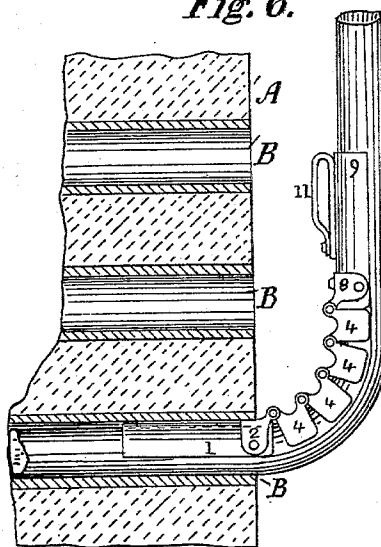


Fig. 6.



Attest,
Per J. E. Leonard
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Inventor,
Frank E. Leonard
by J. E. Leonard
his attorney.

UNITED STATES PATENT OFFICE.

FRANK E. LEONARD, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE AMERICAN BELL TELEPHONE COMPANY, OF BOSTON, MASSACHUSETTS.

CABLE-BENDING APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 592,972, dated November 2, 1897.

Application filed April 20, 1897. Serial No. 633,020. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. LEONARD, residing at Chicago, county of Cook, and State of Illinois, have invented certain Improvements in Cable-Bending Appliances, of which the following is a specification.

In the distribution of electric cables in underground conduits as they are brought out from the ducts into the manholes in the streets or into cable chambers or shafts at terminal stations it becomes necessary to make frequent bends in the cables in order to lead them out and bring them to the required positions.

The bending of large cables consisting of from two hundred and forty to three hundred insulated conductors inclosed in a lead sheath requires skill and time, the usual method being to prepare a block of wood to the shape of the curve desired and to carefully bend the cable over the same, using a mallet and other wooden tools in doing so.

The present invention relates to a self-adjusting device or form over which cables may be bent to any suitable curve, which device consists of a flexible articulated appliance hollowed out on one side so as to embrace the cable and is capable of being bent in one plane only. The appliance is provided at each end with comparatively long straight semicircular iron pieces, to one of which is fastened a handle, and secured between these pieces are malleable-iron shoes or links jointed or articulated and pinned together, each of which is provided with a stop to prevent the bending of the appliance as a whole to a smaller curve than it would be safe to bend the cable, the number of the intervening links depending upon the length of the arc to which the cable is to be bent.

To bend a cable, one end of the device is inserted between the cable and the top of the duct and serves as a fulcrum. The device is held to the cable by its handle, and the cable, with the device, is gradually bent backward to the curve desired. The stops upon the articulated pieces prevent the cable from being kinked or collapsed suddenly or otherwise into a short curve and thereby jamming the insulated conductors together and injuring the same. In a device for such a pur-

pose over which a somewhat cumbersome and stiff cable is to be bent it is necessary that it should be strongly constructed and have some mass or weight, and consequently the malleable-iron shoes or links are jointed together with comparatively large lugs and bolts and are likewise heavily made.

In the drawings which form a part of the specification and illustrate the invention, Figure 1 is a side view of the cable-bending appliance. Fig. 2 is a back view of the same. Figs. 3, 4, and 5 are detached views of parts of the appliance, Fig. 3 being a section on line *y y* of Fig. 4 and Fig. 5 a section on line *x x* of Fig. 4. Fig. 6 is illustrative of the operation of the appliance.

1 and 9 are end pieces of the appliance, which may be made of semicircular pieces of iron pipe, and to the inner end of the piece 1 is secured, by the rivets 3 3, the malleable-iron casting 2, provided with the ears *b b*, while to the inner end of the piece 9 is secured, by the rivets 10 10 10, the malleable-iron casting 8, provided with the single lug *c*. Between the end pieces 1 and 9 are a number of malleable-iron links 4, having a semicircular groove on the front side and provided at their lower ends with ears *b b* and at their upper ends with the lug *c*, each lug fitting between the ears of the adjacent piece and secured by the pins *a*. The pins *a* may be provided with a thread on one end to fit with the thread in the pin-hole of each link, as indicated in dotted lines.

The ends of the sides 7 7 of each link abut against each other, so that the appliance cannot be bent forward, and each lug *c* has a hook-like extension *d* upon its nose which extends over the surface of the contiguous piece or link and limits the bending or articulation of any two links relative to each other, the distance from the straight radial end of the extension to the said surface being such that the appliance as a whole cannot be bent backward except to a predetermined amount or curve.

In the operation of the appliance when a cable in a manhole or cable-chamber is to be bent into a curve the straight piece 1 is inserted, as shown in Fig. 6, between the top of the cable and the top of the duct B, in

which position it serves as a fulcrum. The appliance is then laid down upon the cable, its hollow side embracing the same, and the cable, with the appliance, is then carefully and slowly bent backward, the appliance being held firmly by its handle to the cable.

Large cables such as have been mentioned are comparatively easy to bend, the great difficulty being that when bending them to a comparatively short curve the lead sheath is liable to bend quickly and kink; but by my invention if the appliance and the cable are kept together in the bending operation no kinks can be made, as the limiting-stops prevent the appliance and thereby the cable from assuming a curve which would be detrimental to the latter.

Having now described my invention, I claim—

1. An appliance to regulate and control the bending of lead-covered electric cables, consisting of a plurality of jointed or articulated sections grooved or hollowed on one side to embrace the cable, one end section having a longitudinal extension thereon adapted to enter the cable-conduit and whereby it is adapted to be held tightly against the cable and serve as a fulcrum in the bending operation, and limiting-stops on the several sections for determining the extreme arc or curve of the cable bend, substantially as described.

2. In an appliance for the purpose specified, the combination of a plurality of jointed

or articulated sections grooved or hollowed on one side to embrace the cable, one end section having a longitudinal extension thereon adapted to enter the cable-conduit and be held tightly against the cable and whereby it serves as a fulcrum in the bending operation, an extension on the other end section provided with a handle, and limiting-stops on the several sections for determining the arc or curve of the cable bend, substantially as described.

3. In an appliance for the purpose specified, the combination of a plurality of jointed or articulated sections grooved or hollowed on one side to embrace the cable, one end section being elongated to enter the cable-conduit and thereby to be tightly held against the cable and serve as a fulcrum in the bending operation, and the ends of the several sections abutting against each other and preventing bending of the appliance in one direction, and limiting-stops on the several sections for determining the extreme arc or curve of the cable bend, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 7th day of April, A. D. 1897.

FRANK E. LEONARD.

Witnesses:

A. F. BANKER,
ARTHUR D. WHEELER.