(No Model.)

T. A. B. PUTNAM.

CARRIER FOR UNDERGROUND WIRES, &c.

No. 282,010. Patented July 24, 1883.

Fig. 1.

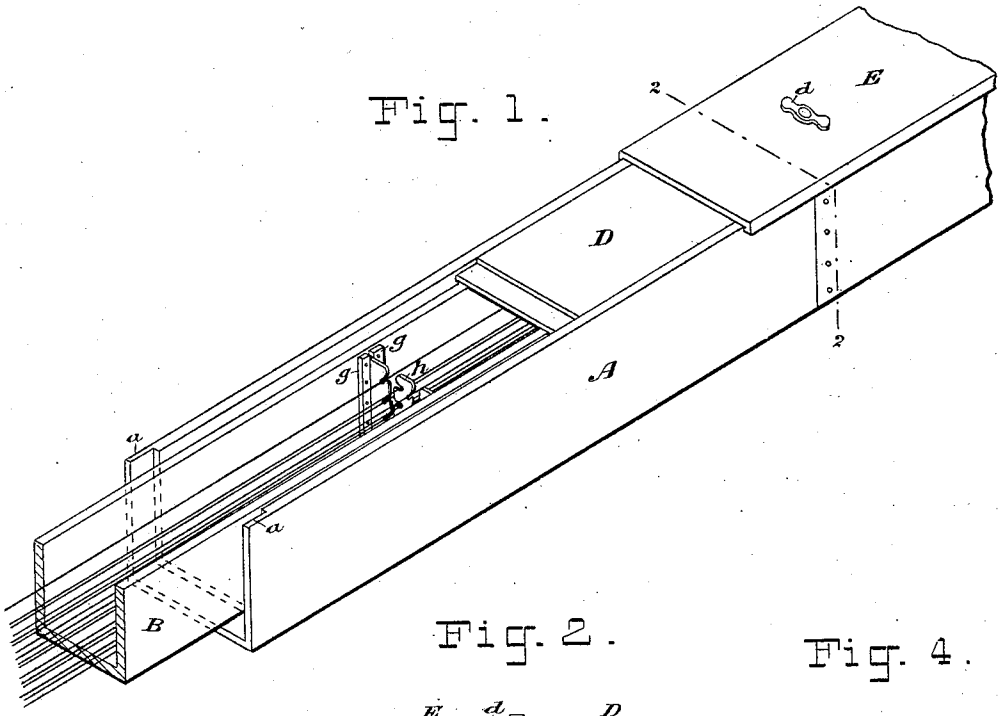


Fig. 2.

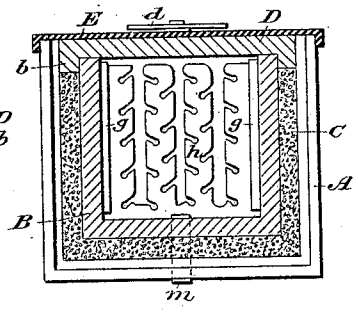


Fig. 4.

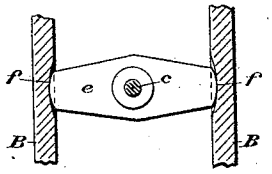


Fig. 3.

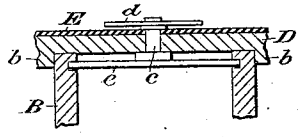


Fig. 6.



Fig. 5.

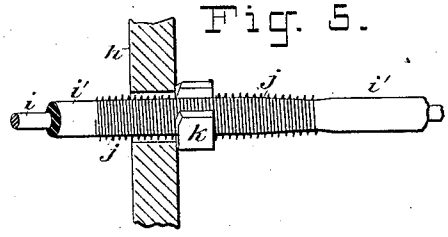
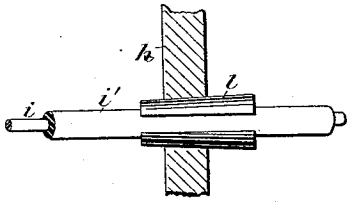


Fig. 7.



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UNITED STATES PATENT OFFICE.

THEODORE A. B. PUTNAM, OF NEW YORK, N. Y.

CARRIER FOR UNDERGROUND WIRES, &c.

SPECIFICATION forming part of Letters Patent No. 282,010, dated July 24, 1883.

Application filed August 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, THEODORE A. B. PUTNAM, a citizen of the United States, residing in the city, county, and State of New York, have invented certain Improvements in Carriers for Underground Wires, &c., of which the following is a specification.

The object of my invention is to provide a dry tubular carrier for electrical wires, pneumatic tubes, and other media of similar character. My purpose is, in the main, to employ the carrier for wires laid under ground, and I prefer to sink it in the ground at the curb of a street or roadway, so that its top may form the bottom of the gutter; but it may be sunk or buried in the ground at any point and to any depth; or it may not be set in the ground at all.

In carrying out my invention I construct an elongated box or tube, generally of rectangular cross-section, for convenience, having double sides and bottom with a space between them, which space I fill with some liquid or plastic material that will harden and serve as a barrier against the entrance of water to the interior of the carrier. I prefer to construct the double sides and bottom of wood, as the cheapest and most convenient material; but other materials might be employed for one or both of the tubular shells between which the plastic material is confined. The tubular shells are made up in sections of convenient length, and when laid are spliced or overlapped at their ends, and the joints of one cell are arranged in different transverse planes from those of the other—that is to say, the two shells break joints, the joints of the inner shell being arranged by preference at about the middle of the sections of the outer shell. The sides of the inner shell do not rise quite as high as those of the outer shell, and an inner cover, preferably of wood, fits down upon the sides of the inner shell. The inner cover is held in place by cleats or strips on its under side at the edges, which take over the sides of the inner shell. This inner cover is made up of sections which are spliced at their ends, and these joints break with the joints in the body of the carrier. Over the inner cover is arranged an outer cover of metal, which has marginal flanges that take over the sides of the outer shell. Tarred paper or some non-pervious plastic material may, if thought necessary, be placed between the inner and outer covers to exclude moisture.

The internal devices for supporting and stretching the wires, &c., and the means for securing the cover on the carrier, will be better understood by reference to the drawings.

Figure 1 is a perspective view, designed to illustrate the construction of the carrier; and Fig. 2 is a cross-section of the same, taken at line 2 2 in Fig. 1. This view is on a larger scale than that in Fig. 1. Figs. 3 and 4 are detached sectional views, designed to illustrate the means for securing the cover on the carrier. Fig. 5 is a side view, and Fig. 6 an end view, of the device for securing and stretching the wire. Fig. 7 is a side view of a conical plug for securing the wire in the holder.

A represents the outer shell of the carrier; B, the inner shell, and C the plastic or liquid filling between them. I do not claim any special material for this purpose; nor do I limit myself to any particular kind. Any of the well-known plastic or liquid compounds that will become hard and exclude moisture may be employed—as, for example, a compound of coal-tar, pitch, and sand, which hardens by cooling, or a mixture of hydraulic cement and sand, which sets and hardens quickly.

In constructing my carrier I excavate a trench, if it is to be laid in the ground, and in this trench place the sections of the outer shell, A. These are spliced together by halving or gaining the sides and bottoms at the ends, as shown at *a* in Fig. 1, and secured by nails or otherwise. After a convenient length of the outer shell has been laid I construct therein the inner shell, B, breaking its joints with those of the outer shell, as before stated. The proper space between the two shells may be provided by means of blocks or cleats placed between the two at intervals, or in any convenient manner. The plastic or liquid filling C may now be filled in, taking care, if the filling be fluid, to stop temporarily the ends of the section being filled.

I will now describe the construction and placing of the cover.

D is the inner cover, which is shown as resting upon the inner shell and coming up flush with the top of the outer shell. Along the margins of this cover are secured cleats *b b*,

which take over the sides of the inner shell, B, and should rest upon the filling C, as shown in Fig. 2. On this inner cover rests a thin metal outer cover, E, which has pendent marginal flanges that take over the sides of the outer shell, A, as clearly shown. The preferred means employed for securing the cover on the carrier are best illustrated in Figs. 3 and 4, the former of which is a cross-section and the latter a horizontal section. On a spindle or axis, *c*, is fixed externally a handle, *d*, and internally a cross-piece or plate, *e*. The ends of this cross-piece *e* are arranged to take into grooves *f f*, formed in the sides of the inner shell, B, when the said piece *e* is turned as shown in Fig. 4—that is to say, transversely of the carrier. These fastenings are arranged at convenient intervals, and serve to prevent the displacement of the cover. Where the carrier is placed wholly below the surface, however, I do not think that any other fastening than that due to the pressure of the superincumbent earth will be needed.

The wood employed for the carrier may be covered or saturated with any of the known preservatives, as coal-tar, creosote, &c.

Having described the carrier-tube and the mode of constructing and laying it, I will now describe the internal devices for supporting and stretching wires therein.

At proper or necessary intervals I form keepers at the sides of the inner shell, B, by cutting grooves in the same, or, better still, by securing cleats *g g* to the sides, as shown. Into the keepers thus formed I slide, vertically, holders *h*, provided with numerous apertures or apertured notches to receive the wires. This holder *h* may be made of any suitable material, as cast-iron, compressed paper, or ceramic materials. An apertured or notched holder of this character has been proposed before, and I do not claim it broadly as my invention; but the mode of mounting it removably in the carrier I believe to be new with me.

Referring now to Figs. 5 and 6, *i* represents the wire; *i*,' its insulating-covering; *j*, a split sleeve of thin elastic metal, screw-threaded externally and drawn down slightly tapering at one end; and *k* is a split nut arranged to screw on said sleeve. The sleeve *j* is slightly expanded normally, so that when it is placed on the wire it may be slipped along the same to the proper point. The wire is placed in the notch in the holder *h*, the sleeve *j* placed on it and slipped to about the position indicated in Fig. 5. The nut *k* is now placed on the wire and screwed onto the tapered end of the sleeve. As it is screwed on it compresses the sleeve on the wire, as will be well understood, and causes the sleeve to grip the wire fast. When the nut has passed from the tapered portion of the sleeve to the straight body of the same, the compression is not further increased, but maintained normal. If the nut be now screwed on until it takes against the fixed holder *h*, it is obvious that, by further turning, said nut must move the sleeve back and with it the wire, thus straining or stretching the latter.

The stretchers may only be required at considerable intervals in the carrier and not at every holder *h;* but intermediate means for securing the wires in every holder should be employed. For this purpose I employ a tapered split plug, *l*. (Shown in Fig. 7.) This plug may be made of wood, metal, rubber, or any other suitable material. The plug is placed on the wire, and then driven onto the aperture or notch in the holder *h*.

By a "split sleeve," "split nut," &c., I mean a nut or sleeve with a slit in one side, so that it may be placed on the wire at any point. This avoids the necessity of putting said nut or sleeve over the end of the wire.

Where naked or uninsulated wires are employed, care must be taken to insulate them from each other and from the earth, as will be well understood.

For taking off branch wires from the carrier, I prefer to make holes in the bottom of the carrier at proper points, and to close these with screw-plugs *m*, Fig. 2, which can be removed and the wires led out as desired.

Where the inner shell, B, is made of wood, which, when dry, is a good non-conductor, the passage of the electric currents will be far less liable to interruption than when the wires are mounted on poles.

For crossings, branches, and angles—as at street-corners, for example—suitable T's, crosses, and elbows will of course be required, and these may be constructed on the same principle as the body of the carrier; or, for these purposes, castings of iron may be substituted for wood in constructing the shells A and B.

With the size, proportions, and shape of the carrier my invention has nothing to do. These will be governed by the circumstances of the particular case.

I am aware that carriers for underground wires have been proposed and employed. These have usually been in the form of tubular sections. These tubes have also been inclosed in exterior shells or casings, and entirely embedded in some plastic water-proof substance. In such construction it is difficult to reach the wires in case of a break in the insulation, as the wires must be drawn through the tubes, which is a very difficult operation, and one apt to destroy the insulated covering of the wires, if one be employed. It has also been proposed to lay wires in troughs or trunks with removable covers, but so far as I am aware none of these have been constructed with a double wooden shell with an interposed shell of some plastic water-proof material, as in my carrier, nor have they been constructed to break joints in the manner shown by me, whereby the entire trunk is made substantially continuous, impervious to water, and easily accessible.

Having thus described my invention, I claim—

1. A carrier for electric wires and other

media, comprising interior and exterior shells or troughs of wood with open tops, an intermediate filling between the sides and bottoms of said troughs, of a plastic material that will harden and exclude moisture, and a double cover constructed and arranged substantially as set forth.

2. The combination, to form the body of a moisture-proof carrier for electric wires and other media, of a wooden outer shell, A, an inner wooden shell, B, the two being made in sections with broken joints, and the interposed material C, having the characteristics described, said plastic material being confined between the bottoms and sides of the shells, and all arranged substantially as set forth.

3. The combination, to form a carrier for electric wires and other media, of the outer and inner wooden shells, A and B, the interposed material C, arranged as shown, of the character specified, the wooden inner cover, D, provided with cleats *b b*, and the outer metallic cover, E, provided with pendent marginal flanges to take over the sides of the exterior shell, A, all constructed and arranged substantially as set forth.

4. As a means for securing and stretching the wire in the carrier, an externally-screw-threaded, tapered, and split sleeve to inclose and clamp on the wire when compressed, and a nut adapted to fit said sleeve, and to compress it on the wire when screwed onto said sleeve from its tapered end, as set forth.

5. As a means for securing and stretching the wire in the carrier, the combination, with a holder mounted in the carrier, of a split clamping-sleeve, *j*, screw-threaded externally, and a split nut, *k*, all constructed and arranged to operate substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

THEODORE A. B. PUTNAM.

Witnesses:
ARTHUR C. FRASER,
GEORGE H. FRASER.