(No Model.)

J. C. REILLY.

ELECTRIC SUBWAY.

No. 458,778. Patented Sept. 1, 1891.

Fig. 1.

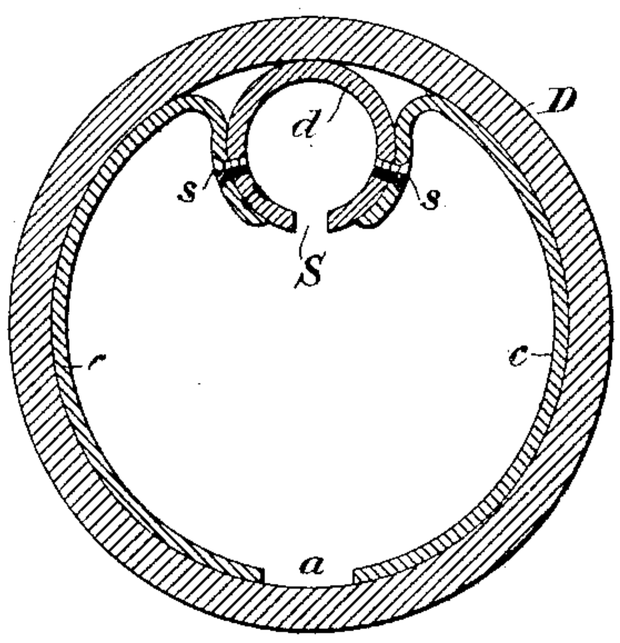


Fig. 2.

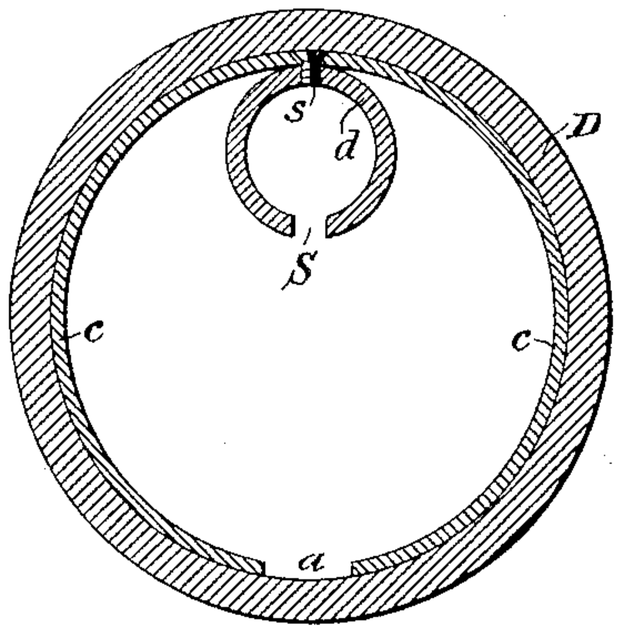


Fig. 3.

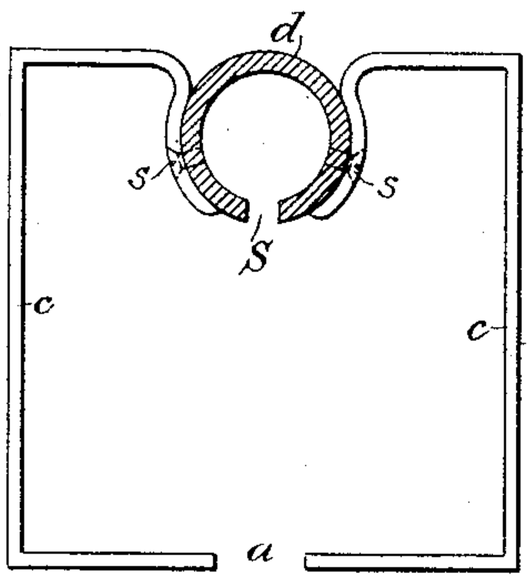


Fig. 4.

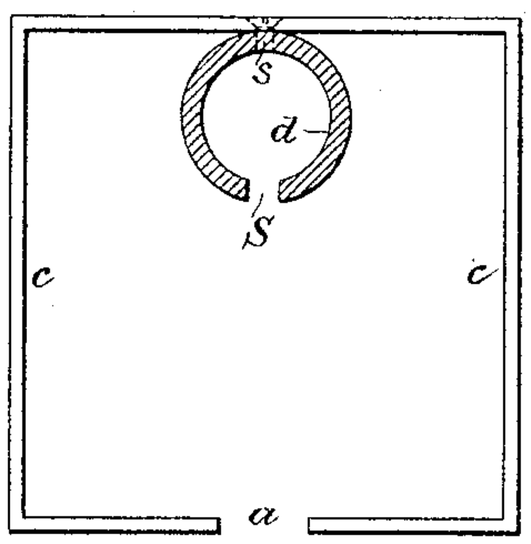
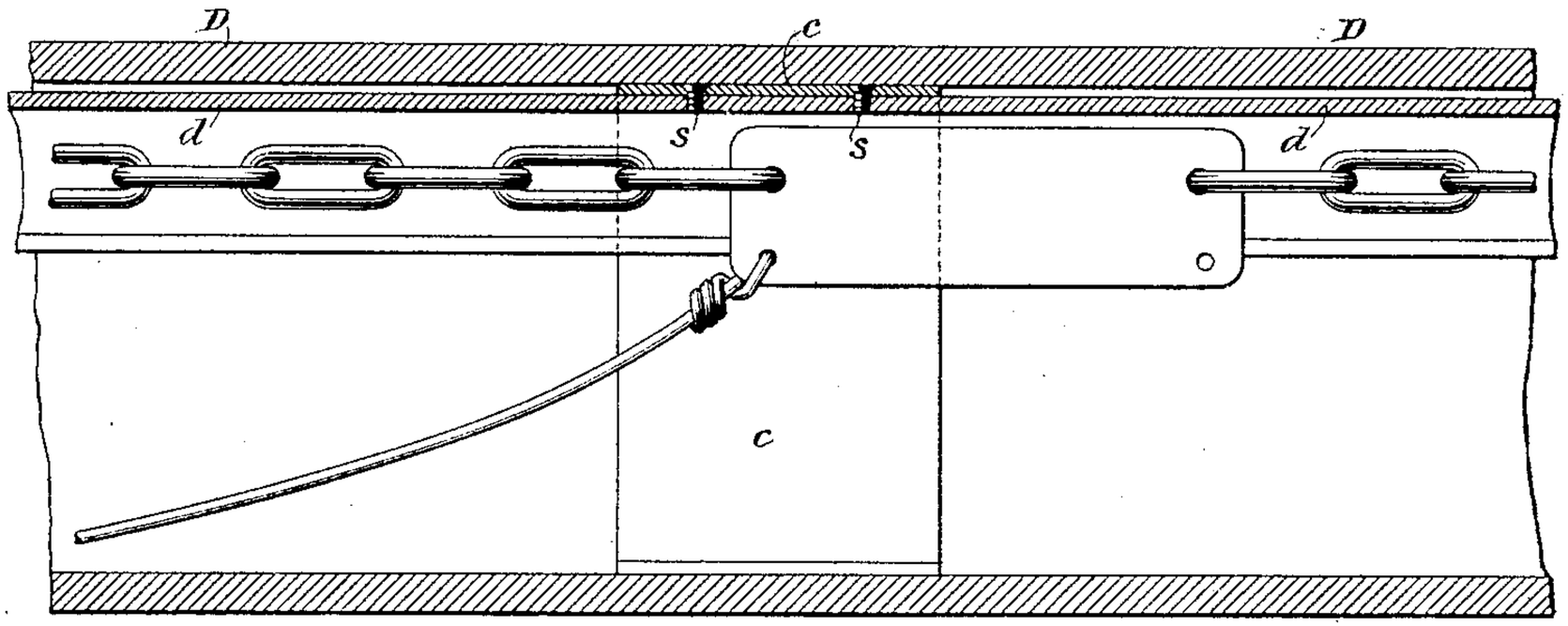


Fig. 5.



Witnesses
Edward Thorpe.
Wm. Riecks

Inventor
John C. Reilly
By his Attorney Wm. B. Vansize

UNITED STATES PATENT OFFICE.

JOHN C. REILLY, OF BROOKLYN, NEW YORK.

ELECTRIC SUBWAY.

SPECIFICATION forming part of Letters Patent No. 458,778, dated September 1, 1891.

Application filed May 19, 1891. Serial No. 393,248. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. REILLY, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electrical Subways, of which the following is a specification.

My invention is an improvement in electric subways.

Electric subways as usually constructed consist of a series of ducts or passages placed under ground and preferably made gas and water tight. Insulated conductors are placed within these ducts either at the time of construction or by the use of "leading-in devices," so arranged that one or more conductors can be pulled through from one end of a section to the other of such duct or passage.

The object of my invention is to provide for leading in or placing in position these insulated conductors more expeditiously and without damage to other conductors already in position. The device or apparatus invented by me for this purpose is so arranged that it may be added to a series of ducts or passages already in position and in use. I take a tube, pipe, or duct, preferably of metal, and slot it from one end to the other. I place inside this tube a chain, wire, or rope. Attached to this chain, wire, or rope is a plate, link, or hook, or any suitable mechanical device, to which the conductors to be drawn in may be readily attached. This is so shaped that it will travel along in the slot back and forth when the chain is properly manipulated.

The devices so far described by me are now well known, being shown and described in my patent, No. 447,350, dated March 3, 1891.

My present invention consists in an improvement in this apparatus by the use of which it may be applied to any duct or passage whether in use and partially filled or in process of construction. A device of this kind increases the capacity of old ducts and facilitates the construction and use of new ducts, while it decreases the cost of construction in respect to both time and money. I take a slotted tube, preferably of metal, and having placed therein a traveling mechanical connecting device, like a link, plate, or hook, and a chain, wire, or rope, I secure thereto by screws or in any suitable manner a series of clips, frames, or brackets of some inoxidizable metal having a suitable degree of resilience, so that when drawn along against the interior wall of the duct or passage (to the shape or outline of which the clips should conform) they will yield to inaccuracies or variations in the surface, and not catch and hold, as would be the case if they were firm and rigid. I prefer to make the clips of inoxidizable metal, as they will not then rust and become fixed in position, and they can always be readily moved along, and I prefer to leave a small space or break in their continuity to allow for a slight degree of adjustment or accommodation to the shape of the duct.

The accompanying drawings illustrate the invention.

Figure 1 shows a circular duct with the improved leading-in device in position. Fig. 2 shows a modification in the method of fixing the clip or frame to the slotted tube. Fig. 3 shows a leading-in device similar to Fig. 1 for use in a duct which is square in cross-section. Fig. 4 is a similar device, the slotted tube having the clip or frame fixed to it in a slightly-modified manner, and Fig. 5 is a longitudinal cross-section showing the duct, the slotted tube, the mechanical connection for the conductor, the chain, and the clip or frame in operative relation and position.

Having at my disposal an underground duct, tube, or passage, or a series of them, of any suitable material and either circular, square, or of any regular form in cross-section, I may apply the means for adding conductors to those already in position, or I may fill the duct from the beginning. D is such a duct. *d* is a tube or duct much smaller in diameter than duct D, having a slot S of uniform dimensions extending from end to end. Let us assume man-holes in duct D to be one hundred feet apart. I may take lengths of the slotted tube *d*—say twenty-five feet long. At intervals of from three to five feet I attach clips, frames, or brackets *c* to the tube *d* by screws *s* or in any other suitable manner. These clips are preferably of a practically inoxidizable metal—such as brass or copper—and are from three to six inches broad and one-eighth to one-quarter inch thick. In outline they conform to the inte-

rior wall of the duct to which they are applied. They are shown circular in Figs. 1 2 and rectangular in Figs. 3 and 4. These clips *c* may be in two sections, as shown in Figs. 1 and 3, or they may be one integral strip, as in Figs. 2 and 4. I make them resilient and yielding in either case by providing a space *a* in the continuity thereof, and I prefer to use a material having a springy nature. The object of this is to allow the clips *c* more readily to move along over the variations and inaccuracies always found in the interior of ducts like D. Having placed the clips in position, as described, the length of tube *d* is pushed into the duct D. Then a similar length is coupled on and both are pushed along. Within the slotted tube *d* I place a chain, rope, or wire, and fixed to it is a mechanical connecting device like the plate shown in Fig. 5. This may be a link or hook; but it travels in the slot S, and the conductor to be drawn into position, as shown in Fig. 5, is attached to it outside of tube *d*, but inside of duct D. This operation may be continued until the duct D is filled.

What I claim, and desire to secure by Letters Patent, is—

1. A duct or passage for the reception of underground wires, in combination with a removable leading-in device placed therein, consisting of a longitudinally-slotted duct or passage of comparatively small diameter supported upon the interior wall of the first-named duct or passage by a frame or bracket conforming in outline to the interior of said duct, substantially as described.

2. A duct or passage for the reception of electrical conductors, in combination with a removable leading-in device consisting of a longitudinally-slotted duct or passage of metal having a comparatively small diameter supported upon the interior wall of the first-named duct by a series of frames or brackets of inoxidizable material, a plate, link, or hook traveling in said slot, and a suitable device for drawing said plate, link, or hook along located within said smaller duct, substantially as described.

3. The combination, in an underground system for electrical conductors, of a duct or passage containing a removable duct or passage of comparatively small diameter having a narrow longitudinal slot upon its under side, said duct being removably supported in position by one or more clips, frames, or brackets, substantially as described, conforming to the interior outline of the first-named duct and having resilience sufficient to permit of being drawn along over small inaccuracies in the interior wall of the first-named duct.

4. The combination, in an underground system of electrical conductors, of a duct or passage for the reception of the conductors, a removable duct or passage having a longitudinal slot for a traveling mechanical connecting device, means for drawing said connecting device along in the slot, and two or more clips, frames, or brackets fixed to the removable duct, conforming in outline to the interior of the first-named duct and having a suitable degree of resilience to provide for variations and inaccuracies in the interior wall of the first-named duct, and thus provide for insertion and removal, substantially as described.

Signed at New York, in the county of New York and State of New York, this 16th day of May, A. D. 1891.

JOHN C. REILLY.

Witnesses:
WM. B. VANSIZE,
WM RIECKS.