

(No Model.)

A. C. CHENOWETH.

MEANS FOR CONSTRUCTING ELECTRIC CONDUITS.

No. 454,939.

Patented June 30, 1891.

Fig. 1.

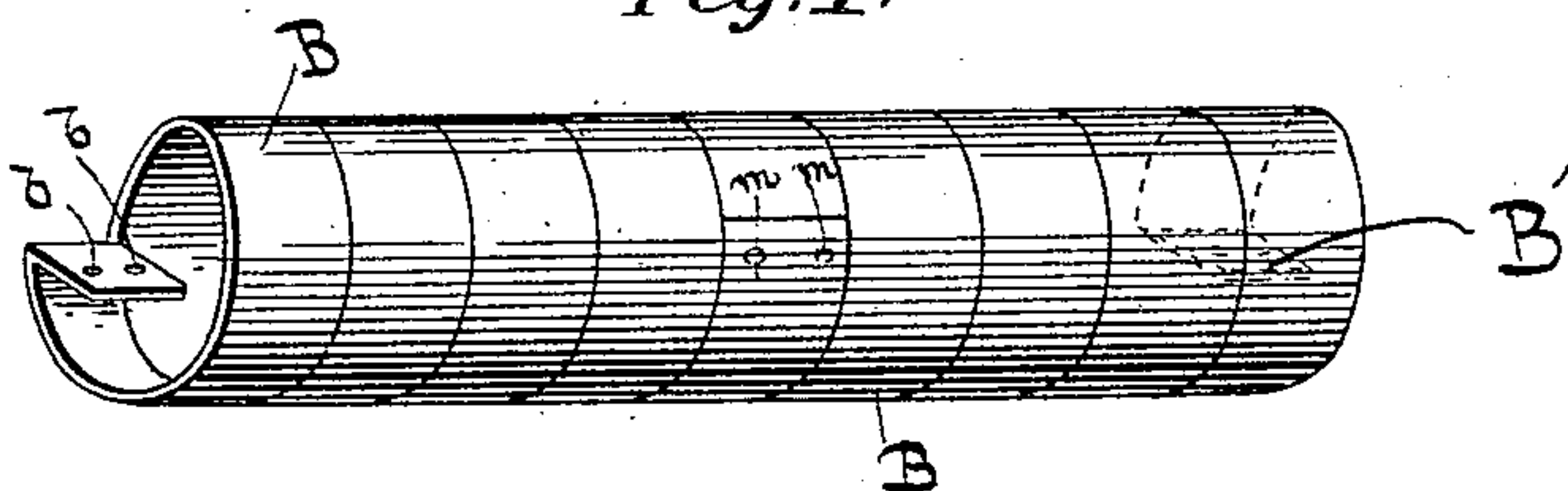


Fig. 2.

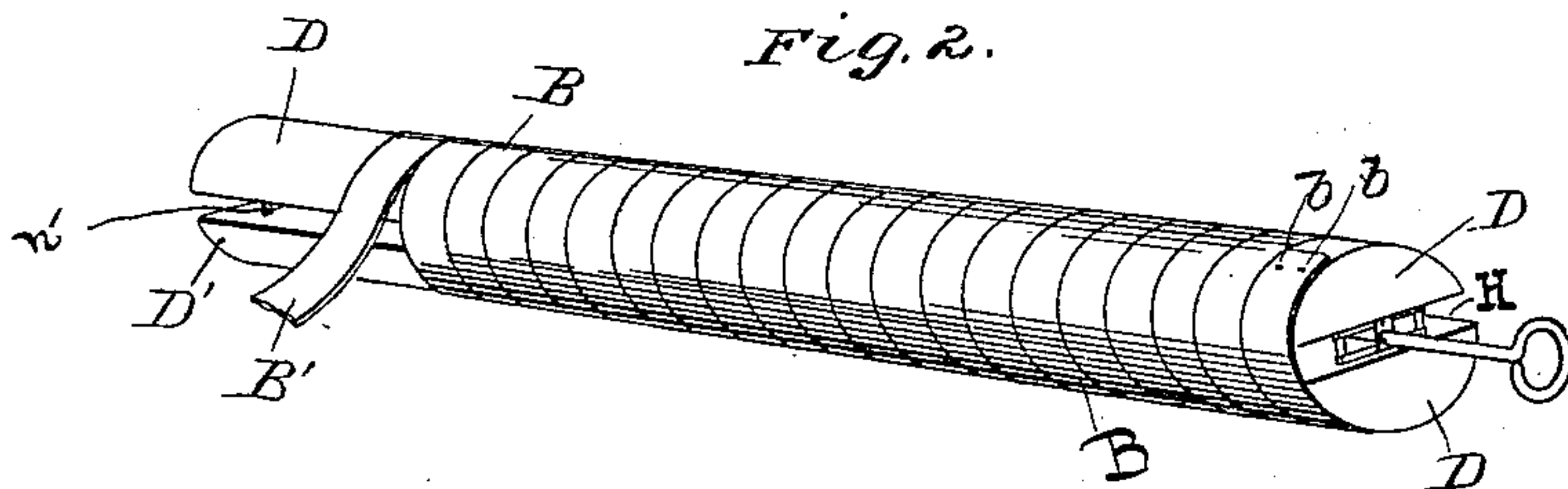


Fig. 3.

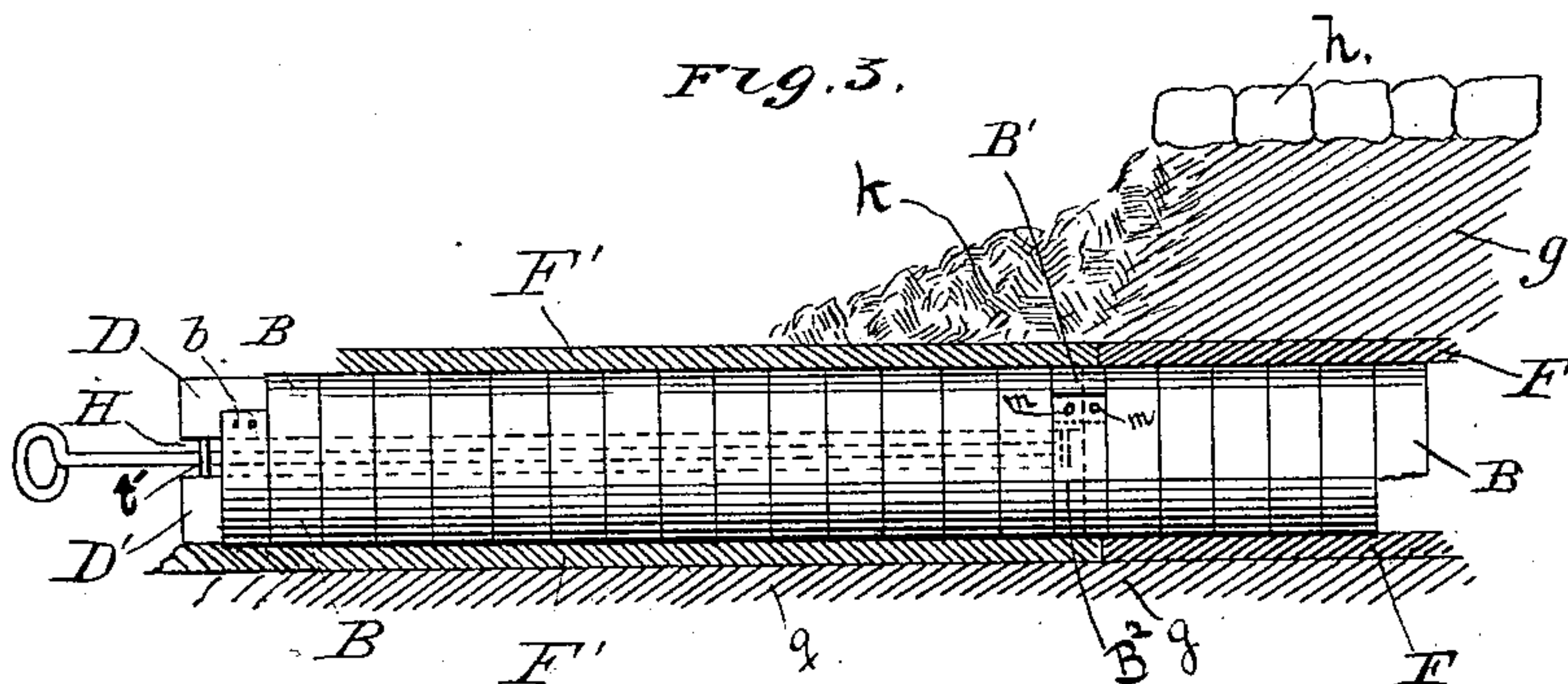
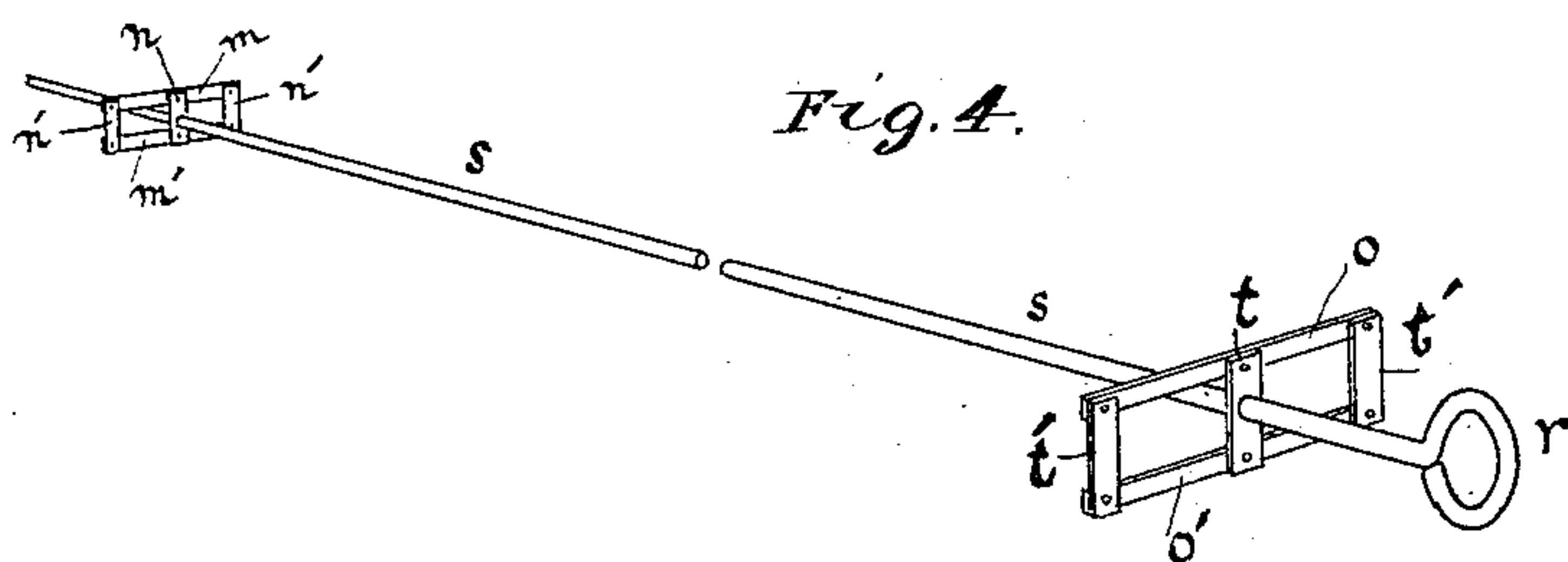


Fig. 4.



WITNESSES:

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MEANS FOR CONSTRUCTING ELECTRIC CONDUITS.

SPECIFICATION forming part of Letters Patent No. 454,939, dated June 30, 1891.

Application filed March 7, 1891. Serial No. 384,176. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER CRAWFORD CHENOWETH, of the city, county, and State of New York, have invented a new and useful Improvement in Methods of and Means for Constructing, Shaping, and Molding Electrical and other Conduits, Pipes, or Conductors, of which the following is a full, exact, and clear description, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a short length of my spiral centering, showing a joint. Fig. 2 is a perspective view of said centering, showing my method of constructing the same about a core, and also showing such core arranged so as to be collapsible. Fig. 3 is a view, partly in section and partly in perspective, showing earth and concrete or other plastic material in section and said centering in perspective, also in perspective a joint in said centering and collapsible core. Fig. 4 is an enlarged view of one form of collapsible wedging apparatus, showing in dotted lines the relation thereto when in use of the sections of my collapsible core.

The object of my present invention is to provide a method of utilizing my spiral centerings, (for which I have now pending another application for Letters Patent, filed June 30, 1887, Serial No. 243,053,) in which the interior support of the core upon which the centering has been wound may be retained until after the application of the concrete or other plastic materials to be molded thereby, and whereby I am enabled at the same time to proceed continuously with the construction of the pipe or conduit without waiting for the concrete or other plastic materials to set or harden before withdrawal of the core.

In the Letters Patent granted to me July 12, 1887, No. 366,457, for method of laying continuous electrical conduits, I described the use of a core in combination with a casing, preferably of rope or wire, wrapped spirally around the core, so that the latter may be withdrawn easily from the casing. Since applying for said Letters Patent I have discovered that such a casing, if constructed out of material of proper cross-section and of sufficient strength and rigidity—such, for instance, as galvanized-iron ribbon—is alone competent to support the plastic materials during

setting and hardening without assistance from the core.

In my process and method of laying continuous electrical conduits, as described in my said Letters Patent No. 366,457, it was necessary in all cases to await the complete setting of the asphaltum, concrete, or other plastic materials before the core could be withdrawn from the spiral anti-frictional casing there described. This was due to the fact that the rope spiral was too weak and flexible to sustain the plastic materials in position without the center support of the core. The same would also have been true of a wire casing unless the wire had been of such large cross-section as to render the handling of it difficult; and, furthermore, inasmuch as the cores then used by me were solid and uncollapsible it was practically impossible to withdraw them without ruinously disturbing the concrete or other plastic material unless the latter was allowed sufficient length of time to completely set prior to power being applied to withdraw the core.

As is well known to those skilled in the use of concrete, a very considerable period of time is required for it to "set." This time varies according to the kind of ingredients used and their proportion, and is rarely, if ever, less than twenty-four hours. After the concrete has set it ceases to be plastic and can be subjected to considerable pressure and disturbance without changing its form. After the setting has been accomplished the "hardening" commences, which continues during several years. In the use of my said former process it was therefore necessary to leave the core within the spirally-wound casing during at least one day, and thus the progress of construction was undesirably interrupted and retarded. Since my invention referred to in my said pending application and the discovery by me that material of proper strength arranged so as to be spirally divisible will operate successfully as a centering, and is sufficient alone to support the plastic materials in the required position, I have further discovered that such centerings, particularly if constructed of as light materials as are economically desirable, may be readily disarranged, indented, or distorted by careless handling on the part of workmen, and that it is

desirable to so protect them and so conduct the process of making pipes or conduits by their assistance that injury may be as far as possible avoided, and the construction thus effected with greater economy and with better results. I attain these objects by means of my present invention, as follows: I construct a core so that it shall be divisible longitudinally into at least two parts or sections $D D'$, separated by a space H . The space between these sections $D D'$ is maintained by means of wedges or a collapsible arrangement of braces so constructed as to be simultaneously collapsed throughout the entire extent of the core, in order that the sections of the core may be approached at will toward each other. I have in the drawings illustrated a simple form of such collapsible braces $t t' o o' n n' m m'$. These braces may be operated or collapsed by means of a rod $s s$, having handle r and extending longitudinally parallel with the core-sections $D D'$ and rigidly fixed to the central braces $t n$, pivoted to the frame $o o' m m'$, supporting the side braces $t' n'$, likewise pivoted to the frame. Thus a workman by turning the rod s approximately ninety degrees to the right or left will simultaneously turn the vertical brace-supports $t n$ and cause the frame to collapse, whereby the two sections $D D'$ will be allowed to approach each other, and thus the diameter of the core diminished. Suitable slots or cavities should be made in the flat or inner surfaces of the core-sections to permit free action of the corner-angles of the vertical braces $t t'$, &c., when the same are caused to project beyond the outer line $o o'$ as they are turned on their pivotal connections, and it is of course also apparent that other devices operating in substantially the same manner might be employed without departing from my invention, it being understood that the wedges, braces, or supports between the sections of the core shall be so arranged and connected as to be simultaneously collapsed or removed throughout the extent of the core by an operator stationed at one end thereof. I next arrange the sections of the core and the distending braces or supports in the position shown in Figs. 2 and 3. The parts may be retained in this position relatively to each other by any obvious means, as by tying them temporarily together with a cord or rope, or may be so held by the unassisted hands of the workmen. The next step is to secure—by a tack, for instance, in any obvious manner—one end of the ribbon or other material which is to constitute the centering to one end of the combined core and distender, as shown at $b b$, Fig. 2. Then the ribbon or the centering material is spirally wound around the distended core by revolving the latter, or in any other way. The centering $B B$ thus combines the core-sections with the distending apparatus, and thus serves to hold all in place. The core having thus been wound with the cen-

tering throughout its length, the remaining end of the centering is securely fastened to the core in the same manner as the front end. The core and centering are now ready for use, and it is manifest that as long as they are retained in the combination described it will be substantially impossible for an external blow or undistributed pressure upon the exterior of the centering to indent or distort the latter out of its required uniform tubular arrangement. The remainder of the process of constructing the core or centering will then be to carry the combined core and centering to the trench or other position in which the pipe is to be constructed, and the centering finally established in position for molding. Next support the combined core and centering in the desired position, either by directly laying the combined core and centering upon a bed of the plastic material, either plane or preferably previously indented or molded by the impression of a templet of the same size and shape as the combined centering and core, or a support may be effected in any other well-known way. If the process is being applied in the construction of a continuous pipe or conduit upon the very location in which it is to be permanently retained and used, as shown in Fig. 3, the next step will be to unite by rivets or in any other well-known way one end of the next previously-used length of spiral centering to one end of the centering thus combined with the core, as aforesaid, as shown, for instance, at $m m$ in Fig. 3, where B^2 represents the end of the ribbon of a previously-laid length of the centering from which the core $D D'$ has been already removed and about which and its surrounding of plastic material $F F'$ the earth g has been restored, and also the street above re-covered with pavement h , and B' represents the end of the ribbon of a length of the centering, which is still combined with the cores $D D'$, the said end B^2 having been superimposed above the underlying end B' and secured thereto by the rivets $m m$. The next step will consist of surrounding the combined core and centering with the plastic materials $F F'$, of any required thickness, which may be done either with the assistance of external molds or without other external molds than the earth or other fillings, as will be readily understood. Next, as soon as the centering has been thus by its covering of plastic material protected against external injury and before the plastic materials have had time to set—in fact, immediately, if required—the step of withdrawing the core from the centering may be accomplished by causing the cores to collapse, as already described, and the centering will thus be left to perform, without the assistance of the core, the function of molding or holding in place the plastic materials while they are setting, and as long thereafter as may be desired. In collapsing and withdraw-

ing the core, as aforesaid, immediately after the application of the plastic materials great care should be taken to withdraw the cores with the least possible friction and disturbance or contact with the interior of the centering. By this means I am enabled to retain the advantage of a core as an internal support to the casing until after it has been placed beyond danger of external injury and to proceed continuously with the construction of the piping or conduit, as each length of core may be withdrawn immediately after its length of centering has been connected with the length previously laid and the plastic material applied. The conduit thus constructed is completely lined with the spiral centering, and the latter may be withdrawn in the usual manner at any convenient time after the plastic materials have set. The centering, after being thus constructed about the core in the manner described, may be further treated by covering the same with an external casing or coating of such as, for instance, asphaltum, rubber, or other non-conducting, impervious, or other material, in any of the numerous well-known ways of applying such materials. The external casing thus applied should be so prepared in any well-known way as to avoid adhesion thereof to the centering. The plastic materials being applied externally to the combined centering and casing, on the withdrawal of the centering the said external casing is left behind, and thereafter constitutes an inner lining of the conduit, pipe, or other molded articles, all as more fully described in my said previous pending application for Letters Patent filed June 30, 1887, Serial No. 243,053.

What I claim as new, and desire to secure by Letters Patent, is the following:

1. The method herein described of forming, shaping, or casting the interiors or concave surfaces of conduits, pipes, or castings, consisting in the preparation of a centering of the required shape and size by spirally winding a properly-shaped mandrel or core with the material out of which said centering is constructed, sustaining the core and centering in position, surrounding them with material out of which the conduit is to be constructed while said material is in a plastic condition, and thereafter and before said material has had time to set withdrawing the core, and finally, after said material has set, withdrawing said centering, substantially as described.

2. The art or method described of forming, shaping, or casting the interiors or concave surfaces of conduits, pipes, or other castings, consisting in the preparation of a centering of the required shape and size by spirally winding a properly-shaped core with the material out of which said centering is constructed, then covering said centering with a casing of non-conducting, impervious, or other material, then supporting said centering and

core so covered in the desired position and surrounding the same with the materials designed to constitute the body of the conduit while the latter are in a plastic condition, and thereafter and before said plastic materials have had sufficient length of time to set withdrawing said core, and after said plastic materials have set or become hard finally withdrawing said centering without said non-conducting covering, thus leaving the latter behind in place as an interior lining, all substantially as described.

3. The method herein described of forming, shaping, or casting the surfaces of pipes or conduits, consisting in the preparation of a centering of the required shape and size by spirally winding a collapsible mandrel or core with the material out of which said centering is constructed, sustaining said core and centering in position, surrounding them with the material out of which the conduit is to be constructed while said material is in a plastic condition, and thereafter, before said material has had time to set, collapsing and then withdrawing said core, then leaving the centering without core to support the plastic materials until after the latter have set, and finally, after said plastic materials have set, withdrawing the said centering, substantially as described.

4. The method herein described of forming, shaping, or casting the surfaces of conduits or pipes, consisting in the preparation of a length of centering of the required shape and size by spirally winding a properly-shaped mandrel or core with the material out of which said centering is constructed, sustaining the core and centering in position, uniting one end of said length of centering with the corresponding end of a similar length of said centering previously in position and from which the core has been previously withdrawn, surrounding the said centering containing its core with the materials out of which the conduit is to be constructed while said materials are in a plastic condition, thereafter and before said materials have had time to set withdrawing the core, then uniting the free end of said length of centering to the end of another length of similar centering subsequently laid in position, and finally, after said plastic materials have set, withdrawing said centering, substantially as described.

5. The method herein described of forming, shaping, or casting surfaces of conduits or pipes, consisting in the preparation of a length of centering of the required shape and size by spirally winding a properly-shaped collapsible mandrel or core with the material out of which said centering is constructed, sustaining said core and centering in position, uniting one end of said centering with the corresponding end of a similar length of said centering previously in position and whose similar core has been previously collapsed and withdrawn, surrounding the said

centering containing its core with the materials out of which the conduit is to be constructed while said materials are in a plastic condition, thereafter and before said materials have had time to set collapsing and withdrawing said core, then uniting the free end of said length of centering to the end of another length of similar centering subse-

quently laid in position, and finally, after said plastic materials have set, withdrawing said centering, substantially as described.

ALEX. CRAWFORD CHENOWETH.

Witnesses:

WM. COTTER DICK,
JOHN J. AHRENS.