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M. KONDOLF.

IMPLEMENT FOR LAYING UNDERGROUND CONDUITS.

APPLICATION FILED FEB. 2, 1903.

NO MODEL

Fig. 1.

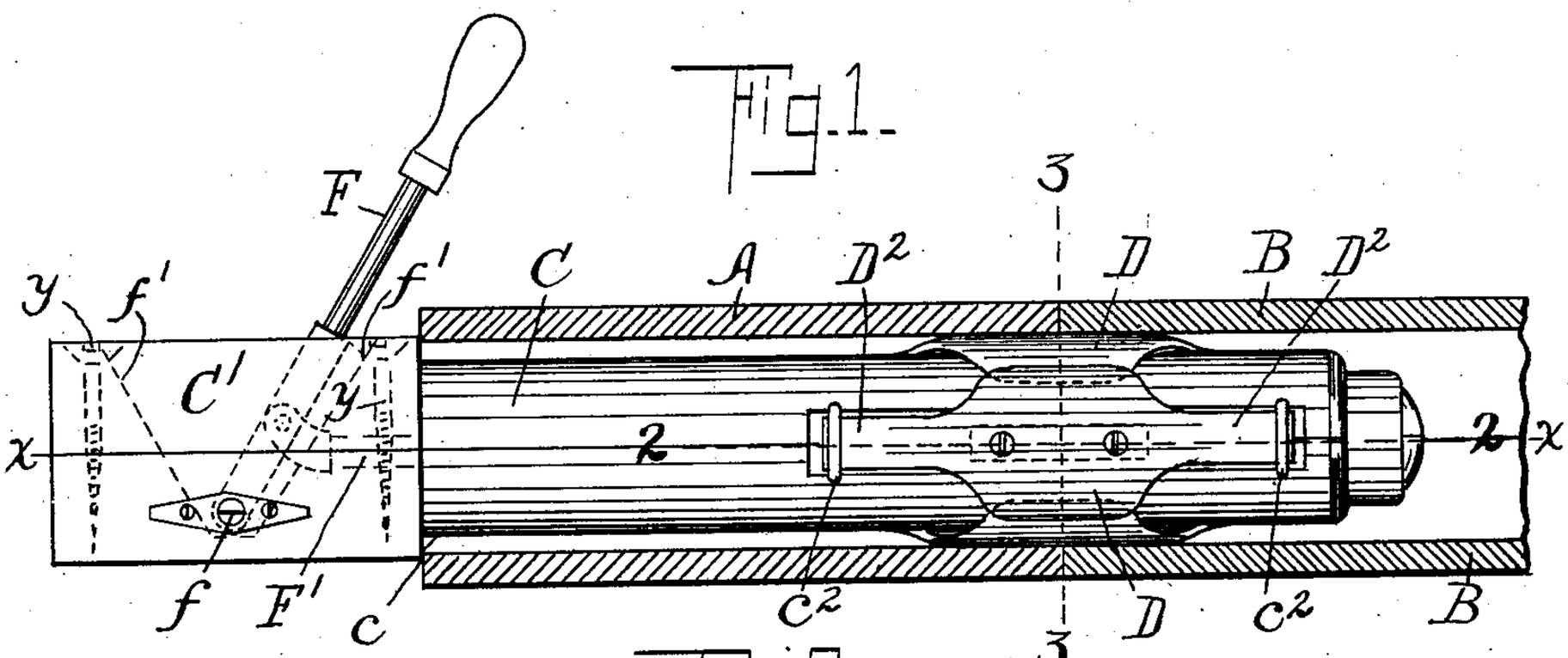


Fig. 2.

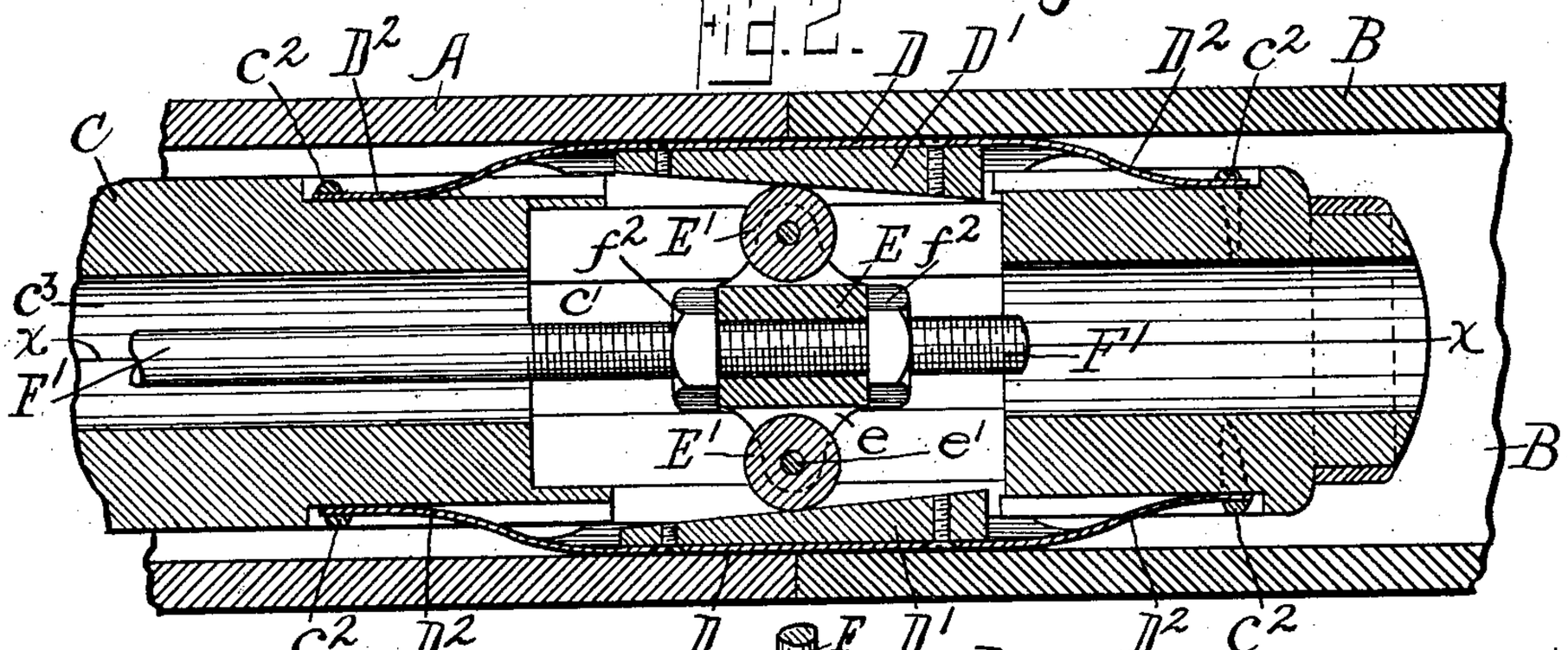


Fig. 3.

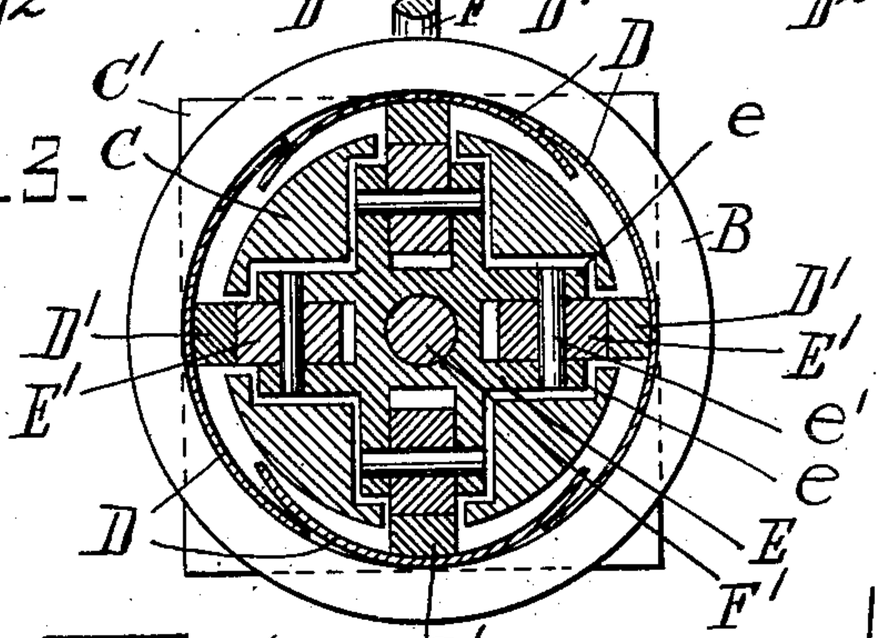
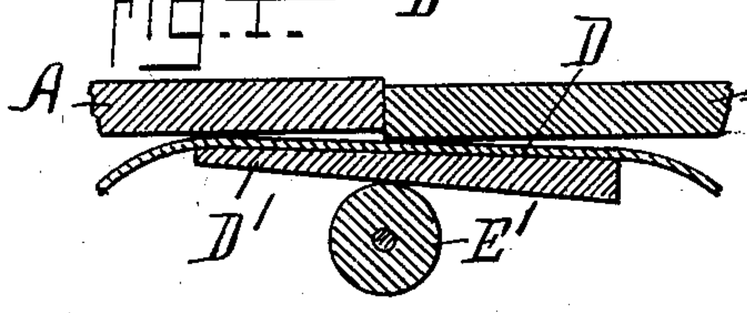


Fig. 4.



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UNITED STATES PATENT OFFICE.

MATHIAS KONDOLF, OF ROCHESTER, NEW YORK.

IMPLEMENT FOR LAYING UNDERGROUND CONDUITS.

SPECIFICATION forming part of Letters Patent No. 744,362, dated November 17, 1903.

Application filed February 2, 1903. Serial No. 141,450. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS KONDOLF, a citizen of the United States, and a resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Implements for Laying Underground Conduits, of which the following is a specification.

This invention relates to implements for laying underground conduits for cables, electric wires, pipes, fluids, and other such purposes, and has for its object to provide means for alining and centering adjacent conduit-sections relatively and for holding them in position until they shall have been permanently secured.

In the drawings, Figure 1 represents the implement within adjacent conduit-sections and shows in dotted lines some of its inner parts. Fig. 2 is a longitudinal section on the line 2 2 of Fig. 1, enlarged. Fig. 3 is a cross-section on the line 3 3 of Fig. 1, enlarged; and Fig. 4 is a partial longitudinal section on the line 2 2 of Fig. 1, showing the position of some of the parts under certain conditions.

A and B represent two adjacent conduit-sections which are to be laid and fixed end to end to form one continuous conduit. It is obviously important that the sections should be carefully alined when they are laid. It is also important that the sections should be centered relatively, for otherwise shoulders will be formed in the bore at the points where the sections join one another that obstruct the passage of the cables, wires, or pipes, or the flow of fluid when used in the last connection. Moreover, the conduit-sections often vary in size or in the diameter of their bores. Tiles are ordinarily employed for underground conduits, and with that material it is impossible to obtain a uniform bore for all of the sections. In the ordinary kiln tiles are subjected to different degrees of heat when they are fired, according to their location in the kiln, and this, as well as differences in the material of which the tile are made, produces even in sections that are constructed from the same size die variations in the size of the sections and the diameters of their bores that made these shoulders at the points where its sections join each other. This improvement obviates these difficulties as far as it is possible to do so by alining and centering adjacent sections as they are laid and before they are cemented or otherwise permanently secured together and by holding them firmly together in such relative positions, so that they can be permanently secured so.

The sections are alined by means of a shaft C, which is of such diameter that it can be introduced readily into all of the sections and whose butt C′ is somewhat larger than the bore of the conduit. The means for centering the adjacent sections and for locking them together in such position consists of one or more clamps located near the end of the smaller part of the shaft C. These clamps lie beneath the junction of the adjacent sections that are to be fastened together when the shaft is so placed within said sections that its shoulder *c* lies against the outer edge of the end section. The clamps are operated from the butt C′ of the shaft C, which projects beyond the end conduit-section, when the shaft is inserted in place within the sections.

In the drawings the clamps are represented in the form of plates D, that have upon their under sides wedges D′, whose apexes point, respectively, toward the butt C′ of the shaft C and arms D^2 D^2, by which they are connected with the shaft. The plates are preferably so made and placed upon the shaft C that they overlap each other, as represented in the drawings, for a purpose that will presently appear, and they are represented as of different curvatures, so that they will overlap. The plates D are so connected with the shaft C that they can be forced outwardly to engage both of the adjacent conduit-sections. In the drawings the arms D^2 D^2 are represented as made of elastic material, like spring-steel, so that when the plates D are expanded it is against the resistance of their spring-arms D^2 D^2, which have sufficient resiliency to return the plates to their normal position when they are released. The arms D^2 are represented as movably connected with the shaft C by staples c^2 at each of their ends, respectively, so that the plates D can be expanded. Several clamps are preferably employed, (four are represented in the drawings,) which are connected to the shaft C at equal

distances from each other, and means are shown for forcing them all out equally at the same time.

The particular means for forcing the plates D out represented in the drawings consists of the wedges D′ upon the under sides of the plates D, respectively, in connection with a block E, which lies in a recess *c′* in the shaft C. The said block bears against the said wedges upon the under sides of the several plates, respectively. This block E is represented as supporting beneath each wedge D′ a roller E′, each of which is supported between flanges *e e* on the block E by a pin *e′*. It requires very little exertion to move the block E when the rollers are employed. They reduce the friction so that the clamps can be released from the sections and the implement withdrawn without disturbing the position of the sections. The fact that the shaft is considerably smaller than the bore of the sections and the use of rollers make it impossible for the implement to stick or bind in the sections; but these rollers have another function. It is apparent that when the bores of the adjacent sections are of unequal diameter they can only be centered accurately by this implement by employing a clamp or plurality of uniformly-expanding clamps that are adapted to engage both of the adjacent sections. The clamps disclosed in the drawings, in combination with the rollers, are adapted to do this, for each of said clamps, each comprising a plate D, arms D^2 D^2, and wedge D′, constitutes a lever whose fulcrum is a roller E′. When the block E expands said plates, they first engage the conduit that has the smaller bore. Continued pressure of the rollers E′ upon the wedges D′, respectively, causes the plates E to tilt, as represented in Fig. 4, until they also engage the other conduit, the spring-arms D^2 of the clamps and their movable connection with the shaft C making the tilting movement possible.

The block E is operated by means of a lever F at the butt C′ of the shaft C. The lever F lies in a socket in the shaft C (indicated by the dotted lines *f′ f′* in Fig. 1) and is represented as pivoted within the butt C′ of the shaft C at its lower end, as by the pin *f*, and as connected to a rod F′, which lies in a slot c^3 in said shaft C. Said rod F′ in turn is connected at its other end with the block E. The rod F′ is represented as passing through the block E and secured thereto by the nuts f^2 f^2, one at either end of said block. For convenience in assembling and reaching the parts of the implement the shaft C may be constructed of two parts joined together on the longitudinal central line *x x*, (see Fig. 1,) as by screws *y y*.

When the implement is to be used, it is thrust in through the section that is to be laid till the shoulder *c* or some other suitable stop upon the shaft C, located approximately at the point where said shoulder *c* is represented, comes in contact with the end of the section. In this position the end of the implement will protrude from the section that is to be laid and enter the end of the last of the laid sections, so that the plates D lie beneath the juncture of these sections. The loose section is alined with those that have been laid by means of the shaft, and said shaft is then clamped to said loose section and the adjacent section by throwing the lever F forward into the position shown in Fig. 1. When the lever is thrust forward into this position, it forces forward the rod F′ and the block E on the end of said rod, so that the block E occupies the position shown in Fig. 2, in which the rollers E′ have forced outwardly the plates D by pressure brought to bear upon the wedges D′. In this position the plates D span the juncture between the two sections and engage them on either side, as shown in Fig. 2. If the adjacent sections have unequal diameters, the plates D when expanded by said block E adjust themselves, taking the tilted positions shown in Fig. 4. Of course if the wedges are pointed in the opposite direction from that shown the movement of the handle is reversed to expand and release said clamps.

If but one clamp is used, it is obvious that when expanded to engage both sections in this manner it will center said sections on a diametrical line drawn through said plate, provided they are approximately of equal diameter; but if a plurality of clamps are used—as, for example, the four clamps shown in the drawings—that are expanded uniformly they will center the two sections absolutely with reference to each other when said sections have bores of the same size, and sections of different bores will be placed concentrically if the clamps are constructed so that they can tilt to adjust themselves to engage both sections, as described above.

In laying conduit-sections considerable difficulty is experienced with cement and dirt that enters between the sections while they are being laid and cemented together, and tools are often employed to withdraw it from the sections before they are put into use. This difficulty is overcome by another feature of this invention, which consists in making the plates D of such size and shape that they overlap each other at the juncture of the two sections. When the implement is inserted within the sections and the plates D are expanded, they cover the inside surfaces of the two sections beneath and on either side of the juncture, making a continuous shield, so that no dirt or cement can pass into said conduits through the crevice between them. This construction also makes it possible to fill up thoroughly the space between the two sections with cement and to make a smooth joint both on the outer and the inner surfaces.

What I claim is—

1. An implement for laying underground conduits comprising a shaft as one member; a longitudinally-movable rod within said

shaft as another member; a plurality of radially-bending, spring, clamping-plates upon one of said members adapted to engage from within adjacent conduit-sections; means attached to the other member for operating said plates to engage and disengage said conduit-sections by the longitudinal movement of said rod; and means for moving said rod longitudinally with reference to said shaft.

2. An implement for laying underground conduits, comprising a shaft, a plurality of radially-bending, spring, clamping-plates at one end of said shaft adapted to engage two adjacent conduit-sections from within, a lever at the other end of said shaft, and a connection between said plates and said lever whereby said plates are operated.

3. An implement for laying underground conduits, comprising a shaft, a plurality of radially-bending, spring, clamping-plates at one end of said shaft, equidistant from each other, and adapted to engage two adjacent conduit-sections, a lever at the other end of said shaft, and a connection between said plates and said lever whereby said plates are operated.

4. An implement for laying underground conduits, comprising a shaft, radially-bending, spring, clamping-plates at one end of said shaft adapted to engage from within two adjacent conduit-sections, a movable block beneath said plate, a lever at the other end of said shaft, and a connection between said block and said lever whereby said block is operated to cause said plate to move radially to engage and disengage said conduit-sections.

5. An implement for laying underground conduits, comprising a shaft, a plurality of radially-bending, spring, clamping-plates at one end of said shaft, equidistant from each other and adapted to engage from within two adjacent conduit-sections, a block adapted to move said plates radially and uniformly to engage said conduits, and means for operating said block from the other end of said shaft.

6. An implement for laying underground conduits, comprising a shaft, radially-bending, spring, clamping-plates at one end of said shaft, adapted to engage from within two adjacent conduit-sections, a movable block, a roller supported by said block beneath each plate, a lever at the other end of said shaft, and a connection between said block and said lever whereby said block is operated to cause each plate to move radially to engage and disengage said conduit-sections.

7. An implement for laying underground conduits, comprising a shaft, a plurality of radially-bending, spring, clamping-plates at one end of said shaft adapted to engage from within two adjacent conduit-sections, a movable block, rollers supported by said block beneath said plates respectively, a lever at the other end of said shaft, and a connection between said block and said lever.

8. An implement for laying underground conduits, comprising the shaft C, the radially-bending, spring, clamping-plates D adapted to engage from within adjacent conduit-sections, means for securing said plates to said shaft, and means for expanding said clamping-plates.

9. An implement for laying underground conduits, comprising the shaft C, the radially-bending, spring clamping-plates D attached to said shaft and adapted to engage from within adjacent conduit-sections; means for attaching said plates to said shaft, the wedges D′ movably supported beneath said plates, and means acting upon said wedges for expanding said clamping-plates.

10. An implement for laying underground conduits, comprising the shaft C having the recess c', the plates D adapted to engage from within adjacent conduit-sections, means for attaching said radially-bending, spring, clamping-plates to said shaft, the wedges D′ beneath said plates, respectively, the movable block E in said recess c' beneath said wedges, and means for moving said block to expand said clamping-plates.

11. An implement for laying underground conduits, comprising the shaft C having the slot c^3 and recess c', the radially-bending, spring, clamping-plates D adapted to engage from within adjacent conduit-sections, means for attaching said plates to said shaft, the wedges D′ beneath said plates, respectively, the block E in said recess c' beneath said wedges, the rod F′ in said slot c^3 and attached to said block E, and means attached to said rod F′ for moving said block to expand said clamping-plates.

12. An implement for laying underground conduits, comprising the shaft C having the recess c', the radially-bending, spring, clamping-plates D adapted to engage from within adjacent conduit-sections, the wedges D′ beneath said plates, respectively, the block E in said recess c', the rollers E′ supported upon said block E beneath said wedges D′, respectively, and means for moving said block to expand said clamping-plates.

13. An implement for laying underground conduits, comprising the shaft C, having the recess c' and slot c^3, the radially-bending, spring, clamping-plates D adapted to engage from within adjacent conduit-sections, means for securing said plates to one end of said shaft, the wedges D′ beneath said plates respectively, the block E in said recess c', the rollers e' supported by said block beneath said wedges respectively, the rod F′ in said slot c^3, connected at one end with said block E, and the lever F pivoted to the said shaft C, and connected to the other end of said rod F′.

MATHIAS KONDOLF.

Witnesses:
NELSON E. SPENCER,
D. GURNEE.