Nov. 26, 1929. J. A. KIRBY 1,737,314

CHANNEL FORMING APPARATUS FOR TELEPHONE AND THE LIKE CABLES

Filed July 1, 1926

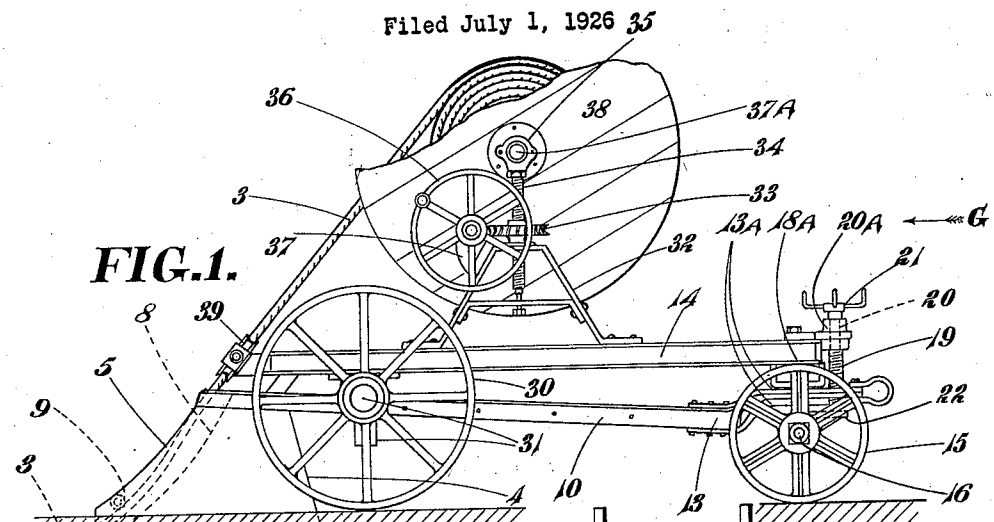


FIG. 1.

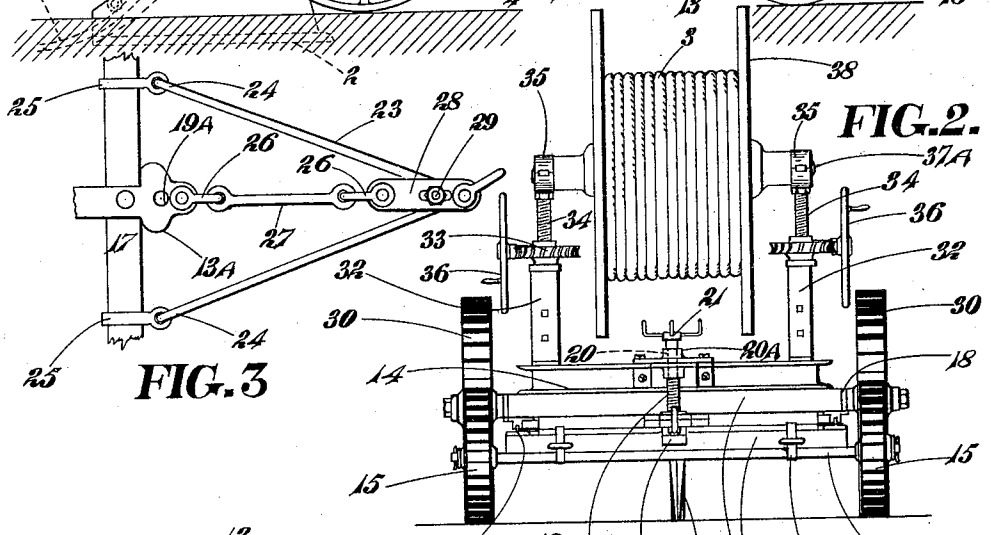


FIG. 2.

FIG. 3

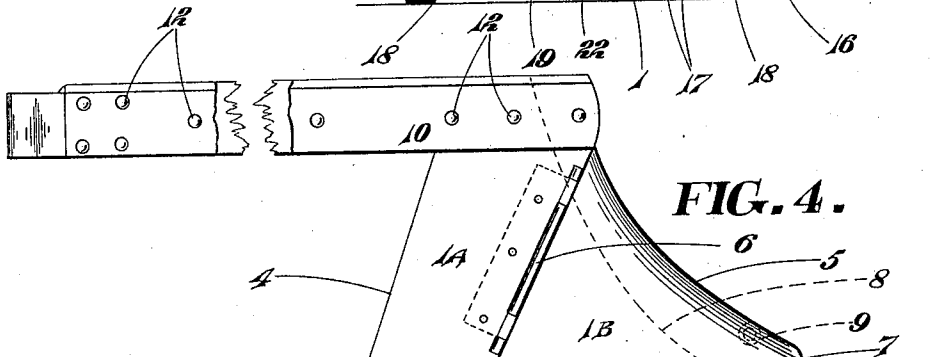


FIG. 4.

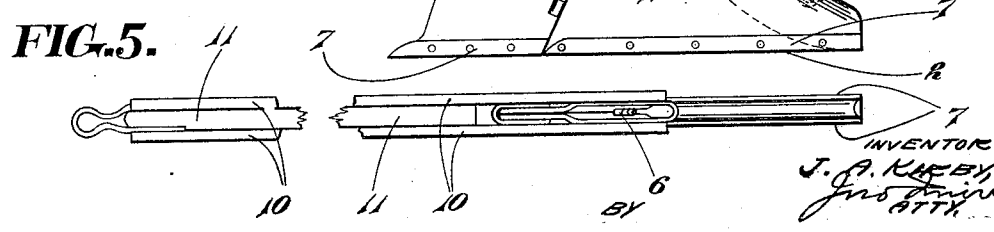


FIG. 5.

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Patented Nov. 26, 1929 1,737,314

UNITED STATES PATENT OFFICE

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CHANNEL-FORMING APPARATUS FOR TELEPHONE AND THE LIKE CABLES

Application filed July 1, 1926. Serial No. 119,964.

This invention relates to laying underground metal, covering telephone and the like wire conductors.

The object of my invention is to lay the said metal duct with a minimum amount of excavation and at a minimum cost.

Referring to the accompanying drawings:—

Figure 1 is a side elevation of the apparatus, showing the method of laying such cables.

Figure 2 is an end elevation of Figure 1 in the direction of the arrow head G.

Figure 3 is a plan view of the draft as applied to the front carriage of the apparatus shown in Figures 1 and 2.

Figure 4 is a side elevation showing a slight modification of the centre plate and centre plate beam shown in Figure 1, a portion of the length of the plate bar having been cut away.

Figure 5 is a plan view of Figure 4.

There is what might be termed a centre plate 1, fashioned to form a fissure or narrow breach, the said plate having preferably three sides, designated the base 2, which is the bottom of the plate, and which forms the bed in the fissure for the metal duct or cable 3, an entering edge 4 of which projects forward and enters the ground to clear a channel for the metal duct or cable 3, and a trailing edge 5 which projects rearwards of the apparatus to deposit the metal duct or cable 3 in the bottom of the channel. In an alternative design, the centre plate 1 is composed of two members 1A and 1B adapted to be separately constructed and hinged together as at 6, for the purpose of facilitating laying operations on bends and sharp turns. The hinge 6 is inclined so that when the apparatus makes a turn, the rear lower point of the rear part will tend to lift out of the ground and greatly reduce the friction with the earth, thereby facilitating the turning movement.

The base 2 is fitted with a renewable shoe 7, suitably constructed to form a channel for the metal duct or cable 3. The entering edge 4 is necessarily sharp, the plate increasing in width towards the trailing edge 5 and being constructed preferably of sheet metal reinforced with a suitable hardwood packing, such as blue gum, a space between the sheet metal being formed; the said space increasing in width from the broken indication line at 8 to the trailing edge 5 providing a passage for the metal duct or cable 3 during the operation of laying.

In order to reduce to a minimum frictional resistance, when laying cable, caused by the metal duct 3 sliding within the casing at the trailing edge 5, a small roller 9 is disposed within the said casing at a point near its lower extremity.

There is a centre plate dragging beam, which may comprise a sheet metal plate sheathing member 10 for housing a suitable hard timber reinforcement 11, which is in length preferably less than the metal plate sheathing member 10. The whole is suitably braced by bolts or rivets 12 and the said centre plate member 1 is made secure at one end by similar means. The opposite end 13 of the said centre plate beam is provided with suitable straps 13A for attaching it pivotally to the fore carriage of the apparatus.

There is a chassis 14 constructed preferably from channel and angle iron, suitably braced with wooden beams and flooring. There is what might be conveniently termed a fore and rear carriage, the fore carriage consisting of two suitably dimensioned road wheels 15 mounted on an axle 16 braced by efficient bolsters and straps 17 and 18 respectively, and adapted to pivot freely on the chassis 14 as at 18 to provide for steering. A threaded screw 19 is adapted to fit a corresponding internally threaded hole 19A fashioned in the centre plate beam straps 13A, the top end of the said screw being checked to a smaller diameter as indicated by the broken lines at 20, and is adapted to fit the vertical bearing bracket 20A secured by bolts to the front end of the chassis 14, the said screw is rendered operable by means of the hand wheel 21, the lower end of the said threaded screw being checked to a smaller diameter, where it is in engagement with the top surface of the bracket 22 secured to the bottom bolster 17 to raise and lower the centre plate 1 as

required. There are suitable means provided for coupling the apparatus to a tractor, this constituting a V shaped bar member 23, secured at its free ends 24 to the bottom bolster 17 by means of the straps 25. Two shackles 26 are connected together by means of the bar 27, one shackle being pivotally mounted on the straps 13A, while the other is mounted at the end of a slotted plate 28. A bolt 29 is adapted to support the V shaped member 23 at its centre portion, the said bolt passing through the slot in the said slotted plate member 28 to the slidable therein.

The rear carriage comprises two road wheels 30 of larger diameter than those of the fore carriage, the wheel face being preferably wider in this case. The said wheels 30 are mounted on an axle 31 secured suitably to the chassis 14 at a point near the opposite end thereof.

There is a strong metal frame 32 mounted on the chassis frame 14, and a worm wheel 33 mounted on the top thereof to rotate with a vertical axis. There is a threaded spindle 34, having at its topmost extremity a bearing bracket 35. A hand wheel 36 is mounted on a horizontal spindle supported in brackets 37 on the frame 32, and a worm keyed to the said spindle engages the worm wheel 33 to turn it on application of pressure to the hand wheel 36 to raise and lower the threaded spindle 34. There are two such brackets, one mounted on each side of the chassis, and the bearing brackets 35 are adapted to receive the axle 37A of the reel 38 on which is wound the metal duct 3.

In order to prevent chafing of the said metal duct or cable 3, while entering the upper end of the metal sheathing at the trailing edge 5, a guide block is introduced, and may consist of two rope sheaves or rollers 39 mounted pivotally at an angle adjacent each other, and secured either to the centre plate 1 or the chassis 14 to guide the metal duct or cable 3 while being unwound from the reel 38 when the apparatus is in operation.

In operation the said centre plate 1 is first sunk into the ground at a depth at which it is desired to lay the cable, the maximum depth thereof being governed by the rear axle 31, the cable having previously been passed through the passage along the trailing edge 5, as described above. The free end of the cable 3 is made fast by suitable means, at the end where it emerges from the said passage, and the tractor started in the forward direction, the cable unwinding from the reel automatically to be deposited in the channel formed by the centre plate 1.

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

An improved channel forming apparatus for the laying of telephones and like cables, comprising a channel forming member including two independent parts connected for horizontal pivotal movement, the forward part being formed with a forwardly and downwardly sharpened edge and a forwardly and downwardly inclined rear edge and the rear part having its front edge inclined to correspond with the inclination of the rear edge of the forward part and its rear edge curved to form a channel to afford a passage for the cable to be laid, an inclined hinge connection between the rear edge of the forward part and the front edge of the rear part, a shoe carried by each part and detachably connected thereto, said shoe being adapted to form a passage in the ground below the upper surface thereof into which the cable passing through said channel is adapted to be laid, a ground engaging means for supporting the channel forming apparatus, and means whereby the channel forming apparatus may be adjusted relative to the ground engaging means for varying the cutting depth of such apparatus.

In testimony whereof, I have signed my name to this specification at Dunedin, New Zealand, this 23d day of April, 1926.

JOSEPH ANNING KIRBY.