T. DE LA MARE.

CONDUIT MOLD.

APPLICATION FILED MAY 1, 1914.

1,144,692.

Patented June 29, 1915.

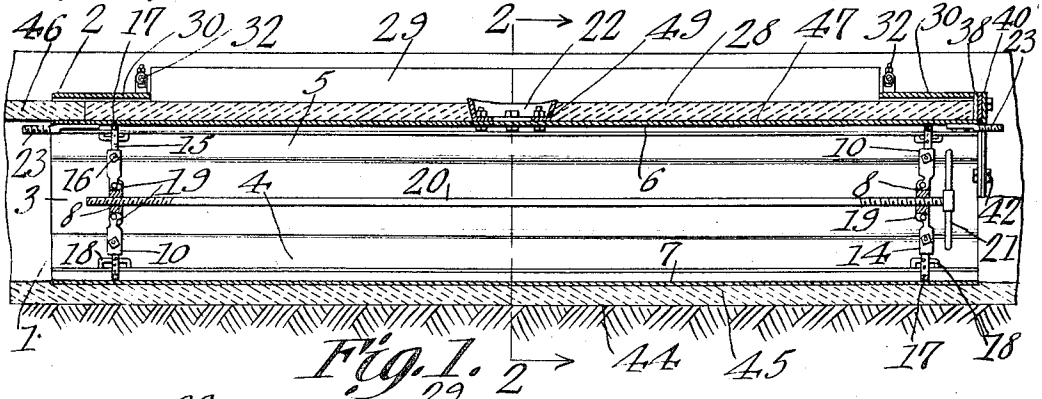


Fig. 1.

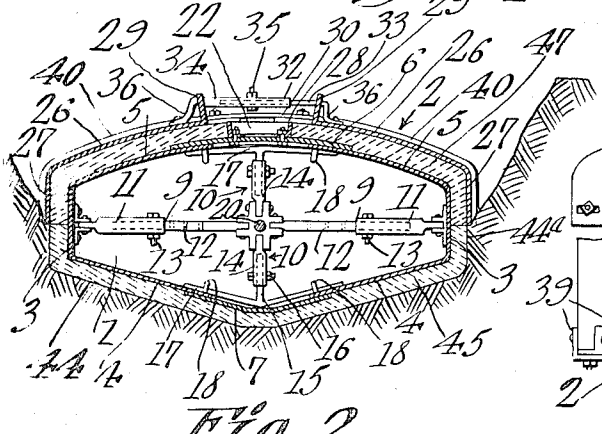


Fig. 2.

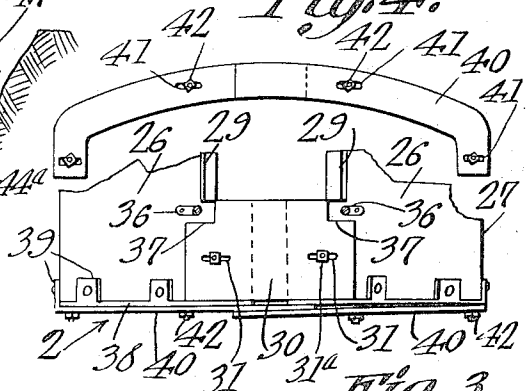


Fig. 4.

Fig. 3.

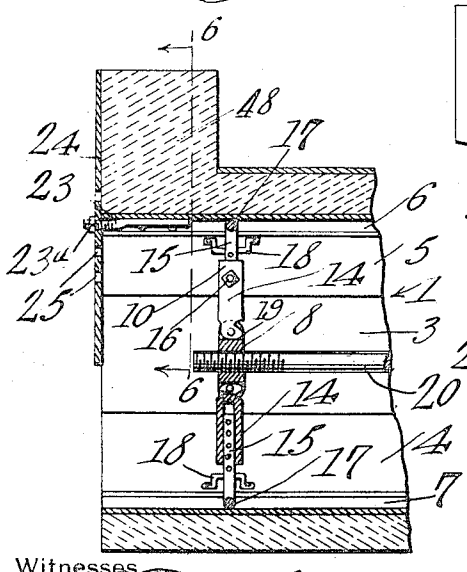


Fig. 5.

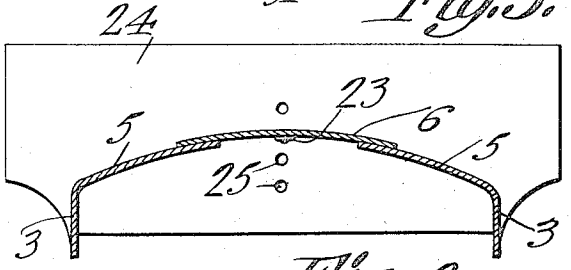


Fig. 6.

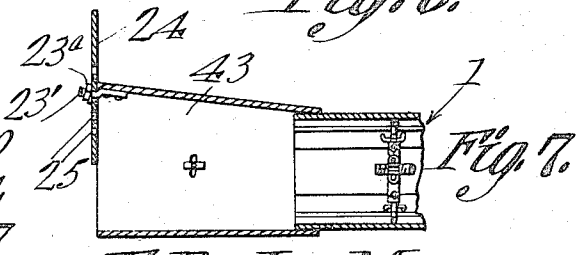


Fig. 7.

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UNITED STATES PATENT OFFICE.

THOMAS DE LA MARE, OF TOOELE, UTAH.

CONDUIT-MOLD.

1,144,692. Specification of Letters Patent. Patented June 29, 1915.

Application filed May 1, 1914. Serial No. 835,734.

To all whom it may concern:

Be it known that I, THOMAS DE LA MARE, a citizen of the United States, residing at Tooele, in the county of Tooele and State of Utah, have invented a new and useful Conduit-Mold, of which the following is a specification.

The present invention appertains to an apparatus for molding conduits, culverts, pipe lines, and the like, and is particularly an improvement of the conduit mold disclosed in my co-pending application filed September 12, 1913, Serial No. 789,551.

The present invention contemplates the provision of a novel and improved apparatus for molding a continuous pipe or conduit within a trench, section by section, in an expeditious and facile manner.

Another object of the present invention is to provide a unique adjustable core for the mold.

A further object of the invention is to provide a novel adjustable cope for the mold.

It is also within the scope of the present invention to improve generally, an apparatus of the present character, whereby the utility of the structure will be enhanced.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention has been illustrated in its preferred embodiment in the accompanying drawings, wherein—

Figure 1 is a longitudinal section of the apparatus, as in use. Fig. 2 is a cross section thereof, taken on the line 2—2 of Fig. 1. Fig. 3 is a fragmental plan view of the forward end portion of the cope, the corresponding handle being broken away. Fig. 4 is a front view of the end flanges of the cope. Fig. 5 is an enlarged vertical section taken through one end of the core, illustrating the head plate attached to the end of the core for molding the head or end of the conduit. Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5. Fig. 7 is a sectional view on a reduced scale, illustrating an auxiliary or supplemental core for forming a flared or tapered end section of the conduit.

In carrying out the present invention, there is provided a core 1, and a cope 2, which are adapted to coöperate in a peculiar manner to provide the mold.

The core 1 comprises side plates or members 3, which are provided with lower inclined flanges 4, and upper inclined flanges 5. The lower or bottom flanges 4 are preferably declined, so as to converge downwardly, while the upper or top flanges 5 are preferably curved. A transversely curved top or crest plate 6 is adapted to rest upon or overlap the inner or free edge portions of the flanges 5, while a bottom plate 7 is adapted to fit below the inner or free edge portions of the lower flanges 4, the bottom plate 7 having its side portions inclined, similar to the inclination of the flanges 4.

The side plates 3 and their flanges, in connection with the top and bottom plates 6 and 7, respectively, form the shell of the core, which as illustrated, is relatively wide, and of relatively small height, to form a conduit of similar outline. The bottom of the core shell is V-shaped, while the top is arched or convexed transversely.

Within the core shell, is arranged a mechanism for expanding and contracting the said shell, and for adjusting the same to vary the width and height of the shell, and to this end, hub members 8 are disposed within the end portions of the core shell and each have pivoted thereto two opposite relatively long side links 9 and upper relatively short and lower links 10, the outer ends of the links 9 being pivoted to the side plates 3. Each of the side links 9 comprises an outer tubular section 11, and an inner section 12 telescoped or fitting slidably within the section 11, the remote ends of the sections 11 and 12 being pivoted to the corresponding side plates and to the hub 8, respectively. A bolt or other securing member 13 is passed through suitable apertures provided in the sections 11 and 12 of each link 9, the sections 12 of the links 9 having longitudinal series of apertures for the engagement of the bolts 13 which enable the links 9 to be expanded or contracted. Each of the upper and lower links 10 is similarly extensible, and comprises an inner tubular section 14 pivoted to the corresponding hub 8, and an outer section 15 telescoping or fitting slidably into the tubular section 14,

the sections 14 and 15 being adjustably connected by means of a bolt or other securing member 16.

The outer ends of the outer sections 15 of the links 10, are provided with lateral T-heads 17, the arms or branches of which overlap the inner sides of the upper and lower flanges 4 and 5 of the side plates 3, longitudinally elongated loops or guides 18 being terminally secured to the inner or free edge portions of the flanges 4 and 5, and having the arms or branches of the T-heads engaged therethrough for sliding movement laterally and longitudinally therein. The loops or guides 18 thus enable the T-heads 17 to move longitudinally of the core shell, to a limited extent, the links 10 also being permitted to swing sufficiently for the purposes, when the hubs 8 are moved longitudinally, and whereby the links 9 and 10 will serve as toggle links to expand and contract the core shell.

As will appear from the drawing, the side links 9 are relatively long, while the upper and lower links 10 are relatively short, due to the variation in the width and height of the core shell.

The inner pivoted ends of the links 9 and 10 are provided with inwardly projecting angular extensions or lugs 19 forming stops arranged to contact with the hubs 8, when the hubs are separated so as to swing the links 9 and 10 of each set, into a common plane, or slightly therebeyond, to thereby lock the links at or slightly beyond dead center, as will be obvious.

In order to actuate the toggle links at the opposite ends of the core shell, a longitudinal actuating rod 20 is disposed axially within the core shell, and has its end portions threaded through the hubs 8, the screw threads at the opposite ends being right and left handed, whereby the rotation of the rod or screw 20 will move the hubs 8 in opposite directions to and from each other. The rod or spindle 20 is provided with a suitable handle or lever 21 at the forward end, for facilitating the manual actuation of the rod or screw 20.

A detachable form 22 is mounted upon the top plate 6 of the core shell, intermediate its ends, for the purpose which will hereinafter appear.

Bolts 23 are secured to the bottom of the top plate 6 adjacent the ends thereof, and project beyond the ends of the said top plate for the engagement of a head or end plate 24 having a vertical series of apertures 25 intermediate its side edges, for the passage of one or the other of the bolts 23, in order that a nut 23^a threaded upon the said bolt 23 may clamp the head or end plate 24 against the end of the core shell, for the purpose as will hereinafter more fully appear.

Coming to the cope construction, the same embodies a pair of opposed top sections 26 arranged at the sides of the mold, and spaced apart longitudinally, the remote edges of the sections 26 having depending flanges 27 forming the sides of the cope. The cope is arched transversely similar to the arching of the top of the core, the cope being of slightly greater proportions than the top of the core, as will be evident.

The cope sections 26 have an opening 28 therebetween, the opening 28 being elongated longitudinally, and terminating short of the ends of the cope. The cope sections 26 are further provided with upturned inclined flanges or lips 29 along the side edges of the opening 28, to serve as a hopper for conveniently filling the cope with concrete, as will hereinafter more fully appear.

The end portions of the cope sections 26 are adjustably connected, by means of yoke plates 30 resting or overlapping the end portions of the sections 26 and having transversely elongated slots 31 adjacent their side edges, and through which bolts or other clamping members 31^a are engaged, so as to engage the cope sections 26. The yoke plates 30 are convexed transversely, similar to the cope sections 26, whereby the cope sections 26 may be adjusted transversely to and from each other, by loosening the bolts or other clamping members 31^a. The yoke plates 20 extend to the ends of the opening 28, or the ends of the hopper flanges 29, and are also flush with the ends of the sections 26.

Extensible yoke-shaped handles 32 are provided for the end portions of the cope, each handle 32 comprising a section 33 telescoped or slidably received by a tubular section 34, the sections 33 and 34 being adjustably connected by means of a bolt or other securing member 35, similar to the links 9 and 10 above described. The remote ends 36 of the sections 33 and 34 of each handle 32 are bent angularly, and secured to the cope sections 26 adjacent the ends of the hopper flanges 29, the inner corners of the yoke plates 30 being cut away, as at 37, to accommodate the ends 36 of the handles. The handles 32 enable the cope to be readily manipulated, and are extensible and contractible, to adjust themselves according to the adjustment of the cope sections 26 relative to each other.

At their forward ends, as seen at the right in Fig. 1, the cope sections 26 are provided with stationary or rigid inturned flanges 38, which conform in shape to the shape of the cope sections 26 and their side flanges 27, the outer or upper edges of the flanges 38 having angular ears 39 overlapping and riveted or otherwise secured upon the cope sections 26. The rigid flanges 38 carry adjustable flanges or form plates 40, which have their inner ends overlapped, and which are of a shape conforming to

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the flanges 38, the inner or lower edges of the flanges 40 being cut to conform to the end portion of the core. Each of the flanges 40 is provided with the horizontal slots 41 through which bolts or other clamping members 42 are passed so as to engage the flanges 38, the bolts 42, when loosened, enabling the flanges 40 to be adjusted transversely relatively to the cope sections 26.

In Fig. 7, there has been delineated, an auxiliary or supplemental core 43, which is tapered or flared, in order to form a flared end for the conduit, when desired. This supplemental core 43 has a bolt 23' secured within its top and at its outer or largest end, for the engagement of the head or end plate 24. The supplemental core 43 is preferably expansible and contractible, in order that its dimensions, such as its width and height, may be adjusted according to the adjustment of the core 1.

As will be obvious from the foregoing, taken in connection with the drawings, the body portions of the core and cope may be constructed of sheet metal, as well as other appropriate parts, such as the flanges 38, and 40, and the head or end plate 24. The several parts of the structure may be readily assembled, and may be constructed of various sizes, according to the nature of work to be done.

In constructing a conduit or culvert with the present apparatus, a suitable trench or ditch 44 is dug in the soil, and the bottom 45 of the conduit is properly formed therein, the side portions of the bottom being preferably synclinal. Thus, the bottom 45 of the conduit or culvert is formed in any suitable manner within the bottom of the trench 44, the bottom may be constructed of any suitable thickness, and is preferably provided with upturned side portions 44^a. After the bottom 45 of the conduit has been molded and formed, and has set sufficiently, the upper portion of the conduit is completed, section by section, as will presently appear. The core 1, when expanded, is placed upon the bottom of the conduit section under construction, and has its rear end engaged or fitted within the end of the previously completed conduit section 46, as seen in Fig. 1. The core 1 may be readily expanded by rotating the shaft 20 properly, so as to move the hubs 8 outwardly, or away from each other, to thrust the toggle links 9 and 10 outwardly, as will be obvious. The cope 2 is then placed over the core 1, the rear end of the cope being seated upon the end of the previously completed conduit section 46, and the forward end flange 40—40 of the cope is seated upon the forward end of the core 1, which will support the cope in place, and in a spaced relation relative to the top of the core 1. It is to be understood, of course, that the core and cope have been properly adjusted, according to the size of the conduit to be molded or formed, in order that the core and cope will coöperate properly for the purposes. Now, after the core and cope have been placed as above indicated, the concrete or other plastic material is poured into the cope through the longitudinal opening 28 in the crest of the cope, this being facilitated by means of the hopper flanges 29, and the concrete in filling the space between the core and cope, will complete the upper portion of the conduit section 47 succeeding or following the conduit section 46. The concrete may be tamped readily, through the opening 28, in order to properly pack the concrete. After the upper half of the new conduit section 47 has been completed and set, the cope 2 may be lifted or removed therefrom, and the core 1 may be contracted, for properly rotating the shaft 20 so as to move the hubs 8 inwardly or toward each other, to pull the toggle links 9 and 10 toward the center of the core, to thereby contract the core shell. When the core has been contracted, the same may be readily slipped out of the conduit section 47, and placed in advance of the conduit section 47, to construct the succeeding or following conduit section, in the manner above described.

It will thus be obvious, that by continuing the operation above described, the conduit or culvert may be conveniently and rapidly formed, step by step, or section by section, the successive conduit sections having their ends bonded together, so as to provide a practically continuous conduit or culvert. The conduit, or culvert may be extended to any suitable length or distance desired, and may be constructed in various sizes or proportions, by properly adjusting the core and cope.

To adjust the width of the core 1, the side links 9 are either extended or contracted, which ever is desired, so as to cause the side plates 3 to be moved from or toward each other, to increase or decrease the width of the core. To increase or decrease the height of the core, the upper and lower links 10 are either extended or contracted, to flex the said lower flanges 4 and 5 either away from or toward each other, it being noted that the T-heads 17 of the links 10 are slidably engaged to the flanges 4 and 5 by means of the loops or guides 18.

To adjust the width of the cope 2 to correspond with the width of the core 1, the sections 26 of the cope may be readily moved to and from each other by loosening the clamping bolts 31^a which adjustably connect the cope sections 26 and the yoke plates 30. The adjustment of the cope sections 26, will also enable the side flanges 27 of the cope to be set at distances more or less from the

side plates 3 of the core, to vary the thickness of the side walls to the conduit sections. The end flanges 40 of the cope being overlapped, may be adjusted transversely with the cope sections 26, without opening up the flange 40—40, the function of the said flange being to hold the concrete between the core and cope, by closing up the end of the space therebetween, as seen in Fig. 1. The flange 40—40 thus has the double function of supporting the forward or free end of the cope from the forward end of the core, and of closing the forward end of the space between the core and cope to confine the concrete therein.

In forming the end of the conduit or culvert, with a head or coping, the head or end plate 24 may be attached to the proper end of the core 1, by engaging the plate 24 over the corresponding bolt 23, and securing the plate 24 in place by means of a nut or other securing element 23^a engaged over the bolt 23. The head or coping 48, as seen in Fig. 5, may thus be conveniently folded against the inner side or face of the head plate 24, the head plate 24 serving as a form for the head or coping 28. The head plate 24 may then be quickly detached, for employing the core in connection with the successive conduit sections as above discussed.

When it is desired to provide the end or ends of the conduit with flared or tapered mouths, the supplemental core 43 illustrated in Fig. 7 is employed. The supplemental core 43, after being properly adjusted, has its inner or smallest end slipped over the end of the core 1, and the head or end plate 24 is then applied to the largest or other end of the supplemental core 43, by securing the plate 24 to the bolt 23', which will enable the concrete to be molded over the supplemental core 43 and against the head plate 24 to provide the flared or tapered mouth and the head or coping at the end of the conduit.

The particular and peculiar shape of the conduit or culvert is of advantage, inasmuch as the conduit requires only a shallow trench to be dug, the conduit being readily passed under the surface of a road, without the necessity of the conduit or culvert being embedded very deep in the road bed. The arched top of the conduit or culvert enables the same to sustain considerable weight, while the synclinal bottom of the conduit or culvert is of advantage, inasmuch as a small stream of water flowing through the conduit or culvert will follow the central or valley portion of the conduit bottom, so as to keep the sediment in motion or suspension.

The top of the conduit or culvert may be provided, at the points desired, with a man-hole or opening 49, as seen in Fig. 1, by attaching the form 22 to the top plate 6 of the core, the form 22 being disposed within the opening 28 of the cope, so that the concrete when surrounding the form 22 will provide the man-hole or opening desired. The form 22 may be readily detached and removed after the concrete has set, to enable the core to be withdrawn.

Having thus described the invention, what is claimed is:

1. In a molding apparatus, a transversely arched cope comprising a pair of side sections, a pair of yoke plates overlapping the said sections adjacent the ends thereof, and means for adjustably clamping the yoke plates and sections together, there being a filling opening between the said sections and yoke plates.

2. In a molding apparatus, a transversely arched cope comprising a pair of side sections adjustably connected and provided with a filling opening therebetween, the said sections having spaced inturned flanges at one end, and flange members adjustably carried by the inturned flanges and having their adjacent ends overlapped.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

THOMAS DE LA MARE.

Witnesses:

W. R. GILLESPIE,

EPH PICKETT.