G. W. CROSS.

FORM FOR MOLDING REINFORCED CONCRETE CONDUITS.

APPLICATION FILED NOV. 21, 1908.

1,007,187. Patented Oct. 31, 1911.

Fig. 1.

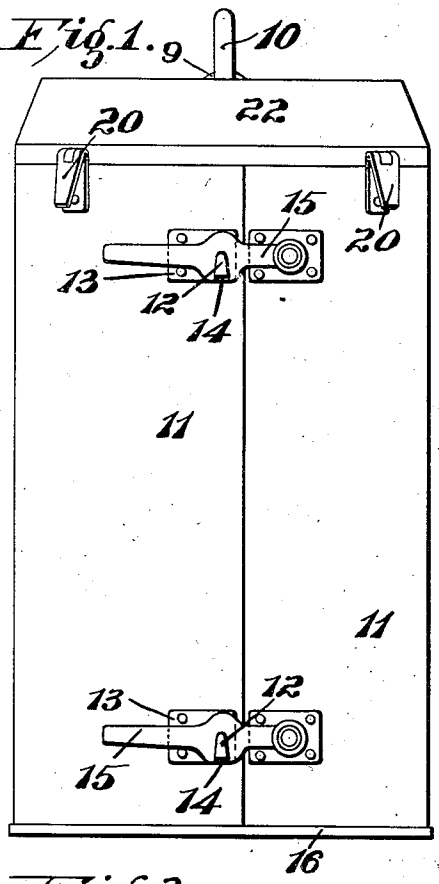


Fig. 2.

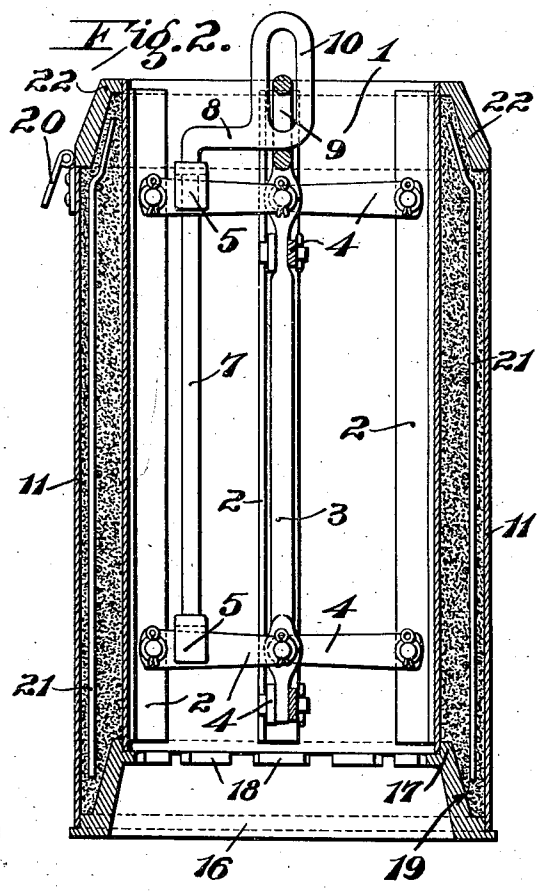


Fig. 3.

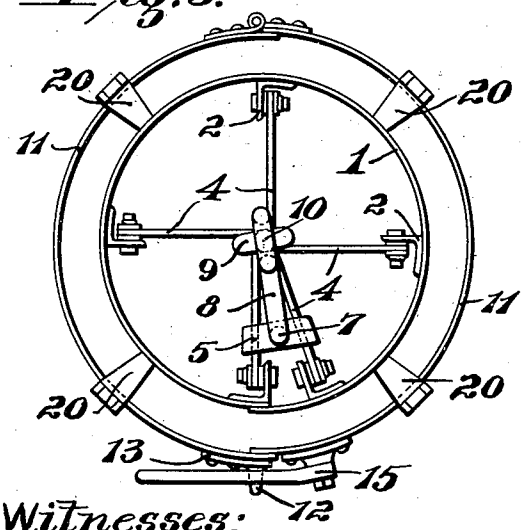
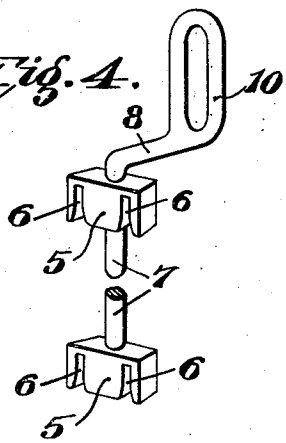


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FORM FOR MOLDING REINFORCED-CONCRETE CONDUITS.

1,007,187. Specification of Letters Patent. Patented Oct. 31, 1911.

Application filed November 21, 1908. Serial No. 463,742.

To all whom it may concern:

Be it known that I, GEORGE W. CROSS, a citizen of the United States, and a resident of the city of Fort Smith, county of Sebastian, State of Arkansas, have invented a new and useful Form for Molding Reinforced-Concrete Conduits, of which the following is a specification.

My invention relates to a device for use in molding pipes, conduits and the like, particularly reinforced concrete work.

It consists principally in a sheet metal core rolled into tubular form so that the edges thereof overlap and means whereby said core can be expanded or contracted peripherally; it also consists in means for locking said core in expanded position; it also consists in a mold adapted for coöperation with said core and in means for centering said mold with respect to the core; and in means for positioning the reinforcing frame. It also consists in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawing, which forms part of this specification, and wherein like symbols refer to like parts wherever they occur, Figure 1 is a side elevation of a mold embodying my invention; Fig. 2 is a vertical section taken on or about the line 2—2 of Fig. 1; Fig. 3 is a top plan view of the mold with the top member removed; and, Fig. 4 is a detail view of the spacing device.

The core comprises a sheet or shell 1 of metal rolled into cylindrical form with its marginal side portions overlapping. On the inner side of the core are a series of longitudinally extending ribs 2, such as angle irons or channels, which are riveted on the inside of the core to stiffen it transversely without interfering with its capacity for binding peripherally. Located at or near the center of the core is a rod or draw bar 3 extending axially thereof. Some or all of the stiffening ribs are connected to the draw bar by means of parallel links 4; that is, all of the links that are pivotally connected to one rib are of equal length and parallel with each other. This arrangement constitutes, in effect, a toggle mechanism. By this arrangement, the endwise movement of the draw bar causes the ends of the links to approach or recede from the draw bar, as the case may be, and thereby correspondingly collapse or expand the shell of the core peripherally. As the links are fastened to the shell, the peripheral contraction or expansion of the shell varies the angular distance between the links; and this variation is provided for in any suitable manner. As the angular variation is not great, the necessary variation may be accommodated by a looseness in the fastenings of the links or by the flexibility thereof.

In order to prevent the core from collapsing accidentally in practical use, a suitable locking device is provided therefor. The device illustrated in the accompanying drawing comprises two spacing members 5 arranged near the top and the bottom, respectively, of said core. Each of these spacing members has two V-shaped slots 6 in its lower portion, which slots are spaced to fit over suitable inwardly projecting members mounted on the respective marginal portions of the sheet. The links 4 constitute suitable projecting members for this purpose. The uppermost or apical portions of the slots are spaced apart such a distance that, when the links rest therein, the core will have the diameter required in practice. By this arrangement, the inclined walls of the slots serve as guides to adjust the core to the required size.

If desired, a suitable guide may be provided for positioning the distance pieces; but, in practice, it is sufficient to have the apical portions of their grooves so arranged that they will be radial with respect to the axis of the core when the distance pieces are in their predetermined locking positions. Both of the spacing members are mounted upon a longitudinal rod 7 located close to the shell and adapted to be operated by hand or other suitable means.

In the construction illustrated in the drawing, the draw bar 3 of the toggle and the rod 7 for operating the spacing members are so connected by a lost motion device that they may be actuated by the same lifting force. For this purpose, the rod has a portion 8 which extends inwardly through a loop or link 9 provided therefor on the draw bar of the toggle mechanism, and thence the rod extends upwardly and terminates in a link 10 or other device adapted for connection to a grab hook or other suitable hoisting apparatus. The loop on the draw bar is of a length greater than the

diameter of the radial portion of said rod, so that said rod is free to move to a limited extent without actuating said draw bar. By this arrangement, an upward pull on the rod releases the spacing members from their engagement with the links and then pulls the draw bar of the toggle mechanism.

The outer shell or member 11 of the mold consists preferably of two semicylindrical sections hinged together with their meeting edges slightly overlapping. The free ends of said sections are locked together by any suitable locking device. As illustrated in the drawing, the marginal portion of one of said sections is provided with lugs 12, and the other section is provided with hinged straps or levers 13 whose lower sides are provided with V-shaped notches 14 adapted to fit over and center said lugs respectively. The outer ends of said levers are provided with handles 15 for the convenient manipulation thereof.

The collapsible core and the separable outer member are the only elements necessary for the construction of a continuous conduit or for cylindrical tubes. When, however, it is desired to form pipe in short lengths, the mold is provided with a base member 16. In the construction illustrated in the drawing, this base member comprises an annular raised portion or rib 17 whose inner surface is of the proper size for the lower end of the core to fit when expanded; and at some distance below the top of said annular rib, the inner surface thereof is provided with lugs 18 to constitute a seat for the lower end of said core. The surface of the middle portion 19 of this annular rib or raised portion is conical and inclines downwardly until the diameter of the cone is equal to the minimum diameter of the outer shell. This point is some distance above the flat marginal portion of the base, so that a shoulder is thus formed which acts as a centering for the outer shell. The upper end of the shell is provided with a series of distance plates 20 hinged on the outer surface thereof and arranged to swing inwardly over the top of the shell and rest thereon or otherwise come to rest in a horizontal position. These hinged plates are of proper length and arranged to abut against the core and thereby center the outer shell accurately with respect to said core.

The reinforcing material 21 is made up into a suitable frame and is initially centered by bearing against the conical portion of the end member. After a sufficient quantity of concrete has been placed in the mold, the frame may be raised by hand and the upper portion thereof centered without affecting the proper centering of the lower end of said frame. When the mold is filled with concrete, the end thereof is shaped with a top member 22 whose inner surface is the counterpart of the base piece, whereby a spigot end is formed on the molded pipe. In case plain cylindrical sections are required, the upper surface of the annular rib is made flat.

Obviously, my device is applicable to elliptical and other curved forms as well as to cylinders. So, too, the use of the device is not restricted to the forming of tubular structures but is applicable to arches and the like. In such case, instead of the core being a complete shell, it would be semicylindrical or otherwise shaped to conform to the interior of the finished structure. Obviously, also, the device hereinbefore described admits of considerable modification without departing from my invention and I do not wish to be restricted to the details of construction above mentioned. For instance, so long as the core is sufficiently flexible to permit of peripheral expansion and contraction, it may be made of any suitable material and in any suitable way, as by flexibly connected sections. So, too, instead of making the sheli of the core of a single member, it may be made of a series of overlapping sections.

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

1. A collapsible core comprising a flexible sheet rolled so that its edges overlap, a draw bar therein, a plurality of groups of parallel links connecting said draw bar to said sheet, and means for locking the side marginal portions of the sheet in adjusted position, said means comprising movable spacing members adapted to fit between projecting members on the inner surfaces of the respective marginal portions and being permanently mounted in operative relation thereto.

2. A collapsible core comprising a rolled flexible sheet, a draw bar therein, a plurality of groups of parallel links connecting said draw bar to said sheet, and means for locking the marginal portions of the sheet in adjusted position, said means comprising spacing members adapted to fit between projecting members on the inner surface of the respective marginal portions, said distance pieces being mounted on a rod having an elongated slot therein, and said draw bar having a pin adapted to coöperate with the lower end of said slot.

3. A collapsible core comprising a rolled flexible sheet, a draw bar therein, a plurality of groups of parallel links connecting said draw bar to said sheet, and means for locking said marginal portions of the sheet in adjusted position, said means comprising spacing members adapted to fit between projecting members on the inner surface of the respective marginal portions, and said distance pieces being connected to a hanger

which has a lost motion connection with the draw bar.

4. A collapsible core comprising a flexible sheet, rolled so that its side edges overlap, a draw bar therein, a plurality of groups of parallel links connecting said draw bar to said sheet, and permanently mounted means for locking said marginal portions of the sheet in adjusted position, said means comprising members having V-shaped slots adapted to fit over projecting members on the inner surface of said core at the top and bottom thereof, and thereby prevent the expansion and contraction of said core.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this 16th day of November, 1908, at Fort Smith, Sebastian county, Arkansas.

GEO. W. CROSS.

Witnesses:
R. D. SALISBURY,
M. F. SMITH.