Dec. 30, 1958 J. L. FORD ET AL 2,866,250

SINGLE USE FIBER BOARD MOLD FOR WATER METER BARRELS

Filed Feb. 11, 1954 2 Sheets-Sheet 1

Fig. 1.

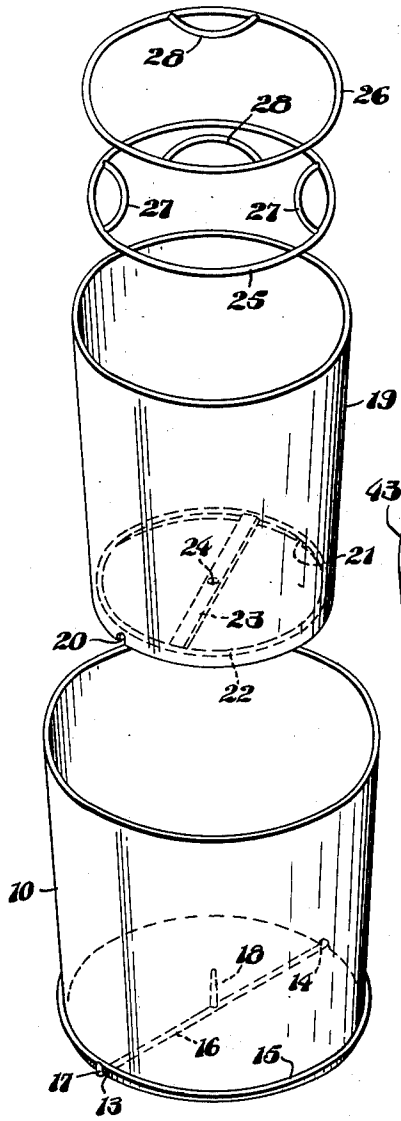


Fig. 2.

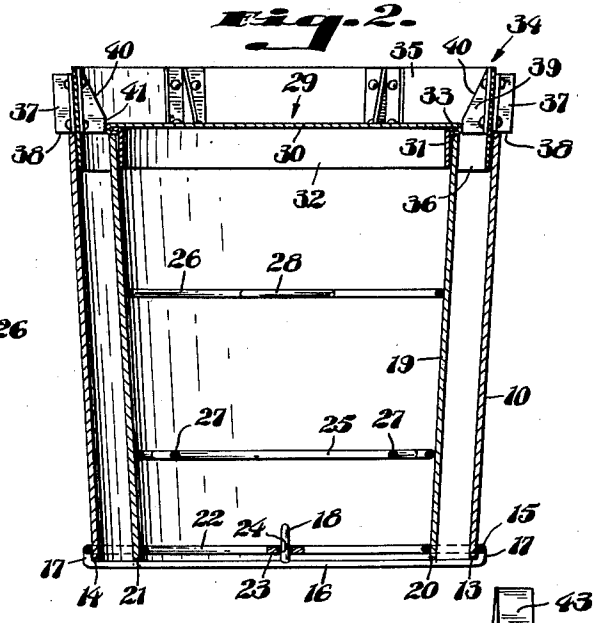
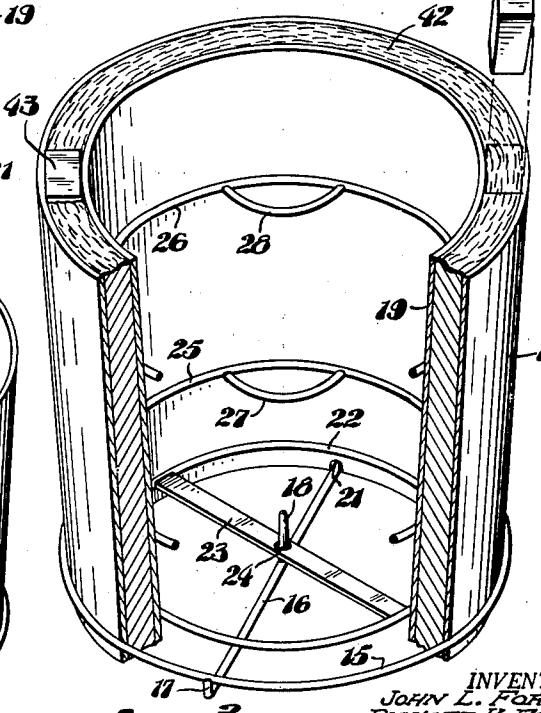


Fig. 3.



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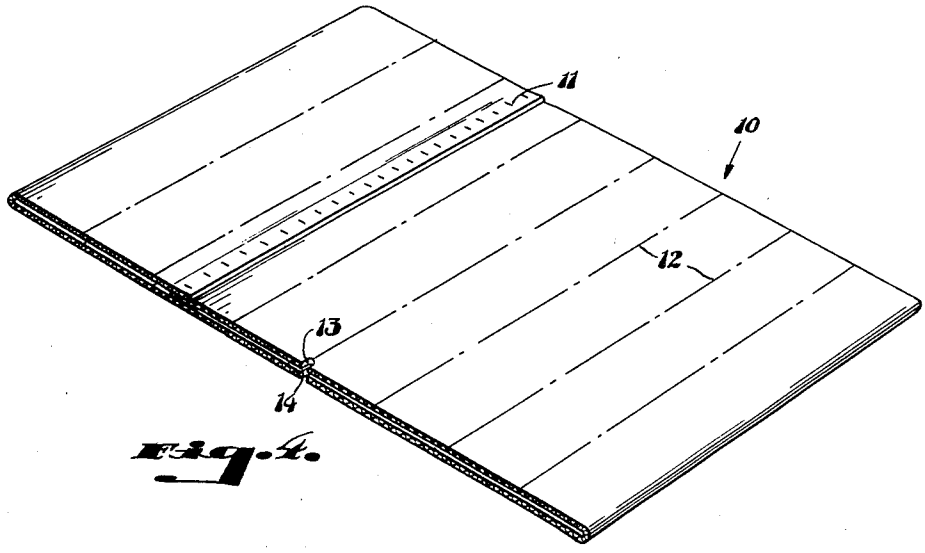


Fig. 4.

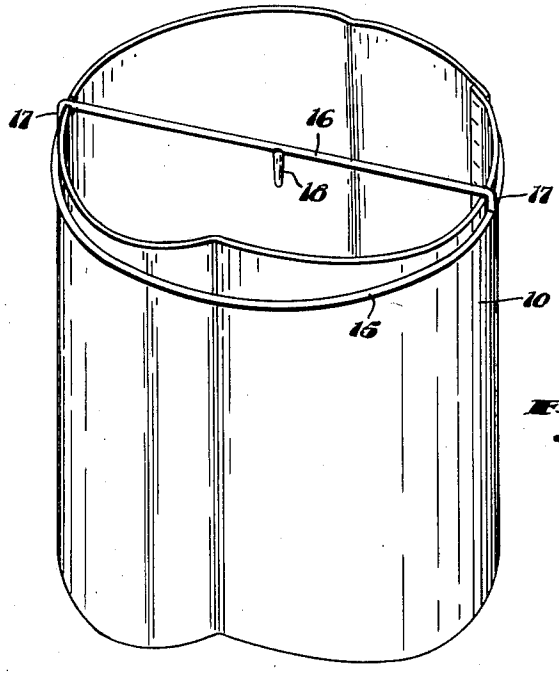


Fig. 5.

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SINGLE USE FIBER BOARD MOLD FOR WATER METER BARRELS

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Application February 11, 1954, Serial No. 409,615

6 Claims. (Cl. 25—118)

The present invention relates to a single-use mold, for use in the production of cast or molded tubular elements. The invention has been developed in connection with the production of concrete barrels for sub-surface water meter installations, and it will be described in that connection, though it will, of course, be understood that the invention may be equally applicable to the production of generally similar devices for other uses.

The primary object of the invention is to provide an assemblage of elements cooperable to define, at minimum expense, a mold in which a tubular element may be cast. A further object of the invention is to provide means whereby the walls of such a mold may be composed of inexpensive and preferably disposable material such as, for instance, corrugated paper board, suitable reinforcing and orienting devices being included in the assemblage.

A further object of the invention is to provide apparatus, including separate sheaths of disposable material, together with suitable reinforcing and orienting devices which may be temporarily associated with the sheaths to define such a mold, the reinforcing and orienting devices being removable, after the cast material has set, for reuse with another pair of sheaths.

A still further object of the invention is to provide apparatus of the character above described, whereby, after the reinforcing and orienting devices have been removed, the sheaths may, if desired, be left in place upon the cast article, to guard and sustain such article against shock damage during shipment or other transit.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that change may be made in the specific construction illustrated and described, so long as the scope of the appended claims is not violated.

Fig. 1 is an exploded view of an assemblage, constructed in accordance with the present invention, for carrying out the objects of the invention;

Fig. 2 is a vertical section through such an assemblage when completely arranged for reception of the moldable material from which the cast article is to be made;

Fig. 3 is a perspective view, showing the assemblage after filling with moldable material, parts being broken away for clarity of illustration;

Fig. 4 is a perspcetive view of a sheath of the character contemplated under the present invention, in flat, knocked-down condition; and

Fig. 5 is a perspective view showing such a sheath in an intermediate condition as it is expanded into cooperative association with a reinforcing ring.

In many sections of the country, tile or concrete tubes or barrels are sunk into the ground to accommodate outdoor water meter installations. Freight shipment of such units is so hazardous that most manufacturers thereof

have abandoned the business, and water companies are finding it quite difficult to purchase such barrels. They can be readily made near the point of use, but the only molds for such devices now available on the market are sheet steel molds which are so expensive that most users find it infeasible to own more than one set of such molds, the result being that only one barrel per day can be produced.

We have devised a mold apparatus admirably adapted to the production of such barrels or tubes, and consisting of a pair of sheaths of corrugated paper board, or other relatively pliable, inexpensive material, so proportioned and designed as to be telescopically associated to define a perimetrally continuous, open-ended chamber, together with a set of members for cooperation with the paired sheaths for the facile production of a suitable mold. In the practice of our invention, the permanent or reusable parts of the mold are so inexpensive that any user can readily afford to own several sets thereof; the sheath elements which define the walls of the mold are so inexpensive as to be disposable; and the construction as a whole is of such character that the reusable elements may be withdrawn from the mold after partial setting of the concrete or other moldable material, whereby a single set of such reusable elements may readily be used, with a second set of disposable sheaths, before final hardening of the first molded article. By this means, the cost of producing concrete barrels or tubular elements is so reduced as to make their use, once more, feasible.

In Fig. 4 of the accompanying drawings, we have shown a sheath, indicated generally by the reference numeral **10**, and comprising a strip of corrugated paper board whose ends are suitably permanently joined as, for instance, by the lapped and stapled joint **11**. Any other suitable and sturdy means, several of which are conventionally known in the corrugated paper board art, may be used in place of the specific form of joint illustrated. The strip is axially scored, on its internal surface, as at **12**, at suitable intervals such as, for instance, two inches to six inches, to facilitate the erection of the sheath into substantially cylindrical form, as indicated in Figs. 1 to 3; and preferably one edge of the sheath will be provided with a pair of diametrically spaced, axially-extending, shallow notches **13** and **14** for a purpose which will appear hereinafter.

When a mold is to be prepared for use, the outer sheath **10** is raised to a substantially vertical position, and its abutting sides are separated, whereby the sheath will approach a cylindrical condition. Now, at one or more points in the circumference of the sheath, the sheath is bent inwardly, as indicated in Fig. 5; and a ring or band **15**, which is substantially non-expansible and which is preferably formed of wrought iron wire or rod material, is slipped over the upper end of the sheath. It is to be noted in this connection that, during such assembly, the sheath is arranged with that edge containing the notches **13** and **14** uppermost. A bar **16**, which diametrically traverses the ring **15**, is rigidly carried from the ring **15** through axially-extending tongues **17**, **17**; and the opposite ends of the bar are seated in the notches **13** and **14**. At its midpoint, the bar **16** carries a spur or post **18** which projects axially toward the opposite end of the sheath **10** and, of course, is located on the axis of said sheath.

Now, the companion sheath **19** of the pair is somewhat similarly erected. The sheath **19** is preferably formed, in one edge, with diametrically spaced, axially-extending, shallow notches **20** and **21** corresponding to the notches **13** and **14** of the sheath **10**. A reinforcing ring or band **22**, which will be preferably formed of material similar to that used for the ring **15**, is now

slipped into the sheath **19** and is located adjacent that end of the sheath in which the notches **20** and **21** are formed. A bar **23** diametrically traverses the ring **22** and is rigidly carried thereby, said bar **23** being formed, at its midpoint, with a perforation **24**. The ring **22**, of course, will be substantially non-collapsible; and acts, when snugly seated within the sheath **19**, to reinforce said sheath against collapse.

Now, the sheath **10** is inverted, so that the bar **16** lies at its bottom, and the sheath **19** is inserted into the sheath **10**, in a position such that the ring **22** lies near the bottom end of the sheath. When the post **18** is engaged in the perforation **24**, obviously a coaxial or concentric relation will be established between the two sheaths; and said sheaths will cooperate to define, therebetween, a perimetrally continuous, open-ended chamber of uniform transverse dimension.

It is not essential to preform the notches **13**, **14**, **20** and **21**. The sheaths **10** and **19** have relatively low crushing strength in an axial direction; and the notches may, if desired, be formed during erection, merely by pressing the parts home to force the bar **16** to crush its way into the sheath edges.

In the illustrated embodiment of the invention, the sheaths **10** and **19** are substantially circular in cross-section, so that the chamber defined therebetween is annular; but it will be obvious that any desired cross-sectional contour may be given to the sheaths. Preferably, but not necessarily, the cross-sectional contour of the sheath **19** will correspond to that of the sheath **10**, but on smaller dimensions, so that the transverse dimension of the chamber defined therebetween will be uniform.

In the illustrated embodiment of the invention, the two sheaths **10** and **19** are substantially cylindrical, though they taper slightly toward their notched ends.

Of course, if a cross-sectional contour other than circular is selected, the several reinforcing rings or bands will conform to the selected contours. In the illustrated embodiment of the invention, of course, all of the cooperating elements are circular.

Either before or after insertion of the sheath **19** into the sheath **10**, two additional reinforcing rings or bands **25** and **26** are preferably inserted in the sheath **10**, the ring **25** being located approximately one-fourth of the distance from the ring **22** to the upper end of the sheath, and the ring **26** being located slightly above the midpoint in the height of the sheath. The rings **22**, **25** and **26**, of course, fit snugly in their locations within the sheath **19**; and each of them is preferably provided with hand-hold means for facilitating manipulation thereof. The bar **23** comprises such hand-hold means for the ring **22**; and grip bars **27** are carried by the ring **25** and project toward the center thereof, while similar grip bars **28** are similarly carried by the ring **26**.

We prefer to provide closure means, indicated generally by the reference numeral **29**, for the upper, open end of the sheath **19** in order to facilitate filling of the chamber between the two sheaths without loss of material to the interior of the sheath **19**. Such closure means comprises a cover plate **30** whose outer perimeter closely conforms to the outer perimeter of the upwardly presented end of the sheath **19**, so that said plate will rest upon the sheath end, fully closing said sheath without obstructing the open end of the chamber defined between the sheaths. Preferably, the plate **30** will be a piece of sheet metal provided, at its perimeter, with a rebent portion **31** which may be continuous or which may be perimetrally interrupted, the only limitation being that there shall be rebent portions at at least three perimetrally spaced locations about the edge of the plate. The closure **29** comprises, also, a collar portion **32** which fits snugly within the upper portion of the sheath **19** and

which is provided with out-turned flange means **33** engaged by the rebent portions **31** of the plate **30**, whereby said collar is supported from the plate. We presently believe that the collar **32** will preferably be formed, likewise, of sheet metal; but it will be appreciated that either or both of the elements **30** and **32** may, instead, be formed of corrugated paper board or other inexpensive or disposable material of reasonable rigidity.

A funnel, indicated generally by the reference numeral **34**, is preferably provided for use in filling the moldable material into the chamber defined between the sheaths **10** and **19**; and preferably the funnel will be formed of permanent material such as, for instance, sheet metal. The funnel comprises a ring **35** having a lower portion **36** snugly receivable within the upper portion of the sheath **10**; and means, such as the wings **37**, **37**, are so carried by the ring **35** as to project radially outwardly therefrom and to define a shoulder **38**, the lower ends of the wings **37** being disposed in a common plane and being adapted to rest upon the upper end of the sheath **10**.

A series of fins **39** is carried upon the inner surface of the ring **35**, each such fin preferably being formed to provide an upper edge **40**, inclining downwardly and radially inwardly from the upper edge of the ring **35**, and an inner edge **41** lying parallel with the common axis of the sheaths **10** and **19** and meeting the edge **40** of its fin in a level higher than the level of the plate **30**, when the funnel is assembled with the other parts in the manner illustrated in Fig. 2. The fin edges **41** lie in a common circle substantially coincident with the outer periphery of the uppermost end of the sheath **19** so that, when the parts are assembled in the manner illustrated in Fig. 2, the ends **41** of all of the fins will engage the periphery of the plate **30** to restrain the upper end of the sheath **19** against transaxial movement relative to the corresponding end of the sheath **10**.

Now, concrete or other moldable material can be poured rather freely into the funnel **34** to fill the chamber defined between the sheaths **10** and **19**. Any excess which may fall upon the closure **29** can, of course, readily be scraped into the said chamber. When the chamber has been filled, the funnel **34** may be removed. Some users prefer that the bottom end of the finished barrel shall be provided with two or more notches opening through the barrel end; and such notches may be provided, in the finished barrel **42**, by setting two or more blocks **43**, **43** in the unset mass of concrete, in the manner indicated in Fig. 3.

After the concrete has taken its initial set, the closure **29** may be removed and the rings **26**, **25** and **22** may be lifted out of the mold through the open upper end of the sheath **19**. The ring **15**, however, cannot be removed from the mold until after the barrel has hardened sufficient to permit inversion thereof. After such removal, the auxiliary apparatus may be assembled with a new pair of corrugated paper board sheaths to begin the production of another barrel, without waiting for final setting of the first barrel.

The inner surface of the corrugated board sheath **10** and the outer surface of the sheath **19** will preferably be waxed, but they tend to adhere reasonably well to the finished concrete barrel; and, if desired, the barrel may be transported to a point of use before removal of those sheaths, whereby the sheaths provide some protection against shock damage to the barrel, while in transit. When the barrel is to be installed, however, the sheaths will usually be removed; and it is found that, by slitting each sheath in one or more places from end to end, removal thereof from the barrel is made quite simple.

We claim as our invention:

1. A single-use mold for use in forming a tubular article from concrete, or the like, comprising an outer, tubular sheath of foldable, disposable material, having

an upper end and a lower end, a one-piece, rigid reinforcing band sleeved on said sheath near the lower end thereof, a transaxially-extending narrow bar permanently secured to said band, underlying said sheath, and traversing the axis of said sheath, said bar being provided with centering means lying substantially in said axis, an inner, tubular sheath of foldable disposable material having an upper end and a lower end, a one-piece rigid reinforcing band snugly fitting within said inner sheath adjacent the lower end thereof, and a transaxially-extending bar carried by said last-named band and traversing the axis of said second sheath, said last-named bar being provided with centering means lying substantially in the axis of said inner sheath and cooperable with said first-named centering means, when said inner sheath is telescopically associated within said outer sheath, to establish a substantially coaxial relation between said sheaths.

2. A device of the class described comprising a first tube formed of foldable, disposable material, said tube being provided, at one end, with two diametrically-spaced, longitudinally-extending radial notches therethrough, a one-piece, rigid reinforcing ring sleeved on said end of said tube, a diametrical bar permanently secured to said ring and seated in said notches, a second tube formed of foldable, disposable material and having a diameter substantially less than that of said first tube, a one-piece, rigid reinforcing ring snugly fitting within said second tube near an end thereof, and a diametrical bar carried by said last-named ring, said bars being respectively provided with mutually-engageable means cooperating, when said second tube is mounted within said first tube, to establish a substantially coaxial relation between said tubes.

3. The mold of claim 1, including closure means for the upper end of said sheath, said closure means comprising a cover portion contoured and dimensioned substantially to conform to the outer perimeter of, and to overlie, the upper end of said inner sheath, and a substantially vertical, perimetral collar depending from said cover portion and proportioned and designed to fit snugly within the upper end portion of said inner sheath.

4. The mold of claim 3, in which said cover portion

comprises a plate having its perimetral edge rebent downwardly and inwardly at each of at least three perimetrally spaced points, and in which said collar is provided, at its upper end, with outturned flange means received in said rebent edge portions of said plate, whereby said collar is dependently supported from said plate.

5. The mold of claim 3, including funnel means separate from and independently movable relative to said closure means, said funnel means comprising a perimetrally-continuous member having a lower portion proportioned and designed to be received snugly within the open, upper end of said outer sheath, means projecting outwardly from said member and defining a downwardly-facing shoulder located above said lower portion to rest upon the upper end of said outer sheath when said lower portion is so received, and a plurality of perimetrally-spaced fins projecting inwardly from said member to engage the perimeter of said closure means when said member lower portion is so received.

6. The mold of claim 5 in which each of said fins is formed to define an upper edge inclining downwardly and inwardly from the inner perimeter of the upper end of said member, and an inner edge substantially coincident with a portion of the perimeter of said closure means, said inner edge of each fin lying in a substantially vertical plane and meeting the upper edge of its fin in a level above said closure means.

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