April 21, 1925. 1,534,134

T. E. MURRAY

APPARATUS FOR MOLDING HOLLOW ARTICLES

Filed Sept. 13, 1924

Fig. 2.

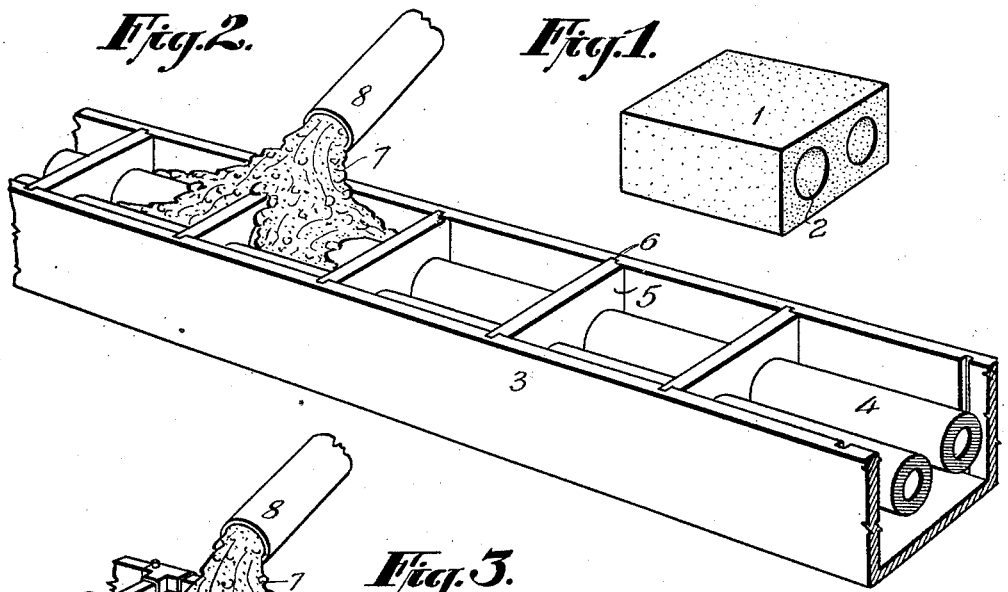


Fig. 1.

Fig. 3.

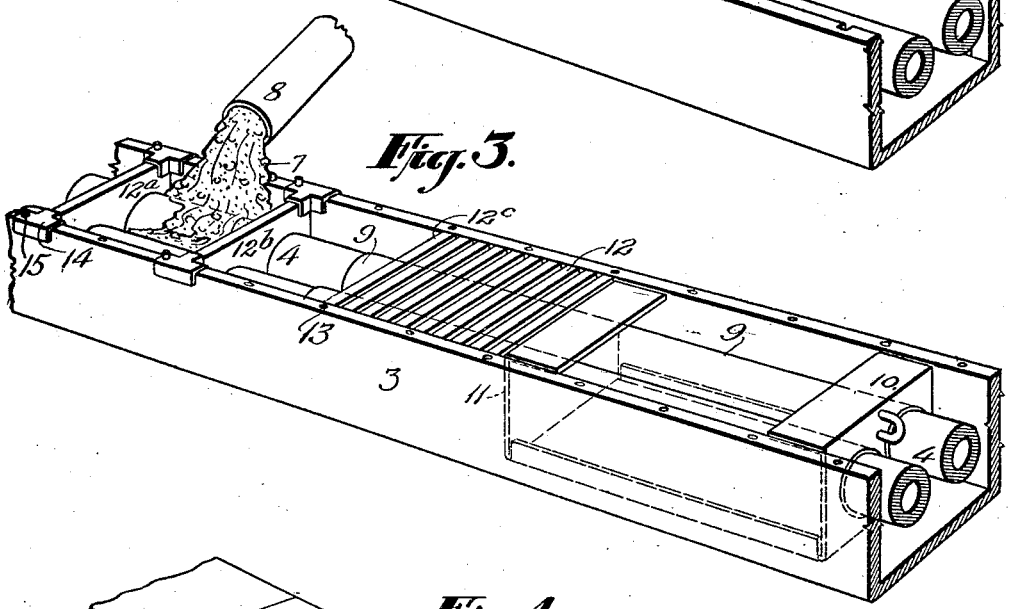
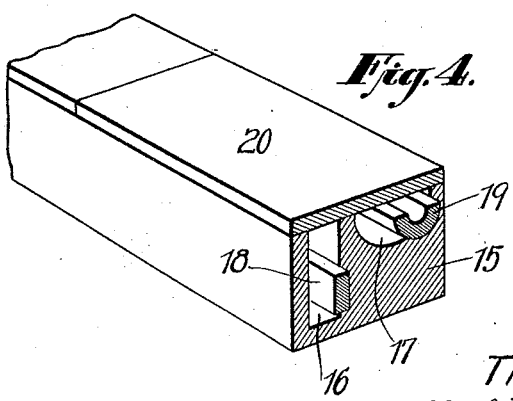


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY, OF BROOKLYN, NEW YORK.

APPARATUS FOR MOLDING HOLLOW ARTICLES.

Application filed September 13, 1924. Serial No. 737,472.

To all whom it may concern:

Be it known that I, THOMAS E. MURRAY, a citizen of the United States, and resident of Brooklyn, Kings County, and State of New York, have invented certain new and useful Improvements in Apparatus for Molding Hollow Articles, of which the following is a specification.

In my previous application No. 722,913 I have described methods and apparatus for molding ducts in concrete or similar plastic material; such, for example, as the conduits of concrete which carry electric cables and the like through the streets. And in said application I have described an apparatus which can be used for producing short transportable sections of such conduits. The present application is in part a division of the aforesaid application and is directed to the making of comparatively short sections of conduit and to the making of a variety of other articles of concrete and similar plastic materials; such, for example, as poles, planks, railroad ties, hollow bricks or blocks for the building of floors, walls and partitions and for the building of conduits for the distribution of fluids and similar uses.

The accompanying drawings illustrate embodiments of the invention.

Fig. 1 is a perspective view of a block molded in accordance with this invention.

Fig. 2 is a perspective view illustrating the method of molding such blocks.

Fig. 3 is an alternative arrangement, shown in perspective, for molding such blocks.

Fig. 4 is a perspective view illustrating another modification.

The block 1 is formed with two circular ducts 2 extending through the block. The invention is applicable to the making of blocks with a single duct or with a number of ducts greater than two, and is particularly useful in making articles having a multiplicity of ducts rather than a single one.

The blocks are molded in a trough or box 3 open at the top, the depth of which corresponds substantially to the thickness of the block to be molded. The cores 4 are carried in the box in position to form the ducts 2. These cores are preferably of the character described in my application No. 670,423, highly resilient rubber tubes with walls of sufficient thickness and strength to support the external pressures, and adapted when pulled endwise to contract transversely and break the adhesion of the rubber to the surrounding concrete so as to permit their withdrawal by continued longitudinal pulling. Cores of this sort are provided of a length corresponding to that of a considerable number of the sectional blocks 1, and are used for molding a number of such blocks at once, so as to secure uniformity in the several blocks and to lessen the work involved in setting up and withdrawing the cores of a number of blocks by doing these things for all the blocks at a single operation. The cores pass through properly spaced holes in bulkheads or partitions 5 extending across the box at intervals and held by grooves 6 in the side walls of the box engaging tongues on the side edges of the partitions. The cores 4 make a snug fit in the holes in the partitions through which they pass; and the ends of the cores (not shown) may be fastened in any way to an end wall of the box. The parts being set up as illustrated in Fig. 1, concrete 7 is poured from a chute or nozzle 8 into the successive compartments in the box, filling them to the top. The excess may be scraped off with a straight edge (and tamped if a dense product is desired) or the exposed side may be finished in any desired way.

When the concrete is sufficiently hard the cores 4 are withdrawn by pulling them longitudinally. The molded blocks can then be pushed up from below, either with the partitions 5 or without these partitions. Or the partitions may first be pushed out from below and the concrete blocks afterwards. A false bottom or any one of various other known expedients may be used for lifting the molded blocks out of the box.

Fig. 3 illustrates the use of the invention in connection with a movable shield similar to that described in my previous application No. 722,913. Here the forward portions of the cores 4 are carried in tubes 9 in a sort of shield with a front wall 10 and a rear wall 11. The tubes 9 project through the rear wall 11 of the shield, as indicated, and are passed through openings in a series of bulkheads or partitions 12. The side walls of the box 1 are formed with openings 13 in their upper edges at certain intervals. T-shaped brackets 14 are arranged to slide on the side walls of the box and

carry pins 15 which may be dropped into the holes 13. The inner arms of these brackets are flanged so as to rest on the upper edge of one of the partitions 12 and hold it in position. Originally all the partitions 12 are laid up against each other at the back of the shield. The shield is advanced and the partitions are caught in succession by brackets 14 placed at intervals along the sides. While the concrete is being poured into the mold thus formed between the partitions 12^a and 12^b, the shield can be moved forward until the next partition 12^c arrives at the desired point, where it will be clamped by means of brackets 14, so that the filling of concrete may proceed in the space immediately behind it while the shield and the other partitions are taking a further step forward. The openings 13 are set so close together that the partitions may be fastened at intervals of varying length, depending on the length of the core which will hold itself substantially straight when supported at the ends. Or, of course, the partitions can be set closer if it be desired to make the blocks of less length. This arrangement has some advantages over the simpler arrangement of Fig. 2. It is easier to locate the partitions 12 on the extended ends of the metal tubes 9 than it is to locate them on a rubber tube. When a partition, as 12^c, is fastened in place and the shield moved on to pull the rear ends of the tubes 9 out of the partition, the cores 4 will fit the holes in the partition with sufficient closeness to prevent the passage of the plastic material.

The shape of the box, which forms the outside of the molded article, can be straight or curved or of various irregular shapes. The flexibility of the cores makes it possible also to bend them around to form curved ducts. And where a plurality of cores are used they may be parallel or may converge according to the particular design of the block and the duct required. In that case all the cores may be pulled out at one operation as by clamping them to the shield in Fig. 3, or they may be pulled out separately if that be more convenient; thus in building sections of a multiple-duct conduit all the cores may be pulled out of all the molded sections at one operation, with a great saving of time. And, though the invention may be applied to different styles of core, yet there are special advantages in simplicity and economy of production in the use of such resilient tubular cores as I have described, of sufficient strength to hold their shape between points of support and to prevent deformation by the external pressure, the resiliency serving to cause a transverse contraction and separation from the concrete when it is pulled longitudinally.

The cores described may also be used with various other styles of mold and with partitions between the successive molds which are fixed instead of being movable like those illustrated.

Fig. 4 illustrates the making of hollow blanks or railroad ties or the like and hollow circular poles. The mold box 15 has a rectangular opening or trough 16 extending lengthwise of it, and a semi-circular trough 17. In the former is a core 18 of highly resilient rubber, solid in the case illustrated, but it may be hollow if of sufficiently large size. In the semi-circular trough is a semi-circular core 19, with the central portion removed. The cores are held at intervals in their length by partitions or bulkheads similar to those in Figs. 1 and 2. A cover 20, preferably made in sections, is removed during the pouring operation. The troughs are filled and levelled off and the cover laid on to secure an even finish on the upper surface. It will be understood, of course, that the trough 17 forms only a semi-circular segment of the post, two such segments being afterwards cemented together to make the finished product. Ordinarily, where two or more molds or troughs are arranged along side of each other in a single structure they will be of the same shape. I have illustrated different shapes in order to show the variety of products to which the invention is applicable.

Although I have described with great particularity of detail certain embodiments of my invention, yet it is not to be understood therefrom that the invention is restricted to the particular embodiments disclosed. Various modifications may be made by those skilled in the art without departure from the invention as defined in the following claims.

What I claim is:—

1. An apparatus for molding a plurality of hollow articles comprising a mold box, partitions therein, and a core passing through the several partitions so that the same core serves in the several compartments to mold the duct in the several blocks, in combination with a shield carrying a tube surrounding said core and passing through said partitions.

2. An apparatus for holding a core in position during the casting of plastic material around it comprising means for supporting the core and a plurality of separate bulkheads at the rear of said supporting means adapted to be used in succession.

3. An apparatus for holding a plurality of cores properly spaced during the casting of plastic material around them, comprising means for supporting said cores in proper relative positions and a plurality of separate bulkheads at the rear adapted to be used in succession.

4. An apparatus for molding hollow arti-

cles comprising a plurality of molds and a common core passing through said molds, said core being tubular, of sufficient strength to support the external pressures and of such a composition that when pulled it will contract transversely and separate from the surrounding material so as to permit its withdrawal and of such resiliency that when released it will resume its original shape.

5. An apparatus for holding a core properly spaced during the casting of plastic material around it, comprising means for supporting said core in proper positions and a plurality of separate bulkheads at the rear adapted to be used in succession.

6. An apparatus for holding a plurality of cores properly spaced during the casting of plastic material around them, comprising means for supporting said cores in proper relative positions and a plurality of separate bulkheads at the rear adapted to be used in succession.

In witness whereof I have hereunto signed my name.

THOMAS E. MURRAY.