# United States Patent [19]

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[11] **3,850,403**

[45] **Nov. 26, 1974**


[54] **TILE-SETTING AND MOLD FORM APPARATUS**


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[22] Filed: **Oct. 20, 1972**

[21] Appl. No.: **299,207**

[52] **U.S. Cl.** ..... **249/27,** 52/379, 249/19, 249/93, 249/95, 249/DIG. 3, 264/35

[51] **Int. Cl.** ..... **E04g 11/02**

[58] **Field of Search** ..... 249/DIG. 3, 1, 19, 27, 249/83, 91, 93, 95; 264/31, 35, 275, 278; 52/169, 378, 379



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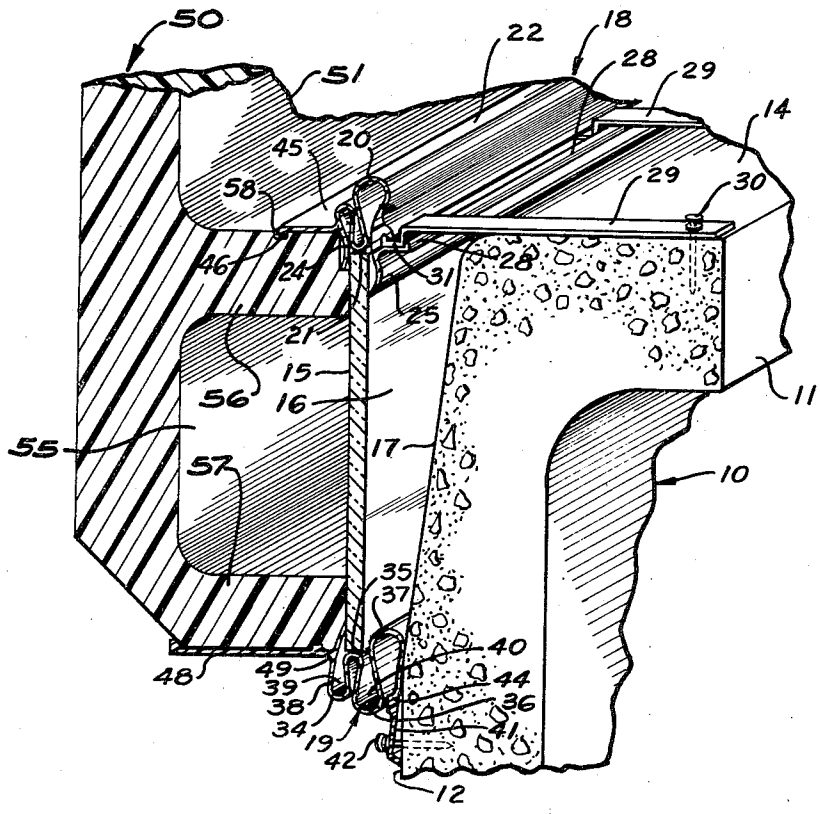
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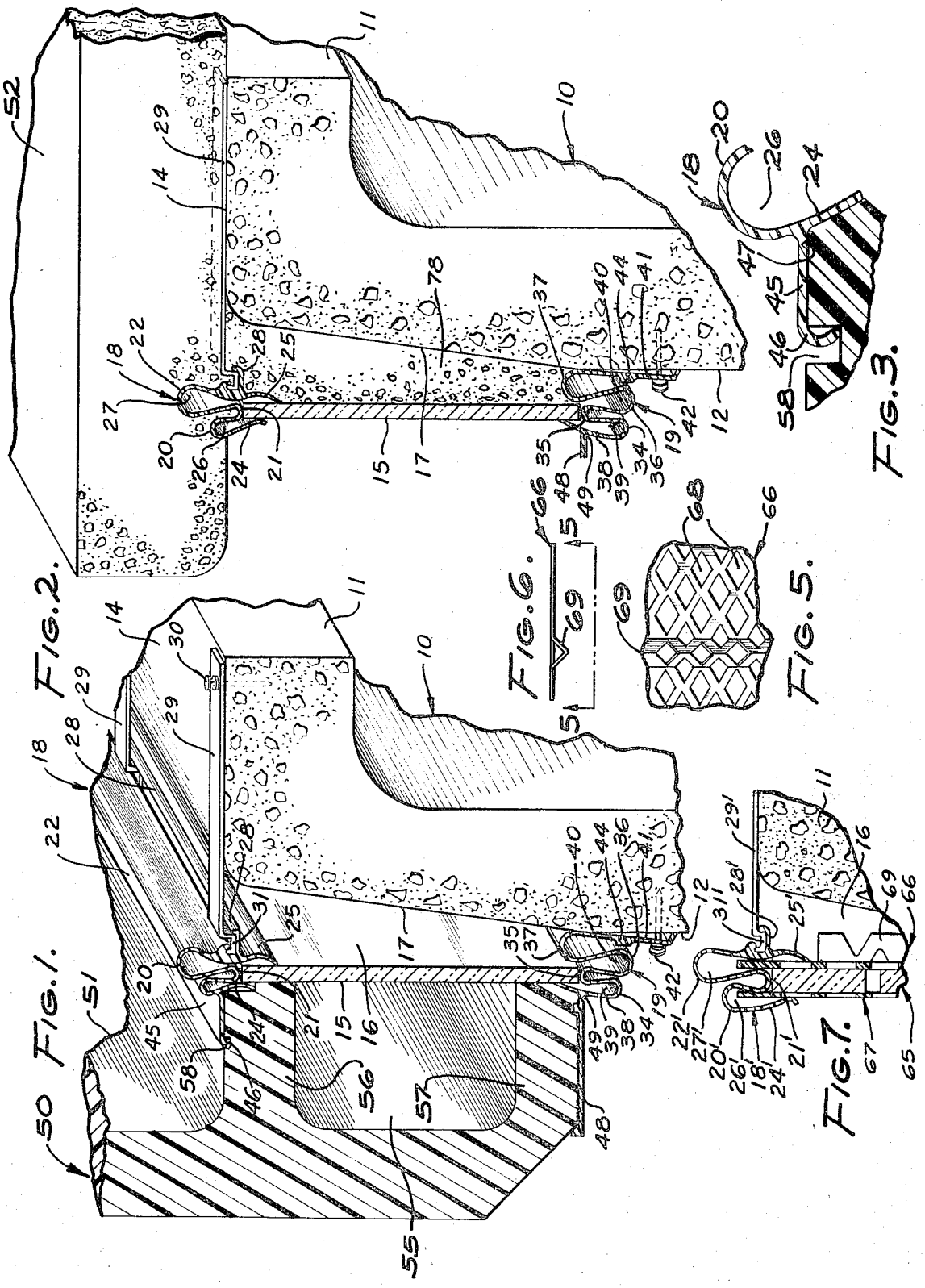


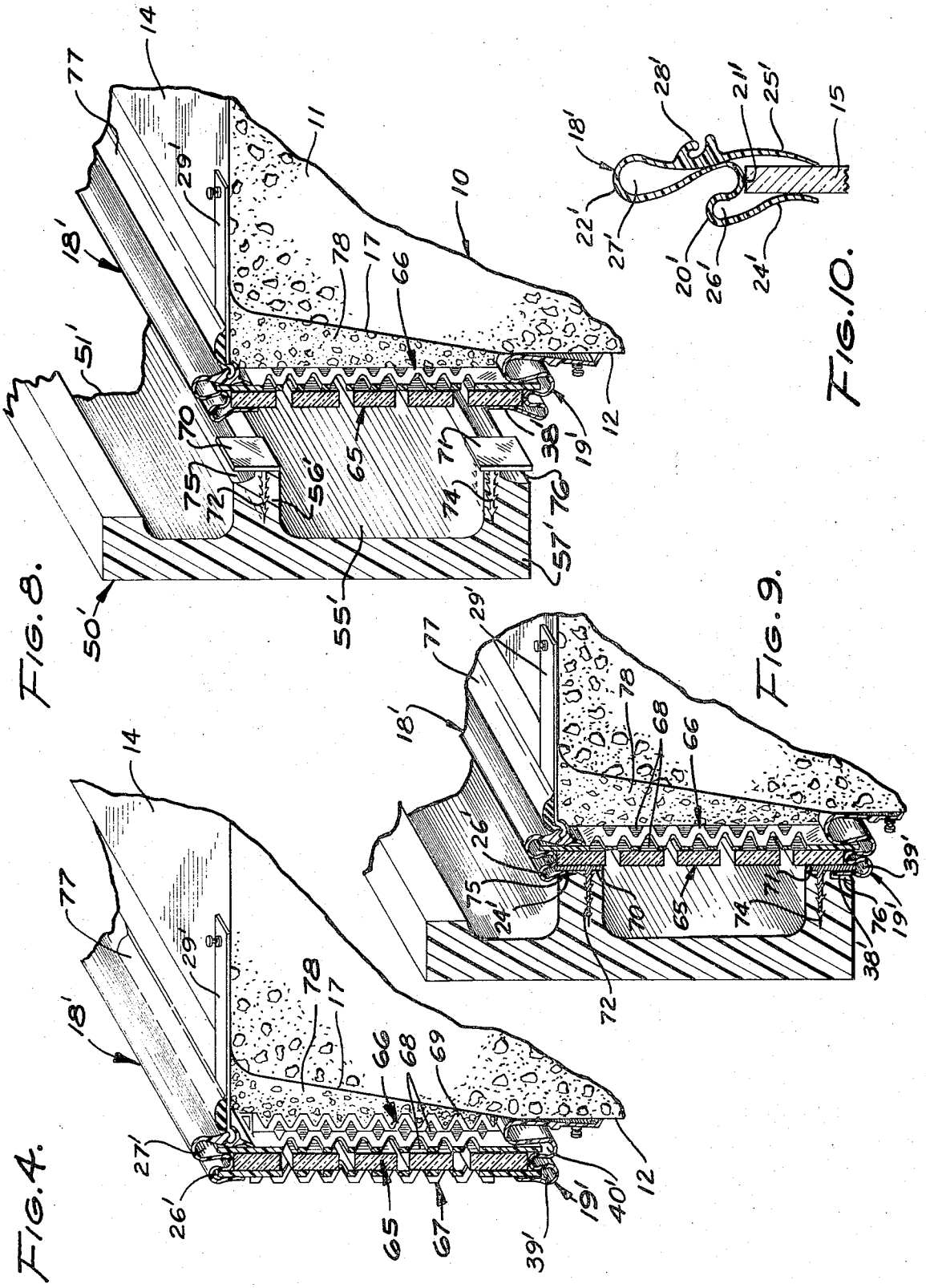
[57] **ABSTRACT**

Apparatus for setting a row of tile along an upwardly extending wall of a swimming pool or the like and for forming a concrete deck along the upper edge of such wall in overlying relation therewith. The apparatus includes upper and lower support components adapted to be secured to such wall and respectively defining downwardly facing and upwardly facing seats adapted to receive the upper and lower edge portions of rigid tile blocks or flexible mosaic tile sheets therein so as to support the same spaced distance from the pool wall. The apparatus further includes a mold form cooperative with the supports so as to be held thereby, and having a shaped configuration defining the perimetric edge portion of a concrete deck formed from a mass of concrete poured against the mold in overlying relation with the pool wall. The space between the tile units, whether rigid blocks or flexible sheets, is filled with mortar either before or as part of the deck-forming procedure so as to secure the tile to the pool wall. The mold form and lower support are removable, and the upper support remains in place and forms a water stop in association with the concrete deck. The apparatus further includes backing structure cooperative with the upper and lower supports to stiffen or rigidify flexible mosaic tile sheets so as to permit the mortar to secure the same to the pool wall.


**29 Claims, 10 Drawing Figures**




FIG. 1.
FIG. 2.
FIG. 3.
FIG. 5.
FIG. 6.
FIG. 7.


14
77
29'
18'
11
10
78
17
66
51'
70
75
72
56'
65
74
71
38
19'
12
57'
76
50'
55'
FIG. 8.
28'
21'
25'
15
18'
22'
27'
20'
26'
24'
FIG. 10.
77
29'
18'
78
68
66
26'
75
24'
70
65
74
71
39'
76'
19'
38'
72
FIG. 9.
14
77
29'
18'
78
17
66
68
69
27'
26'
65
67
39'
19'
40'
12
FIG. 4.

# TILE-SETTING AND MOLD FORM APPARATUS

This invention relates to apparatus for setting a row of tile along an upwardly extending concrete wall of a swimming pool or the like and for molding a concrete deck along the upper edge of such wall in overlying relation therewith.

In constructing swimming pools, the technique now generally followed is to form the upwardly extending and bottom closure walls of a pool with concrete which may be poured into molds erected for this purpose but is more usually deposited by a gunite process in which the cement, water, and aggregate are mixed at a nozzle and ejected under pressure against a prepared support or backing. After the concrete has cured sufficiently, the inner surfaces of the concrete that are intended to contain water are covered with a suitable finishing material, and a horizontal deck is provided at the top of the upwardly extending pool walls to form a walkway and drainage area about the pool, and to establish an esthetically attractive frame thereabout. The deck may be poured concrete and is often a cantilever deck that overhangs the pool walls.

Whereas in the past it was common to finish or face the water-containing concrete wall surfaces of a swimming pool with ceramic tile, material and labor costs today generally prohibit the overall use of tile facing, and a finishing coat of concrete (which is usually referred to as plaster and comprises an admixture of cement and fine aggregate) is used to face the concrete walls. However, it is desirable, if not necessary, to provide at least a single horizontal row of ceramic tile adjacent the upper edge portion of the side walls of a swimming pool at the elevation at which the water level in the pool is to be maintained. The reason therefor is that body oils collect along the water surface in a swimming pool and adhere to the pool walls with considerable tenacity at the water level, threby making removal of such oils from the wall surfaces quite difficult. The hard, substantially impervious finish of glazed ceramic tile facilitates removal of such oils and other matter, and is advantageously used in a swimming pool at this location. Such use of tile has been found practicable because the costs of setting one such row of tile is not prohibitive with reference to the advantages attributable thereto.

The tile-setting procedure now universally followed is for a tile setter to locate the highest elevation along the pool wall, patch or fill the upper edge of the pool wall to bring it to this elevation (this is not always done but should be), and then nail a continuous horizontal ledger board to the wall a measured distance below such elevation. A suitable mortar is then prepared, spread along the upper edge portion (often referred to as a bond beam) of the concrete walls above the ledger board, and each tile block (or sheet of mosaic tile) is seated upon the ledger board and pressed into the mortar, care being taken to align each tile vertically and in planar relationship with those tiles adjacent thereto as well as horizontally. Evidently, this procedure is slow and time-consuming and therefore relatively expensive but, more importantly, it is often difficult to obtain the services of a qualified tile setter especially in remote areas so that unskilled labor must be used which more often than not results in workmanship that is not initially satisfactory or subsequently proves to be unsatisfactory and therefore expensive to the contractor if the tile breaks loose and must be replaced.



Analogously, it is far too expensive in many cases to construct a pool deck by hand-setting coping along the edge and then laying tile or block outwardly from the coping to form a generally horizontal deck surface. As a result, poured concrete decks are used with increasing frequency, and very often "cantilever decks" (i.e., decks having an edge portion thereof freely overhanging the side walls of the pool in overlying relation with the water confined therewithin) are preferred because of their functional and esthetic advantages. It is necessary to provide mold forms to confine the mass of flowable concrete that cures to define a cantilever deck, thereby requiring a mold form and a means for supporting the same along the side walls of the pool adjacent the upper edge portions thereof.

Until quite recently, the universal practice in this latter respect has been to construct the requisite form by nailing appropriate strips of lumber to each other and to the pool side walls and, after the concrete poured against such form has cured, to remove the form and then set the necessary row of tile (in the manner previously described) along the side walls of the pool in underlying relation with the overhang of the cantilever deck. There have been some recent improvements in this reference which enable the tile to be set prior to pouring the cantilever deck which has obvious advantages; and in more specific terms, such improvements are disclosed in my pending patent application, Ser. No. 761,726, filed Sept. 23, 1968. Even with such improvements, the tile is nevertheless set by a conventional technique, and the deck is poured as a separate operation after the tile is set and the mortar bonding the same to the pool walls at least partially cured.

In view of all of the foregoing, objects, among others, of the present invention are to provide apparatus for setting tile along an upwardly extending wall of a swimming pool or the like and for forming a cantilevered concrete deck along the upper end of the wall in overlying relation therewith; to provide apparatus of the character described that enables tile to be set and a deck to be formed quickly, easily, without the requirement of skilled tile setters and similar professionals and, accordingly, inexpensively; and to provide apparatus that is versatile and can be used selectively to set tile and construct a deck concurrently as part of a single procedure, or to set the tile and form the deck individually and disassociated one from the other in a time sense.

Additional objects and advantages of the invention, especially as concerns particular features and characteristics thereof, will become apparent as the specification continues.

In general summary terms, apparatus embodying the invention includes an upper support component having a downwardly facing seat adapted to position the upper edge portion of a tile unit therein, and which support component is adapted to be secured to the upwardly extending wall of a swimming pool adjacent the top thereof. The apparatus further includes a lower support having an upwardly facing seat adapted to receive the lower edge portion of a tile therein, and which lower support is adapted to be removably secured to the upwardly extending wall a spaced distance below the upper support in substantially vertical alignment therewith. The apparatus still further includes a mold form

adapted to be secured to and held by the upper and lower supports in position to receive and confine a concrete mass which cures to form the swimming pool deck.

These supports are elongated components adapted to be secured to the pool wall in aligned succession so as to receive and support tile units in side-by-side juxtaposition a spaced distance from the pool wall so as to define a cavity therewith which is substantially filled with mortar to fixedly secure the tile to the wall. The lower support may be removed for reuse after the mortar has set, but the upper support remains in place and serves as a water stop in association with the concrete deck. The mold form is disposable and is not intended for reuse although careful removal may permit such result. In the case of flexible sheets of mosaic tile, the apparatus also includes backing structure cooperative with the upper and lower supports to hold or rigidify the flexible tile sheets until they are bonded to the pool wall by mortar.

Embodiments of the invention are illustrated in the accompanying drawings, in which:

FIG. **1** is a broken perspective view of apparatus embodying the invention shown in position along a pool wall and with tile units in place preparatory to have mortar and concrete poured to bond the tile to the wall and form a cantilever deck;

FIG. **2** is a broken perspective view illustrating the pool wall shown in FIG. **1** after the mortar and concrete have been poured and cured and the mold form removed;

FIG. **3** is an enlarged, fragmentary sectional view illustrating cooperative interconnection of the upper support and mold form;

FIG. **4** is a broken perspective view of a somewhat modified apparatus and showing the same in functional association with a swimming pool wall and flexible mosaic tile sheets;

FIG. **5** is a broken face view in elevation of a backing structure used with flexible tile sheets, as shown in FIG. **4**, the view being taken generally along the line **5—5** of FIG. **6**;

FIG. **6** is a broken top plan view of the backing structure shown partially in FIG. **5**;

FIG. **7** is an enlarged, broken vertical sectional view illustrating the upper support and mosaic tile sheet shown in FIG. **4**;

FIG. **8** is a broken perspective view similar to that of FIG. **4**, but illustrating a modified mold form in spaced relation with the supports;

FIG. **9** is a broken perspective view similar to that of FIG. **8** but illustrating the mold form in cooperative engagement with the upper and lower supports so as to be held thereby; and

FIG. **10** is an enlarged vertical sectional view of the modified upper support shown in FIGS. **4** and **7** through **9** but in association with a unitary tile rather than a mosaic tile sheet.

As heretofore indicated, tile-setting and mold form apparatus embodying the present invention is adapted for use in setting tile along the upwardly extending or generally vertical walls of a swimming pool. Walls of this type are generally concrete and ordinarily equipped at the upper ends thereof with an integral section that extends laterally and is frequently referred to as a "bond beam". A wall of this type is illustrated in FIG. **1** and is denoted in its entirety with the numeral **10**, and the bond beam at its upper end is designated with the numeral **11**. As respects the present invention, the wall **10** may be essentially conventional and can be formed by any suitable construction process — a gunite technique usually being employed. The inner surface of the wall **10** facing the interior of the pool to define the water-receiving container is identified with the numeral **12**, and the upwardly facing surface of the bond beam **11** is denoted with the numeral **14**.

A row of tile units, usually ceramic, is secured to the wall **10** adjacent the upper edge thereof as heretofore explained, and one such tile is illustrated in FIG. **1** and is designated with the numeral **15**. Tile of the type shown in FIG. **1** ordinarily takes the form of rigid square-shaped blocks that are approximately **6** inches in length and width and may be a thickness of from about one-fourth to three-eights of an inch although this may vary considerably from brand to brand. The tile-setting apparatus being considered herein is adapted to accommodate such standard variations in the thickness of the tile blocks **15**, and it is of substantially no significance whether the blocks are square-shaped or whether rectangular, and the lengths and widths of the blocks may vary materially from the usual 6-inch standard. For example, the blocks **15** could be rectangular as well as square-shaped, and the length and/or vertical dimension thereof might be 12 inches, for example, rather than the dimension noted.

The tile blocks **15** are adapted to be secured to the wall **10** by means of mortar which is poured into a cavity or space **16** defined between the facing surfaces of the wall **10** and tile. Before the mortar is poured, it will usually be advantageous to first wet the facing surfaces of the wall and tile, and in many instances the inner surface of the tile will be brushed, dipped, or otherwise coated with a slurry of cement and water. Respecting the present invention, the surface preparation and mortar compositions used may be completely conventional. It may be of convenience to relieve the upper portion of the wall **10** along the inner surface **12** thereof to facilitate pouring of the mortar into the space or cavity **16**, and such relief is illustrated in FIG. **1** and for identification is designated with the numeral **17**.

The apparatus further includes upper and lower support components **18** and **19**, respectively, each of which is elongated and longitudinally extending and is adapted to be secured to the wall **10** so as to support the tile blocks **15** in side-by-side juxtaposition and substantially horizontal alignment. Each of the supports **18** and **19** is advantageously formed of a material that does not readily corrode or rust since they are used in a water-laden environment, and such supports may be formed of any of a number of synthetic plastic materials as, for example, polyvinyl chloride. Conveniently, this material will be extruded to provide the supports **18** and **19** in the configurations and with the characteristics shown.

The supports **18** and **19** are also somewhat resilient and flexible so as to grip and hold each tile block **15** along the upper and lower edges thereof, and the supports are also bendable and flexible in transverse directions (i.e., generally normal to the plane of the wall **10**) so as to enable each support to follow at least gradual inside and outside curves that may be formed along the wall **10** of a swimming pool, especially in pools of free-form design. This desirable bending attribute of each support is enhanced by increasing the ratio of the verti-

cal dimension to the transverse dimension thereof, especially as concerns each convolution, as will be noted hereinafter. By way of example, the maximum vertical dimension of a typical embodiment of the supports **18** and **19** is about 1.25 inches and 1.875 inches, respectively, and corresponding transverse dimensions of about 0.505 of an inch and 0.50 of an inch, respectively.

The support **18** comprises a plurality of successive convolutions formed integrally with each other and running substantially from one side of the support to the other. In the form shown, there are essentially three serpentine-like convolutions respectively denoted with the numerals **20,21** and **22.** The convolution **21** together with the downwardly extending lips **24** and **25** bordering the same define a downwardly facing seat constructed to receive the upper edge of the tile block **15** therein, as shown. The convolution **21** establishes the inner terminus of the seat and may positively engage the upper edge of the tile block **15,** although this will depend on the precise spacing between the supports **18** and **19.** The lips **24** and **25** are adapted to substantially engage the opposite faces of the tile block **15,** and the support **18** has sufficient resilience or flexibility so as to permit relative transverse displacements between the lips for the purpose of accommodating tile blocks of different thickness. The convolutions **20** and **22** provide recesses **26** and **27,** respectively, for purposes to be particularized hereinafter.

The upper support **18** is also equipped with an attachment section **28** generally adjacent the lip **25** and, in the form shown, the attachment section **28** is essentially continuous and runs from end-to-end of the support. The attachment section **28** is adapted to cooperate at spaced apart locations therealong with a plurality of anchor straps **29** fixedly secured to the wall **10** such as by being fastened by nails **30** to the bond beam **11** along the upper surface **14** thereof. Each strap **29** is provided adjacent an end thereof with a fastener element **31** adapted to interlockingly engage the attachment section **28** and thereby secure the support **18** to the wall **10.** Referring to FIG. **7,** it will be seen that the fastener **31** has a somewhat J-shaped configuration so as to seat within the complementary configuration of the attachment section **28.** The inherent resilience of the support **18** and cooperative, interlockingly engageable elements of the attachment section and fastener effect an adequate and appropriate mounting for the support by means of which it is secured to the wall **10.** Any number of anchor straps **29** may be used depending upon the individual preferences of the contractor and the requirement for maintaining a proper dimensional relationship between the support **18** and wall **10** along the length thereof so that the successive tile blocks **15** have the requisite orientation (usually vertical).

The lower support **19** is quite similar to the upper support **18** and comprises a plurality of successive convolutions formed integrally with each other and running substantially from one side of the support to the other. In the form shown, there are essentially four serpentine-like convolutions respectively denoted with the numerals **34, 35, 36,** and **37.** The convolution **35** together with the upwardly extending lip **38** and convolution **37** bordering the same define an upwardly facing seat constructed to receive the lower edge of a tile block **15** therein, as shown. The convolution **35** establishes the inner terminus of the seat and may positively engage the lower edge of the tile block **15.** The lip **38** and convolution **37** are adapted to substantially engage the opposite faces of the tile block **15,** and the support **19** has sufficient resilience or flexibility so as to permit relative transverse displacements between the lips for the purpose of accommodating tile blocks of different thickness. The convolutions **34** and **36** provide recesses **39** and **40,** respectively, for purposes to be particularized hereinafter.

The convolution **37** of the lower support **19** defines a spacer adapted to separate the tile-receiving seat from the surface **12** of the wall **10,** and therefore to separate the tile block **15** therefrom by a relatively determinant transverse distance generally equivalent to the width of the convolution. Accordingly, the spacer convolution **37** is located intermediate the wall face **12** and tile block **15** and resiliently engages the lower edge of the tile, as heretofore described. The convolution **37** extends downwardly along the terminal end thereof to form a depending section or portion **41** adapted to be removably secured to the wall by a plurality of nails or comparable fasteners **42** which can be driven through the section **41** and into the wall, as illustrated in FIG. **1.**

Referring to FIGS. **1** and **2,** the convolutions **37** and depending section **41** thereof have a transversely projecting stop or abutment **44** extending therealong which is located in transverse alignment with the convolution **36** adjacent its lower end. The stop **44** may comprise a plurality of longitudinally spaced protuberances, or it may be essentially a continuous component running from end-to-end of the lower support, as shown. The abutment is operative to engage the facing surface of the convolution **36** and thereby limit inward movement of such convolution together with the associated convolutions **34** and **35** under the weight of the tile blocks **15** seated upon the convolution **35.**

The upper support **18** is provided along the lip **24** with a transversely extending flange or latch **45** equipped adjacent its outer end with a depending finger **46.** The latch flange **45** and finger **46** thereof extend longitudinally along the support **18** from one end to the other thereof, and adjacent the mergence of the latch flange with the convolution **20,** a notch or line of weakness **47** enables the latch flange to be broken free from the support **18,** as will be described subsequently. Similarly, the lower support **19** is equipped along the lip **38** thereof with a transversely extending shelf or purchase **48** having a pair of fingers or ridges extending upwardly therefrom in transversely spaced relation, and further having a notch or line or weakness **49** to enable the shelf to be broken free from the support **19.** The shelf **48** and notch **49** extend longitudinally from end-to-end of the support **19.** The shelf **48** and latch flange **45** are adapted to support a mold form, as will now be described.

As shown in FIG. **1,** a mold form **50** is supported along the exposed face of the tile units **15** so that a configurated or shaped portion **51** of the form extends above the wall **10** and upper surface **14** of the bond beam and is adapted to confine a mass of concrete poured thereagainst so as to define the inner edge thereof and enforce a predetermined configuration thereon. Such mass of concrete cures to form a deck **52** (see FIG. **2**) along the upper edge of the pool wall **10** with a portion of the deck overhanging the wall in can-

tilever fashion. Although the mold form **50** can be attached along the tile units **15** at different times, depending upon the exact procedure being followed, it may be placed (as suggested by FIG. 1) before the tile units are attached by mortar.

The form **50** is an elongated component provided in lengths convenient to handle 8-foot lengths, for example), and the particular form shown is fabricated from a synthetic plastic foam such as polystyrene. A plurality of mold form sections are disposed in end-to-end relation to define a continuous form about the upper perimetric edge portion of a pool, and the form sections are sufficiently flexible or bendable to accommodate and conform to gradual inside and outside bends or curves along the edges of the pool as is often found in freeform configurations. The form **50** may have a large longitudinally extending opening **55** therein to reduce material requirements, and such opening defines or is bordered by spaced feet or ribs **56** and **57** which have outer free surfaces lying essentially within the same plane. As shown, the ribs **56** and **57** cooperate to provide the form with a body portion adapted to be disposed along the swimming pool wall in facing orientation therewith. Form sections of this type are disclosed in detail in my aforementioned pending application, Ser. No. 761,726, and reference may be made to such application for these details.

Each form section **50** is removably supported along the wall **10,** and such support is effected by releasable interconnection with the aforementioned supports **18** and **19** and, more particularly, by cooperative interconnection of the form section with the shelf **48** and latch flange **45.** The form section **50** seats upon the shelf **48** and the latch flange **45** overlies the form along the configurated section **51** thereof. The projecting fingers of the shelf and flange seat within grooves provided for this purpose in the form **50** (as shown in FIG. **3** by the finger **46** being located within the grove **58**), thereby constraining the form against transverse displacements. The shelf **48** and flange **45** may or may not be broken off along the respective lines of weakness **49** and **47** when the form **50** is removed, as described hereinafter.

The tile-setting apparatus so far described is especially suited for use with tile blocks **15** that are rigid and therefore self-sustaining. Although tile blocks of this type are most commonly used to line or face the upper concrete vertical wall surface of a swimming pool, occasionally mosaic tile is preferred for this purpose and, as well known, mosaic tile is ordinarily not self-sustaining and is generally sold in sheets comprising a plurality of small tiles (either regular or irregular in shape) adhesively secured to an inexpensive web that is quite porous so as to enable substantial surface areas of the individual tiles to be contacted by the mortar used to secure the tiles to a support surface therefor. In FIGS. **4, 8,** and **9,** in particular, the additional components of the tile-setting apparatus which are used with mosaic tile sheets are shown and will now be described.

First, however, it may be noted that the usual flexible webbing to which the small mosaic tiles are adhesively secured to facilitate handling has not been shown so as to simplify the illustration and avoid pictorial complexity. The mosaic tile sheet illustrated is denoted in its entirety with the numeral **65,** and it is shown to comprise six generally horizontal rows of substantially identical tile pieces with each row being spaced from those adjacent thereto so as to accommodate grout, all as is well known. The flexible sheet **65** is rigidified or reinforced by backing structure comprising, in the form shown, two substantially identical backing strips or components **66** and **67** respectively disposed along opposite faces of the tile sheet. Although the backing sheets **66** and **67** can differ one from the other, they are identical in the form shown and may be cut or taken from the same stock material.

As is shown best in FIGS. **5** and **6,** the backing components are for the most part planar and are provided with a plurality of apertures or openings **68** therealong which in the aggregate constitute a large surface area through which the inner surface of the tile sheet **65** is exposed for contact with the mortar used to secure such sheet to the wall **10.** In more specific terms, the aggregate area defined by the openings **68** should be as large as practicable without so weakening the backing component that it cannot afford adequate support for the tile sheet **65.** By way of example, the aggregate area of the openings **68** is of the order of, and preferably in excess of, 50 percent of the total surface area of the component **66.**

The backing component **66** is stiffened or strengthened by transverse ribs or corrugations **69** spaced longitudinally therealong. Such strengthening ribs in the form shown have a generally V-shaped configuration although this shape is in no sense mandatory. The backing strip is formed of a material that does not corrode or rust since materials having such characteristics are undesirable because rust has a tendency to bleed through grout used to fill the spaces between the small mosaic tiles. Many different materials can be used to form the backing strip **66,** and various synthetic plastics are very suitable therefor — a specific example being polyvinyl chloride. The backing strip **66** could be formed in various ways and, for example, may be a flat sheet punched or stamped to form the openings **68** therein and deformed by application of heat and pressure to provide the ribs **69** which, in a typical embodiment of the invention, are spaced apart longitudinally by approximately 8 inches center-to-center.

Comparison of the upper and lower supports shown in FIGS. **4** and **7** through **9** with the supports **18** and **19** heretofore described in detail establishes that the supports shown in such figures are modified in the sense that they do not have the transversely extending latch flange **45** and shelf **48.** In other respects, however, the modified supports are essentially the same as the supports **18** and **19** and, for this reason, the primed form of the same numerals used to identify the respectively corresponding elements of the supports **18** and **19** will be used in association with the modified supports. Also, because of the evident similarities between the supports **18** and **19** and their modified counterparts **18'** and **19',** further specific description of the modified supports will not be included, it being sufficient to note that the essential differences in the modified supports is that they do not have the flange **45** and shelf **48.**

As is most evident in FIGS. **4** and **7,** the backing strips **66** and **67** have upper and lower edge portions respectively receivable within the transversely spaced recesses **26'** and **27'** of the upper support **18'** and in the transversely spaced recesses **39'** and **40'** of the lower support **19'.** These recesses have restricted mouths or entrances thereinto formed by the converging-

diverging configurations of the successive convolutions associated therewith; and as a result, the upper edge portions of the backing strips tend to be resiliently confined within such recesses by the restricted mouths associated therewith, as shown in FIG. 7. Accordingly, the backing strips or components 66 and 67 are held by the supports 18' and 19' in substantially contiguous juxtaposition with the mosaic sheet 65 so as to prevent transverse collapse thereof in either direction.

The modified supports 18' and 19' are especially adapted for use with the modified form section shown in FIGS. 8 and 9. This modified form section differs very little from the form section 50 heretofore described in detail, and again as respects the modified form section the same numerals are used to identify respectively corresponding elements found in the form section 50 except that the primed form of the numerals is employed. The form section 50' is adapted to be removably supported along the wall 10 by releasable interconnection with the supports 18' and 19' and, more particularly, by cooperative interconnection of a plurality of longitudinally spaced upper latch plates 70 carried by the upper rib 56' and longitudinally spaced lower latch plates 71 carried by the lower rib 57' with the supports 18' and 19'. Each of the plates 70 and 71 is a generally square-shaped element fixedly secured to the respectively associated ribs 56' and 57' by one or more barbed wedge-like fasteners or projections 72 and 74, respectively, fixedly secured to the associated plate and embedded in the adjacent rib, as shown in FIGS. 8 and 9. An adhesive may also be used intermediate the contiguous surfaces of the ribs and plates about the wedge fasteners 72 and 74 to further enhance the attachment between the plates and form. The plates 70 and 71 and fasteners 72 and 74 thereof may be integral, and these components can be formed of a synthetic plastic material such as polyvinyl chloride. The fasteners 72 and 74 can, if desired, be elongated longitudinally, and can continue from end-to-end of the associated form.

As shown best in FIG. 8, the rib 56' has an upwardly opening groove or channel 75 along the upper edge of the plate 70 and, correspondingly, the rib 57' has a downwardly facing groove or channel 76 along the lower edge of the plate 71. The grooves 75 and 76 are adapted to receive the lips 24' and 38' therein when the upper and lower edge portions, respectively, of the latch plates 70 and 71 are inserted behind the lips 24' and 38' and into the associated recesses 26' and 39', as shown in FIG. 9. The latch plates 70 and 71 are provided along the form section 50' in sufficient numbers and at appropriate intervals to supply the requisite degree of support therefor in association with the components 18' and 19'.

The inherent flexibility of the support elements 18' and 19' permit insertion and removal of the latch plates 70 and 71 into and from the recesses 26' and 39'; and the form may have sufficient resiliency that the spaced ribs or feet 56' and 57' can be pressed toward each other to facilitate such insertion and removal. In this respect, the form sections 50' (and 50) can be fabricated from various materials having such inherent resilience, polystyrene, for example. After the concrete deck 52 (FIG. 2) has been poured and cured sufficiently to be self-sustaining, the form sections 50' are removed. The form sections can be carefully removed and preserved for reuse or, depending upon their construction, they may be disposable components not intended to be reused since relatively inexpensive. In the latter case, they may be destroyed in the removal process. The lower support 19' (or 19) is also removed and can be preserved for reuse. In this respect, the nails or fasteners 42' are simply withdrawn from the concrete wall 10 to release the support 19' therefrom.

In use of either embodiment of the apparatus, the support 19 (or 19', as the case may be) is removably secured to the wall 10 by driving an adequate number of nails 42 through the depending support section 41 and into the concrete wall, it being understood that the support will be leveled before it is firmly attached so that the row of tile blocks 15 subsequently seated within the support will have a true horizontal orientation enforced thereon. The upper support 18 is similarly secured to the wall 10, and the anchor straps 29 may be interlockingly connected with the attachment section 28 either before or after they are secured to the wall by driving nails 30 thereinto. The straps 29 are located so that the upper support 18 in cooperation with the lower support 19 will orient the tile blocks in the vertical disposition desired.

Ordinarily, the supports 18 and 19 should locate each tile block 15 so that the upper edge thereof is slightly below the upper surface 14 of the bond beam 11 (about one-fourth of an inch below, for example) so that the lowest point along the upper surface of an irregular bond beam will have an elevation greater than that of the tile. Should a tile 15 extend above the surface 14 at any location therealong, it would be necessary to build up or increase the height of the bond beam at that location for otherwise any shifting of the concrete deck 52 (FIG. 2) poured above the bond beam in overlying relation with the tile would dislodge such tile. Also, built-up sections often do not bond properly. In the case of rigid tile blocks 15, they are inserted into the seats respectively defined by the upper and lower supports 18 and 19 so as to be held thereby in enforced side-by-side juxtaposition in the manner illustrated in FIG. 1.

After the tile blocks 15 are so supported, mortar is used to fill the space 16 intermediate the inner face of each tile block and the wall 10 and, after the mortar has cured, the tile blocks are thereby affixed to the wall. It may be desirable to prepare the tile blocks and facing wall surface by wetting or coating the same with a mixture of cement and water, and in the case of the blocks they may be presoaked or wetted before being seated within the supports 18 and 19. Advantageously, a mastic material 77 (see FIGS. 4, 8, and 9) is laid along the juncture of the upper support 18 and mortar mass 78 when a two stage process is followed in which the mortar is first poured and then permitted to cure before the deck 52 is constructed. The mastic 77 augments the water barrier otherwise defined by the support 18. The mastic 77 may be spread as a viscous liquid which then cures, and a number of different mastics may be used. A specific example of one found satisfactory is silicone rubber which cures quickly and adheres readily to both the concrete mortar and plastic support. The mastic 77 is usually applied after the mortar has at least partially cured, and the spaces between the tile units 15 are usually grouted before the mortar has completely cured. The grouting step is a conventional operation performed manually, and need not be elaborated.

As shown in FIGS. 1 and 9, a mold form 50 (or 50') is supported along the exposed face of the tile units 15 so that the configurated or shaped portion 51 of the form extends above the wall 10 and upper surface 14 of the bond beam and is adapted to confine a mass of concrete poured thereagainst so as to define the inner edge thereof and enforce a predtermined configuration thereon. Such mass of concrete cures to form the deck 52 along the upper edge of the pool wall 10 with a portion of the deck overhanging the wall in cantilever fashion. Although the mold form can be attached along the tile units 15 at different times, depending upon the exact procedure being followed, it may be placed (as shown in FIGS. 8 and 9) after the tile units are secured by mortar to the wall 10 and after the mastic 47 has cured. The form can also be attached before the mortar has been poured, as shown in FIG. 1. If the forms are set after the tile is secured by a mortar mass 78, the tile may also be grouted before such setting of the forms; and in the case of mosaic tiles, the outer reinforcing component 67 is first removed, as shown in FIGS. 8 and 9.

After the mortar has set sufficiently to support the tile blocks 15, the lower support 19 may be removed carefully so as to preserve the same for reuse by withdrawing each of the nails 42. Generally, the spaced intermediate adjacent tile blocks is filled with a grout before the mortar completely sets, thereby establishing a better bond between the grout and mortar and generally effecting better results.

Although the upper support 18 might be removed for reuse, it is advantageous to let it remain because it then serves as a water stop to prevent or significantly minimize ingress of water along the contiguous surfaces of the bond beam 11 and concrete deck which will be poured thereover ordinarily in cantilever configuration so that it overhangs the tile blocks 15 and interior of the pool. The serpentine convolutions of the support 18 define a long barrier path along which any moisture must travel before reaching the contiguous surfaces of the bond beam and deck, and the natural or inherent resilience of the support also insures a continuing tight engagement with the contiguous surfaces of the concrete deck which, because of the weight of the concrete, will tend to compress the convolutions somewhat. Further, the lips 24 and 25 because of their engagement with the tile blocks 15 tend to prevent movement of water therebetween. The lip 25 also functions as a mortar stop in the sense that it prevents mortar filling the space 16 from flowing outwardly therefrom over the upper edge of the tile blocks.

The spacer 37 extends behind each tile block 15 along the lower edge thereof and not only establishes the spacing between each block and the wall 10, but also forms a downwardly facing recess or channel which permits surfacing material (generally referred to as plaster but comprising a cement binder rather than lime) to be forced upwardly and into the space behind each tile when the lower surface areas of the wall 10 are coated to form a finish therealong that usually terminates in planar alignment with the exposed face of the tile blocks. The provision of a mass of plaster behind the lower edge of each tile block results in a good, essentially water-tight joint being established thereat.

Should flexible sheets 45 of mosaic tile be used rather than rigid tile blocks 15, the backing structure shown in FIGS. 2 and 3 is used to rigidify such sheets or hold the same in planar orientation until the mortar attaches the same to the wall 10. The sheets 45 together with the backing components 46 and 47 may be arranged in the relative positions shown in FIGS. 2 and 3 in any way most convenient to the workman providing the installation; and as an example, the component 46 might first be placed in position with the upper and lower edge portions thereof seated within the recesses 27 and 40. Next, the sheets 45 are placed along the backing component 46 and are held in place until the backing component 47 is placed in supporting relation therealong with its upper and lower edge portions seated within the recesses 26 and 39.

Thereafter, mortar is poured into the space 16 intermediate the facing surfaces of the sheets 45 and wall 10, and the mortar flows through and into the various openings 48 in the component 46 to contact the mosaic tiles and thereby anchor the same to the wall 10. After sufficient curing, the exposed backing component 47 and the lower support 19 are removed and preserved for reuse, and the tile is grouted as heretofore explained. The component 46, it will be apparent, becomes a permanent part of the installation. In certain instances the inner support component 46 may be omitted, sufficient support being provided by the outer component 47 since mortar poured into the space 16 will tend to push the tile sheets outwardly thereagainst.

The supports 18 and 19 and backing structure 46,47 may be provided in any lengths desired and they may differ in length one from another. As an example of typical lengths, each of these members may be sold in eight foot segments. The backing components will have a vertical height slightly in excess of six inches, for standard tile dimensions, and the guage thereof in one specific instance approximates 0.050 of an inch. The guage of the material used in the supports 18 and 19 in a typical embodiment thereof is approximately 0.080 of an inch. It will be evident that these exemplary dimensions may vary considerably. The support 18 and especially the lip 24 thereof serves also as a hidden member to conceal the upper edges of the tile blocks 15 (or mosaics 45), thereby accommodating some upward movement or "heaving" of a deck relative to the pool wall 10. Further, the resilience of the support 18 generally and particularly the convolutions 20,21 and 22 thereof accommodate horizontal movement (as well as vertical movement, as noted) of a deck owing to temperature changes, soil changes, etc. without disturbing the brittle tile which is often cracked loose or broken by such deck movement. Further, the resilient mastic 77 both individually and in concert with the support 18 and convolutions thereof, cushions the tile from the deck by establishing a resilient buffer therebetween.

It may be noted that as respects the mosaic tiles 65, at least in certain instances elimination of the inner reinforcing component 66 may nevertheless result in such mosaic sheets being adequately supported by the outer support component 67 which of itself may be then adequate to maintain the orientation and disposition of the mosaic sheets until the mortar mass cures.

As previously observed, the mastic 77 may be a synthetic rubber-like material, polyurethane liquid being a specific example thereof. Also, the mold forms 50 and 50' may be fabricated of expanded polystyrene which is often referred to in the art as "bead board."

While in the foregoing specification embodiments of the invention have been set forth in considerable detail for purposes of making a complete disclosure thereof, it will be apparent to those skilled in the art that numerous changes may be made in such details without departing from the spirit and principles of the invention.

What is claimed is:

**1.** In apparatus for forming a molded concrete deck along the upwardly extending wall of a swimming pool and for concurrently holding a narrow band of tile along said wall while said band is being secured thereto: elongated support means adapted to be secured to such wall; means for securing said support means to said wall in generally horizontal disposition therealong; an elongated mold form section having a surface portion configurated in the finished shape to be imposed thereby upon such deck and having also body portion means adapted to be disposed along such wall in facing orientation therewith; and means for securing said mold form to said support to orient the same therewith in generally horizontal disposition along such wall.

**2.** The apparatus of claim **1** in which said mold form is releasably secured to said support means.

**3.** The apparatus of claim **2** in which said support means is a lower support adapted to be secured to such wall a spaced distance below the upper edge thereof.

**4.** The apparatus of claim **1** in which said support means is an upper support; and further including an elongated lower support adapted to be secured to such wall a spaced distance below said upper support; and in which the aforesaid securing means are effective for securing said mold form to each of said supports.

**5.** The apparatus of claim **4** in which said securing means releasably secures said mold form to each of said supports.

**6.** The apparatus of claim **1** in combination with the upwardly extending concrete wall of a swimming pool or the like having a bond beam defining the upper edge thereof, said support means being a synthetic plastic component that is substantially moisture impervious and is relatively flexible so as to be bendable in transverse directions to accommodate gradual curvatures along the length of said wall.

**7.** In apparatus for forming a molded concrete deck along the upwardly extending wall of a swimming pool: elongated support means adapted to be secured to such wall in generally horizontal disposition therealong; an elongated mold form section having a surface portion configurated in the finished shape to be imposed thereby upon such deck and having also body portion means adapted to be disposed along such wall in facing orientation therewith; and means for securing said mold form to said support to orient the same therewith in generally horizontal disposition along such wall; said support means being an upper support; and further including an elongated lower support adapted to be secured to such wall a spaced distance below said upper support; and in which the aforesaid securing means are effective for securing said mold form to each of said supports; said means for securing said mold form to each of said supports including a latch flange provided by said upper support for interconnection with said mold form, and a shelf provided by said lower support for interconnection with said mold form.

**8.** In apparatus for forming a molded concrete deck along the upwardly extending wall of a swimming pool: elongated support means adapted to be secured to such wall in generally horizontal disposition therealong; an elongated mold form section having a surface portion configurated in the finished shape to be imposed thereby upon such deck and having also body portion means adapted to be disposed along such wall in facing orientation therewith; and means for securing said mold form to said support to orient the same therewith in generally horizontal disposition along such wall; said support means being an upper support; and further including an elongated lower support adapted to be secured to such wall a spaced distance below said upper support; and in which the aforesaid securing means are effective for securing said mold form to each of said supports; said means for securing said mold form to each of said supports including upper and lower latch plates respectively carried by said mold form and interlockingly engageable with said upper and lower supports.

**9.** In apparatus for forming a molded concrete deck along the upwardly extending wall of a swimming pool: elongated support means adapted to be secured to such wall in generally horizontal disposition therealong; an elongated mold form section having a surface portion configurated in the finished shape to be imposed thereby upon such deck and having also body portion means adapted to be disposed along such wall in facing orientation therewith; and means for securing said mold form to said support to orient the same therewith in generally horizontal disposition along such wall; said support means being an upper support; and further including an elongated lower support adapted to be secured to such wall a spaced distance below said upper support; and in which the aforesaid securing means are effective for securing said mold form to each of said supports; said upper and lower supports respectively defining downwardly facing and upwardly facing seats constructed to receive the upper and lower edges of a plurality of tiles and support the same in side-by-side adjacency along such wall.

**10.** The apparatus of claim **9** in which said means for securing said mold form to each of said supports includes a latch flange provided by said upper support for interconnection with said mold form, and a shelf provided by said lower support for interconnection with said mold form.

**11.** The apparatus of claim **9** in which said means for securing said mold form to each of said supports includes upper and lower latch plates respectively carried by said mold form and interlockingly engageable with said upper and lower supports.

**12.** The apparatus of claim **9** in which said upper support is an elongated longitudinally extending component defining a water stop generally adjacent the mergence of such tile and wall and any deck generally overlying the same, and said upper support having depending lips bordering said seat and in part defining the same and adapted to lie in substantially contiguous relation with such tile along opposite faces thereof.

**13.** The apparatus of claim **12** in which said upper support is provided with an attachment section therealong; and further including a plurality of straps respectively adapted to be affixed to such wall and each being equipped adjacent an end thereof with a fastener interlockingly engageable with said attachment section to secure said upper support to such wall as aforesaid.

14. The apparatus of claim 9 in which each of said supports comprises a plurality of successive convolutions defining the associated seats, one of said convolutions in said lower support being downwardly extending and adapted to have a fastener project therethrough to secure said lower support to such wall as aforesaid.

15. The apparatus of claim 14 in which said means for securing said mold form to each of said supports includes upper and lower latch plates respectively provided by said mold form and removably insertable into convolutions provided by said supports to releasably interconnect said mold form therewith.

16. The apparatus of claim 9 and further including backing structure adapted to extend along flexible mosaic tile sheets to support the same.

17. The apparatus of claim 16 in which said backing structure has upper and lower edge portions respectively cooperative with said upper and lower supports so as to be held in position thereby.

18. In apparatus for forming a molded concrete deck along the upwardly extending wall of a swimming pool: elongated support means adapted to be secured to such wall in generally horizontal disposition therealong; an elongated mold form section having a surface portion configurated in the finished shape to be imposed thereby upon such deck and having also body portion means adapted to be disposed along such wall in facing orientation therewith; and means for securing said mold form to said support to orient the same therewith in generally horizontal disposition along such wall; said apparatus being in combination with the upwardly extending concrete wall of a swimming pool having a bond beam defining the upper edge thereof, said support being a synthetic plastic component that is substantially moisture impervious and is relatively flexible so as to be bendable in transverse directions to accommodate gradual curvatures along the length of said wall; said support means being an upper support; and further including an elongated lower support adapted to be secured to such wall a spaced distance below said upper support; and in which the aforesaid securing means are effective for securing said mold form to each of said supports; each of said supports being a synthetic plastic component that is substantially moisture impervious and relatively flexible so as to be bendable in transverse directions to accommodate gradual curvatures along the length of said wall, said lower support being removably secured to said wall, said upper support being provided with an attachment section therealong; and further including a plurality of straps respectively affixed to said bond beam and each being equipped adjacent an end thereof with a fastener interlockingly engaging said attachment section to secure said upper support to such wall.

19. The apparatus of claim 18 in which said upper and lower supports respectively define downwardly facing and upwardly facing seats receiving the upper and lower edges of a plurality of side-by-side tiles therein to positively locate the same in aligned juxtaposition to form a row thereof adjacent the upper edge of said wall, and in which said upper support defines a water stop generally adjacent the mergence of such tile and wall and any deck generally overlying the same, said upper support having depending lips bordering said seat and in part defining the same and lying in substantially contiguous relation with such tile along opposite faces thereof.

20. The apparatus of claim 19 in which said means for securing said mold form to each of said supports includes a latch flange provided by said upper support for interconnection with said mold form, and a shelf provided by said lower support for interconnection with said mold form.

21. The apparatus of claim 19 in which each of said supports comprises a plurality of successive convolutions defining the associated seats, one of said convolutions in said lower support being downwardly extending and adapted to have a fastener project therethrough to secure said lower support to such wall as aforesaid.

22. Apparatus for forming a molded concrete deck along the upwardly extending wall of a swimming pool, comprising: an elongated upper support adapted to be secured to such wall and supportingly engage a plurality of side-by-side tiles adjacent the upper edges thereof; an elongated lower support adapted to be secured to such wall a spaced distance below said upper support and supportingly engage a plurality of side-by-side tiles adjacent their lower edges; an elongated mold form section having a surface portion configurated in the finished shape to be imposed thereby upon such deck and having also body portion means adapted to be disposed along such wall in facing orientation therewith; and means for securing said mold form to at least one of said upper and lower supports in generally horizontal disposition along such wall with said configurated surface portion projecting thereabove; said upper and lower supports respectively defining downwardly facing and upwardly facing seats constructed to receive the upper and lower edges of side-by-side tiles therein to positively locate the same in aligned juxtaposition.

23. The apparatus of claim 22 in which said upper support is provided with an attachment section therealong; and further comprising a plurality of straps respectively adapted to be affixed to such wall and each being equipped adjacent an end thereof with a fastener interlockingly engageable with said attachment section to secure said upper support so such wall as aforesaid.

24. The apparatus of claim 23 in which said upper support is an elongated longitudinally extending component defining a water stop generally adjacent the mergence of such tile and wall and any deck generally overlying the same, and said upper support having depending lips bordering said seat and in part defining the same and adapted to lie in substantially contiguous relation with such tile along opposite faces thereof.

25. The apparatus of claim 24 in which said means for supporting said mold form along such wall includes means for releasably securing said mold form to at least one of said supports.

26. Apparatus for forming a molded concrete deck along the upwardly extending wall of a swimming pool, comprising: an elongated upper support adapted to be secured to such wall and supportingly engage a plurality of side-by-side tiles adjacent the upper edges thereof; an elongated lower support adapted to be secured to such wall a spaced distance below said upper support and supportingly engage a plurality of side-by-side tiles adjacent their lower edges; an elongated mold form section having a surface portion configurated in the finished shape to be imposed thereby upon such deck and having also body portion means adapted to be disposed along such wall in facing orientation therewith; and means for supporting said mold form in gen-

erally horizontal disposition along such wall with said configurated surface portion projecting thereabove; said apparatus being in combination with the upwardly extending concrete wall of a swimming pool having a bond beam defining the upper edge thereof, each of said supports being a synthetic plastic component that is substantially moisture impervious and is relatively flexible so as to be bendable in transverse directions to accommodate gradual curvatures along the length of said wall; said upper support being provided with an attachment section therealong, and further comprising a plurality of straps respectively affixed to said bond beam and each being equipped adjacent an end thereof with a fastener interlockingly engaging said attachment section to secure said upper support to such wall, said lower support being removably secured along said wall and said mold form being supported along said wall and secured to said supports.

**27.** The apparatus of claim **26** in which said mold form is releasably secured to at least one of said supports.

**28.** The apparatus of claim **26** and further including a strip of mastic extending along said upper support in overlying relation with portions of both said upper support and wall to attach one to the other.

**29.** Apparatus for forming a molded concrete deck along the upwardly extending wall of a swimming pool and for concurrently holding a narrow band of tile along said wall while said band is being secured thereto, comprising: elongated upper support means adapted to be secured to such wall and supportingly engage a plurality of side-by-side tiles adjacent the upper edges thereof; an elongated lower support means adapted to be secured to such wall a spaced distance below said upper support and supportingly engage a plurality of side-by-side tiles adjacent their lower edges; means for securing said upper and lower means to said wall in generally horizontal disposition therealong; an elongated mold form section having a surface portion configurated in the finished shape to be imposed thereby upon such deck and having also body portion means adapted to be disposed along such wall in facing orientation therewith; and means for securing said mold form to at least one of said upper and lower support means in generally horizontal disposition along such wall and said configurated surface portion projecting thereabove.

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