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Oliver

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[54] **METHOD AND APPARATUS FOR FORMING SWIMMING POOL GUTTERS**

[76] Inventor: **Steve Oliver,** 657 Chestnut, Deerfield, Ill. 60015

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[52] **U.S. Cl.** **264/34;** 249/DIG. 3; 264/35; 264/309; 264/DIG. 72; 425/59

[51] **Int. Cl.²** **E03C 1/00;** E03C 1/24

[58] **Field of Search** ..... 264/31, 34, 35, 256, 309, 264/DIG. 72; 249/177, DIG. 3; 425/59, DIG. 121; 4/172, 172.18, 172.21

[56] **References Cited**

UNITED STATES PATENTS

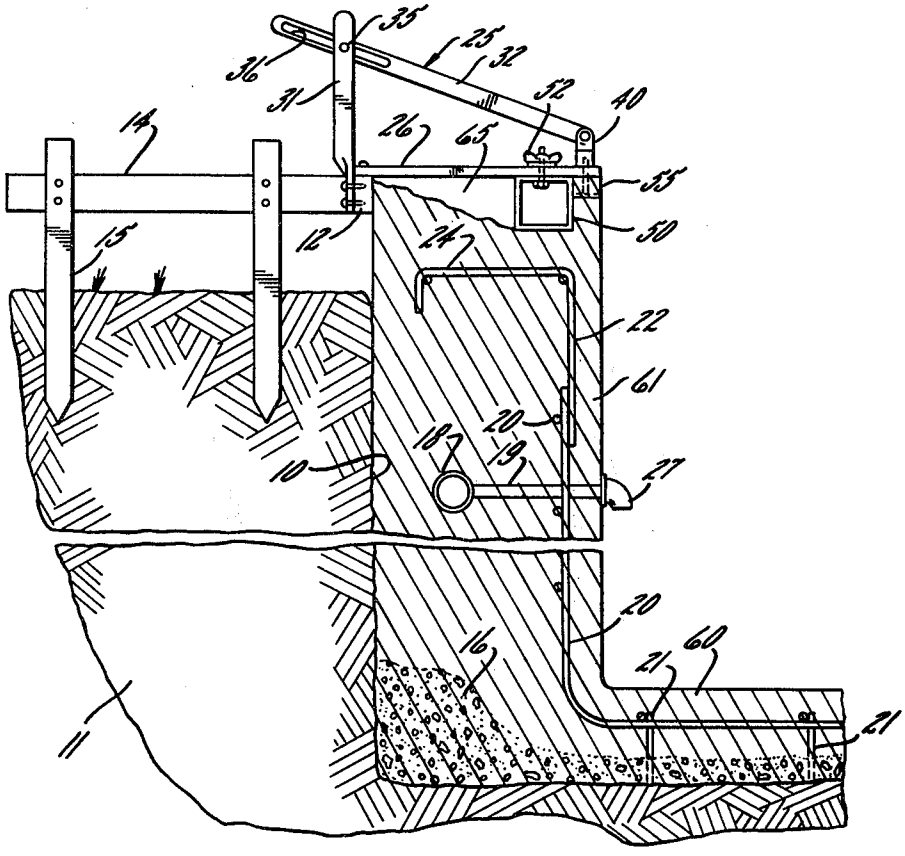
2,140,978	12/1938	Beeby	4/172
2,729,093	1/1956	Ridley	264/31
3,313,515	4/1967	Mullen	249/DIG. 3
3,348,801	10/1967	Denson	249/DIG. 3
3,526,070	9/1970	Denson	4/172 X
3,610,564	10/1971	Mottingly	4/172 X
3,793,428	2/1974	Gordon	264/DIG. 72

Primary Examiner—Robert F. White
Assistant Examiner—Thomas P. Pavelko
Attorney, Agent, or Firm—Wolfe, Hubbard, Leydig, Voit & Osann, Ltd.

[57] **ABSTRACT**

A method for constructing the side wall and gutter section of an in-the-ground, pressure-sprayed concrete, swimming pool and for forming a cantilever deck overlying the pool side wall. The method is performed utilizing apparatus which includes a reusable flat panel that is horizontally positionable over the perimeter of the excavation for the pool and a gutter form removably attachable to the underside of the panel so that upon spraying of concrete the side wall and gutter section can be simultaneously and accurately formed. After completion of the gutter and removal of the gutter forming apparatus, an independent reusable deck form is positionable in the gutter to facilitate laying of the cantilever deck.

9 Claims, 12 Drawing Figures



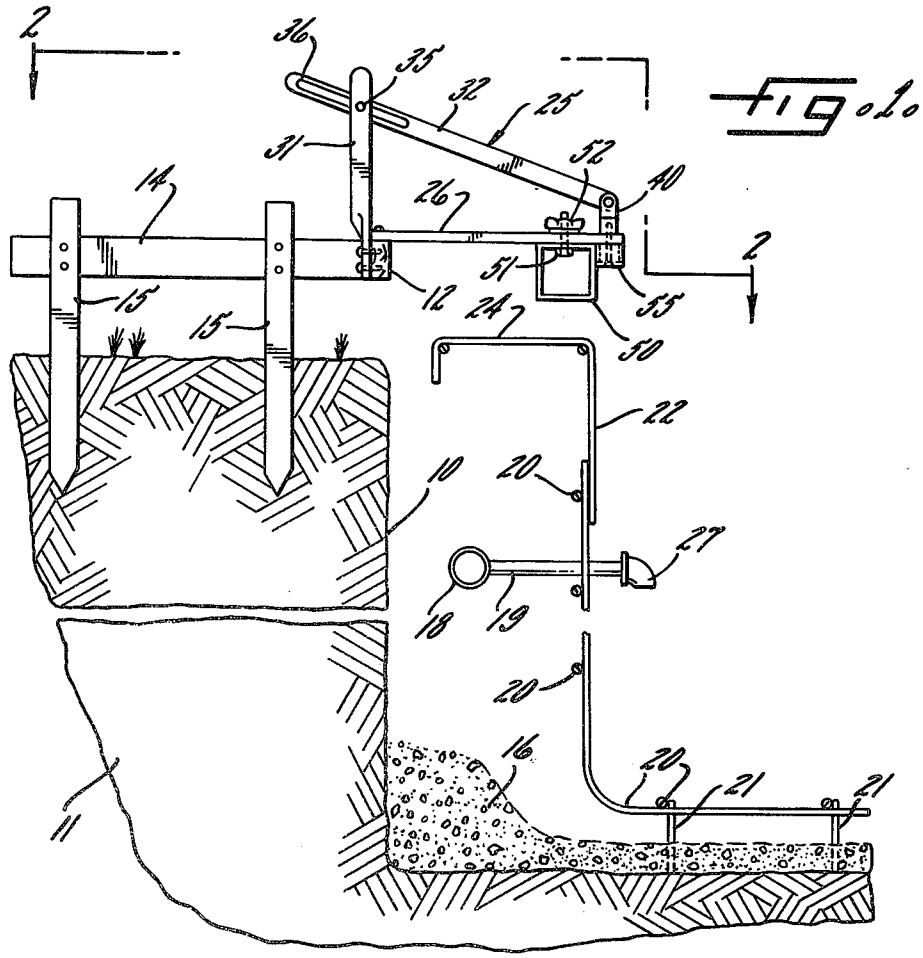

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Fig. 1

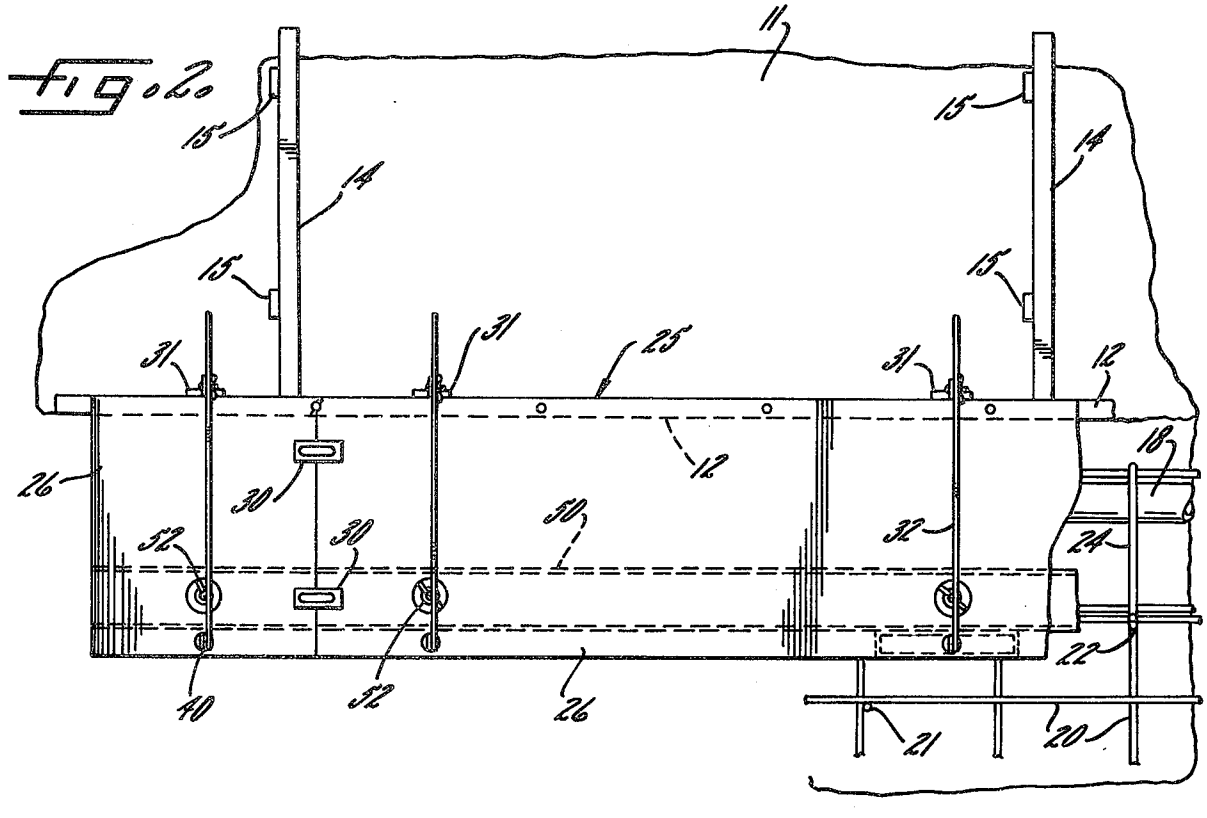

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Fig. 2

Fig. 3

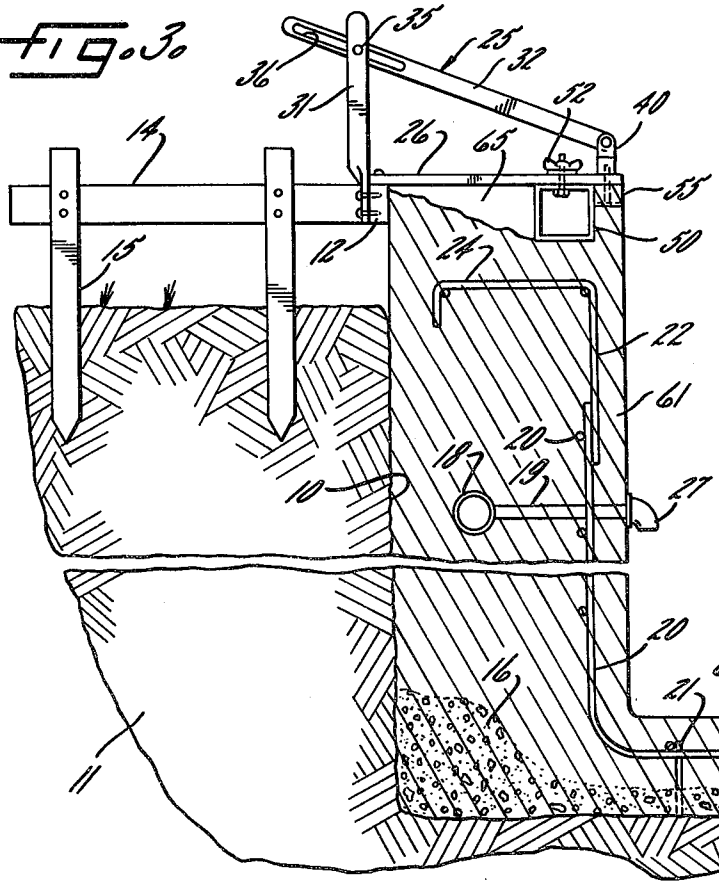


Fig. 6a

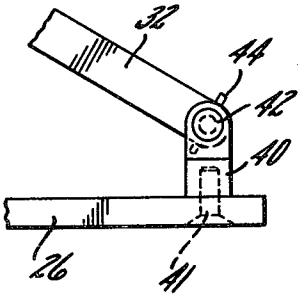


Fig. 4

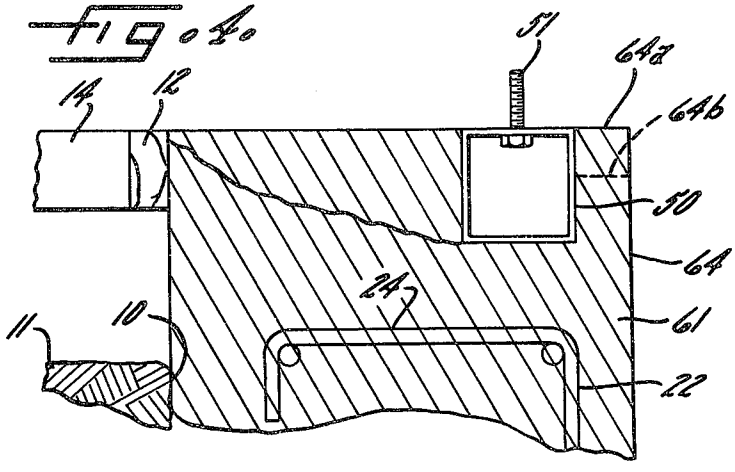


Fig. 5

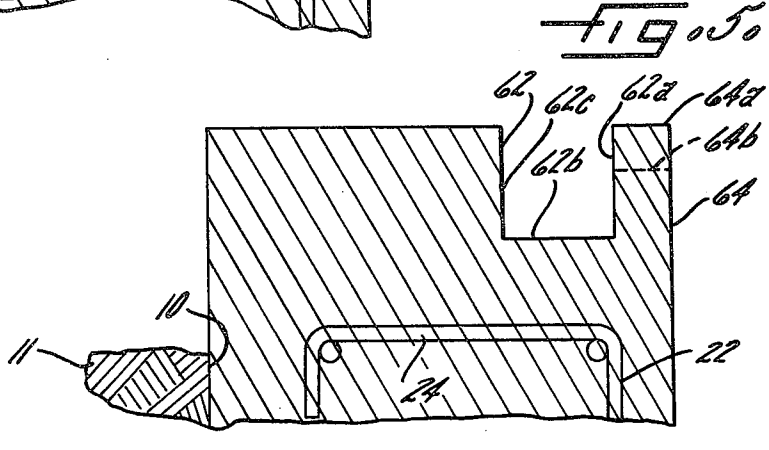


Fig. 6

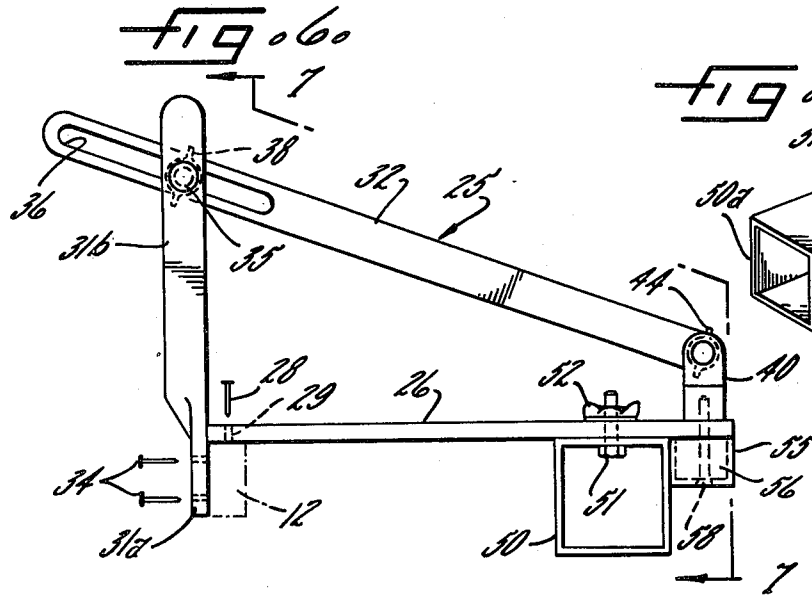


Fig. 8

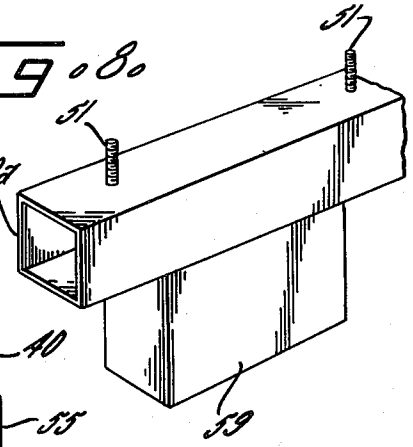


Fig. 7

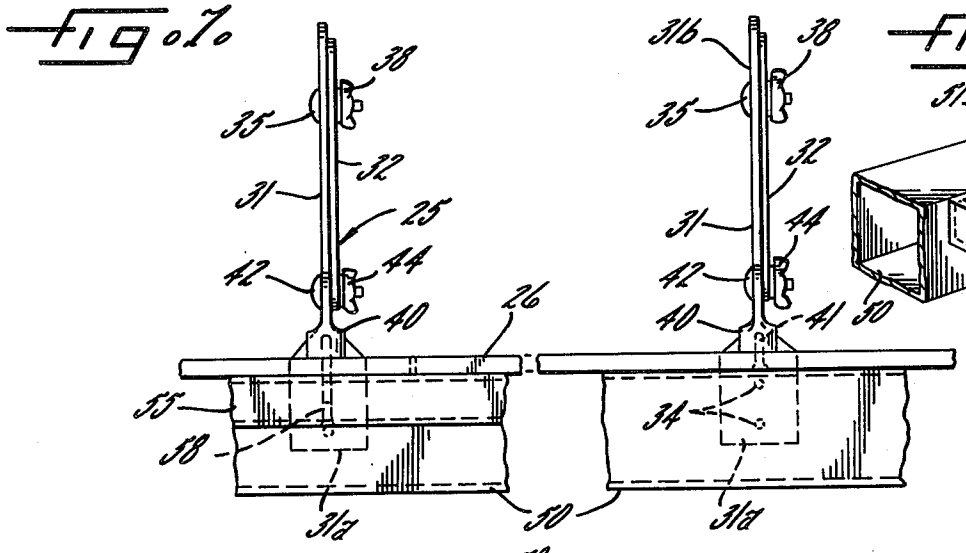


Fig. 9

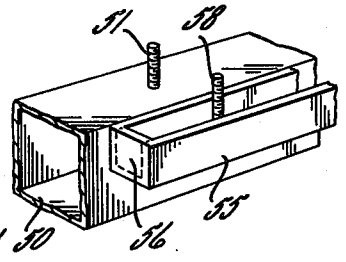


Fig. 10

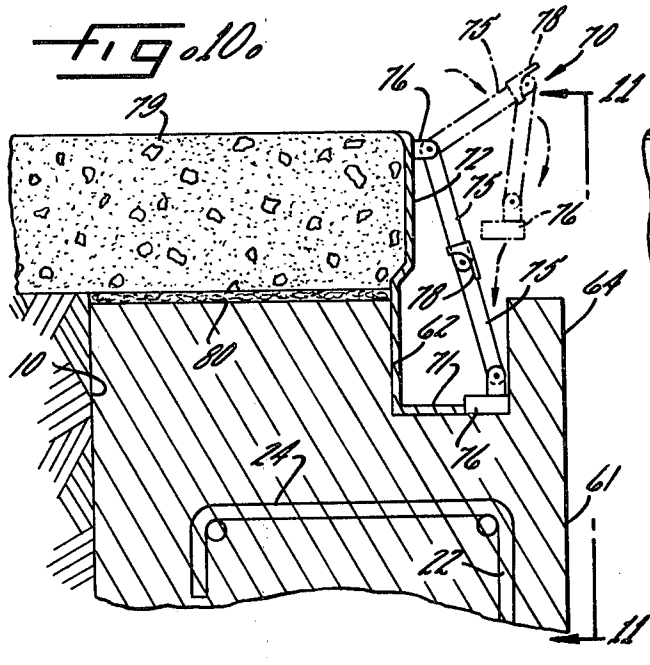
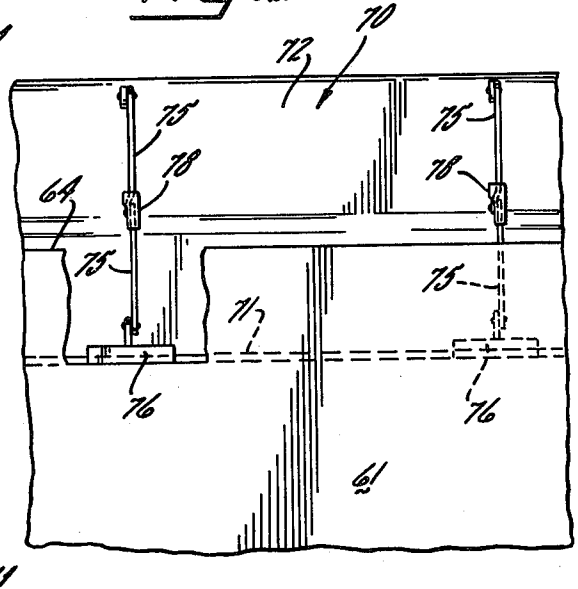


Fig. 11



METHOD AND APPARATUS FOR FORMING SWIMMING POOL GUTTERS

DESCRIPTION OF THE INVENTION

The present invention relates generally to swimming pools, and more particularly, to an improved method and apparatus for forming the gutter section and cantilever deck of swimming pools.

By reason of state and local laws, swimming pools, whether public or private, commonly are required to have a gutter section about its upper perimeter. First, such gutters provide a ledge which a swimmer may readily grasp and hold when in the pool. In addition, such gutters have facilitated the recirculation of pool water when selected areas of the gutter ledge are relieved to permit the continuous flow of water into the gutter, which water then drains to a central pumping area for recirculation through a filtering system and back into the pool.

While the gutter has been a relatively important feature of swimming pools, it heretofore has been a time consuming and relatively expensive portion of the pool to contruct, particularly in pools that are formed from a pressure-sprayed concrete and sand mixture, commonly called gunite. In such gunite pools, it generally has been necessary to independently construct the gutter after the pool side walls have been formed. In one prior gutter construction method, for example, when the side walls of the pool have been completed, a bond beam is separately formed on top of the side walls to define an outer wall of the gutter. The inner wall or ledge of the gutter is then manually constructed out of several slabs of tile. These several steps of forming the side wall, bond beam, and tile ledge generally each must be carried out on successive days.

In another method of constructing the gutter of such gunite pools, following formation of the basic side walls of the pool, a metal frame is constructed on top of the side walls, onto which a stainless steel preformed gutter is secured. After the steel gutter is in place, gunite in then shot to fill in the areas below and to the side of the gutter to complete the pool side wall and to permanently embed the steel gutter therein. Such a multi-step process again usually requires several working days to complete. In addition, since the steel gutter form remains in the side wall, it substantially increases the cost of the pool.

When a cantilever deck is to be constructed outwardly from the top of the pool side walls, certain of these prior gutter constructions have presented still further problems. In many gunite formed swimming pools, the upper surface of the pool side wall, or the bond beam, is left relatively rough and uneven, and must be manually leveled and smoothed before the cantilever deck may be laid. Such procedure further increases the construction time of the pool, and thus, the cost.

It is an object of the present invention to provide a method and apparatus for more efficiently and economically forming the gutter of a gunite constructed swimming pool.

Another object is to provide a method of forming a substantially monolithic gutter section in a gunite swimming pool. A related object is to provide such a method which permits simultaneous formation of the gutter and side wall and enables their completion in a single working day.

A further object is to provide a method and apparatus as characterized above which is adapted to form the gutter with a smooth, finished appearance.

Yet another object is to provide a method and apparatus of the above kind which facilitates the accurate and efficient laying of a concrete cantilever deck upon the pool side wall.

Still another object is to provide an apparatus of the above kind that is reusable and substantially maintenance free.

Other objects and advantages of the invention will become apparent upon reading the following detailed description and upon reference to the drawings in which:

FIG. **1** is a vertical section showing an excavation with gutter forming apparatus embodying the present invention in assembled relation thereto;

FIG. **2** is an enlarged top view of the apparatus shown in FIG. **1** taken in the plane of line **2—2;**

FIG. **3** is a vertical section comparable to FIG. **1,** but showing the excavation after gunite has been shot to form the bottom and side walls of the pool;

FIG. **4** is an enlarged vertical section of the upper side wall of the pool with a portion of the gutter forming apparatus removed and additional gunite applied to complete the side wall and gutter;

FIG. **5** is a vertical section, comparable to FIG. **4,** but showing the final gutter construction with the gutter forming apparatus completely removed;

FIG. **6** is an enlarged elevational view of the gutter forming apparatus of the present invention;

FIG. **6*a*** shows a second form of means for securing the leveling arm to the shooting panel of the illustrated apparatus;

FIG. **7** is a plane view of the gutter forming apparatus shown in FIG. **6** taken in the plane of line **7—7;**

FIG. **8** is a perspective of one of the gutter forms used with the apparatus of the present invention for further forming a drain section of the gutter;

FIG. **9** is a perspective of the gutter form shown in FIG. **6** with a weir form supported adjacent thereto;

FIG. **10** is a vertical section of the finished gutter, comparable to FIG. **5,** but showing a cantilever deck forming apparatus embodying the present invention supported therein and a concrete cantilever deck laid on top of the pool side wall; and

FIG. **11** is a side elevation view of the cantilever deck forming apparatus shown in FIG. **10** taken in the plane of line **11—11.**

While the invention is susceptible to various modifications and alternative forms, a specific embodiment thereof has been shown by way of example in drawings and will herein be described in detail. It should be understood, however, that it is not intended to limit the invention to the particular form disclosed, but, on the contrary, the intention is to cover all modifications, equavalents, and alternatives falling within the spirit and scope of the invention.

Referring more particularly to FIG. **1** of the drawings, there is shown an excavation **10** in the ground **11** that has been made for the purpose of constructing a swimming pool. Prior to excavating, a wood perimeter rail **12** is set up to define the outer periphery of the excavation. The perimeter rail **12** is supported by a plurality of horizontal support members **14** which in turn are each nailed to a pair of stakes **15** that are driven into the ground at outwardly spaced distances from the periphery of the intended excavation. Follow-

ing excavation, gravel **16** is spread throughout the bottom of the hole in a customary manner, such as at a gradually decreasing depth from about 6 inches in the deep end of the pool to about 3 inches in the shallow end. Appropriate plumbing may then be installed. In the illustrated embodiment, as shown in FIG. **1**, there is a horizontal water supply line **18** supported in spaced relation from the side of the excavation **10** at a position such that it will be encompassed within the side wall of the completed pool. A plurality of inwardly projecting pipes **19**, each with a discharge nozzle **27**, extend from the supply line **18**. It will be understood that the water may be supplied to the line **18** from a central pumping station in a conventional manner.

To provide reinforcement for the bottom and side walls of the pool a network **20** of crossing, interconnected reinforcing rods are supported in spaced relation to the walls of the excavation **10** by suitable means, including support brackets **21**. In order to further enhance the strength in the upper or bond beam section of the pool side walls, J-shaped reinforcing rods **22**, each with an outwardly extending leg **24**, are secured to the top of the reinforcing network **20** at spaced intervals.

In accordance with the invention, a reusable gutter forming apparatus is provided which permits efficient and economical formation of a gutter in the pool side walls as the side walls are being gunite formed. To this end, a gutter forming apparatus **25** is provided which includes a plurality of flat shooting panels **26** disposed in end-to-end relation about the perimeter of the excavation **10**, with each panel **26** being secured at one side to the perimeter rail **12** and extending in cantilever fashion over the periphery of the excavation. The illustrated shooting panels **26** are secured to the perimeter rail by nails **28** which pass through apertures **29** formed along the side of the panels (FIG. **6**). The shooting panels **26** preferably are made of aluminum of about ¼-inch thickness and each is of a length, such as 8 feet, which enables it to be readily handled and nailed to the perimeter rail **12**. Suitable fastening means, such as releasable brackets **30**, preferably are provided for interconnecting the panels **26** in end-to-end relation.

For adjustably supporting the shooting panels **26** in a substantially horizontal position, a plurality of braces **31** are secured to the perimeter rail **12** in upstanding relation and an adjustable leveling arm **32** is secured between the upper end of each brace **31** and the opposite cantilever end of the shooting panel **26**. The braces **31** each are formed with a flat bottom portion **31***a* having apertures through which fasteners such as nails **34** may be passed to secure the brace to the perimeter rail **12** (FIG. **6**). An upper portion **31***b* of each brace **31** is perpendicularly disposed relative to its lower portion **31***a* and formed with an aperture for receiving a locking bolt **35**. To permit selective positioning of the leveling arm **32** relative to the upper end of the brace **31**, and thus adjustable positioning of the cantilever end of the shooting panel **26**, the leveling arm **32** is formed with an elongated slot **36** through which the bolt **35** passes. A wing nut **38** is engagable with the bolt **35** for securing the arm **32** to the brace **31** at the desired position (FIG. **6**). For securing the opposite end of the leveling arm **32** to the cantilever end of the shooting panel **26** in the usual case, as shown in FIG. **6***a*, a nut **40** is pivotably mounted at the end of the arm **32** and is adapted for threaded engagement by a screw **41** passing through an appropriate aperture formed in the shooting panel. The nuts **40** in this instance each are mounted on a stud **42** that passes through the end of the arm **32** and is secured by a wing nut **44**. The appertures in the panel **26** are countersunk to receive the heads of the screws **41** so that the underside of the shooting panel has a substantially uninterrupted flat surface.

For the purpose of defining a gutter section in the finished pool wall, a gutter form **50** is detachably secured to the underside of each shooting panel **26**. The gutter form in this case is a hollow, open-ended, square tubular member preferably made of aluminum. The gutter form **50** is removably secured to its respective shooting panel by studs **51** passing through aligned apertures formed in the top of the gutter form and the shooting panel for engagement by wing nuts **52**. Suitable means may be provided for retaining the studs within the gutter form apertures to facilitate mounting of the gutter form to the shooting panel. The gutter forms **50** preferably are of the same length as the shooting panel **26**, such as 8 feet, and are secured to the gutter form after the shooting panel has been adjusted to a substantially horizontal position by the leveling arms **32**. After the gutter form is attached, the leveling arm **32** may be readjusted if necessary to insure horizontal positioning of the shooting panel. Since the shooting panels **26** are secured in end-to-end relation, the abutting ends of the gutter forms need not be positively secured together. As will become apparent, with the gutter forms **50** attached to the underside of the shooting panel **26**, when the pool side wall is formed by pressure sprayed gunite the shooting panel **26** and gutter form **50** will define the upper surface of the side wall and gutter therein, respectively.

To form relieved sections in the finished gutter ledge so as to permit the flow of water from the pool into the gutter at selected locations about the pool, weir forms **55** are secured immediately adjacent the gutter form **50** at spaced intervals. Each illustrated weir from **55** is an upturned channel supported against the underside of the shooting panel **26**. Since the weir forms are located only at spaced intervals, the ends of the weir forms each are enclosed by an end panel **56**. To secure the weir form **55** to the shooting panel **26**, a screw **58** passes through each weir form and shooting panel and is threadably engaged by the pivotable nut **40** of the associated leveling arm **32**. It will be appreciated that when a weir form **55** is so secured to the shooting panel, the screws **41** normally used to secure the shooting panel to the leveling arm are replaced by the longer weir form securing screws **58**. Since the weir form **55** is immediately adjacent the gutter form **50**, a single bolt at its center generally is sufficient to retain it against relative rotational movement. The apertures in the weir form **55** through which the screws **58** pass again preferably are countersunk to receive the head of the screws.

In order to provide a drain area in the finished gutter that can be connected to a suitable converter to facilitate recirculation of water entering the gutter, one of the gutter forms **50***a* has a gutter drain form **59** secured to the underside thereof, as shown in FIG. **8**. The gutter drain form **59** in this case is a rectangular enclosure permanently welded to the underside of the gutter from **50***a*. Since for each pool there generally is required only a single drain area into which water from the entire gutter flows, only one of the gutter sections need be provided with a drain form **59**.

Prior to assembling the gutter forming apparatus **25** in position over the excavation, a lubricant, such as vegetable oil or the like, preferably is applied to the surfaces of the panels **26,** forms **50** and weir forms **55** that will later be exposed to gunite concrete. Such lubricant will prevent sticking of the forms to the concrete and permit easier removal of the forms from the finished pool side wall, as will become apparent. By applying the lubricant prior to assembling of the apparatus over the excavation it will prevent undesirable drippage of the lubricant onto the steel reinforcing rods **20** and plumbing **18.**

With the gutter forming apparatus finally positioned and lubricated, the construction area is ready for the pressure sprayed application of gunite concrete to form the pool bottom and side walls. As is well known in the art, gunite concrete may be directed against the bottom and side walls of the excavation to the desired thickness. As shown in FIG. **3,** gunite has been applied to form a pool bottom **60** with a thickness sufficient to completely encompass the reinforcing network of rods **20.** The side walls **61** likewise have formed to encompass the reinforcing network, as well as the water supply line **18** and the outwardly extending inlet pipes **19.** The spray nozzles **27** of the outlet pipes remain exposed. It will be appreciated that while in the illustrated embodiment the side wall **61** of the pool is of uniform thichness alternatively the upper portion of the side wall may be of greater thickness than the lower portion so as to form a more conventional bond beam appearance.

As further shown in FIG. **3,** in forming the side wall **61** gunite concrete is directed about an outer side surface and a bottom surface of the gutter form **50,** which defines in the side wall one side **62***a* and a bottom **62***b* of a gutter **62.** In addition, an outer bottom surface of the shooting panel **26** establishes a top surface **64***a* of a gutter ledge **64** at locations between longitudinally spaced weir forms **55,** and the weir forms **55** define a relieved section **64***b* in the ledge. In view of the location from which the gunite must be sprayed, however, a relatively small void **65** may result on the opposite side of the gutter form **50** (FIG. **3**). To complete the formation of the pool side wall **61** and gutter wall **62***c*, therefore, the wing nut **52** may be removed to permit disassembly and removal of the shooting panel **26** while leaving the gutter form **50** in place. With the gutter form **50** remaining, the void **65** may then be filled, as shown in FIG. **4.** The gutter form **50** is then removed, leaving a smooth, finished appearing gutter **62** with an outer ledge **64.** As is inherent in such gunite spraying, although a portion of the wall section is shot at a later time there are no substantial adverse effects in the appearance or strength of the final wall section. It will be seen that the drain form **59** of the gutter form **50***a* will similarly establish a drain recess (not shown) in the completed pool side wall **61** below the level of the gutter. Because of the extremely smooth surfaces which result in the formation of the gutter **62** by use of the apparatus **25,** it will be further apparent that mere painting of the gutter, or any other cover, will achieve an attractive finished appearance.

In keeping with the invention, a reusable cantilever deck form **70** is provided to facilitate laying a concrete cantilever deck on top of the pool side wall **61.** As shown in FIGS. **10** and **11,** the deck form **70,** which again preferably is made of aluminum, includes a base **71** and an upstanding portion **72.** The base **71** is positionable in the botton of the formed gutter **62,** and the upstanding portion **72** has a contoured upper end for defining the side of the deck. To releasably secure the deck form **70** in the gutter **62,** there is a bracket including a pair of collapsible arm members **75** which are rotatably journaled together at one end. The opposite end of one of the arm members **75** is rotatably secured to a mounting bracket **76** at the upper end of the cantilever form **70,** and opposite end of the other arm member **75** is rotatably attached to a mounting bracket of an aluminum foot **76.** As shown in FIG. **10,** when the arms **75** are in a raised collapsed position, shown in phantom, the cantilever form **70** may be placed into the gutter **62.** The foot **76** may then be positioned adjacent the end of the form base **71** to firmly secure it in place. A suitable latch **78** is provided for securing the arms in their extended locked position.

With the cantilever form **70** in position in the gutter **62,** the upper end of the upstanding portion **72** will establish the outer contour of a poured concrete cantilever deck **79.** Prior to laying the concrete, a suitable expansion layer **80,** such as rubber, is first provided on top of the rearward or bond beam section of the pool side wall **61.** After the cantilever deck has been poured and set, by merely releasing the latch **78** and collapsing the arms **75** the foot **76** may be raised out of its securing position to permit removal of the form **70** from the gutter.

From the foregoing, it will be seen that the use of the method and apparatus of the present invention provides an efficient and economical means for constructing a substantially monolithic or one piece pool gutter and side wall. In summary, the construction steps are as follows. First, the perimeter rail **12** is set to establish the outer periphery of the excavation **10.** The hole for the pool is then excavated, gravel **16** placed in the bottom, and plumbing **18** and reinforcing rods **20, 22** set up. The gutter forming apparatus **25** may then be secured in place. The shooting panels **26** are nailed along their edges to the perimeter rail **12** in end-to-end relation. Support braces **31** likewise are nailed to the perimeter rail **12** and the leveling arms **32** are adjusted to support the shooting panel **26** in a substantially horizontal position. The gutter sections **50, 50***a* may then be secured to the underside of the shooting panel **26** in end-to-end relation, with the gutter form **50***a* located at the gutter drain location. In addition, weir forms **55** are secured to the underside of the shooting panels **26** immediately adjacent the gutter form and at spaced intervals about the perimeter of the pool.

With the gutter forming apparatus in place, the gunite may then be shot to form the bottom **60** and side walls **61** of the pool to the appropriate thickness. In doing so, the gutter ledge **64,** including its relieved sections **64***b*, are precisely and smoothly formed. The gutter **62** itself also is formed, except for a possible void **65** which may be left due to the inability to shoot gunite into the area immediately behind the gutter form **50.** Upon removal of the wing nut **52,** the shooting panel **26** together with the weir forms **55** may be removed leaving the gutter form **55** in place. Any void **65** may then be filled to complete the side wall **61** and guttter **62.** The cantilever form **70** may then be secured in the gutter **62** to facilitate pouring of a cantilever deck.

It will be appreciated that the foregoing method and apparatus enables the construction of a monolithic or one piece pool side wall and gutter section in significantly shorter time than previously required. In addi-

tion, the gutter and ledge have a smooth finish which can be easily and attractively painted or otherwise covered if desired. Moreover, the gutter forming apparatus is reusable so that there is no necessity of leaving expensive metal forms permanently in the pool.

I claim as my invention:

1. A method of constructing in an excavation in the ground a swimming pool wall with a gutter about its periphery comprising supporting an elongated flat form panel in a substantially horizontal position above the periphery of said excavation and parallel to the upper side of the intended pool wall securing an elongated gutter form to the underside of said panel in parallel relation to said panel, pressure spray directing concrete from within said excavation toward the side of said excavation and the underside of said elongated form panel and gutter form thereby simultaneously forming a side wall of a pool with the upper side thereof at least partially bounded by said form panel and at least patially forming a gutter in the upper portion of said side wall, and removing said panel and gutter form.

2. The method of claim **1** including supporting said panel from one side in cantilever fashion over the outer perimeter of said excavation.

3. The method of claim **2** including supporting said panel by fastening it to a rail positioned in elevated adjacent the periphery of said excavation.

4. The method of claim **1** including only partially forming said gutter during pressure directing of said concrete with said form panel and gutter form in place, removing said form panel, pressure spray directing additional concrete with only said gutter form in place to complete the formation of said gutter, and removing said gutter form.

5. The method of claim **1** including applying a lubricant to said panel and gutter form prior to pressure directing of said concrete for preventing excessive cohesion of said concrete to said panel and gutter form.

6. The method of claim **1** including supporting a plurality of said elongated form panels in end-to-end relation about the perimeter of said excavation, and releasably securing said form panels together.

7. The method of claim **6** including securing a plurality of weir forms at longitudinally spaced intervals to the underside of said panels immediately adjacent said gutter form, and pressure directing said concrete about said gutter and weir forms to form a gutter with a ledge having longitudinally spaced relieved areas.

8. The method of claim **1** including supporting a cantilever deck form in the gutter formed by said panel and gutter form after removal of said panel and gutter form. and laying a concrete deck on top of said pool side wall immediately adjacent said gutter with said cantilever deck form defining the side of said deck, and removing said cantillever deck form from said gutter following laying of said deck.

9. The method of claim **4** including forming a bottom surface and one side surface of said gutter when said panel and gutter form are in place, and forming a second opposed side surface of said gutter after removal of said panel.

* * * * *