# United States Patent

[11] 3,600,773


[72] Inventors **Leland J. Davis**
**1409 N. Mar Les Drive, Santa Ana, Calif. 92706;**
**Paul T. Ogilvie, 1129 Orangegrove, Orange, Calif. 92667**



[21] Appl. No. **810,645**
[22] Filed **Mar. 26, 1969**
[45] Patented **Aug. 24, 1971**


[54] **CONCRETE-FORMING DEVICE**
**9 Claims, 14 Drawing Figs.**


[52] **U.S. Cl.** ..... **25/118 W,** 25/132, 249/2, 249/8
[51] **Int. Cl.** ..... **E01c 19/50**
[50] **Field of Search** ..... 249/2, 8; 25/2, 118 N, 41.1, 41 J, 32; 94/46 A



[56] **References Cited**

UNITED STATES PATENTS

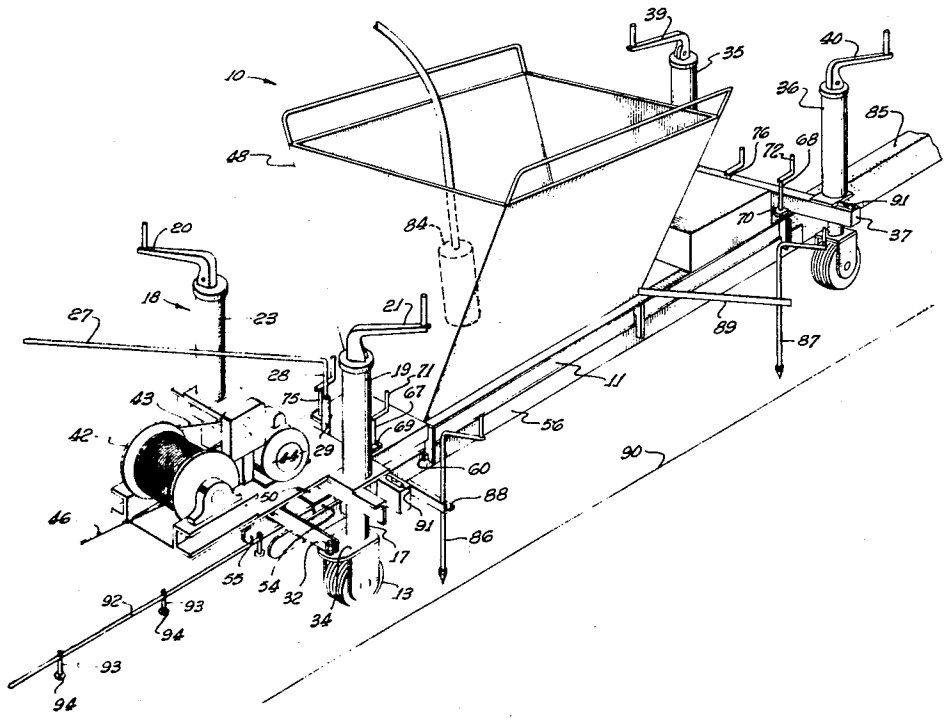
| | | | |
|---|---|---|---|
| 2,524,683 | 10/1950 | Sumpf | 25/41 (R) |
| 3,177,552 | 4/1965 | Roth | 25/2 X |
| 3,193,902 | 7/1965 | Cheney | 25/2 X |
| 3,200,177 | 8/1965 | Dodd | 25/2 X |
| 3,292,227 | 12/1966 | Olds | 25/2 |
| 2,225,015 | 12/1940 | Lebelle | 25/118 W |
| 2,818,790 | 1/1958 | Canfield et al. | 25/118 W |
| 3,115,074 | 12/1963 | Smith | 94/46 A |
| 3,175,478 | 3/1965 | Smith | 94/46 A |



*Primary Examiner*—J. Spencer Overholser
*Assistant Examiner*—Ben D. Tobor
*Attorney*—Gausewitz & Carr



**ABSTRACT:** A concrete-forming device that includes an elongated open-ended mold complementary to a shape to be produced, the mold having movable lower side edge portions resiliently biased downwardly to accommodate surface irregularities for confining the concrete in the mold, with adjustable means being provided for obtaining further movement of the lower side edge portions. A hopper communicates with the upper portion of the mold for receiving concrete to flow by gravity into the mold, and a vibrator is introduced into the concrete to cause it to fill the entire section of the mold. Steerable wheels are at the front of the unit, which is powered by an electric motor winding a cable to pull the machine forwardly.

Patented Aug. 24, 1971 3,600,773

6 Sheets-Sheet 1

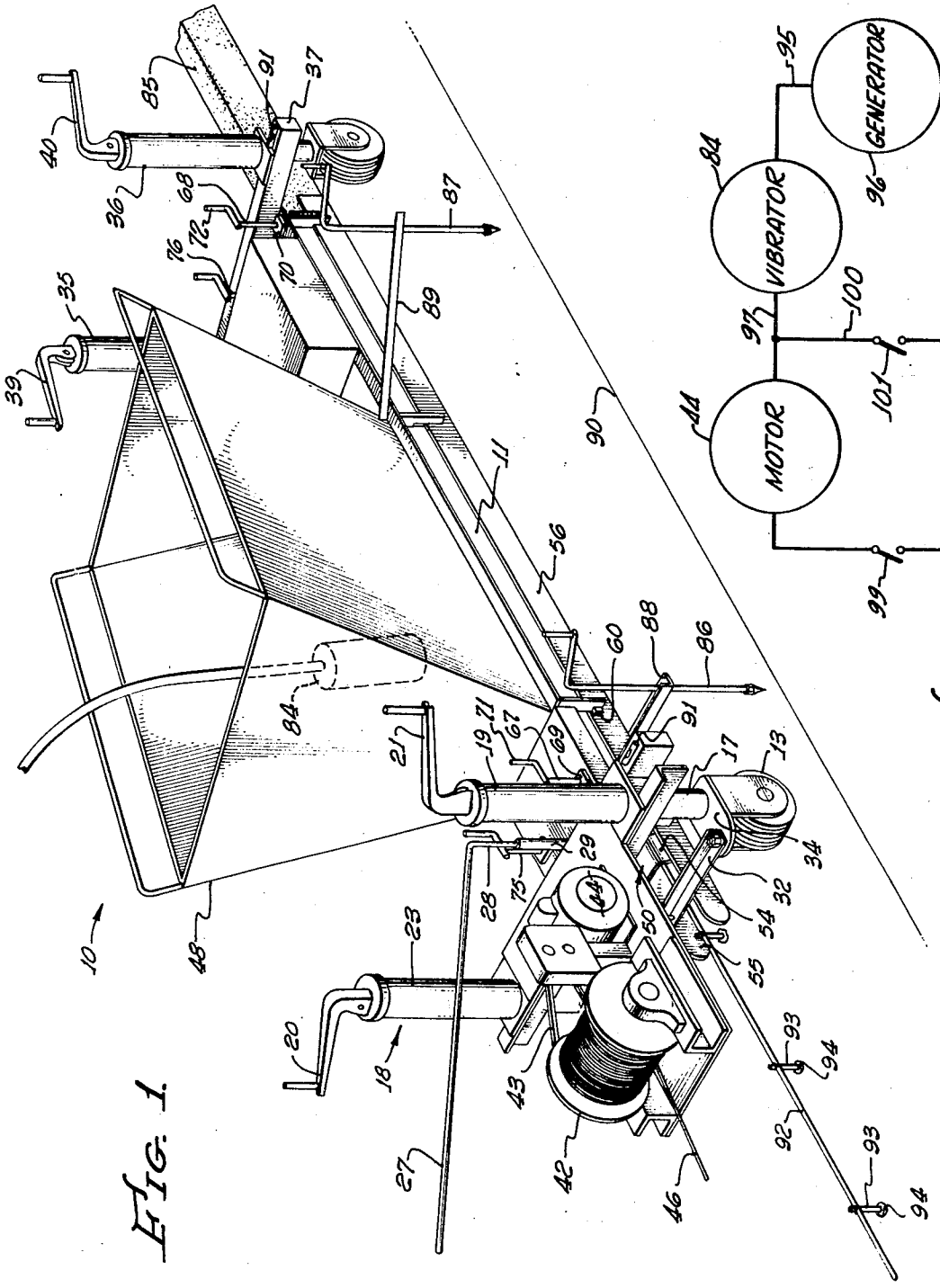


FIG. 1.




FIG. 9.

INVENTORS.
LELAND J. DAVIS
PAUL T. OGILVIE
BY
Jaworsky & Carr.
ATTORNEYS.

FIG. 2.

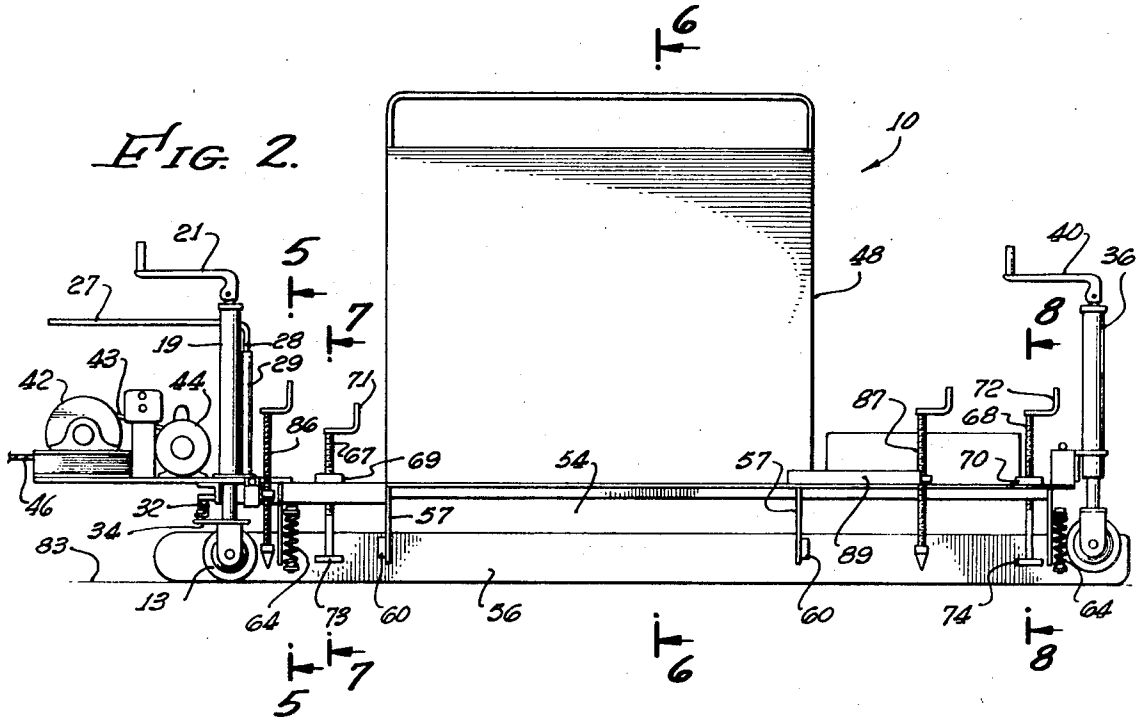
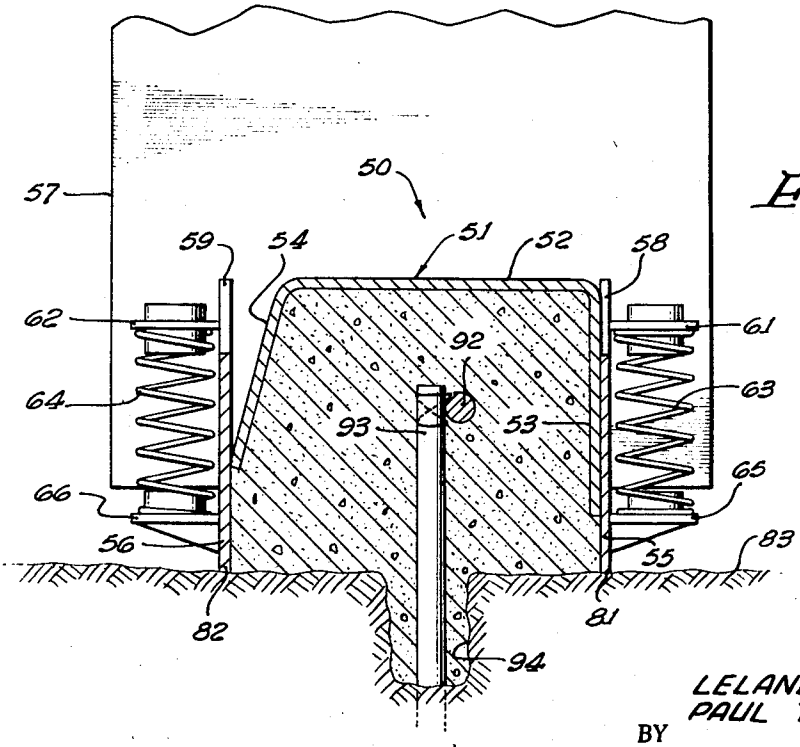



FIG. 5.




INVENTORS.
LELAND J. DAVIS
PAUL T. OGILVIE

BY

Jansewitz & Carr.
ATTORNEYS.

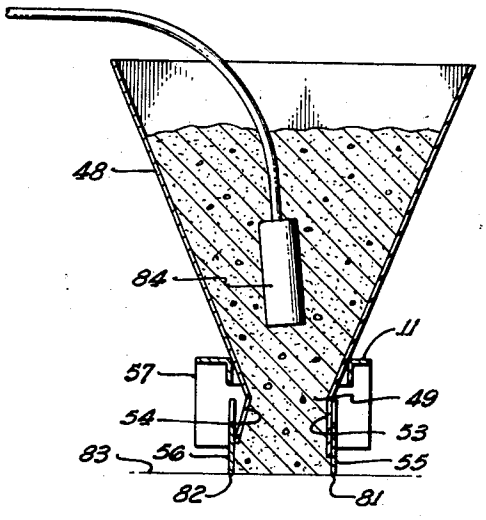



FIG. 6.

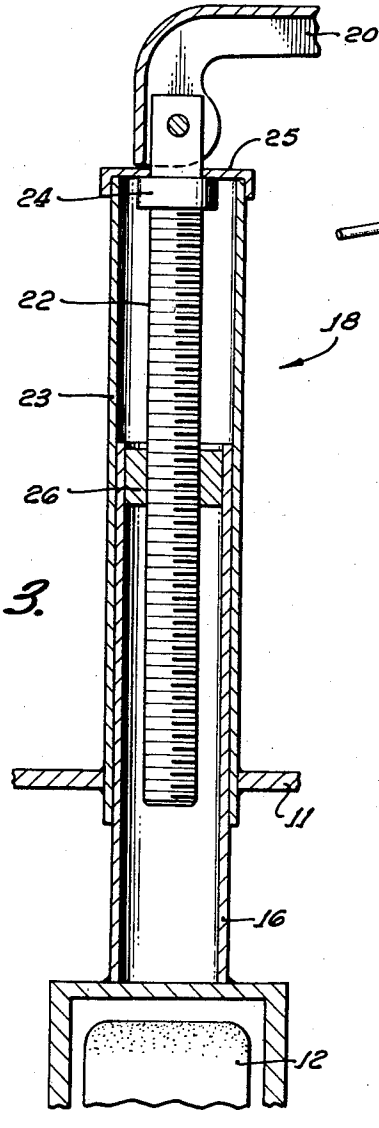



FIG. 3.

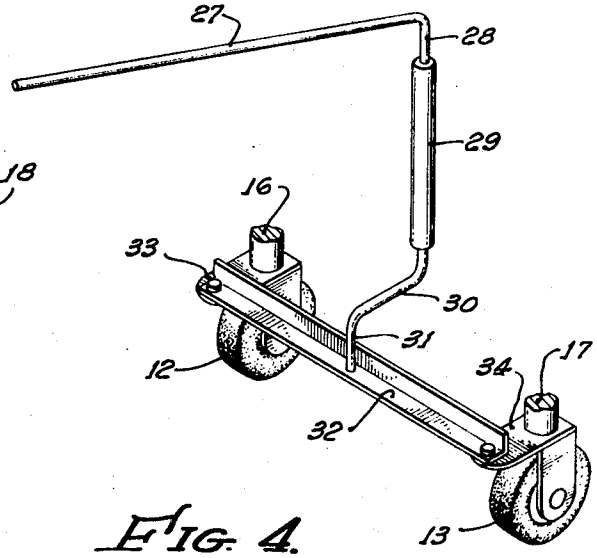



FIG. 4.

INVENTORS.
LELAND J. DAVIS
PAUL T. OGILVIE
BY
Janeway & Carr.
ATTORNEYS.

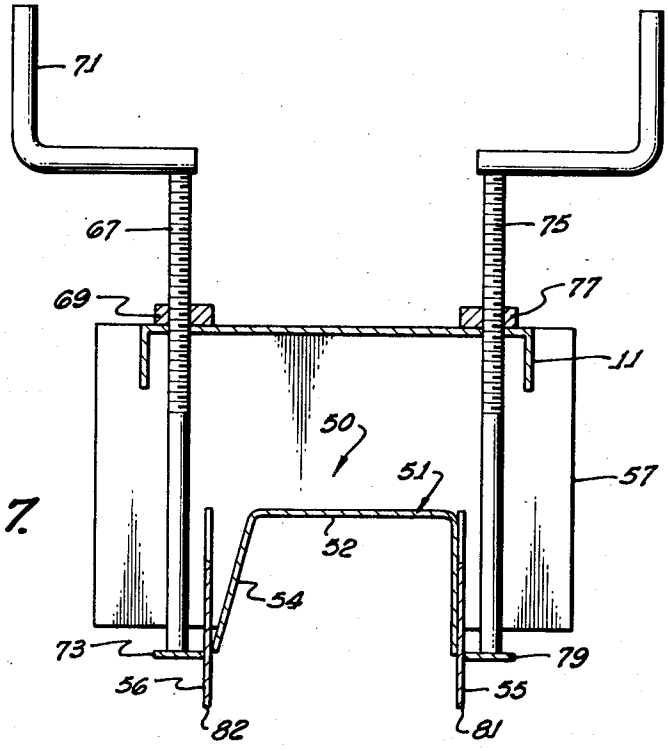



FIG. 7.

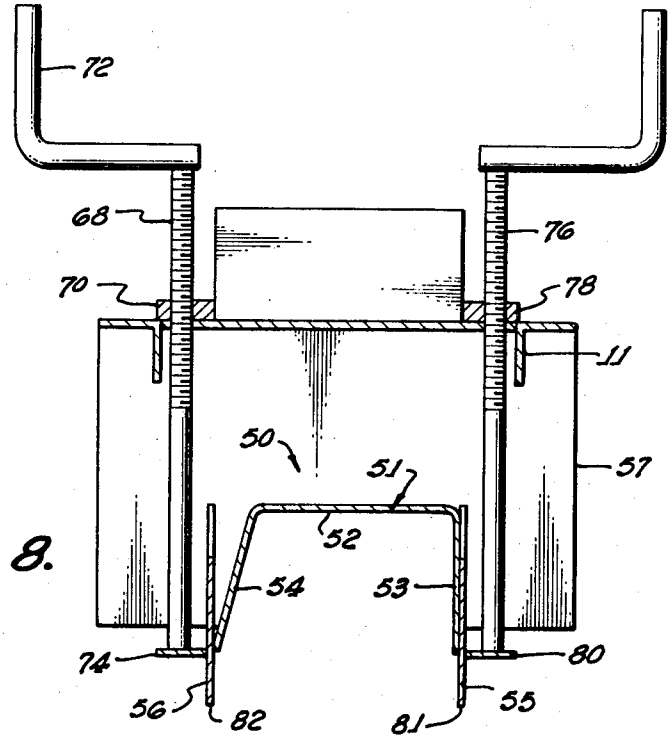



FIG. 8.

INVENTORS.
LELAND J. DAVIS
PAUL T. OGILVIE
BY
Jamieson & Burr
ATTORNEYS.

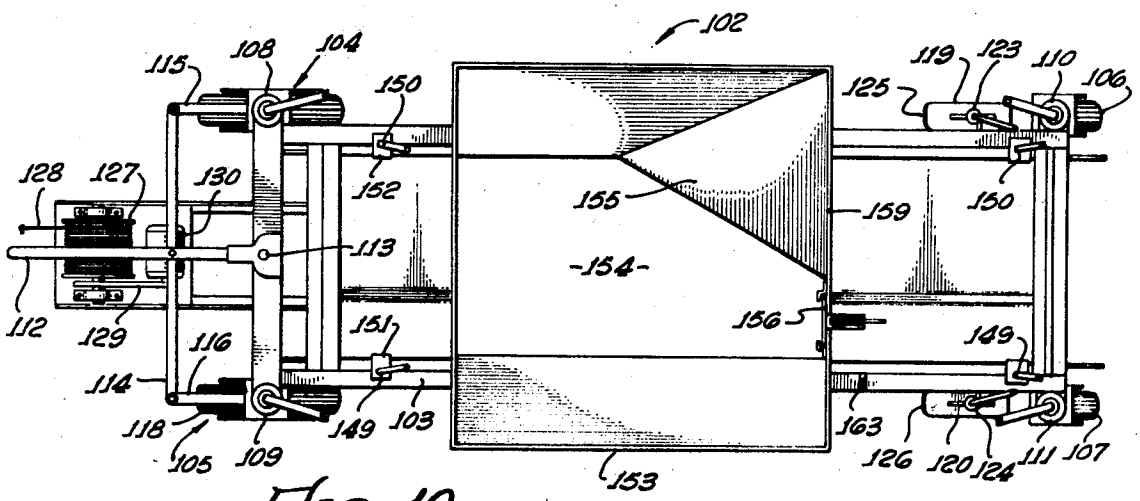



FIG. 10.

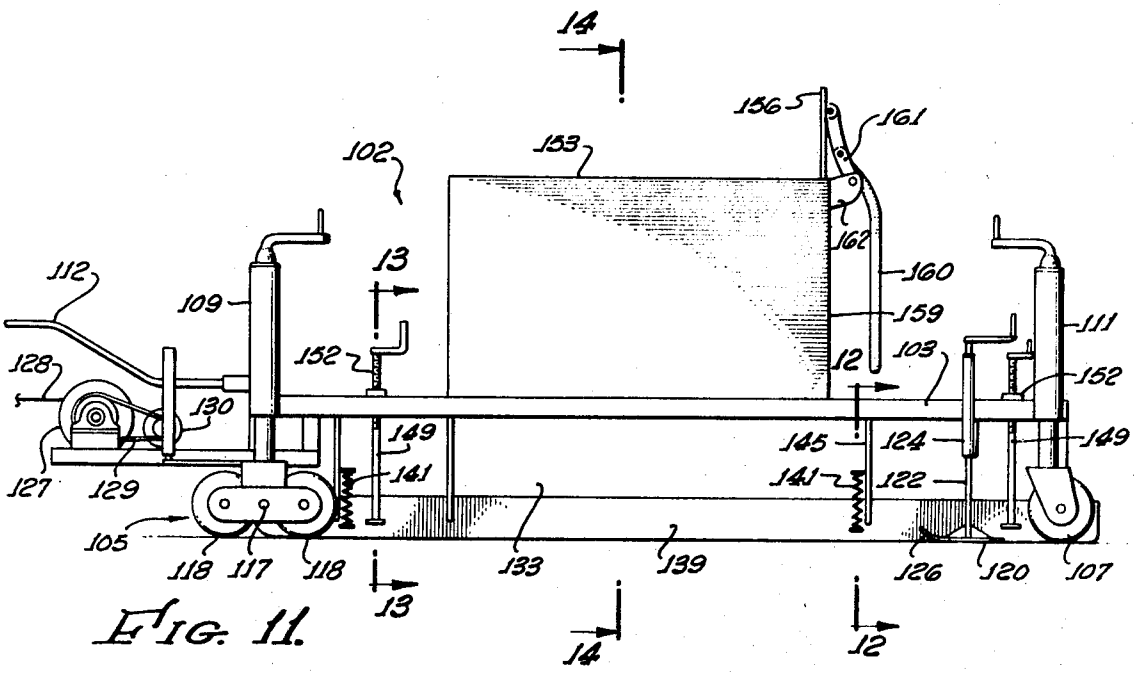



FIG. 11.

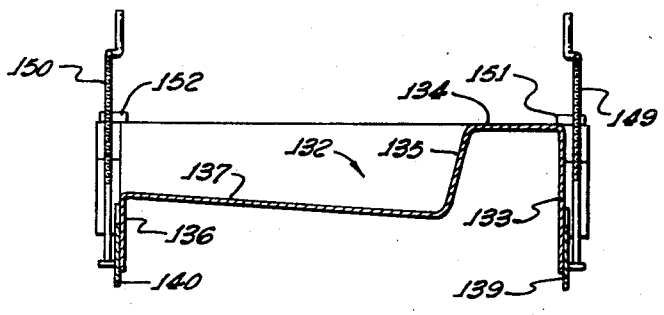



FIG. 13.

INVENTORS.
LELAND J. DAVIS
PAUL T. OGILVIE
BY
Jansweig & Carr
ATTORNEYS.

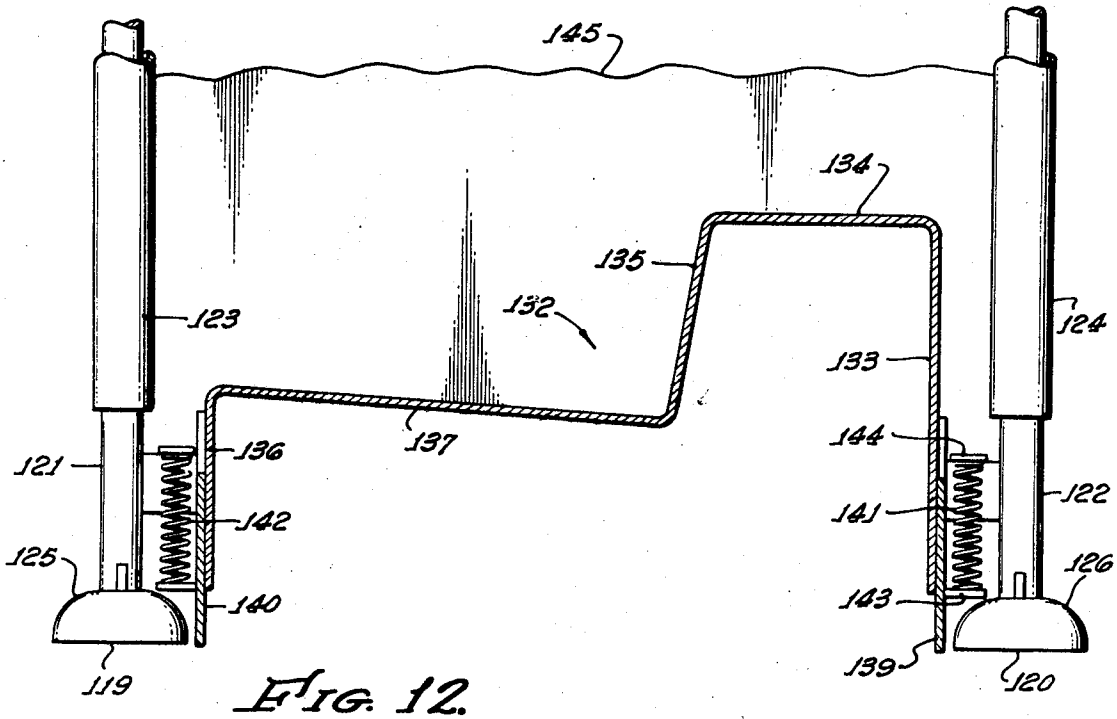



FIG. 12.

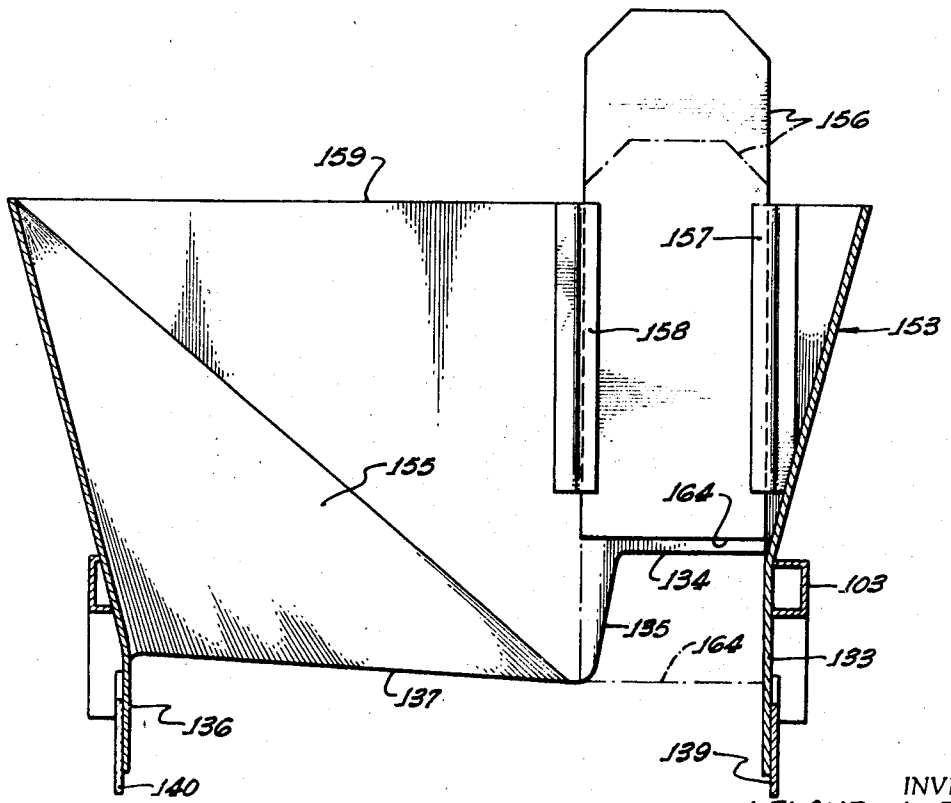



FIG. 14.

INVENTORS.
LELAND J. DAVIS
PAUL T. OGILVIE
BY
ATTORNEYS.

# CONCRETE-FORMING DEVICE

## BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a concrete-forming machine.

2. The Prior Art

The conventional manner of forming curbs and gutters is to provide a wooden forms into which the concrete is cast. This is a laborious, time-consuming and expensive operation in view of the labor in setting up the forms, pouring the concrete and later removing the forms. In an effort to alleviate this, machines have been proposed in the past, providing movable form arrangements to produce a curb on a more or less continuous basis. These machines have bee relatively complex and expensive, and have not offered enough advantages to gain general acceptance. The prior machines include extruding devices for forcing the concrete through the form. This has prevented them from being capable of producing a reinforced curb. The extruding mechanism will interfere with the steel reinforcing rods, so that these machines cannot be used where reinforcing is present, and the curbs produced by them cannot contain the reinforcing required for many uses. This has restricted the areas in which such machines can be used. In addition, such machines have been unable to maintain contact between the bottom form edges and the surface beneath where irregularities occur, so that the concrete is not confined to the mold but is dispersed outwardly to the side. Moreover, prior machines have lacked versatility, not being adaptable to produce concrete elements of different sizes and shapes.

## SUMMARY OF THE INVENTION

The present invention provides an improved concrete-forming device overcoming the disadvantages of the prior art noted above. Not only is the machine relatively simple to construct, but also it provides an exceptionally fast arrangement for producing a curb or curb and gutter combination. For example, in a typical job where 30,000 feet of curbing are required, a crew of 12 men laying down 1,000 feet of curb per day will require 360- man days for the project. With an existing prior art curb-forming machine, 11 men could produce 2,100 feet per day of curbing. However, the machine of this invention, with a crew of eight, can provide 4,000 feet of curbing per day. This will complete the job in only 60 man days.

The device of this invention includes an elongated form complementary to the contour to be imparted to the curb, curb and gutter combination or other shape to be produced. This mold is open at its rearward end and includes an upper opening that communicates with a hopper into which the concrete is dumped continually as the machine is operated. The concrete flows by gravity into the mold as the machine is advanced to produce the completed item. A vibrator is used to cause the concrete to assume the shape of the mold without any voids. No extruding device is necessary, and the machines can produce steel-reinforced curbs. Along the side edges of the mold are vertically movable plates which engage the surface beneath and which are resiliently biased downwardly. This allows the mold to compensate for variations in the contour of the surface, while still precluding lateral dispersion of the concrete. Skids may be provided to accept part of the weight of the device to prevent the lower edges of the movable sideplates from digging into the surface beneath.

The machine is advanced by a drum powered by an electric motor winding up a cable to pull the machine forwardly. The electric motor provides a smooth and steady movement for the device absent from internal combustion engine-powered propelling systems. The motor and vibrator are series vibrator being in operation.

At the front end of the machine are steerable wheels allowing the device to produce shapes of curved configuration as the machine is advanced forwardly. Bogie mountings may be provided for the front wheels to assist in tranversing irregularities in the supporting surface without disturbing the attitude of the mold. A positive means also is provided for pushing downwardly on the vertically movable sideplates to accommodate more extreme surface irregularities and to allow the machine to be kept level.



When the mold defines a curb and gutter combination, a movable gate may be included to block off the upper curb-forming portion of the mold. This gate is brought into play when a driveway is to be provided, so that no curb will be produced at the driveway areas. This not only saves considerably time, but also conserves much concrete, as conventionally it has been necessary to discard quantities of concrete as curb portions first were formed and then removed at the driveway areas. The front wheels may be lowered and retractable rear wheels also lowered for allowing the machine to be transported readily from one site to another.

An object of this invention is to provide an improved means for producing concrete shapes.

Another object of this invention is to provide a machine for producing curbs, gutters and the like at an extremely rapid rate and without the use of conventional stationary forms.

A further object of this invention is to provide a device for forming curbs, gutters and the like which is of low-cost and simplified construction.

An additional object of this invention is to provide a device for forming a reinforced concrete item on a continuous basis.

A further object of this invention is to provide a device which will produce a curb and gutter combination, but which will provide for the elimination of the curb portion when a driveway is to be provided for.

Yet another object of this invention is to provide a device having a movable form arrangement provided with means to accommodate surface irregularities so as to always confine the concrete to the mold.

These and other objects will become apparent from the following detailed description taken in connection with the accompanying drawing.

## BRIEF DESCRIPTION OF THE DRAWINGS:

FIG. 1 is a perspective view of the curb-forming machine of this invention;

FIG. 2 is a side elevational view of the machine;

FIG. 3 is an enlarged fragmentary sectional view showing the arrangement for raising and lowering the wheels;

FIG. 4 is a fragmentary perspective view illustrating the steering mechanism for the front wheels;

FIG. 5 is an enlarged transverse sectional view taken along line 5—5 of FIG. 2;

FIG. 6 is a transverse sectional view taken along line 6—6 of FIG. 2;

FIG. 7 is a transverse sectional view taken along line 7—7 of FIG. 2;

FIG. 8 is a transverse sectional view taken along line 8—8 of FIG. 2;

FIG. 9 is a wiring diagram of the circuit for the motor and vibrator;

FIG. 10 is a top plan view of a modified form of the machine for producing a curb and gutter combination;

FIG. 11 is a side elevational view of the machine of FIG. 10;

FIG. 12 is an enlarged transverse sectional view taken along line 12—12 of FIG. 11;

FIG. 13 is a fragmentary transverse sectional view taken along line 13—13 of FIG. 11; and

FIG. 14 is an enlarged transverse sectional view taken along line 14—14 of FIG. 11.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIGS. 1 through 8, the machine 10 is adapted for producing a concrete curb on a continuous basis without the use of conventional forms. The machine 10 includes a frame 11 provided with front wheels 12 and 13, as well as a pair of rear wheels 14. The front wheels 12 and 12 are positioned at the bottom ends of posts 16 and 17 that extend into

jackscrew units 18 and 19. The latter units are provided with actuating cranks 20 and 21 which can be rotated to raise of lower the wheels 12 and 13.

The construction of the jackscrew unit 18, which is similar to that of the unit 19, may be seen in FIG. 3. The crank 20 connects to a threaded rod 22 that extends downwardly in a tube 23 that is attached to the frame 11. A collar 24 on the threaded rod 22, beneath the upper end wall 25 of the tube 23, prevents upward displacement of the rod. The post 16 is telescoped into the lower end of the tube 23, and at its upper end carries a nut 26 through which the threaded rod 22 extends. Therefore, when the crank 20 is rotated, the rod 22 is rotated also about its axis and, through its engagement with nut 26, causes the post 16 and the wheel 12 to move vertically relative to the frame 11.

The front wheels 12 and 13 may be steered by horizontal rotation of a forwardly projecting lever 27. The latter member includes a vertical portion 28 extending downwardly through a sleeve 29 (see FIG. 4). A rod 30 projects forwardly from the lower end of the vertical portion 28 connecting, through a depending section 31, to a bar 32 that extends transversely of the machine 10. The outer ends of the bar 32 pivotally connect to forwardly extending arms 33 and 34 on the wheel-mounting units. As a result of this linkage, rotation of the lever 27 causes transverse movement of the bar 32 and, hence, simultaneous pivoting of the wheels 12 and 13 about vertical axes.

The rear wheels 14 are pivotally mounted at the bottom ends of jackscrew units 35 and 36 that are carried by a transverse frame member 37. The jackscrew units 35 and 36 are similar to the units 18 and 19, including actuating cranks 39 and 40 which are rotatable for raising or lowering the rear wheels 14. The rear wheels 14 are extended downwardly to help support the machine 10 when the machine is being transported from one location to another, but are elevated and inoperative when the machine is in use in forming a curb.

Motive power for the machine 10 is provided by a drum 42 which, through a chain 43 is rotatable by an electric motor 44. It is preferred to use a portable gasoline engine-driven generator (not shown) to supply current for the motor 44. The generator may be carried by the machine 10 or provided as an auxiliary item. A cable 46 is wound around the drum 42. The outer end of the cable 46 is secured to a stationary object when the machine is to be used. Thereafter, upon rotation of the drum 42, the cable 46 is wound onto the drum and the machine 10 is pulled forwardly.

Located generally at the central portion of the machine 10 is a hopper 48 which is adapted to receive concrete used in producing a curb. The bottom end of the hopper communicates, through an opening 49, with the upper portion of a mold or form assembly 50, which extends longitudinally along the lower portion of the machine 10. The mold assembly 50, as best seen in FIG. 5, includes an open-ended main form section 51, which is rigidly attached to the frame 11 of the machine. The form section 51, which is of uniform cross section throughout its length, includes a top wall 52 from which depend a vertical sidewall 53 and an inclined sidewall 54. Parallel flat plates 55 and 56 extend along the sides of the stationary mold section 51, completing the shape defined by the mold. The plate 55 is positioned vertically, overlapping the wall 53 and extending downwardly below the bottom edge of that wall. The other sideplate 56 also is vertical and is positioned along the lower edge of the inclined wall 54 of the stationary mold member 51. Transverse webs 57 are carried by the frame 11 of the machine 10. These webs include vertical slots 58 and 59 that receive and guide the upper portions of the slide mold plates 55 and 56. Brackets 61 and 62 on the webs 57 are engaged by the upper ends of compression springs 63 and 64. The lower ends of the springs 63 and 64 engage brackets 65 and 66 that are fastened to the outer surfaces of the side mold plates 55 and 56, respectively. Consequently, the side mold plates 55 and 56 are biased downwardly by the compression springs 63 and 64.

Fore and aft movement of the side plates 55 and 56 relative to the mold section 51 is prevented by suitable means, such as blocks 60 on the outside of plate 55 as seen in FIG. 2.

Positioned along one side of the machine 10 adjacent its forward and rearward ends, respectively, are vertical threaded rods 67 and 68 received in stationary threaded nut members 69 and 70 mounted on the frame 11 (see FIGS. 7 and 8). Therefore, the rods 67 and 68 may be moved vertically by rotation of the cranks 71 and 72 at their respective upper ends. The lower ends of the rods 67 and 68 may be brought to bear against laterally outwardly projecting brackets 73 and 74 carried by the side plate 56. Consequently, the rods 67 and 68 can be rotated to react through the brackets 73 and 74 and push downwardly on the side mold plate 56. This may be selective as to the end of the side mold plate 56 moved downwardly in this manner.

Similar provision is made for the other side mold plate 55. Thus, there are vertical rods 75 and 76 extending through stationary threaded nuts members 77 and 78 on the frame 11 and engageable at their lower ends with brackets 79 and 80 on the side mold plate 55. Therefore, the side mold plate 55 may be moved downwardly by appropriate rotation of either of both of the rods 75 and 76.

In operation of the machine, the front wheels 12 and 13 and the rear wheels 14 are elevated, so that the bottom edges 81 and 82 of the side mold plates 55 and 56, respectively, are permitted to engage the surface 83 beneath the machine. Initial downward movement of the machine is resisted by the compression springs 63 and 64, and limited by the rods 67 and 68 on one side, and 75 and 76 on the other side. The rear wheels 14 are raised to positions where they clear the surface 83. The front wheels 12 and 13, however, are elevated sufficiently to allow the forward portions of the edges 81 and 82 of the side mold plates 55 and 56 to engage the surface 83, but not enough to lose contact with the surface 83. Consequently, the front wheels 12 and 13, upon rotation of the steering lever 27, can cause steering of the front end of the machine 10.

When the device is in use, concrete is introduced into the hopper 48, flowing downwardly by gravity through the hopper opening 49 into the form 50. A portable vibrator 84 is inserted downwardly into the concrete that is received in the machine 10. The drum 42 is rotated by the motor 44, winding the cable 46 to cause the machine 10 to move. As a result, a curb 85 is produced to the rear of the machine as it is pulled forwardly. The machine may be moved rapidly, with concrete from a mixer truck alongside the machine being continuously introduced into the hopper 48. The machine may be steered by the lever 27, causing the curb 85 to be given a curved configuration as required. Guiding of the machine is facilitated through the use of adjustable guide rods 86 and 87 carried in brackets 88 and 89 projecting outwardly from the side of the machine. This permits sighting to be made along a guide string 90 or other guiding mark.

As the machine 10 moves along the surface 83, the springs 63 and 64 maintain the lower edges 81 and 82 of the side form members 55 and 56 in contact with the surface 83. This is accomplished despite irregularities, as the springs automatically push the sideplates 55 and 56 selectively into any depressions or allow upward movement from protrusions which are encountered. This assures, therefore, that there are no appreciable gaps at the lower edges of the mold so that the concrete is confined to the mold 50 and does not flow outwardly to the sides of the machine.

When particularly deviations in the contour of the surface 83 are encountered beyond the capacity of the springs 63 and 64 to accomplish adequate movement of the side plate of the mold, any of the rods 67, 68, 75 and 76 may be brought into play. These rods can force the side plates 55 and 56 downwardly to any desired depth. This can serve to keep the machine level so that the upper mold wall 52, and hence the top of the curb 85, will be horizontal. Spirit levels 91 are included on the machine to enable accurate leveling during its use.

Unlike machines that have a positive means for pushing the concrete through the form, the machine of the present invention is usable in producing a curb which is reinforced with steel. This may be required, for example, for curbs defining center dividers or turnout lanes in highways. As seen in FIG. 1, therefore, the machine is producing the curb 85 over an elongated reinforcing rod 92 held on short posts 93 so that it is spaced above the surface 83. With the rod 92 and posts 93 positioned along the path where the curb is to be laid, the curb 85 automatically is steel-reinforced when completed. The posts 93 are located in clearance openings 94 extending downwardly beneath the surface 83. The openings 94 around the lower ends of the posts 93 are filled with concrete as the machine 10 passes by. This rigidly holds the support posts 93 in place when the concrete cures. In conventional curb forming, it is necessary to grout individually around each supporting post for the reinforcing rod prior to the time that the concrete is poured into the fixed form. The time-consuming grouting operation is eliminated entirely through the use of the machine of this invention.

The vibrator 84 serves the important function of enabling the concrete to entirely fill the mold unit 50, assuming the contour of the mold to produce a smooth and attractive curb 85 having no internal voids. It also assures entry of the concrete into the clearance openings 94 around the lower ends of the reinforcing posts 93. In order to assure that the vibrator will accomplish its function while the machine 10 is in use, the vibrator 84 and motor 44 are connected in series so that the motor cannot be operated to advance the machine unless the vibrator also is in operation. A circuit to accomplish this is shown in FIG. 9. A conductor 95 extends from a generator 96 to the vibrator 84, while an additional conductor 97 connects the vibrator to the motor 44. The circuit is completed through a wire 98 to the generator, with the current flow being controlled by a switch 99. An additional conductor 100, having a switch 101, interconnects the vibrator 84 and the conductor 98. This allows independent operation of the vibrator, but prevents current from flowing to the motor 44 unless the vibrator also is in operation.

The electric motor 44 is preferred as the prime mover for the machine 10 because it results in a smooth advancement of the machine at a steady speed. This, in turn, helps in the production of a well-formed curb.

The machine 102 shown in FIGS. 10 through 14 is generally similar to the machine 10 illustrated in FIG. 1 through 9. However, the machine 102 is adapted to be made in a larger size and used to form simultaneously an integral curb and gutter. The machine 102 includes a frame 103 at the front of which are bogie-type front-wheel units 104 and 105, with rear wheels 106 and 107 being at the aft portion of the frame 103. Jackscrew units 108, 109, 110 and 111 provide vertical adjustment for the wheel units 104, 105, 106 and 107, respectively. The front-wheel units 104 and 105 are steerable through a rod 112 pivotally connected to the frame by pin 113, and also pivotally connected to a transverse bar 114. The latter member connects at its ends to arms 115 and 116 that extend from the front-wheel units 104 and 105, respectively.

The bogie mountings for the front-wheel units include a transverse trunnion between each pair of wheels, allowing the wheels to pivot about the trunnion and move vertically relative to each other. This may be seen for the front-wheel unit 105 in FIG. 11, with the trunnion 117 being positioned between the individual wheels 118.

Skids 119 and 120 are carried by rods 121 and 122 extending from jackscrew units 123 and 124 mounted along the rearward side portions of the frame 103. Thus, the skids 119 and 120 are movable vertically so that they may be positioned to support the machine 102 at the rearward end when it is in use. The rear wheels 106 and 107 are retracted at that time. The forward ends 125 and 126 of the skids 119 and 120 incline upwardly to assist the skids in passing over obstructions.

The machine 102 is powered similarly to the machine 10, including a drum 127 around which is wrapped a cable 128. A chain 129 interconnects the drum 127 and an electric motor 130. Therefore, when the motor 130 is operated, the cable 128 is wrapped onto the drum 127, and the machine 102 is pulled forwardly.

Extending longitudinally along the lower portion of the machine is a mold assembly 132. This defines a shape complementary to the cross section of a curb and gutter. At one side, to the right as illustrated in FIG. 12, the mold assembly 132 includes a vertical wall 133 connecting to a top horizontal wall 134 extending to an inclined sidewall 135. This defines the cross section of the curb. The gutter portion is formed by a vertical wall 136 at the left-hand edge, as shown in FIG. 12, from the upper edge of which is a wall 137 that slopes to the bottom of the sidewall 135.

In order to confine the concrete to the interior of the mold, movable side plates 139 and 140 overlap the lower portions of the sidewalls 133 and 136, respectively. These are biased downwardly by springs 141 and 142. The springs 141 are positioned between a bracket 143 on the plate 139 and an additional bracket 144 on a transverse web 145 carried by the side 133 of the mold. Similarly, the spring 142 is positioned between a bracket 146 at the lower portion of the side plate 140 and a bracket 147 at its upper end which is carried by the web 145. Hence, the side plates 139 and 140 can move up and down as required when variations in terrain beneath the machine are encountered.

In addition, vertically adjustable threaded rods 149 and 150, extending through stationary nuts 151 and 152, can be brought to bear against the side plates 139 and 140 to press them downwardly as required. The rods 149 and 150, seen in FIG. 13, are arranged similarly to the rods 67, 68, 75 and 76 in the previously described embodiment.

A hopper 153 is positioned at the central portion of the machine, connecting through an opening 154 to the interior of the mold assembly 132. The hopper 153 includes a downwardly inclined diagonally positioned wall 155 at the rearward corner of the hopper above the wall 137 of the gutter-forming portion of the mold. This assists in directing concrete toward the section of the mold where the curb is to be produced. This is desirable because the curb portion, being elevated above the level of the gutter, takes a greater quantity of concrete than does the gutter portion.

The hopper 153 also includes a vertically adjustable gate 156 permitting the curb-forming portion of the mold 132 to be closed off, as best seen in FIG. 14. The gate 156, which is a flat plate, is guided by flanges 157 and 158, which are parallel to the rearward wall 159 of the hopper. The upper end of the gate 156 is pivotally connected to the upper end of an elongated handle 160. A link 161 pivotally connects to the handle 160 adjacent but below the connection of the handle to the gate 156. The lower end of the link 161 pivotally connects to a bracket 162 mounted on the rearward wall 159 of the hopper 152. Therefore, when the handle 160 is raised, the gate 156 is lowered by the linkage so that it blocks off the curb-forming portion of the mold 132, as indicated in phantom in FIG. 14.

Use of the machine 102 is substantially the same as that of the machine 10. The hopper 153 receives the concrete and the electrically driven vibrator 84 is inserted into the concrete to assist it to flow evenly and fill the space within the mole 132. The drum 127, winding the cable 128, advances the machine, while the steering lever 112 permits the direction to be changed. During operation, the skids 119 and 120 rest upon the surface beneath the machine, absorbing a portion of the weight of the machine. This is needed for the machine 102 because a curb and gutter assembly normally is formed on graded earth. A curb alone, on the other hand, as produced by the machine 10 usually will be provided on a more firm surface, such as asphalt pavement. With the skids 119 and 120 absorbing some of the weight of the machine, the bottom edges of the movable vertical side plates 139 and 140 of the mold 132 will not dig into the earth objectionably. The machine may be advanced rapidly, continuously producing an integral curb and gutter unit of superior appearance.

The threaded rods **149** and **150** allow the side plates **139** and **140** to be forced downwardly where larger deviations in the contour of the surface beneath the machine are found. This permits the machine to be maintained in a horizontal attitude, with spirit levels **163** being used to indicate such condition.

The bogie front-wheel units **104** and **105** assist in keeping the machine level. With the wheels of each bogie unit being disposed one behind the other, there is engagement with the supporting surface at spaced positions. The wheels may move upwardly or downwardly independently of each other when irregularities are encountered without disturbing the attitude of the machine.

The gate **156** is utilized where driveways are to be formed. As the driveway area is approached, the handle **160** is raised slowly to progressively drop the lower edge **164** of the gate **156**. With the machine moving forwardly as the edge **164** moves downwardly, there is a gradual transition from the curb level to that of the gutter. This provides the customary side slope at the edge of the driveway. The gate **156** is held downwardly, closing off the curb-forming portion, as the machine traverses the full width of the driveway. Following this, the handle **160** moved downwardly slowly, thereby progressively raising the bottom edge **164** of the gate **156**. Consequently, again, a gradual transition will be made between the gutter level for the driveway and the curb level beyond the driveway. This not only make driveway production much faster, but also conserves a great deal of concrete.

We claim:

**1**. A device for producing an elongated concrete article comprising

an elongated mold having a substantially uniform cross section,

said mold having an open bottom and rearward end,

said mold including a duality of sideplates disposed one at either lower edge of said mold,

guide means for allowing vertical movement of said sideplates relative to said lower side edges of said mold,

resilient means biasing said side plates downwardly for engaging a surface beneath said mold, selectively movable means for moving said sideplates downwardly,

a hopper communicating with the upper portion of said mold for introducing concrete therein, a vibrator for insertion into concrete received in said hopper,

steerable wheels at the forward end of said mold for controlling the direction of movement thereof, and means for moving said mold in a generally longitudinal direction.

**2**. A device as recited in claim **1** in which said means for moving said mold includes a drum, a cable wound on said drum and attachable to a stationary object, and means for rotating said drum.

**3**. A device as recited in claim **2** in which said means for rotating said drum is an electric motor.

**4**. A device as recited in claim **3** in which said vibrator is electrically driven, and in which said vibrator and motor are series connected to allow operation of said motor only upon operation of said vibrator.

**5**. A device as recited in claim **1** in which said mold on one side includes a relatively high portion complementary to a curb, the remaining portion of said mold being relatively low and complementary to a gutter, said portions of said mold being in communication for producing an integral curb and gutter combination.

**6**. A device as recited in claim **5** in which said hopper includes a diagonal wall portion over said remaining portion of said mold for assisting in directing concrete to said relatively high portion of said mold.

**7**. A device as recited in claim **5**, including in addition a vertically movable gate for blocking off said relatively high portion of said mold, and means for progressively moving said gate vertically for providing a gradual transition between a curb and gutter at a driveway entrance.

**8**. A device as recited in claim **1** including in addition vertically adjustable means along either side of the rearward portion of said mold, said vertically adjustable means having lower portions adapted to engage a surface beneath the same for providing a support for said device.

**9**. A device as recited in claim **8** in which said lower portions of said vertically adjustable means are elongated skids, said skids having upwardly inclined forward ends.

PO-1050
(5/69)

# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,600,773 Dated August 24, 1971

Inventor(s) Leland J. Davis and Paul T. Ogilvie

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 7, line 36, before "edge" insert -- side --.

Signed and sealed this 29th day of February 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents