Feb. 18, 1969 B. F. HANDY, JR., ETAL 3,427,938

CURB AND GUTTER EXTRUDING MACHINE

Filed Feb. 2, 1967 Sheet 1 of 4

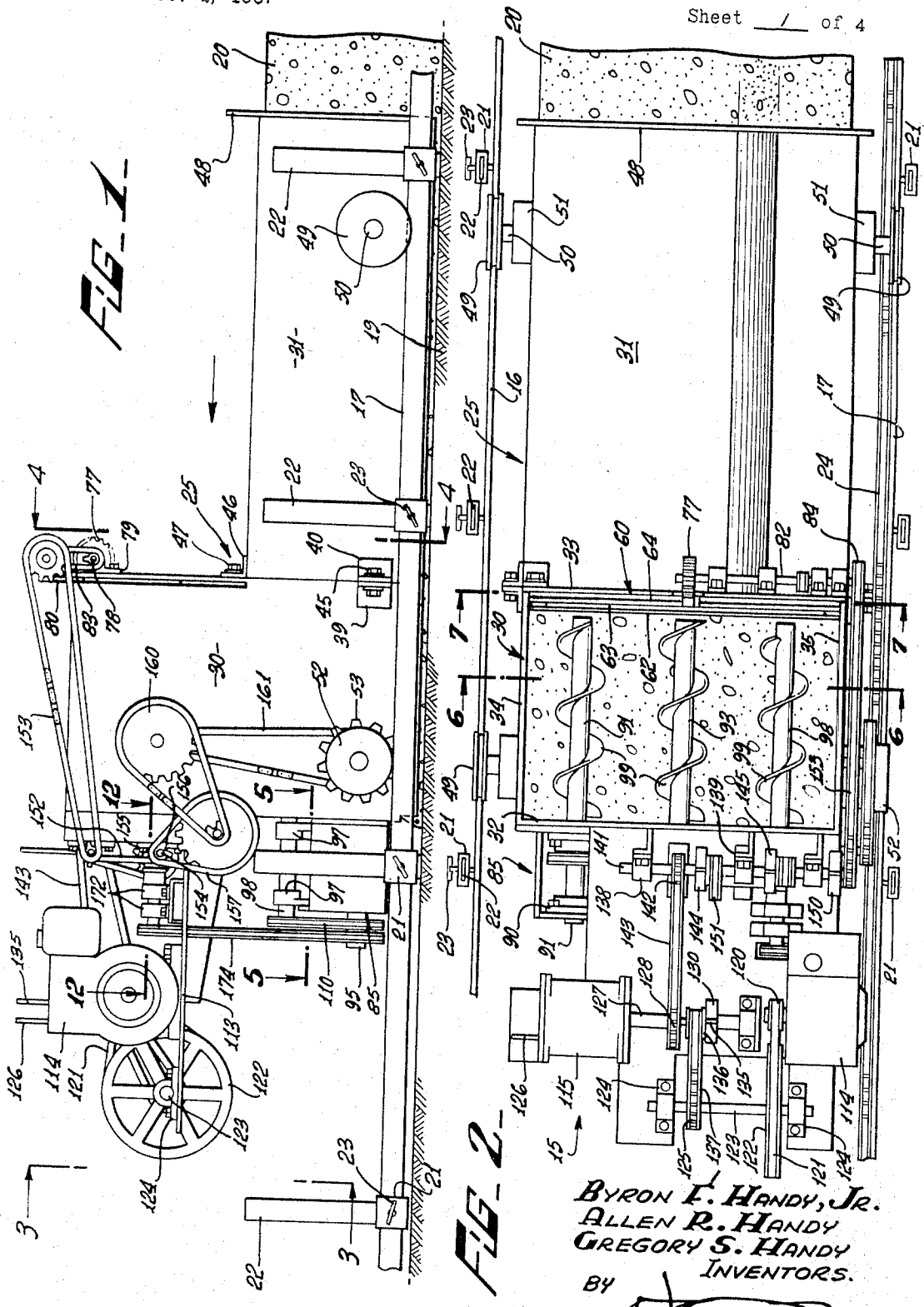


FIG. 1

FIG. 2

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CURB AND GUTTER EXTRUDING MACHINE

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FIG. 4

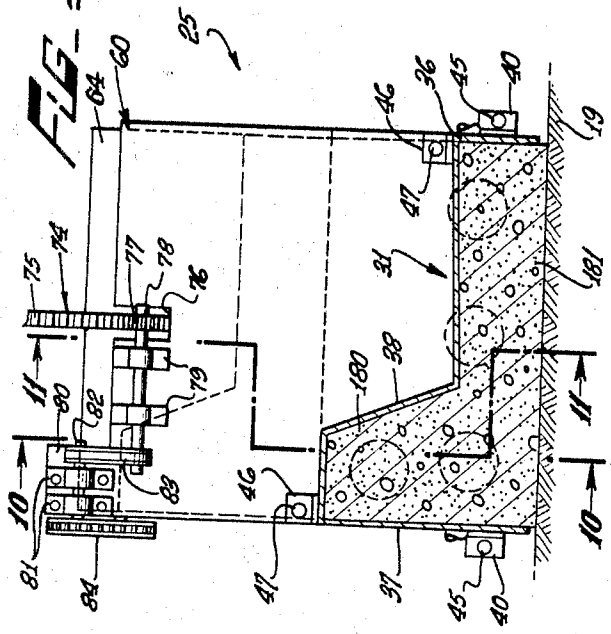


FIG. 3

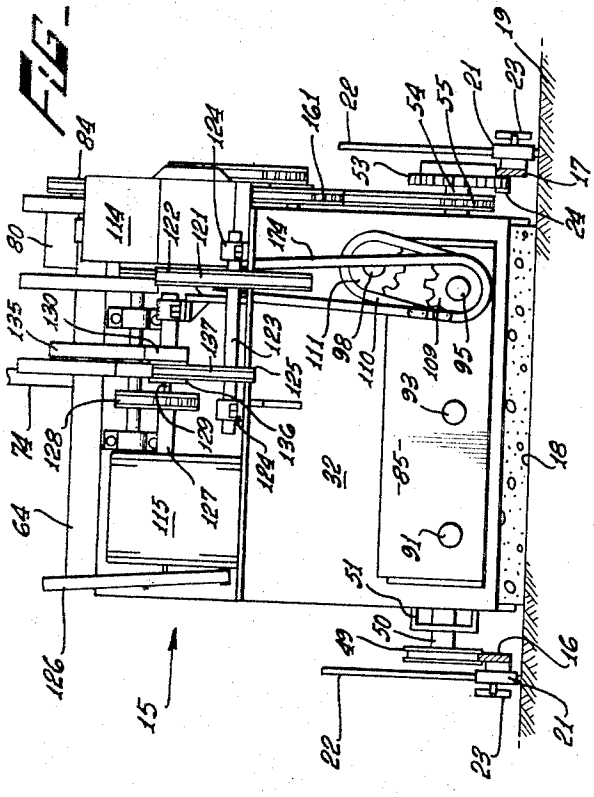
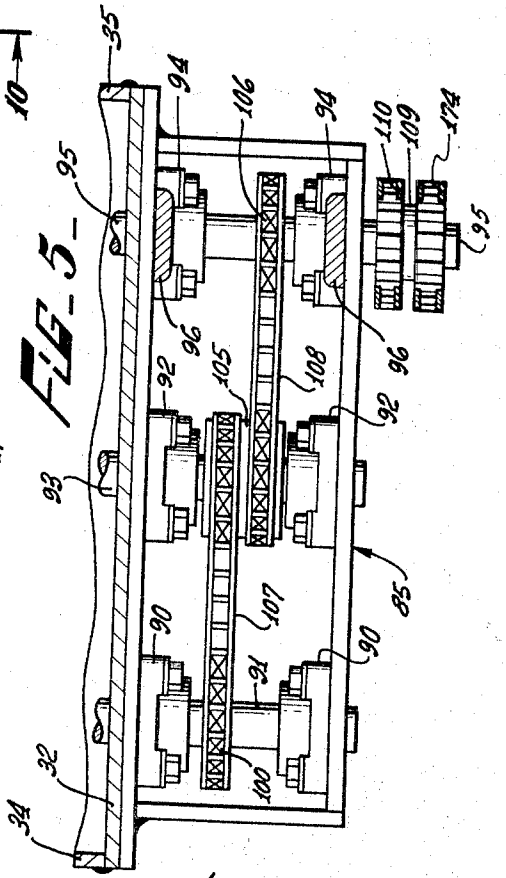


FIG. 5



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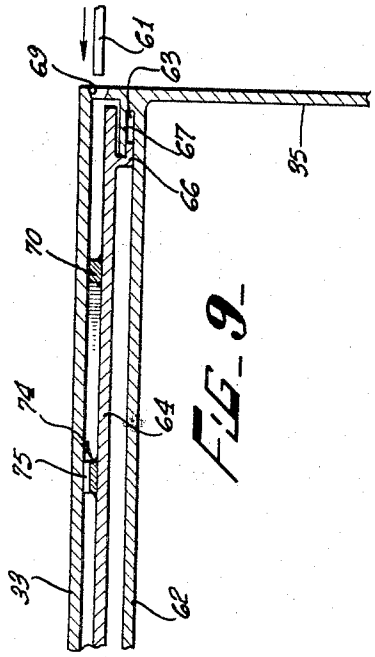


FIG. 9

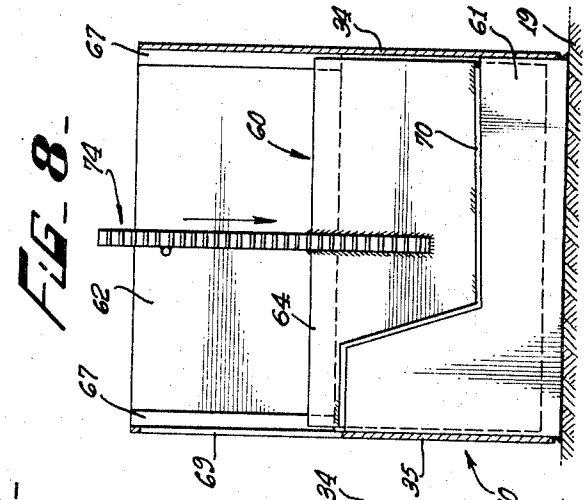


FIG. 8

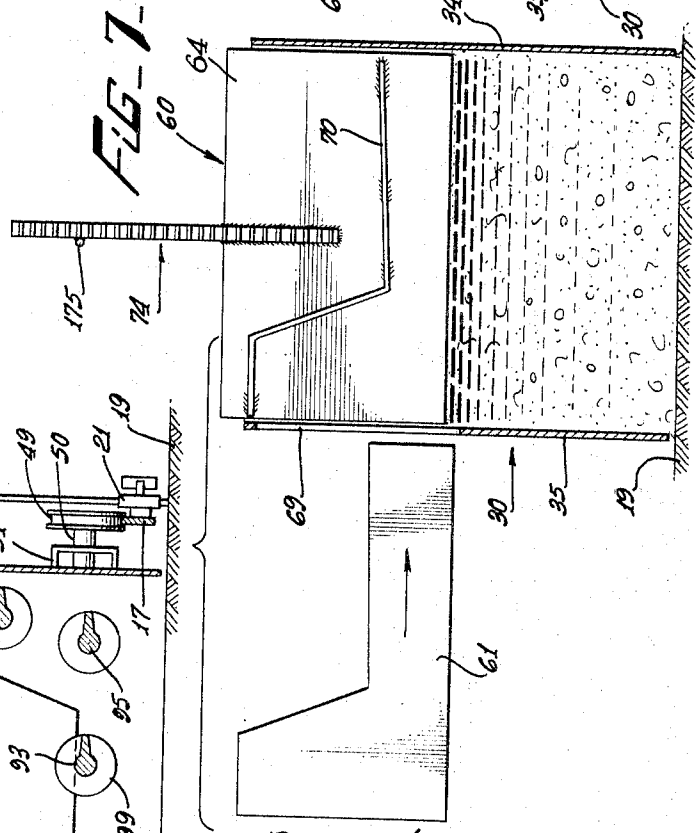


FIG. 7

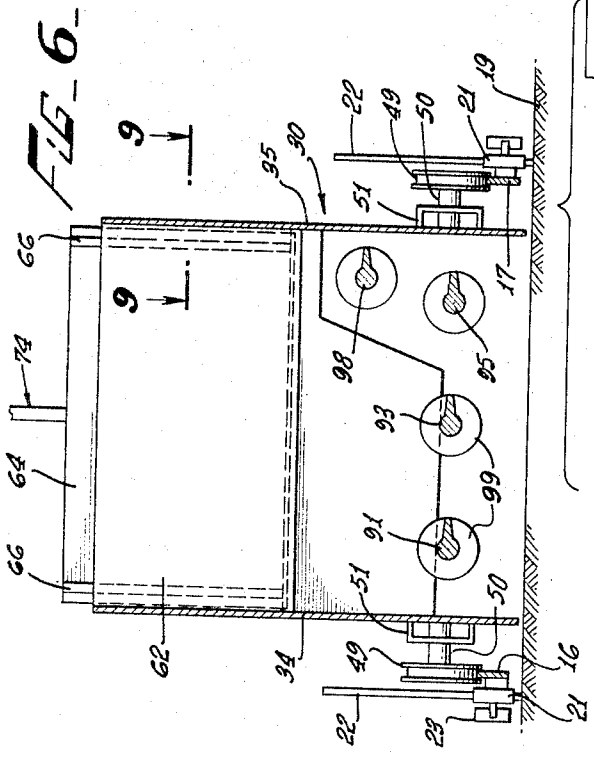


FIG. 6

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FIG. 11

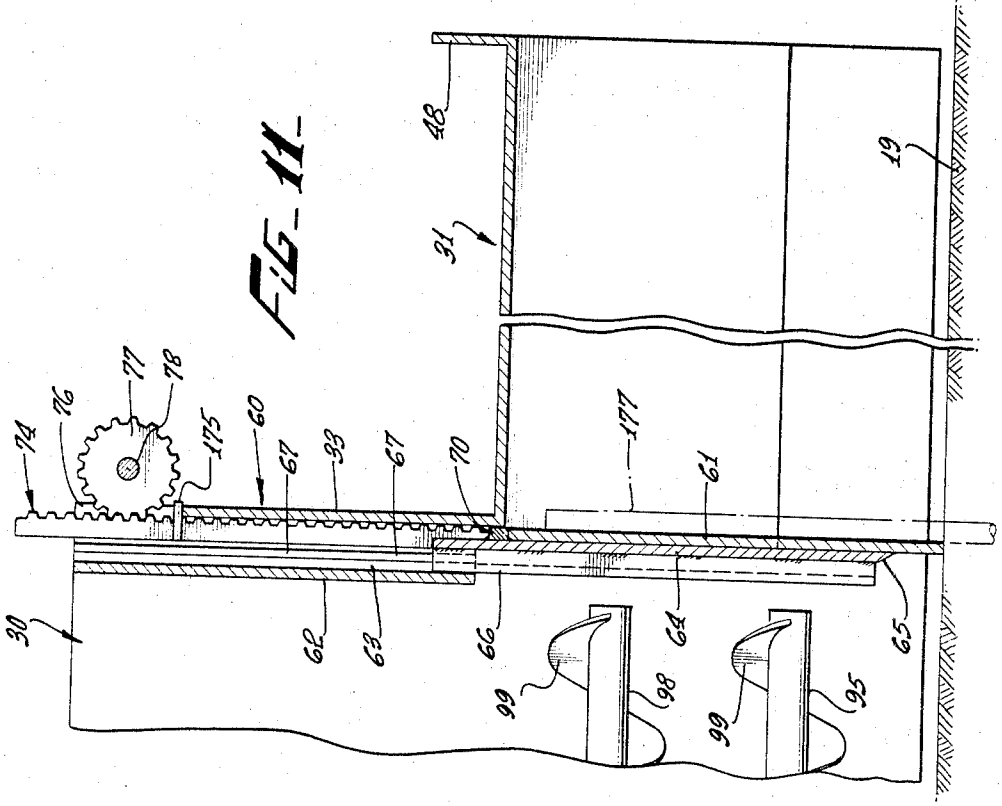


FIG. 10

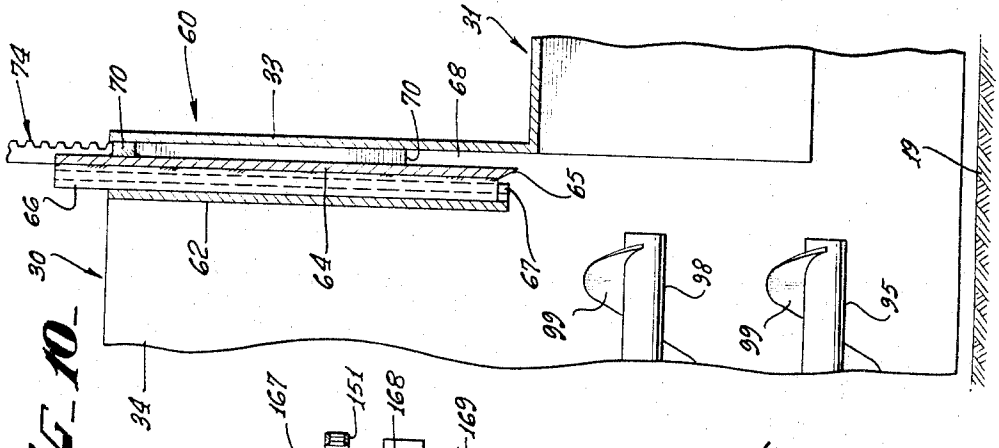
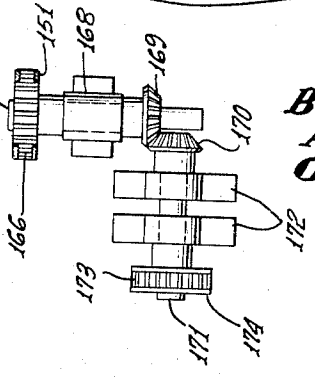


FIG. 12



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United States Patent Office 3,427,938 Patented Feb. 18, 1969

3,427,938

CURB AND GUTTER EXTRUDING MACHINE

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Filed Feb. 2, 1967, Ser. No. 613,648
U.S. Cl. 94—46 6 Claims
Int. Cl. E01c 19/48

ABSTRACT OF THE DISCLOSURE

A travelling rail supported fluid concrete hopper from the bottom of which said concrete is screw-fed rearwardly through a curb extruding shoe to form on the soil a finished curb and having a vertical power ram for installing transversely in said curb and at suitable intervals lengthwise thereof a sheet expansion joint element.

BACKGROUND OF THE INVENTION

Field of invention

Development of methods and power tools for rapid machine production of concrete curbing at opposite side edges of public thoroughfares.

Description of the prior art

Known prior U.S. patents include: (1) Leatherman, 2,204,021, June 11, 1940; (2) Canfield et al., 2,818,790, Jan. 7, 1958; (3) O'Connor Jr., 3,108,518, Oct. 29, 1963; (4) Smith, 3,138,079, June 23, 1964; (5) Larsen et al., 3,161,116, Dec. 15, 1964; (6) Supject, 3,161,117, Dec. 15, 1964; (7) Sigmund, 3,208,362, Sept. 28, 1965; (8) Jones et al., 3,223,006, Dec. 14, 1965.

The machines of prior art patents (1), (3), (5), and (7) travel on rails formed by longitudinal curb mold members, which confine opposite side edges of the curb as it is molded therebetween.

The machines of prior art patents (2), (4), (6), and (8) are supported on wheels or track-laying devices resting directly on the ground.

The general object of these prior art machines has been to machine extrude concrete curb and thus eliminate most of the labor required in the current practices of molding curb in stationary molds which have to be set up and removed by hand. The applicants are without knowledge of the patented machines having met with any appreciable success in accomplishing this object, and the patents cited above are therefore believed to be "paper" patents.

SUMMARY OF THE INVENTION

The present invention provides a vertically adjustable pair of tracks spaced laterally from side edges of the hopper and the curb extruding shoe and the latter are supported on said tracks for movement along the true grade established by the tracks for depositing the curb directly on the ground.

Another unique feature of the present invention is the bottomless hopper thereof in which the earth itself forms the bottom so that the voids in the surface portion of the soil which will subsequently underlie the curb are filled with fluid concrete while this soil is under the hopper. This results in a tendency of the curb to retain the shape given it by the extruder shoe because a good union is produced between the body of concrete to be used in forming the curb and the supporting soil therebeneath *before* the form of the curb is given said concrete by said extruder shoe.

A further unique feature of the invention is the provision of a power ram optionally operable at selected intervals along the curb extruded by the machine to install transversely in said curb a sheet expansion joint element.

BRIEF DESCRIPTION OF THE DRAWING

The manner of accomplishing the foregoing objects as well as further objects and advantages will be made manifest in the following description taken in connection with the accompanying drawings in which

FIGURE 1 is a diagrammatic side elevational view of a preferred embodiment of the invention.

FIGURE 2 is a plan view of FIGURE 1.

FIGURE 3 is an end elevational view of FIGURE 1 taken in the direction of arrows **3**.

FIGURE 4 is a transverse sectional view taken on the line **4—4** of FIGURE 1.

FIGURE 5 is an enlarged fragmentary horizontal sectional view taken on the line **5—5** of FIGURE 1.

FIGURE 6 is a transverse vertical sectional view taken on the line **6—6** of FIGURE 2.

FIGURE 7 is a diagrammatic vertical sectional view taken on the line **7—7** of FIGURE 2 and illustrates the vertical ram of the invention in elevated position with a sheet expansion joint element poised for insertion through the vertical slot for receiving the same into a position beneath said ram in readiness to be delivered downwardly through the liquid concrete in the machine into a transverse dividing relation within the curb being extruded by said machine.

FIGURE 8 is a view similar to FIGURE 7 showing said element positioned beneath said ram and with the latter lowered so as to embody said element with said curb.

FIGURE 9 is an enlarged horizontal fragmentary detail view taken on the line **9—9** of FIGURE 6, this view illustrating the internal structure of said ram and showing an expansion joint element aligned for insertion through the vertical slot in the side of the machine for admission to the chamber of the said ram for receiving said element prior to the operation of the ram to install said element in the curb being extruded by said machine.

FIGURE 10 is an enlarged fragmentary vertical longitudinal sectional view taken on the line **10—10** in FIGURE 4 and illustrates said ram in raised position in readiness to receive an expansion joint element therebeneath.

FIGURE 11 is a view similar to FIGURE 10 and is taken on line **11—11** of FIGURE 4, this view showing said ram with an expansion joint element inserted therebeneath and with the ram lowered to its downward-most position, thereby installing said element in a curb being formed by the invention.

FIGURE 12 is an enlarged fragmentary detail sectional view taken on the line **12—12** of FIGURE 1 and shows the miter gears through which the concrete screw conveyors are power-driven.

DESCRIPTION OF THE PREFERRED EMBODIMENT

This embodiment comprises a curb extruding machine **15** which is designed to preferably be supported by and travel on parallel rails **16** and **17** which are provided on opposite sides of a path **18** provided by the upper surface of the soil **19** on which the machine **15** is provided to extrude "in situ" a concrete curb **20**.

Each of the rails **16** and **17** is made up in twenty foot lengths, each length comprising a flat steel bar with clamps **21** welded thereto at spaced intervals and disposed outwardly from these rails. Each clamp **21** is vertically apertured to slidably receive a flat steel stake **22** to which the clamp is adjustably secured by a wing-headed screw **23**. The stakes **22** are inserted downwardly through the clamps **21** and driven into the ground while the screws **23** are loose. The clamps **21** are then tightened on these stakes so as to set the rails **16** and **17** at a desired level and grade so that when machine **15** is operated on these rails it will

be properly related to the soil **19** to extrude the curb **20** thereon.

The rail **17** has an industrial sprocket chain **24** secured to the inner face thereof at a suitable distance below the upper edge of this rail so as to extend the entire length of the rail. This chain of course is also divided into sections each section being coextensive with the twenty foot length of rail **17** to which it is secured. The securing of this chain to the rail **17** is done by welding about every fourth or fifth link of the chain to the rail so that there is a slight degree of slackness in the portions of the chain **24** between such points of attachment. The purpose of this will be made clear hereafter.

The machine **15** has a body **25** the principal elements in which are a liquid concrete hopper **30** and a curb extruding shoe **31**. The hopper has front and rear vertical end walls **32** and **33** which are connected together by welding at their opposite ends to the opposite ends of sidewalls **34** and **35**.

The lower portion of rear end wall **33** is shaped to serve as a screed having the same transverse contour as the curb **20** to be extruded by the machine.

The shoe **31** has sidewalls **36** and **37** and a top wall **38** and the shoe **31** is shaped so as to fit the rear end of the hopper **30** and has a transverse conformation so that the inner surface of this conforms to the shape to be given the curb **20**. Thus, sidewalls **36** and **37** form rearward extensions of sidewalls **34** and **35** of hopper **30** and the inner surface of top wall **38** conforms to the contour of the lower edge of rear end wall **33** of hopper **30** when the hopper and shoe are secured together to form the body **25**. This assembly of these two elements is effected by the welding of angle brackets **39** and **40** respectively on said hopper and shoe on opposite sides of the transverse plane where these elements meet and near the lower ends and uniting these brackets with bolts **45**. Other angle brackets **46** are welded on the top wall **38** of shoe **31** which are secured to the rear end wall **33** of hopper **30** by cap screws **47** extending through apertures in these brackets and screwed into suitable tapped holes provided in the said end wall.

The rear end of curb extruding shoe **31** is preferably reinforced by a flange **48** welded to and extending outwardly from the rear open end of said shoe.

The body **25** is supported on rails **16** and **17** by three double flanged wheels **49** which rotate idly on axles **50** supported by channel brackets **51** welded to the sides of the body and by a power-driven sprocket-flanged wheel **52** having sprocket **53** serving thereon as a flange and meshing with chain **24** on rail **17**. The wheel **52** is fixed to a rotatable hollow shaft **54** which carries a sprocket **55** by which this shaft is rotated in a manner which will be made clear hereinafter.

One pair of the double flanged wheels **49** ride on rail **16** while the other double flanged wheel **49** and the sprocket-flanged wheel **52** ride on rail **17** and the body **25** of machine **15** is thus supported on these two rails for travel thereon.

The machine **15** is provided with a power-driven vertical ram **60** for use in the operation of this machine for the purpose of ramming a sheet expansion joint element **61** downwardly into the liquid concrete passing through said machine during its operation so that this element will transversely divide the adjoining sections of the concrete curb **20** extruded from said machine. A false end wall **62** is welded in place in hopper **30** between the sidewalls **34** and **35** thereof in close spaced relation with rear end wall **33** of said hopper so as to provide a narrow transverse well **63** between the walls **62** and **33** in which an expansion element depressing blade **64** of said ram may reciprocate vertically in performing its function. This blade is preferably made up of a rectangular sheet of steel about ½ inch in thickness, the outline of which is clearly shown in FIGURE 7. The lower edge **65** of this blade is preferably sharpened so as to facilitate its penetrating the liquid concrete immediately therebeneath when performing its function of setting an expansion joint element **61** in the concrete curb **20**. The blade **64** is guided in its vertical movement in the well **63** by interengagement of angle guides **66** and **67** which are welded respectively on the blade **64** and on the false end wall **62** so as to closely interfit with each other as shown in FIGURE 9. The blade **64** is thus guided vertically in the chamber **63** so as to be spaced from the hopper rear end wall **33** a slightly greater distance than the thickness of a sheet expansion joint element **61**. This space comprises a ram chamber **68** for receiving an expansion joint element **61** through a vertical slot **69** formed in the plane of this chamber in hopper side wall **35**. Extending rearwardly from blade **64** into ram chamber **68** is a bar **70** preferably formed of ½ inch square rod welded to the rear face of said blade, this rod being bent to conform to the upper edge of a joint element **61** when the latter is inserted into chamber **68** and is slidably related to rear end wall **33** of hopper **30** during the operation of blade **64**.

Vertical movement of the blade **64** in the well **63** is effected by a rack bar **74** made of inch square stock with the rack teeth **75** facing rearwardly therefrom. A certain lower portion of this rack bar is recessed about half the thickness of the bar so it will interfit with the upper portion of blade **64** and the bar is thus welded to said blade. A deep notch **76** is formed in the upper edge of rear hopper wall **33** so as to permit the rack teeth **75** to mesh with a gear **77** mounted on the inner end of a shaft **78** which journals in bearings **79** fixed to the rear face of wall **33**. The adjacent end of said wall has an upward extension **80** on which bearings **81** are mounted in which a jack shaft **82** journals. The inner end of shaft **82** is in parallel overlapping relation with the outer end of shaft **78** and has a driving connection therewith through radially aligned sprockets mounted on said overlapping shaft ends which are connected by an endless chain **83**. Fixed on the outer end of jack shaft **82** is a sprocket **84**.

Mounted on the forward face of front end wall **32** of the hopper **30** is a heavy sheet metal box **85** in which are mounted aligned pairs of bearings **90** (in which a shaft **91** is journaled); **92** (in which a shaft **93** is journaled); and **94** (in which a shaft **95** is journaled). Connected integrally with bearings **94** by webs **96** is an aligned upper pair of bearings **97** in which a shaft **98** journals. The aforesaid pairs of bearings **90**, **92**, **94**, and **97** support the shafts **91**, **93**, **95** and **98** in horizontal parallel relation and apertures are provided in front wall **32** of the hopper **30** through which these shafts extend into said hopper, where said shafts are provided with conveyor screws **99**.

Mounted within the bearing box **85** on the shafts **91**, **93** and **95**, respectively, are a single sprocket **100**, a double sprocket **105**, and single sprocket **106**. Endless chains **107** and **108** connect the double sprocket **105** respectively to the single sprockets **100** and **106** so that rotation of shaft **95** through a double sprocket **109** mounted on the outer end thereof also causes rotation of shafts **91** and **93**. Through a chain **110** which connects double sprocket **109** with a sprocket **111** mounted on the forward end of shaft **98**, rotation of shaft **95** also causes a corresponding rotation of shaft **98**.

The machine **15** has a power-and-transmission unit **112** which, in the illustrated embodiment of the invention, is mounted on a platform **113** which extends forwardly from and is rigidly secured to the front end wall **32** of the hopper **30**. Mounted in confronting relation on opposite sides of platform **113** is a ten horsepower gasoline engine **114** and a transmission **115** the latter being preferably of the type used in a 1965 Chevrolet Corvair automobile. The engine **114** has a small diameter drive pulley **120** which is connected by a belt **121** to a large driven pulley **122** mounted on a jack shaft **123** which

journals in bearings **124** mounted on platform **113**, said shaft having a relatively small diameter sprocket **125**.

The transmission **115** is controlled by a lever **126** to offer the option of three forward drive ratios and one in reverse. This transmission has a hollow output shaft **127** carrying a sprocket **128**, and an input shaft **129** which connects through a clutch **130**, controlled by lever **135**, with a sprocket **136** which is radially aligned with and connected with the sprocket **125** by an endless chain **137**. When the engine **114** is running so as to rotate the jack shaft **123** and the sprocket **136**, and the lever **135** is moved to engage clutch **130**, the input shaft **129** of the transmission **115** is rotated thereby causing rotation of the output shaft **127** and sprocket **128** in the direction and at the drive ratio determined by the position of lever **126**.

Mounted on suitable brackets welded to and extending forwardly from an upper portion of hopper front end wall **32** are three aligned bearings **138**, **139**, and **140** in which a shaft **141** journals. This shaft has fixed thereon a sprocket **142** which is radially aligned with sprocket **128** on the output shaft **127** and connected thereto by an endless chain **143**. Three manually controlled clutches **144**, **145**, and **150** are mounted on shaft **141** which are adapted to transmit rotational movement, respectively, through endless chains **151**, **152** and **153**, the latter chain connecting clutch **150** with sprocket **84** on jack shaft **82**.

Endless chain **152** connects manual clutch **145** with a short jack shaft **154** which is journaled in a suitable bearing **155** provided on front end wall **32** and which has a sprocket **156** which is connected by an endless chain **157** to a double sprocket **158** which is pivotally mounted on side wall **35** and is in turn connected by an endless chain **159** to a double sprocket **160**, also pivotally mounted on sidewall **35**, and which in turn is connected by an endless chain **161** to the sprocket flange **53** of the drive-wheel **52** of the machine **15**.

Manual clutch **144** is connected by endless chain **151** to a sprocket **166** mounted on one end of a shaft **167** which journals in a bearing **168** supported on platform **113**. This shaft has on its opposite end a miter gear **169** which meshes with another miter gear **170** provided on the rear end of a shaft **171** which journals in bearings **172** mounted on platform **113** and which has, at its front end, a sprocket **173** which is connected by an endless chain **174** to double sprocket **109** provided on the forward end of shaft **95**.

From the foregoing description it should be evident that when manual clutches **144**, **145** and **150** are disengaged, by manually actuating the handles respectively associated therewith, the engine **114** may be operated with the clutch **130** engaged so as to deliver power through the input shaft **129** to the transmission **115** and thus cause output shaft **127** and sprocket **128** thereon to rotate thereby rotating the main clutch shaft **141** without power being transmitted from the latter to any of the operative elements of the machine **15**. When the shaft **141** is thus being rotated, and clutch **144** is manually engaged, this will produce rotation of shaft **95** which rotation is transmitted as already described to shafts **91**, **93** and **98** on which conveyor screws **99** are mounted.

When shaft **141** is power-driven and idling and manual clutch **145** is engaged this will transmit rotation from shaft **141** to drive wheel **52** which will cause the machine **15** to start travelling along the rails **16** and **17**, the direction of this travel depending upon whether transmission **115** has been set by manipulation of lever **126** to transmit rotation to output shaft **127** in one of three forward speeds or in reverse.

When main clutch shaft **141** is idling and clutch **150** is manually engaged this will cause rotation of shaft **78** and gear **77** mounted thereon, which meshes with rack teeth **76** and, if transmission **115** is set to operate in one of its forward speeds, this engagement of clutch **150** will rotate gear **77** in an anticlockwise direction as seen in FIGURE 11 so as to propel the ram blade **64** downwardly from its upper position, in which it is shown in

FIGURE 10, to its downward position as shown in FIGURE 11. When the blade **64** arrives in the latter position, it is halted from further downward movement by a lug **175** welded on one side of rack bar **75** engaging the bottom of the notch **76** formed in the upper edge of rear upper end wall **33**.

In order to elevate ram blade **64** from its lower position as shown in FIGURE 11 to its upper position as shown in FIGURE 10, the transmission **115** is manually shifted into reverse while the main clutch shaft **141** is idling and clutch **150** is then manually engaged to cause a reverse rotation of gear **77** until the raising of blade **64** to its upper position has been effected.

Operation

For convenience a boom-equipped truck is provided for handling the machine **15** on the job and for transporting it from place to place.

The first step in the operation of this machine for extruding curb **20** on a given job is the surveying of the path along which the curb is to be laid and the setting up of the rails **16** and **17** along opposite sides of this path and in the proper spaced parallel relation and the setting of these rails at exactly the desired grade so that travel of the machine **15** along these rails will cause this machine to traverse said path in the proper parallel relation with the surface of the soil **19** within said path so that the normal operation of the machine while so travelling and which will now be described will result in the extruding of the concrete curb **20** which it is desired to produce in said path. It should be noted at the outset, that the rails **16** and **17** are installed so as to start a sufficient distance in advance of the point where the curb **20** is to start that the machine **15** may overlie this starting point with the latter approximately in the transverse plane of the ram blade **64**.

To begin with, the machine **15** is hoisted by the boom of the auxillary service truck and set on rails **16** and **17** in advance of the point at which the curb is to begin. A sheet expansion joint element **61** is now set up on the soil transversely of the path in which the curb **20** is to be extruded and at the point of beginning of said curb and this element is backed up by suitable stakes **177** (shown in broken lines in FIGURE 11) which are driven into the soil **19** behind said element and wired thereto so as to hold said element erect so it will serve as the initial end piece of the curb **20**.

The machine **15** is now driven in reverse to back the same along the rails **16** and **17** with the ram blade **64** lowered as shown in FIGURE 11 until this ram blade engages the endmost element **61** as shown in this view, whereupon the rearward movement of the machine **15** is halted.

It is to be noted at this time that the lower ends of both the liquid concrete hopper **30** and the curb extruding shoe **31** are open and that the lower edges of the sidewalls of the hopper and the shoe are held by the setting of the rails **16** and **17** in closely spaced parallel relation with the path **18** on the soil **19** on which the curb is to be extruded.

A ready-mixed concrete delivery truck now takes up a position alongside the machine **15** and delivery of liquid concrete into the hopper **30** is started. When the hopper is about two-thirds full of liquid concrete and with the transmission **115** set in reverse drive, and with the main clutch shaft **141** running idle, manual clutch **150** is engaged to rotate gear **77** in a clockwise direction as shown in FIGURES 1 and 11 thereby lifting the ram blade **64** from its lower most position as shown in FIGURE 11 to its upper position as shown in FIGURE 10 thereby allowing the liquid concrete in the hopper **30** to bear directly on the expansion joint element **61** which is resting against the stakes **167** to mark the beginning point of the concrete curb **20**.

As soon as the ram blade **64** has thus been raised to its upper position, clutch **150** is manually disengaged, trans-

mission **113** is shifted from reverse into low speed forward so that the shaft **141** now idles in a counterclockwise direction. Clutches **145** and **144** are now manually engaged in that order so as to start the machine **15** travelling forwardly away from the starting point of the curb **20** marked by the stakes **177** and, a moment later, to start the conveyor screws **99** turning in a direction to set up a rearward current of the liquid concrete in the lower portion of the hopper **30**. This causes concrete from the lower portion of the hopper to be constantly packed into the forward end of the curb extruding shoe **31** thus keeping this shoe continuously packed full of liquid concrete under pressure as the travel of the machine **15** progresses.

Successive portions of the curb **20** which are formed by the extruding shoe **31** and are left standing on the soil **19** as the shoe moves from over these portions, are found to possess the hard smooth finished surface which is requisite in this kind of work.

The ready-mix concrete truck supplying liquid concrete to the machine **15** travels alongside this and regulates the delivery of such concrete to the machine so as to keep liquid concrete in the hopper **30** at the desired level. Markers are provided at spaced intervals along the path **18** indicating points where it is desired to introduce into the curb **20** one of the expansion joint elements **61**, and the machine is stopped in its travel, whenever such a marker is reached by the ram **60**, by manually disengaging clutches **144** and **145**. This leaves the main clutch shaft **141** idling in a forward direction. Inasmuch as the ram blade **64** is now in its elevated position as shown in FIGURES 7 and 10, and element **61** may be poised as shown in FIGURE 7 opposite the slot **69** provided for receiving the same and manually inserted lengthwise into the ram chamber **68** where the upper edge of the element is engaged by the shoulder **70** which extends rearward from the ram blade **64**. As soon as the element **61** has thus been completely inserted into ram chamber **68**, the clutch **150** is manually engaged which rotates gear **77** in a counterclockwise direction thereby depressing ram bade **64** and element **61** in the chamber **68** downwardly into curb **20** as shown in FIGURE 11. Immediately upon this having been accomplished, the transmission **115** is reversed which rotates the gear **77** in a clockwise direction thus returning the ram blade **64** to its upper position and leaving the element **61** installed in the curb.

The clutch **150** is now disengaged, the transmission reset to drive shaft **141** forwardly in low gear and clutches **145** and **144** are again engaged manually in that order to produce forward movement of the machine **15** along the rails **16** and **17** and to resume rotation of the conveyor screws **99**.

It is to be noted that the machine **15** will travel around a curve in which the outside track has a seventy foot radius. Whenever the machine **15** arrives at a driveway area where it is desired to eliminate the curb portion **180** which stands above the gutter portion **181** of the curb, this is accomplished by throwing in the clutch **150** while the machine is travelling forwardly and thus lowering the ram blade **64** just far enough downwardly to accomplish a striking-off operation of the higher portion **180** of the curb while the machine **15** is travelling through said driveway area. When the machine arrives at the opposite edge of this area, it is halted by disengaging the clutches **144** and **145**, reversing the direction of rotation of the drive shaft **141**, with this idling, and then engaging clutch **150** to return the ram blade **64** to its upward position whereupon the clutch **150** is disengaged, the transmission **115** reset in low forward drive and the clutches **145** and **144** again manually engaged in that order to resume forward movement of the machine **15** and start screw conveyors **99** rotating.

The slackness provided in chain **24** between adjacent points at which this is attached to rail **17** is for the purpose of permitting the latter to be set up so as to guide the machine **15** in extruding curb **20** around a curve. The chain **24** is thus rendered relatively taut when rail **17** is on the inside of a curve and has an increased degree of looseness when rail **17** is on the outside of a curve. These changes in tautness of chain **24** have not been found to interfere with the satisfactory engagement of the teeth of sprocket flange **53** with the links of said chain in causing powered travel of the machine **15** over rails **16** and **17**.

We claim:

1. A curb extruding machine comprising

a concrete hopper;

a curb extruding shoe connecting to a lower portion of said hopper and extending rearwardly therefrom;

rail means for supporting said hopper and shoe for travel along a particular grade conforming to the path in which said curb is to be extruded;

and horizontal screw means in said lower portion of said hopper for delivering fluid concrete horizontally from said hopper into said shoe as said machine travels on said rail means;

wherein the improvement resides in said hopper and shoe both being open at the bottom with said open bottoms being disposed close to the soil therebeneath so that the fluid concrete at the bottom of the hopper is pressed, by the fluid head imposed thereon, into the surface voids of said soil therebeneath and remains in place to be given the shape of a curb by said shoe.

2. A curb extruding machine as recited in claim **1** wherein

ram means is provided on said machine for forcing a sheet expansion joint element through the liquid concrete passing through said machine to install said element transversely in the curb formed of said concrete.

3. A curb extruding machine as recited in claim **2** wherein

said ram means is located to function in a vertical plane at the point where said liquid concrete is delivered horizontally from said hopper into said shoe.

4. A curb extruding machine as recited in claim **3** wherein said ram means includes a vertically reciprocable plunger comprising;

a concrete parting blade coextensive in width with said curb and

shoulder means on said blade which conform to the contour of and engage the upper edge of said element to carry the latter downwardly through said liquid with said blade.

5. A curb extruding machine as recited in claim **4** wherein

said hopper has side walls and front and rear end walls and

said shoe has side walls comprising of said hopper sidewalls and a shaped upper wall reflecting the transverse contour of said curb;

means for guiding said blade in close spaced parallelism with said rear hopper end wall with said shoulder means occupying the space therebetween,

there being a vertical slot in one of said hopper sidewalls in alignment with said space for the introduction of an expansion joint element into said space beneath said shoulder means when said blade is in raised position.

6. A curb extruding machine comprising:

a concrete hopper;

a curb extruding shoe connecting to a lower portion of said hopper and extending rearwardly therefrom;

means for supporting said hopper and shoe for travel along a path in which said curb is to be extruded; and

screw means in said hopper for delivering fluid concrete from said hopper into said shoe as said machine travels along said path

wherein the improvement resides in the provision of ram means for forcing a sheet expansion joint element

through the liquid concrete passing through said machine to install said element transversely in the curb formed of said concrete.

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