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Jennings, Jr. et al.

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[45] **Nov. 18, 1975**

[54] **CURB FORMING APPARATUS**

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[73] Assignee: **Irl Daffin Associates, Inc.,** Lancaster, Pa.

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[52] **U.S. Cl.** **404/98**

[51] **Int. Cl.²** **E01C 19/52**

[58] **Field of Search** 404/98, 105

[56] **References Cited**

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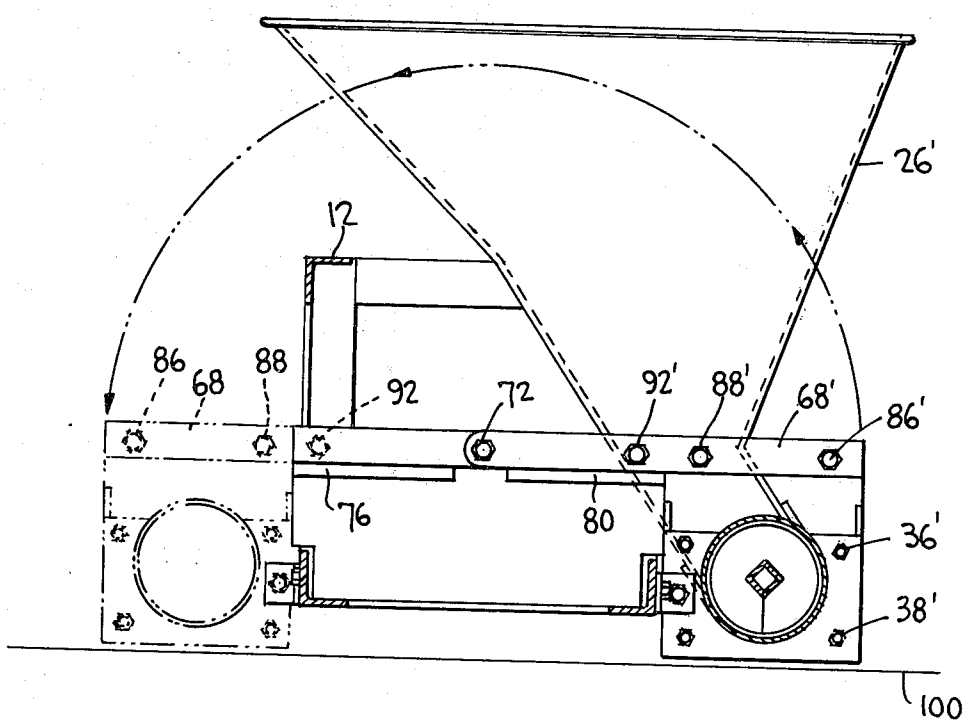
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[57] **ABSTRACT**

A curb forming apparatus for extruding a paving material such as asphalt or concrete to continuously produce an elongated curb, median strip or the like including an extrusion assembly pivotable to either side of the frame means to enable the apparatus to be operated to lay a curb or the like on opposite sides without changing the direction of travel.

8 Claims, 6 Drawing Figures



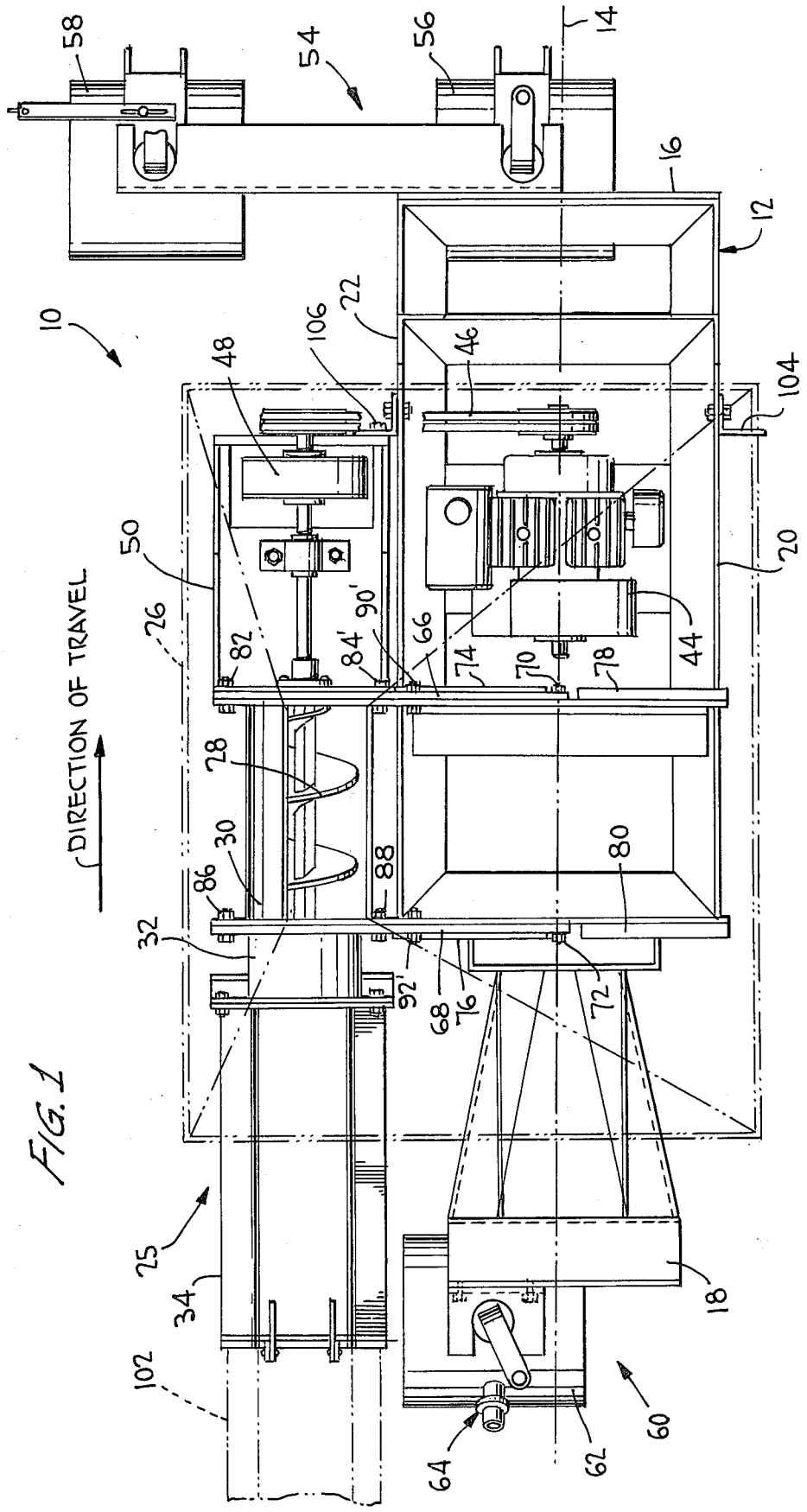

58
54
56
14
16
12
10
22
106
48
46
104
50
20
26
82
84'
90'
66
74
70
78
44
DIRECTION OF TRAVEL
28
30
86
88
80
32
92'
68
76
72
25
34
18
102
64
62
60

FIG. 1

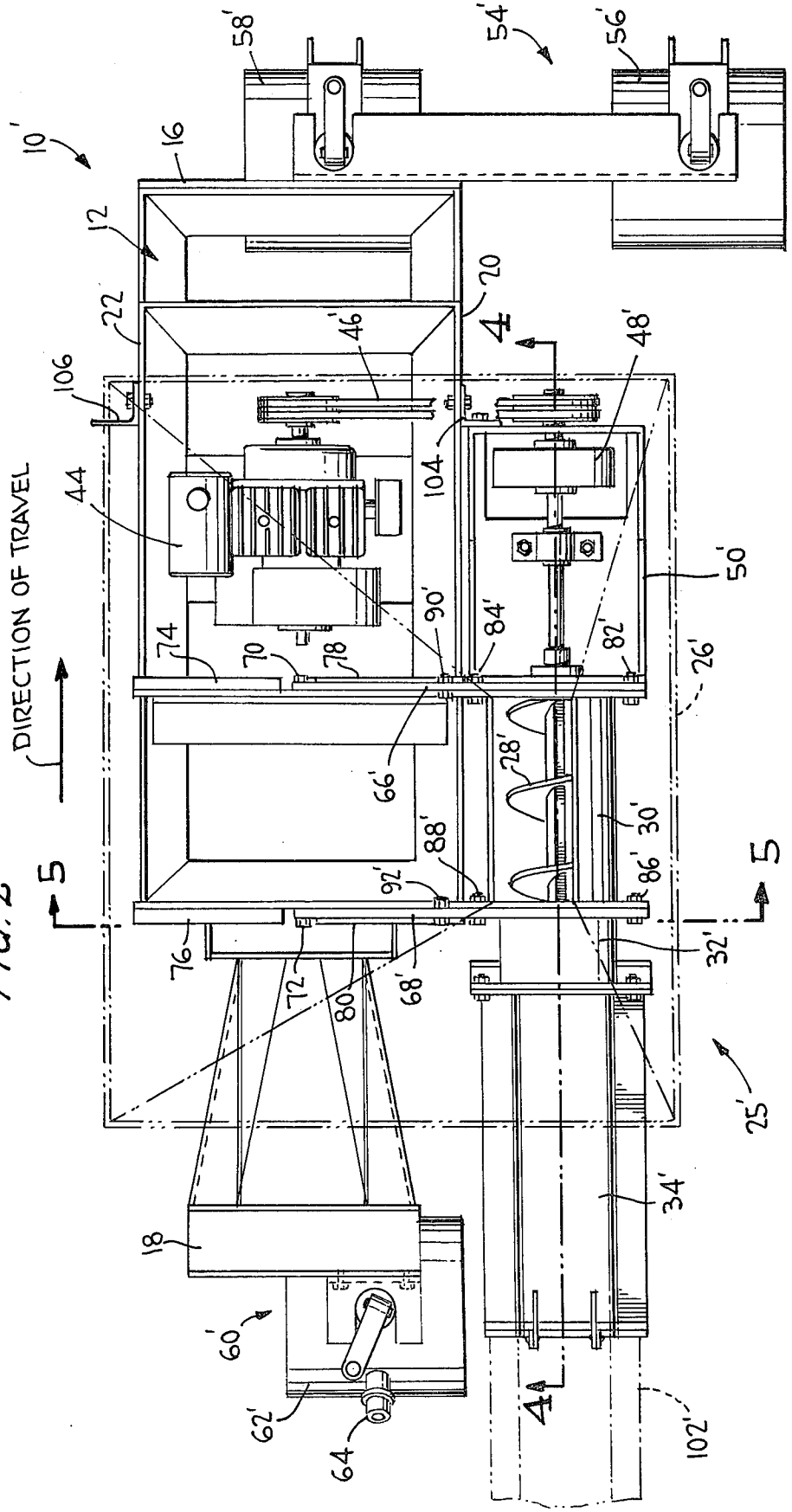

10'
12
16
18
20
22
25'
26'
28'
30'
32'
34'
44
46'
48'
50'
54'
56'
58'
60'
62'
64
66'
68'
70
72
74
76
78
80
82'
84'
86'
88'
90'
92'
102'
104
106
DIRECTION OF TRAVEL
4
4
5
5

FIG. 2

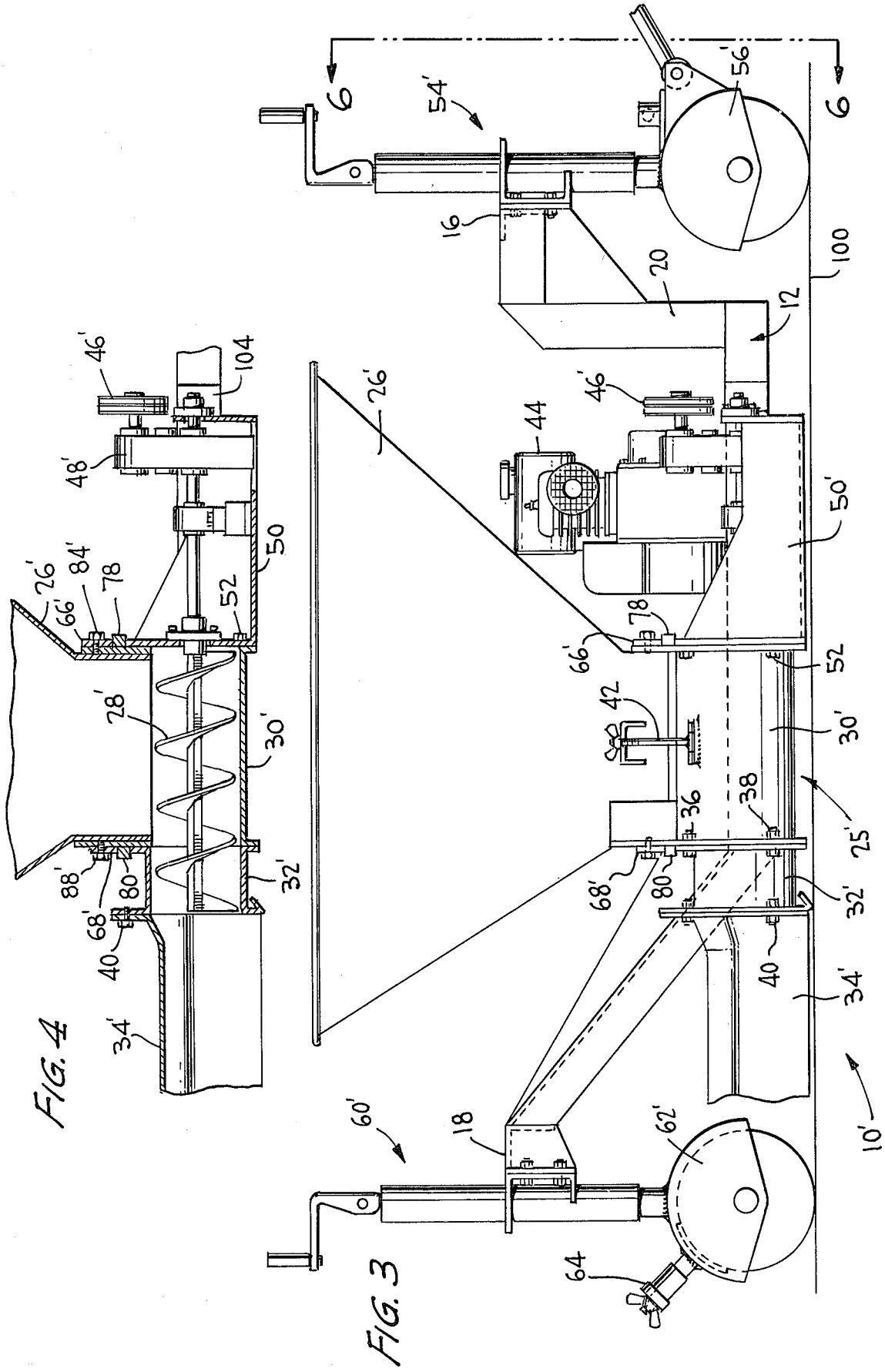

6
6
54'
56'
16
20
100
12
46'
104
48'
26'
44
46'
50'
78
66'
52
42
30'
36
38
25'
68'
80
32'
40
34'
10'
60'
18
62'
64
26'
66'
84'
78
52
50
28'
30'
32'
88'
80
68'
40
34'

FIG. 4

FIG. 3

FIG. 5

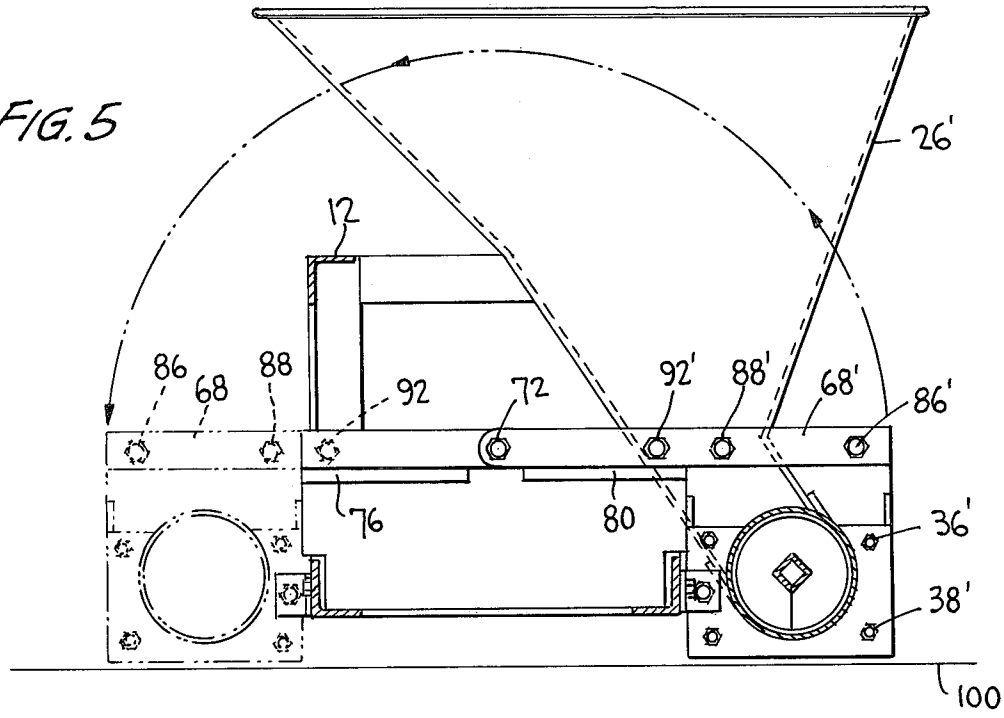
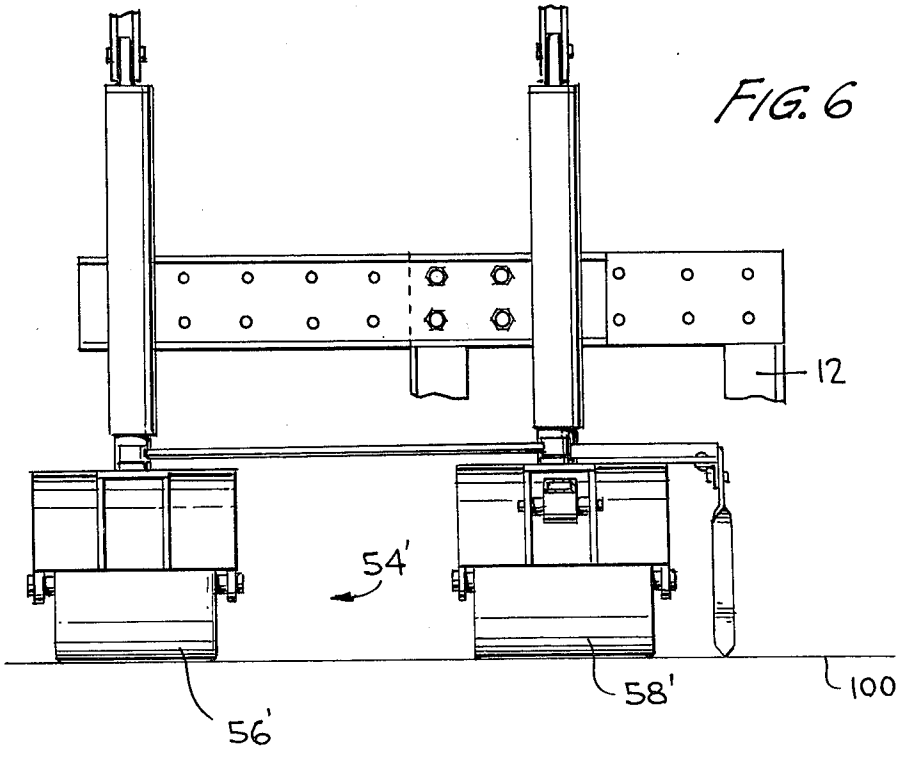


FIG. 6



CURB FORMING APPARATUS

This invention relates to a curb forming apparatus and relates more particularly to a device for extruding a paving material to continuously form a curb or the like on opposite sides of the apparatus without the necessity for changing its direction of travel.

Curb forming machines are quite well known and are used extensively to preclude the necessity for laying inidividual forms to produce an elongated curb, which obviously requires a great deal of time and affort. A curb forming apparatus which is self-contained and self-propelled is shown and described in detail in commonly assigned and now abandoned U.S. application Ser. No. 362,346 filed May 21, 1973 in the name of Charles E. Jennings, Jr., the entire disclosure of which is incorporated herein by reference. With a device of that type it is merely necessary to continuously feed a paving material into a hopper and guide the device as it moves to insure that the curb is layed along the proper path. Once the initial curb is layed it acts to propel the apparatus forwardly as additional paving material is extruded.

With prior art devices of this type it is necessary to actually turn the apparatus around 180° in order to extrude a curb in the opposite direction. A modified form of curb forming apparatus is shown and described in detail in commonly assigned U.S. application Ser. No. 551,390 filed Oct. 2, 1974 in the names of Ralph W. Coho, Jr. and John L. Kugle, the entire disclosure of which is also incorporated herein by reference. This modified device enables extrusion of a paving material in opposite directions on the same side of the wheeled support so that the device can be propelled in either direction.

The instant modified curb forming apparatus provides an arrangement whereby the extrusion assembly can be pivoted to either side of the wheeled support so the direction of travel of the apparatus need not be changed while permitting the curb to be layed on either side of the main frame.

Commonly, it is desirable to operate a curb forming apparatus of the type with which the instant invention is concerned either on a flat grade or in a generally uphill direction to insure a proper compaction of the extruded paving material. If a machine of this nature is operated downhill, the weight of the apparatus has a tendency to cause the same to "runaway" from the curb being layed so that it is difficult to produce good compaction. Sometimes this difficulty can be overcome by modifying the paving material being used. Additionally, both of the prior applications referred to hereinabove propose to utilize a braking or retarding means to slow the progress of the machine as it moves downhill.

The instant invention enables the machine to be operated in the same direction while the curb can be laid on either side of the frame. In some instances, it is impossible to lay a curb on one side of a machine because obstructions such as guardrails and the like preclude the frame from rolling on that side of the extrusion. The undesirability of reversing certain prior art devices to extrude curbs on opposite sides of the apparatus is also believed to be evident.

Thus, it is a primary object of this invention to provide a curb forming apparatus which is capable of laying a curb or the like on either side of the wheeled support while the machine is moved in the same direction. This construction enables the operator to selectively place an extrusion assembly in a desired relation with respect to the frame depending upon the terrain.

Another object of this invention is the provision of a curb forming apparatus which is relatively easy to modify so as to enable extrusion of the paving material on either side of the frame without modifying the direction of travel. This construction also minimizes duplication of elements by providing reversible parts that can be used on either side of the wheeled support depending upon the environment in which the curb is to be laid.

Yet another object of this invention is to provide a curb forming apparatus which is relatively simple and inexpansive to manufacture, utilize and maintain and, yet, which is extremely strong and durable in construction. Other and further objects of the invention reside in the combination of elements, arrangement of parts and features of construction.

Still other objects will in part be obvious and in part be set forth in the following detailed description which makes reference to the accompanying drawings wherein:

FIG. **1** is a top plan view of a curb forming apparatus according to the instant invention, with the parts being arranged for extruding a curb to the left of the device, selected elements being shown in dotted lines for illustrative clarity and convenience;

FIG. **2** is a top plan view of the device of this invention with the parts being arranged for extruding a curb on the right of the wheeled support;

FIG. **3** is a side elevational view of the arrangement shown in FIG. **2**;

FIG. **4** is a fragmentary cross-sectional view through the extrusion assembly taken substantially along lines **4—4** of FIG. **2**;

FIG. **5** is a transverse cross-sectional view taken substantially along lines **5—5** of FIG. **2**, with the alternate position of the extrusion assembly being shown in dotted lines; and

FIG. **6** is an elevational view taken substantially along lines **6—6** in FIG. **3**.

Like reference characters refer to like parts throughout the several views of the drawings.

It is to be understood that any well-known paving material could be utilized in the apparatus of this invention, such as asphalt or concrete and that the term "curb" is used to herein, and in the appended claims, in a generic sense to encompass ordinary curbs, median strips and the like of any desired cross-section.

The various elements and members of the apparatus of this invention may be made of any suitable material, normally welded steel.

Reference is now made to the drawings, more particularly to FIG. **1**, wherein a curb forming apparatus according to the instant inventive concepts is designated generally by the reference numeral **10**. In the remaining figures similar parts shown in their alternative positions are designated by the same reference numeral followed by a prime (').

This device comprises basically an elongated frame means **12** having a longitudinally extending central axis **14**, longitudinally spaced forward and rearward ends **16, 18** and laterally spaced sides **20, 22.**

An extrusion assembly is designated generally by the reference numeral **25** and comprises, in combination, a hopper means **26,** a rotabably supported elongated auger means **28,** an auger housing means **30,** a compac-

tion tube **32,** and curb forming means **34.** The various elements of the foregoing assembly **25** are removably secured to each other by any selected means, illustratively shown as bolts **36, 38** and **40,** as well as the releasable attaching means **42** which secure the hopper means **26** to the auger housing means **30** (note particularly FIG. 3).

A driving means in the form of a motor means **44** supported by the frame means **12** is operatively secured to drive the auger means **28** via a pulley assembly **46** and a gear box means **48.** With this type of transfer arrangement, a gear box housing **50** is also provided, secured to the auger housing means **30** by releasable securing means such as bolts **52.** The type of motor means is not critical to the instant invention and can be an internal combustion engine, an electric motor, a hydraulic motor or the like.

A wheeled support is provided for the frame means **12** in the form of front roller means **54** including a pair of laterally spaced, steerable front wheel members **56, 58,** the front roller means being secured to the forward end **16** of the frame means **12,** and rear roller means **60** including a single rear wheel member **62** with a brake means **64.** The front and rear roller means are vertically adjustable and these elements along with the brake means are of a nature similar to like parts shown in the previously mentioned co-pending applications. Moreover, these elements may be laterally adjusted in the same manner as with the previous modifications, this lateral adjustment enabling the wheel means to be properly positioned depending upon which side of the frame means the curb is to be layed.

Uniquely provided in the instant apparatus is a pair of elongated support arms **66, 68,** one end of each of which is pivotably supported to the frame means about the central axis as shown at **70, 72,** respectively. The support arms are of such a length that when laterally extended, portions of each support arm overhang the respective side **20** or **22** of the frame means **12** so that the extrusion assembly **25** can be secured thereto. Cleat members **74, 76, 78, 80** are carried by the frame means to provide a surface on which the support arms rest when they are pivoted to one side or the other of the frame means. Note particularly FIG. **5.**

The manner in which the instant apparatus is utilized is believed to be self evident. With the support arms **66, 68** pivoted to overhang the left side **22** of the frame means **12** as shown in FIG. **1,** the extrusion assembly **25** can be supported thereby. Specifically, the opposite ends of the auger housing **30** are secured by bolts or the like to the support arms. The gear box housing **50** is secured to one end of the auger housing **30** and the compaction tube **32** is secured to the other end of the auger housing **30** with the curb forming means secured to the rear end of the compaction tube **30.** The hopper means **26** is secured with its outlet communicating with the inlet of the auger housing **30.**

When it is desired to extrude a curb on the opposite side of the frame means **12** the apparatus can be modified to connect the various elements to each other in the manner shown in FIG. **2–6.** Specifically, the bolt means **82, 84, 86** and **88** securing the auger housing **30** to the support arms **66, 68** are removed and the bolt means **90, 92** securing the support arms to the frame means are also removed so that the support arms can be pivoted to overhang the right hand side **20** of the frame means **12.** All of the other items of the compaction assembly **25** are removed, reassembled and secured together and to the support arms as shown in the remaining figures. In order to operate from the right hand side of the frame means it is necessary to turn the auger housing **30** 180° so that the opening thereof extending upwardly and inwardly and, additionally, the hopper means **26** must be turned by 180° before reassembly. If the profile of the curb forming means **34** needs to be reversed, a modified curb forming means is secured to the compaction tube **32.** The pulley **46** is operatively associated between the power output shaft of the motor means **44** and the gear box **48.** The wheeled supports are laterally offset, as necessary and vertically adjusted to insure that the curb forming means engages the surface **100** on which a curb **102** is to be laid. All of the various securing means are then reconnected on the opposite side so that operation can be begun.

Brackets **104,106** may be provided, if necessary, to additionally support the gear box **50.**

It is now believed that the advantages of a device of this nature will be readily understood and that all of the objectives set forth herein above, and many others of commercial importance, are satisfied by the curb forming means of this invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A curb forming apparatus comprising, in combination, elongated frame means having a longitudinally extending central axis, longitudinally spaced forward and rearward ends and laterally spaced sides; hopper means having an inlet for receiving a material from which the curb is to be formed, and an outlet; conveyor means including a rotatably supported elongated auger means, an elongated auger housing having a generally upwardly opening inlet and longitudinally spaced open ends, and a compaction tube having longitudinally spaced ends; releasable securing means for attaching said hopper means to said auger housing with said outlet of said hopper means communicating with said inlet of said auger housing; driving means for rorating said auger means including motor means carried by said frame means and power transfer means operatively connecting said motor means to said auger means; curb forming means having longitudinally spaced open ends and longitudinally extending, laterally spaced, lower edged; and front and rear roller means carrying said forward and rearward ends, respectively, of said frame means and adapted for rollingly supporting said apparatus on a surface to be provided with a curb with said lower edges of said curb forming means juxtaposed to the surface; longitudinally spaced, laterally extending, elongated support arms, pivot means securing one end of each support arm to said frame means at about said central axis so that said support arms can be swung about said pivot means with portions of said support arms overhanging one or the other of said sides of said frame means, cleats on said frame means upon which said support arms rest; means for securing said auger housing; said auger means, said compaction tube and said curb forming means to each other in operable relationship to define an extrusion assembly, and means for securing said extrusion assembly to said overhanging portions of said support arms so that said apparatus can be operated to form a curb on either side of said frame means.

2. A curb forming apparatus according to claim **1** wherein means are provided for securing said auger housing to said overhanding portions of said support

arms, further means being provided for securing one end of said compaction tube to one end of said auger housing with said auger means extending through both said auger housing and said compaction tube, and still further means being provided for securing one end of said curb forming means to the other end of said compaction tube.

3. A curb forming apparatus according to claim **2** wherein said power transfer means include a gear box operatively connected to said auger means, a gear box housing supporting said gear box, means for securing said gear box housing to the other end of said auger housing, and pulley means operatively connecting said motor means with said gear box.

4. A curb forming apparatus according to claim **1** wherein said inlet of said auger housing extends generally upwardly and inwardly toward said frame means, said auger housing being reversed for forming a curb on opposite sides of said frame means.

5. A curb forming apparatus according to claim **1** further including vertically adjustable means securing said frame means to said front and rear roller means whereby said longitudinally extending lower edges of said curb forming means may be adjustably juxtaposed to the surface to be provided with a curb.

6. A curb forming apparatus according to claim **1** further including laterally adjustable means securing said frame means to said front and rear roller means whereby said front and rear roller means may be adjustably offset in one direction or the other depending upon the side of said frame means on which the curb is to be formed.

7. A curb forming apparatus according to claim **1** wherein said front roller means includes a pair of laterally spaced, steerable front wheel members and said rearwheel means includes a single rear wheel members.

8. A curb forming apparatus according to claim **7** further including brake means operatively associated with said rear wheel member, thereby providing control over the compaction of the curb forming material in the event the apparatus is progressing downhill.

* * * * *