Dec. 23, 1969 H. M. ZIMMERMAN 3,485,481

CONCRETE CONVEYOR

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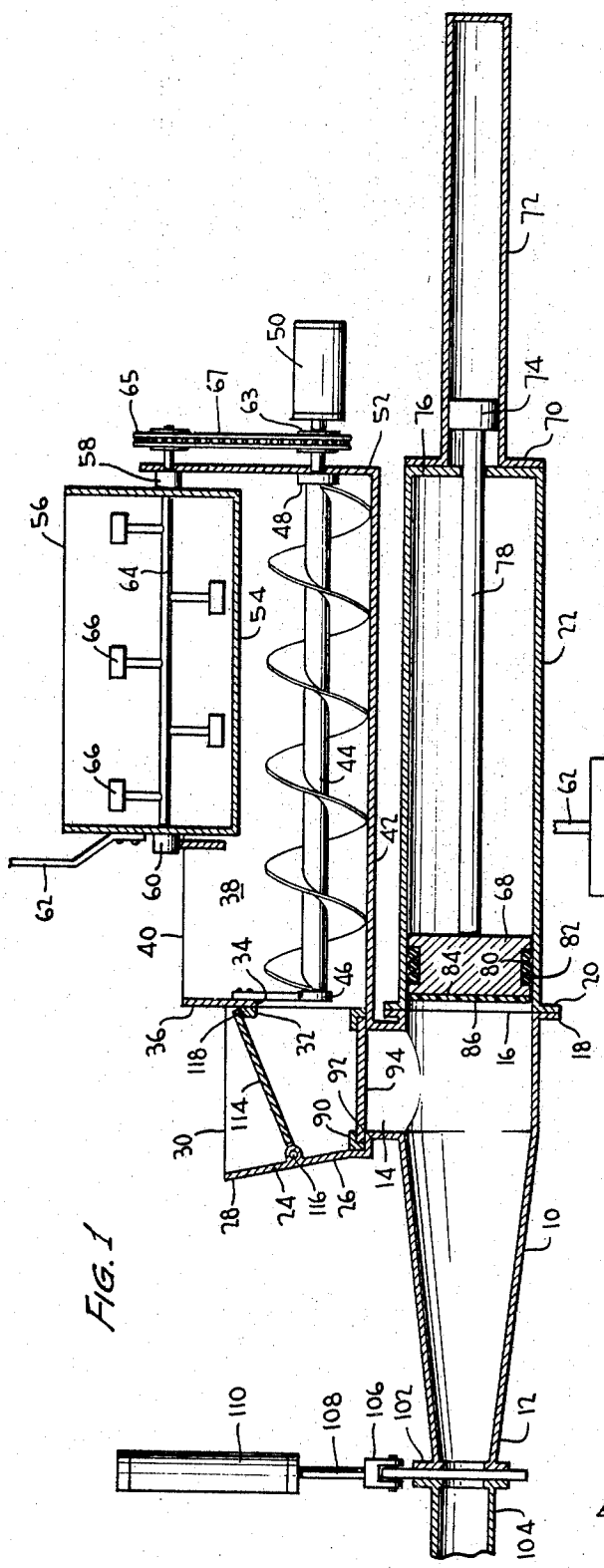

FIG. 1

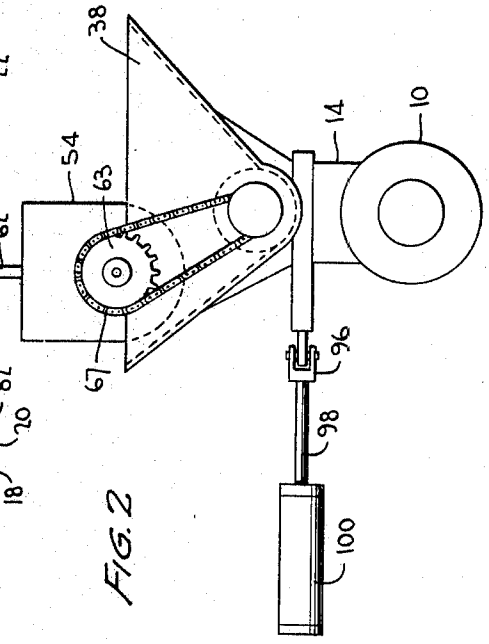

FIG. 2

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CONCRETE CONVEYOR

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FIG. 3

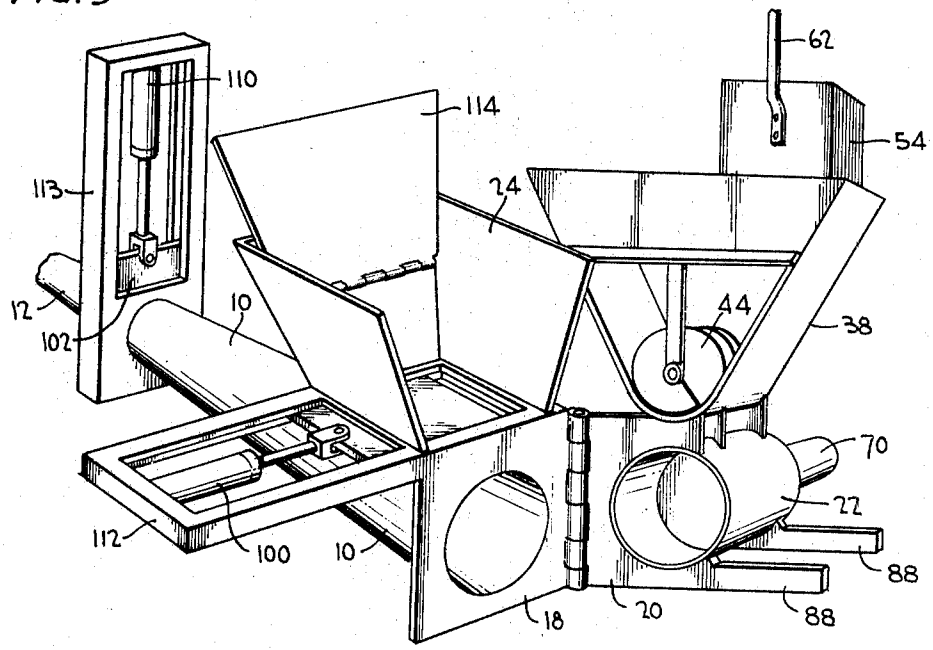

FIG. 5

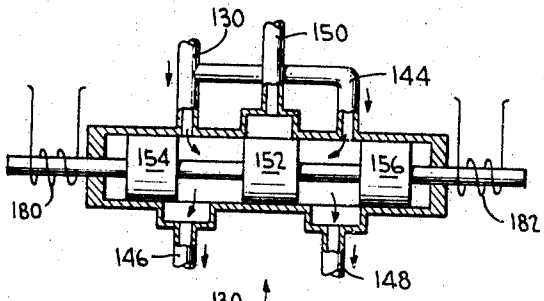

FIG. 6

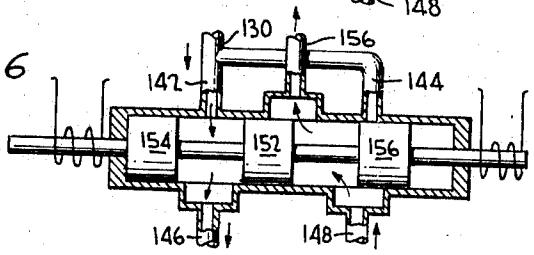

FIG. 7

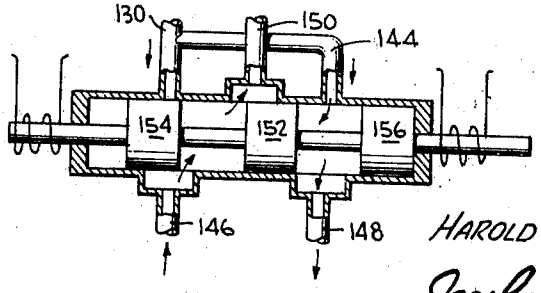

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FIG. 4

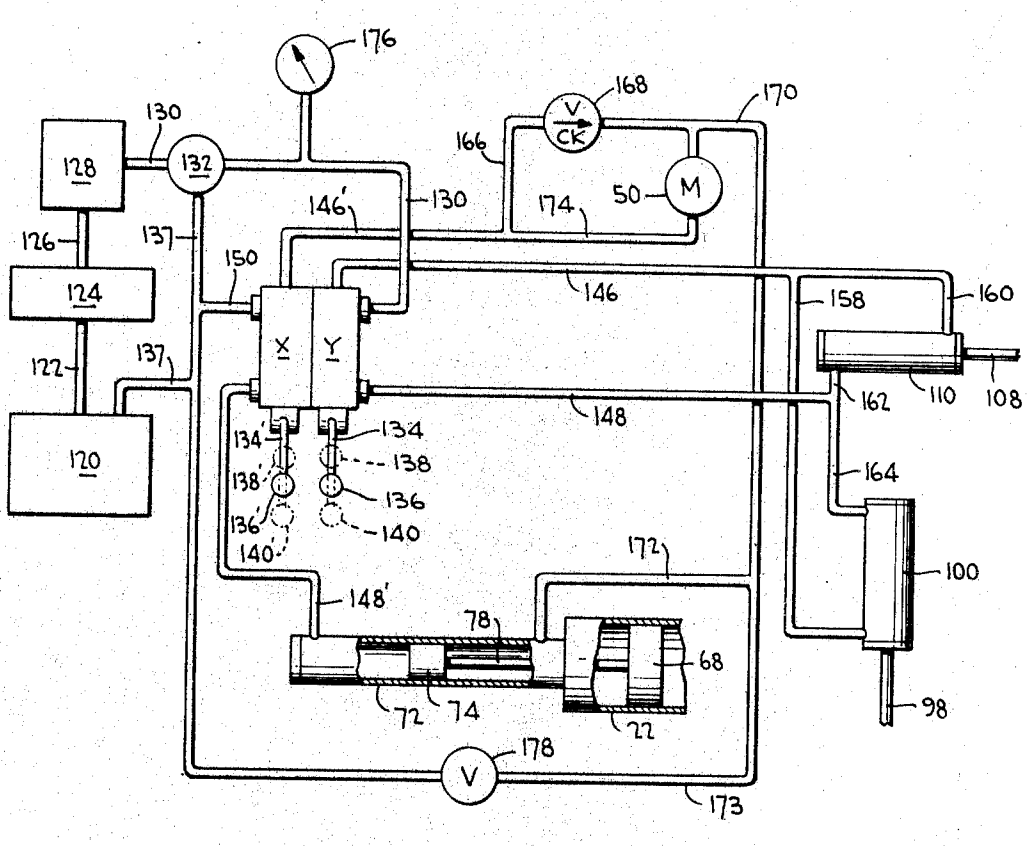
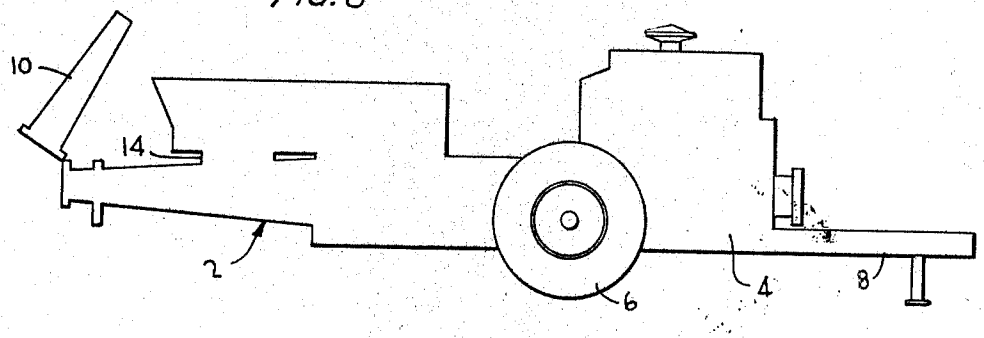


FIG. 8



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CONCRETE CONVEYOR

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Int. Cl. B28c 7/16; B65g 25/08
U.S Cl. 259—170 19 Claims

ABSTRACT OF THE DISCLOSURE

There is disclosed a conveyor arrangement for receiving pre-mixed concrete and causing the same to be moved through an outlet so that the concrete can be delivered to a location remote from the conveyor arrangement. The arrangement is such that it can conveniently take the form of a trailer unit, although it can be mounted on other bases. The arrangement incorporates a fluid motor operated displacement pump and means for receiving the concrete and positively moving the same toward the displacement pump chamber. Further, the arrangement incorporates valve means cooperatively associated with the displacement pump so as to permit proper filling of the displacement pump chamber with concrete, and proper movement of the concrete therefrom. Desirably, such valve means include a valve which seals the dislacement chamber from the atmosphere while the chamber is filling. Auxiliary components such as an agitating hopper, self-contained power unit and the like can be utilized to advantage as part of the arrangement. In accordance with the disclosed embodiment, the displacement pump is actuated by a fluid motor supplied with operating fluid under pressure delivered thereto by a valve controlled fluid supply conduit; a by-pass conduit communicates with the fluid supply conduit in such a manner that fluid under pressure may be delivered to a rotary fluid motor associated with the agitating hopper so that operation of the agitator may be continued even though the flow of fluid through the fluid conduit leading to the fluid motor for actuating the displacement pump is discontinued.

BACKGROUND OF THE INVENTION

The invention relates generally to a pre-mix concrete conveyor and particularly to a conveyor that is capable of pumping pre-mixed concrete from a self-contained pre-mix producing unit or a pre-mix delivery truck directly to a remote point of use, such as a building construction form.

It is well known that among the problems that building contractors face today are labor shortages, the high cost of labor and the high cost of equipment necessary to transport pre-mixed concrete from a self-contained concrete producer unit or a concrete delivery truck to a remote point of use. Thus, the need for a practical and profitable device to convey concrete from the mixer to the form is apparent. For example, extensive investigation shows that pumping concrete from a mixer to a form can reduce the cost of this operation by about 35 percent and that concrete pumping is practical at more than one-third of all pours. Concrete pumping is both practical and profitable where it can replace manpower, where

it can replace ramps, bridges, hoists, etc., where job evaluation shows concrete can be placed faster and at less costs than by other methods, and with many special pours such as sewers, tunnel linings, etc.

The low cost of the present development, which is about half that of the larger pumps now on the market, makes it a practical investment when used as a single unit or in multiples of single units. With multiple units, it is practical to operate them (1) teamed together to equal or exceed the capacity of larger units; (2) teamed in relay to extend horizontal and/or vertical delivery distance; (3) to operate them in teams to assure continuing delivery without stoppage (cold joint prevention); and (4) maximum dependability.

Taking into consideration the foregoing problems, it is the primary object of the present invention to entirely eliminate these problems, or at least, to reduce them to a minimum.

Another object of the invention is to provide a pre-mix concrete conveyor having a capacity just sufficient to keep an average handling finishing crew continuously busy.

Yet another object of the invention is to provide a concrete mix conveyor of such a size and weight that it can be readily transported from one building site to another. To this end, it may take the form of a trailer unit. It may, however, be formed as an integral part of a construction truck or mounted as an independent unit on a base and then mounted on a construction truck.

Still another object of the invention is to provide a concrete conveyor in which concrete may be delivered from a concrete pre-mix producing unit or concrete pre-mix supply truck, over substantial distances, to remote points of use without entraining air into the concrete, or at least, reducing the amount of entrained air to a minimum.

A further object of the invention is to provide a concrete conveyor that includes a concrete mix displacement pump, the valves and motor of which are operated by fluid pressure.

A still further object of the invention is to provide a concrete conveyor having a fluid actuated displacement pump and a fluid actuated concrete agitator having a common valve controlled fluid supply conduit.

Another object of the invention is to provide a concrete conveyor wherein the motor of the displacement pump and the motor of the agitator are supplied with fluid from a valve controlled fluid supply conduit that includes a by-pass conduit leading to the motor of the agitator so that operation of the agitator may be continued, notwithstanding the fact that flow of fluid to the fluid motor for operating the concrete displacement pump has been discontinued.

A further additional object of the invention is to provide a concrete displacement pump in which certain parts of the pump may be displaced relative to each other to facilitate cleaning thereof.

A still further additional object of the invention is to provide a concrete conveyor, according to the teachings of the present invention, that is simple in construction, durable and made of materials of relatively low cost.

The invention will be better understood and objects other than those set forth will become apparent, after reading the following detailed description thereof.

Such description refers to the annexed drawings presenting preferred and illustrative embodiments of the invention.

In the drawings:

FIGURE 1 is a longitudinal sectional view of a concrete conveyor in accordance with the present invention;

FIGURE 2 is an end view thereof;

FIGURE 3 is a perspective view of a concrete conveyor showing a portion thereof swung to a position to permit cleaning thereof;

FIGURE 4 is a diagrammatic view showing the fluid conduit system for operating the fluid motors thereof;

FIGURE 5 is a view, partly in section, showing a motor control valve in a neutral position;

FIGURE 6 is a view, partly in section, showing a motor control valve in one operative position;

FIGURE 7 is a view, partly in section, showing a motor control valve in another operative position;

FIGURE 8 is a perspective view of a concrete conveyor in accordance with the present invention mounted on a trailer unit.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, it is to be noted that FIGURE 8 discloses a self-contained concrete conveyor **2** mounted on a trailer **4** and having wheels **6** and a trailer hitch **8**. The concrete conveyor **2** includes a trap chamber unit **10** that is tapered toward an outlet end **12**. The trap chamber **10** is provided with a laterally extending inlet **14** adjacent its opposite end **16**. The end **16** of the trap chamber **10** is provided with a flange **18** to which a flange **20** of a pump or displacement cylinder **22** is attached in any conventional manner. A trap inlet chamber **24** has one of its ends **26** secured to and in communication with the lateral inlet **14**. The opposite end **28** of the trap inlet chamber **24** is open at **30** to the atmosphere. The trap inlet chamber is also provided with a lateral opening **32** in communication with an opening **34** formed in the end wall **36** of a concrete mix receiver **38**. Concrete mix receiver **38** is open at its top **40** and provided with a closed bottom at **42**. A feed screw or auger **44** is mounted adjacent the bottom **42** of the concrete mix receiver **38** by means of bearings **46**, **48**. A rotary fluid motor **50**, mounted adjacent end wall **52**, is operatively attached to the feed screw or auger **44** in such a manner that, on rotation of the feed screw or auger **44**, concrete is fed thereby through openings **34** and **32** into trap inlet chamber **24**. A dump hopper **54**, having an open top **56**, is mounted by means of bearings **58**, **60** for pivotal movement above concrete mix receiver **38**. Dump hopper **54** is provided with a handle **62** by means of which it may be inverted and its contents dumped into the concrete mix receiver **38**. An agitator shaft **64** is mounted for rotation within dump hopper **54** and it is provided with a plurality of agitating paddles **66**. A gear **63** is secured to the shaft of the feed screw or auger **44** and a similar gear **65** is secured to agitator shaft **64**. An endless chain **67** extends around gears **63** and **65** so that on rotation of the feed screw or auger **44** the agitator paddles **66** are also rotated.

A pumping or displacement plunger **68** is mounted for reciprocating or sliding movement within pump or displacement cylinder **22**. A fluid motor **70** comprising a cylinder **72** and piston **74**, slidable in cylinder **72**, is mounted on the end wall **76** of pump or displacement cylinder **22**. A piston rod **78** is arranged to connect pumping or displacement plunger **68** with the piston **74** of fluid motor **70**.

Pumping or displacement plunger **68** is provided in its periphery with a circumferential groove **80** into which a plurality of O-rings **82**, formed of any well known sealing or packing material, are inserted. The forward face of pump or displacement plunger **68** is provided with a layer of Teflon or rubber **86** to prevent build-up of solid concrete mix on the forward face **84** of displacement plunger **68**.

In FIGURE 3 of the drawings, the trap chamber **10** is shown with its flange **18** spaced from flange **20** which is associated with the displacement plunger cylinder **22** that is provided with supporting legs **88**.

A pair of cooperating gate valve seat members **90**, **92** are provided adjacent the outlet end of trap inlet chamber **24**. Slidably mounted between the cooperating gate valve seat members **90**, **92** is a horizontally disposed gate valve member **94**. Gate valve member **94** is connected by means of a fork **96** and connecting rod **98** to a double acting fluid actuated motor **100**. A vertically disposed gate valve **102** is mounted between the outlet end **12** of trap chamber unit **10** and concrete mix delivery conduit **104**. Gate valve **102** is arranged to be moved between its open and closing positions by means of a fork **106** and connecting rod **108** attached to a double acting fluid actuated motor **110**. A horizontally disposed frame **112** which is integral with, or otherwise secured to, the trap chamber **10** is arranged to support double acting fluid motor **100**. A similarly arranged vertically disposed frame **113** is formed integral with, or otherwise secured to, trap chamber **10** and supports the double acting fluid motor **110** that is associated with gate valve **102**.

A valve **114** is arranged to be pivotally mounted at **116** within the interior of trap inlet chamber **24**. Valve **114** is arranged to seat by gravity on a seating surface **118** formed adjacent the upper edge of lateral opening **32**. Pivotally mounted valve **114** when seated on seating surface **118** precludes, or at least materially reduces, the entrance of air into trap chamber **10** when pumping or displacement plunger **68** is retracted in cylinder **22** by the fluid actuated piston **74**.

In FIGURE 4, there is diagrammatically illustrated a fluid system for supplying fluid to an exhausting fluid from the several double acting fluid motors **70**, **100** and **110**. A pump **128**, of any conventional design, is arranged to draw fluid from storage reservoir **120** by means of conduits **112**, **126** and filter **124** and deliver same to a fluid conduit **130** which leads to a reciprocating fluid motor supply and exhaust valve indicated generally by the reference character Y. A relief valve **132** is provided in fluid conduit **130**. Relief valve **132** may be of any conventional type and may be set to relieve pressures in excess of any predetermined value. The fluid under pressure which is released by the excess pressure relief valve **132** is returned by conduit **137** to the storage reservoir **120**. Motor supply and exhaust valve Y is provided with an operating handle **134** and when the valve is in its neutral position, the handle is positioned as illustrated by the full line circle **136**. This position of the valve Y corresponds to the position of the valve illustrated in FIGURE 5 of the drawings. From the position of the valve as indicated by the position of handle **134**, the valve may be pushed to the position indicated at **138** in FIGURE 4 which corresponds to the position shown in FIGURE 6 of the drawings. Likewise, from the position **136** of the valve as indicated by the handle **134** in FIGURE 4, the valve handle may be pulled to the position **140** which corresponds to the position of the motor supply and exhaust valve as illustrated in FIGURE 7 of the drawings.

In the position of the motor supply and exhaust valve Y ilustrated in FIGURE 5, the valve lands **154** and **156** uncover the fluid inlet passages **142**, **144** which connect with the supply conduit **130** so that fluid under pressure may pass through the supply and exhaust valve to the motor control conduits **146** and **148** and land **152** closes the port leading to the return passage **150**. When fluid under pressure is supplied simultaneously to both conduits **146** and **148** by the valve Y, it wil also be supplied to conduits **158**, **160**, **162** and **164**, and, accordingly, to both sides of each piston in the double acting fluid motors **100**, **110**. The fluid pressure acting on each side of the piston in cylinder **110** will then be balanced as will be the pressure on each side of the piston in cylinder **100**. With such

a balance of the pressures acting on the pistons in cylinder **100** and **110**, the position of the inlet gate valve **94** and outlet gate valve **102** will remain unchanged.

When the handle **134** of the supply and exhaust valve Y is moved to the position **138** as shown in FIGURE 4, which corresponds to the position of the supply and exhaust valve as illustrated in FIGURE 6, the valve lands **152**, **154** and **156** will be moved toward the left, as illustrated in FIGURE 6. In this position of the valve Y, the valve land **154** will uncover the passage **142** and motor conduit **146** will then be in communication with fluid pressure supply conduit **130**. Also, communication between motor conduit **146** and exhaust conduit **150** will be cut off by valve land **152**. At the same time, valve land **156** will cut off communication between supply passage **144** and motor conduit **148** but motor conduit **148**, because of the position of valve land **152**, wil be in communication with exhaust passage **150**. When fluid under pressure is supplied to the motor conduit **146** and exhausted from motor conduit **148**, pressure fluid will be supplied to one side of the fluid motors **100** and **110** in such a manner that the inlet gate valve **94** to the trap chamber **10** will be opened and the outlet gate valve **102** from the trap chamber will be closed.

When the handle **134** of the supply and exhaust valve for the motors **100** and **110** is pulled to the position shown at **140** in FIGURE 4, motor supply and exhaust valve Y will take the position illustrated in FIGURE 7 of the drawings, wherein all of the valve lands **152**, **154** and **156** have been moved to the right. Land **154** will cut off flow of pressure fluid from supply passage **142** to motor conduit **146** while valve land **152** opens communication between motor conduit **146** and exhaust conduit **150**. At the same time, fluid under pressure in supply conduit **130** will flow through conduit **144** to motor conduit **148** while flow of pressure fluid from motor conduit **148** to exhaust conduit **150** is cut off by valve land **152**. With the motor conduit **148** in communication with the source of pressure fluid and the motor conduit **146** in communication with the exhaust conduit **150**, the valve motors **100** and **110** will be actuated so as to close the inlet gate valve **94** of the trap chamber and to open the outlet gate valve **102** of the trap chamber.

The fluid system illustrated in FIGURE 4 is provided with an additional double acting motor supply and exhaust valve designated by the reference character X. Since the construction of the valve X is identical with the construction of the valve Y, a detailed description of the valve X is believed to be unnecessary. Moreover, reference numerals which apply to the valve Y likewise apply to the valve X. However, in the case of the valve X, the reference numerals which relate to similar structural details have been distinguished by providing such numerals with a prime designation. Thus, when the handle **134'** of the motor supply and exhaust valve X is moved to the position designated **138'**, pressure fluid will flow from the reservoir **120** through the filter **124** by means of the supply conduits **122** and **126** to the pump **128**. From pump **128** the pressure fluid will flow through conduit **130** and a conventional passage in valve Y (not illustrated) to a fluid motor conduit **146'** conected to one side of cylinder **72** containing fluid piston **74**.

At the same time, with the handle **134'** of the motor supply and exhaust valve X in the position designated by **136'**, fluid will flow from the supply conduit **130**, valve X and conduit **148'** into the cylinder **72** on the other side of the piston **74**. The fluid pressure acting on opposite sides of the piston will then be balanced and the piston **74** and associated pumping or displacement plunger **68** will remain in the same position. If the motor supply and exhaust valve handle is now moved to the position designated by **138'**, fluid under pressure will flow from supply conduit **130** through conduit **146'**, conduit **166**, check valve **168** and conduits **170** and **172** to the connecting rod end of motor cylinder **72**. Meanwhile, the opposite end of the motor cylinder **72**, through conduit **148'**, valve X and conduit **150** will be in communication with exhaust conduit **137** leading to supply reservoir **120**. The differential pressure acting on piston **74** in cylinder **72**, through piston rod **78**, will cause the pumping or displacement plunger **68** to be retracted in pump or displacement cylinder **22**. Similarly, when the handle **134'** of the motor supply and exhaust valve X is moved to the position designated by **134'**, fluid under pressure will be supplied by the valve X through the conduit **148'** to the cylinder **22** on the side of the piston **74** opposite the connecting rod **78**, while the opposite end of said cylinder through conduits **172** and **173** wil be connected to the supply reservoir **120** by way of exhaust conduit **137**. A by-pass conduit **174** is arranged to extend between the supply conduit **146'** and the fluid conduit **170**. A rotary fluid motor **50**, which drives the feed screw or auger **44**, is, preferably, located in by-pass conduit **174**. The fluid supply conduit **130** which leads to the motor supply and exhaust valves X and Y may, if desired, be provided with a pressure gauge **176** and the fluid conduit **173**, downstream of its junction with the conduit **172**, may be provided with a shut-off valve **178**.

FIGURES 5 to 7 illustrate an arrangement whereby the supply and exhaust valves could be actuated by electromagnets **180**, **182** instead of handles **134**, **134'**, if desired.

When it is desired to make use of the concrete mix conveyor system herein described, whether it be built as an independent unit that must be lifted onto and off a construction truck, a self-powered vehicle or trailer-mounted, it is transported to a location which is as near as possible to the point of use or the building construction form into which the concrete is to be poured but which is still accessible to concrete supply trucks or another concrete supply source. The concrete delivery conduit **104**, which may be formed as a plurality of sections, is then attached to the end of trap chamber unit **10** and extends to, or near, the concrete construction form into which the concrete is to be delivered.

The handle **134** of valve Y is then pushed from the position indicated at **136** to the position indicated at **138**. In this position of the motor supply and exhaust valve Y, the lands of the valve will be positioned as illustrated in FIGURE 6 of the drawings, with the land **154** positioned to permit flow from the pump **128**, conduit **130**, supply passage **142** and conduit **146** to motors **100** and **110** to apply pressure to the pistons thereof in a direction to open gate valve member **94** and close gate valve member **102**. The opposite side of the pistons in motors **100** and **110** will be connected by conduits **162**, **164**, **148**, **150** and **137** to the fluid storage reservoir **120**. Handle **134'** of supply and exhaust valve X will then be moved from the position indicated at **136'** to the position indicated at **140'**. This will result in a flow of pressure fluid from the pump **128**, conduit **130**, valve Y, valve X and conduits **146'**, **166**, **174**, **170** and **172** into motor cylinder **72** and to apply pressure to the side of piston **74** attached to connecting rod **78** while the cylinder adjacent the opposite side of the piston **74** is exhausted through conduit **148'**, valve X and conduits **150** and **137** to the fluid supply reservoir **120**. The differential pressure acting on piston **74**, through connecting rod **78**, will cause the pumping or displacement plunger **68** to be pulled or retracted toward the end of cylinder **22** remote from trap chamber unit **10**. Since at this time, gate valve **94** will be open and gate valve member **102** will be closed, concrete will be drawn, with the aid of gravity, from the concrete mix receiver **24** into pump or displacement cylinder **22** and trap chamber unit **10**. The handle **134** of the motor supply and exhaust valve Y is then moved to the position indicated as **140**. This position of the motor supply and exhaust valve Y corresponds to that illustrated in FIGURE 7. In this position of the supply and exhaust valve Y, the lands **152**, **154** and **156** are positioned so that the flow of pressure fluid from pump **128** and conduit **130** to the conduit **146** is prevented by

the valve land **154**, but flow of pressure fluid from conduit **130** through conduit **144** and valve Y to conduit **148** to the opposite side of the pistons in motor cylinders **100** and **110** is made possible. Meanwhile, fluid pressure acting, respectively, on the other faces of the pistons located therein will be exhausted by way of conduits **158, 160, 146**, valve Y and conduits **150** and **137** to supply reservoir **120**. Upon actuation of the pistons associated with motors **100** and **110** in this manner, connecting rods **98** and **108** will reposition gate valves **94** and **102** so that gate valve **94** will be closed and gate valve **102** opened. The handle **134'** of supply and exhaust valve X will then be moved to the position indicated at **138'**. In this position of the supply and exhaust valve X, fluid pressure will be exhausted from the side of piston **74** connected to the connecting rod **78** through conduits **172, 173** and **137** to the supply reservoir **120**. Simultaneously, fluid under pressure will be supplied from supply reservoir **120** through conduit **122**, filter **124**, conduit **126**, pump **128**, conduit **130**, valve Y, valve X, and conduit **140'** to the cylinder **72** so as to apply fluid under pressure to the side of fluid piston **74** opposite to that to which the connecting rod **78** is attached. The differential in pressure acting on opposite surfaces of piston **74**, through connecting rod **78**, will cause movement of pumping or displacement plunger **68** in a direction to cause discharge of concrete through the open gate valve **102** into concrete delivery conduit **104**. From the delivery conduit **104** the concrete may, if desired, be discharged directly into building construction forms.

It will be noted, upon reference to FIGURE 4 of the drawings, by reason of the provision of a by-pass conduit **173** between conduits **170, 172** and fluid return conduit **137**, the operation of rotary motor **50** and associated feed screw or auger **44** and the mixing paddles **66** on agitator shaft **64** may be continued even though flow of fluid to the piston for actuating the pump or displacement plunger has been discontinued. If at any time it is desired to discontinue operation of the rotary fluid motor **50**, all that is necessary is to close the shut-off valve **178** located in the fluid return conduit **173**.

After reading the foregoing detailed description, it will be apparent that the objects set forth initially have been successfully achieved. Accordingly, what is claimed is:

1. A concrete conveyor system for advancing concrete from a source of supply to a selected location comprising a concrete displacement means including a trap chamber unit having an outlet at one end, an inlet-outlet at its other end and an inlet intermediate said outlet and said inlet-outlet a cylinder secured to said trap chamber unit in communication with said inlet-outlet; plunger means slidably mounted in said cylinder for reciprocation within said cylinder; means for effecting reciprocation of said plunger means; a concrete receiver chamber for supplying concrete to said inlet of said displacement means, said receiver chamber including a first opening in communication with said displacement means, a lateral second concrete admission opening for communication with a source of concrete and a third atmospheric opening located outwardly of said first and second openings; and an outwardly opening check valve means disposed outwardly of said first and second openings and inwardly of said third opening arranged to substantially preclude the admission of air through said receiver chamber into said displacement means during a suction operation of said displacement means; inlet valve means associated with said inlet; outlet valve means associated with said outlet; first operating means for causing said inlet valve means to open and close said inlet; second operating means for causing said outlet valve means to open and close said outlet and means associated with said first and second valve operating means for causing said inlet valve means to open the inlet while the outlet remains closed and for causing said outlet valve means to open the outlet while the inlet remains closed.

2. A concrete conveyor system as defined in claim **1** wherein said first operating means comprises a first fluid motor means and said second operating means comprises a second fluid motor means.

3. A concrete conveyor system as defined in claim **2** wherein each of said fluid motor means are double acting motors.

4. A concrete conveyor system as defined in claim **3** wherein both of said double acting fluid motors are controlled by a single supply and exhaust valve means.

5. A concrete conveyor system as defined in claim **1** wherein said means for effecting reciprocation of said plunger means is a fluid motor means.

6. A concrete conveyor system as defined in claim **5** wherein said fluid motor means for effecting reciprocation of said plunger means is a double acting fluid motor means.

7. A concrete conveyor system as defined in claim **6** wherein said double acting fluid motor means for effecting reciprocation of said plunger means is controlled by a supply and exhaust valve means.

8. A concrete conveyor system as defined in claim **1** wherein said first operating means said second operating means and said means for effecting reciprocation of said plunger means are each independent double acting fluid motor means; a first supply and exhaust valve means for simultaneously actuating the double acting fluid motor means associated with said inlet and said outlet and a second supply and exhaust valve for actuating said double acting fluid motor means associated with said plunger means.

9. A concrete conveyor system as defined in claim **1** wherein said means for effecting reciprocation of said plunger means, said first operating means and said second operating means are fluid actuated means; at least the fluid actuated means for effecting reciprocation of the plunger means includes a supply and exhaust conduit means for supplying and exhausting actuating fluid thereto and therefrom; said concrete conveyor system further including a concrete receiver hopper having a rotatable feed screw means therein arranged for feeding concrete to said inlet means; a rotary fluid motor means arranged for the actuation of said feed screw means by fluid under pressure passing through said supply and exhaust conduit means; and a by-pass conduit means connecting said supply and exhaust conduit means downstream of said rotary fluid motor means with a region of low pressure whereby operation of said feed screw means may continue after flow of actuating fluid to said fluid actuated means for effecting reciprocation of said plunger means has been discontinued.

10. A concrete conveyor system as defined in claim **1** and further including hingedly connected plate means hingedly mounting said trap chamber with respect to said cylinder whereby said trap chamber and cylinder can be opened at the junction therebetween for cleaning thereof.

11. A concrete conveyor system comprising a concrete displacement means including a concrete inlet means and a concrete outlet means; a first fluid operated motor means associated with said concrete displacement means to effect operation thereof; a concrete receiver including a feed screw for feeding concrete through said inlet means into said displacement means; a main fluid conduit means for supplying operating fluid to said first fluid operated motor means; a second fluid motor means arranged to actuate said feed screw in response to the flow of fluid through said main conduit means and a by-pass conduit means leading from said main conduit means downstream of said second motor means whereby operation of said second motor means may be continued even though flow of fluid through said main conduit means to said first fluid motor means has been terminated.

12. A concrete conveyor system as definend in claim **11** wherein a dump hopper, provided with an opening in a

wall thereof, is mounted to rotate about an axis extending longituidnally of and above the inlet opening of the concrete receiver whereby the hopper may be rotated about its axis so as to locate the opening in the hopper in a position in which concrete may be introduced into said hopper through said opening or to a position in which concrete may be discharged therethrough into said concrete mix receiver.

13. A concrete conveyor system as defined in claim **12** wherein said dump hopper is provided with an agitator means.

14. A concrete conveyor system as defined in claim **13** wherein said adgitator means comprises a rotatably supported agitator shaft provided with a plurality of paddles.

15. A concrete conveyor system as defined in claim **14** wherein said rotary auger includes a rotatable shaft and means is provided to rotate said agitator shaft by said auger shaft.

16. A concrete conveyor system comprising a support means; a concrete displacement means mounted on said support means having an outlet terminating in a first member having a first plate-like surface lying in a plane; a concrete receiver mounted above said concrete displacement means having a delivery outlet lying in the plane containing said first plate-like surface; and a trap chamber unit, including a trap chamber means having a second plate-like surface, mounted for pivotal movement into and out of engagement with said first plate-like surface and an open ended inlet chamber movable simultaneously with said trap chamber means into and out of registration with said delivery outlet of said concrete receiver.

17. A concrete conveyor system for advancing concrete from a source of supply to a location remote therefrom, and comprising:

(A) a concrete displacement means comprising:
  (1) a trap chamber having an inlet;
  (2) cylinder means disposed at one end of said trap chamber and in communication therewith;
  (3) plunger means slidably mounted in said cylinder means for reciprocation therewithin; and
  (4) means for effecting reciprocation of said plunger means;

(B) concrete mixing and supply means for supplying concrete to said trap chamber through said inlet;

(C) a hydraulically operable valve system for opening and closing said inlet of said trap chamber and for opening and closing the path of travel of material through said trap chamber;

whereby when said inlet is open, said path of travel can be closed, and when said path of travel is open said inlet can be closed so that movement of said plunger means in a direction away from said trap chamber causes concrete to flow through said inlet in said trap chamber into said cylinder means while said path of travel is closed, and movement of said plunger means in a direction toward said trap chamber causes concrete to flow therethrough while said inlet is closed.

18. A concrete conveyor system as defined in claim **17** and further including hingedly connected plate means hingedly mounting said trap chamber with respect to said cylinder whereby said trap chamber and cylinder can be opened at the junction therebetween for cleaning thereof.

19. A concrete conveyor system for advancing concrete from a source of supply to a selected locating comprising a concrete displacement means having an inlet means and an outlet means; a concrete receiver chamber for supplying concrete to the inlet of said displacement means, said receiver chamber including a first opening in communication with said displacement means, a lateral second concrete admission opening for communication with a source of concrete and a third atmospheric opening located outwardly of said first and second openings; and an outwardly opening check valve means disposed outwardly of said first and second openings and inwardly of said third opening arranged to substantially preclude the admission of air through said receiver chamber into said displacement means during a suction operation of said displacement means.

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