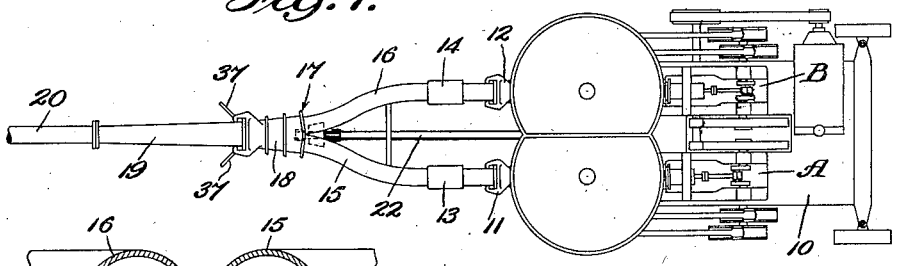
Sept. 8, 1936. C. I. LONGENECKER 2,054,022

PUMPING SYSTEM FOR PLASTIC CONCRETE AND SIMILAR MIXTURES

Filed Oct. 20, 1933

Fig. 1.



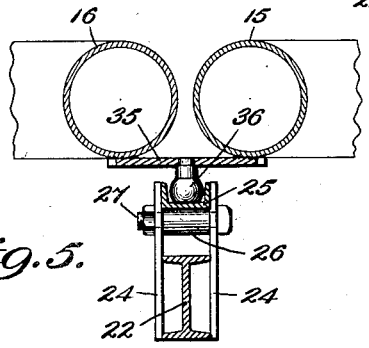
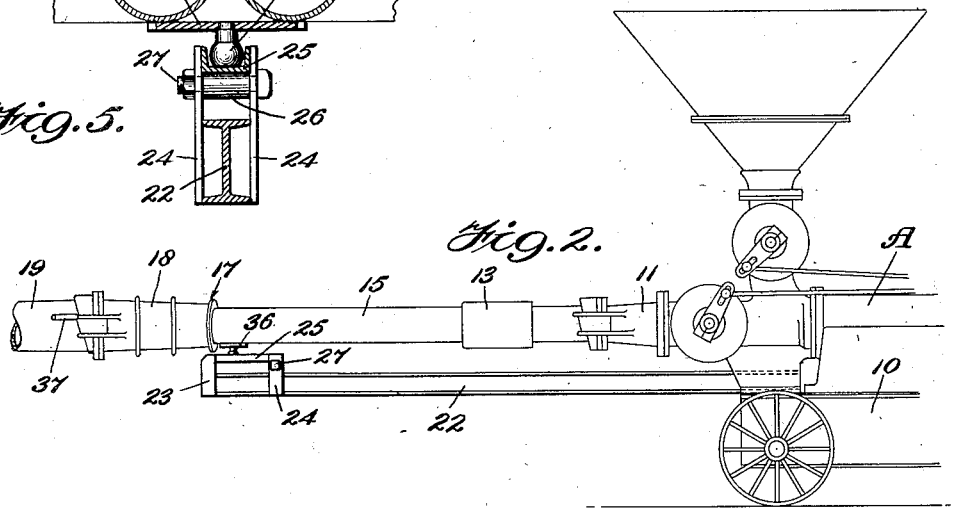


Fig. 5.

Fig. 2.



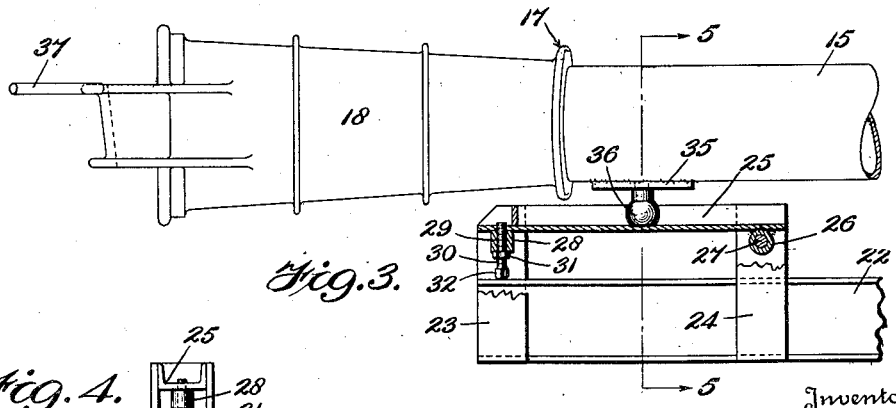
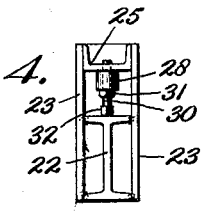


Fig. 3.

Fig. 4.



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PUMPING SYSTEM FOR PLASTIC CONCRETE AND SIMILAR MIXTURES

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Application October 20, 1933, Serial No. 694,482

5 Claims. (Cl. 285—209)

This invention relates to pumping systems for plastic concrete and similar mixtures, and more particularly to the pipes or conduits through which the mixture travels from the propelling means to the point of discharge, and has for one of its objects to provide simple and effective means for facilitating the handling of certain of the conduit sections.

While susceptible of use with other types of propelling means, the present apparatus has been developed primarily for use in connection with a recently developed mechanical concrete pump, known to the trade as "Pumpcrete". These pumps are built in both single cylinder and multiple cylinder models, and although the invention may in some instances find use with the single cylinder pump, it is more particularly adapted to employment with the multiple cylinder type, and for purposes of the present disclosure has been shown in the accompanying drawing in conjunction with a twin "Pumpcrete".

As is now known to those especially skilled in the art, the combining of two or more confined streams of plastic concrete mixture presents certain inherent difficulties not met with in connection with other materials, such as liquids and gases, the individual particles of which are quite free to move about and change their positions relative to one another. The presence in a concrete mixture of the relatively large proportion of coarse aggregate, in the form of gravel or crushed rock, in sizes up to 3" or more in greatest dimension, imparts to such mixtures a property known as "stowing". That is to say, the pieces of aggregate of this size, which usually constitute at least 50% of the mixture, when confined in closed conduits cannot readily change their positions relative to one another, and this is further aggravated by the sticky character of the binding constituents, e. g. the water-and-cement paste, in a Portland cement concrete. As a result, such mixtures moving through a closed conduit under pressure, upon encountering a sudden restriction or obstruction in the conduit, or undue resistance to their travel, instead of having their particles rearranged and speeded up in passing the obstruction, will "stow" or pack at such obstruction, so as to completely stop the flow of the stream.

This "stowing" property is quite troublesome in attempting to combine two or more confined streams of concrete moving under pressure, but has been successfully met and overcome in a peculiar type of Y-connection and combining chamber, known as a "Siamese", described and claimed in a co-pending application filed by Charles F. Ball on September 8, 1933, Serial No. 688,650, entitled Multiple unit concrete pumping apparatus. These "Siamese" connections are heavy and unwieldy, being ordinarily composed of a cast combining chamber some 10" or 12" in diameter, and two or more legs of 7" steel pipe, the whole being some 6 feet long. They must, however, be removed from the discharge line at the conclusion of a pour, or when the pump is shut down over night, in order that the system may be flushed, and prepared for resumption of work the next day, as disclosed in the co-pending application filed jointly by Charles F. Ball and myself on November 24, 1933, Serial No. 699,632, entitled Method of cleaning and preparing conduits for the handling of plastic concrete mixtures; and it is the principal object of the present invention to provide a supporting structure for such conduit sections, which will greatly facilitate the manipulation thereof, enabling it to be performed by a single operator.

With the above and other objects in view which will appear as the description proceeds, the invention consists in the novel details of construction and combinations of parts which will be more fully hereinafter described and particularly pointed out in the appended claims.

Referring to the accompanying drawing forming a part of this specification in which like reference characters designate like parts in all the views:—

Figure 1 is a more or less diagrammatic plan view of a twin concrete pump of the type above mentioned, with a "Siamese" and supporting structure therefor, in accordance with the present invention;

Figure 2 is a side elevational view of the "Siamese" and supporting structure, together with a portion of the pump;

Figure 3 is an enlarged elevational view, partly broken away and in section, of a portion of the "Siamese" and supporting structure;

Figure 4 is an end elevational view of the supporting structure, as seen from the left of Figure 3; and

Figure 5 is a transverse sectional view, taken approximately on the plane indicated by the line 5—5 of Figure 3, looking in the direction of the arrows.

The pump illustrated in Figures 1 and 2 comprises two substantially identical units, A and B, mounted upon a frame 10, and provided respectively with the outlet members 11 and 12, to which are connected by means of suitable slip joints 13

and 14, the legs 15 and 16 of "Siamese" 17. The said legs converge into the combining chamber 18 of the "Siamese", which discharges into a reducing taper section 19 which is connected to the remainder of the discharge line 20 as will be clear from Figure 1.

The supporting structure for the "Siamese" 17 constituting the present invention comprises an elongated supporting bar 22, here shown as an I beam, one end of which is suitably secured to the frame 10 of the pump and the other end of which has rigidly secured to it, by welding or otherwise, longitudinally-spaced pairs of upstanding plates or ears 23 and 24. A track member 25, here shown as being of channel shape, is positioned above the end of beam 22, between the said pairs of ears 23 and 24 and has rigidly secured by welding or otherwise, to one of its end portions, a sleeve 26 through which passes a stud or bolt 27 carried by and extending between the ears 24. The trackway 25 is thus pivotally mounted relative to the supporting member 22 for vertical swinging movements between the ears 23 and 24.

The other end of the said member 25 is provided with a rigid boss 28 having a threaded aperture 29 in which is mounted an adjusting screw 30 which may be provided with a lock nut 31 for maintaining the same in any set position. Said screw has a head 32 which is adapted to engage and rest upon the upper surface of the supporting member 22 as will be clear from Figures 3 and 4. Obviously by adjusting the screw 30 the trackway 25 may be adjusted about its pivot 27 relative to the supporting member 22.

The "Siamese" 17 is provided with a plate 35 which is welded or otherwise rigidly secured to the legs 15 and 16 adjacent the juncture of the said legs with the combining chamber 18. The said plate is so positioned intermediate the ends of the "Siamese" structure that the ball or nubbin 36 rigidly carried thereby will lie approximately in the plane of the center of gravity of the structure so that the latter will substantially balance upon the said nubbin. The nubbin is received within the channel trackway 25 as clearly illustrated in Figures 2, 3 and 5 and thus furnishes a support for the "Siamese" which permits of both longitudinal sliding and universal swinging movements of this section when it is uncoupled from the remainder of the conduit. The combining chamber 18 of the "Siamese" is preferably provided with a pair of extending hand grips 37 by means of which the section may be manually manipulated by the operator in assembling and disassembling the section with and from the system.

While one form of the invention has been illustrated and described, it is obvious that those skilled in the art may vary the details of construction as well as the precise arrangement of parts without departing from the spirit of the invention, and therefore it is not wished to be limited to the above disclosure except as may be required by the claims.

What is claimed is:

1. Means for mounting a readily removable horizontal section of the conduit of a plastic concrete transportation system, comprising a support; and means engageable with said support arranged to mount said removable section thereon for sliding movements to facilitate connection and disconnection of the section to and from the remainder of the conduit, and to provide for free swinging movements of the section when disconnected.

2. Means for mounting a readily removable horizontal section of the conduit of a plastic concrete transportation system, comprising a support; and means at substantially the balancing point of said removable section arranged to mount the latter upon said support for free universal swinging movements when disconnected from the remainder of the conduit.

3. Means for mounting a readily removable section of the closed conduit of a pressure concrete transportation system, comprising a supporting channel; and a nubbin carried by said section receivable in said channel to mount the section thereon for sliding movements relative thereto, and to provide for free universal swinging movements of the section when disconnected from the remainder of the conduit, there being a slip joint between said section and conduit to facilitate said sliding movements.

4. Means for mounting a readily removable section of the conduit of a plastic concrete transportation system, comprising a recessed supporting member; and a nubbin carried by said section at substantially its balancing point, said nubbin being receivable in the recess of said supporting member to mount the section thereon for universal swinging movements when disconnected from the remainder of the conduit.

5. Means for mounting a readily removable section of the conduit of a plastic concrete transportation system, having a pressure inducing means, comprising a support adapted to extend from said pressure inducing means; a trackway pivotally secured to said support; means for adjusting said trackway about its pivotal connection, relative to said support; and a member carried by said conduit section for engagement with said trackway to mount said section for sliding and swinging movements relative to the remainder of the conduit.

CHARLES I. LONGENECKER.