T. EMTMAN.

CONCRETE DELIVERY APPARATUS.

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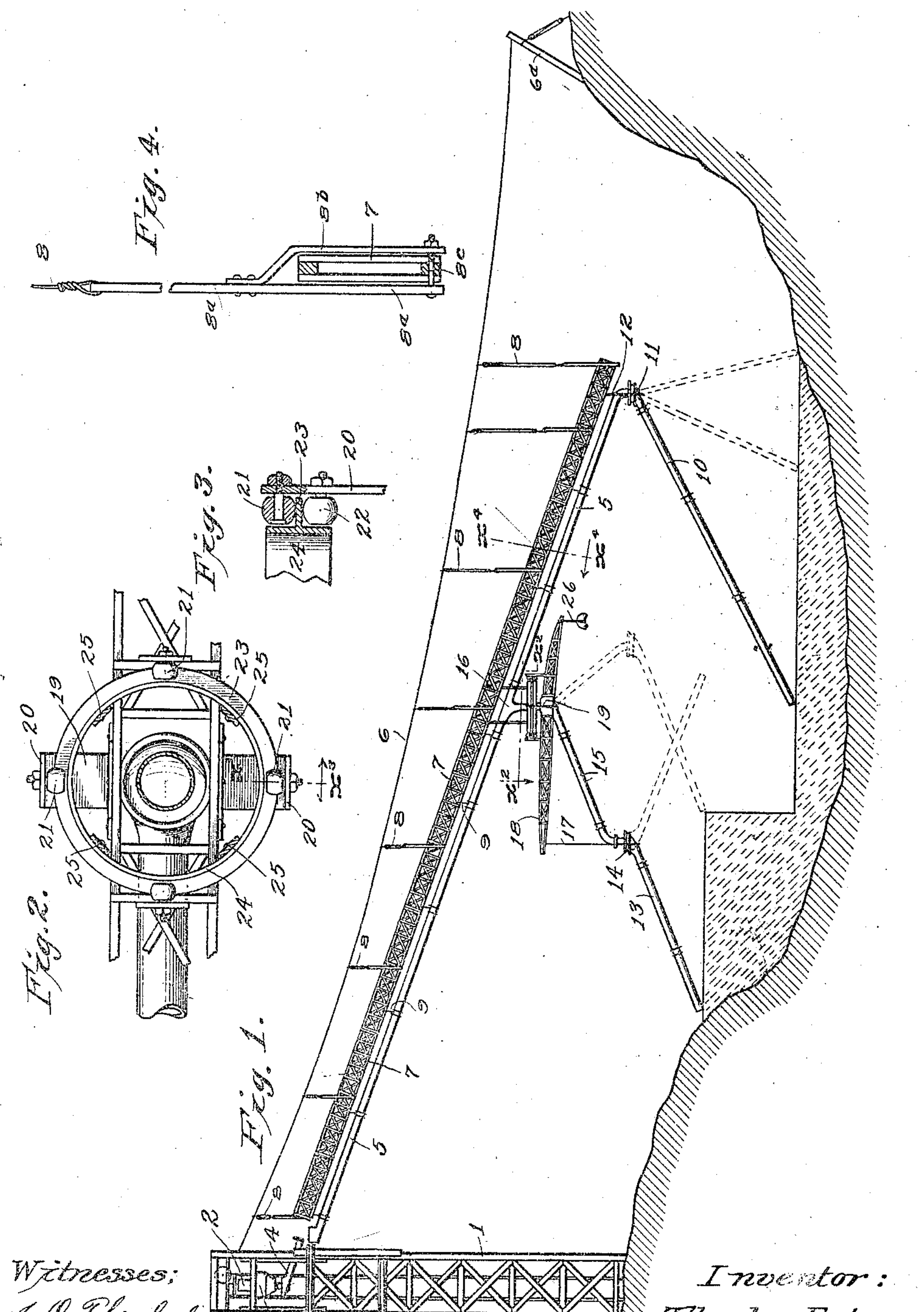
1,031,778. Patented July 9, 1912.



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UNITED STATES PATENT OFFICE.

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CONCRETE-DELIVERY APPARATUS.

1,031,778. Specification of Letters Patent. Patented July 9, 1912.

Application filed March 22, 1911. Serial No. 616,238.

To all whom it may concern:

Be it known that I, THEODORE EMTMAN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Concrete-Delivery Apparatus, of which the following is a specification.

This invention relates to an apparatus for delivering concrete, being especially adapted for use where the material is to be placed at a considerable distance from the tower, as in the construction of dams or building foundations of extensive area.

In a previous patent of mine, No. 948,723, dated February 8th, 1910, I have shown and described an apparatus for delivering concrete by gravity, wherein the concrete was raised in a tower to the desired elevation and then delivered into a downwardly sloping main delivering chute or pipe, and thereby conducted to the point of delivery, the chute or pipe being supported solely from the tower. Such an apparatus is well adapted for the purpose where the point of delivery is not at too great a distance from the tower, but in the construction of dams, bridges or large building foundations, the point of delivery is often at such a distance from the tower that other means must be employed to support the main delivering chute or pipe and while cribbing has been employed under the main delivering pipe to support the same, such expedient is not only expensive, but it does not permit of a quick change or shifting of position of the main delivering pipe or chute, and it is often impossible to even employ cribbing, especially in the construction of dams which are thrown across a ravine.

The present invention affords means for properly supporting the main delivering chute or pipe under such conditions, and avoids the use of cribbing and permits the main delivering pipe or chute being readily shifted in position according to the demands of the work. It is not necessary that the main delivering pipe or chute be shifted very much, as I provide an adjustable distributing pipe or pipes in communication with it which are capable of covering a wide area without disturbing the position of the main delivering pipe or chute.

Other objects of the invention will appear hereinafter.

Referring to the drawings: Figure 1 is a vertical side elevation of the apparatus showing a portion of the dam in section. Fig. 2 is an enlarged sectional plan view on line x^2—x^2 Fig. 1. Fig. 3 is an enlarged section on line x^3—x^3 Fig. 2. Fig. 4 is an enlarged section on line x^4—x^4 Fig. 1.

1 designates the tower, having an elevating apparatus 2, adapted to lift the concrete and discharge the same through a hopper 3, from which the concrete is delivered into a short chute 4, and from the latter is delivered into the main delivery pipe or chute 5.

The distributing chute or pipe 5 is supported by means of a cable 6, the latter being secured at one end, preferably to the tower 1, and at the other end being secured to any suitable support, as the post 6^a, which in the present case is shown on the bank opposite that on which the tower stands. Hung from the cable 6 is a rigid member in the form of a truss, consisting of several sections 7 secured end to end and supported at various points by block and tackle 8. Fig. 4 shows the manner of connecting the block and tackle to the truss in a manner to prevent lateral swinging of the truss. 8^a is a vertical bar to which the tackle 8 is secured, and a strip 8^b secured to the bar 8^a is offset and passes over the opposite side of the truss 7, and the bolt 8^c passes through the offset strip 8^b and bar 8^a. The bar 8^a extends above the truss 7 a sufficient distance to give a long lateral swinging radius to the truss, which promotes its lateral stability, preventing a twisting action of the truss which it might sustain if the tackle 8 extended down to the upper edge of the truss, as the truss could, under such conditions, swing laterally on its upper edge. The block and tackle are so adjusted that each carries an equal load and yet allows the cable 6 to assume its natural catenary curve, and the strains on the cable 6 and truss 7 are thus uniformly distributed. The main delivering pipe or chute 5 is supported from the truss in any suitable manner, as by the connections 9. The rigid truss member in addition to its function of supporting the main delivering pipe 5 and holding the latter in a straight line, also enables workmen to walk out along the truss to reach and adjust the tackle 8, or to reach the adjustable distributing pipe or pipes.

In the present case, I have shown two adjustable distributing pipes communicating with the main delivering pipe or chute for

delivering concrete therefrom to the exact point in the work, each having a different area of action, but it is obvious that more or less of these may be employed as desired. At the end of the main delivering pipe or chute 5, I have shown the distributing pipe 10 which is adjustable in its movements, whereby it may be directed to the exact point at which the concrete is to be delivered, having at its upper end, a pan-shaped hopper 11 and being adjustably supported by connection 12 which permits the distributing pipe 10 to be revolved horizontally as well as adjusted vertically, without disturbing the end of the main delivering pipe 5 or interrupting the flow of concrete from the main delivering pipe 5 into the distributing pipe 10, the pan-shaped hopper 11 being sufficiently large to accommodate this. I have also shown another distributing pipe 13, which has a pan-shaped hopper 14 receiving concrete from an intermediate delivering pipe 15, the latter receiving from a Y-section 16 in the main delivering pipe 5. The distributing pipe 13 may be moved around horizontally or swing vertically with respect to the intermediate delivering pipe 15, and the intermediate delivering pipe 15 in turn may be similarly moved with respect to the main delivering pipe 5. The upper end of the distributing pipe 13 is adjustably supported by a section 17 from a boom 18, the latter in turn being supported by a saddle 19 from which rise two arms 20, carrying rollers 21 and 22 as shown in detail in Figs. 2 and 3, the rollers 21 and 22 riding on opposite sides of a flange 23 which projects from a circular band 24, supported by arms 25, the latter depending from truss 7. The boom 18 can thus be swiveled, the rollers 21 riding on the flange 23, which provides the necessary support. The boom 18 has a counter-weight 26 to balance the weight of the distributing pipe 13 and intermediate delivering pipe 15. Dotted lines indicate the manner in which the distributing pipe 13 and intermediate delivering pipe 15 may be adjusted into various positions to deliver the concrete at the exact point desired. This adjustment is performed instantly and without interrupting the flow of concrete.

What I claim is:

1. A concrete delivery apparatus comprising a main delivering pipe or chute, a cable extending along the main delivering pipe or chute, and supported at each end, a rigid member extending along the main delivering pipe or chute, and connected at intervals with the cable, the main delivering pipe or chute being supported by the rigid member, a revoluble boom supported by the rigid member and an adjustable pipe or chute supported by the boom.

2. A concrete delivering apparatus comprising a main delivering pipe or chute, a cable extending along the main delivering pipe or chute and supported at each end, a rigid member extending along the main delivering pipe or chute, and connected at intervals with the cable, the main delivering pipe or chute being supported by the rigid member, a revoluble boom supported by the rigid member, an adjustable intermediate delivering pipe or chute supported by the boom, and an adjustable distributing pipe or chute.

3. A concrete delivery apparatus comprising a main delivering pipe or chute, a cable extending along the main delivering pipe or chute and supported at each end, a rigid member extending along the main delivering pipe or chute and connected at intervals with the cable, the main delivering pipe or chute being supported by the rigid member, a revoluble boom supported by the rigid member, an adjustable intermediate delivering pipe or chute supported by the boom, and an adjustable distributing pipe or chute supported by the intermediate delivering pipe or chute.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 23rd day of February, 1911.

THEODORE EMTMAN.

In presence of—

G. T. HACKLEY,

FRANK L. A. GRAHAM.