Aug. 23, 1932. C. JACKSON 1,873,413

APPARATUS AND METHOD FOR COVERING PIPES OR CONDUITS WITH CONCRETE

Filed March 2, 1931 2 Sheets-Sheet 1

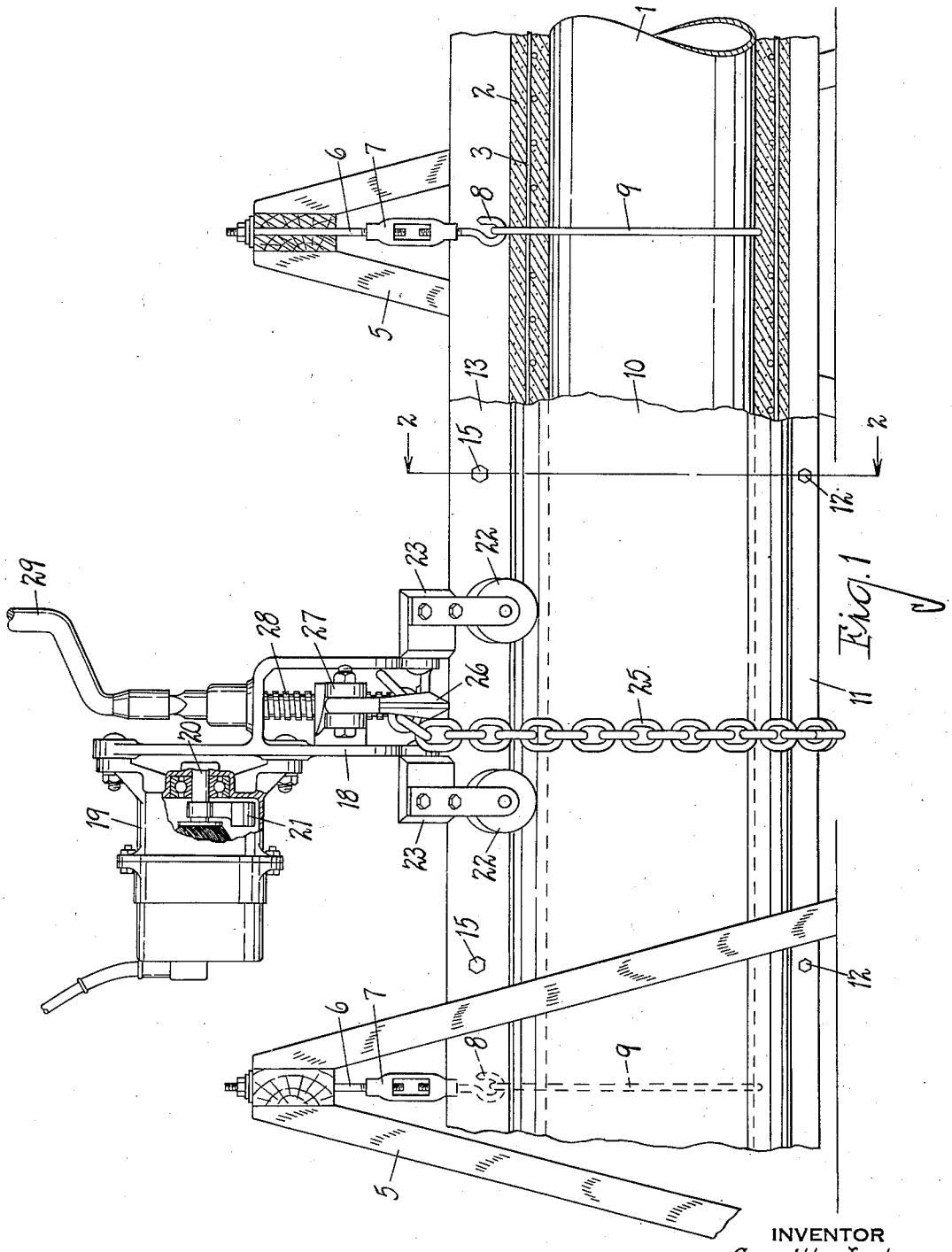


Fig. 1

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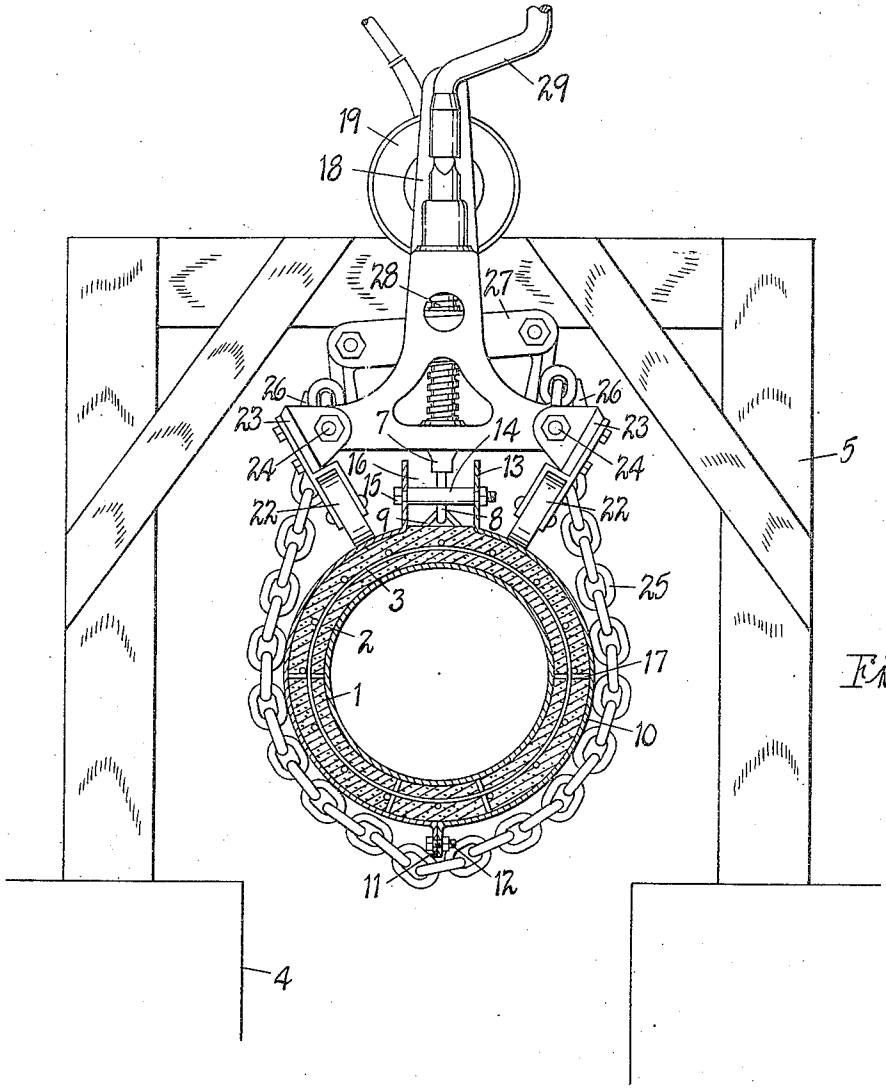


Fig. 2

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Patented Aug. 23, 1932 1,873,413

UNITED STATES PATENT OFFICE

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APPARATUS AND METHOD FOR COVERING PIPES OR CONDUITS WITH CONCRETE

Application filed March 2, 1931. Serial No. 519,368.

In pipe lines for gas, oil and water the loss due to corrosion, particularly in certain soils, is an important factor but one which it is impossible to calculate in advance. Efforts have been made to coat the metal conduits or pipe with asphaltum and like materials but this has not proved entirely satisfactory.

It is the main object of this invention to provide a portable apparatus for covering conduits with concrete which makes it practical to cover the conduits at the place where they are to be laid, thereby avoiding transportation and also permitting the covering of a section of considerable length as a complete unit, thereby reducing the number of joints.

A further object is to provide an apparatus by means of which conduits may be very rapidly and effectively covered with concrete.

A still further object is to provide a method of covering conduits with concrete which results in a very superior product.

Objects pertaining to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary side elevation of an apparatus embodying my invention, no attempt being made to show the parts in relative proportions.

Fig. 2 is a detail transverse section on line 2—2 of Fig. 1, the trench in which the conduit is to be laid being indicated.

In the embodiment illustrated 1 represents the conduit to be covered, 2 the concrete covering thereof and 3 the reinforce embedded within this covering. In Fig. 2, 4 represents a trench in which the conduit is to be laid.

My improvements are especially designed by me for use in covering pipe or conduits such as oil and gas lines or water lines, and the apparatus illustrated is portable so that it may be moved from place to place along the trench as successive sections of the conduit are covered. It is considered desirable to cover sections of considerable length thereby reducing the number of joints, and that is also practical with my apparatus.

To accomplish this, I provide a number of horses or supports 5 which are disposed at intervals along the trench, or, in any event, astride the pipe or conduit to be covered. These supports 5 are provided with hangers 6 having turn buckles 7 by means of which the length of the hangers may be adjusted. The hangers have hooks 8 with which the suspending rings 9, through which the conduit is arranged, are detachably engaged. The pipe or conduit is thus suspended, preferably in position over the trench.

I provide a form or mold which in the embodiment illustrated comprises a pair of segmental longitudinal sections 10 having downturned flanges 11 at their lower edges detachably secured together by bolts 12. These sections have flanges 13 at their upper edges of considerable width and supported in spaced relation by the spacing sleeves 14 on the bolts 15 to provide a charging hopper 16 through which the concrete is introduced into the form. The form is supported in spaced relation to the pipe, preferably concentric thereto, by means of the spacing elements 17.

I provide a vibrating unit preferably consisting of a carriage 18 on which I mount a motor 19 having a shaft 20 provided with an unbalancing weight 21. This carriage is provided with wheels 22 adapted to travel on the form, the wheel supporting brackets 23 being adjustably connected to the carriage by means of the bolts 24 which are disposed so that the wheels may be adjusted laterally of the form, thereby permitting them to be disposed radially of the form as shown in Fig. 2.

While the carriage may travel along on the form, the wheels engaging the form at each side of its charging hopper flanges 13, I provide means for clamping to the form at any selected point comprising a chain or cable 25, the ends of which are engaged with hooks 26 carried on the ends of the bar 27 which is adjustably supported by means of the screw 28 disposed vertically and provided with a crank 29 so that the clamping means may be quickly released to permit the carriage to be

moved along the form, and also quickly adjusted to clamp the form.

By this means high frequency vibrations may be imparted to the form and to the concrete material within the form so that the apparatus is adapted for the practice of the method of molding concrete, the subject matter of Letters Patent No. 1,787,449 issued to me January 6, 1931.

In the use of the apparatus the vibrating unit is preferably operated as the concrete is introduced through the charging hopper which not only insures a complete distribution of the concrete around the conduit but also permits the use of a relatively dry non-workable concrete mixture as described in my said patent. This results in a superior product and permits the removal of the forms more promptly than would be possible with the usual wet mixes or concrete mixed with the usual proportions of water, greatly facilitating the covering of the pipe and reducing the number of forms required. After the concrete has set sufficiently to permit handling the forms are removed and the covered conduit placed in the trench.

My improved apparatus enables the very rapid and effective covering of conduits at the point where they are to be laid.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe or conduit to be covered in a horizontal position including rings through which the pipe is disposed and hangers with which said rings are engaged disposed centrally above the pipe or conduit, a form disposed concentrically of the pipe and comprising complementary segmental longitudinal sections having outwardly projecting detachably connected flanges at their edges, the upper flanges being of substantial width and disposed in substantially spaced relation providing a charging hopper, a carriage provided with wheels traveling on said form, a motor having an unbalancing weight mounted on the carriage, and means for clamping the carriage to the form comprising an adjusting screw on the carriage, a bar on said screw provided with hooks at its ends, and a cable embracing said form and engaged with said hooks.

2. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe or conduit to be covered in a horizontal position, a form disposed concentrically of the pipe and comprising complementary segmental longitudinal sections having outwardly projecting detachably connected flanges at their edges, the upper flanges being of substantial width and disposed in substantially spaced relation providing a charging hopper, a carriage provided with wheels traveling on said form, a motor having an unbalancing weight mounted on the carriage, and means for clamping the carriage to the form comprising an adjusting screw on the carriage, a bar on said screw provided with hooks at its ends, and a cable embracing said form and engaged with said hooks.

3. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe or conduit to be covered in a horizontal position including rings through which the pipe is disposed and hangers with which said rings are engaged disposed centrally above the pipe or conduit, a form disposed concentrically of the pipe and comprising complementary segmental longitudinal sections having outwardly projecting detachably connected flanges at their edges, the upper flanges being of substantial width and disposed in substantially spaced relation providing a charging hopper, a carriage provided with wheels traveling on said form, a motor having an unbalancing weight mounted on the carriage, and means for clamping the carriage to the form.

4. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe or conduit to be covered in a horizontal position, a form disposed concentrically of the pipe and comprising complementary segmental longitudinal sections having outwardly projecting detachably connected flanges at their edges, the upper flanges being of substantial width and disposed in substantially spaced relation providing a charging hopper, a carriage provided with wheels traveling on said form, a motor having an unbalancing weight mounted on the carriage, and means for clamping the carriage to the form.

5. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe or conduit to be covered in a horizontal position, a form embracing and spaced from the pipe, a vibrating unit, a carriage provided with wheels traveling on said form, said wheels being provided with supporting brackets tiltingly adjustable on the carriage to permit their adjustment radially of the form, a motor having an unbalancing weight mounted on the carriage, means for clamping the carriage to the form comprising an adjusting screw on the carriage, a bar on said screw, and a cable embracing said form and engaged with said bar.

6. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe or conduit to be covered in a horizontal position, a form embracing and spaced from the pipe, a vibrating unit, a carriage provided with wheels traveling on said form, said wheels being

provided with supporting brackets tiltingly adjustable on the carriage to permit their adjustment radially of the form, a motor having an unbalancing weight mounted on the carriage, and means for clamping the carriage to the form.

7. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe or conduit to be covered in a horizontal position, a form embracing and spaced from the pipe, a vibrating unit, a carriage provided with wheels traveling on said form, a motor having an unbalancing weight mounted on the carriage, and means for clamping the carriage to the form comprising an adjusting screw on the carriage, a bar on said screw, and a cable embracing said form and engaged with said bar.

8. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe to be covered in a horizontal position including annular hanger members through which the pipe is disposed and supports with which said hanger members are engaged disposed above the pipe or conduit, a form embracing and spaced from the pipe and having outwardly projecting spaced flanges at the top of the pipe providing a charging hopper extending longitudinally of the pipe, a vibrating unit traveling on said form, and means for clamping the vibrating unit to the form.

9. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe to be covered in a horizontal position, a form embracing and spaced from the pipe, a vibrating unit traveling on said form, and means for clamping the vibrating unit to the form.

10. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe to be covered in a horizontal position, a form embracing and spaced from the pipe, a vibrating unit provided with wheels traveling on said form, and means for clamping the vibrating unit to the form comprising a screw on said carriage, a cable embracing the form, and a member on the screw with which the cable is connected.

11. An apparatus of the class described comprising a carriage provided with form-engaging wheels, said wheels being tiltingly adjustable on the carriage, a motor having an unbalancing weight mounted on the carriage, and form clamping means comprising a form embracing cable, a member to which said cable is connected, and an adjusting screw for said member carried by the carriage.

12. An apparatus of the class described comprising a carriage provided with form-engaging wheels, a motor having an unbalancing weight mounted on the carriage, and form clamping means comprising a form embracing cable, a member to which said cable is connected, and an adjusting screw for said member carried by the carriage.

13. An apparatus of the class described comprising a carriage provided with form-engaging wheels, said wheels being tiltingly adjustable on the carriage, a motor having an unbalancing weight mounted on the carriage, and means for clamping the carriage to the form.

14. An apparatus of the class described comprising a carriage provided with form-engaging wheels, a motor having an unbalancing weight mounted on the carriage, and means for clamping the carriage to the form.

15. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe in horizontal position, a form supported in spaced relation to the pipe or conduit, said form being open at the top for the introduction of concrete, a vibrating unit provided with wheels traveling on said mold, the wheels being adjustable radially of the form, and means for clamping said carriage to the form including a cable embracing said form and a screw adjusting means for said cable on said vibrating unit.

16. In an apparatus for covering pipe or conduits with concrete, the combination of means for suspending the pipe in horizontal position, a form supported in spaced relation to the pipe or conduit, said form being open at the top for the introduction of concrete, a vibrating unit provided with a carriage traveling on said mold, and means for clamping said carriage to said form.

17. In an apparatus of the class described, the combination of means for supporting a pipe or conduit, a form adapted to receive the pipe, a vibrating unit provided with a carriage traveling on said form, and means for clamping said vibrating unit to said form at selected points including a form embracing cable.

18. In an apparatus of the class described, the combination of means for supporting a pipe or conduit, a form adapted to receive the pipe, a vibrating unit provided with a carriage traveling on said form, and means for clamping said vibrating unit to said form at selected points.

19. The method of covering pipe or conduit consisting of suspending the pipe or conduit to be covered in a horizontal position, supporting a form concentrically of the pipe or conduit, introducing concrete into the form, and subjecting the form to high frequency vibrations.

20. The method of covering pipe or conduit consisting of suspending the pipe or conduit to be covered, arranging a form in spaced relation to the pipe or conduit, introducing concrete into the form, and sub-

jecting the form to high frequency vibrations.

21. In an apparatus of the class described, the combination of means for supporting a pipe or conduit in a horizontal position, a form supported in spaced concentric relation to the pipe and open at the top for the introduction of concrete, a portable vibratory unit adjustable on said form, and means for clamping said vibratory unit to said form at selected points.

22. In an apparatus of the class described, the combination with means for supporting a pipe or conduit in a horizontal position, of a form supported in spaced relation to the pipe and open at the top for the introduction of concrete, and a portable vibratory unit provided with a flexible form embracing clamping means whereby the vibratory unit may be clamped to the form at selected points.

23. In an apparatus of the class described, the combination with means for supporting a pipe or conduit in a horizontal position, of a form supported in spaced relation to the pipe and open at the top for the introduction of concrete, a portable vibratory unit, and means for clamping said vibratory unit to said form at selected points.

In witness whereof I have hereunto set my hand.

CORWILL JACKSON.