Jan. 15, 1935. C. JACKSON 1,988,316

APPARATUS FOR TREATING CONCRETE AND LIKE PLASTIC MATERIALS

Filed July 24, 1933 2 Sheets-Sheet 1

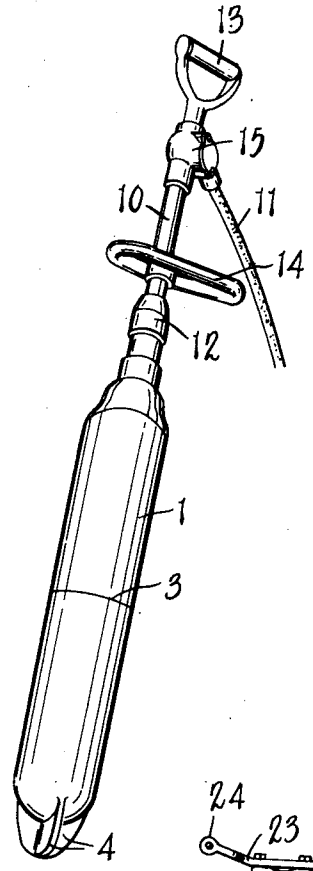


Fig. 1

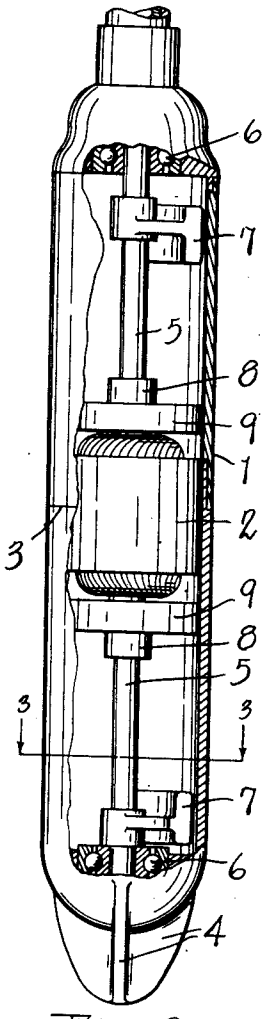


Fig. 2

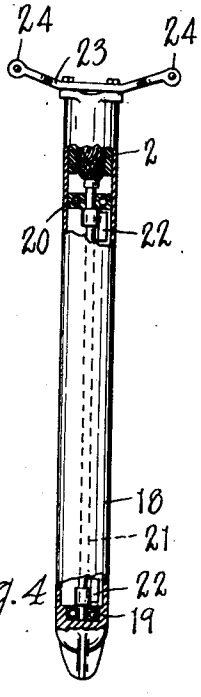


Fig. 4

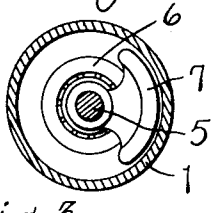


Fig. 3

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APPARATUS FOR TREATING CONCRETE AND LIKE PLASTIC MATERIALS

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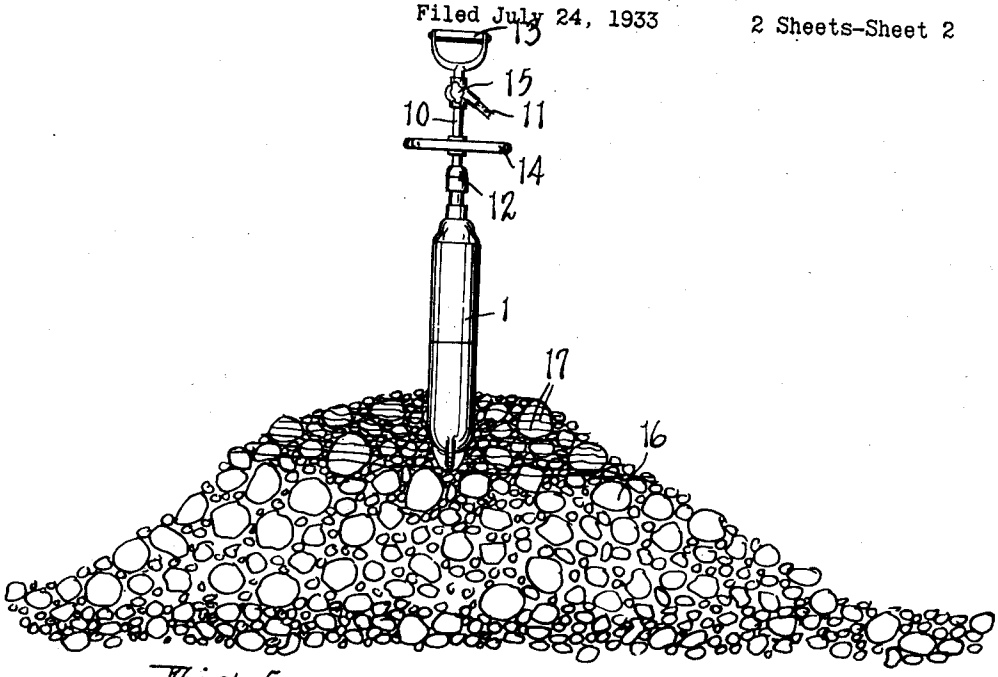


Fig. 5

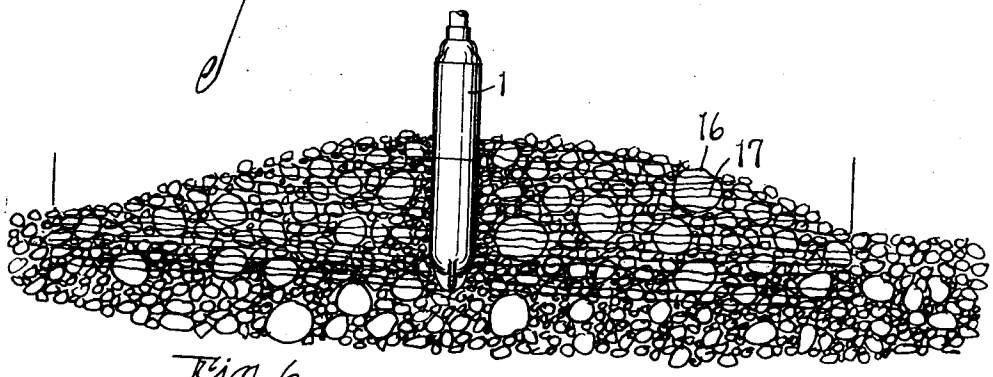


Fig. 6

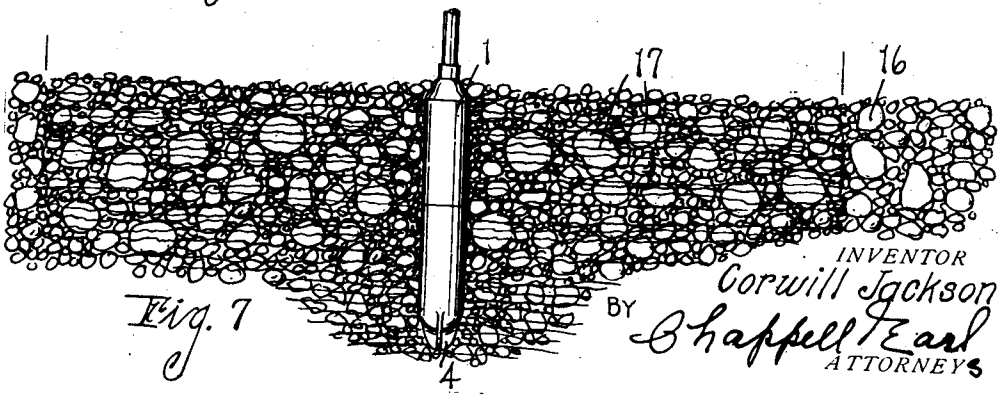


Fig. 7

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UNITED STATES PATENT OFFICE

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APPARATUS FOR TREATING CONCRETE AND LIKE PLASTIC MATERIALS

Corwill Jackson, Ludington, Mich.

Application July 24, 1933, Serial No. 681,901

14 Claims. (Cl. 25—1)

This invention relates to apparatus for treating concrete and like plastic materials of the type illustrated in my application for Letters Patent filed September 6, 1932, Serial No. 631,806, and is an adaptation of and in some respects an improvement upon the structure there illustrated and claimed.

The main objects of this invention are:

First, to provide an apparatus for treating concrete and like materials—for example, the placing of large masses of concrete as in walls, dams and various other situations which is of very large capacity, and capable of easy and rapid manipulation.

Second, to provide an apparatus for treating and placing concrete or like plastic materials which enables the effective placing of concrete of such low water content as would be difficult or impossible to place by the usual tamping methods.

Third, to provide an apparatus for treating and placing concrete having these advantages which may be manipulated with a relatively small amount of labor and in which the operating parts are effectively housed, the driving motor being positioned to balance the structure for highly effective action and so that, in use, its weight is largely supported during various manipulations by the material treated.

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

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

Fig. 1 is a perspective view of a commercial embodiment of my invention which has been found highly satisfactory.

Fig. 2 is a fragmentary side elevation with the casing partially broken away and partially in longitudinal section.

Fig. 3 is a cross section on line 3—3 of Fig. 2.

Fig. 4 is a side elevation of a modified form or embodiment of my invention, the rotor shaft and its unbalancing weights and bearings for the shaft being indicated by dotted lines.

Figs. 5, 6 and 7 are views illustrating the method of using the apparatus and the action thereof in use under working conditions such as illustrated, the views showing successive stages of operation.

My device or apparatus in the commercial embodiment illustrated in Figs. 1, 2 and 3 and 5, 6 and 7 comprises an elongated cylindrical motor housing 1, at least of such diameter as to receive a motor, preferably an electric motor designated generally by the numeral 2, the motor being in supporting engagement with the walls of the housing and preferably disposed centrally thereof, as shown in Fig. 2. The housing is preferably made up of sections having a central telescoped joint 3.

The housing is of uniform diameter from end to end except that its ends are rounded, its lower end terminating in the longitudinally disposed blades or fins 4, these blades being disposed in angular crossed relation to each other. The housing is not only designed to enclose and house the motor but to be inserted or embedded into a mass of concrete or other plastic material to be treated and is closed or sealed to protect the parts therein.

The rotor of the motor is provided with a shaft 5 extending at each end of the motor and supported at the ends of the shaft and at the ends of the housing in bearings 6, these bearings being mounted or carried by the walls of the housing. The shaft is provided with unbalancing weights 7 disposed adjacent these bearings 6.

I also provide the shaft with bearings 8 disposed adjacent the ends of the motor and carried by the disk-like supports 9 fitting the walls of the housing so that the shaft is directly supported at this point by the walls of the housing. The housing is, with this arrangement, uniformly vibrated from end to end and in a plane transverse to the axis of the shaft.

The rod-like handle 10, preferably tubular to serve as a conduit for the electrical cable 11, is disposed axially of the shaft and connected to the housing by a tubular resilient connection 12, this connection being preferably that shown in my said application for patent and is not detailed herein. This handle is provided with an outer D-grip 13 at its end and an inner transverse grip bar 14, this grip bar being preferably transversely offset from the longitudinal plane of the handle to facilitate grasping.

This tool which is illustrated is designed to be manipulated by two workmen.

A switch box 15 is disposed on the handle between the grips.

In Fig. 5, I illustrate a mass of concrete designated generally by the numeral 16, this being shown in a pile such as results from being dumped from a conveyor bucket. The tool is shown partially embedded in the mass and the upper part of the mass indicated at 17 as subject to vibrations, the lines of the vibrations being indicated by the wavy horizontal lines.

In Fig. 6, the housing is shown further sub-

merged or embedded and an attempt has been made to illustrate its action in the same way, and in Fig. 7, the casing is shown completely submerged in the concrete mass.

In practice, it has been found that with a dry unworkable concrete mix; that is, a concrete mixture of such low water content as to be commonly regarded as unworkable or in accordance with the method disclosed in my United States Letters Patent No. 1,787,449, issued January 6, 1931, a four cubic yard batch may be reduced to the condition indicated in Fig. 7 in about three minutes, the vibrations being effective in a circle of about ten feet in diameter and to the depth of the casing which, in the commercial structure illustrated, is about three feet.

The device may be manipulated with a minimum of labor on the part of the operators and is highly efficient for the placing of concrete in numerous relations, it being of considerably larger capacity than the structure illustrated in my said application for Letters Patent but being heavier and commonly requiring two men to manipulate, the present structure being particularly well adapted for placing concrete in dams or other placements where large volumes are to be placed.

The arrangement of the motor within the housing serves to effectively balance the vibrations and also provides a balanced structure for handling. The submerging of the housing serves to effectively cool the motor so that ventilation is not required.

In the embodiment of my invention shown in Fig. 4, the housing 18 is designed to receive the motor at its upper end, a shaft bearing 19 being provided at the lower end of the housing and a bearing 20 adjacent the lower end of the motor. The shaft 21 has unbalancing weights 22 adjacent these bearings. The handle 23 is a cross handle provided with grips 24 at each end.

The structure shown in Figs. 1 to 3 is, however, the preferred construction.

I have not attempted to illustrate or describe other adaptations or embodiments of my invention as it is believed that this disclosure will enable those skilled in the art to which my invention relates to embody or adapt the same as may be desired.

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

1. An apparatus for treating concrete and like plastic materials comprising an elongated cylindrical motor housing adapted to be inserted into a body of plastic material, bearings at the ends of said housing, an electric motor disposed centrally within said housing, the rotor of which is provided with a shaft projecting at both ends of the motor and supported at its ends by said bearings, said shaft being provided with unbalancing weights disposed adjacent said bearings, bearing supports disposed within said housing at each end of the motor and in supporting engagement with the walls of the housing, said supports being provided with bearings for said shaft, a handle disposed axially relative to said shaft and having a resilient connection to said housing and having an outer grip at its upper end, and an inner grip disposed transversely of said handle in spaced relation to said outer grip and in transversely offset relation to the handle.

2. An apparatus for treating concrete and like plastic materials comprising an elongated cylindrical motor housing adapted to be inserted into a body of plastic material, bearings at the ends of said housing, an electric motor disposed centrally within said housing, the rotor of which is provided with a shaft projecting at both ends of the motor and supported at its ends by said bearings, said shaft being provided with unbalancing weights disposed adjacent said bearings, bearing supports disposed within said housing at each end of the motor and in supporting engagement with the walls of the housing, said supports being provided with bearings for said shaft, and a handle disposed axially relative to said shaft and having a resilient connection to said housing.

3. An apparatus for treating concrete and like plastic materials, comprising an elongated cylindrical motor housing adapted to be inserted into a body of plastic material, bearings within said housing, an electric motor disposed centrally within said housing, the rotor of which is provided with a shaft projecting at both ends of the motor and supported at its ends by said bearings, said shaft being provided with unbalancing weights disposed adjacent said bearings, a handle disposed axially relative to said shaft and having a resilient connection to said housing and having an outer grip at its upper end, and an inner grip disposed transversely of said handle in spaced relation to said outer grip and in transversely offset relation to the handle.

4. An apparatus for treating concrete and like plastic materials comprising an elongated cylindrical motor housing adapted to be inserted into a body of plastic material, bearings within said housing, an electric motor disposed centrally within said housing, the rotor of which is provided with a shaft projecting at both ends of the motor and supported at its ends by said bearings, said shaft being provided with unbalancing weights disposed adjacent said bearings, and a handle disposed axially relative to said shaft and having a resilient connection to said housing.

5. An apparatus for treating concrete and like plastic materials comprising an elongated motor housing adapted to be inserted into a body of plastic material, bearings at the ends of said housing, a motor disposed centrally within said housing and having a rotor provided with a shaft projecting at both ends of the motor and supported by said bearings, said shaft being provided with unbalancing weights at both sides of the motor, a bearing at each end of the motor and having supports in supporting engagement with the walls of the housing, a handle disposed axially relative to said shaft and having resilient connection to said housing and having an outer grip at its upper end, and an inner grip disposed in spaced relation to said outer grip.

6. An apparatus for treating concrete and like plastic materials comprising an elongated motor housing adapted to be inserted into a body of plastic material, bearings at the ends of said housing, a motor disposed centrally within said housing and having a rotor provided with a shaft projecting at both ends of the motor and supported by said bearings, said shaft being provided with unbalancing weights at both sides of the motor, a bearing at each end of the motor and having supports in supporting engagement with the walls of the housing, and a handle for manipulating said housing attached to the upper end thereof.

7. An apparatus for treating concrete and like plastic materials comprising an elongated motor housing adapted to be inserted into a body of plastic material, bearings within said housing, a motor disposed centrally within said housing and

having a rotor provided with a shaft projecting at both ends of the motor and supported by said bearings, said shaft being provided with unbalancing weights at both sides of the motor, a handle disposed axially relative to said shaft and having resilient connection to said housing and having an outer grip at its upper end, and an inner grip disposed in spaced relation to said outer grip.

8. An apparatus for treating concrete and like plastic materials comprising an elongated motor housing adapted to be inserted into a body of plastic material, bearings within said housing, a motor disposed centrally within said housing and having a rotor provided with a shaft projecting at both ends of the motor and supported by said bearings, said shaft being provided with unbalancing weights at both sides of the motor, and a handle for manipulating said housing attached to the upper end thereof.

9. An apparatus for treating concrete and like plastic materials comprising a motor provided with a rotor, a closed elongated housing adapted to be inserted into a body of plastic material, a shaft for said rotor provided with bearings at the ends of the housing, said shaft being provided with unbalancing weights disposed adjacent said bearings, and a handle disposed axially relative to said shaft and having resilient connection to said housing.

10. An apparatus for treating concrete and like plastic materials comprising a motor provided with a rotor, a closed elongated housing adapted to be inserted into a body of plastic material, a shaft for said rotor provided with bearings at the ends of the housing, said shaft being provided with unbalancing weights disposed adjacent said bearings, and a handle for manipulating said housing.

11. An apparatus for treating concrete and like plastic materials comprising a motor provided with a rotor, a closed elongated housing adapted to be inserted into a body of plastic material, said motor being disposed centrally of said housing, a shaft for said rotor provided with bearings at both sides of the motor, said shaft being provided with an unbalancing weight at each side of the motor, and a handle disposed axially relative to said shaft and having an outer grip at its end and an inner grip disposed transversely of the handle and spaced from the outer grip.

12. An apparatus for treating concrete and like plastic materials comprising a motor provided with a rotor, a closed elongated housing adapted to be inserted into a body of plastic material, said motor being disposed centrally of said housing, a shaft for said rotor provided with bearings at both sides of the motor, said shaft being provided with an unbalancing weight at each side of the motor, and a handle for manipulating said housing.

13. An apparatus for treating concrete and like plastic materials comprising a motor provided with a rotor, a closed elongated housing for said motor adapted to be inserted into a body of plastic material, a shaft for said rotor provided with bearings adjacent the ends of the housing, said shaft being provided with unbalancing weights disposed adjacent said bearings, a handle disposed axially relative to said shaft and having resilient connection to said housing, an outer grip at the end of the handle, and a transversely disposed inner grip.

14. An apparatus for treating concrete and like plastic materials comprising a motor provided with a rotor, a closed elongated housing for said motor adapted to be inserted into a body of plastic material, a shaft for said rotor provided with bearings adjacent the ends of the housing, said shaft being provided with unbalancing weights disposed adjacent said bearings, and a handle for manipulating said housing attached to the upper end thereof.

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