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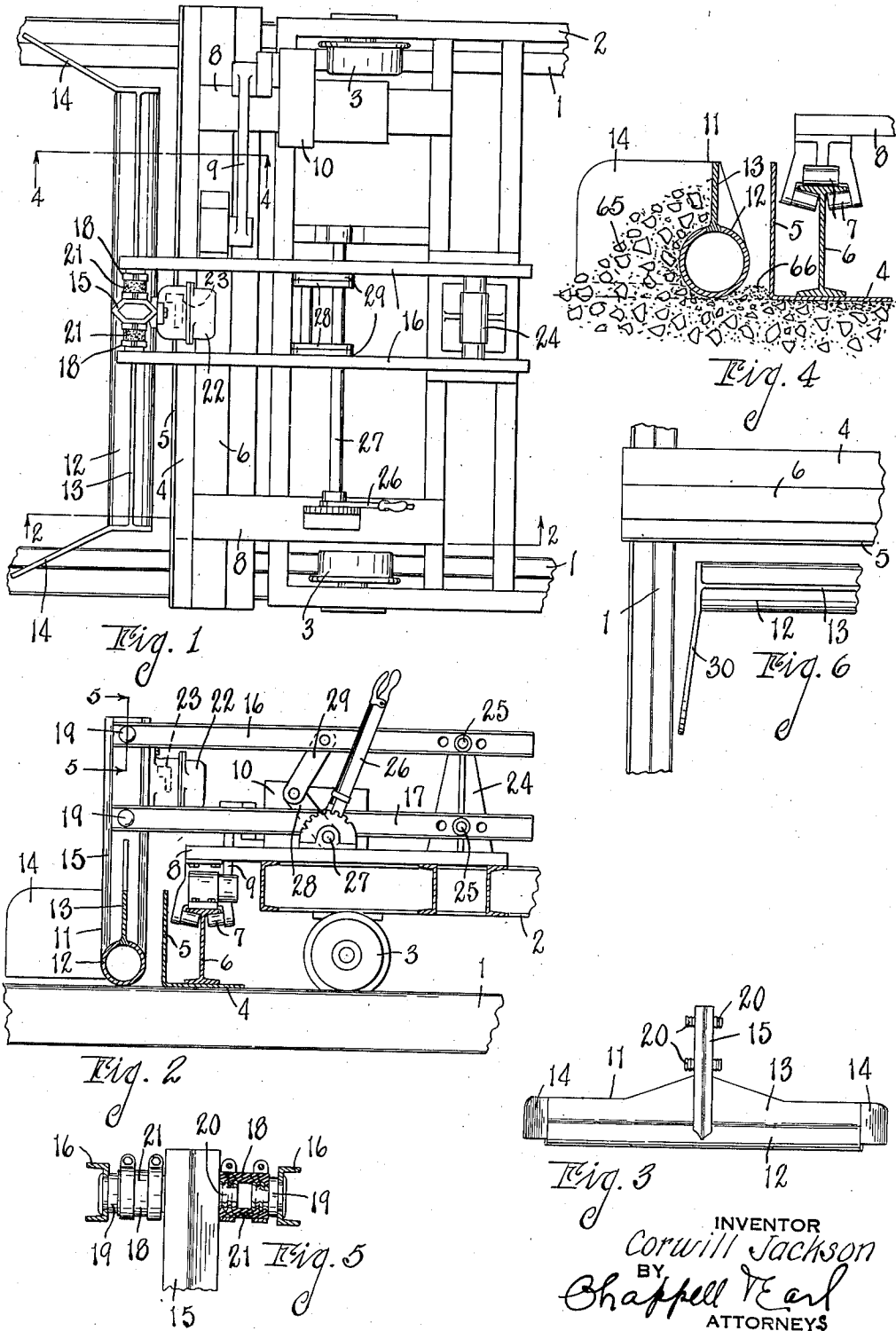
C. JACKSON

2,154,206

CONCRETE PLACING MACHINE

Filed April 9, 1935

2 Sheets-Sheet 1



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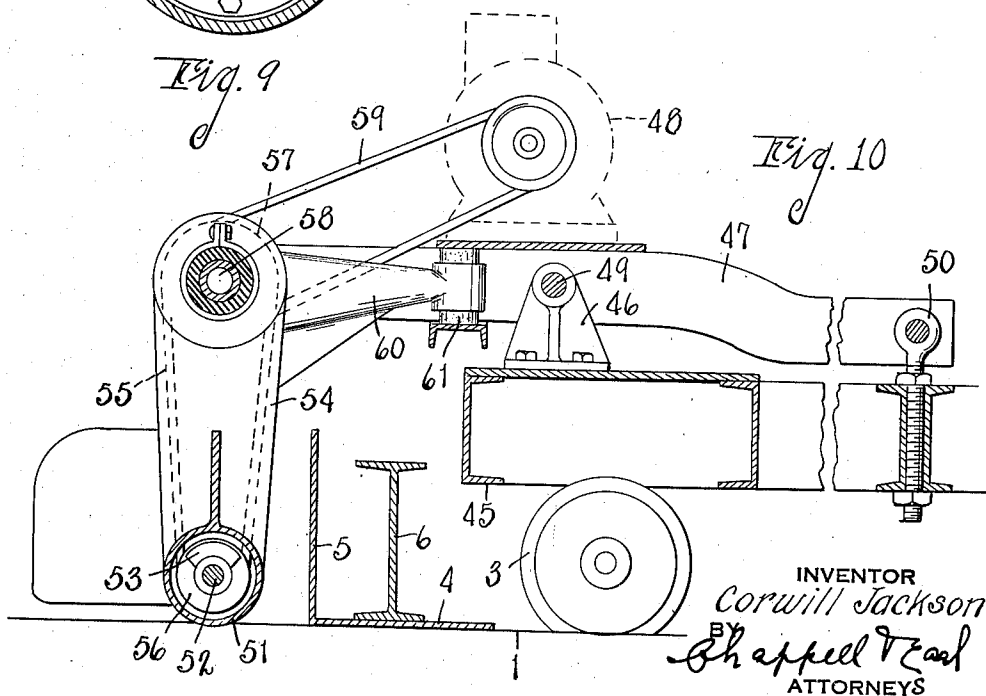
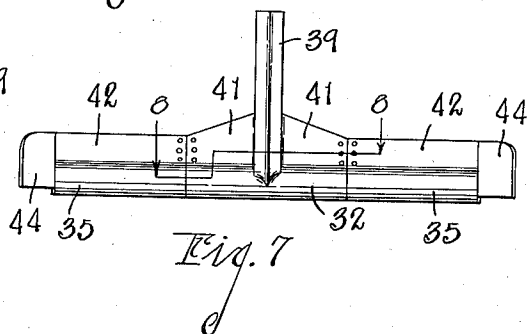
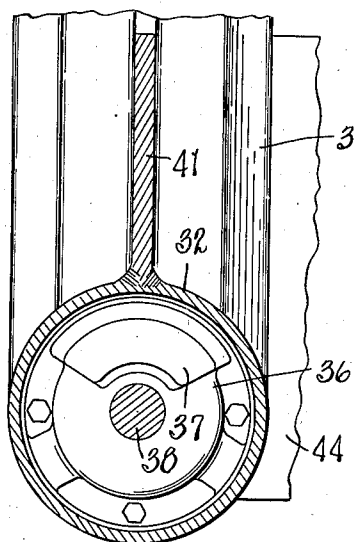
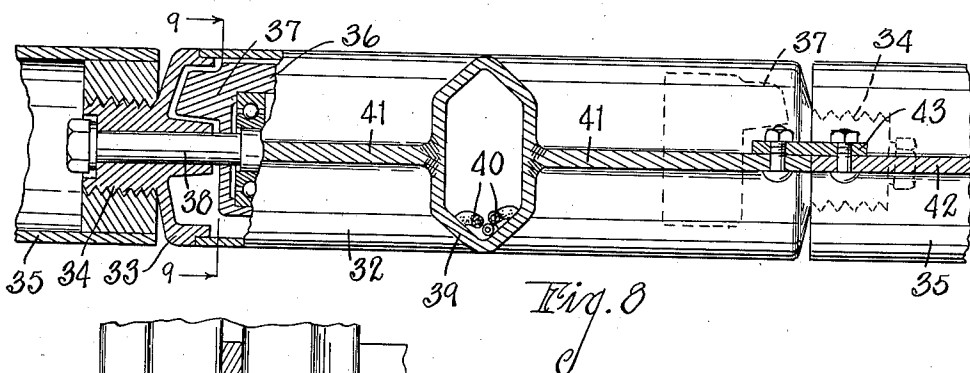
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CONCRETE PLACING MACHINE

Corwill Jackson, Ludington, Mich.

Application April 9, 1935, Serial No. 15,460

8 Claims. (Cl. 94—48)

The main objects of this invention are:

First, to provide a machine for the placement of concrete such as pavements and the walls of concrete ditches or conduits which is of very large capacity and is highly efficient in the rapid and effective placement of concrete masses having large aggregate and/or low water content.

Second, to provide a machine of this character which enables the rapid placement and simultaneous finishing of the surface of concrete.

Third, to provide a machine of this character which is of wide adaptability and may be operated by comparatively unskilled labor.

Fourth, to provide a structure having these advantages which is comparatively simple and economical and at the same time very durable.

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

A structure which embodies the features of my invention is clearly illustrated in the accompanying drawings forming part of this application, in which:

Fig. 1 is a fragmentary plan view of a machine embodying the features of my invention, various parts being shown mainly in conventional form.

Fig. 2 is a vertical fragmentary view on line 2—2 of Fig. 1.

Fig. 3 is a front elevation of the vibrating unit or element.

Fig. 4 is an enlarged fragmentary section corresponding to that of Fig. 2 illustrating the machine in operative relation to concrete being placed.

Fig. 5 is an enlarged fragmentary view partially in section on line 5—5 of Fig. 2 showing details of mounting of the vibrating element.

Fig. 6 is a fragmentary plan view of a slightly modified form or embodiment of the vibrating element or unit.

Fig. 7 is a front elevation of another form or embodiment of the vibrating element.

Fig. 8 is an enlarged fragmentary view in section on the broken line 8—8 of Fig. 7.

Fig. 9 is an enlarged detail view in section on line 9—9 of Fig. 8.

Fig. 10 is a fragmentary view partially in section of still another embodiment or adaptation embodying my invention.

In the placement of concrete I have discovered that so-called dry or harsh unworkable mixes, that is, mixes having such low water content as to have practically no slump or very little slump, and which are commonly designated as "unwork-

able mixes", can be placed by subjecting to high frequency vibrations as described in my method patent on Method of forming and molding concrete, No. 1,787,449, dated January 6, 1931. While the machine of this application is especially well adapted for the practice of the method of said patent, it is very desirable for use in the treating and placement of concrete of higher water content, or of water content such as is commonly designated as a workable water content or mix.

In the accompanying drawings I have shown various parts of the machine or apparatus mainly in conventional form, particularly as to features not directly concerned with my present improvements.

Referring to the drawings, 1, I represent the parallel forms of a highway bed or other strip of concrete and 2 a carriage provided with wheels 3 adapted to travel on the forms. It will be understood that the truck or carriage is commonly a four-wheeled carriage but I have illustrated only one pair of wheels. The truck is commonly provided with an engine for propelling or driving the carriage, the driving connections to the driving wheels, however, not being illustrated.

A screed 4 having an upwardly projecting front plate 5 is mounted on the carriage for reciprocation transversely of the path of the carriage, the screed illustrated being provided with a longitudinal beam 6, the upper part of which is engaged by the rollers 7 carried by the arms 8 which support the screed for transverse reciprocation, the screed being preferably of such length as to rest or reciprocate on the forms.

The screed is reciprocated as the carriage is advanced by means of the pitman or connecting rod 9, a transmission or gear box being indicated at 10. These parts described are shown mainly in conventional form as the details thereof form no part of this invention other than that the screed is mounted on the carriage for transverse reciprocatory movement as the carriage is advanced.

In front of the screed I mount a vibrating element designated generally by the numeral 11. In the embodiment illustrated in Figs. 1 to 6, this vibrating element comprises a cylindrical tubular or chambered body 12 provided with a central upstanding longitudinal plate 13 and also provided with forwardly projecting diverging wings 14, these wings being secured to the ends of the body member and being of such length and diverging to such extent that they project or extend over the forms 1 to wipe the concrete there-

from and gather or carry it into effective relation to the vibrating element. It will be understood, however, that not only the body of the vibrating element is vibrated but the plate 13 and wings 14 are also vibrated. The vibrating member is provided with a central upstanding upright or post 15 mounted on the coacting pairs of parallel bars 16 and 17. These are connected to the upright by means of the flexible couplings 18, the bars carrying studs 19 while the upright is provided with aligned studs 20. These studs receive the tubular flexible members 21 which are secured upon the studs by means of clamps.

The vibrating element is vibrated by means of an electric motor 22 having an unbalancing weight 23 shown by dotted lines, that is, the rotor of the motor is provided with an unbalancing weight so that when the motor is in operation the vibrating element is vibrated at high frequency, preferably in the neighborhood of 3600 R. P. M.

The bars 16 and 17 are mounted on the upright or pedestal 24 by means of pivots 25, and the vibrating element is raised and lowered through the lever 26, the rockshaft 27 of which is provided with arms 28 connected to the upper bars by means of links 29 so that through manipulation of this lever the vibrating member may be raised and lowered relative to the screed or vertically adjusted relative thereto.

In the modification shown in Fig. 6 the wings 30 are not designed to overlie the forms. This is sometimes desired as it is desirable to drop the vibrating element so that its under side at least is below the plane of the upper surfaces of the forms as, for example, in laying a foundation. In such case a short screed would preferably be used, although it will be understood that in laying a foundation the screeding is not so essential as ordinarily it is not necessary or desirable to finish or reduce such foundation to a perfectly smooth surface.

In the modified embodiment of my invention shown in Figs. 7, 8 and 9 the vibrating member is made up of a central tubular body 32 having end portions 33 provided with threaded studs 34 adapted to receive the tubular extensions 35. This central member 32 constitutes a motor housing adapted to receive an electric motor, the rotor 36 of which is provided with unbalancing weights 37.

The shaft 38 is disposed centrally of the housing and is non-rotatably mounted in the end members 33. The upright 39 serves as a conduit for the electric circuit wires 40. In this embodiment the central body member has a flat section 41 while the end members have flat sections 42, these sections being secured together by the splice plates 43. The splice plates prevent the relative rotation of the members and prevent their becoming disconnected as might otherwise result from the vibrations. The end sections are provided with wings 44.

In the embodiment of my invention shown in Fig. 10 the carriage 45 is provided with a bracket 46 on which are pivotally mounted supporting arms 47 for the vibrating element, these supporting arms carrying an engine 48. The arms are pivoted on the bracket at 49 and anchored by means of the bolts 50, which may be adjusted to raise and lower the front ends of the arms.

The vibrating element, designated generally by the numeral 51 in this case, has a shaft 52 disposed longitudinally thereof and provided with unbalancing weights 53. The upright 54 con-

stitutes a boot or housing for the driving belt 55 connecting a pulley 56 on the shaft with a pulley 57 at the upper end of the boot or upright. This pulley 57 is mounted on a shaft 58 which is in turn driven from the engine through the belt 59. The upright is provided with an arm 60 mounted on the supporting bars 47 by means of the cushioned connection designated generally by the numeral 61. In all of these embodiments the vibrating element is supported independently of the screed and preferably for vertical adjustment independently thereof.

In Fig. 4 I illustrate a mass of concrete 65 disposed in front of and overlying the front portion of the vibrating member. This concrete mixture may comprise large aggregate and be of such low water content as to be what is known as unworkable. However, when subjected to the high frequency vibrations it is reduced to a fluid or flowing workable condition so that it is worked down and passes under the vibrating element. Usually there is some surface boiling or flowing up as indicated at 66 in front of the screed so that the screed may act upon the same to smooth out and provide a perfectly smooth uniform surface.

The machine of this invention is highly efficient and of very large capacity, and it is adapted for a great variety of uses. I have shown it in a wheeled machine of considerable size such as a paving machine, but it is adapted for embodiment in smaller machines for the placing of the bottom walls of conduits, irrigation ditches and the like.

I have not attempted to illustrate and describe various embodiments and adaptations which I contemplate as it is believed that this disclosure will enable those skilled in the art 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. In a machine of the class described, the combination of a carriage, an elongated vibrating element of cylindrical cross section disposed horizontally and provided with an upwardly projecting longitudinal centrally disposed face plate and forwardly diverging wings at the ends thereof, a central upright on said vibrating element, means for vibrating said vibrating element and the parts carried thereby comprising a motor mounted on said upright and provided with a rotor having an unbalancing weight, a support for said vibrating element comprising coacting pairs of parallel bars pivotally mounted on said carriage and having resilient connections to said upright, and means operatively associated with said parallel bars for raising and lowering said vibrating element.

2. In a machine of the class described, the combination of a carriage, an elongated vibrating element disposed horizontally, an upright on said vibrating element, means for vibrating said vibrating element comprising a motor mounted on said upright and provided with a rotor having an unbalancing weight, a support for said vibrating element comprising coacting pairs of parallel bars pivotally mounted on said carriage and having resilient connections to said upright, and means operatively associated with said parallel bars for raising and lowering said vibrating element.

3. In a machine of the class described, the combination of a carriage, an elongated vibrating element disposed horizontally, means for vibrating said vibrating element, a support for said

vibrating element comprising coaxing pairs of parallel bars pivotally mounted on said carriage and having resilient connections to said upright, and means operatively associated with said parallel bars for raising and lowering said vibrating element.

4. In a machine of the class described, the combination of a carriage, a horizontally disposed chambered vibrating element mounted on said carriage for vertical adjustment and comprising a tubular body portion having forwardly extending outwardly diverging wings at the ends thereof and an upstanding longitudinal plate disposed centrally thereof, said wings and longitudinal plate being adapted to support a substantial mass of material while it is subjected to the action of the vibrating element and a rotor provided with an unbalancing weight disposed within said body member.

5. In a machine of the class described, the combination of a carriage, an elongated horizontally disposed cylindrical vibrating element provided with an upwardly projecting longitudinal centrally disposed face plate and forwardly diverging wings at the ends thereof, said wings and longitudinal plate being adapted to support a substantial mass of material while it is subjected to the action of the vibrating element, means for vibrating said vibrating element and the parts carried thereby at high frequency, and means for supporting said vibrating element for vertical adjustment relative to the mass to be treated.

6. In a machine of the class described, the combination of a wheeled carriage, a horizontally disposed vibratory element disposed transversely of the path of travel of the carriage and flexibly mounted on said carriage, said vibratory element being provided with an upwardly projecting longitudinal plate and with forwardly projecting wings at its ends adapted to support a substantial mass of the material subjected to the vibrations of said vibratory member, and means for vibrating said vibratory element carried thereby.

7. In a machine of the class described, the combination of a wheeled carriage, a horizontally disposed vibratory element disposed transversely of the path of travel of the carriage and flexibly mounted on said carriage, said vibratory element being provided with forwardly projecting wings at its ends adapted to support a substantial mass of the material subjected to the vibrations of said vibratory member, and means for vibrating said vibratory element carried thereby.

8. In a machine of the class described, the combination of a wheeled carriage, a horizontally disposed vibratory element disposed transversely of the path of travel of the carriage and flexibly mounted on said carriage for vertical adjustment therewith, said vibratory element being provided with an upwardly projecting longitudinal plate, and means for vibrating said vibratory element carried thereby.

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