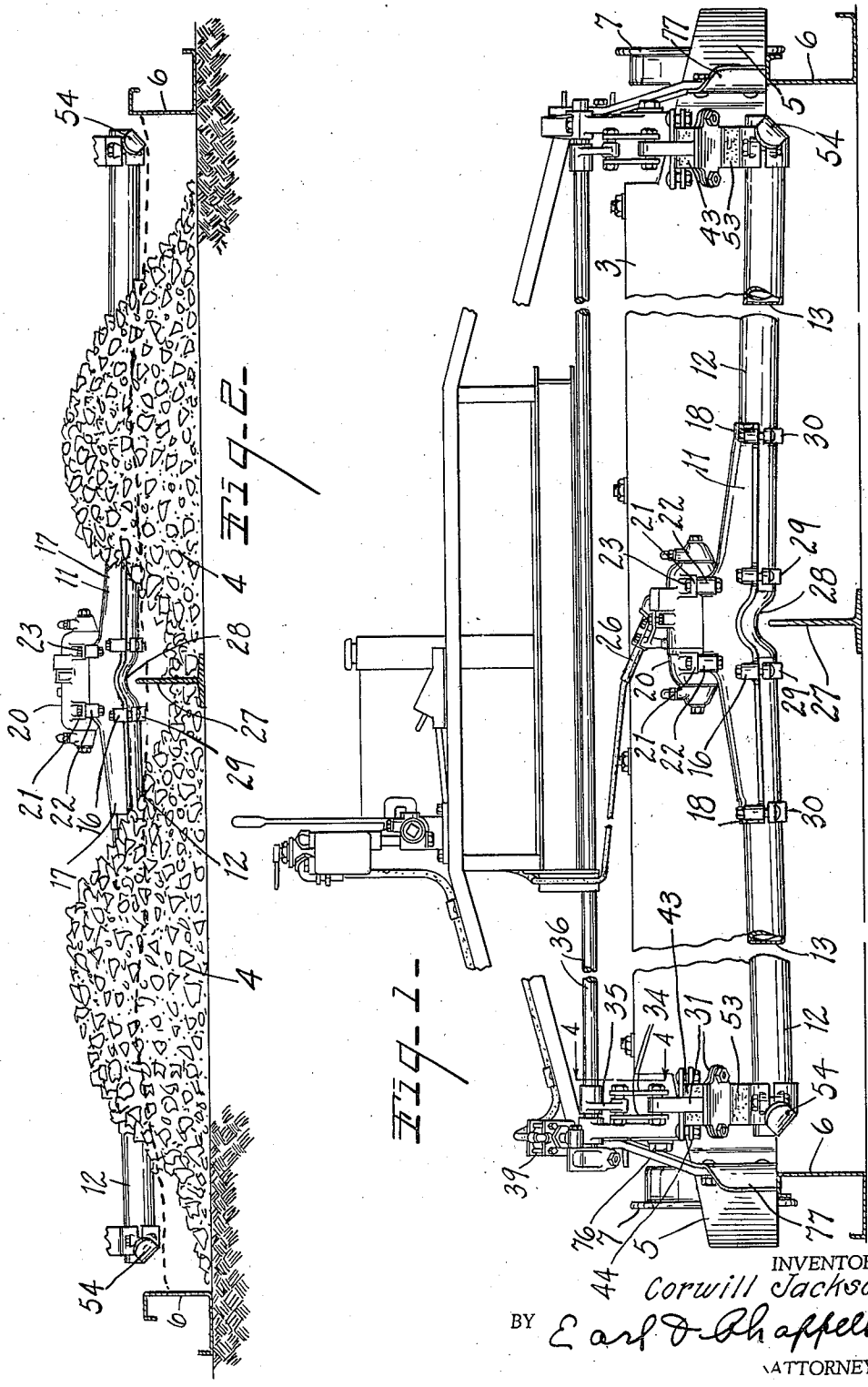
Sept. 2, 1941. C. JACKSON 2,254,743

CONCRETE PLACEMENT APPARATUS

Filed Aug. 11, 1939 4 Sheets-Sheet 1



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CONCRETE PLACEMENT APPARATUS

Filed Aug. 11, 1939 4 Sheets-Sheet 2

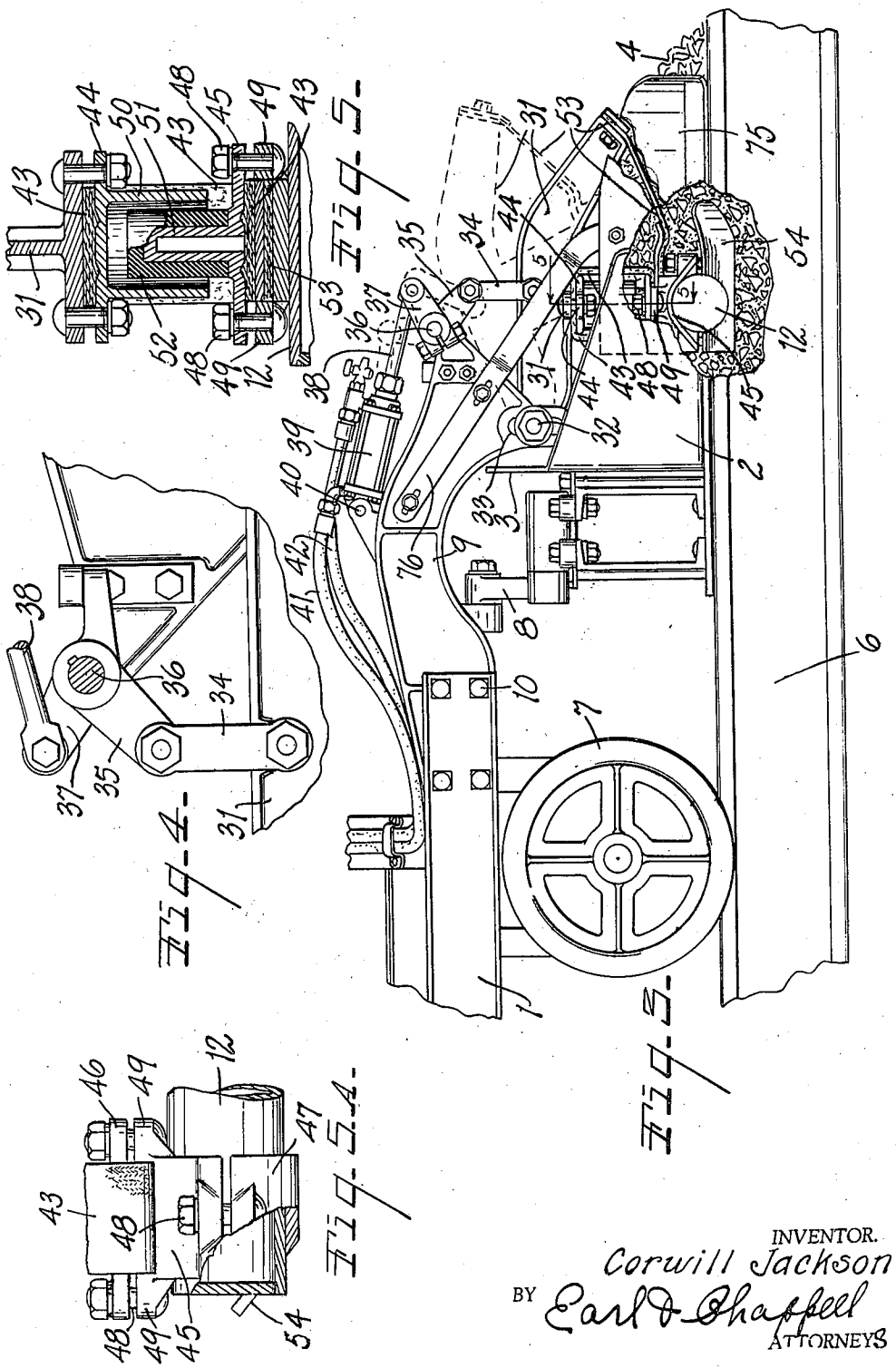


Fig. 5.

Fig. 4.

Fig. 5A.

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CONCRETE PLACEMENT APPARATUS

Filed Aug. 11, 1939 4 Sheets-Sheet 3

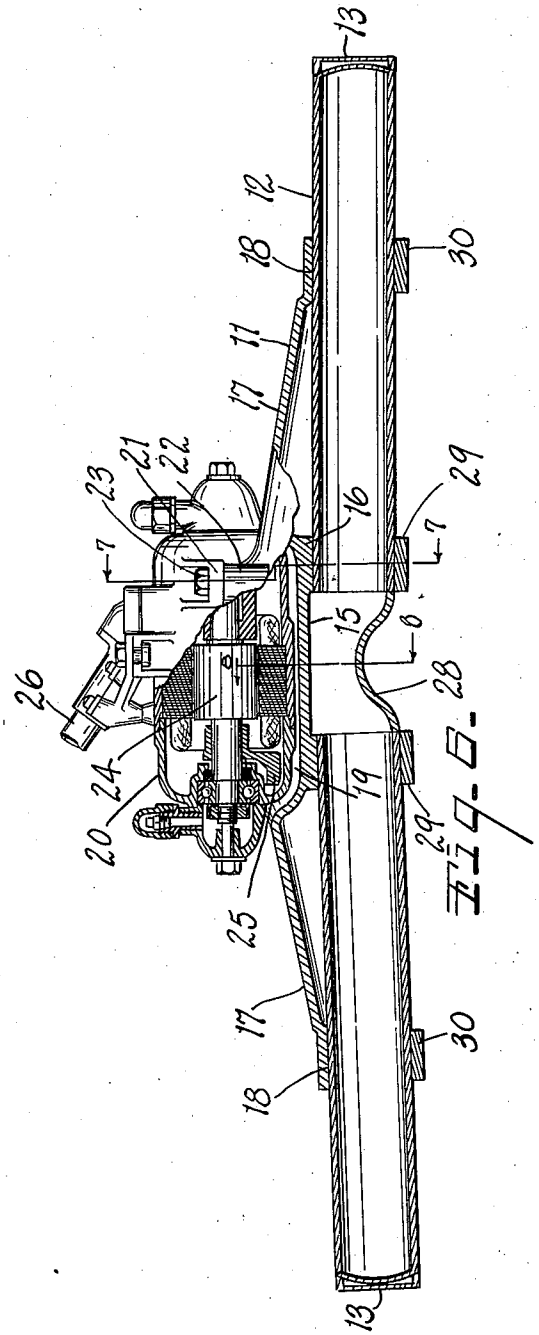


FIG. 5.

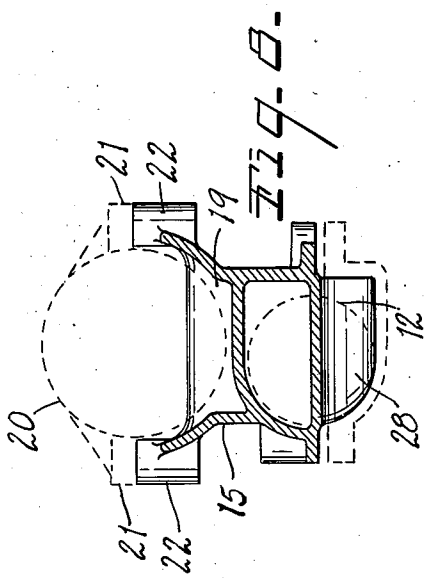


FIG. 8.

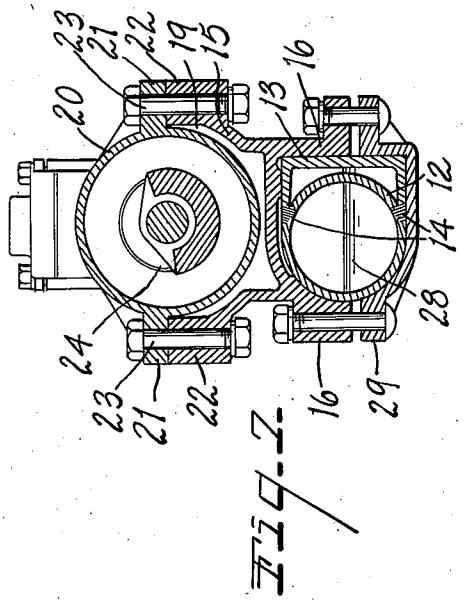


FIG. 7.

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CONCRETE PLACEMENT APPARATUS

Filed Aug. 11, 1939 4 Sheets-Sheet 4

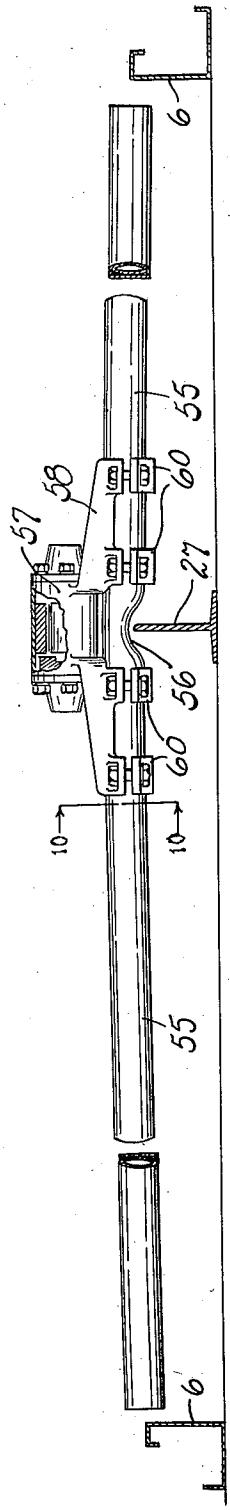


FIG. 9.

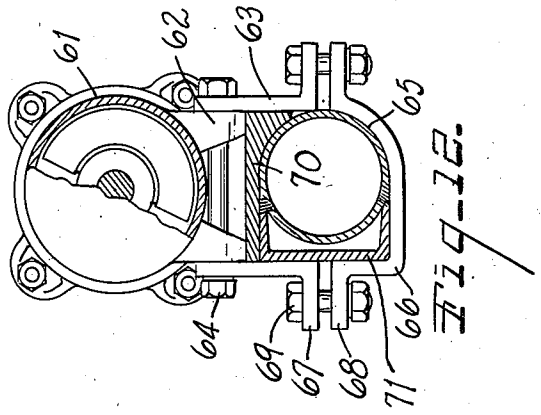


FIG. 12.

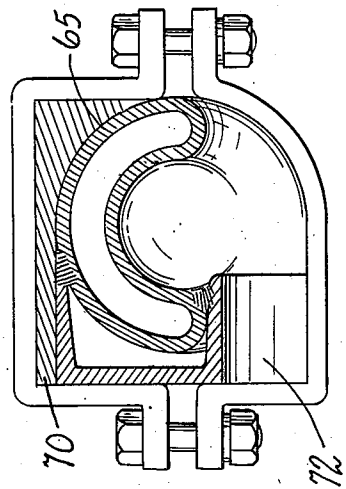


FIG. 13.

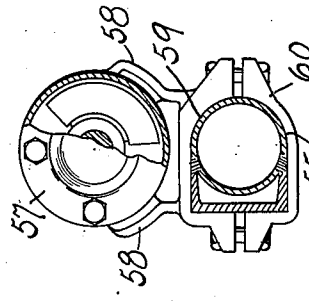


FIG. 10.

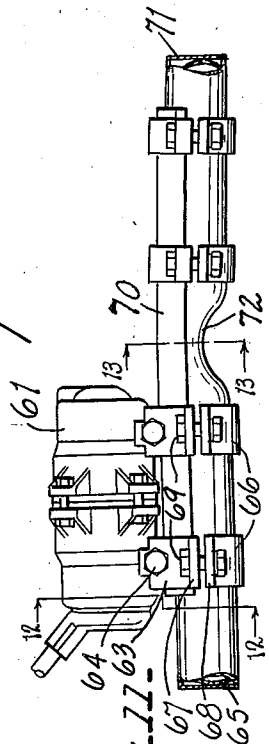


FIG. 11.

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UNITED STATES PATENT OFFICE

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CONCRETE PLACEMENT APPARATUS

Corwill Jackson, Ludington, Mich.

Application August 11, 1939, Serial No. 289,594

11 Claims. (Cl. 94—48)

The main objects of this invention are:

First, to provide a machine or apparatus for the placement of concrete such as pavements, concrete slabs, the walls of ditches or conduits, or the like, which is well adapted for use as an attachment to a concrete paving machine of the reciprocating screed type.

Second, to provide a concrete placing machine or apparatus which may be very easily operated to submerge or lift the vibratory element from the mass of concrete.

Third, to provide in a machine of the character described an improved vibratory element.

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

Preferred embodiments of the invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary front elevation of a concrete placing machine or apparatus embodying the features of my invention, certain parts thereof being shown in conventional form and other parts of the machine or apparatus being omitted.

Fig. 2 is a fragmentary elevation showing the vibratory element in one relation to a mass of concrete to be placed which has been dumped upon the foundation between side forms.

Fig. 3 is a fragmentary side elevation looking from the left of Fig. 1, the vibratory element being shown in one operative position by full lines and in raised or retracted position by dotted lines.

Fig. 4 is an enlarged fragmentary view in section on line 4—4 of Fig. 1 showing details of the vibratory element supporting and raising and lowering means.

Fig. 5 is an enlarged fragmentary vertical section of the hanger and buffer means for the vibratory element.

Fig. 5A is an enlarged fragmentary view partially in section showing a further detail of the hanger means.

Fig. 6 is an enlarged fragmentary view mainly in longitudinal section of the vibratory element and the vibrating motor incorporated therewith.

Fig. 7 is a view mainly in vertical section on line 7—7 of Fig. 6.

Fig. 8 is a fragmentary view on line 8—8 of Fig. 6 showing details of the combined motor base and coupling unit of the vibratory element.

Fig. 9 is a fragmentary view of a modified form of vibratory element and motor mounting.

Fig. 10 is a view partially in transverse section on line 10—10 of Fig. 9, the motor housing being partially broken away and sectioned.

Fig. 11 is an enlarged fragmentary front elevation of a further modification of my invention.

Fig. 12 is a fragmentary view partially in section on the broken line 12—12 of Fig. 11.

Fig. 13 is an enlarged fragmentary section on line 13—13 of Fig. 11.

In the accompanying drawings, no attempt has been made to illustrate the parts in their relative proportions and certain parts have been conventionalized to simplify the drawings. Structures embodying the features illustrated have, however, been commercialized, and certain of the features illustrated constitute the subject matter of my Letters Patent No. 2,199,074 of April 30, 1940.

Referring particularly to Fig. 3, 1 represents the frame of a main carriage which in this instance is a paving machine provided with a reciprocating screed designated generally by the numeral 2 and having a face plate 3 of substantial height adapted to support a substantial mass of concrete conventionally illustrated at 4. The screed is provided with forwardly projecting wings 5 at the ends thereof adapted to overhang the side forms 6 which constitute tracks for the wheels 7 of the paving machine. The means for reciprocating the screed are generally designated by the numeral 8. There are, however, certain paving machines in which the screed is not reciprocated and my improvements are adapted for use on various types of machines as its frame end pieces 9 are adapted to be attached to the frame of a paving machine or may be provided with adapters for different types of frames, the main point being that the frame members or supports 9 are rigidly supported on a carrying frame. In the structure illustrated, the members 9 are secured by bolts 10, see Fig. 3.

The submersible vibratory element of my present invention designated generally by the numeral 11 consists of a pair of tubular members 12 formed of pieces of pipe or tube of suitable dimensions and reinforced by means of the channels 13 which are welded to the rear sides thereof as shown in Fig. 7, the welding being indicated at 14. These vibratory element members are secured together by the combined coupling and motor mounting member 15 which has opposed sockets 16 receiving the inner ends of the members 12 and laterally projecting arms 17 of suitable length having openings 18 therein aligned with the sockets receiving the members 12.

The member 15 is provided with an upwardly facing chamber or recess 19 receiving the lower portion of the motor housing 20 which has ears 21 resting upon the corresponding bosses 22 on the member 15, the motor housing being clamped in position by means of the bolts 23. This forms a very rigid connection for the motor to the member 15 so that the vibrations thereof resulting from the unbalanced rotor 24 of the

motor are imparted to the vibratory element. The rotor 24 in the embodiment illustrated is the rotor of an electric motor, one of the unbalancing weights being indicated at 25. There are preferably two of these unbalancing weights. The circuit connections for the motor are indicated at 26.

Two-way pavements are usually laid with a longitudinal parting or joint strip 27, and to permit suitable lowering of the vibratory element into the concrete, the member 15 is provided with a recess 28 in its under-wall, this wall serving to close the ends of the tubular members 12. The members 12 are clamped in the socket 16 and the recess of the socket 18 by means of clamps 29 and 30, thus making a very rigid vibratory element and at the same time one in which the parts are easily fabricated and assembled.

The apparatus may be adapted to different widths of pavement by changing or varying the length of the members 12. With this arrangement, the axis of the vibrating unit is fairly close to the axial center of the vibratory element.

The vibratory element is carried by the forwardly projecting supports 31 which are pivoted at 32 on the frame members 9. The pivot bolts 32 are vertically adjustable in slots 33. The pivoted support members 31 are connected by links 34 to arms 35 on the rockshaft 36 which extends between the members 9 and journaled thereon. The rockshaft is provided with an arm 37 connected to the piston rod 38 of a suitable piston or plunger operative in the hydraulic cylinder 39, the cylinder being pivoted at 40 to permit swinging thereof as would be necessary owing to the direction for the connection of the piston rod 38 to the arm 37. The hydraulic connections for the ends of the cylinder are indicated at 41 and 42, the means for supplying fluid under pressure and controlling the delivery thereof not being illustrated.

The vibratory element is suspended for free vibratory movement from the swingable arms or supports 31 by means of the flexible non-extensible hangers 43, the upper ends of which are secured by the clamps 44 to the under sides of the members 31 intermediate the ends thereof, the lower ends being secured by the clamps 45 and 46 to the ends of the vibratory element. The clamp 45 is formed of two parts, its lower part 47 being connected to the upper part by means of the bolts 48. The clamp 46 is secured by the bolts 48 to the ears 49 on the member 45, see Figs. 5 and 5A. The clamp 44 is provided with a downwardly opening tubular socket 50 in the space between the front and rear reaches of hangers 43, the said socket receiving the bumper carrying stud 51 on the clamp member 45, see Fig. 5.

A resilient bumper, closed end 52 of inverted U section is sleeved upon the stud 51 and coacts with the walls of the socket to limit the movement of the vibratory element under undue stress while permitting vibration thereof.

Flexible non-extensible draft members 53 extend from the forward ends of the pivot arms to be secured between the clamp members 45 and 46.

The clamp members 47 in the embodiment illustrated are provided with shoes 54 disposed in an outwardly facing inclined relation to the axis of the vibratory element, the shoes in this embodiment being formed as a part of or integrally with the clamp member.

In the embodiment of my invention shown in Fig. 9, the vibratory element 55 is formed of one piece and has the under side or central portion 56 thereof upset to provide a recess for the parting or joint strip 27 of a pavement. In this embodiment, the motor housing 57 is provided with laterally projecting arms 58 having clamping sockets or recesses 59 therein adapted to receive the member 55 which is secured in these recesses by means of the clamp members 60.

In the embodiment shown in Figs. 11, 12 and 13, the motor housing designated generally by the numeral 61 is provided with downwardly projecting ears 62 which are secured to the clamp members 63 by means of bolts 64, the clamp member 63 coacting in clamping the member 65 with the clamp member 66, the members 63 and 66 having opposed ears 67 and 68 receiving the bolts 69. In this embodiment, the member 65 is provided with a reinforcing bar 70 superimposed thereon and overlapping the channel reinforcing member 71 arranged on the rear side thereof. The motor is here disposed at one side of the upward offset 56 and the bar 70 serves to rigidify the member 65 at this point. In this embodiment, the reinforcing channel 71 is upwardly offset at 72 in alignment with the upward offset 56.

To confine the mass being treated at the ends of the vibratory element and to clear the side forms for the screed and the wheel 7, I provide the combined side and scraper members 75 which are mounted on the arms 76 extending forwardly and downwardly from the members 9, see Fig. 3. These members 75 are adapted to slide or scrape along the tops of the forms and have outwardly converging front end portions 77 for that purpose, see Figs. 1 and 3. One of the main purposes, however, is to retain the concrete as it is acted upon by the vibratory element. In Fig. 2, I illustrate that the mass to be treated may be dumped in piles in front of the machine, the machine acting to largely level off the material, as indicated by dotted lines, for finishing action by the screed, thus saving a very substantial amount of manual labor.

I have illustrated and described my improvements in embodiments which have been used commercially. I have not attempted to illustrate or describe other embodiments or adaptations which I contemplate as it is believed that this disclosure will enable those skilled in the art to embody or adapt my improvements 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 with a carriage provided with forwardly projecting frame members, of a rockshaft mounted adjacent the forward ends thereof, supporting arms pivotally mounted on said frame members, arms on said rockshaft having link connection to said supporting arms, means for actuating said rockshaft to pivotally adjust said supporting arm through said rockshaft arm and link connection, a submersible horizontally disposed elongated vibratory element, flexible non-extensible hangers for said vibratory element mounted on said supporting arms intermediate the ends thereof, telescoping members associated with said hangers and provided with bumpers, and flexible non-extensible draft members con-

nected to the forward ends of said supporting arms and to the ends of said vibratory element.

2. In a machine of the class described, the combination with a carriage, of supporting arms pivotally mounted on said carriage, means for raising and lowering said supporting arms, a submersible horizontally disposed elongated vibratory element, flexible non-extensible hangers for said vibratory element mounted on said supporting arms intermediate the ends thereof, telescoping members associated with said hangers and provided with bumpers, and flexible non-extensible draft members connected to the forward ends of said supporting arms and to the ends of said vibratory element.

3. In a machine of the class described, the combination with a carriage provided with forwardly projecting frame members, of a rockshaft mounted adjacent the forward ends thereof, supporting arms pivotally mounted on said frame members, the pivots of said supporting arms being mounted for vertical adjustment, arms on said rockshaft having link connection to said supporting arms, means for actuating said rockshaft to pivotally adjust said supporting arm through said rockshaft arm and link connection, a submersible horizontally disposed elongated vibratory element, hangers on said vibratory element carried by said supporting arms, and side members mounted on said forwardly projecting frame members and disposed on the ends of said vibratory element for supporting the mass of concrete operated upon by the vibratory element at the ends thereof.

4. In a machine of the class described, the combination with a carriage provided with forwardly projecting frame members, of supporting arms pivotally mounted on said frame members, the pivots of said supporting arms being mounted for vertical adjustment, means for raising and lowering said supporting arms, a submersible horizontally disposed elongated vibratory element, hangers for said vibratory element mounted on said supporting arms, and side members mounted on said forwardly projecting frame members and disposed on the ends of said vibratory element for supporting the mass of concrete operated upon by the vibratory element at the ends thereof.

5. In a machine of the class described, the combination with swingable supporting arms, of means for adjustably supporting said arms, a submersible horizontally disposed elongated vibratory element, flexible non-extensible hangers for said vibratory element mounted on said supporting arms intermediate the ends thereof, telescoping members associated with said hangers and provided with bumpers, and flexible non-extensible draft members connected to the forward ends of said supporting arms and to the ends of said vibratory element.

6. In a machine of the class described, the combination with a supporting frame, an elongated submersible vibratory element comprising a rotor housing support having downwardly facing clamp sockets and also having laterally projecting arms of substantial length provided with downwardly facing clamp sockets at their ends, elongated vibratory element end members disposed in said sockets, said sockets being conformed to the cross sectional shape of said elongated vibratory end members and embracing a substantial portion thereof, clamps coacting with said sockets for securing said end members to said supports, an unbalanced rotor, and a housing therefor mounted on said support.

7. In a machine of the class described, the combination with a supporting means, of an elongated submersible vibratory element comprising a pair of elongated end members, a vibratory unit support provided with downwardly facing clamp sockets in which said end members are disposed, said clamp sockets being of a cross section to correspond with the end members and embracing a substantial portion thereof, clamps rigidly securing said end members within said sockets and to said support, said support being of substantial length and constituting a reinforcing means for said end members, and an unbalanced rotor provided with a housing rigidly secured to said support.

8. In a machine of the class described, the combination with a supporting means, of an elongated submersible vibratory element comprising a pair of elongated end members, a vibratory unit support provided with clamp sockets in which said end members are disposed, said clamp sockets being of a cross section to correspond with the end members and embracing a substantial portion thereof, clamps rigidly securing said end members within said sockets, said support being of substantial length, and an unbalanced rotor provided with a housing rigidly secured to said support.

9. In a machine of the class described, the combination with a supporting means, of an elongated submersible vibratory element comprising an elongated tubular body member having a reinforcing channel secured to the rear side thereof, and a vibrating unit housing support rigidly secured to said body member centrally thereof and provided with clamping means at each side of a central zone, the bottom of said body member including the reinforcing channel being upwardly offset within said zone to provide clearance for a pavement parting or joint strip, said support constituting a reinforcing means for said central portion of said body member.

10. In a machine of the class described, the combination with a supporting means, of an elongated submersible vibratory element comprising an elongated body member, and a vibrating unit housing support rigidly secured to said body member centrally thereof and provided with clamping means at each side of a central zone, said body member being upwardly offset within said zone to provide clearance for a pavement parting or joint strip, said support constituting a reinforcing means for said central portion of said body member.

11. In a machine of the class described, the combination with a supporting means, of an elongated submersible vibratory element comprising a rotor housing support having an upwardly facing rotor housing recess and having downwardly facing clamp sockets and also having laterally projecting arms provided with downwardly facing clamp sockets, elongated vibratory element end members clamped in said sockets and comprising tubular body portions, said support member having an upwardly offset central bottom portion constituting a closure for the inner ends of said tubular members, an unbalanced rotor, and a housing therefor disposed in said recess on said support and rigidly secured to the support.

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