

April 11, 1939.

C. JACKSON

2,154,207

CONCRETE PLACING APPARATUS

Filed Jan. 10, 1936

3 Sheets-Sheet 1

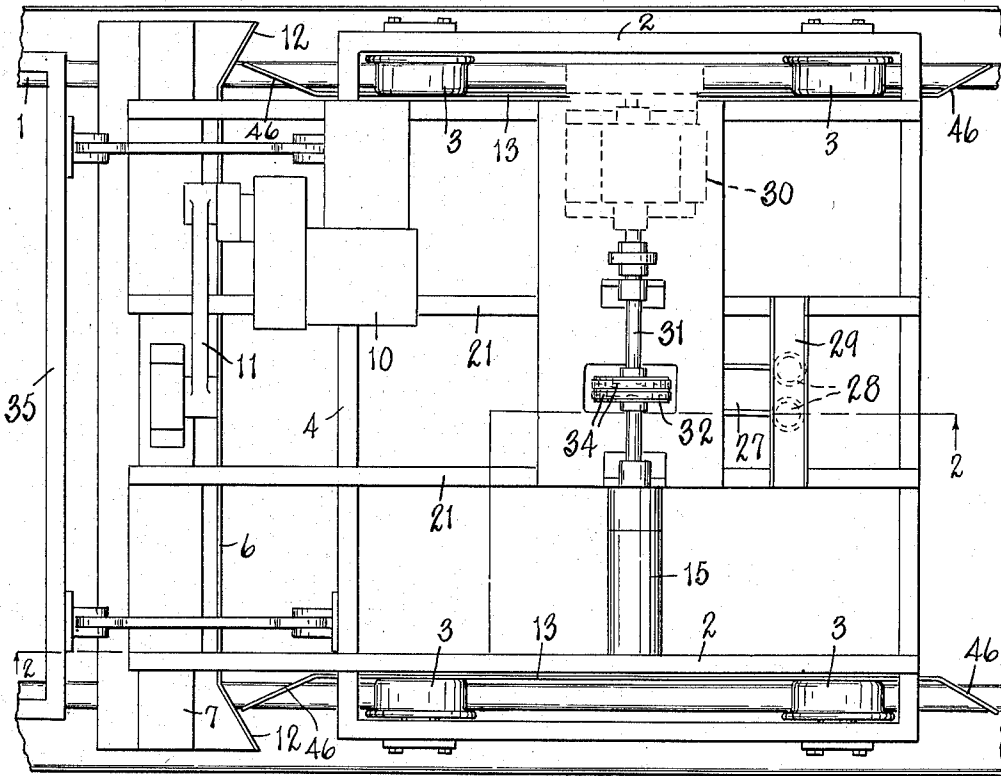


Fig. 1

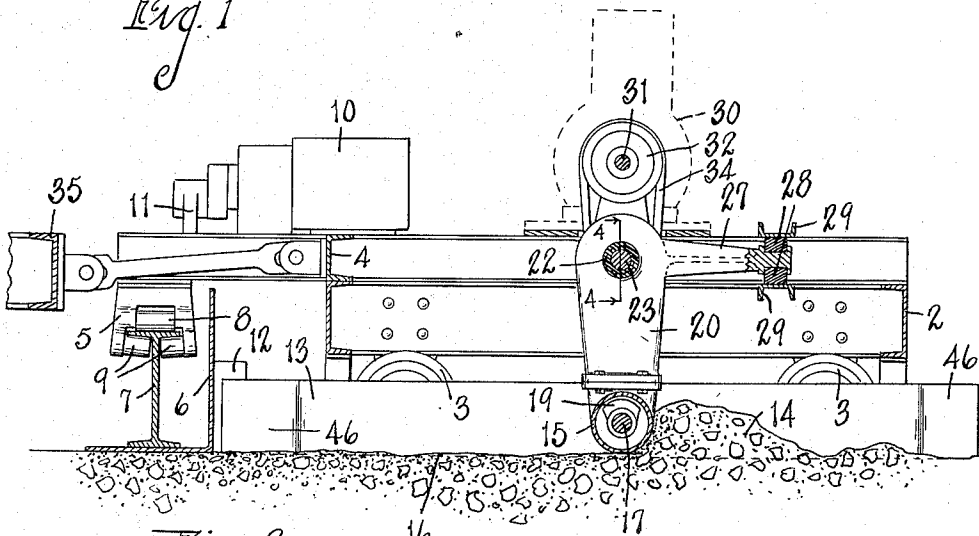


Fig. 2

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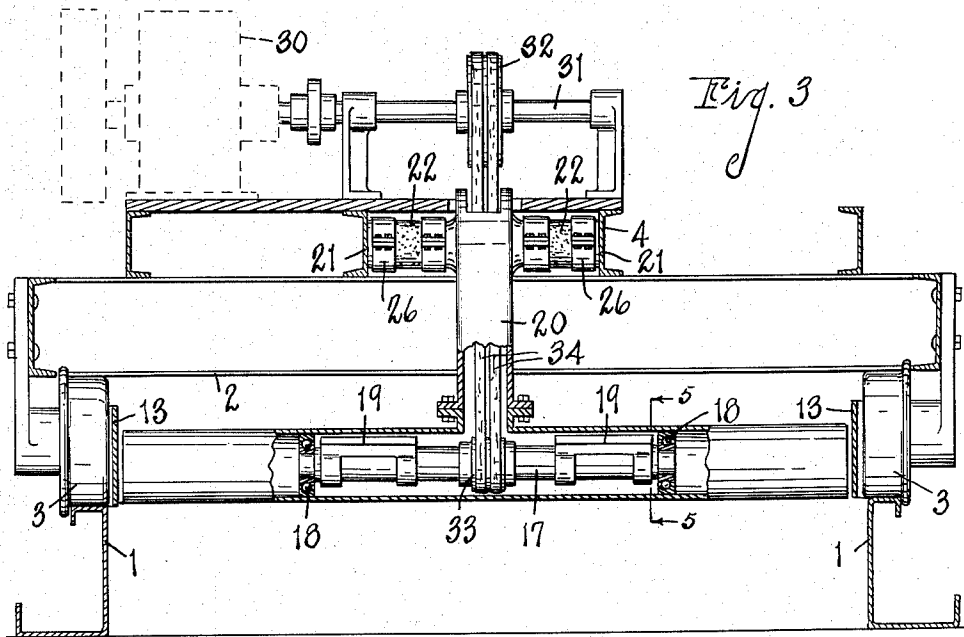
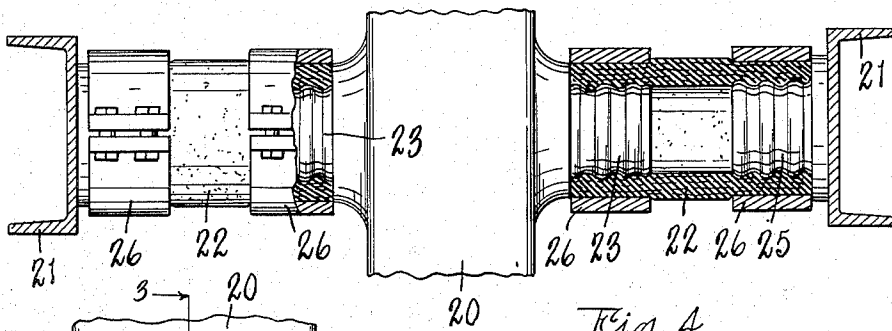
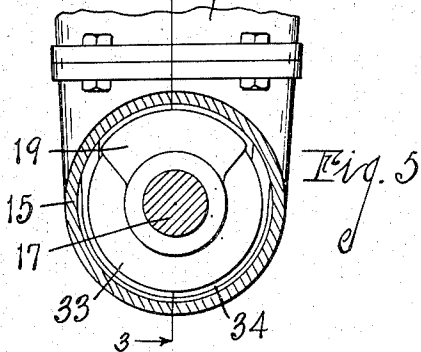
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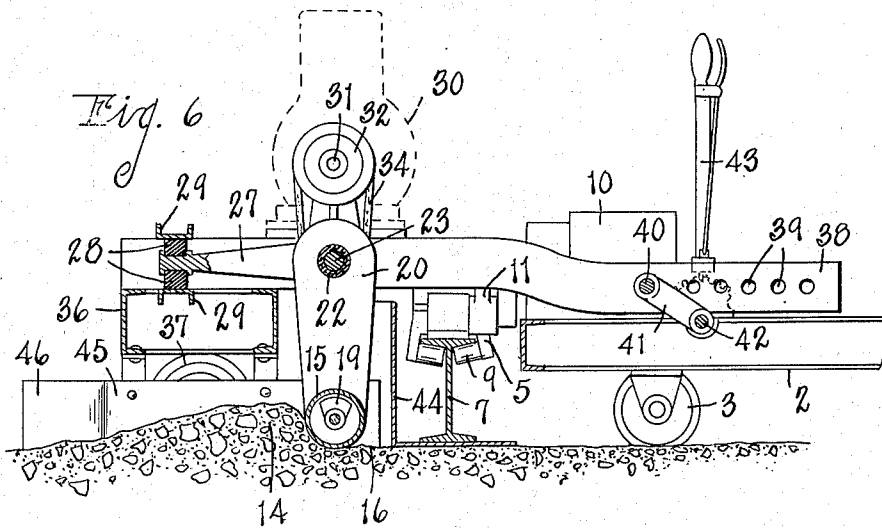
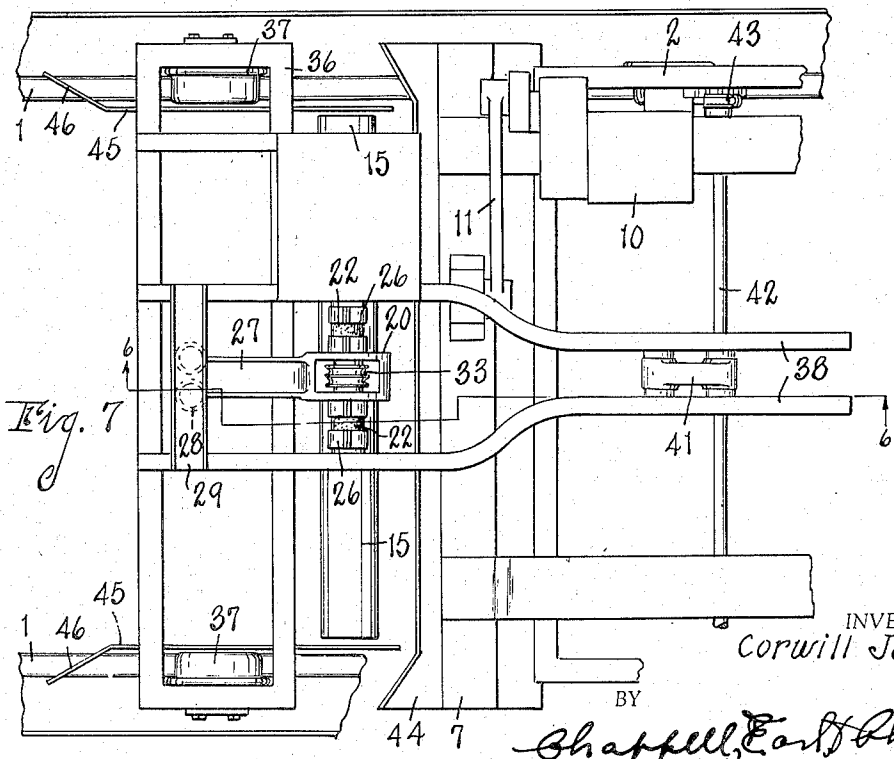
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CONCRETE PLACING APPARATUS

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3 Sheets-Sheet 3



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2,154,207

CONCRETE PLACING APPARATUS

Corwill Jackson, Ludington, Mich.

Application January 10, 1936, Serial No. 58,556

16 Claims. (Cl. 94-48)

The main objects of this invention are:

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

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

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

Fourth, to provide a concrete placing machine which may be very economically produced and which is adapted for use in connection with propelling or tractor means of various types and for use in connection with paving machines or other concrete placing apparatus.

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.

A preferred embodiment of my invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary plan view of an embodiment of my invention designed to be propelled by a suitable tractor or propelling means not detailed herein.

Fig. 2 is a fragmentary vertical section on line 2-2 of Fig. 1.

Fig. 3 is a detail fragmentary view partially in elevation and partially in vertical section on a line corresponding to line 3-3 of Fig. 5.

Fig. 4 is an enlarged fragmentary view partially in section on line 4-4 of Fig. 2.

Fig. 5 is a fragmentary view in section on line 5-5 of Fig. 3.

Fig. 6 is a fragmentary view partially in longitudinal section of a modified form or embodiment of my invention on the broken line 6-6 of Fig. 7.

Fig. 7 is a fragmentary plan view of the embodiment shown in Fig. 6.

Referring to the embodiment of my invention illustrated in Figs. 1 to 5 inclusive, 1, 1 represent form members which are adapted to serve as rails or track for the machine. This machine comprises a suitable frame 2 provided with flanged carrying wheels 3. The frame 2 is provided with an auxiliary or sub-frame 4, the longitudinal beams of which project rearwardly of the truck frame 2 and are provided with hangers 5 for the

reciprocating screed 6. This screed is provided with an I-beam 7, the I-beam being mounted on its shoe, the upper flange of the beam engaging the hanger which is provided with suitable anti-friction rollers 8 and 9. The screed is thus mounted for horizontal reciprocatory motion, being driven from the engine 10, the pitman or connecting rod 11 connected to the screed being connected to the engine through a suitable transmission. The screed is preferably provided with forwardly projecting end portions or wings 12.

On the carriage in front of the screed I mount side plates 13, these side plates having outwardly directed front and rear ends. The side plates are mounted longitudinally of the carriage and at the inside of the wheels with the lower edges of the plates in substantially the plane of the bottoms of the wheels or the top of the tracks on which the wheels are traveling. These side plates are adapted to support the piled-up concrete material indicated at 14 in advance of the vibratory element 15. This vibratory element is arranged between the side plates 13 preferably in advance of and in parallel relation to the screed. The member 15 is supported to carry along excess material and roughly level it off as indicated at 16 ahead of the screed, the final finish being accomplished by the finishing screed 6.

The vibratory element 15 is vibrated at high frequency, at least about 3600 R. P. M., the apparatus being especially designed for the placement of concrete according to the method claimed in my Patent No. 1,787,449, dated January 6, 1931. A mass of concrete is subjected by this vibratory element to high frequency vibrations so that concrete mixes of low or so-called unworkable water content are rendered workable and may be effectively placed by means of this vibratory element and the coacting smoothing screed. The machine is also well adapted for use in the placement of concrete having a large aggregate, the voids, even with large aggregate, being effectively filled or eliminated.

The vibratory member 15 is preferably of substantial diameter so that it does serve as a screed to roughly place the concrete. It is, however, preferably cylindrical as illustrated and of a length so that its ends are quite close to the side plates 13. Housed within the vibratory element is a rotor preferably in the form of a shaft 17 having supporting bearings 18 at its ends carried by the wall of the vibratory element. Unbalancing weights 19 are arranged on the shaft adjacent its ends or its bearings.

The vibratory element is carried by a tubular

or hollow upright 20 disposed centrally thereof, this upright being mounted on the longitudinal bars 21 by means of the flexible supports 22, these flexible supports being preferably in the form of
 5 pieces of rubber or elastic tubing clamped on the studs 23 on the housing and the studs 25 on the bars 21 as by means of the clamps 26.

To support the vibratory member against turning movement on its supports 22, it is provided
 10 with an arm 27 projecting longitudinally of the carriage and supported at its forward end by means of the cushions 28 arranged between the cross pieces 29 on the bars 21. This supports the vibratory member so that it may be vibrated at
 15 high frequency. It is not intended that the vibrations shall have a large amplitude as the purpose is to set up high frequency vibrations within the mass being placed.

In the embodiment illustrated, the rotor is
 20 driven from a suitable motor indicated at 30, the shaft 31 of which is provided with pulleys 32 connected to the pulley 33 on the shaft 17 by means of the belts 34 disposed longitudinally through the upright 20. The belts are thus effectively
 25 protected and the vibrating means may be driven by a gas engine or the like. I have illustrated a direct connection to the shaft 31 although it will be understood that a variable speed or other transmission may be provided if desired.

30 In the embodiment shown in Figs. 1 to 5, the propelling means is indicated at 35.

In the embodiment shown in Figs. 6 and 7, the vibratory member 15 is mounted on a two-wheel carriage 36, the carrying wheels 37 being arranged
 35 in advance of the vibratory member. This carriage is provided with a pair of rearwardly projecting push bars 38 having a series of holes 39 with which the pivot 40 of the arm 41 on the rock-shaft 42 may be engaged. This rockshaft is controlled by the lever 43 which may be manipulated
 40 to raise or lower the rear ends of the bars 38 and thus tilt the frame 36 on its carrying wheels or the axis of its carrying wheels. The upright 20 is mounted through its flexible supports 22 to
 45 these bars 38 so that by raising and lowering the rear ends of the bars and by selectively engaging the pivot 40 with the holes 39, the relation of the vibratory member to the screed 44 both vertically and horizontally or to and from the screed may
 50 be varied.

Side plates 45 corresponding generally to the side plates 13 are provided, the rear ends of these side plates being adjacent the screed and projecting to the rear of the vibratory member to
 55 support the mass of concrete 14 in advance of the screed. In both of these embodiments, the ends of the side plates are preferably turned outwardly to extend across the forms as shown at 46. The vibrating means of this embodiment is
 60 substantially the same as that described.

The screed 44 is also mounted for reciprocatory movement, the mounting means being substantially that described for the previously described
 65 embodiment.

This embodiment shown in Figs. 6 and 7 is adapted to be used in connection with certain types of paving machines now in use and may be readily applied thereto.

Both embodiments are designed to produce a
 70 very simple and economical apparatus or machine which is at the same time effective in operation.

I have illustrated two adaptations or embodiments which I consider highly practical. I have
 75 not attempted to illustrate or describe other

embodiments or adaptations 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 5 claim as new and desire to secure by Letters Patent, is:

1. In a machine of the class described, the combination with a wheeled carriage, of a screed mounted on said carriage for horizontal reciprocatory motion, side plates mounted on said carriage in front of said screed and at the inside of the carriage wheels with their lower edges in approximately the plane of the bottom of the wheels, a tubular cylindrical vibratory element
 15 disposed in advance of said screed between said side plates, said vibratory element being provided with a tubular upright opening to said vibratory element, a flexible supporting means for said upright including a cushioned laterally projecting supporting arm for maintaining the upright in upright position, an unbalanced rotor mounted within said vibratory element, a motor mounted on said carriage, and driving connections therefor to said rotor including a transmission belt disposed through said upright.
 20

2. In a machine of the class described, the combination with a wheeled carriage, of a screed mounted on said carriage for horizontal reciprocatory motion, side plates mounted on said carriage in front of said screed and at the inside of the carriage wheels with their lower edges in approximately the plane of the bottom of the wheels, a vibratory element disposed in advance of said screed between said side plates, said
 35 vibratory element being provided with an upright, a flexible supporting means for said upright including a cushioned laterally projecting supporting arm for maintaining the upright in upright position, and a vibrating means carried by said
 40 vibratory element.

3. In a machine of the class described, the combination with a wheeled carriage, of side plates mounted on said carriage at the inside of the carriage wheels with their lower edges in approximately the plane of the bottom of the wheels, a tubular cylindrical vibratory element disposed between said side plates, said vibratory element being provided with a tubular upright opening to said vibratory element, a flexible supporting means for said upright including a cushioned laterally projecting supporting arm for maintaining the upright in upright position, an unbalanced rotor mounted within said vibratory element, a motor mounted on said carriage, and driving connections therefor to said rotor including a transmission belt disposed through said upright.
 50

4. In a machine of the class described, the combination with a wheeled carriage, of side plates mounted on said carriage at the inside of the carriage wheels with their lower edges in approximately the plane of the bottom of the wheels, a vibratory element disposed horizontally between said side plates, said vibratory element being provided with an upright, a flexible supporting means for said upright including a cushioned laterally projecting supporting arm for maintaining the upright in upright position, and a vibrating means carried by said vibratory
 60 element.
 65

5. In a machine of the class described, the combination with a wheeled carriage, of a tubular cylindrical horizontally disposed vibratory element provided with a tubular upright opening
 75

to said vibratory element, a flexible supporting means for said upright including a cushioned laterally projecting supporting arm for maintaining the upright in upright position, an unbalanced rotor mounted within said vibratory element, a motor mounted on said carriage, and driving connections therefor to said rotor including a transmission belt disposed through said upright.

6. In a machine of the class described, the combination with a wheeled carriage, of a horizontally disposed vibratory element provided with an upright, flexible supports for said upright disposed on opposite sides thereof, a cushioned laterally projecting supporting arm disposed at an angle to said flexible supports for maintaining the upright in upright position, and a vibrating means for said vibratory element.

7. In a machine of the class described, the combination with a carriage, of longitudinal side plates mounted on said carriage, a horizontally disposed vibratory element, means for resiliently supporting said vibratory element transversely between said side plates and for vertical adjustment independently of said plates, and vibrating means for said vibratory element.

8. In a machine of the class described, the combination with a carriage, of longitudinal side plates mounted on said carriage, a horizontally disposed vibratory element disposed transversely between said side plates and for vertical adjustment independently of said plates, and vibrating means for said vibratory element.

9. In a machine of the class described, the combination with a carriage, of a vibratory element disposed horizontally and transversely of the path of travel of the carriage, side plates disposed at the ends of the vibratory element and in relation thereto to support the concrete acted upon by the vibratory element, and means for vibrating said vibratory element at high frequency.

10. In a machine of the class described, the combination with a main carriage, of a screed mounted on said main carriage, an auxiliary carriage, side plates mounted on said auxiliary carriage at the inside of the wheels thereof, a tubular vibratory element resiliently mounted on said auxiliary carriage between said side plates, a motor mounted on said auxiliary carriage, an unbalancing rotor within said vibrating element, driving connections from said motor to said rotor, and a push bar for said auxiliary carriage mounted on said main carriage for longitudinal and vertical adjustment whereby the position of the vibratory element relative to the screed may be varied vertically and horizontally.

11. In a machine of the class described, the combination with a main carriage, of a screed mounted on said main carriage, an auxiliary carriage, a tubular vibratory element resiliently mounted on said auxiliary carriage, a motor mounted on said auxiliary carriage, an unbalancing rotor within said vibrating element, driv-

ing connections from said motor to said rotor, and a push bar for said auxiliary carriage mounted on said main carriage for longitudinal and vertical adjustment whereby the position of the vibratory element relative to the screed may be varied vertically and horizontally.

12. In a machine of the class described, the combination with a main carriage, of a screed mounted on said main carriage, an auxiliary carriage, side plates mounted on said auxiliary carriage at the inside of the wheels thereof, a vibratory element mounted on said auxiliary carriage between said side plates, means for vibrating said vibratory element at high frequency, and a push bar for said auxiliary carriage mounted on said main carriage for longitudinal and vertical adjustment whereby the position of the vibratory element relative to the screed may be varied vertically and horizontally.

13. In a machine of the class described, the combination with a main carriage, of a screed mounted on said main carriage, an auxiliary carriage, side plates mounted on said auxiliary carriage at the inside of the wheels thereof, a vibratory element mounted on said auxiliary carriage, means for vibrating said vibratory element at high frequency, and a push bar for said auxiliary carriage mounted on said main carriage for longitudinal and vertical adjustment whereby the position of the vibratory element relative to the screed may be varied vertically and horizontally.

14. In a machine of the class described, the combination with a main carriage, of an auxiliary carriage, a horizontally disposed vibratory element mounted on said auxiliary carriage, means for vibrating said vibratory element at high frequency, and a push bar for said auxiliary carriage mounted on said main carriage for longitudinal and vertical adjustment whereby the position of the vibratory element may be varied vertically and horizontally.

15. In a machine of the class described, the combination of a two-wheeled carriage, a vibratory element mounted on said carriage horizontally and transversely of its path of travel, means for vibrating said vibratory element at high frequency, the vibrating element being arranged at the rear of the axis of the wheels, and a rearwardly projecting supporting and propelling bar for said carriage provided with means for adjustably supporting its rear end.

16. A machine of the class described comprising a main carriage, a screed mounted on said main carriage, an auxiliary carriage provided with a pair of supporting wheels, said carriage being provided with a propelling and supporting bar mounted on said main carriage for longitudinal and vertical adjustment, and a vibrating element mounted on said auxiliary carriage substantially at the rear of its traction wheels and in advance of and in parallel relation to said screed on said main carriage.

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