

April 30, 1940.

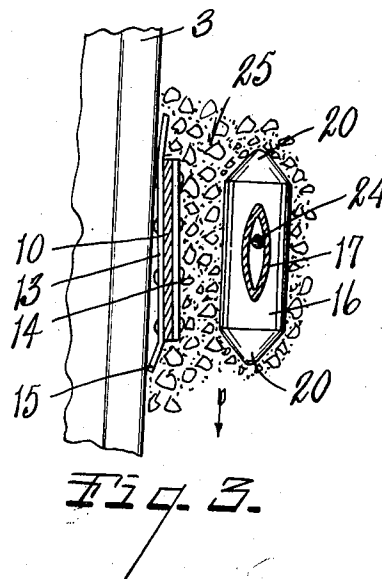
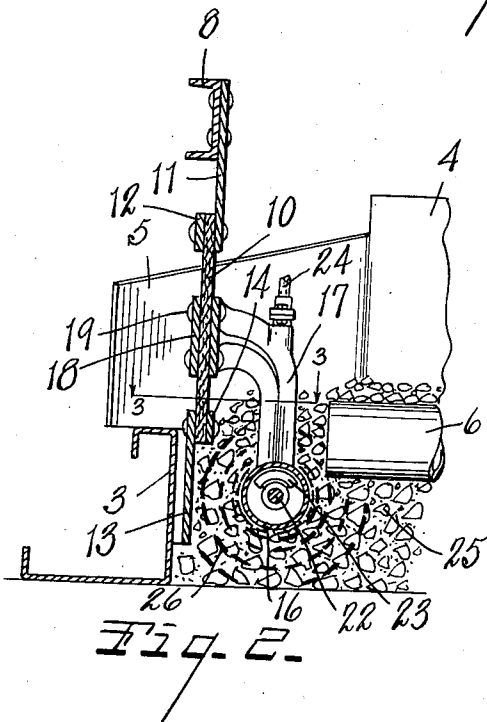
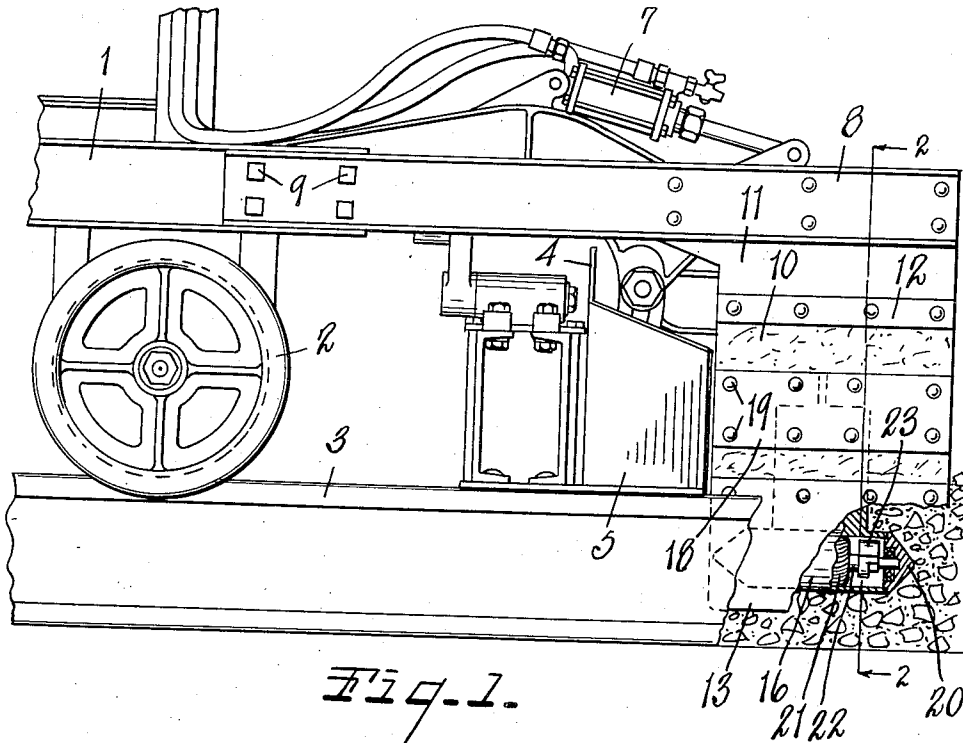
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2,199,075

CONCRETE PLACEMENT APPARATUS

Filed Nov. 7, 1938

2 Sheets-Sheet 1



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CONCRETE PLACEMENT APPARATUS

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2 Sheets-Sheet 2

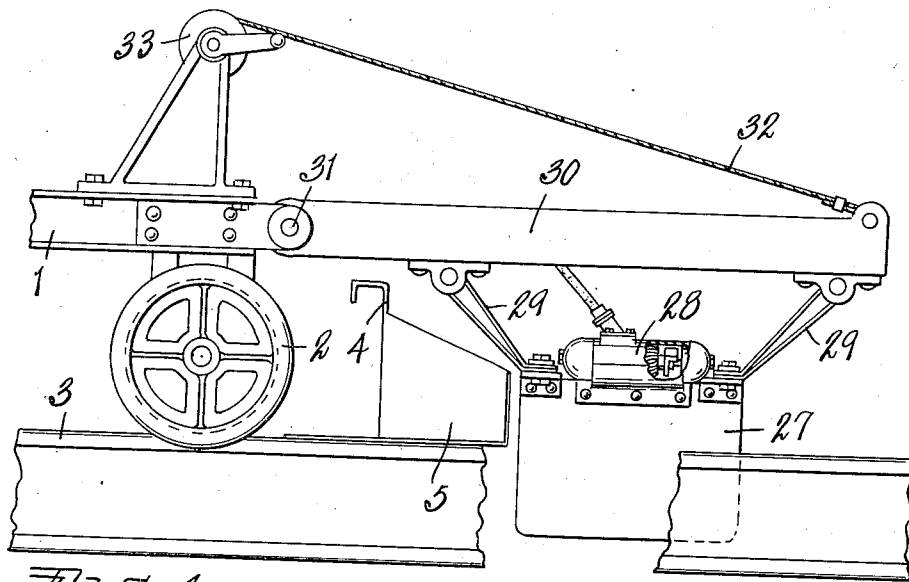


Fig. 4.

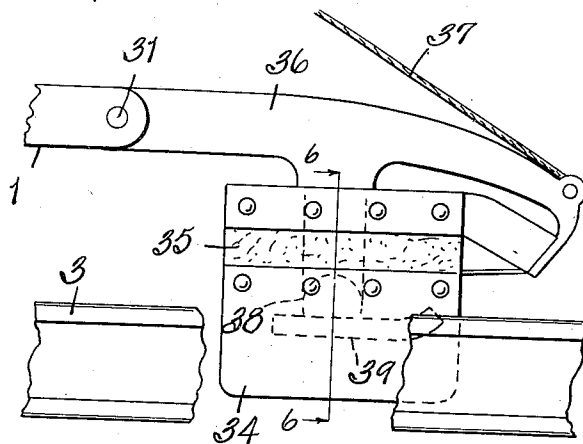


Fig. 5.

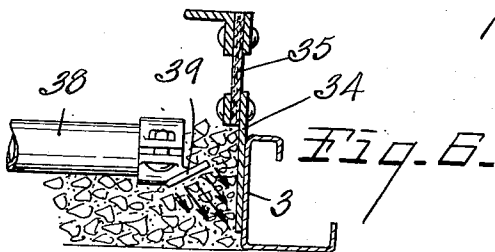


Fig. 6.

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UNITED STATES PATENT OFFICE

2,199,075

CONCRETE PLACEMENT APPARATUS

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Application November 7, 1938, Serial No. 239,311

12 Claims. (Cl. 94-48)

This invention relates to improvements in concrete placement apparatus.

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, and the like in which the edge portions of the pavement or slab are very effectively subjected to vibration without objectionable vibration of the forms.

Second, to provide a machine or apparatus of this character in which the paving slabs are effectively subjected to vibration from edge to edge thereof.

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 side elevation of a paving machine or apparatus embodying the features of my invention shown in operative relation to a paving form and a mass of concrete, various parts being conventionally illustrated and other parts of the apparatus being omitted for convenience in illustration.

Fig. 2 is a fragmentary view in section on a line corresponding to line 2-2 of Fig. 1.

Fig. 3 is a fragmentary view in horizontal section on line 3-3 of Fig. 2.

Fig. 4 is a fragmentary side elevation of a modified form or embodiment of the invention.

Fig. 5 is a fragmentary side elevation of another modified form or embodiment of the invention.

Fig. 6 is a fragmentary view partially in section on line 6-6 of Fig. 5.

My present invention relates in general to paving machines or apparatus employing vibratory elements mounted on a carriage and disposed in advance of a screed operated or translated therewith, one of my embodiments of such an apparatus being illustrated in my Letters Patent No. 2,150,326 dated March 4, 1939. The apparatus is especially designed for the practicing of the method of placing concrete of my Patent No. 1,787,449, dated January 6, 1931.

I have, in the accompanying drawings, illustrated only such portions of a paving machine or apparatus as seems to me to be necessary or desirable to illustrate practical commercial embodiments of my present invention and various parts are shown conventionally in order to sim-

plify the illustration and for the sake of clarity.

In the accompanying drawings, the carriage 1 of the paving machine is provided with wheels 2 adapted to travel on the longitudinal members 3 of a pavement form. The screed 4 is mounted on the carriage for advancement therewith and is provided with forwardly diverging wings 5 disposed and supported for sliding engagement with the form members 3 in advance of the wheels, keeping the wheels free from scraping the concrete material from the forms and also supporting the concrete material or preventing piled-up concrete material subjected to the action of the main vibratory element 6 from overflowing the forms.

This vibratory element 6 is an elongated vibratory element and is disposed horizontally in front of the screed and transversely of the carriage. Its operative relation to the screed is preferably as illustrated in my said Patent No. 2,150,326. The element 6 is mounted for high frequency vibration and provided with means for accomplishing that end. Practical means are illustrated in my said Letters Patent 2,150,326. The means for raising and lowering the vibratory element 6 are designated generally by the numeral 7, the means shown being a hydraulic means.

The carriage is provided with forwardly projecting supporting bars 8 at each side, these bars being detachably mounted on the frame of the carriage at 9 so that they can be readily applied or removed, as in this embodiment shown in Figs. 1 to 3 no means are provided for elevating them for the travel of the machine other than on the longitudinal form members 3. However, it is merely a matter of removing four bolts indicated in order to detach the bars.

The bars carry the flexible non-extensible hangers 10 which are clamped to the plates 11 by means of clamping strips 12, the plates 11 being metal and the hangers 10 being preferably sections of wide belt or other suitable non-extensible flexible material. In other words, these hangers 10 are plate-like members disposed on the bars 8 for edgewise advancement.

To the lower ends of these hangers 10, I secure guard plates 13, these guard plates being clamped to the hangers by means of the clamping bars 14 and suitable bolts or rivets. The guard plates depend at the inner side of the form members 3 to travel along the same as the machine is advanced. The guard plates are preferably provided with out-turned front edges 15 having a scraping engagement with the forms as the machine is advanced.

The hangers 10 also carry the longitudinally disposed auxiliary vibratory elements 16 which have upwardly projecting brackets 17 secured to the hangers 10 intermediate the point of their attachment to the plates 11 and the attachment of the guard plates thereto by means of suitable clamping plates 18 and the bolts or rivets 19. This provides a support for the vibratory elements 16 which permits free vibratory movement thereof.

The vibratory elements 16 are preferably tubular and have tapered or conical ends 20. In the preferred embodiment, the vibratory elements constitute housings for electric motors conventionally shown at 21, the rotors 22 of which are provided with unbalancing weights 23. Electrical connections for the motors are conventionally indicated at 24.

By this means, the vibratory elements 16 are vibrated at high frequency and in opposed relation to the guard plates but out of contact therewith. The mass of concrete is indicated at 25 and the vibrations set up therein by the vibratory elements is indicated at 26, see Fig. 2.

The guard plates are effective in preventing undesirable vibration of the forms. However, the concrete mass is vibrated along the forms so that portions not directly subjected to the vibrations of the vibratory element 6 are effectively vibrated.

In the embodiment shown in Fig. 4, the vibratory element 27 is in the form of a plate having a vibratory motor 28 mounted on the top thereof. This plate 27 is suspended from the flexible hangers 29 from the support 30 pivoted at 31 and raised and lowered by means of the cable 32 and the winch 33, being supported in its lowered position by means of the cable. In this illustration, the guard plate is omitted.

In the embodiment of my invention illustrated in Fig. 5, the plate 34 is mounted by means of the flexible hanger 35 from the pivoted support 36 which is adjusted by means of the cable 37. The main vibratory element 38 in this embodiment is provided with a transversely disposed shoe 39 at the end thereof acting in opposed relation to the guard plate 34. A similar arrangement is illustrated in my application for Letters Patent Serial No. 234,918, the flexible mounting of the guard plate, however, not being disclosed in that application.

I have illustrated and described my improvements in what I consider highly practical embodiments thereof. I have not attempted to illustrate or describe other modifications 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 claim as new and desire to secure by Letters Patent, is:

1. In an apparatus of the class described, the combination with a carriage adapted to travel on the longitudinal members of a form, of a screed propelled with said carriage, an elongated horizontally disposed vibratory element mounted on said carriage transversely thereof in advance of said screed, flexible hangers carried by said carriage, guard plates mounted on said hangers to travel along the inner sides of the longitudinal form members, and submersible auxiliary vibratory elements mounted on said hangers independently of said guard plates and supported for vibratory movement at the inner sides of

said guard plates in non-contacting relation thereto.

2. In an apparatus of the class described, the combination with a carriage adapted to travel on the longitudinal members of a form, of hangers carried by said carriage, guard plates mounted on said hangers to travel along the inner sides of the longitudinal form members, and submersible vibratory elements mounted on said hangers independently of said guard plates and supported for vibratory movement at the inner sides of said guard plates in non-contacting relation thereto.

3. In an apparatus of the class described, the combination with a carriage adapted to travel on the longitudinal members of a form, of supporting means on said carriage, flexible hangers carried by said means, guard plates mounted on the lower ends of said hangers to travel along the inner sides of the longitudinal form members and having out-turned forward edges adapted for sliding engagement with the inner sides of the form members, and submersible vibratory elements disposed longitudinally of the carriage and clamped to said hangers intermediate the supporting means and guard plates for mounting said longitudinal vibratory elements for vibratory movement at the inner sides of said guard plates.

4. In an apparatus of the class described, the combination with a carriage adapted to travel on the longitudinal members of a form, of a screed propelled with said carriage, an elongated horizontally disposed vibratory element mounted on said carriage transversely thereof in advance of said screed, guard plates mounted on said carriage for advancement at the inner sides of the longitudinal members of a form, and submersible vibratory elements mounted on said carriage for vibratory movement at the inner sides of said guard plates in non-contacting relation thereto.

5. In an apparatus of the class described, the combination with a carriage adapted to travel on the longitudinal members of a form, of guard plates mounted on said carriage for advancement at the inner sides of the longitudinal members of a form, and submersible vibratory elements mounted on said carriage for vibratory movement at the inner sides of said guard plates in non-contacting relation thereto.

6. In an apparatus of the class described, the combination with a carriage, of a flexible non-extensible hanger member mounted on said carriage, a guard plate mounted on the lower end of said hanger and adapted to travel at the inner side of a form member as the carriage is advanced, and a submersible vibratory element mounted on said hanger intermediate the carriage and guard plate and independently of the guard plate attachment to the hanger.

7. In an apparatus of the class described, the combination with a carriage, of a guard plate mounted on said carriage to depend on the inner side of a form member on which the carriage is traveling, and a submersible vibratory element provided with vibrating means mounted on said carriage in opposed relation to said guard plate.

8. In an apparatus of the class described, the combination with a carriage, of an elongated horizontally disposed main vibratory element mounted on said carriage and provided with a transversely disposed shoe at the end thereof, a guard plate adapted to travel at the inner side of a form member as the carriage is advanced in opposed relation to said shoe, and flexible means

for supporting the guard plate for edgewise advancement.

5 9. In an apparatus of the class described, the combination with a carriage adapted to travel on the longitudinal members of a form, of a longitudinally disposed vibratory element, means for supporting said vibratory element for longitudinal advancement at the inner side of a longitudinal form member, and a motor mounted on the upper edge of said vibratory element and provided with an unbalancing weight.

10 10. In an apparatus of the class described, the combination with a carriage adapted to travel on the longitudinal members of a form, of a longitudinally disposed plate-like vibratory element, means for supporting said vibratory element for edgewise advancement at the inner side of a longitudinal form member, and means for vibrating said vibratory element at high frequency.

15 11. In an apparatus of the class described, the

combination with a carriage adapted to travel on the longitudinal members of a form, of a transversely disposed elongated submersible vibratory element, and longitudinally disposed submersible vibratory elements mounted on said carriage in advance of said transversely disposed vibratory element for endwise advancement adjacent to and in parallel relation to the longitudinal form members upon which the carriage travels but in non-contacting relation therewith. 5

12. In an apparatus of the class described, the combination with a carriage adapted to travel on the longitudinal members of a form, of a longitudinally disposed submersible vibratory element mounted on said carriage for endwise advancement to and in parallel relation to a longitudinal form member upon which the carriage travels but in non-contacting relation therewith. 10 15

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