

Oct. 29, 1940.

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2,219,986

TAMPING AND/OR MIXING MACHINE

Filed Sept. 26, 1939

2 Sheets-Sheet 1

Fig. 1.

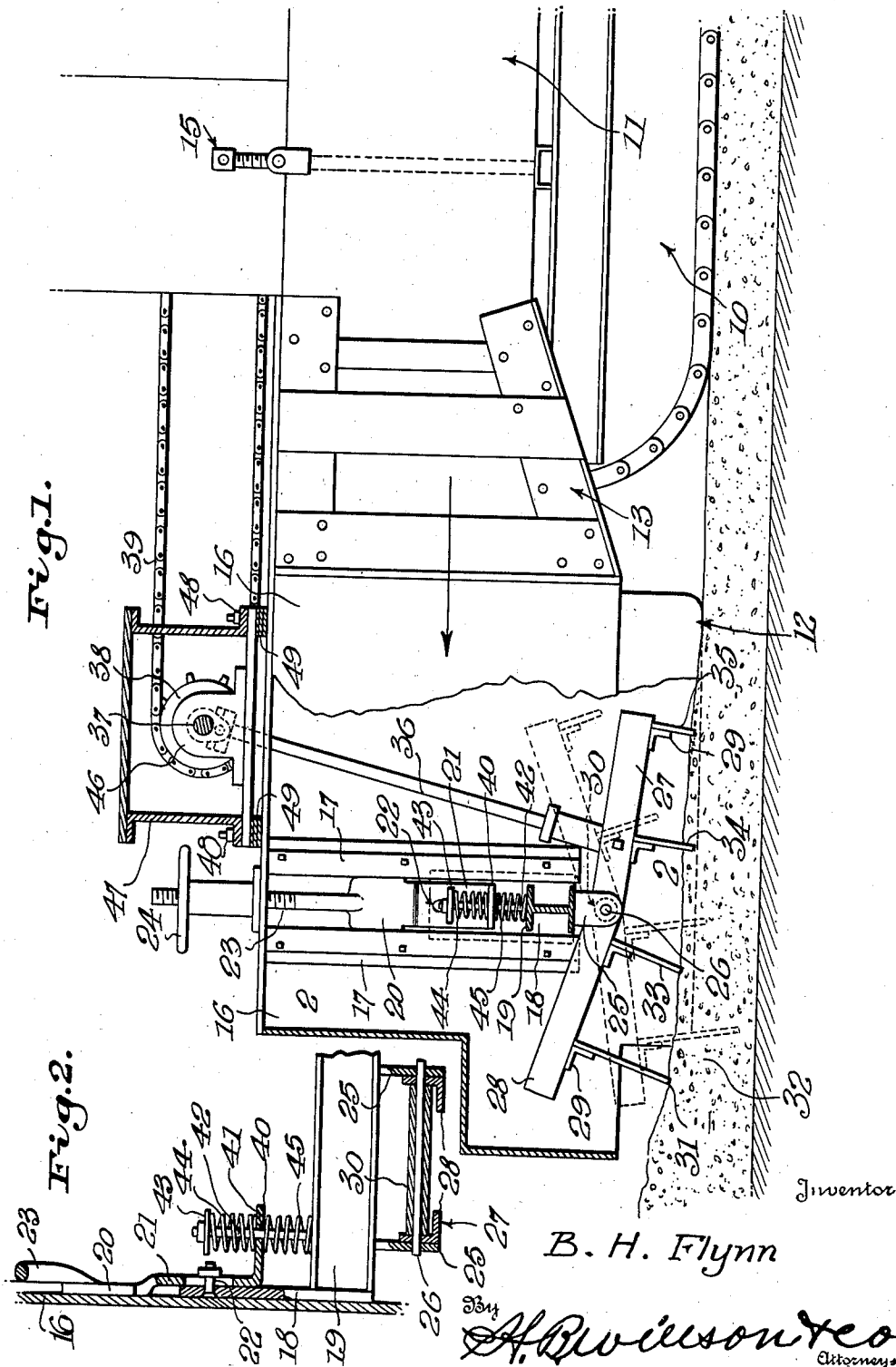
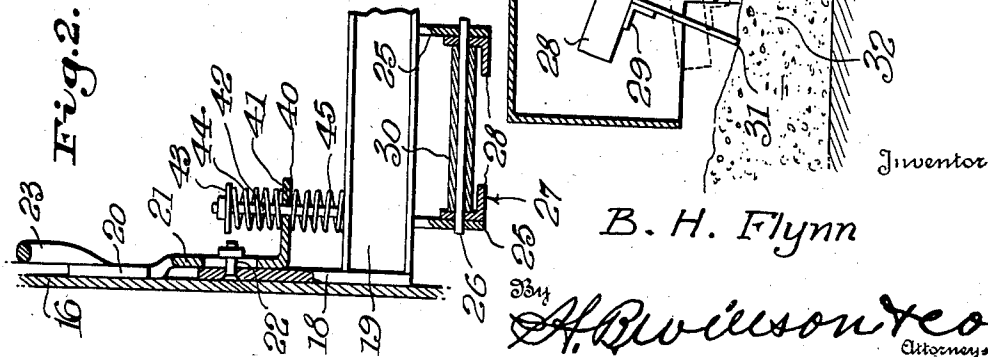


Fig. 2.



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Fig. 3.

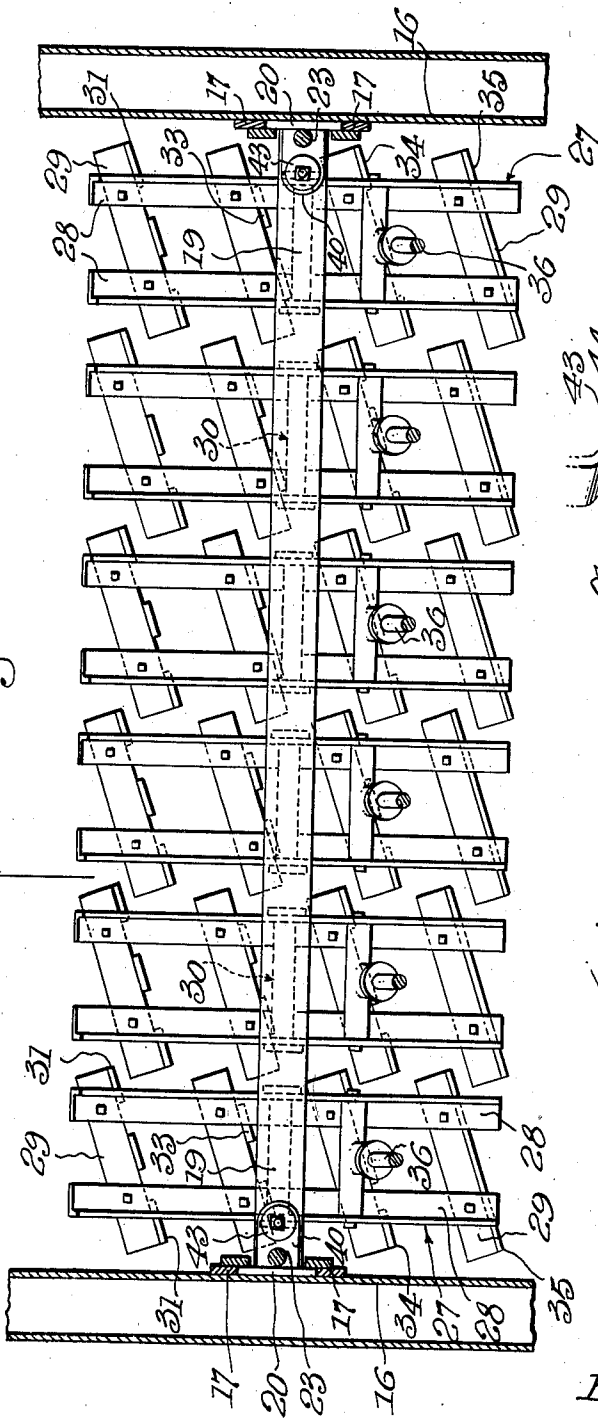


Fig. 5.

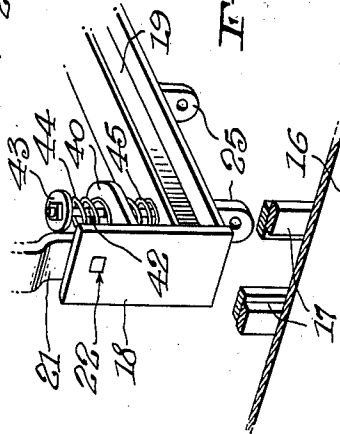
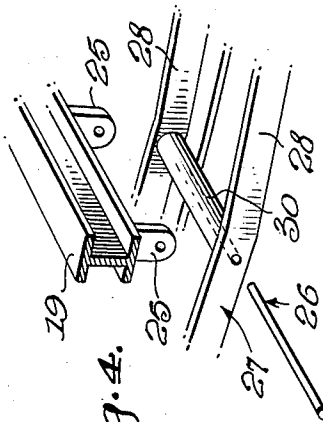


Fig. 4.



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TAMPING AND/OR MIXING MACHINE

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7 Claims. (Cl. 94—39)

The invention aims to provide a new and improved mobile machine for propulsion over materials to be tamped, mixed, or both tamped and mixed, the principal use of the machine being in the construction or reconditioning of various kinds of roadways and the like, whether acting on dry, damp, or slurry mixes.

In carrying out the above end, a further aim is to provide a plurality of vertically oscillating levers fulcrumed between their ends and carrying mixers, tampers, or other work-performing elements at opposite sides of their fulcrums, whereby a double action is obtained, with the work-performing elements at one side of the lever fulcrums ascending, while those at the other side are descending, and vice versa.

Yet another object is to provide novel yieldable mounting means for the aforesaid levers, preventing injury to any part if any of the work-performing elements should strike obstructions preventing them from completing their downward strokes.

A still further aim is to provide for easy adjustment of the machine to tamp and/or mix to any desired depth.

With the foregoing and minor objects in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Figure 1 is a side elevation partly in vertical section.

Figure 2 is a vertical transverse sectional view on line 2—2 of Fig. 1.

Figure 3 is a fragmentary top plan view partly in horizontal section.

Figures 4 and 5 are detail perspective views.

In the drawings above briefly described, one practicable form of construction has been illustrated, and while this construction will be rather specifically described, it is to be understood that within the scope of the invention as claimed, numerous variations may be made.

A "crawler type" tractor 10 has been illustrated, with the frame 11 of said tractor provided with a forward extension frame 12 rigidly secured thereto by suitable structural members 13, the improved tamping and/or mixing means being carried by said extension frame 12. It is preferable that the frame 11 be mounted to swing upwardly and downwardly about the back axle of the tractor 10 or about some other suitable pivot, and that jacks 15 be provided to effect upward and downward swinging of said frame 11 (and the extension frame 12) to lower the tamp-

ing and/or mixing means for use and to raise it when the machine is to be moved from place to place. While screw-threaded jacks 15 have been shown for illustrative purposes, hydraulic jacks will be preferably used in practice. On the inner sides of the side members 16 of the frame extension 12, suitable vertical guideways 17 are provided, and two vertical plates 18 secured to the ends of a transverse I-beam or the like 19, are slidably received in said guideways, said plates being welded or otherwise secured to the ends of said beam. Two additional vertical plates 20 are slidably engaged with the guideways 17 and are provided with narrowed inwardly offset lower end portions 21 which slidably overlap the upper portions of the plates 18, which portions project several inches above the beam 19. The plates 18 and 20 are slidably connected, for example, by means of pin-and-slot connections 22, permitting vertical movement of the beam 19 with respect to the plates 20, for a purpose to appear. Vertical rods 23 are shown welded or otherwise secured to the plates 20 and projecting upwardly therefrom, said rods having threaded engagement with hand wheels 24 suitably swiveled upon the frame extension 12, whereby rotation of said hand wheels will raise or lower the rod 23 as required, to vertically adjust the beam 19 which carries the tamping and/or mixing means, hereinafter described. While the adjusting devices for effecting desired vertical adjustments of the beam, may be constructed as or substantially as shown, other suitable adjusting devices can of course be provided if desired.

The beam 19 is provided with downwardly projecting lugs 25 which are welded or otherwise secured thereto, said lugs supporting fulcrum pins 26 for a plurality of vertically oscillatory levers 27 which extend longitudinally of the frame, said fulcrum pins 26 being disposed about centrally between the ends of the levers. When each lever 27 is composed of two longitudinal angle metal bars 28 connected by transverse angle bars 29, as herein disclosed, a sleeve 30 may extend between said bars 28 and be welded or otherwise secured thereto to receive the fulcrum pin 26. The bars 29 in the present disclosure serve as carrying means for various tamping and/or mixing elements, some of which are disposed in front of the lever fulcrum 26 and others behind said fulcrum, whereby a double-action is obtained when the various levers are vertically oscillated.

In the present disclosure, I have shown a front set of spaced tamping and/or mixing blades 31 to penetrate substantially to the bottom of the

material 32 over which the machine is being propelled, and behind said front set 31, I have shown another set of tamping and/or mixing blades 33, the two sets 31 and 33 being in advance of the fulcrums 26. The blades 33 penetrate the material 32 to somewhat less depth. A third set of tamping and/or mixing blades 34 has been shown on each lever 27 behind its fulcrum 26 to penetrate the material 32 to a still lesser degree, and a final tamping and/or mixing plate 35 is shown on the rear end of each lever 27. The various blades 31, 33 and 34 are disposed in staggered relation with each other and by penetrating the material 32 to different depths, they insure thorough mixing and/or compacting of said material as the machine is being propelled thereover, the plate 35 acting only on the surface material and leaving same substantially smooth.

Connecting rods 36 are pivoted at their lower ends to the levers 27 near the lever fulcrums 26, the upper ends of said rods being connected with a transverse eccentric shaft 37 mounted on the extension frame 12, said shaft being driven by any preferred means such as a sprocket chain 39 and appropriate sprockets 38, from the tractor motor, an appropriate transmission being of course interposed between the motor and the chain 39. By connecting the rods 36 with the levers 27 near the fulcrums 26 of these levers, the eccentrics or cranks of the shaft 37 may be relatively short and still the ends of the levers will have the necessary vertical movement to move the tamping and/or mixing elements into and out of the material, as required. Should any of these tamping and/or mixing elements strike obstructions preventing the rods 36 from completing their downward or upward strokes, the beam 19 may vertically move to prevent breakage of any parts, the beam movement being upwardly if one of the tamping and/or mixing elements 31 or 33 in advance of the lever fulcrums, cannot complete its downward stroke, whereas the movement of said beam will be downward if any of the rearmost elements 34 and 35 cannot complete their downward strikes. Yieldable, spring connections are preferably employed between the beam 19 and the adjusting devices 20, 23, 24 to permit the required vertical movements of the beam 19, just referred to, and still normally hold said beam against any loose vertical play.

In providing the above mentioned spring connections between the beam 19 and the adjusting device, I may equip each plate 20 with an inwardly projecting lug 40 having an opening 41. Vertical rods 42, one at each end of the beam 19, pass through the openings 41 and are secured at their lower ends to said beam, the upper ends of said rods being provided with appropriate heads or collars 43. Between the upper side of each lug 41 and the head or collar 43, I provide one coil compressing spring 44, and between the lower side of said lug and the beam 19, I provide another coil compression spring 45. Spring 44 compresses and permits downward yielding of the beam 19 if any of the rearmost elements 34, 35 strike obstructions and cannot move downwardly to the limits of their strokes, while the associated rod 36 is being driven downwardly by the eccentric shaft 37. The spring 45 permits upward yielding of the beam 19 in case any of the foremost elements 31 or 33 of any lever 27 strike obstructions and cannot complete their downward travel, while the rod 36 is pulling upwardly upon the lever. It is thus insured

that the rods 36 can complete their travel either upwardly or downwardly even if the normal oscillatory movements cannot be imparted to the levers 27, due to any of the tamping and/or mixing elements striking obstructions, and hence, there is no danger of breaking any parts of the machine.

When the beam 19 is vertically adjusted to change the depth to which the tamping and/or mixing elements will penetrate the material 32, it is also necessary that a suitable adjustment be made in the operating means for the levers 27. This adjustment could be made by varying the length of the connecting rod 36 but this would be a long and arduous task. Therefore, I mount the eccentric shaft 37 in such manner that it may be bodily adjusted upwardly or downwardly, as required. In the present showing, this shaft 37 is mounted in bearings 46 suitably secured within an elongated box-like casing 47, this casing being secured by bolts 48 upon the frame extension 12, any desired number of shims 49 being interposed between the casing bottom and said frame extension. Thus, by adding or removing shims and retightening the bolts 48, the shaft 37 may be adjusted vertically as required.

By providing the novel construction shown and described or a substantial equivalent thereof, various tamping and/or mixing operations may be performed upon numerous kinds of material over which the machine may be propelled, there being a double action due to locating some of the tamping and/or mixing elements in front of the lever fulcrums, and some of said elements behind said fulcrums. The machine may be readily adjusted to meet requirements and regardless of the adjustments, failure of any of the tamping and/or mixing elements to penetrate the material the proper extent due to striking obstructions, cannot injure any parts of the machine due to the yieldable mounting of the lever fulcrums, attained in the present disclosure by the yieldable mountings above described for the beam 19.

Excellent results may be obtained from the construction shown and described, but attention is again invited to the possibility of making variations within the scope of the invention as claimed.

I claim:

1. A machine of the class described comprising a mobile frame, a plurality of laterally spaced levers extending longitudinally thereof, a transverse beam upon which said levers are fulcrumed for vertical oscillation, means mounting said beam on said frame for vertical yielding, means connected with said levers for oscillating the same, and work-performing elements on said levers to act upon material over which the machine is propelled.

2. A machine of the class described comprising a mobile frame, a plurality of laterally spaced levers extending longitudinally thereof, a transverse beam upon which said levers are fulcrumed for vertical oscillation, means mounting said beam on said frame for vertical movement, adjusting devices carried by the frame for vertically adjusting said beam, vertically yieldable connecting means between said adjusting devices and said beam, means connected with said levers for oscillating the same, and work-performing elements on said levers to act upon material over which the machine is propelled.

3. A machine of the class described comprising a mobile frame, a plurality of laterally spaced levers extending longitudinally thereof, a transverse beam upon which said levers are fulcrumed

for vertical oscillation, vertical plates secured to and projecting upwardly from the ends of said beam, vertical guideways on said frame slidably receiving said plates, additional vertical plates 5 slidably received in said guideways, vertically yielding connections between said first mentioned plates and said additional plates, means connected with said additional plates for vertically adjusting the same, means for oscillating said levers, and work-performing elements on said levers to act upon material over which the machine is propelled. 10

4. A machine of the class described comprising a mobile frame, a plurality of laterally spaced 15 levers, fulcrums between the ends of said levers mounting the latter for vertical oscillation, a transverse beam carrying said fulcrums, yieldable means mounting said beam on said frame and including spring means for allowing upward yielding of said beam and additional spring 20 means for allowing downward yielding of said beam, means connected with said levers at one side of said fulcrums for vertically oscillating said levers, and work-performing elements on said levers in advance of and behind said fulcrums to act upon material over which the machine is propelled. 25

5. A machine of the class described comprising a mobile frame, a plurality of laterally spaced 30 levers, fulcrums between the ends of said levers mounting the latter for vertical oscillation, a transverse beam carrying said fulcrums, means mounting said beam on said frame for vertical movement, adjusting devices on said frame for 35 vertically adjusting said beam, vertically yieldable connecting means between said adjusting devices and said beam including spring means for allowing upward yielding of said beam and additional spring means for allowing downward

yielding of said beam, means connected with said levers at one side of said fulcrums for vertically oscillating said levers, and work-performing elements on said levers in advance of and behind said fulcrums to act upon material over which 5 the machine is propelled.

6. A machine of the class described comprising a mobile frame, a plurality of laterally spaced levers, fulcrums between the ends of said levers mounting the latter for vertical oscillation, a 10 transverse beam carrying said fulcrums, vertical plates secured to and projecting upwardly from the ends of said beam, vertical guideways on said frame slidably receiving said plates, additional vertical plates slidably received in said guide- 15 ways, yieldable connecting means between said first mentioned plates and said additional plates including spring means for allowing upward yielding of said beam and additional spring means for allowing downward yielding of said 20 beam, means connected with said levers at one side of their fulcrums for oscillating said levers, and work-performing elements on said levers in advance of and behind said fulcrums to act upon material over which the machine is propelled. 25

7. A machine of the class described comprising a mobile frame, work-performing members mounted on said frame for up and down movement to act upon material over which the machine is propelled, connecting rods connected 30 with and extending upwardly from said work-performing members, an eccentric shaft with which said connecting rods are connected to effect said up and down movement, means for simultaneously adjusting all of said work-perform- 35 ing members vertically, and means for correspondingly adjusting said eccentric shaft vertically.

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