

July 17, 1928.

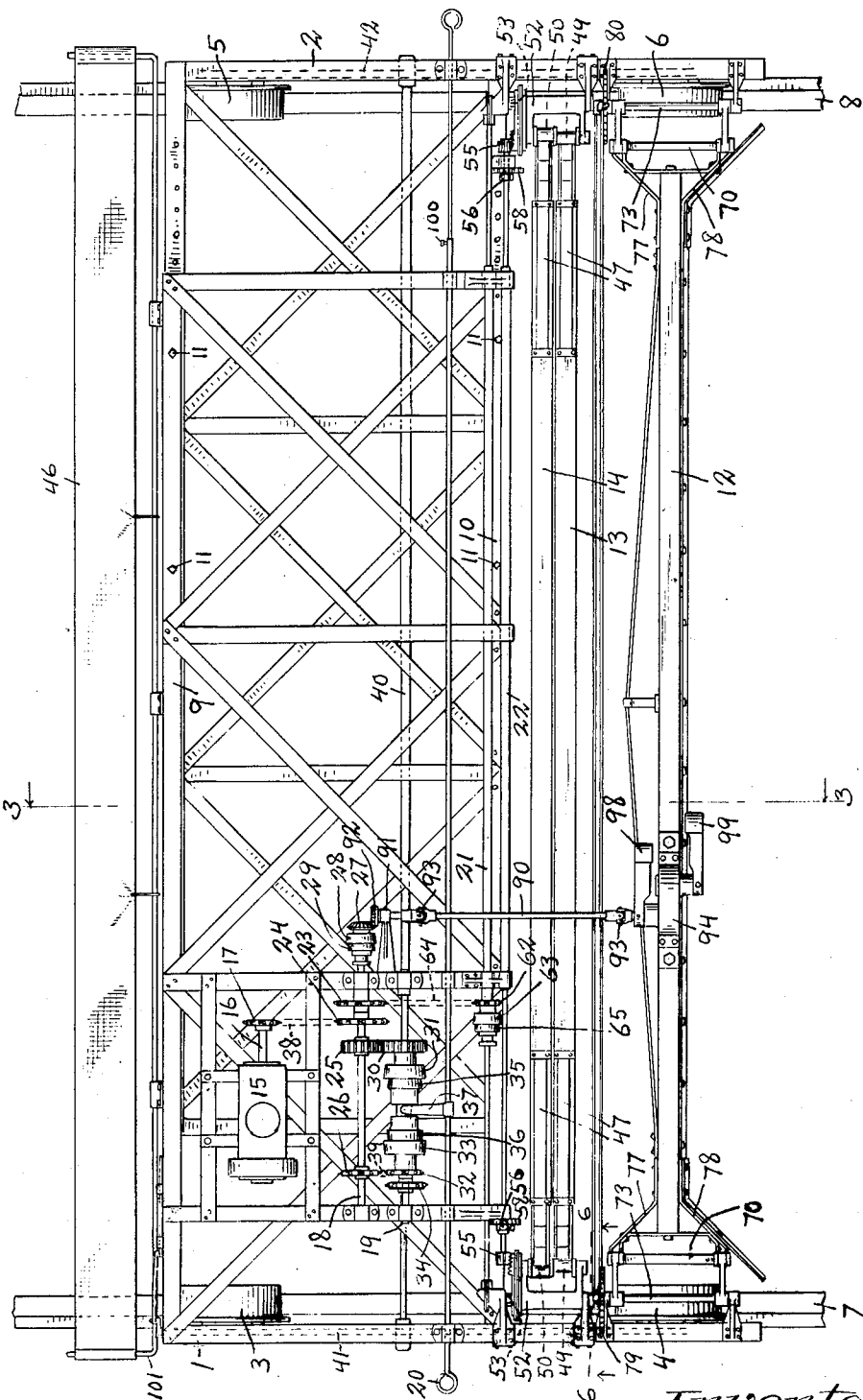
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1,677,877

CONCRETE ROAD MACHINE

Filed Dec. 29, 1921

4 Sheets-Sheet 1



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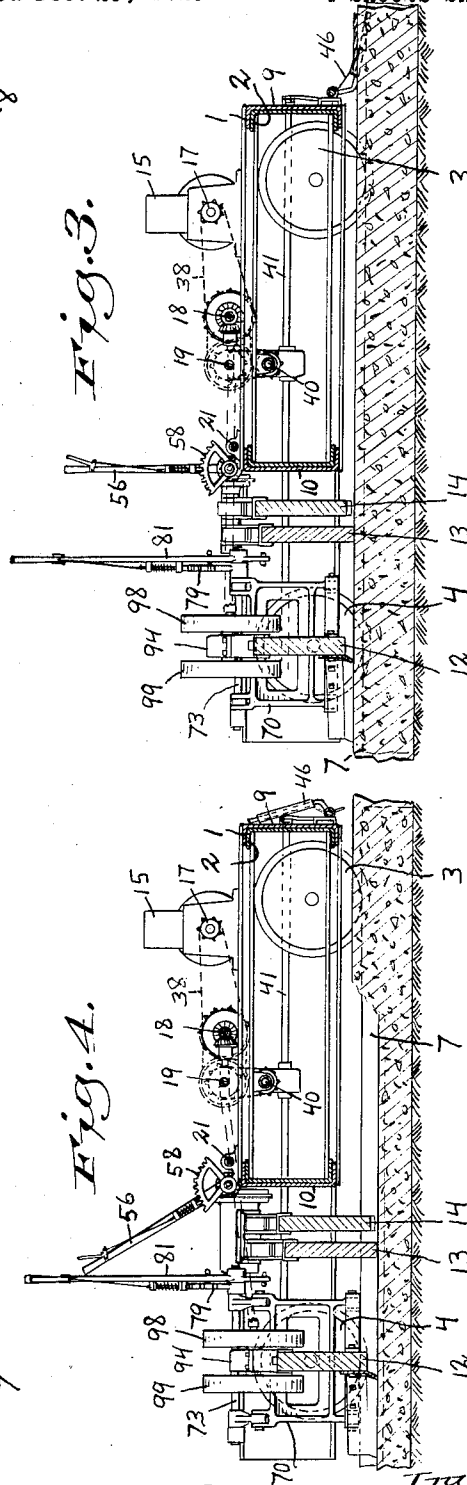
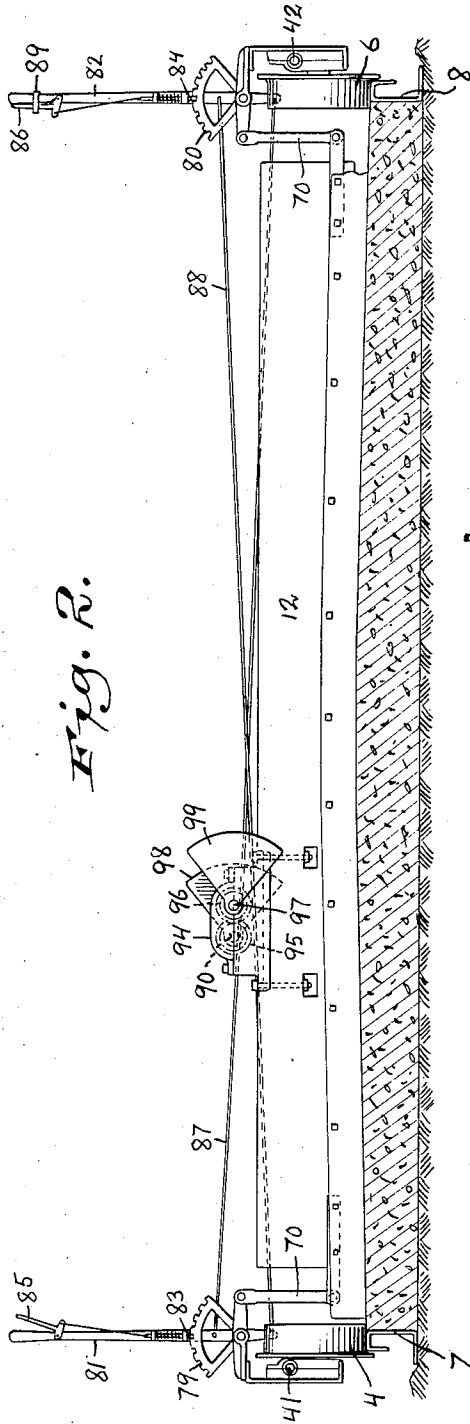


Fig. 4.

Fig. 3.

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Fig. 5.

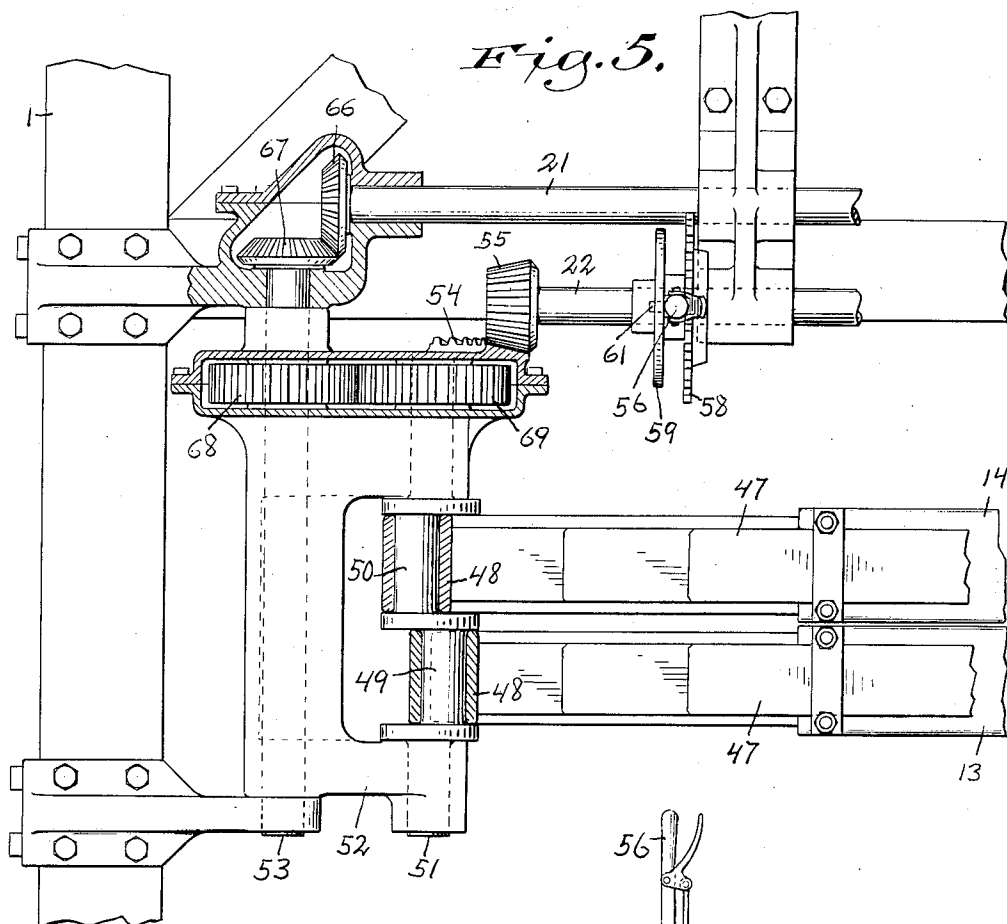
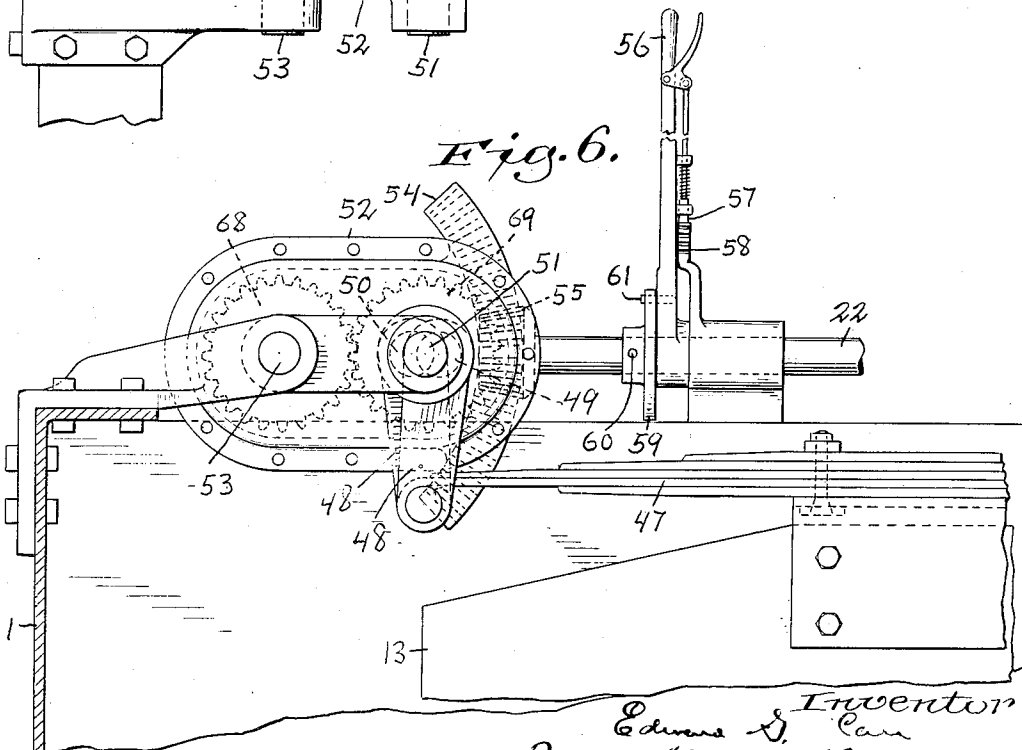


Fig. 6.



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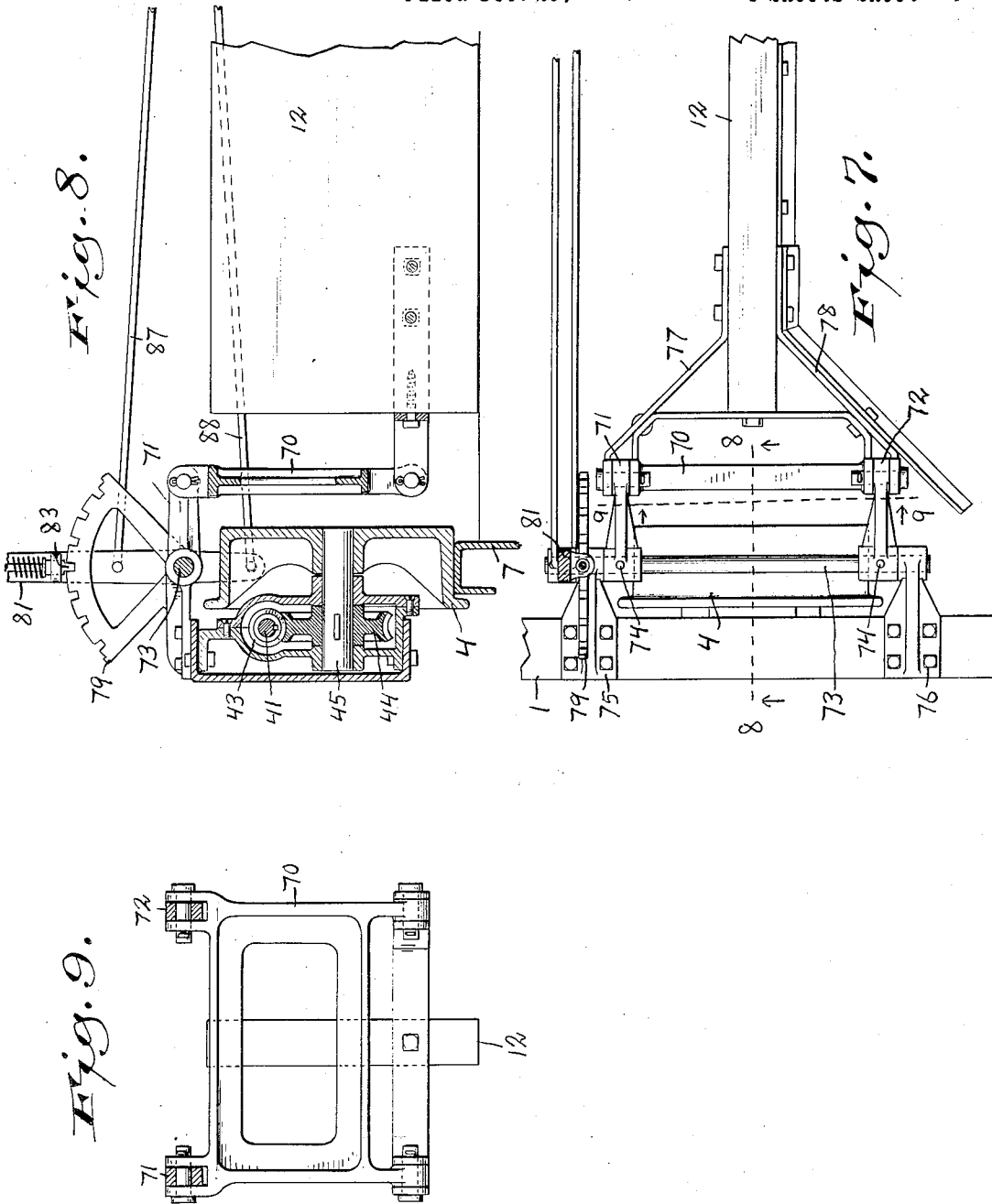
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

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CONCRETE-ROAD MACHINE.

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This invention relates to concrete road machines and the object of the invention is to improve the construction and operation of concrete road machines in the manner to be hereinafter described and claimed.

Referring to the drawings which accompany this specification and form a part hereof, which drawings illustrate an embodiment of this invention, and on which drawings the same reference characters are used to designate the same parts wherever they may appear in each of the several views, Fig. 1 is a plan view of a concrete road machine; Fig. 2 is an elevation of the front of the machine, parts being omitted; Fig. 3 is a vertical, longitudinal section of parts of the machine on the line 3—3 on Fig. 1, looking in the direction indicated by the arrows; Fig. 4 is a section similar to Fig. 3 but showing parts in different positions; Fig. 5 is a plan view of parts of the machine, shown on a larger scale and parts being shown in section; Fig. 6 is a cross section of a part of the machine on line 6—6 on Fig. 1, looking in the direction indicated by the arrows, and shown on a larger scale; Fig. 7 is a plan view of parts of the machine, shown on a larger scale; Fig. 8 is a cross section of parts of the machine on the line 8—8 on Fig. 7, looking in the direction indicated by the arrows; and Fig. 9 is a longitudinal section of parts of the machine on the line 9—9 on Fig. 7, looking in the direction indicated by the arrows.

Referring to the drawings, the reference numerals, 1 and 2 designate frame members which are supported at their outer ends by wheels 3 and 4 and 5 and 6, respectively, and which are adjustably connected together at their inner ends in a manner to be hereinafter described. These frame members may be constructed in any suitable or preferred manner and are illustrated by the drawings as suitably trussed and braced and as being generally of a rectangular shape in plan view. The frame members 1 and 2 are movable with respect to each other so that the machine can be adjusted in width to conform to the distances between the tracks or forms 7 and 8 which are ordinarily so set as

to predetermine the width of the concrete. 50 Different widths of concrete are specified in different localities and sometimes the width of the concrete is increased on curves. The frame members 1 and 2 may be made to engage each other in any suitable manner and the drawings illustrate the frame member 2 as made slightly smaller in parts than parts of the frame member 1 and slidable within channel bars 9 and 10 forming parts of the frame member 1, as clearly shown by Figs. 3 and 4 of the drawings. The engaging ends of the frame members may be secured together by any suitable clamping means as, for example, bolts 11 passed through holes in both frame members which may be brought into registry. The frame members 1 and 2 support a strike-off or leveler 12 and two templates or tampers 13 and 14. One of the frame members, the frame member 1 for example, supports a motor 15 of any suitable or preferred type, the motor illustrated by the drawings being an ordinary gasoline or internal combustion motor or engine to the shaft 16 of which is rigidly secured a sprocket wheel 17. A countershaft 18, a main shaft 19, a shifting-rod 20, a tamper-shaft 21, and a rock-shaft 22 are also mounted on the frame member 1. The counter-shaft 18 has the sprocket wheels 23, 24, the gear 25, and the sprocket wheel 26 all rigidly fastened thereto and also has the bevel gear 27, provided with the clutch member 28, loose thereon but restrained from longitudinal movement with respect thereto. The clutch member 29 is splined, or otherwise suitably secured, to the countershaft 18 so as to be rotated thereby while being free to be moved longitudinally thereof to clutch the bevel gear 27 to the countershaft 18 or to unclutch it therefrom. The main shaft 19 has a gear 30, provided with a clutch member 31, and a sprocket wheel 32, provided with a clutch member 33, loose thereon but restrained from longitudinal movements with respect thereto. The main shaft 19 also has the sprocket wheel 34 rigidly secured thereto and the two connected clutch members 35 and 36 splined, or otherwise se-

cured, thereto so as to rotate the same while being free to be moved longitudinally thereof to clutch the gear 30 or the sprocket wheel 32 to the main shaft 19, or to unclutch them therefrom, or to disengage the clutch members 35 and 36 from the clutch members 31 and 33 to stop or prevent rotation of the main shaft 19. In other words, the clutch members 35 and 36, which are connected together, can occupy a neutral or stop position or can be moved to positions to clutch either the gear 30 or the sprocket wheel 32 to the main shaft 19. The two connected clutch members 35 and 36 can be shifted by the shifting-rod 20 and the yoke 37. The sprocket wheels 17 and 24 are connected by the straight sprocket chain 38 and the sprocket wheels 26 and 32 are connected by the straight sprocket chain 39. With this construction it will be readily seen that the main shaft 19 is rotated in one direction by the gears 25 and 30 and in the opposite direction by the sprocket wheels 26 and 32 and the sprocket chain 39, according as the clutch member 35 is engaged with the clutch member 31 or the clutch member 36 is engaged with the clutch member 33. A transverse driving shaft 40 lies below the main shaft 19 and is driven by the sprocket wheel 34 by means of a sprocket chain and a sprocket wheel whenever the main shaft 19 is being rotated. The transverse driving shaft 40 is provided at its ends with worms which mesh with worm wheels on longitudinal driving shafts 41 and 42 which in turn are provided with worms 43 which in turn mesh with worm wheels 44 which are secured to spindles or axles 45 to which wheels 2, 3, 4 and 5 are secured, so that the machine can be propelled forward or back. A float or finisher 46 can be reciprocated from one of the longitudinal driving shafts 41 or 42.

The tampers or templates 13 and 14 are supported at their ends by stiff springs 47 hung upon links 48 which in turn are supported by oppositely disposed cranks 49 and 50 on shafts 51 which are supported by rocking-frames 52. The rocking-frames 52 are pivotally supported upon shafts 53 and are provided with gear-segments 54 with which bevel gears 55 on the rock-shaft 22 mesh. It will be obvious that by rocking the rock-shaft 22 the rocking-frames 52 and the tampers 13 and 14 may be raised or lowered so that the tampers can operate upon different levels or courses of concrete, as it is sometimes desirable to tamp concrete in different layers or courses, especially when reinforcing rods, or other forms of reinforcing members, are to be embedded in the concrete. A lever 56 is loosely mounted on the rock-shaft 22 and is provided with a detent 57 to engage in notches in a notched sector 58 which is illustrated as secured to

the frame member 1 of the machine. The lever 56 with its detent 57 is primarily designed to adjust the height of the tampers to the consistency of the concrete or the violence of the blows desired to be struck, as the greater the speed of the motor the more violent will be the blows and the violence of the blows can be very nicely regulated by the amount of flexure permitted in the springs 47. A collar 59 is secured to the rock-shaft 22 by a pin 60 and the collar is provided with holes through which a pin 61 may be passed into a hole in the lever 56 to provide for a large or coarse adjustment of the angular position of the rock-shaft 22 and, consequently, of the rocking-frames 52 for tamping at different levels. The tampers 13 and 14 have only vertical movements as they are suspended by links from their cranks and their cranks rotate in opposite directions and extend in opposite directions when extending horizontally from their shafts as is clearly shown by Fig. 1 of the drawings. As the two cranks 49 and 50 on the same shaft 51 are placed 180 degrees apart, one tamper balances the other.

The tamper shaft 21 has a sprocket wheel 62, provided with a clutch member 63, loose thereon, but restrained from longitudinal movement with respect thereto, and this sprocket wheel 62 is connected by a straight sprocket chain 64 with the sprocket wheel 23 which is fast on the countershaft 18. A clutch member 65 is splined, or otherwise secured, to the tamper shaft 21 so as to rotate the same, while being free to be moved longitudinally thereof, and the tamper shaft 21 can be caused to rotate by clutching it to the sprocket wheel 62, as will be readily understood. The clutch members so far described are illustrated by the drawings as of the friction-cone type for simplicity of illustration and description. The tamper shaft 21 is provided at its ends with bevel gears 66 which mesh with bevel gears 67 secured to the shafts 53. The shafts 53 have spur gears 68 secured thereto which mesh with spur gears 69 secured to the shafts 51. It is thus apparent that the rotation of the tamper shaft 21 will rotate the shafts 51 in opposite directions and move the tampers 13 and 14 only in vertical directions, although the rocking-frames 52 may be so adjusted that the tampers 13 and 14 are required to work upon concrete, at different times, on different levels.

The strike-off or leveler or spreading template 12 is pivotally connected with links 70 which are pivotally suspended from crank-arms 71 and 72 rigidly secured to shafts 73 by pins 74, or other suitable fastening means, so that rocking of the shafts 73 will lift or lower the spreading template 12 entirely independently of the tampers 13 and 14, so that the spreading template 12 can be working on

one level while the tampers 13 and 14 are working upon a different level. For example, the spreading template 12 may be set low to spread the concrete for a lower course or
 5 for lower courses and then be lifted to spread concrete for the top course and the tampers be used only upon the top course for tamping all the courses simultaneously. Such a procedure facilitates the placing of one or more
 10 layers of reinforcing members in concrete, and also permits the concrete to be spread and tamped in whatever manner may be desirable. The shafts 73 are supported by brackets 75 and 76 upon the frame members
 15 1 and 2, see Fig. 7 of the drawings, and are sufficiently long to provide for the links 70 being of a sufficient length longitudinally of the machine so that the spreading template 12 can be held to its work by diagonal braces
 20 77 and 78. Notched sectors 79 and 80 are secured to the frame members adjacent the sides of the machine and levers 81 and 82 are rigidly secured to the shafts 73 so that the shafts 73 can be rocked to raise or lower the
 25 strike-off or spreading template. The levers 81 and 82 are provided with spring-pressed detents 83 and 84 connected with grips 85 and 86. The levers 81 and 82 are interconnected for simultaneous movement by rods 87
 30 and 88 each of which leads from above a shaft 73 to below the shaft 73 on the opposite side of the machine, as clearly shown by Fig. 2 of the drawings. The two levers 81 and 82 are employed so that an operator can
 35 raise or lower the spreading template 12 from either side of the machine according to where he is working. One of the detents 83 and 84 can be held disengaged from its notched sector by a link or ring 89 slipped
 40 over a grip and a lever, see Fig. 2 of the drawings where the link or ring 89 is illustrated as slipped over the grip 86 and the lever 82 keeping the detent 84 free from its notched sector 80 so that the spreading tem-
 45 plate 12 can be raised or lowered by the lever 81 when the operator is at that side of the machine.

The strike-off or spreading template 12 is reciprocated horizontally and balanced
 50 against vertical movements in the following manner. A shaft 90 is supported by a bracket 91 and has a bevel gear 92 rigidly secured thereto which meshes with the bevel gear 27. The shaft 90 is provided with universal
 55 joints 93 and has a bearing in a gear-housing 94 secured to the spreading template 12, and has a spur gear 95 rigidly secured thereto. The spur gear 95 meshes with another spur gear 96 rigidly secured to a shaft 97 which
 60 is journaled in the gear-housing 94. The shaft 90 has an eccentric weight 98 rigidly secured thereto and the shaft 97 has the eccentric weight 99 rigidly secured thereto. The two eccentric weights 98 and 99 should
 65 be of the same weight and located at the same distances from their shafts, or equalized in an equivalent manner, as their purpose is to thrust the spreading template 12 longitudinally while balancing it against
 vertical movements. The principle of op- 70
 eration will be readily understood from an inspection of Figs. 1 and 2 of the drawings where the two weights are illustrated as ex-
 tending in the same direction horizontally 75
 from their shafts and, in arriving at these positions, their kinetic energy, or energy of motion, has thrust the spreading template 12 in the direction in which the weights
 were moving, or towards the observer's right 80
 hand. Now, as the weights continue in their revolutions, one weight will go up and the other weight will go down, thus each bal-
 ancing the effect of the other and avoiding or preventing a vertical movement being im- 85
 parted to the spreading template, but, when the weights are approaching horizontal po-
 sitions opposite to those illustrated, they will be moving in the same direction, towards the
 observer's left hand and will thrust the spreading template 12 in the same direction 90
 horizontally. The simplest way to obtain the result sought is to have the spur gears 95
 and 96 of the same diameter, the centers of gravity of the two weights at the same
 distances from their shafts, and to set the 95
 two weights so that they will extend in the same direction horizontally from their shafts.

The construction and operation and prin-
 ciple of operation of the machine has been 100
 hereinbefore fully described and explained but there remain a few matters to which at-
 tention should be directed. To avoid the necessity for dismantling or disconnecting
 shafts and like members when the adjust- 105
 ment of the frame members 1 and 2 is altered, the rotatable shafts may be formed in sections movable longitudinally with re-
 spect to each other but so united as to be compelled to rotate together. Tubes with 110
 squared ends may be used for one section of a shaft, the other section of the shaft
 having a squared part to engage within the tube. The transverse driving shaft 40, the
 tamper shaft 21 and the rock-shaft 22 are 115
 illustrated by Fig. 1 of the drawings as of this construction. The shifting-rod 20 is
 illustrated as composed of parts one of which telescopes within the other, the parts being
 held together by a set screw 100. This con- 120
 struction is adopted because the shifting-rod 20 is not rotated but is pushed or pulled. Where desirable, a member may be connected
 with only one of the frame members as the U-shaped frame 101 of the float or finisher 125
 46, which is illustrated by Fig. 1 of the drawings as secured solely to the frame member 1
 of the machine. The tampers 13 and 14 and the strike-off or spreading template 12 are
 illustrated by the drawings as non-adjustable 130

as the preferred form of construction. The tampers and the spreading template sometimes encounter very severe working conditions and, ordinarily, are subject to hard work, and I prefer to make these members as unitary members and replace them with members of the length required for a different adjustment of the frame members 1 and 2 of the machine.

What is claimed is:

1. The combination in a concrete road machine, of a frame member, a motor secured to said frame member, wheels for partly supporting said frame member, a second frame member engaging said first frame member for movement with respect thereto and for additionally supporting said first frame member, wheels partly supporting said second frame member, means for securing said frame members together in different positions of adjustment, vertically movable links secured to said frame members, a spreading template secured to said vertically movable links, rocking-frames secured to said frame members, a tamper secured to said rocking-frames, a float or finisher supported by said frame members, and means for propelling the machine and operating the spreading template, the tamper, and the float or finisher, from said motor.

2. The combination in a concrete road machine, of two frame members, wheels supporting the frame members at their outer ends, one of the frame members being provided with channel bars, and the other of the said frame members being made slightly smaller in parts, so as to be slidable in said channel bars, means for securing the engaging ends of the frame members together, a motor secured to one of the frame members, vertically movable links secured to each frame member, a spreading template connected with the said vertically movable links, rocking-frames secured to said frame members, a tamper secured to said rocking-frames, a float or finisher supported by both the said frame members, means for raising or lowering the vertical links and the spreading template, means to change the positions of said rocking-frames to raise or lower the tamper independently of the spreading template, and means for operating the spreading template and tamper and the float or finisher from said motor when they are operating on the same level or on different levels.

3. The combination in a concrete road machine, of a horizontally movable spreading template, means to adjust said template to different heights, a vertically movable tamper, means for adjusting the tamper vertically to different mean positions of reciprocation for different heights of working positions, and means for reciprocating the tamper vertically, in any of its working po-

sitions, both below and above its mean position.

4. The combination in a concrete road machine, of means for compacting concrete, a spreading template, means for supporting the spreading template to permit of horizontal reciprocations thereof, means for reciprocating the spreading template horizontally, and means for raising or lowering the spreading template to enable it to be reciprocated either on the same level or on a lower level than the level on which the means for compacting the concrete may be working.

5. The combination in a concrete road machine, of a spreading template, a tamper, springs secured at each end of the tamper by their ends, means for adjusting the spreading template vertically to different working positions, adjustable means secured to the other ends of said springs for adjusting the tamper vertically to different working positions, means for reciprocating the spreading template horizontally, and means for reciprocating the tamper vertically and flexing said springs below and above their unflexed positions.

6. The combination in a concrete road machine, of a spreading template, a plurality of tampers, means for adjusting the spreading template vertically to different working positions, springs secured at their ends to the ends of the tampers, rocking-frames provided with oppositely disposed cranks to which the other ends of said springs are connected, means for simultaneously adjusting the rocking-frames vertically to different working positions, means for reciprocating the spreading template horizontally in any one of its several positions of adjustment, and means for rotating said cranks to reciprocate the tampers simultaneously, in different directions vertically, both below and above the unflexed positions of said springs.

7. The combination in a concrete road machine, of a frame, a tamper, resilient means for holding said tamper in a non-operative position, means for adjusting said resilient means and the tamper to different vertical positions, and means for producing vertical movements of the tamper below and above said resilient means in any selected position of their vertical adjustment.

8. The combination in a concrete road machine, of a frame, a rocking-frame secured to the frame, a tamper, means for supporting the tamper from the rocking-frame, and means to cause vertical reciprocations of the tamper with respect to the rocking-frame.

9. The combination in a concrete road machine, of a frame, a tamper, rocking-frames pivotally supported from the frame and supporting the tamper, means to rock the rocking-frames, and means for producing vertical movements of the tamper.

10. The combination in a concrete road machine, of a frame, shafts supported by the frame, rocking-frames pivotally supported upon said shafts, shafts provided with cranks, supported by said rocking-frames, a tamper, springs supporting said tamper from said cranks, motion transmitting means connecting the shafts with the shafts provided with cranks, and means to retain said rocking-frames in selected positions of adjustment. 10

In witness whereof I hereto affix my signature.

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