

May 24, 1927.

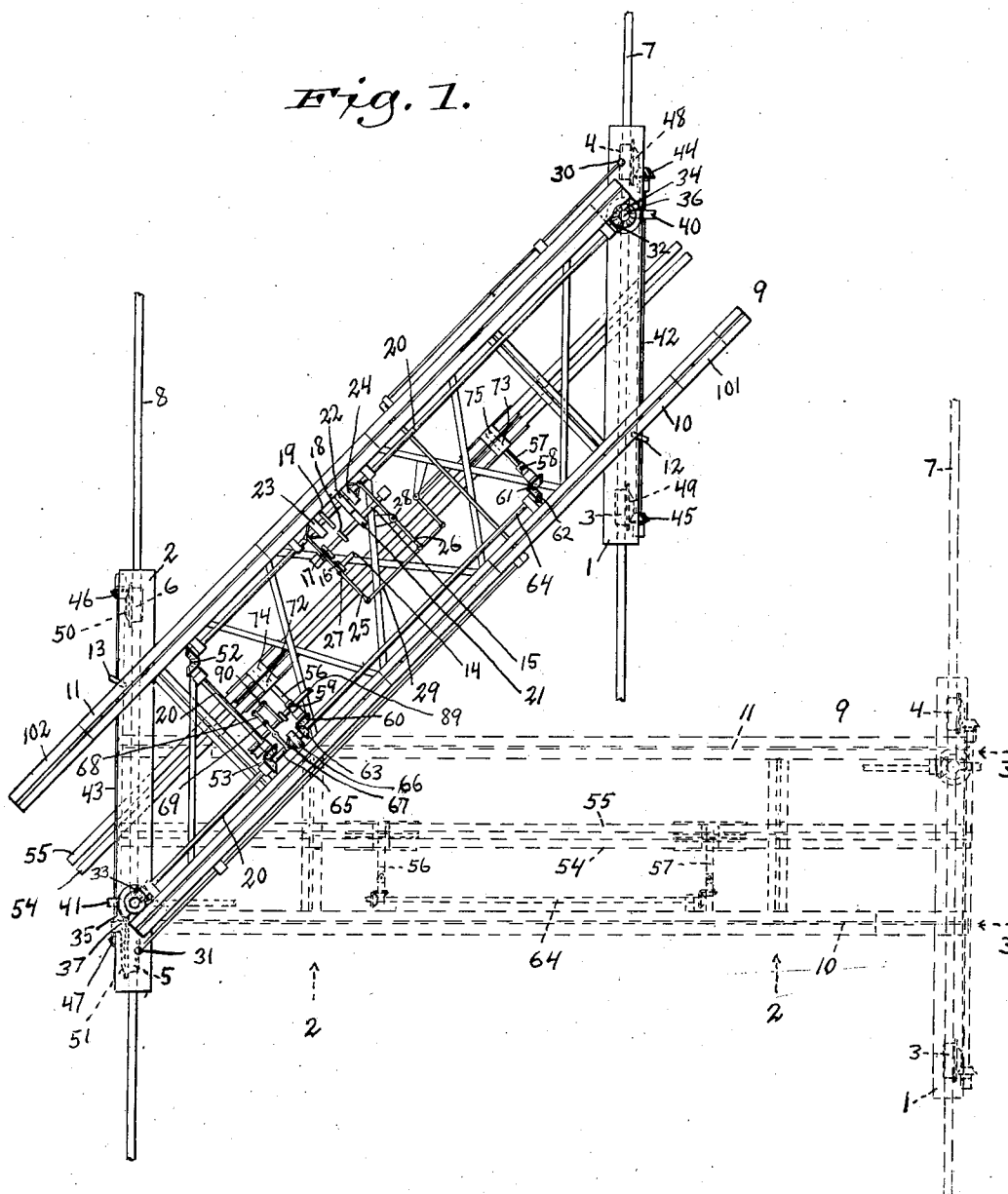
1,629,611

E. G. CARR

CONCRETE ROAD MACHINE

Filed Feb. 19, 1921

3 Sheets-Sheet 1



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Fig. 2.

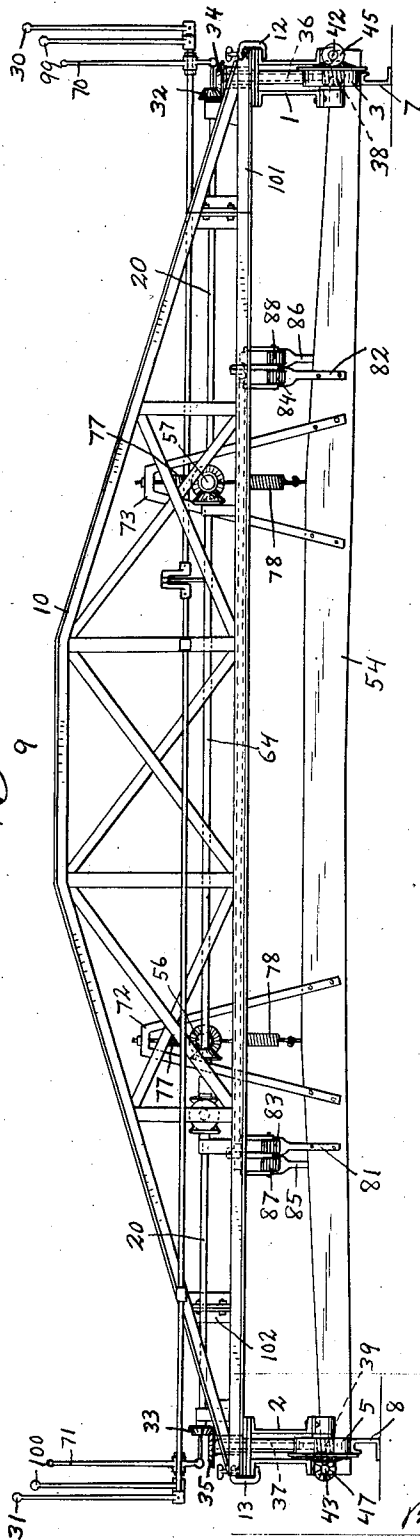
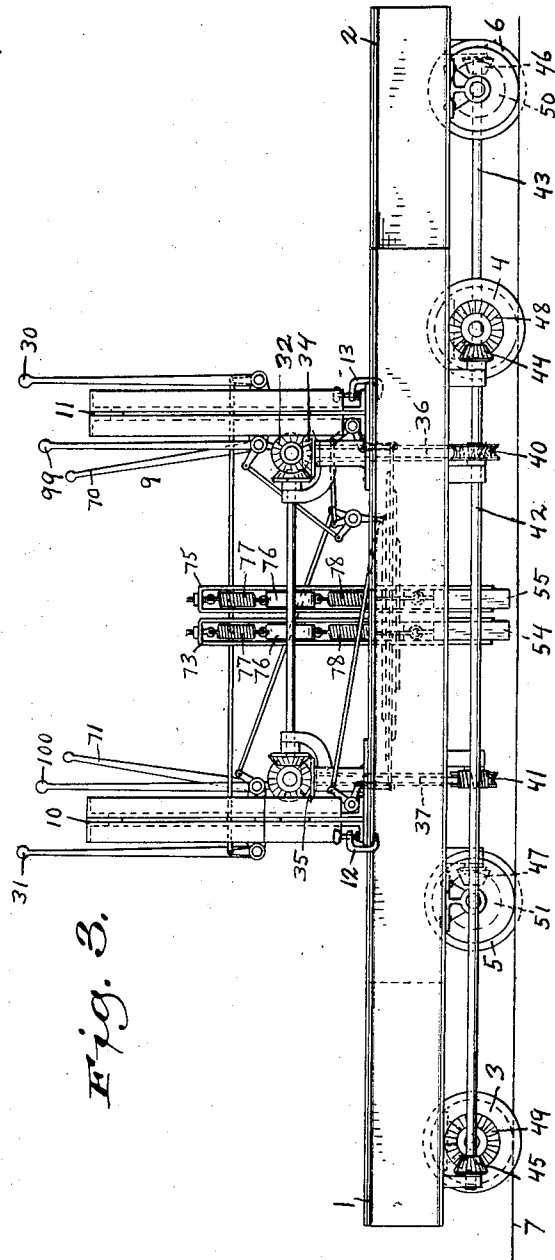


Fig. 3.



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Fig. 4.

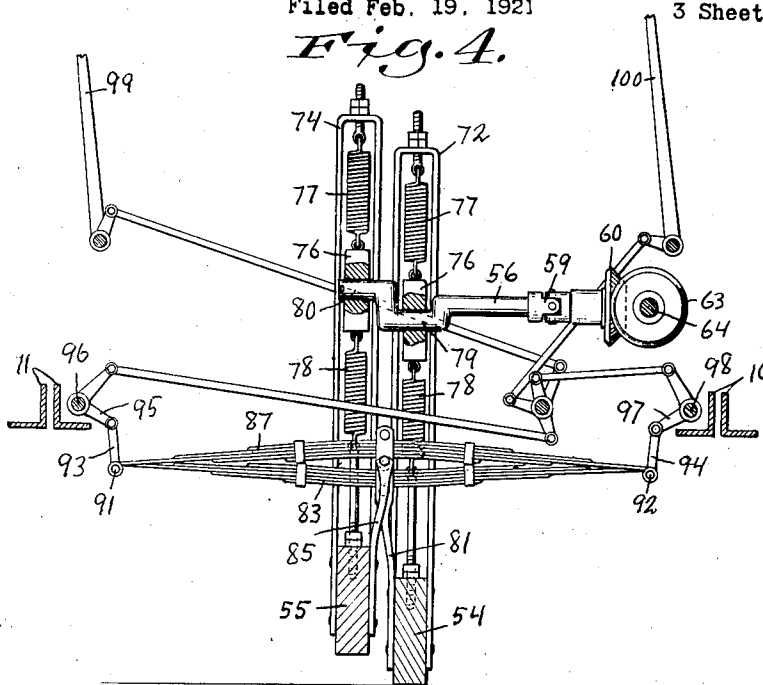
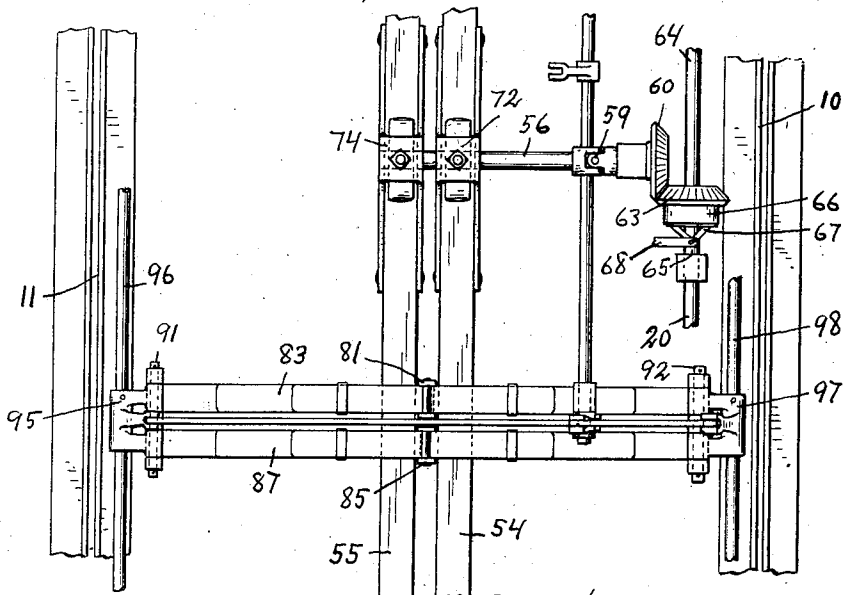


Fig. 5.



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UNITED STATES PATENT OFFICE.

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CONCRETE-ROAD MACHINE.

Application filed February 19, 1921. Serial No. 446,271.

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 on each of the several views, Fig. 1 is a plan view of the machines; Fig. 2 is an elevation of the machine, looking in the direction of the arrows, marked 2 on Fig. 1, which refer to the dotted line position of the machine; Fig. 3 is an end elevation of the machine, looking in the direction of the arrows marked 3 on Fig. 1; Fig. 4 is an elevation, on a larger scale of parts of the machine, parts being shown in section; and Fig. 5 is a plan view of some of the parts shown by Fig. 4.

Referring to the drawings, the reference numerals 1 and 2 designate supporting members which are preferably provided with wheels 3, 4, 5 and 6 adapted to run on forms, tracks or supports 7 and 8. A frame 9 is supported by the supporting members 1 and 2 and can be constructed in any suitable or preferred manner. This frame 9 is essentially simply a platform or bridge spanning the space between the supporting members 1 and 2 and adapted to support operating mechanism. The drawings illustrate the frame 9 as composed of two truss members 10 and 11 which are suitably braced and connected together to form a substantially rigid structure.

The frame 9 is adapted to be secured to the supporting members 1 and 2 in different angular relations therewith, as clearly shown by Fig. 1 of the drawings so that the machine can be used on roads differing in width and so that the action of a tamper on a road will be diagonally of the road, instead of directly across the road, to obviate a corduroy effect.

The frame 9 may be secured to the supporting members 1 and 2 in any suitable or preferred manner. The drawings illustrate it as pivotally connected with the supporting members 1 and 2 at diagonally opposite corners and with the free corners clamped to the supporting members by any suitable

clamping means 12 and 13, which can be readily loosened or tightened.

A motor, not shown, is supported by the frame 9 and can rotate a power shaft 14. An internal combustion engine may be used for the motor and directly drive the power shaft 14 which may form a part of the motor. The power shaft 14 drives the lay shaft 15 by means of the sprocket wheels 16 and 17 and a sprocket chain, not shown. A fixed sprocket wheel 18 on the lay shaft 15 drives a loose sprocket wheel 19 on the main shaft 20 and a fixed gear 21 on the lay shaft 15 drives a loose gear 22 on the main shaft 20. The sprocket chain, not shown, for the sprocket wheels 18 and 19 runs straight, as distinguished from crossed, so it will be apparent from an inspection of Fig. 1 of the drawings that when the main shaft 20 is rotated by the sprocket wheel 18 it will rotate in one direction while, when it is rotated by the gear 21, its direction of rotation will be reversed. The desired speeds of rotation of the main shaft 20 can be obtained from the motor by properly proportioning the sizes of the several sprocket wheels and the comparative sizes of the gears 21 and 22, as will be readily understood. A clutch 23 clutches the sprocket wheel 19 to the main shaft 20 or releases it therefrom and a clutch 24 clutches the gear 22 to the main shaft 20 or releases it therefrom. The clutches are shifted by clutch levers 25 and 26 which rock on pivots 27 and 28 and the clutch levers are connected together for simultaneous operation by a bar 29 which can be operated by levers 30 and 31 which are located at opposite ends of the machine and which are both connected by suitable rods and cranks to the bar 29. The throw of the clutches 23 and 24 is sufficient so that the main shaft 20 can be clutched to either the sprocket wheel 19 or to the gear 22 or can be unclutched or disengaged from both the sprocket wheel 19 and the gear 22.

The main shaft 20 is illustrated as provided with gears 32 and 33 which mesh with gears 34 and 35 on upright shafts 36 and 37 which are provided with worms 38 and 39 for rotating the worm wheels 40 and 41 secured to shafts 42 and 43. The shafts 42 and 43 are provided with gears 44, 45, 46 and 47 which mesh with gears 48, 49, 50 and 51 on the wheels 3, 4, 5 and 6, so that

the rotation of the main shaft 20 in one direction will propel the machine in one direction while the rotation of the main shaft 20 in the opposite direction will propel the machine in the reverse direction. The shafts 36 and 37 are the pivots with respect to which the frame 9 can be turned to different angular relations with respect to the supporting members 1 and 2. The main shaft 20 is illustrated as divided into sections by couplings 52 and 53 composed of gears, which serve as universal couplings so that the main shaft can follow the structural lines of the frame 9 and be adequately supported and yet extend from one corner of the frame to a diagonally opposite corner of the frame.

The tampers or tamping templets 54 and 55 are operated by shafts 56 and 57 which are provided with universal joints 58 and 59 and which are rotated by gears 60 and 61 which mesh with gears 62 and 63 secured to a shaft 64 which is in alignment with a part 65 of the main shaft 20. A clutch member 66 is secured to the shaft 64 and a coacting clutch member 67 is secured to the part 65 of the main shaft 20 so as to be rotated thereby but so as to be movable longitudinally thereof. A clutch lever 68 rocks on a pivot 69 and can be operated by the levers 70 and 71, at opposite ends of the machine, so as to engage the clutch member 67 with the clutch member 66 or so as to disengage the clutch member 67 from the clutch member 66, by motion transmitting rods and levers. The tamper 54 is provided with hangers 72 and 73 and the tamper 55 is provided with hangers 74 and 75. Bearings 76 are positioned between the tops of the hangers and the tampers 54 and 55 by springs 77 and 78, which can be adjusted to a desired tension, and the bearings receive eccentric members adapted to be rotated by the shafts 56 and 57. It will be understood that each of the shafts 56 and 57 operates both tampers and the construction for shaft 56 is clearly shown by Figs. 4 and 5 of the drawings where the eccentric members rotated by the shaft 56 are illustrated as cranks 79 and 80 which are located on opposite sides of the shaft 56 and 180 degrees apart for a purpose to be explained later. The tamper 54 is connected by rigid links 81 and 82 with the centers of leaf springs 83 and 84 and the tamper 55 is also connected by rigid links 85 and 86 with the centers of leaf springs 87 and 88. These leaf springs are placed near the ends of the tampers and, for convenience, adjacent springs are united at their ends by common bolts to common spring hangers. This construction is clearly illustrated by Figs. 4 and 5 of the drawings on which the bolts common to two springs are designated by the reference numerals 91 and 92 and the spring hangers

common to two springs are designated by the reference numerals 93 and 94. The spring hangers at one side of the machine are connected by cranks 95 with a rock shaft 96 and the spring hangers at the opposite side of the machine are connected by cranks 97 with a rock shaft 98. These rock shafts are connected by cranks and rods with levers 99 and 100 so that the ends of the leaf springs 87 and 88 can all be elevated or depressed simultaneously by swinging either lever 99 or lever 100 in the required direction, as will be apparent from an inspection of Figs. 4 and 5 of the drawings.

The levers 70 and 71 which shift the bar 89 to rock the bell-crank lever 90 to move the clutch lever 68 are located at opposite ends of the machine, the same as levers 30 and 31 and levers 99 and 100, so that the operator can control all movements from the end of the machine where he happens to be.

The machine can be made in any suitable or desired size and the parts may be made in sections if desired. The drawings illustrate the free ends of the truss members 10 and 11 as provided with detachable parts 101 and 102. These free ends or corners project beyond the supporting members 1 and 2 when the frame is arranged diagonally of a road, for example, and might interfere with the sides of a cut or with shade trees or other obstructions, so, by removing the detachable parts, the extreme width of the machine can be kept within the limits of the area to be worked over.

The construction and operation of the machine will be obvious from the foregoing description, when read in connection with the drawings, and the following description of the operation of the machine.

The machine can be adjusted to different widths of roads by loosening the clamping means 12 and 13 and swinging the frame 9 to bring the supporting members 1 and 2 to the required distance apart, and then tightening the clamping means.

If it is desired that the tampers shall not operate directly across a road, the frame can be adjusted diagonally of the road to obviate the so-called corduroy effect.

The main shaft 20 can be revolved in either direction and the machine propelled forward or backward, or stopped, by the manipulation of either the lever 30 or the lever 31. The tampers can be thrown into action or thrown out of action, when the main shaft 20 is revolving, by manipulating either lever 70 or lever 71. The object of using a plurality of tampers is twofold. By using a plurality of tampers contacting with the concrete at different times, the speed at which a single tamper should be operated can be decreased as the object is to keep the concrete mortar in motion throughout the

mass of the concrete, or between the larger aggregate of the concrete, instead of pounding the concrete mass down by blows acting only on its top surface. This action of a 5 tamper has been fully described in my co-pending application Serial Number 195,473, filed October 8, 1917, and is well known by the users of my machines. The use of a plurality of tampers also assists in balancing the 10 tampers as a downward movement of one tamper, with the construction illustrated by the drawings, assists in the quick lifting of the other tamper which is of great importance in moving the concrete mortar and 15 keeping it in motion. The object of the springs 83, 84, 87 and 88 is to lift, or help lift, the tampers quickly. By lowering these springs their lifting effect is decreased and they offer less resistance to the downward 20 movements of the tampers so that harder blows can be struck by the tampers. By raising these springs their lifting effect is increased and they offer greater resistance to the downward movements of the tampers 25 so that lighter blows are struck by the tampers. The springs 77 and 78 might with propriety be called compensating springs and are stiffer than springs 83, 84, 87 and 88 and their object is primarily to transmit 30 the tension of springs 83, 84, 87 and 88 to the eccentric members on the shafts 56 and 57 and secondarily to yield when necessary. It is obvious that springs 77 would yield and permit rotation of the shafts 56 and 57 if a 35 tamper should strike an obstacle. Looking now at Fig. 4 of the drawings, it will be seen that the tamper 54 is down and that the tamper 55 is up and that the cranks 79 and 80 are on dead center. Let the shaft 56 40 now be rotated slightly. The spring 87 is exerting tension to straighten and is applying a downward pressure to the tamper 55 by the link 85 and this force is transmitted to the crank 80 by the spring 78 tending to 45 turn the crank 80 down. The spring 83 is exerting tension to straighten and is applying an upward pressure to the tamper 54 by the link 81 and this force is transmitted to the crank 79 through the hanger 72 and the 50 spring 77 to turn the crank 79 up. The mechanical effect is that of two couples acting to rotate the shaft 56 in the same direction whereby the shaft is unloaded or a balancing effect is secured to obtain a quick 55 lift of the tamper 54, which is the object sought.

The springs 77 and 78 will yield sufficiently to permit the bearings 76 to move sideways as the cranks 79 and 80 are rotated.

60 The gears 60 and 61 may be supported in any suitable manner and, for the sake of clearness of illustration, supports or bearings are not shown by the drawings. As these machines are used in the open, it is 65 preferred to enclose gears in casings adapted

to contain lubricant, but such details of construction are well known to mechanics and form no part of this invention.

The tampers 54 and 55 are set pretty close 70 together for the reason that one of my tampers creates a sphere of disturbance of the concrete adjacent to it which is readily recognized by the movement of the concrete mortar. By placing another tamper within 75 this sphere of influence, it will be acting on the concrete during the interval when the first tamper is elevated. In this way a movement or agitation of the concrete will be continued and two tampers, so placed, can 80 be run at a less number of strokes per minute, for one tamper, than if there were only one tamper. For example, assuming that the concrete being tamped were of a consistency requiring three hundred strokes of a single 85 tamper per minute to keep the concrete in the required condition of agitation, then with two tampers the stroke per tamper could be reduced to one hundred and fifty strokes per minute with a great saving of 90 wear on the parts.

The springs interposed between the tampers and the shafts 56 and 57 are resilient or yielding means and prevent the stoppage 95 of one tamper being communicated to the other. Suppose that the tamper 54, see Fig. 4 of the drawings, had encountered a piece of rock on its down stroke and stopped. Such stoppage would not stop the rotation 100 of the crank 79 and the shaft 56 and, therefore, would not be communicated to the tamper 55.

What is claimed is:

1. In a concrete road machine, the combination with supporting members, of a 105 tamping templet, which conforms to the surface to be tamped, arranged diagonally with respect to the direction of movement of the machine, said tamping templet extending across the entire width of the concrete to be 110 acted upon, and means for imparting vertical movements to the tamping templet.

2. In a concrete road machine, the combination with supporting members, of a 115 frame, a tamper carried by the frame, and clamping means to retain the frame at a selected angular position with respect to the supporting members.

3. In a concrete road machine, the combination with supporting members, of a 120 frame pivoted to the supporting members at diagonally opposite corners and means to clamp the free corners of the frame to the supporting members.

4. In a concrete road machine, the combination with supporting members, of a 125 frame provided with detachable parts, and clamping means to clamp the frame to the supporting members in different positions.

5. In a concrete road machine, the combination with a frame, of a plurality of 130

tampers, rotatable means for moving tampers in opposite directions vertically, and resilient means actuated in unison with the tampers and adapted to assist the rotation of said rotational means, when a tamper is in its down position, in order to effect a quick lift of that tamper.

6. In a concrete road machine, the combination with a frame, of a plurality of tampers, means for simultaneously moving tampers in opposite directions and yieldable means interposed between the tampers and the means for simultaneously moving the tampers in opposite directions.

7. In a concrete road machine, the combination with a frame, of two tampers, means adapted to simultaneously move said tampers in opposite directions, and a plurality of springs interposed between each tamper and said means adapted to simultaneously move said tampers in opposite directions.

8. In a concrete road machine, the combination with a frame, of two tampers, means adapted to move said tampers simultaneously in opposite directions, a plurality of springs interposed between each tamper and said means adapted to move said tampers simultaneously in opposite directions, and additional springs secured to the tampers in such manner as to be put under tension through the plurality of springs aforesaid.

9. In a concrete road machine, the com-

bination with a frame, of a plurality of tampers each tamper extending across the entire width of the concrete to be tamped, and one tamper being behind another tamper, the tampers being placed close enough together to operate within the same general sphere of disturbance of the concrete, and means for causing alternate operations of tampers.

10. In a concrete road machine, the combination with a frame, of two diagonal tampers, each tamper extending across the entire width of the concrete to be tamped with the two tampers placed close enough together to operate within the same general sphere of disturbance of the concrete, and means for causing the tampers to descend in alternations.

11. In a concrete road machine, the combination with a frame, of a plurality of tampers, common means adapted to move tampers vertically and simultaneously in opposite directions, and yieldable means interposed between the tampers and said common mean adapted to move tampers vertically and simultaneously in opposite directions, so as to prevent stoppage of another tamper in case a tamper should be prevented from completing its full normal stroke downwardly.

In witness whereof I hereunto affix my signature.

EDWARD G. CARR.