

April 14, 1925.

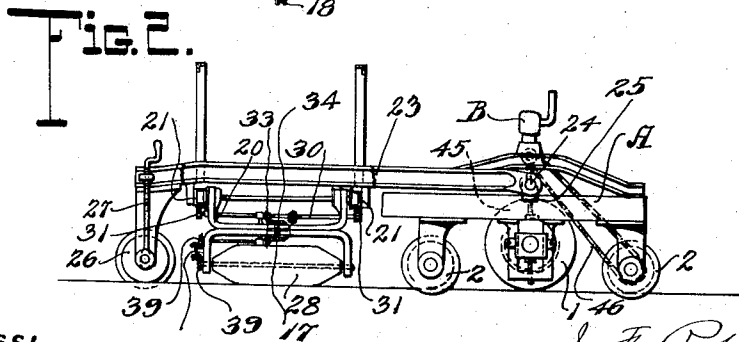
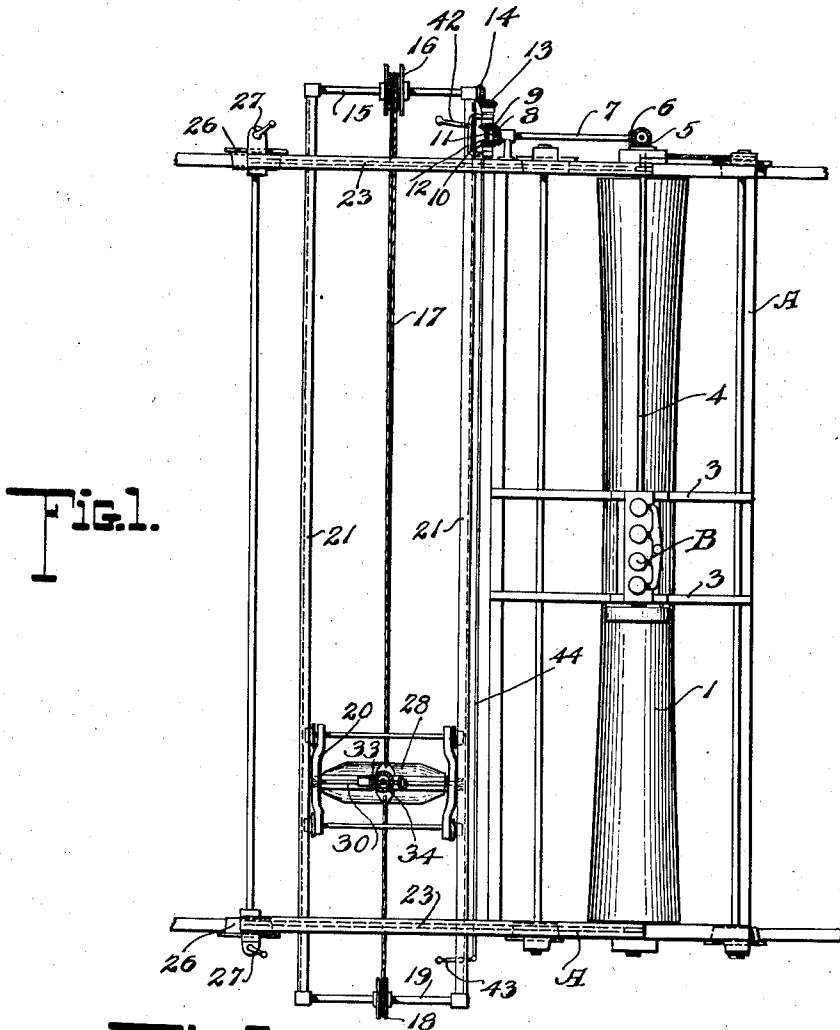
J. F. ROBB

1,533,464

FINISHING MACHINE

Filed Feb. 2, 1923

4 Sheets-Sheet 1



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Fig. 3.

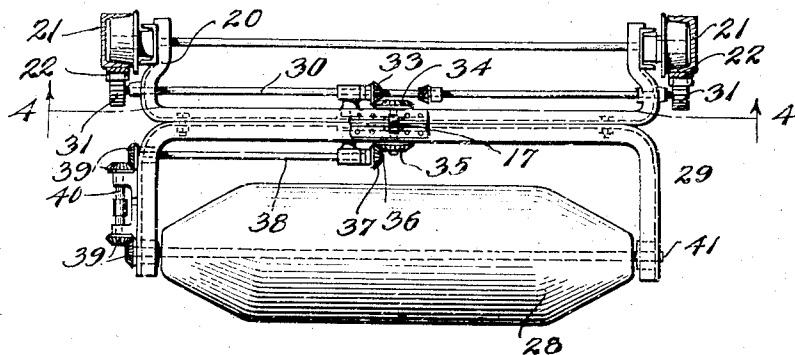


Fig. 4.

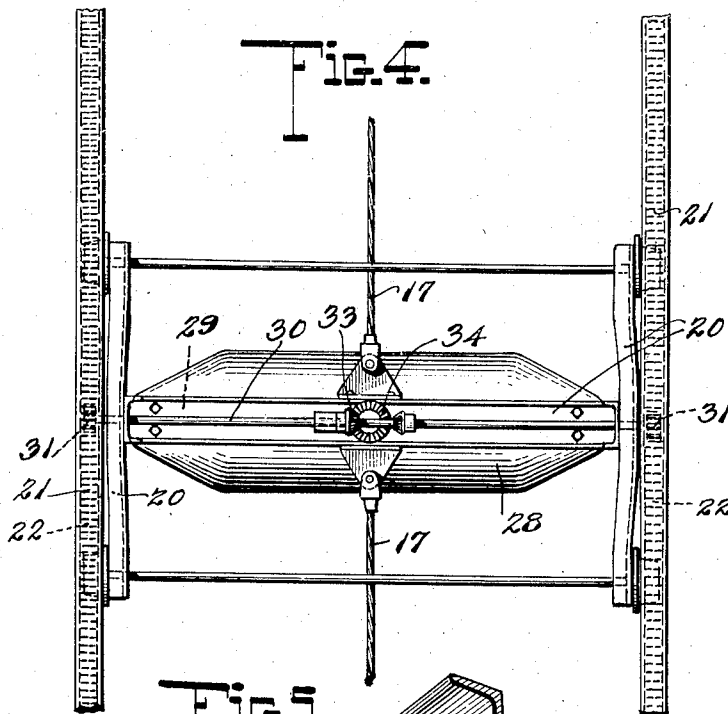
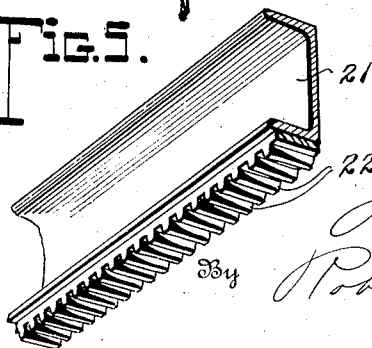


Fig. 5.



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Fig. 6.

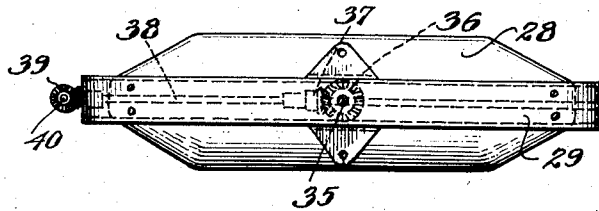


Fig. 7.

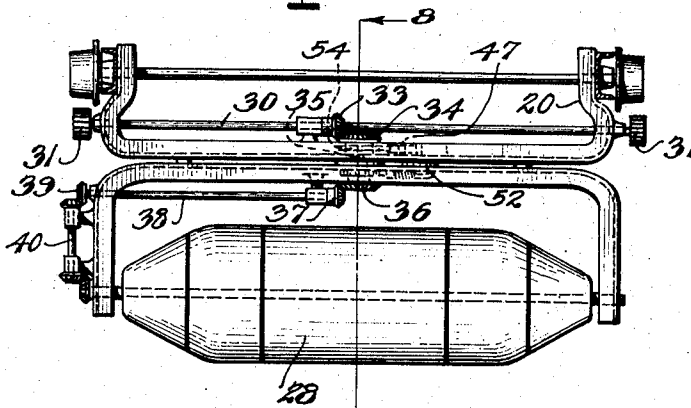
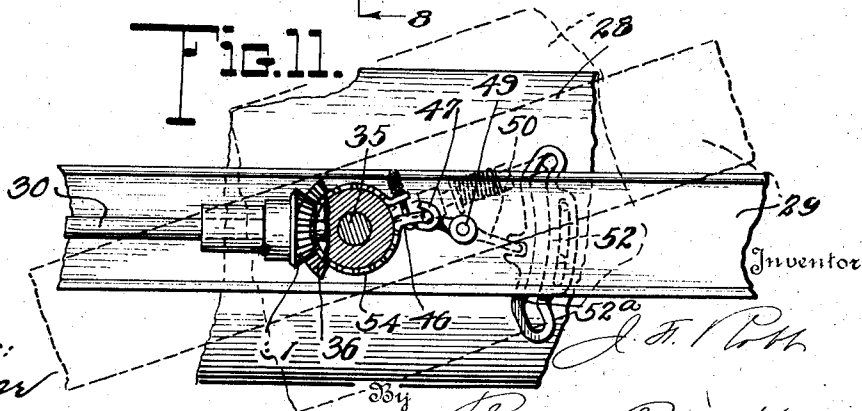


Fig. 11.



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Fig. 8.

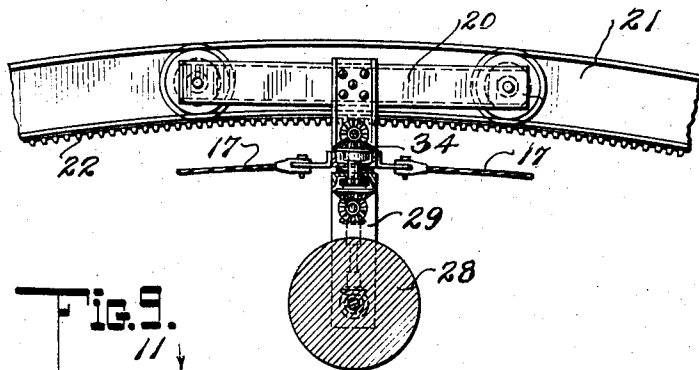


Fig. 9.

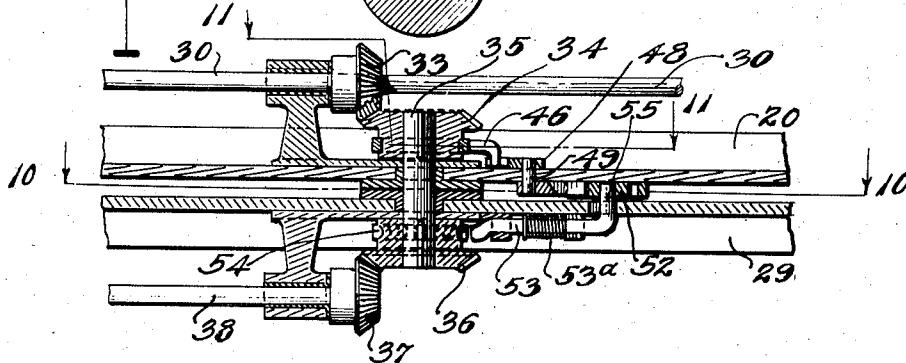
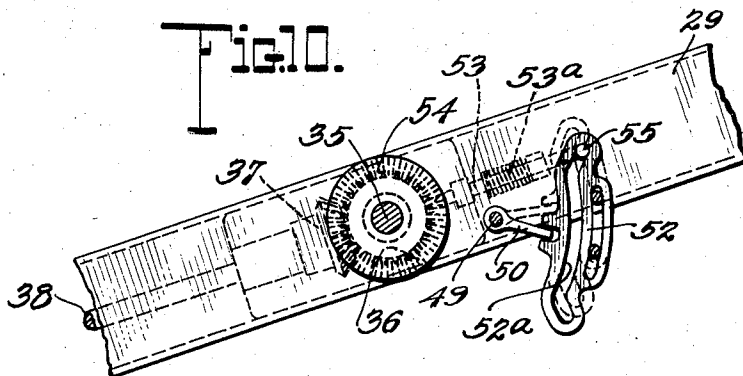


Fig. 10.



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UNITED STATES PATENT OFFICE.

JOHN F. ROBB, OF CLEVELAND HEIGHTS, OHIO, ASSIGNOR TO KOEHRING COMPANY,
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FINISHING MACHINE.

Application filed February 2, 1923. Serial No. 616,562.

To all whom it may concern:

Be it known that I, JOHN F. ROBB, a citizen of the United States, residing at Cleveland Heights, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Finishing Machines, of which the following is a specification.

In the art of making concrete pavements and roads it has been proposed to utilize a finishing machine comprising a roller adapted to be moved back and forth over the plastic concrete so as to act thereon by pressure, or ironing, so to speak, to finish the road surface. This roller, arranged transversely of the road-bed is of considerable weight, and, therefore, is enabled to have the ironing effect desired in order to strike-off, and work the concrete in such a manner as to form the desired smooth surface.

The present invention comprises the combination with a roller suitably supported to operate on the plastic aggregates of a concrete road, in the making thereof, the said roller being arranged transversely of the road, of a second roller disposed longitudinally, or approximately longitudinally of the road, and movable back and forth crosswise of the road-bed, so as to supplement the action of the first named roller in performing the finishing operation. The transverse and longitudinal rollers are complementary in their functions, in that one acts primarily to iron the plastic road aggregates in one direction whilst the other irons or works the aggregates in another direction, namely transversely of the road-bed, the latter roller furthermore acting to carry off surplus water that may rise to the surface of the aggregate in the finishing operation.

Subsidiary to the foregoing, I utilize means whereby, if desired, the roller which operates transversely of the road may be caused to shift into slightly angular positions, as distinguished from a true longitudinal position in relation to the road-bed, so that said roller is given a sort of diagonal disposition enabling it to travel slightly forwards as the machine which carries the several rollers moves forwards in its progressive finishing action. Since this second acting roller reciprocates in its movement across the road-bed, in its practical operation, it is evident that its angularity of disposition just referred to must be reversed

when its direction of reciprocation is reversed, and the invention comprehends means enabling such action.

My invention embodies other phases of construction and combination of parts which will be more fully understood upon reference to the following description in conjunction with the accompanying drawings in which;

Figure 1 is a top plan view illustrating a simple embodiment of my combined transverse and longitudinal roller type finishing machine.

Figure 2 is a side elevation of the same.

Figure 3 is an enlarged view showing more clearly the drive mechanism for positively rotating the transversely moving roller.

Figure 4 is an enlarged plan view showing more clearly the operating connection between the moving cable and said transversely moving roller.

Figure 5 is a detail view of one of the supporting beams for the reciprocating roller carriage or trolley, and the actuating rack thereon.

Figure 6 is a plan view more fully showing the actuating gearing of the transversely moving roller.

Figure 7 is a view illustrating a modified embodiment of the invention wherein automatic devices are employed for reversing the angularity of disposition of the transversely moving roller, and incident to its reversal of reciprocation.

Figure 8 is a sectional view taken about on the line 8—8 of Fig. 7.

Figure 9 is an enlarged sectional view of the gearing and automatic trip mechanism used to shift the transversely movable roller thru its supporting means.

Figure 10 is a sectional view taken about on the line 10—10 of Fig. 9.

Figure 11 is a sectional view taken about on the line 11—11 of Fig. 9.

Referring to the drawings, and especially Figures 1 to 5 inclusive, A denotes a wheeled truck or support in which is mounted in suitable bearings a main finishing roller 1. The wheels of the support A are denoted 2, and are adapted to operate upon what are ordinarily known as road rails or forms such as commonly used today in pavement and road construction. The roller 1 is contracted toward its middle portion from op-

posite ends, or in other words, is provided with a contour which corresponds with the crown of the road. This roller 1 may be mounted for vertical adjustment, if desired, this not being material to the present invention. I utilize any suitable power plant, such as a motor B, on cross pieces 3 of the support A, for driving the roller 1. For the above purpose I utilize a drive shaft 4 leading from the motor B to one end of the support or carrier A, said shaft having a bevel gear 5 meshing with the corresponding gear 6 on a shaft 7. The shaft 7 has a gear 8 with which either one of two clutch gears 9 and 10 is adapted to engage. The gears 9 and 10 are carried by a suitable shaft 11 to which they are keyed, and are movable by a yoke 12 to alternately engage with the gear 8. In this way the motion of the shaft 7 is adapted to be transmitted to the shaft 11 to operate the latter in reverse directions. The shaft 11 has a gear 13 meshing with a bevel gear 14 on a cable actuating shaft 15. The shaft 15 carries a drum 16 about which winds and unwinds a cable 17. The cable 17 passes over a pulley 18 on a shaft 19 supported at one side of the carrier or wheeled support A, the shaft 15 and the drum 16 being located at the opposite side. It will be evident that by connecting the cable 17 with the frame of a trolley 20, and controlling the clutch gears 9 and 10 to reverse the driving of the cable 17, a reciprocating motion may be imparted to said trolley 20. The trolley 20 is mounted in curved tracks 21 which consist of channels, shown best in Figure 5, there being attached to the under side of one of said channels, an operating rack 22. The tracks 21 are supported upon a pair of arms 23, which really constitute a sort of auxiliary support extending to the rear of the main wheeled support or carrier A. The arms 23 are pivoted at their front ends at 24 to vertically adjustable members 25 adapted to be raised and lowered slightly by means of turning collars 26 mounted upon threaded portions of said members 25 and having a bearing against the upper surfaces of the sides of the frame which constitutes the support A. Any suitable means may be used to adjust the pivotal connections 24 between the arms 23 and the truck or carrier A. The rear ends of the arms may be equipped with wheels 26, or not, as may be found most desirable, and rendered susceptible of vertical adjustment by means of adjusting screws 27, adapted to raise and lower the wheels 26 in their journals. The trolley 20 is equipped with small rollers which operate in the channels or the tracks of channel beams 21, and this trolley 20 supports what may be called the transversely moving roller 28 of the machine. The roller 28 is suitably journaled in a U shaped frame 29, carried by the frame of the trolley 20. Mounted in the frame of the trolley 20 is a shaft 30 equipped at its ends with gears 31 which mesh with the racks on the under sides of the tracks 21. While a single rack 22 may be utilized, preferably two of these racks are employed for the drive of the roller 28. As the trolley is moved by the cable 17 the engagement of the gears 31 with the racks 22 rotates the shaft 30 which is connected by bevel gear 33 with a bevel gear 34 on the upper end of a short vertical shaft 35 which passes thru the central portions of the trolley frame and the roller supporting frame 29. At its lower end the shaft 35 carries a bevel gear 36 meshing with a corresponding gear 37 mounted on a short shaft 38 that leads from the center of the frame 29 to one end thereof and is connected by a train of gears 39 and a shaft 40 with the roller shaft 41 that carries the roller 28. It is obvious, therefore, that as the trolley 20 is pulled in one direction across the machine and across the roadbed, the roller 28 will be driven by rotation in one direction, and when the movement of the trolley is reversed, the roller 28 will be driven in an opposite direction. The elevation of the roller 28 may be controlled by the parts 27 and 26 as before described. The movement of the trolley 20 is automatically reversed as the roller 28 approaches one side of the machine, by contact of one end of the trolley 20 with a clutch reversing lever 42 associated with the shifting yoke 12 previously mentioned, and when the trolley has been reversed, and moves so that it has reached the opposite side of the machine, the said trolley engages another reversing lever 43 which is connected by a rod 44 with the yoke 12 by which the gears 9 and 10 are shifted. Any suitable mechanism may be utilized for effecting the desired movement in opposite directions, automatically controlled, of the trolley 20 and its roller 28. It is contemplated that the roller 28 shall move transversely of the machine until it reaches a point very slightly beyond the road forms or rails upon which the wheels 2 and 26 of the machine move. This insures a proper surfacing action by the roller 28, an action upon the whole surface of the concrete aggregates, and the pushing off of surplus water if desired. It is notable that the rails 21 for the trolley 20 are curved crosswise of the machine to correspond with the crown of the road-bed, so that in effect the roller 28 moves in a curved path conforming with the contour or crown of the road when finished. It is noted also that the roller 1 may be driven in either of opposite directions, by positive driving effect transmitted to said roller from the shaft 4 thru suitable gearing such as a sprocket chain illustrated in dotted lines in Fig. 2, at 45.

It is notable also that the roller 28 is preferably tapered at its opposite ends so as to prevent endwise pushing of the surface aggregates of the plastic concrete being operated upon during travel of the machine. In other words, the main support or carrier A will be positively driven forward at a slow rate of speed by some suitable driving connection, such as a sprocket chain 46 leading from the shaft 4 to one of the shafts upon which certain of the wheels 2 are mounted. The driving action will be under suitable manual control means, not illustrated, because immaterial to this invention. As the machine progresses forwardly the roller 1 is driven either in the same direction as the forward movement, or in an opposite direction, as may be found most desirable in practice. At the same time, the roller 28 moves transversely of the machine, in rear of the roller 1, and during its transverse movement the roller 28 is positively actuated while it bears with pressure upon the surface aggregates. The roller 1 irons out the surface aggregates, so to speak, in one direction, and the roller 28 acts likewise in another direction.

I contemplate to use certain means best illustrated in Figs. 7 to 11 inclusive, to shift the frame 29, to position the roller 28 with a slight degree of angularity, or facing slightly forwards in the direction of its transverse movement, so that in effect it is not presented exactly lengthwise to the progressing movement of the entire machine. This adjustment of the roller 28 will have a tendency to avoid any possibility of edge-wise pushing or disturbance of the surface aggregates, and will facilitate the free movement of the roller over the aggregates as the machine progresses. With the above in view, instead of having the frame 29 substantially rigid with the frame of the trolley, as shown in Fig. 5, I utilize the shaft 35 as a pivot means connecting the trolley frame 20 and the roller supporting frame 29 at their central portions. As seen best in Fig. 9, the gear 34 has mounted thereon a friction arm 46 which engages in the fork 47 of a trip arm 48 carried by the stub shaft 49 mounted in the frame 20. At its lower end the shaft 49 carries a trip member 50 engaging between lugs 51 of a reversing slide 52 mounted and guided on the under side of the frame 20. On the roller frame 29 is a sliding latch 53 normally spring actuated to become disengaged at its inner end from clutch lugs 54 on the gear 36. At its outer end the latch 53 has an upwardly extending projection or lug 55 passing thru a slot in the frame 29 and engaging in a cam slot 52^a of the reversing slide 52. The cam slot 52^a has cams at its opposite ends and the action of the mechanism described is substantially as follows:

When the trolley 20 reaches one end of its traverse on the truck or support A, the movement of the trolley is reversed and this results in a reversal of the movement of the shaft 30. Such movement of the shaft 30 is transmitted to the gear 34 and its friction arm 46. Such action causes a rocking of the shaft 49 and this thereby shifts the reversing slide 52 camming the latch 53 into engagement with the gear clutch lugs 54 and against the tension of the spring 53^a surrounding said latch. The latch 53 is thus momentarily clutched and the gear 36 which is of course turning in the now reverse direction to its previous movement and since the latch 53 is carried by the frame 29, the latter is compelled to turn with the gear 36 a slight distance until the lug 55 of the latch reaches the other end of the cam slot 52^a of the reversing slide 52, see Fig. 10, whereupon the lug enters the cam slot extension at the opposite end of the slide 52, and the latch becomes disengaged from the gear 36. The frame 29 will thus have been shifting to carry the roller 28 into a position of angularity such as assumed by the frame 29, and seen in Fig. 10. The action of the slide 52 is automatic both in engaging the latch 53 with the gear 36, and disengaging it, and is controlled by the operation of reversal of movement of the shaft 30 incident to the reversal of direction of drive of the trolley 20 thru the operating mechanism including the gears 9 and 10, cable 17, and intermediate connections. The operation of the parts shown in Figs. 9 and 10 takes place furthermore at both extremes of movement of the trolley 20 and its roller 28.

For the purposes of this description, the roller 1 may be said to be a transverse roller in the sense that it is mounted transversely of the machine; roller 28 is a longitudinal roller generally speaking, and moves transversely of the machine. Furthermore, the rollers 1 and 28 are disposed at angles to one another, a right angle as shown in Figures 1 to 4 inclusive, and at slightly different angles when adjusted in the operation of the parts set forth in Figures 7 to 11 inclusive. Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a concrete road finishing machine, in combination, a portable support adapted to move over the road-bed on which the plastic concrete is disposed, a transverse finishing roller mounted on said support and disposed transversely of the road-bed over which the support operates, and a longitudinal finishing roller carried by said support and also adapted to operate upon the materials operated upon by the transverse roller, and means to move the longitudinal roller transversely of the machine and of the road-bed.

2. In a concrete road finishing machine, in combination, a portable support adapted to move over the road-bed on which the plastic concrete is disposed, a transverse finishing roller mounted on said support and disposed transversely of the road-bed over which the support operates, and a longitudinal finishing roller carried by said support and also adapted to operate upon the materials operated upon by the transverse roller, and means to move the longitudinal roller transversely of the machine and of the road-bed, and for also driving the longitudinal and transverse rollers positively at the same time.
3. In a concrete finishing machine, the combination with a wheeled support adapted to travel over a sub-grade on which concrete aggregates are disposed, transverse and longitudinal finishing rollers arranged one in advance of the other on said portable support, means for driving said rollers to positively turn the same, and means for moving the longitudinal roller transversely of the support in its operation.
4. In a concrete finishing machine, the combination with a wheeled support adapted to travel over a sub-grade on which concrete aggregates are disposed, transverse and longitudinal finishing rollers arranged one in advance of the other on said portable support, means for driving said rollers to positively turn the same, means for moving the longitudinal roller transversely of the support in its operation, the transverse roller having a peripheral portion conforming in contour with the desired crown of the road-bed aggregates when finished, and means acting on the longitudinal roller compelling it to operate in a path or arc conforming with the crown of the road-bed when finished.
5. In a concrete finishing machine, a portable support adapted to operate over a road-bed on which plastic aggregates are disposed, a longitudinal roller mounted upon said support, means for moving the portable support in a finishing operation, means to move said roller back and forth across said support in performing the finishing operation on the plastic concrete, and means to shift said roller to dispose it at a slight angle to the longitudinal, and slightly facing its direction of movement as it is reversed in its operation.
6. Means substantially as set forth in claim 5, wherein the last named means comprises a vertical axis for the roller, and positive means for shifting the roller about the said axis to dispose it in the manner described, with means to positively rotate the said roller while moving as stated.
7. In a concrete finishing machine, in combination, a portable support, means for moving said support to advance it over a road sub-grade having plastic concrete thereon, and complementary transverse and longitudinal finishing rollers on said support and operable each to perform a finishing operation on the said plastic concrete, and in respect to a predetermined transverse area or section of the same, and means to simultaneously positively drive the said rollers.
8. In a concrete finishing machine, in combination, a portable support, means for moving said support to advance it over a road sub-grade having plastic concrete thereon, complementary transverse and longitudinal finishing rollers on said support and operable each to perform a finishing operation on the said plastic concrete, and in respect to a predetermined transverse area or section of the same, and means for moving the longitudinal roller transversely of the machine and reversing such movement as the roller reaches the side extremes of the road-bed concrete.
9. In a concrete finishing machine, in combination, a portable support, means for moving said support to advance it over a road sub-grade having plastic concrete thereon, complementary transverse and longitudinal finishing rollers on said support and operable each to perform a finishing operation on the said plastic concrete, and in respect to a predetermined transverse area or section of the same, means for moving the longitudinal roller transversely of the machine and reversing such movement as the roller reaches the side extremes of the road-bed concrete, and means to shift said longitudinal roller slightly at an angle to an exact longitudinal disposition whereby it faces slightly forwards as the machine advances.
10. In a concrete finishing machine, a portable support, longitudinal and transverse finishing rollers mounted upon said support, means for rotating the transverse roller, means for moving the longitudinal roller back and forth transversely of the machine, and means for moving the machine during the movements of said rollers.
11. In a concrete finishing machine, a portable support, longitudinal and transverse finishing rollers mounted upon said support, means for rotating the transverse roller, means for moving the longitudinal roller back and forth transversely of the machine, means for moving the machine during the movements of said rollers, and means for shifting the longitudinal roller about a vertical axis and at predetermined times during its back and forth movement across the machine.
12. In a concrete finishing machine, a portable support, longitudinal and transverse finishing rollers mounted upon said support, means for rotating the transverse

roller, means for moving the longitudinal roller back and forth transversely of the machine, means for moving the machine during the movements of said rollers, and
 5 means for shifting the longitudinal roller about a vertical axis and at predetermined times during its back and forth movement across the machine, comprising automatic devices operated as an incident to the re-
 10 versal of the direction of movement of said roller.

13. In a concrete finishing machine, a portable support adapted to operate over a road-bed on which plastic aggregates are
 15 disposed, a longitudinal roller mounted upon said support, means for moving the portable support in a finishing operation, means to move said roller back and forth
 20 across said support in performing the finishing operation on the plastic concrete, and means to shift said roller to dispose it at a slight angle to the longitudinal, and slightly facing its direction of movement as it is
 25 reversed in its operation, said last means including driven mechanism operable by movement of the roller back and forth across the support.

14. In a concrete finishing machine, a portable support adapted to operate over a

road-bed on which plastic aggregates are
 30 disposed, a longitudinal roller mounted upon said support, means for moving the portable support in a finishing operation, means to move said roller back and forth across said
 35 support in performing the finishing operation on the plastic concrete, and means to shift said roller to dispose it at a slight angle to the longitudinal, and slightly facing its direction of movement as it is reversed in its
 40 operation, said last means including positive driven gearing cooperative with the support whereby it is actuated incident to the movement back and forth across the support.

15. In a concrete finishing machine, a portable support adapted to operate over a
 45 road-bed on which plastic aggregates are disposed, a longitudinal roller mounted upon said support, means for moving the portable support in a finishing operation, means to move said roller back and forth across
 50 said support in performing the finishing operation on the plastic concrete, and driven gearing for positively turning said roller as it is shifted back and forth across the
 55 support.

In testimony whereof I affix my signature.

JOHN F. ROBB.