

March 1, 1927.

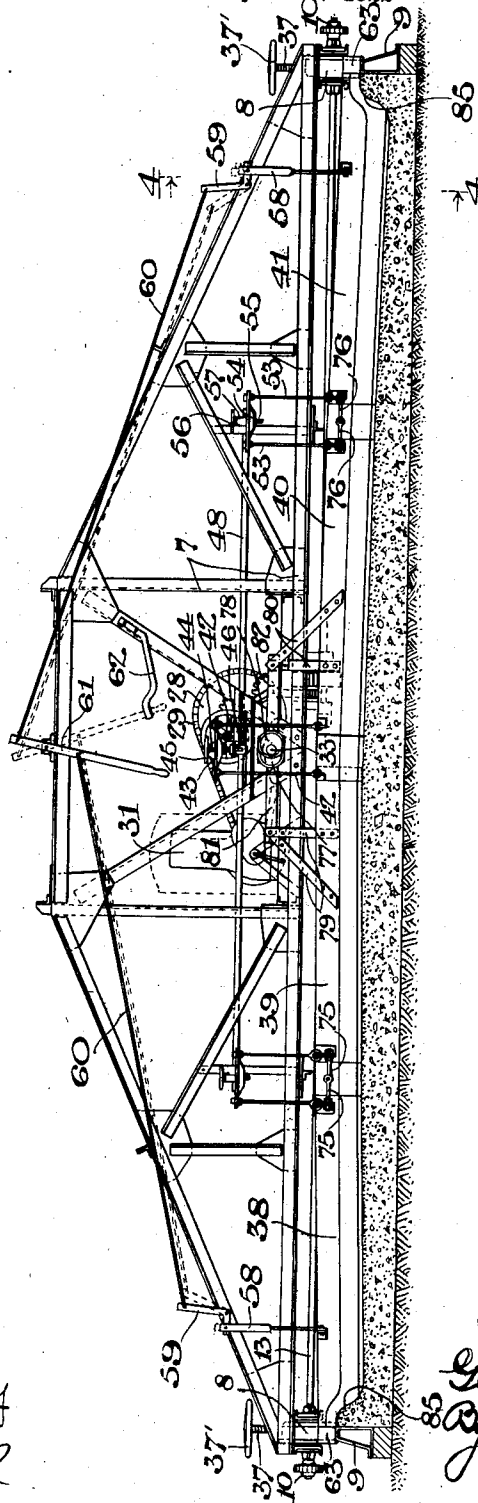
G. MAXON, JR

1,619,083.

FINISHING MACHINE FOR CONCRETE ROADS

Filed April 8, 1922

4 Sheets-Sheet 1



WITNESSES

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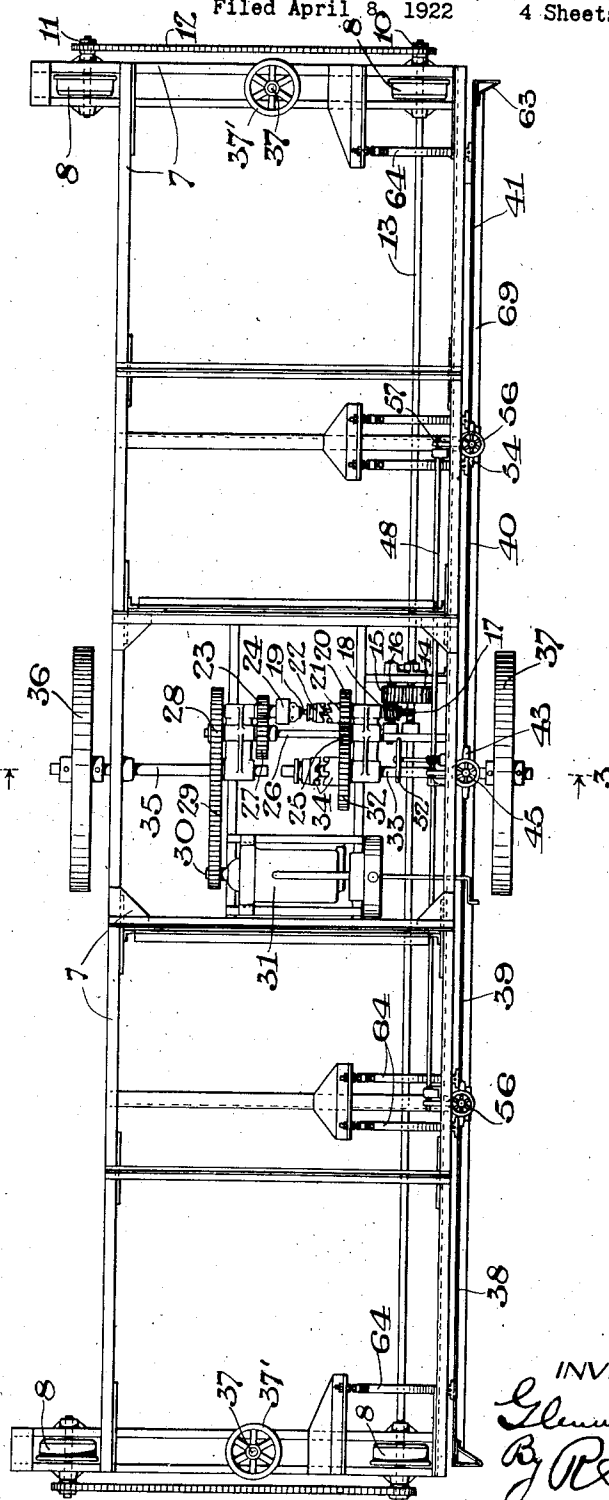
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4 Sheets-Sheet 2

FIG. 2



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FIG. 3

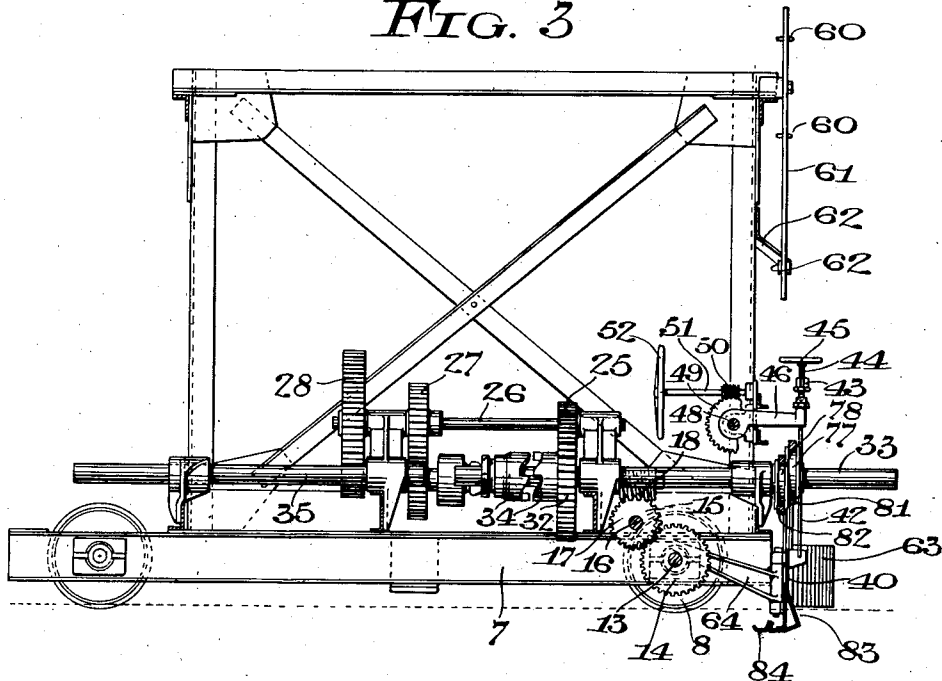
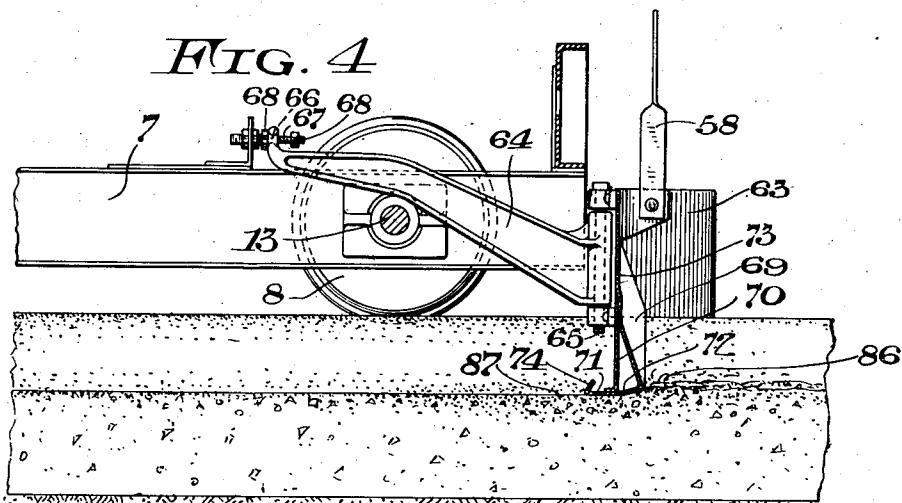


FIG. 4



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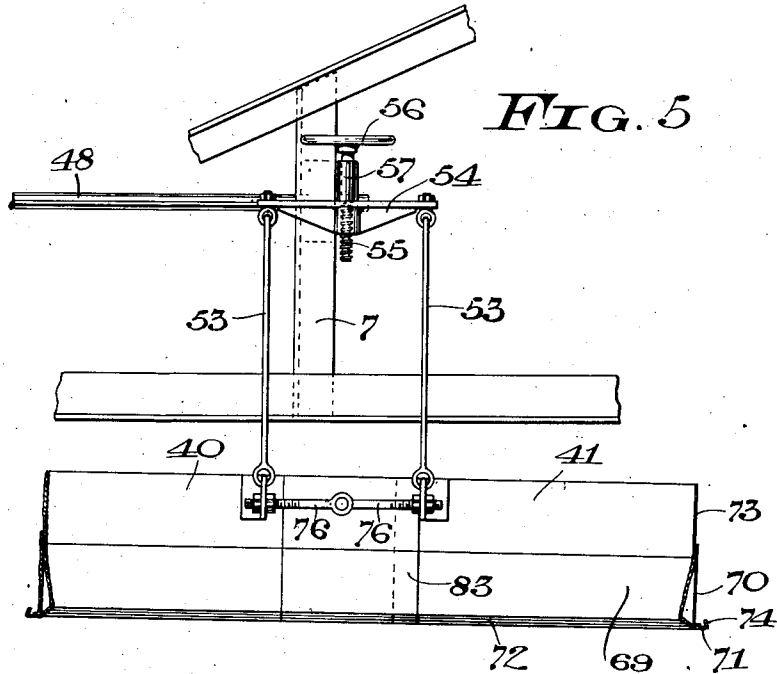


FIG. 5

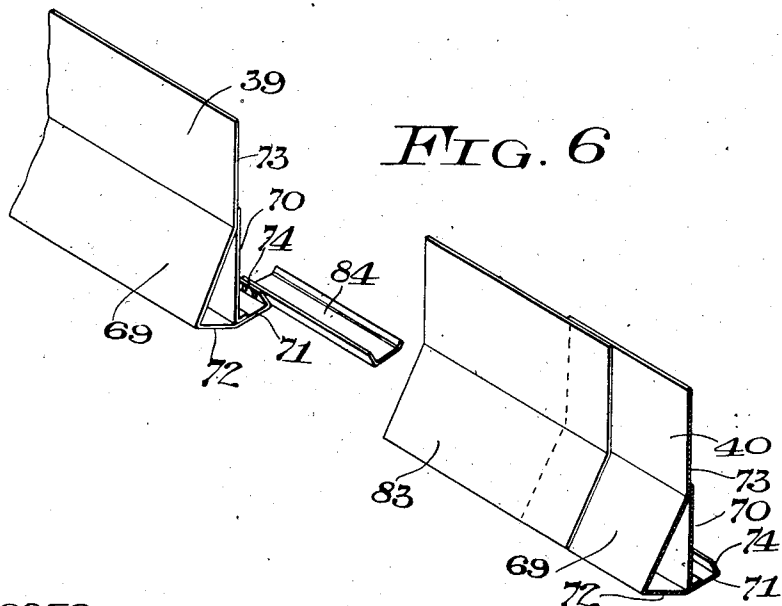


FIG. 6

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UNITED STATES PATENT OFFICE.

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FINISHING MACHINE FOR CONCRETE ROADS.

Application filed April 8, 1922. Serial No. 550,840.

The invention relates to road-finishing machines, more particularly for finishing concrete roads.

One of the objects of this invention is to provide a templet composed of a plurality of sections which are moved in a substantially horizontal plane to strike off the road surface to a certain level and also form the curb. More specifically this strike mechanism is also formed to press down upon the roughly struck-off concrete.

A further object of the invention is to provide a strike-off templet made of a plurality of sections whose position with respect to the road may be adjusted to vary the shape of the crown of the road when desired.

A further object of the invention is to provide an arrangement for readily transporting the machine from one job to another.

A further object of the invention is to improve upon the strike-off device shown and described in my United States Letters Patent No. 1,386,348, granted August 2, 1921.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a front elevation view of a machine embodying the invention; Fig. 2 is a plan view thereof; Fig. 3 is a section taken on the line 3—3 of Fig. 2; Fig. 4 is a detail sectional view taken on the line 4—4 of Fig. 1; Fig. 5 is a detail front view of part of the mechanism shown in Fig. 1; Fig. 6 is a detail view of the finishing templet showing the joint construction between parts of said templet.

In the drawings the numeral 7 designates generally the frame-work of the machine which is mounted on wheels 8 that run on rails or guides 9. The wheels at each end of the machine are drivingly connected together by sprockets 10 and 11 and a chain 12. One of the wheels of each set is mounted on a transmission shaft 13 which also carries the sprockets 10. The shaft 13 carries a gear 14 meshing with a gear 15 on a shaft 16. The shaft 16 carries a worm wheel 17 meshing with a worm 18 on a shaft 19. A gear 20 is loosely mounted on the shaft 19 but is adapted to be drivingly connected therewith by a clutch mechanism 21 including a clutch element 22 slidably but non-rotatably mounted on said shaft. Another gear 23 is also adapted to be drivingly con-

nected to the shaft 19 through a clutch device 24. The gear 20 meshes with a gear 25 on a shaft 26 and the gear 23 with a gear 27 on said shaft 26. The shaft 26 is provided with a sprocket 28 connected by a chain 29 with a sprocket on the drive shaft 30 of an internal combustion engine 31, or other suitable source of power.

With this arrangement, when the clutch 21 is in and the clutch 24 out the drive will be from the shaft 26 through gears 25 and 20 to the shaft 19, which through the worm gearing and the gears 16 and 14 rotates the shaft 13 to cause it to propel the machine forwardly, and when the clutch 21 is out and the clutch 24 is in the drive will be from the shaft 26 through the gears 27 and 23 to the shaft 19, which through the worm gearing and the gears 16 and 14 rotates the shaft 13 to produce a backward travel of the machine. The gear ratios are preferably such that the forward travel is at a slower speed than the rearward travel.

The gear 25 also meshes with a gear 32 loosely mounted on a shaft 33 and adapted to be drivingly connected thereto by a clutch 34. The shaft 33 is located in the central portion of the machine in line with a stud shaft 35. The ends of both shafts 33 and 35 extend beyond the frame of the machine so as to receive carrying wheels 36. At the end portions of the frame I provide jack-screws 37 engageable with the rails 9 and having handwheels 37' to elevate the machine above the roadbed and the rails to permit the wheels 36 being slipped onto the shafts 33 and 35 so that the machine, when equipped with these wheels, may be moved along like a push-cart or two-wheeled trailer vehicle and thus moved from one job to another.

The finishing templet comprises a plurality of members 38, 39, 40 and 41 which are hung from the front portion of the frame.

For suspending the inner ends of the members 39 and 40, I provide links 42 connected to the ends of an equalizer bar 43 mounted on a threaded jack-shaft 44, provided with a handwheel 45, so that the turning of said shaft will raise or lower said bar. The jack-shaft is supported upon the free end of a crank arm 46 mounted on a shaft 48 and adapted to be turned to raise or lower the shaft 44 by means of a segmental worm wheel 49 mounted on said shaft and meshing

with a worm 50 on a shaft 51 provided with a handwheel 52.

For suspending the outer end of the member 39 and the inner end of the member 38, and for suspending the outer end of the member 40 and the inner end of the member 41, in each instance I provide links 53 connected to the ends of an equalizer bar 54 mounted on a threaded jack-shaft 55, provided with a handwheel 56, so that the turning of said shaft will raise or lower said bar. Each of these jack-shafts are supported upon the free end of a crank arm 57 mounted on the shaft 48 so that the turning of this shaft through the mechanism previously described will raise or lower the shafts 55.

By this arrangement the turning of the shaft 48 in the proper direction will act to simultaneously raise or lower the bars 43 and 54 so that the members 39 and 40 and the inner ends of the members 38 and 41 may be simultaneously raised and lowered to finish off the road to the desired level. Furthermore, the individual adjustment accomplished by the turning of the jack-shaft 44 and the jack-shaft 55 permit the members 38 and 41 being suspended at different inclinations to the adjacent members 39 and 40 so as to vary the shape of the crown of the road when desired.

The outer end portions of the templets 38 and 41 are respectively connected by a link 58 to a two-armed lever 59 pivoted on the frame of the machine, and these levers are also connected by links 60 to a lifting lever 61 pivoted intermediate its ends upon the machine frame, the links 60 being respectively connected to said lever on opposite sides of its pivot. This lever is somewhat yieldable so that when swung into the dotted line position, shown in Fig. 1, it may be sprung back of a projection 62' on a bar 62 and held by said stop. When the lever is so moved the outer ends of the members 38 and 40 will be elevated clear of the road. When the lever is released from the bar the outer ends of the members 38 and 40 rest upon the road, though their lowermost position is limited by their ends 63 coming in contact with or resting upon the rails 9.

Each of the members forming the templet is maintained in a substantially vertical position in advance of the front portion of the frame of the machine by means of struts 64 which are vertically pivotally connected at their front ends to pins 65 carried by said members, and which are universally pivotally connected to points on the frame by forming their rear ends into eyes 66 mounted on threaded studs 67 between stop-nuts 68. These universal pivot points for the struts are located at a higher elevation than the surface of contact between the members and the concrete so that the reaction of the

concrete through these struts produces a downward pressure on the members 38, 39, 40 and 41, and use is made of this downward pressure in compacting or producing a trowelling action upon the concrete by said members.

Each of the members forming the templet consists of steel plates 69 and 70. The steel plate 69 is bent to provide a flat road shoe portion 71 and a slightly inclined road shoe portion 72, the road shoe thus formed extending the length of this plate. From the front edge of the shoe portion 71 the plate is inclined upwardly and back to a vertically disposed portion 73 which is located in a plane passing through the central portion of the shoe. The plate 70 is vertically disposed and connected to the plate 69, by welding or in any other suitable manner, as shown in Figs. 4 and 6, and serves as a reinforcement for the plate 69. The rear edge 74 of the shoe portion 71 is preferably bent upwardly and forwardly.

The members 38 and 39 are connected so as to move together by means of a jointed tie-rod construction formed by two eye-bolts 75, one anchored to the inner end of the member 38 and the other anchored to the inner end of the member 39. The members 40 and 41 are similarly connected to move together by a jointed tie-rod construction formed by two eye-bolts 76 similar to the eye-bolts 70 and similarly anchored to the members 40 and 41.

In the striking-off of concrete roads it is desirable to have the strike-off device move transversely of the road and it is further desirable to relieve the frame-work of the machine of objectionable stresses and strains so that I provide mechanism for reciprocating the members 38 and 39 as a unit toward and away from the members 40 and 41 as a unit. For this purpose the shaft 33 is provided with eccentrics 77 and 78 which are respectively operatively connected to bracket arms 79 and 80 on the members 39 and 40 by connecting rods 81 and 82. The eccentrics 77 and 78 are arranged at 180 degrees with respect to each other so that as the shaft 33 rotates the unit composed of members 38 and 39 and the unit composed of members 40 and 41 move toward each other and then away from each other as the machine moves along the road, thus relieving the frame and the guide rails of objectionable strains.

A plate 83 is secured to the member 40 so that when said member is moved with respect to the member 39 said plate will overlap the front face of that portion of the member 39 that is disposed adjacent the member 40. A trough-shaped member 84 is secured to the edge 74 of the member 39 and has a close sliding fit with the similar edge of the member 40, and cooperates with the

plate 83 to insure the vertical alinement of said members. The construction of the sliding joint thus formed is shown in Fig. 6, where the parts are separated. Similar joints to the one just described are provided between the adjacent ends of the members 38 and 39 and between the adjacent ends of the members 40 and 41, such joints being employed in these locations because of the angular adjustment of the members.

In many instances concrete roads are provided with concrete curbs and in order to form such curbs while the road itself is being finished, the shoe portions of the members 38 and 40 have curb-forming portions 85 so that as the strike-off units reciprocate the concrete at the sides of the road will be struck off to form the curbs.

It is not only desirable to strike off the concrete deposited upon the subgrade to a certain level, but it is also desirable to compress or compact this concrete and by reason of the inclined portion 72 of the members forming the templet and the downward pressure exerted upon them by the reaction of the concrete through the struts 64, the top of the road and the sides of the curb are worked down to a smooth and dense surface by the time the roughly struck-off surface comes under the action of the flat shoe portion 71 of the members; in other words the road surface is gradually compacted or pressed down during the time the rough uneven surface comes under the action of the finishing templet. The effect of this action is shown in Fig. 4 where the numeral 86 indicates the roughly laid concrete ahead of the machine and the numeral 87 the smoothed finished surface.

The finishing templet may be actuated when the clutch 34 is thrown in while the machine is travelling forwardly or rearwardly, it being noted that the shaft 26 is constantly rotated by the engine 31 and transmits its power to the strike-off operating mechanism as well as to the propelling mechanism.

I desire it to be understood that this invention is not to be limited to any specific form or arrangement of parts except in so far as such limitations are specified in the claims.

What I claim as my invention is:

1. In a road-finishing machine, a strike-off device comprising a plurality of reciprocating strike-off members, and means for moving said members transversely of the roadway, said device having curb forming ends laterally compressing the paving material.

2. In a road-finishing machine, the combination with a frame, of a strike-off element having a strike-off surface engageable at its lower and forward portions with the paving material, struts connected to said element and universally pivotally connected to said

frame at points above the road surface whereby to resolve a part of the lateral pressure exerted upon said element by the paving material upon which it is acting into a downward component upon said element to compact the material passed over by said element, and means for moving said element transversely of the road.

3. In a road-finishing machine, a strike-off device comprising two pairs of articulated members forming strike-off sections, means for moving said sections transversely of the roadway toward and away from each other, and means for adjusting the relative positions of the members of each section to vary the crown of the road.

4. In a road-finishing machine, the combination with the frame, of a strike-off element having an upwardly inclined front shoe portion and a substantially flat rear shoe portion, struts vertically pivotally connected to said element and universally pivotally connected to said frame at points above the pivotal connections of said struts with said element whereby to resolve a part of the lateral pressure created upon said element by the material upon which it is acting into a downward component upon the shoe portions of said element to compact the material passed over by said shoe portions, and means for moving said element transversely of the road.

5. In a road-finishing machine, the combination with the frame, of a strike-off device comprising intermediate strike-off members and outer strike-off members, means for suspending the intermediate strike-off members and the inner ends of said outer strike-off members from the frame, said outer strike-off members having curb-forming end portions, and means for moving the members forming the device transversely of the road.

6. In a road-finishing machine, the combination with the frame, of a strike-off device comprising intermediate strike-off members and outer strike-off members, means for suspending the intermediate strike-off members and the inner ends of said outer strike-off members from the frame, the intermediate and outer strike-off members being operatively connected together to operate in pairs, and means for moving one pair of strike-off members oppositely to the other pair transversely of the road.

7. In a road-finishing machine, the combination with the frame, of a strike-off device comprising intermediate strike-off members and outer strike-off members, means for suspending the intermediate strike-off members and the inner ends of said outer strike-off members from the frame, the suspension means providing for individual adjustment of the strike-off members relative to each other to vary the crown of the road, the intermediate and outer strike-off members be-

ing operatively connected together to operate in pairs, and means for moving one pair of strike-off members oppositely to the other pair transversely of the road.

5 8. In a road-finishing machine, the combination with the frame, of a strike-off device comprising intermediate strike-off members and outer strike-off members, said outer
10 strike-off members having curb-forming end portions, means for suspending the intermediate strike-off members and the inner ends of said outer strike-off members from the frame, the suspension means providing
15 for individual adjustment of the strike-off members relative to each other to vary the crown of the road, the intermediate and outer strike-off members being operatively connected together to operate in pairs, and means for moving one pair of strike-off

members oppositely to the other pair transversely of the road. 20

9. In a road-finishing machine, the combination with the frame, of a strike-off device comprising intermediate strike-off members and outer strike-off members, means 25 for adjustably suspending the intermediate strike-off members and the inner ends of said outer strike-off members from the frame, means cooperating with said suspension means to raise said intermediate strike-off 30 members and the inner ends of said outer strike-off members clear of the road, means for raising the outer ends of said strike-off members clear of the road, and means for moving the members forming the device 35 transversely of the road.

In testimony whereof I affix my signature.
GLENWAY MAXON, JR.