

July 6, 1926.

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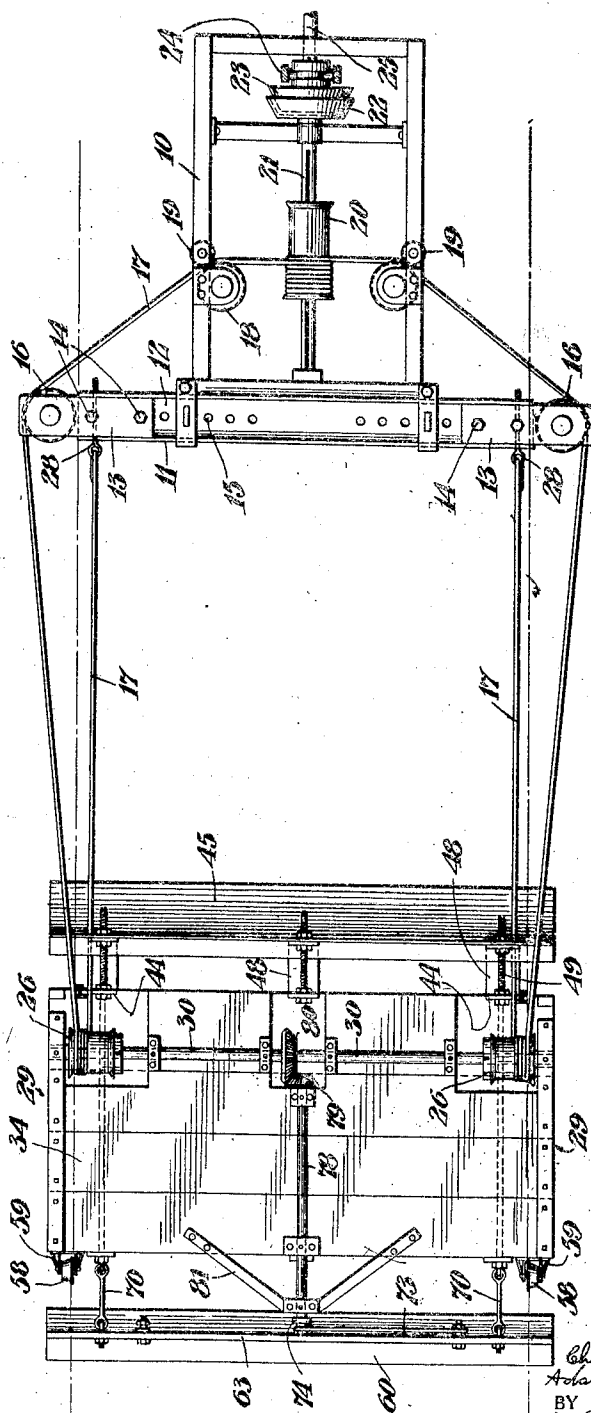
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ROAD MACHINE

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5 Sheets-Sheet 1

Fig. 1.



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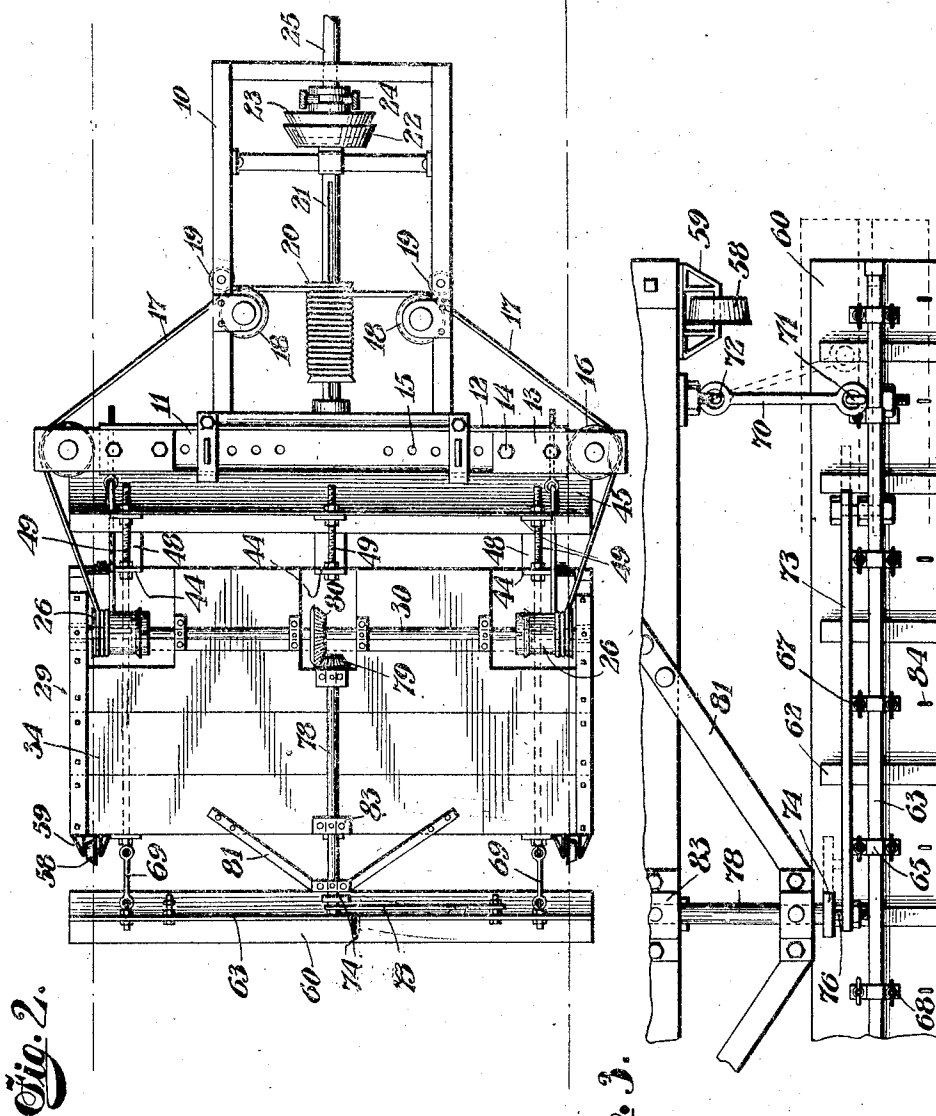
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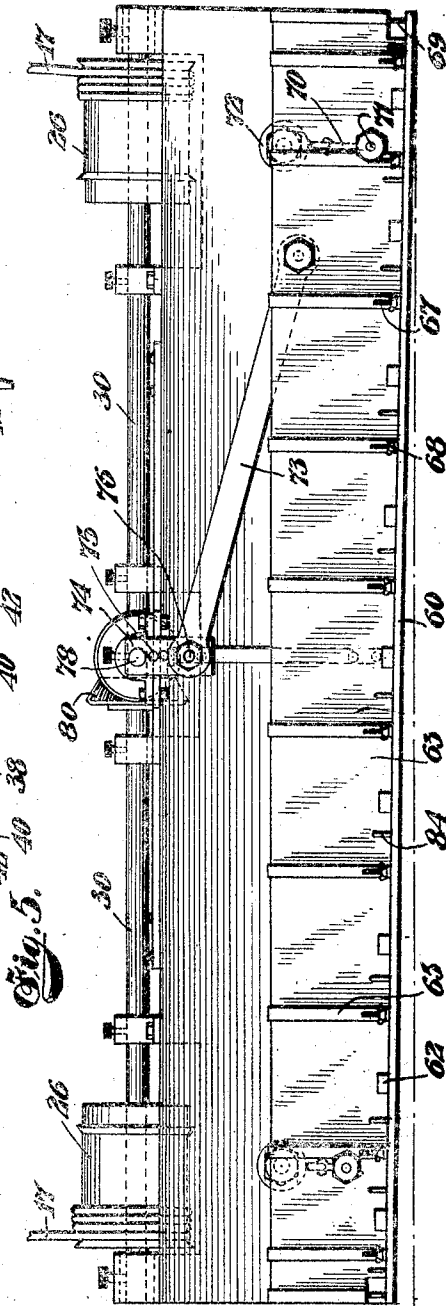
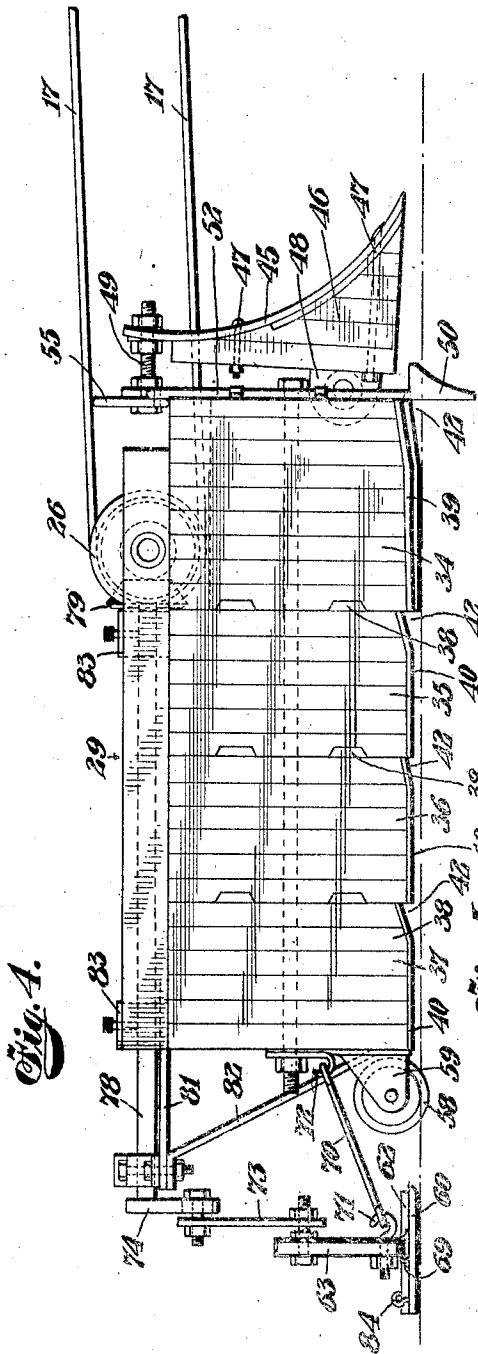
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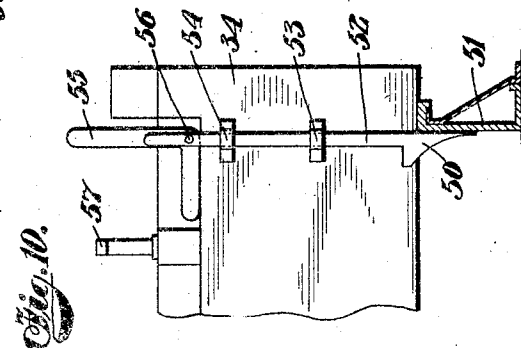
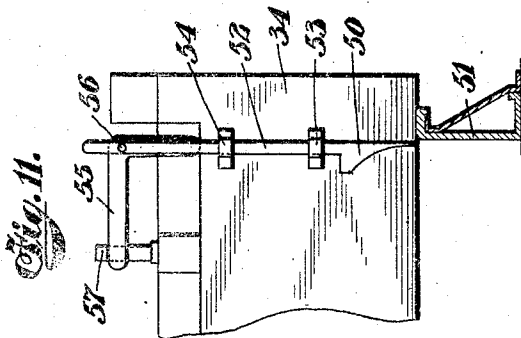
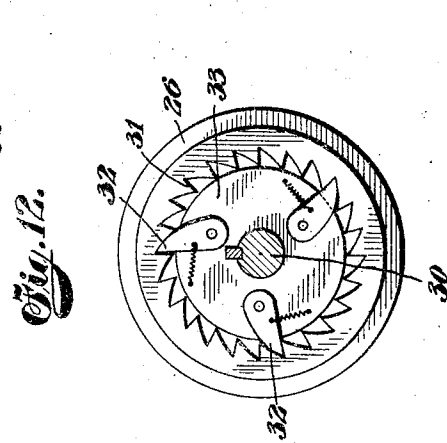
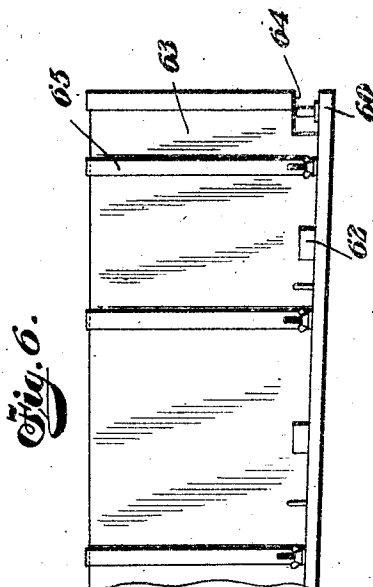
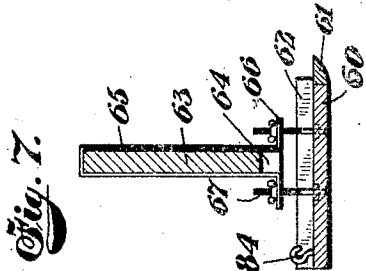
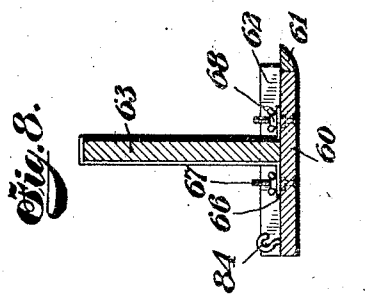
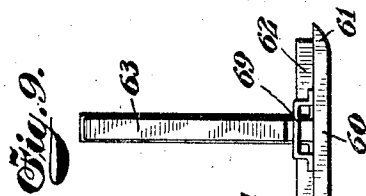
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ROAD MACHINE

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Fig. 13.

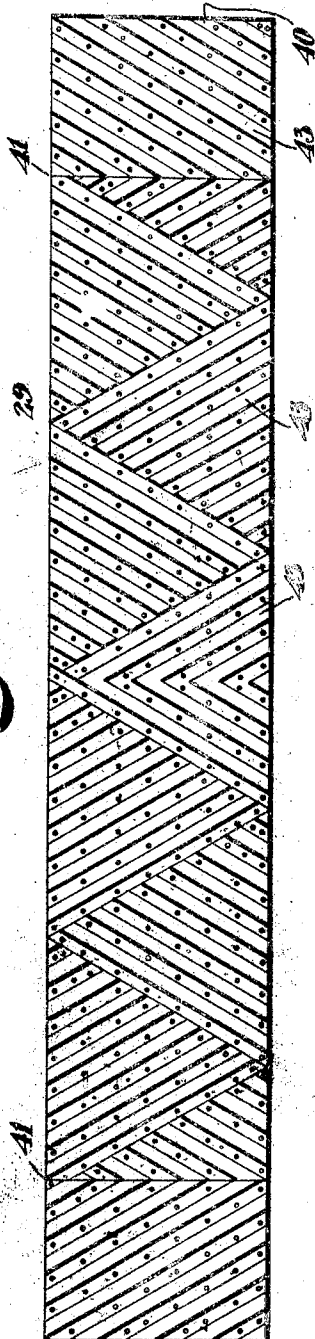
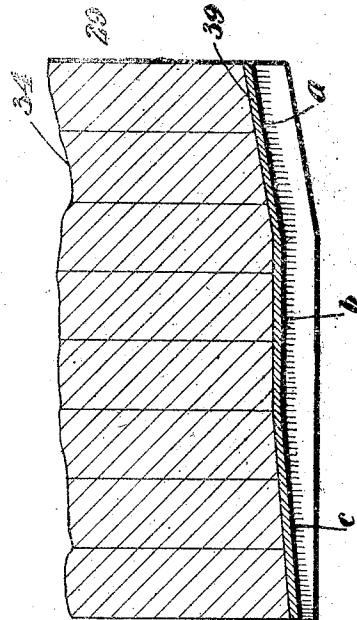


Fig. 14.



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UNITED STATES PATENT OFFICE.

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ROAD MACHINE.

Application filed April 5, 1924. Serial No. 704,401.

Our invention relates to improvements in machines which are used for finishing roadbeds for highways, and the machine is particularly applicable to the finishing of concrete or other cementitious roadbeds. The object of the invention is to produce a strong, simple, easily operated machine, which can be used in connection with standard or other apparatus and in which a drag sufficiently flexible to conform to the roadbed, and sufficiently heavy to make a compact smooth surface, is drawn over the top of the road, and leaves it smooth and compact. This drag can be used in connection with a concrete mixer or the like, or can be connected to some other fixed support in the roadbed, and can be drawn by power from the advance position or from power installed upon said drag, so that as it is drawn forward, it smooths and finishes the road, trims the edges, carries off the surplus water to the sides, and in general acts to do a great deal of finishing work in a short time. The particular advantages of the structure, and the manner in which it is used and operated, will appear more clearly from the description which follows.

Reference is to had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a plan view of the machine showing the drag and driving means somewhat separated.

Figure 2 is a similar view but showing the drag drawn up into close connection with the driving means.

Figure 3 is an enlarged fragmentary plan of one rear corner portion of the machine.

Figure 4 is a side elevation of the drag.

Figure 5 is a rear view thereof.

Figure 6 is a broken enlarged rear elevation of the levelling shoe which follows and is really a part of the drag.

Figure 7 is a cross section of the structure shown in Figure 6, with the web somewhat raised from the body of the shoe.

Figure 8 is a view similar to Figure 7, but with the web and shoe body in close connection.

Figure 9 is a side elevation of the smoothing shoe.

Figure 10 is a detail view showing one of the shares for trimming the roadbed, with the share depressed.

Figure 11 is a view similar to Figure 10 but with the share raised.

Figure 12 is a detail of the form of ratchet which can be used in connection with the means for hauling the drag.

Figure 13 is an inverted plan of one section of the drag showing the corrugated shoe thereof, and

Figure 14 is a detail section showing the conformation of the front section of the drag bottom and shoe.

The drawings are by way of example, and the details of the structure can be departed from quite materially without affecting the invention.

In using the apparatus, the driving mechanism which operates it is located in advance of the main body or drag of the machine, and this can conveniently be a frame 10 which can be secured to a concrete mixer or other substantial support at a desired position on the roadbed, and the frame is provided with a spanner 11 which can conveniently have a body 12 of channel iron with adjustable bracket arms 13 at the ends, these being capable of sliding in the channel iron and being fastened by means of bolts 14 or the like, which extend through the bracket arms and through some of the holes 15 in the bottom of the channel iron. As there are a number of these holes, it will be seen that the length of the spanner can be regulated by adjusting the bracket arms.

The bracket arms 13 carry at their outer ends guide pulleys 16 over which runs the cable 17 which we have shown as a convenient means of hauling the body part or drag of the apparatus. The cable 17 also runs over guide pulleys 18 on the frame 10 (see Figures 1 and 2), and pulleys or wheels 19 can be arranged opposite the pulleys 18 to prevent displacement of the cable. The cable is adapted to be wound on or unwound from a main drum 20 which is keyed to the shaft 21 mounted longitudinally in the frame 10, and this is provided with a cone pulley 22 which frictionally engages a cone pulley 23 on the driving shaft 25, which can be driven from any suitable source of power, and the pulley 23 is moved backward and forward by a fork 24. This structure just described is an ordinary cone clutch, and any other suitable clutch can be substituted for it.

The cable 17 extends rearward and is wound on the drums 26 on the drag 29 (see

Figures 1 and 2), and is then extended forward, and its ends are made fast to a suitable support as for instance the eyes 28 on the spanner 11. When the drum 20 is
 5 turned in one direction, the cable 17 is wound thereon, and drawing from opposite sides of the drag 29 will haul the latter forward over the roadbed until it is close up to the frame as shown in Figure 2. Then
 10 when the frame 10 is advanced, the drum 20 is unwound, permitting the operation to be repeated. This action is facilitated by a suitable ratchet connection between the drums 26 and the shaft 30 on which they are
 15 mounted. This shaft can be arranged in any suitable way, and we have shown it supported at the front upper part of the drag 29.

In Figure 12 is shown a suitable ratchet
 20 connection between the shaft 30 and each drum 26. As illustrated, the drum has a ratchet wheel 31 interiorly attached thereto, and this is engaged by spaced pawls 32 which are pivoted on the hub 33 attached
 25 to the shaft 30. The drag 29 is a heavy body made up preferably in sections 34, 35, 36, and 37, as shown best in Figure 4. Obviously there may be more or less of these sections, or a single section can be used,
 30 but several sections are preferably employed, and they are rather flexibly connected so as to adapt themselves and fit snugly against the road surface which is being finished. These sections can be made in any suitable
 35 way, but we have shown them in the preferred form of heavy laminated planks. Each section has preferably a dovetail connection with the following section as shown
 40 at 38 in Figure 4. The forward section 34 is provided with a shoe 39 which contacts with the road surface, and the following sections have somewhat similar shoes 40. The shoes are preferably made in sections
 45 as shown in Figure 13, where the point of connection is illustrated at 41, so as to facilitate their removal in case one part wears out quicker than another. Each section 34, 35, etc., of the drag, and the corresponding shoe, has a clearance space 42 at the front
 50 edge which permits the surplus water squeezed out of the surface by the heavy drag to flow transversely through these channels thus formed, and be discharged at the sides of the road. The shoes 39 and 40
 55 are also preferably made with intersecting channels 43 (see Figure 13) which gives a corrugated surface adapted to smooth and rub down the top surface of the road under treatment, and permits the water to rise into
 60 the channels so that the bottom surfaces of the shoes will have the best grinding and smoothing effect on the road. The front section 34 of the drag is recessed as shown at 44 to provide space for the drums 26 and
 65 the gears 79 and 80 hereinafter referred to.

At the front end of the drag is an adjustable scraper which is adapted to scoop up and smooth out any surplus material on the road surface, and this has preferably a
 curved face plate 45 which is backed by a
 70 suitable body portion 46, the parts being held together as shown by transverse bolts 47. The lower part of the scraper is pivotally connected by means of brackets 48 with the body of the drag, and the pitch of the
 75 scraper is regulated by means of bolts 49 which are provided with suitable nuts, and which extend through the upper part of the face plate 45 and suitable abutments on the front end of the drag.

At the front corner of the drag just behind the scraper, are trimming shares 50 which are adapted to run along the sides of the road against the formers 51, which are
 80 laid down in the conventional way to determine the road width, and these shares can be moved downward so as to trim the road to the desired depth, or can be raised as preferred. To this end each has a shank
 85 52 working in guide keepers 53 and 54. The shank can be raised up and down by any suitable means, and we have shown a bell-crank 55 pivoted as shown at 56 to each shank, and when the bell-crank is tilted as in
 90 Figure 11 to raise the shank, it can be held by a latch 57. When turned in the opposite direction the bell crank rests on its short arm, and the share 50 moves in its depressed position.

At the rear corners of the drag are also
 100 arranged trimmers which in this case are preferably trimming wheels 58, these being mounted in suitable brackets 59, and they run along and trim the edge of the road. A levelling shoe or follower 60 moves behind the body of the drag as shown in
 105 Figures 1, 2 and 4, and gives a final finishing smoothness to the roadbed. This follower has its front edge beveled upward as shown at 61 in Figures 7 to 9, and it is preferably
 110 provided with transverse stiffening cleats 62 and a vertically movable longitudinal web 63, this being notched at 64 so that the notches will fit over the cleats 62 when the web is moved downward into close contact
 115 with the shoe 60. The web is adjustable, and to this end it is straddled by numerous stirrups 65 having flanges 66 at the bottom which are adapted to abut with the top of the shoe 60, and through which run bolts
 120 67 which are secured in the shoe, and wing nuts 68 fit the bolts or may be used to fasten the web 63 firmly against the shoe as in Figure 8.

The web can be removed from the shoe if
 125 desired, and the shoe has handles 69 at the ends so that workmen may take hold of the handle and move the shoe by hand, and use it as a lever means for special purposes if desired. The shoe or follower 60 is hauled
 130

behind the drag body, and it also has an independent lateral movement. To this end it is flexibly connected with the drag body, and the flexible connection also makes it act better as a smoothing element in finishing the roadbed. Any connection can be made, but we use links 70 which connect with hooks 71 on the web 63 of the follower, and with hooks 72 on the back of the drag. The means illustrated for imparting a lateral movement to the follower include a pitman 73 which is pivoted to the web 63 at one side of the center, and the pitman connects with a crank 74 (see Figure 5). The crank has numerous holes 75 to receive the pivot bolts 76, so that the throw of the crank may be regulated, and the crank is fast to the shaft 78 which is arranged longitudinally on the top of the drag and can be turned in any convenient way. For instance, as by the meshing gear wheels 79 and 80 which connect it with the transverse shaft 30 above referred to. It will be seen that as the shaft 78 turns, the pitman 73 will impart a longitudinal movement transversely of the loose end of the followers 60, and as the latter is also being drawn forward as described, it will finish the road very nicely. The shaft 80 can be supported at its rear end in suitable boxes carried by the braces 81 and 82, and we prefer to have the shafts 78 and 30 provided with adjustable boxes 83 which are not shown in detail, but which are well known, and which can be adjusted to give the shafts the proper bearing and support. We also prefer to provide the follower 60 with hooks 84 or the like, to which burlap or other finishing substance can be attached and drawn behind the follower to give a final finish to the road.

It will be noticed that the inclined shoes of the drag sections enable the drag to impinge upon the road with the best effect, and in Figure 14 is shown the preferred conformation of the shoe of the forward section, where it will be noticed that the front portion is inclined upward as shown at "a", the middle section is substantially level as at "b", and the rear section is inclined downward as shown at "c". This conformation applies more particularly to the bed of the shoe at the base of the channels 43, and the extreme bottom surface is level for the most part, but inclined upward at the front as in the figure referred to.

From the foregoing description it will be seen that it is a simple matter to fasten the frame 10 to some support, preferably a concrete mixer, and that the heavy drag when drawn over the mixture forming the roadbed will serve to smooth it perfectly, will scoop off the surplus material, will carry off the surplus water, and will leave the road in a smooth nice condition.

We claim:—

1. In a road machine, a surface drag comprising a heavy body portion formed of sections flexibly united and following one behind the other, each of said sections having a corrugated under surface. 70
2. In a road machine, a surface drag comprising a heavy body having a corrugated under surface with the channels of the corrugations intersecting. 75
3. In a road machine, a drag comprising a plurality of sections one behind the other flexibly connected and having corrugated shoes and transverse channels. 80
4. In a road machine the drag lying with its full weight upon the ground comprising a plurality of sections having corrugated shoes on the bottom, the sections being flexibly united and having transverse channels on the bottom at points of intersection, and a hinged scraper projecting from the front end of the drag body. 85
5. In a road machine, a drag comprising a heavy body portion lying with its full weight on the road bed and having a corrugated road finishing bottom surface with the channels of the corrugations intersected, and trimming devices at the sides of said body portion. 90
6. In a road machine, a drag comprising a heavy body portion lying with its full weight upon the roadbed having a road finishing bottom surface with transverse drainage channels and corrugations discharging into the channels, and trimming devices at the lower corner portions of the body. 95
7. In a road machine, a drag comprising a heavy body lying with its full weight upon the roadbed and having a road finishing bottom surface, an independent smoothing follower flexibly connected to the rear portion of the drag body and arranged to ride on the road surface, and means for imparting lateral movement to said follower independent of the movement of the drag. 100
8. A road finishing machine comprising a heavy body arranged to lie with its full weight upon a road and having closely following sections flexibly connected one behind the other, with transverse drainage channels at the bottom and at the junction of the sections, and with angular corrugations on the bottom of the sections and connecting with the aforesaid channels. 105
9. In a road machine, the combination with the drag adapted to lie on the road surface, of a smoothing follower behind the drag body, a vertical web adjustably supported on the follower, a rotary shaft on the drag body, and a crank and pitman connection between the aforesaid shoe web and the said shaft. 110
10. In a road machine, a drag constructed to lie bodily upon the ground comprising a heavy body formed of sections following one 115

behind the other and flexibly connected, said sections having bottom surfaces inclined upward at their forward parts thereby forming transverse channels at the junction of the several sections and corrugations at an angle to and connected with the channels.

11. A road machine comprising a surfacing drag lying with its full weight upon the ground, a surfacing member movable with and also independently of the drag body, a driving mechanism anchorable in advance of the drag, and means connecting the drag and driving mechanism for hauling the drag and also imparting independent motion to said movable member.

12. A road machine comprising a surfacing drag lying with its full weight upon the ground, a surfacing member movable with and also independently of the drag body, a driving mechanism anchorable in advance of the drag, a cable connection be-

tween the drag and driving mechanism for hauling the drag forward, and means connecting the cable mechanism and the independently movable member for imparting motion to the latter.

13. A road machine comprising a surfacing drag, lying with its full weight upon the ground, a driving mechanism anchorable in advance of the drag, an independently movable surfacing member connected with the drag, a cable drive operating over a drum on the driving mechanism and drums on the drag whereby the drag drums will be turned and the drag hauled forward, and an operative connection between the independently movable member and the drag drums.

In testimony whereof, we have signed our names to this specification this 29th day of March, 1924.

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