

Dec. 6, 1938.

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2,138,904

ROAD SURFACE TREATING MACHINE

Filed Aug. 12, 1935

3 Sheets-Sheet 2

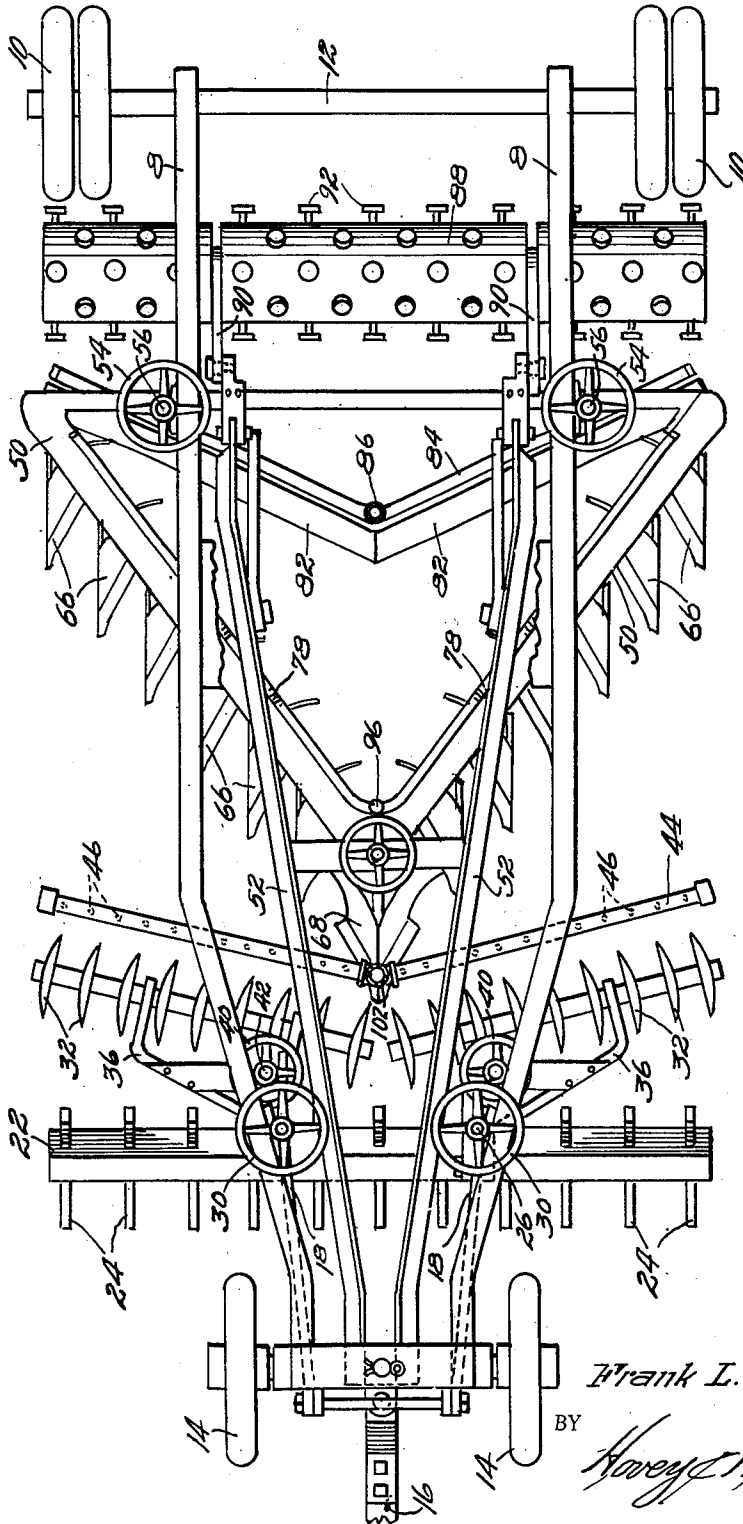


Fig. 2

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Fig. 3

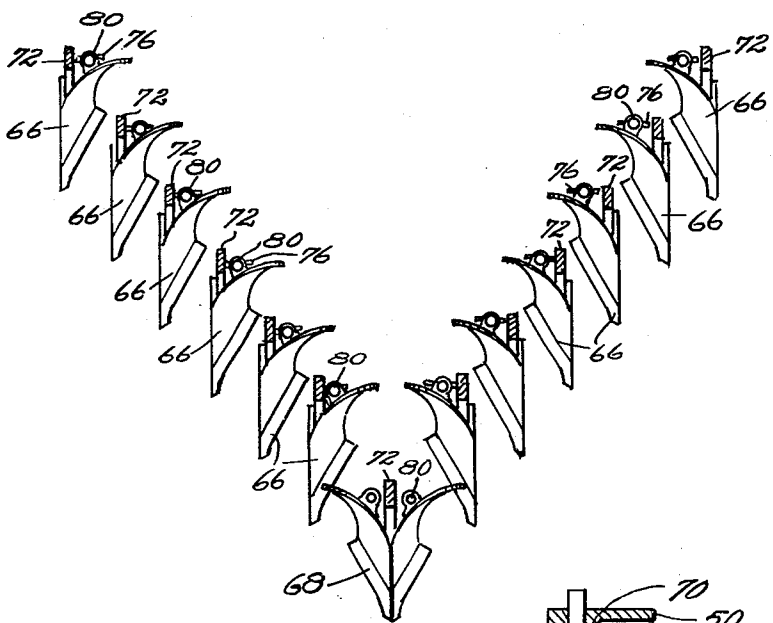


Fig. 4

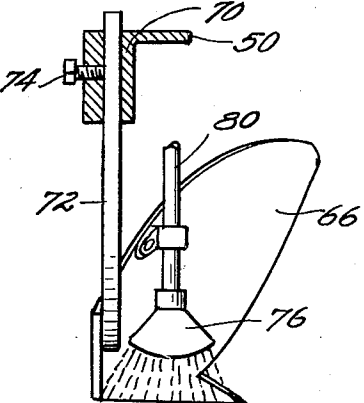
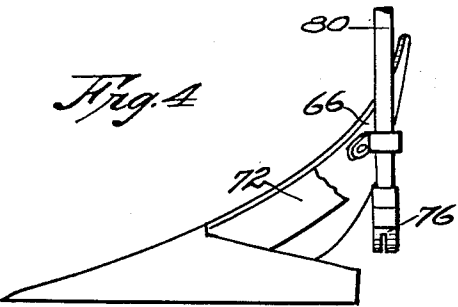
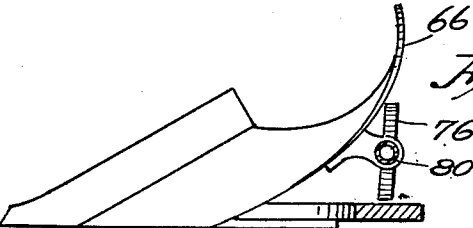


Fig. 5

Fig. 6



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UNITED STATES PATENT OFFICE

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ROAD SURFACE TREATING MACHINE

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14 Claims. (Cl. 94-44)

This invention relates to road surface treating machines of the character especially adapted for preparing what is known in the art as an oil road, and one of the primary objects is the provision of such a machine comprising a combination of specifically formed parts which permits completely producing a finished road surface after one passage of the machine along the road.

A machine embodying this invention is of the general type of that shown and described in my copending application Serial Number 32,847, filed July 24, 1935, for Road making machine, and the improvement over the machine shown in said co-pending application lies principally in the employment of a series of plows disposed in a particular manner and inter-related so that the furrow formed in the roadbed by one plow is filled by roadbed material lifted and deposited by the next succeeding plow, by one subsequent to the deposition of road making material in the said furrow immediately after it has been created.

A yet further object of this invention is the provision of a unique method of treating the surfaces of roadways which comprises forming longitudinally extending furrows, depositing road making material in the bottom of the furrow, filling the said furrow with road material as the next succeeding furrow is formed, and then smoothing the surface of the roadway and, if desired, spraying thereover a layer of road oil or similar material immediately prior to finally tamping the roadway.

A large number of minor objects of this invention will appear during the course of the following specification, referring to the accompanying drawings, wherein one embodiment of the invention has been illustrated, and wherein:

Figure 1 is a side elevation of a road surface treating machine made in accordance with this invention.

Fig. 2 is a top plan view of the same, with parts broken away for clearness.

Fig. 3 is a fragmentary, horizontal, sectional view taken along the line III-III of Fig. 1.

Fig. 4 is a fragmentary, detailed, side elevation of one of the plows and the associated nozzle.

Fig. 5 is an end view of the same, and,

Fig. 6 is a top plan view of one of the plows of the machine.

In constructing the machine, a frame 8 is provided with means for drawing the same along over the roadway and in most instances, this means will comprise wheels 10, disposed at the rear end of the machine and carried by an axle

12, and wheels 14 positioned at the forward end of the machine and having a hitch member 16 secured to the frame intermediate thereof whereby the machine may be fastened to a tractor or the like for the purpose of drawing it along a roadway, the surface of which is being treated.

The numeral 18 designates draw bars that are connected to the forward end of frame 8 through a pivotal connection 20. The rear ends of these draw bars are secured to a transverse member 22 forming a part of the scarifying device which also includes a plurality of forwardly and downwardly inclined teeth 24, each of which is adjustably secured to member 22 in any suitable fashion. Draw bars 18 may be moved toward and from the roadway through the medium of a screw-threaded shaft 26, one of which is associated with each draw bar 18 respectively through the medium of a link 28. A hand wheel 30 in screw-threaded engagement with shaft 26 may be manipulated to raise and lower the respective draw bar and all parts associated therewith.

There are two gangs of discs 32 carried immediately behind scarifying members 24, as illustrated in Fig. 2. These discs 32 are mounted upon shafts 34 that extend outwardly from and at an angle to the longitudinal axis of frame 8 and each gang of discs 32 is connected to a draw bar 18 by an arm 36 that is pivotally mounted to the draw bar 18 at its forward end as at 38. Each gang of discs 32 is individually adjustable up and down toward the roadway surface by a hand wheel 40 in screw-threaded engagement with shaft 42 which is connected at 44 directly to arm 36.

It has been found in handling some soils that it is desirable to first place a coating of oil upon the roadway prior to the next step in the method which the machine performs. In such instances, a transverse header 44, having apertures 46 formed along the bottom thereof, is disposed immediately behind the two gangs of discs 32 and connected to reservoirs 48 in a manner which will hereinafter be more fully set down.

A frame 50 which forms a circumscribing body of substantially triangular nature is mounted upon frame 8 through the medium of a pair of draw bars 52, the forward ends of which are secured to the frame as a whole adjacent front wheels 14 thereof, while the rearwardly extending ends thereof are attached to frame 50 along the rear side thereof. A hand wheel 54 carried by screw-threaded shaft 56 and linked to frame 50 as at 58, allows raising and lowering of beams

52 for the purpose of carrying frame 50 and all the parts bodily toward and from the roadway. This frame 50 may be tilted with respect to the horizontal by a similar device comprising hand wheel 60, threaded shaft 62 and bearing 64. The latter interconnects beams 52 and frame 50 as illustrated. It is obvious that any means for raising and lowering or otherwise adjusting the parts may be employed other than the means just described. It is common in this art to employ pneumatic or hydraulic adjusting mechanism and where the adjustment of the parts is to be controlled from a central cab, such means should be provided.

15 The step in the method of treating the roadway surface which follows discing forms the important part of this invention and the machine illustrated embodies one exemplification of means for creating longitudinal furrows in the roadway and then filling the furrows in a special manner subsequent to depositing road making material in each individual furrow. Frame 50 carries a series of plows 66, one of which is in the form of a double mold board plow 68, which is located at the longitudinal center of the roadway. Plows 66 are arranged in paths extending laterally from the longitudinal center of the roadway and these paths intersect at plow 68. In one form, the plows are arranged in paths which project outwardly and rearwardly of the roadway center and the respective plows of each series is positioned so that one plow will lift and deposit material from the roadbed into the furrow formed by the plow just ahead. Such action takes place during the time the first mentioned plow is forming a furrow in the roadbed.

These plows 66, as well as the central plow 68, are adjustably mounted upon frame 50 as shown in Fig. 5. In order to mount these plows 66 for adjustment, a boss 70 is formed integrally with frame 50 to receive the beam 72 so that it can be engaged by bolt 74 for the purpose of holding the plow per se in the desired position with respect to the other plows of the series and with respect to the normal surface of the roadway.

Each plow is provided with a nozzle 76, specially formed as illustrated in Figs. 4, 5 and 6 so that oil or other road making material may be spread along the entire width of the furrow formed by the associated plow. Each nozzle 76 is connected to a manifold 78 by a branch pipe 80 and this manifold in turn is joined to tanks 48 in a manner to be hereinafter set down. It is obvious that the particular arrangement of plows 66 and 68 might be reversed so that instead of throwing the earth inwardly, the plows may throw the earth outwardly and accomplish the same end. Varying the height of the plows will permit altering the thickness of the surface material which overlies the layer of oil or the like and through the arrangement of plows illustrated, it will be seen that an unfilled furrow will be left along the outer edges of the roadway.

Smoothing scrapers 82, angled rearwardly and outwardly from the longitudinal center of the roadway will draw earth to these unfilled furrows and it is important that rear wheels 10 be arranged so that they will ride over the earth which is moved into the two outside furrows by scrapers 82. A manifold 84 positioned along behind scrapers 82 may be attached to tanks 48 by branch pipe 86 and other means for the purpose of laying on a final coating of road oil or the like.

As a final step in treating the surface of the road, a tamping drum 88 is joined to beams 52 and frame 50 by links 90, all to the end that the

surface of the road is compacted by the plurality of members 92 that form a part of drum 88.

It is possible to treat the road surface with oil or material of different characteristics and the invention contemplates the use of pumps 94 which draw oil from either one of tanks 48 and force it to nozzles 76, header 44, or manifold 84. Plow 68 has two of these nozzles because of the width of the furrow which it forms and branch pipe 96, having a valve 98 therein, supplies oil to manifold 78 as desired. Branch pipe 86 is valved as at 100 to control the flow of oil to manifold 84. Branch pipe 102 joins header 44 and a valve 104 interposed therein allows the operator to control the flow of oil therethrough. The piping arrangement is such that oil from either tank 48 may be pumped to any one of the three zones mentioned, i. e., header 44, nozzles 76 and manifold 84. The use of a double mold board plow 68 insures that the machine will follow a distinct straight line along the roadway and the disposition of plows 66 to each side of the center equalizes the entire machine.

Drawing the machine along the roadway once will create a finished oil road and while a particular combination of parts and specific structures of the said parts are set down, it is understood that many modifications might be made in the machine without departing from the spirit of the invention and scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A machine of the character described comprising a frame; a series of plows mounted on the frame; and means adjacent each plow respectively for depositing road making material along the bottom of the furrow formed by that plow, said plows being arranged in a path extending laterally and rearwardly from a point on the longitudinal center of the machine, whereby the road material moved by each plow is deposited in the furrow made by the adjacent preceding plow.

2. A machine of the character described comprising a frame; a series of flat bottom plows mounted on the frame; and means adjacent each plow respectively for depositing road making material along the bottom of the furrow formed by that plow, said plows being arranged in converging paths meeting at the longitudinal center of the roadway, with their cutting edges in overlapped relation whereby the bottoms of the several furrows are in a continuous plane.

3. A machine of the character described comprising a frame; a series of plows mounted on the frame; and means adjacent each plow respectively for depositing road making material along the bottom of the furrow formed by that plow, said plows being arranged in a path extending at an angle across the longitudinal center of the roadway and in such fashion as to cause the roadbed material raised by any given plow to be inverted and deposited in the furrow formed by the plow next ahead whereby the road-making material in that furrow is covered by roadbed material, whereby a layer of road making material is completely covered by the road bed material.

4. A machine of the character described comprising a frame; a series of plows mounted on the frame in paths extending laterally at an angle to the longitudinal center of the roadway and meeting at said center adapted to move all of the material of said roadway; means adjacent each

plow for depositing road making material along the bottom of the furrow formed by that plow; and a double mold board plow at the meeting point of said paths of plows for the purpose specified.

5 5. A machine of the character described comprising a frame; a series of plows mounted on the frame in paths extending laterally and rearwardly at an angle to the longitudinal center of the roadway and meeting at said center; means
10 adjacent each plow for depositing road making material along the bottom of the furrow formed by that plow; a double mold board plow at the forward meeting point of said paths of plows for the
15 purpose specified; and a means adjacent each mold board of said double mold board plow respectively for depositing road making material along the bottom of the furrow formed by that particular plow.

20 6. A machine of the character described comprising a frame; a series of plows mounted on the frame and positioned so that substantially all the roadbed material from one plow is deposited in the furrow formed by the plow next adjacent thereto;
25 means behind each plow respectively for depositing road making material along the bottom of the furrow formed by that plow prior to the deposition of the road bed material therein; and means for setting said plows at different heights with respect
30 to the normal surface of the roadbed.

7. A machine of the character described comprising a frame; a series of plows mounted in V shaped formation on the frame and positioned so that the roadbed material from one plow is deposited in the furrow formed by the plow next adjacent thereto; means behind each plow respectively
35 for depositing road making material along the bottom of the furrow formed by that plow; means for raising and lowering all of said plows toward and from the roadbed; and means for individually setting said plows in different positions with respect to each other and with respect to the
40 normal surface of the roadbed.

8. A machine of the character described comprising a frame; a V shaped series of plows mounted on the frame and positioned so that the roadbed material from one plow is deposited in the furrow formed by the plow next adjacent thereto; means behind each plow respectively
45 for depositing road making material along the bottom of the furrow formed by that plow; and means for depositing roadbed material in the furrow formed by the last plow of the series whereby to present a smooth surface after one passage of the machine along the roadbed.
50

9. A machine of the character described comprising a frame; a series of plows mounted on the frame and positioned so that substantially all the roadbed material from one plow is inverted
55 and deposited in the furrow formed by the plow next adjacent thereto; means behind each plow respectively for depositing road making material

along the bottom of the furrow formed by that plow; and means for smoothing the surface of the roadbed material behind the series of plows.

10. A machine of the character described comprising a frame; a series of plows mounted on the frame and positioned so that the roadbed material from one plow is deposited in the furrow formed by the plow next adjacent thereto; means
5 behind each plow respectively for depositing road making material on the entire bottom surface of the furrow formed by that plow; means for smoothing the surface of the roadbed behind the series of plows; and means for depositing a coating of road making material over the so smoothed roadbed.
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11. A machine of the character described comprising a frame; means carried by the frame for scarifying the roadbed to a predetermined depth; a series of plows positioned in an inverted V shape to the direction of travel to simultaneously create
15 and fill furrows in the scarified roadbed; means for depositing road making material at the bottom of each furrow respectively comprising a nozzle adjacent each of the plows respectively of said series; means on the frame for smoothing the
20 roadbed surface; means for depositing a coating of road making material over the so smoothed roadbed; and means mounted on the frame for tamping the roadbed.

12. The method of treating the surface of a roadway which comprises forming a furrow longitudinally along the roadbed; depositing road making material in said furrow at the bottom thereof; and subsequently covering said material with roadbed material lifted from the roadbed along
25 a strip of the roadbed immediately adjacent to the said furrow, whereby said road making material is completely covered.

13. The method of treating the surface of a roadway which comprises forming a series of flat bottom furrows longitudinally along the roadbed to produce a planar surface across said roadbed substantially parallel with the surface thereof; depositing road making material in said furrows as they are being formed; and filling each
30 of the furrows subsequent to depositing the said road making material with the roadbed material lifted from the roadbed during the formation of the adjacent furrow.

14. The method of treating the surface of a roadway which comprises forming a series of furrows of different depths longitudinally along the roadbed; depositing road making material entirely across the bottom of each of said furrows as they are formed; and filling each of the furrows
35 subsequent to depositing the said road making material with the roadbed material lifted from the roadbed during the formation of the next adjacent furrow, whereby a layer of road making material is entirely covered by road material entirely across the roadway.
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