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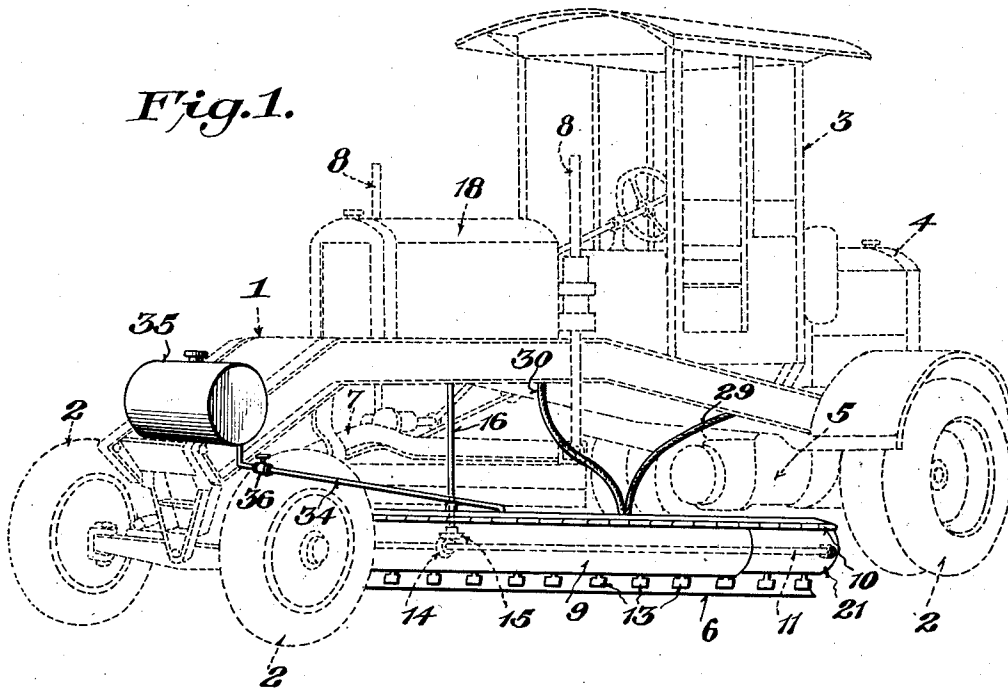
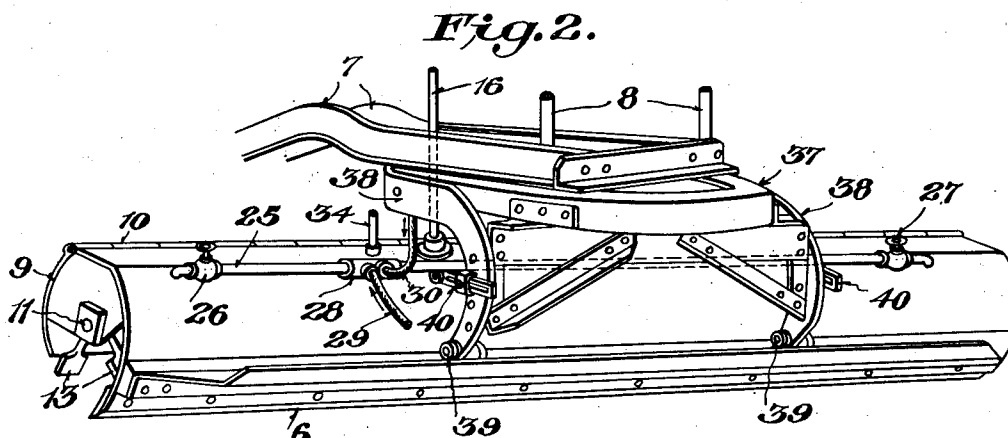
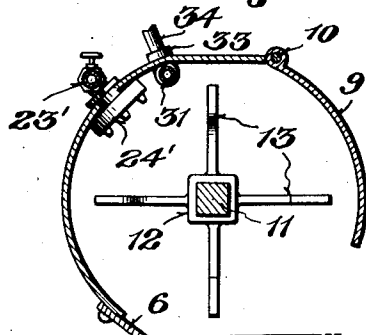
D. W. McLAUGHLIN

1,921,688

ATTACHMENT FOR ROAD TREATING MACHINES

Filed April 15, 1932

2 Sheets-Sheet 1



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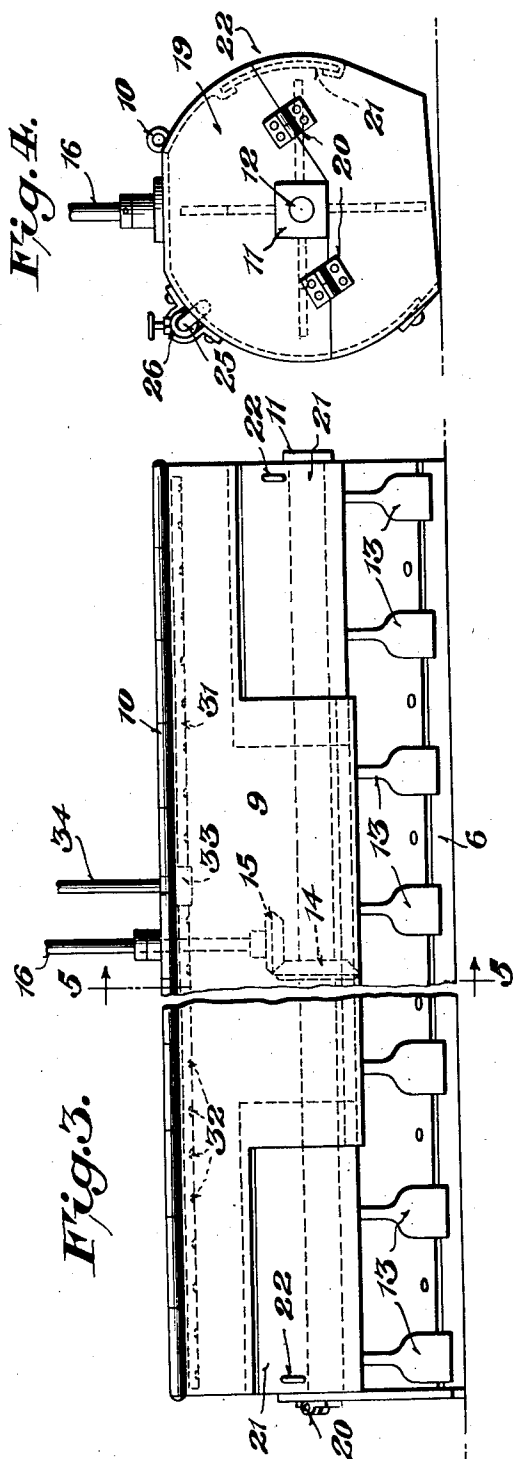
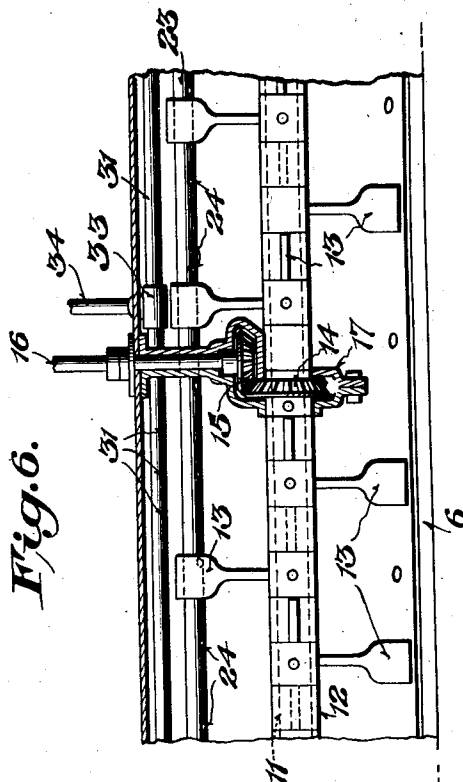
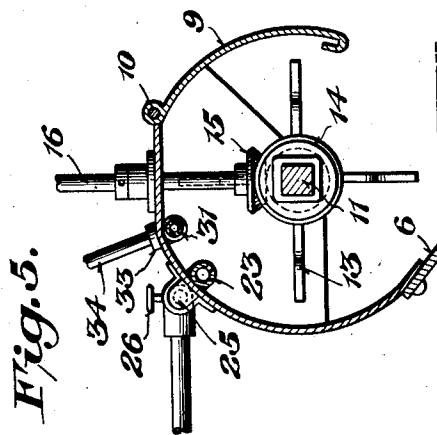
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ATTACHMENT FOR ROAD TREATING MACHINES

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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ATTACHMENT FOR ROAD TREATING
MACHINES

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Application April 15, 1932. Serial No. 605,487

14 Claims. (Cl. 94-44)

This invention relates to attachments for road treating machines; and more particularly to a mixing and drying attachment for such machines and comprises a blade such as commonly used on standard blade grading machines, a shroud or mixing chamber secured to the blade and extending above and forwardly of the blade, rotary means within the chamber for mixing and aerating aggregate gathered by the blade, heating means connected with the chamber for drying and treating the aggregate and means for delivering road treating material to the chamber for admixture with the aggregate; and it further comprises such chamber having openings and closures in the front ends thereof to enable the blade to gather aggregate from windrows, and hinged end portions for said chamber which may be raised during mixing and drying and lowered when spreading aggregate over the road to give a straight edge to the side of the road; all as more fully hereinafter set forth and as claimed.

In mixing and drying aggregate material in situ on the road the practice is to go over the material with a standard blade grading machine. Since at each trip of the machine over the road the blade merely turns the material over, with little mixing, it requires many such trips to obtain the desired result, i. e., a thoroughly mixed and dried aggregate.

It is an object of this invention to provide a mixing and drying device which may be readily attached to a standard blade road grading machine in place of the blade thereof or affixed to the blade and which will thoroughly mix and dry the aggregate on the road with a minimum number of trips of the machine over the road.

Another object of this invention is to provide a mixing chamber in juxtaposition to and in combination with the blade of a road grader with a mixing device such as a rotating shaft carrying a plurality of paddles which will churn and aerate the aggregate gathered by the blade, and to provide means for heating the material being churned in the chamber to quickly dry the same.

Another object of this invention is to provide such mixing chamber with hinged end portions which may be raised during mixing and drying and lowered during spreading of the aggregate over the road to give a straight edge to the side of the road.

In accordance with my invention I provide a road scraper blade with a forwardly and downwardly curved extension forming a substantially cylindrical chamber directly in front of the

blade. The forward portion of this extension extends to within a few inches of the ground, forming a restricted opening to the chamber defined by the lower edge of the scraper blade at the rear and the lower edge of the front wall of the chamber. The extension is hinged at the top so that it may be raised or even removed for purposes of inspection. Each forward end of the extension is provided with a sliding gate which may be opened when the blade is gathering material from a windrow or discharging material to form a windrow. These gates may also be opened to permit unrestricted ingress and egress of air during mixing and drying. Each end of the chamber is provided with a cover, the lower portion of which is hinged so that it may be lowered when the blade is spreading material on the road to serve as a mold board and to give a straight edge to the material deposited on the road. In the chamber formed by the extension to the scraper blade and throughout the length thereof I provide a rotatable shaft carrying a series of mixing paddles. The paddles tumble the material upon itself to expose all the surfaces thereof to the drying action of air. I also provide a heating device in the chamber. This consists of a long perforated pipe or tube connected to a source of hot gases, such as exhaust gases from the internal combustion engine used to propel the grader, or an auxiliary engine for driving the mixing shaft or the exhaust gases from both engines may be used. The pipe is positioned with respect to its perforations to discharge the hot gases directly upon and into the tumbling material to thoroughly dry it. If desirable, burners may be used instead of the hot exhaust gases. In this case, one or more burners are arranged to connect with the chamber to heat the materials therein. The desirability of using some form of heater can be readily appreciated since the presence of moisture prevents proper admixture of road treating material, especially oily material, with the aggregate. During the time the material is being mixed and dried, oil or other road treating substance may be added thereto. This is accomplished by means of a second perforated pipe arranged in the chamber and extending throughout the length thereof. Oil is fed to this pipe from a tank or a reservoir carried by the road grader or drawn along therewith on a separate vehicle, such as a trailer.

In the accompanying drawings, in the several views of which like numerals indicate corre-

sponding parts, I have shown one form of specific embodiment of my invention.

Fig. 1 is a perspective view of my invention applied to a common form of road grading machine showing the machine in dotted lines;

Fig. 2 is a rear view in perspective of my improved mixing device and shows the various connections for heating the chamber and spraying oil therein and the drive shaft connection for rotating the mixing blades;

Fig. 3 is a front elevation of a scraper blade and mixing chamber with a portion broken away, showing in dotted lines the beveled gears for driving the blades and the oil discharge tube;

Fig. 4 is an end elevation of the combined scraper blade and mixing chamber, showing the adjustable mold board;

Fig. 5 is a transverse section taken along line 5-5 of Fig. 3 looking in the direction of the arrows; and

Fig. 6 is a longitudinal section of the central portion of the blade showing the interior arrangement of the mixing chamber.

Fig. 7 is a view similar to Fig. 5 showing a modification of the exhaust manifold.

Referring to the drawings, the road grading machine is provided with the usual arched chassis 1 mounted on wheels 2 and provided with cab 3, from which the operator controls the operation of the machine. The machine is also provided with an engine 4 and transmission gearing 5 for propelling it along the road. About midway between the wheels and directly below the arched portion of the chassis is positioned the scraper blade 6 which is arranged to present itself at various angles across the road. The blade is secured to the chassis at the front by draw bars 7 and at the top by a pair of vertical elevating screws 8. These screws are used to raise or lower the blade and to adjust its depth of cut in the aggregate. The blade is provided with a shroud or cylindrical mixing chamber 9, which extends forwardly and downwardly to within a short distance of the ground in front of the blade. The forward portion of the shroud is hinged as at 10 so that it may be raised if desired for inspection or repair. As shown in Fig. 2 each end of the chamber so formed is provided with a bearing 11 supporting a rotatable shaft 12 carrying the paddles 13. These paddles are arranged so that each alternate paddle retards the conveying action of the other paddles and thus prolongs the period of travel of the aggregate from one end of the mixing chamber to the other. Keyed to shaft 12 at a point about midway between its ends is a beveled gear 14 which meshes with a second gear 15 keyed to drive shaft 16. These gears are enclosed in a housing 17 bolted to the top wall of the mixing chamber as shown in Fig. 6. The drive shaft is connected with any suitable source of power such as motor 18 mounted directly over the blade on the arched frame. It is not necessary to use a separate motor such as motor 18 for driving the mixing blades. Sometimes it is preferable to drive them from the same source of power that is used to propel the machine such as motor 4. Each end of the chamber is provided with a cover 19, the lower portion of which is hinged as at 20 so that it may be lowered when the blade is spreading material on the road to serve as a mold board and give a straight edge to the material deposited. At the front of each end of the shroud

forming the chamber 9 there is a sliding gate 21 provided with handles 22. These are opened by sliding inwardly towards the center of the shroud. When opened these gates enable the ends of the blade to be driven into a pile of material such as a windrow to gather the same without interference from the shroud which otherwise extends to a short distance from the ground.

Within the chamber 9, at the rear thereof and near the top, there is a pipe 23 extending nearly the entire length of the chamber. This pipe is provided with perforations 24 and connects at each end in the rear of the blade to a second pipe 25 provided with valves 26, 27. Pipe 25 is connected at a point, say 28, with flexible metal hose 29 and 30 which in turn connects with the exhaust manifolds of the internal combustion engines 4 and 18. In this way the hot exhaust gases from the engines may be discharged into the chamber to dry the material. Valves 26 and 27 are provided so that the gases may be discharged into either end of the chamber separately or into both ends at the same time if such is to be desired. There is also positioned in the chamber an oil or other material discharge pipe 31 provided with perforations 32 discharging into the tumbling material or gravel. This pipe also extends through practically the entire length of the chamber and is connected to the outside of the blade or shroud through the T 33 to communicate by means of pipe 34 with an oil tank or reservoir 35, which may either be mounted upon the machine or carried as a separate unit by a trailer or other vehicle. Between the tank 35 and the discharge pipe 31 there is positioned a valve 36 which is used to regulate the flow of oil to the chamber. Each of the valves mentioned may be arranged to be controlled by the operator in the cab 3 of the machine, if so desired.

In Fig. 7 is shown a modified exhaust manifold 23' running along the outside of the housing blade 6 instead of inside it as shown at 23 in Fig. 5 and a spreader nozzle 24' is provided in place of holes 24, which may be preferable when more even heating is desired.

The blade and mixing chamber as a unit is attached to and supported by the machine in the usual manner, that is, through a fifth wheel 37 or other arrangement. Yoke 38 secured to the fifth wheel is connected by pivoted pins 39 to the rear of the blade and sliding adjustments 40 on each arm of the yoke hold the blade in the desired vertical or nearly vertical position. All connections with the blade are arranged to permit the customary vertical and angular adjustment thereof.

As described, the combined mixing and drying apparatus may be manufactured and sold as a unit, adapted to be readily attached to any of the usual forms of road grading machinery. Or the combination may be incorporated in the machine as originally built.

The device is adapted to be used wherever a blade scraper or grader is used.

The operation of the machine is as follows: The machine is first driven over the road with the blade adjusted to the proper depth of cut and set at an angle to discharge the gathered aggregate material in a windrow at the side of the machine. The mixing shaft is set in motion to drive the paddles through the material to thoroughly mix and aerate it. At the same time the hot exhaust gases from the engines are dis-

charged into the mass of tumbling material to thoroughly dry it. During this drying process the paddles expose large surfaces of the material to the air to aerate it, evaporate the moisture and carry away the water vapor evolved during tumbling. By suitably adjusting the angle of the blade the speed of the material through the chamber may be controlled. If the material is very damp the blade is set at almost right angle to the road. If the material is only slightly damp the blade should be set at an acute angle with the side of the road. If desired, oily or other road treating substance may be mixed with the aggregate at this time, thereby accomplishing in one operation of the machine over the road what used to require the use of two or more machines traveling over the road several times. If the material on the road is very damp, it is best that it be gone over to heat and dry it before adding the oil.

After the material has been thoroughly mixed and deposited in windrows at the side of the road the gates of the shroud are slid back and the blade raised slightly and set at an angle to gather the material from the windrows and spread it evenly on the surface of the road. Where the far end of the blade travels along the edge of the road the mold board is lowered to deposit the material with a straight edge. It will be noted that during this latter operation the scraper blade does not scrape the surface of the road but acts as a pusher and leveler.

From the foregoing it will be seen that the present device is simple in construction, cheap to manufacture, and very efficient in operation; that its use will result in great savings of time, labor and materials and because of the combined drying and mixing action of the machine a roadway is prepared having a more uniform mixture than any heretofore made.

What I claim is:—

1. In a road surfacing vehicle the combination with a scraper blade of a mixing and treating chamber positioned directly in front of the blade, said chambers substantially enclosing material gathered by the blade, and said blade forming the rear wall of said chamber.

2. The combination with a scraper blade for road vehicle surfacing machinery of a substantially cylindrical mixing chamber, the front wall of said chamber extending downwardly and terminating at a point within a short distance of the ground to substantially enclose material gathered by the blade and confine such material in close proximity to the blade.

3. In combination, a blade for vehicle road surfacing machines, a mixing chamber in juxtaposition with said blade and rotary means within said chamber for mixing material gathered therein, the front wall of said chamber extending downwardly and terminating at a point within a short distance of the ground to substantially enclose material gathered by the blade and to subject such material to the action of said rotary mixing means.

4. In combination, a road scraper blade adapted for use with vehicles for treating roads, a mixing chamber in juxtaposition to said blade and adapted to receive material gathered by said blade, and means for heating the material in said chamber.

5. A vehicle road surfacing machine or the like comprising a scraper blade adapted to be driven over the surface of the road to gather

material therefrom, a mixing chamber carried by said blade, rotary means positioned in the chamber for mixing the material gathered by the blade and a heater also positioned in said chamber for drying the material therein during mixing.

6. A road scraping vehicle or the like comprising a blade adapted to travel over the surface of the road to gather material therefrom, a chamber carried by said blade and arranged to receive said material, means in the chamber for mixing and drying the material and means for adding a second material to the material being mixed.

7. In combination a scraper blade adapted for use in road vehicle surfacing machinery to scrape the surface of a road and deposit the material removed therefrom in a windrow, and a mixing chamber carried by said blade, the front end walls of said chamber being removable to permit said blade to gather material from said windrow for deposit back upon the road.

8. A scraper blade for use with road vehicle surfacing machinery comprising a cutting edge, a substantially cylindrical extension mounted on said scraper blade and extending forwardly and downwardly thereof to a point within a short distance of the plane of said cutting edge, the forward ends of said extensions being provided with inwardly sliding gates to expose the ends of the blade for gathering material from piles.

9. In combination a scraper blade for road vehicle grading machines and the like and a transversely positioned mold board at the end of said blade for molding the side of the road and giving a straight edge thereto.

10. In combination a scraper blade or the like for road grading machines and a transversely positioned mold board pivoted thereto and extending forwardly thereof, said mold board adapted to be raised when not in use and lowered when in use to give a straight edge to the material deposited on the road.

11. Apparatus for surfacing roads and the like comprising a machine adapted to be driven over the road, a scraper blade carried by said machine and arranged for adjustment with the surface of the road, a mixing chamber carried by said blade and arranged to receive material gathered by the blade, mixing paddles operatively arranged in said chamber, means for drying the material being mixed therein, a supply tank carried by said machine and means connecting said supply tank with said mixing chamber for delivering material to said chamber for admixture with the material removed by the blade.

12. Apparatus for building and surfacing roads comprising a scraper blade adapted for attachment to a road vehicle surfacing machine, a mixing chamber carried by said blade, the front wall of said mixing chamber extending downwardly and terminating at a point within a short distance of the ground to substantially enclose material gathered by the blade and hold said material in close proximity to the blade, a discharge device positioned in said mixing chamber and means for delivering oil and like materials to said discharge device for admixture with material in said chamber.

13. Apparatus for surfacing roads and the like comprising a machine adapted to travel over the road, an internal combustion engine

for propelling said machine, a scraper blade carried by the machine and adapted to operate upon the road, a mixing chamber carried by said blade and adapted to receive material removed from the surface of the road by said blade and means for heating the material in said chamber with the hot exhaust gases from said internal combustion engine.

14. In a road surfacing vehicle, a scraper blade, a mixing chamber carried by said blade,

said scraper blade forming the rear wall thereof, rotary mixing means positioned in and enclosed by said chamber for mixing material gathered by the blade, the entrance to said chamber being restricted to a relatively small elongated opening in its lower portion defined by the lower edge of the scraper blade and the lower edge of the front wall of said chamber.

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