

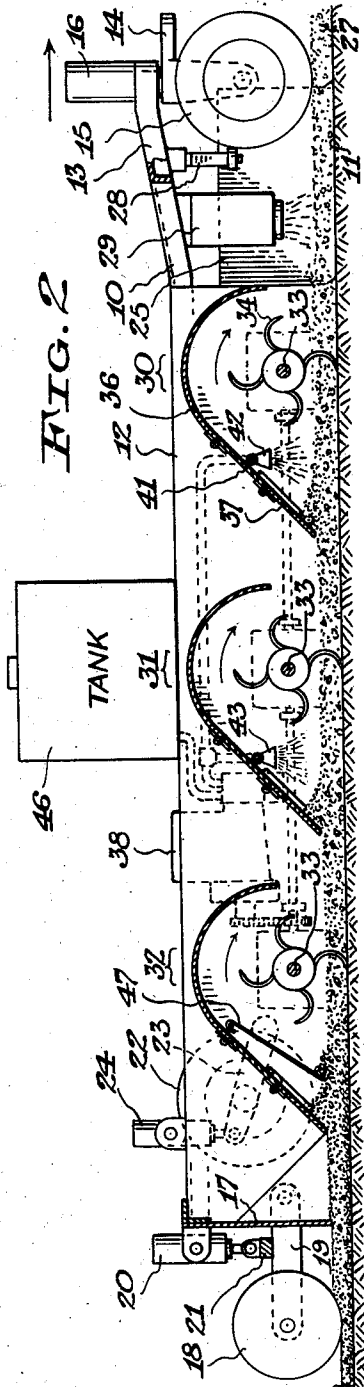
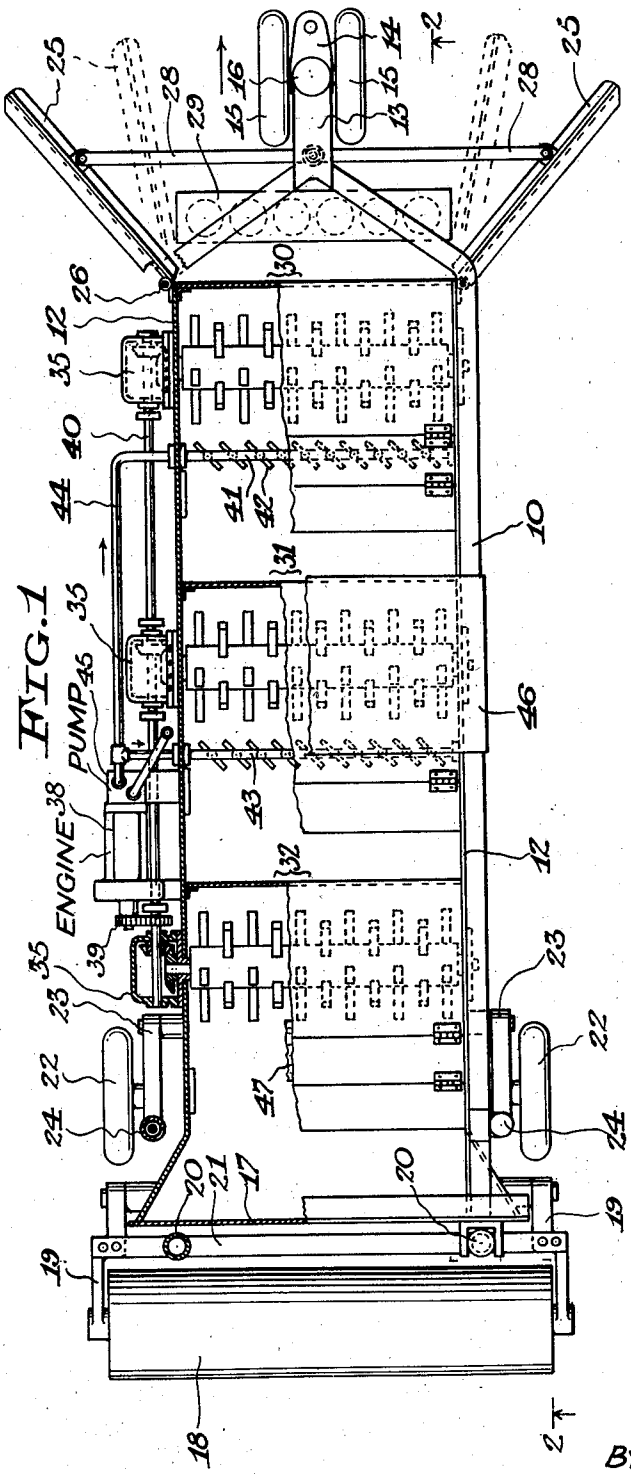
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ROAD BUILDING MACHINE

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## ROAD BUILDING MACHINE

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### 1 Claim. (Cl. 94-44)

The present invention relates to road building apparatus, and has for an object to provide a simple and efficient machine which, during its movement along a roadway, will mix and otherwise treat surfacing material on the roadway to form a paving layer.

Another object is to provide a road building machine by which a fluid binder is effectively and economically applied to the surfacing material while the material is undergoing a mixing action.

The invention further consists in the several features hereinafter described and claimed.

In the accompanying drawing,

Fig. 1 is a top view of a road building machine constructed in accordance with the invention, parts being broken away and parts being shown in section, and

Fig. 2 is a longitudinal sectional elevation taken generally along the line 2-2 of Fig. 1.

In the drawing, 10 designates an elongated frame adapted to be moved over a road surface or roadbed 11 which is to be treated. The frame includes parallel side wall members 12, the lower edges of which normally extend close to the road surface 11. At the front of the frame is a central extension 13 which is supported on a steering truck 14 having a pair of closely spaced pneumatically-tired wheels 15, the truck being swiveled on the extension to swing on a vertical axis, and the frame extension being vertically shiftable on the truck, as by a hydraulic jack or lift 16. The front truck 14 is adapted to be coupled to a tractor or other draft device, not shown. The rear ends of the side wall member 12 are connected by an end wall member 17, the lower edge of which is spaced above the road surface to form a strike-off. At the rear end of the frame is a transversely extending roller 18 spaced rearwardly of the end wall member 17, the roller being pivotally connected at its ends to arms 19, the front ends of which are pivotally connected to the side wall members 12. The rear end of the frame is vertically adjustable with respect to the roller, as by means of hydraulic jacks or lifts 20 engaging a cross bar 21 secured to the arms 19. The roller 18 is adapted to ride on the finished surfacing material, which is processed as hereinafter described, and forms a compacting means for this material.

At their outer sides and near their rear ends the side wall members carry respective pneumatically-tired road wheels 22 which are normally inactive, although, if desired, they may remain in contact with the road surface to provide support for the frame. Each wheel is mount-

ed on a swingable arm 23 pivotally secured to the side wall member and angularly adjusted as by means of a hydraulic jack or lift 24.

To the front ends of the side wall members 12 are pivotally secured the rear ends of respective scraper blades or wings 25 which are swingable at 26 on vertical axes. The scraper blades normally diverge in a forward direction, as seen in Fig. 1, to gather loose surfacing material 27 resting on the roadbed and deflect this material inwardly for entrance between the side wall members of the machine. The scraper blades are suitably retained in angular position, as by releasable brace bars 28 secured to the frame. For road transport of the machine the scraper blades can be swung inwardly, as to the dotted line position shown in Fig. 1. In some cases, the scraper blades may be omitted, particularly if the machine frame is of considerable width, or if the bed of loose surfacing material is restricted in width.

The loose surfacing material usually consists of a mineral aggregate, and in some instances some or all of this material may be obtained by scarifying the old road to a sufficient depth.

Behind the front truck 14, the frame carries a transversely extending heater or burner 29, the flames from which impinge downwardly on the loose surfacing material to heat and dry the same. The heater is used in cold weather and also whenever heating of the surfacing material will facilitate processing.

Mixing devices 30, 31 and 32 extend transversely of the machine frame and are spaced longitudinally of the frame. Each mixing device includes a mixing rotor having a transverse horizontal drum shaft 33 journaled at opposite ends in the side wall members 12, the shaft being provided with numerous forwardly hooked mixing and pulverizing teeth or tines 34. The shafts 33 are rotatable in the direction indicated by arrows and are driven through respective transmissions 35, as of the bevel gear type, secured to one of the side wall members. The tines 34 are resilient or resiliently mounted, and the paths of travel of the outer ends of the tines extend approximately to the road surface or base 11. The mixing rotors are partially enclosed by respective curved hoods 36 which are rigidly secured at opposite ends to the side wall members 12. The downwardly projecting front edges of the hoods are spaced above the bed of surfacing material undergoing processing, and the rear portion of each hood slopes rearwardly and is formed of hinged sections 37 for access to the rotor and for yielding

to obstructions, the lower rear edge of the hood forming a yieldable strike-off. The sloping rear walls of the hood present a material-pulverizing impact surface.

The mixing rotors are power-driven, as by an internal combustion engine 38 carried by one of the side wall members 12, the engine having a gearing connection 39 with a longitudinal drive shaft 40 which is coupled to the bevel gear transmissions 35. The direction of rotation of the mixing rotors is such as to aid the propulsion of the machine.

Under the hood 36 of the front mixing device 30 and to the rear of the associated rotor is a transversely extending spray pipe 41 provided with a series of downwardly directed spray nozzles 42, the nozzles preferably being of the flat type and obliquely arranged to improve distribution. The spray pipe is suitably supported as by attachment to the side wall members 12 of the frame. Preferably a similar nozzle-carrying spray pipe 43 is arranged in like manner under the hood of the middle mixing device 31. The spray pipes are adapted to spray a suitable liquid binder, such as oil or asphalt emulsion, into the surfacing material while it is in suspension and undergoing the mixing action. The spray pipes are connected by piping 44 to an engine-driven pump 45 which draws the liquid from a tank 46 mounted on the machine frame.

In some instances, a grate or screen 47 is pivotally and detachably supported under the hood of the rear mixing device 32, and behind the rotor thereof, to separate the coarser material from the fines. The coarse material is thus automatically placed at the base of the mix.

In setting up the machine for use, the frame 10 is lowered by operating the front wheel jack 16 and rear wheel jacks 24, the rear wheels being usually raised out of contact with the road surface or base 11, as seen in Fig. 2. In this position the lower edges of the side wall members 12 are close to the road surface. The rear compacting roller 18 is lowered by the jacks 20 to rollably support the rear portion of the frame, and may require readjustment after the roller reaches the surfacing material. If desired, the road wheels may remain in contact with the road surface to furnish support for the rear end of the frame. The front scraper blades or wings 25 are swung to the full line angular position of Fig. 1, and are held in place by the brace bars 28.

In operation, the frame 10 is drawn forwardly over the road surface 11 by a tractor or other suitable draft device, not shown. The scraper blades or wings 25 gather the loose surfacing material which has been deposited in a bed on the roadway and deflect it toward the center of the path of the machine. The burner 29 passes over the loose surfacing material to heat the same, and

the material is then subjected to the action of the front mixing device 30. The rotary tines of this mixing device dig into the material and throw it violently against the inner walls of the hood, the material thus being thoroughly mixed and pulverized. The liquid binder sprayed from the nozzles 42 is thoroughly mixed with the surfacing material while this material is in suspension. The surfacing material is then further mixed by the middle mixing device 31 and additional liquid binder is incorporated, after which the material is finally mixed by the rear mixing device 32. When the screen 47 is used, the effect will be to place the coarse material at the base of the mix. The bed of surfacing material, with the incorporated binder, is struck off by the rear end wall 17 of the frame, the action of the striking off being to thin and widen the bed. The surfacing material is finally compacted by the roller 18 to form a completed paving layer or course R. It will be seen that this paving layer is formed in one passage of the machine. The machine may also be used in surfacing other areas, such as airport landing strips and runways. The forwardly diverging scraper blades 25 not only permit a substantial reduction in the length of the mixing rotors but also serve to increase the average thickness of the bed of loose material so as to obtain more efficient operation of the mixing rotors.

For road transport of the machine the frame 10 is raised above the road surface by operating the jack 16 for the front wheels and the jacks 24 for the rear road wheels 22, the latter wheels then supporting the frame. The roller 18 is raised out of contact with the road by the jacks 20, and the scraper blades are swung inwardly. The machine may then be towed at a fair rate of speed.

One specific embodiment of the invention has been shown and described, but it will be understood that changes and modifications may be made therein within the spirit of the invention.

What I claim as new and desire to secure by Letters Patent is:

A road building machine comprising a frame adapted to move over a surface carrying material to be treated, a rotor extending transversely of said frame and having projections for mixing and throwing the material, the lower portion of said rotor being movable rearwardly during rotation, a hood for said rotor, said hood having a downwardly projecting rear wall portion forming a material-pulverizing impact surface and forming a strike-off to the rear of said rotor, and a screen interposed between said rotor and said rear wall portion to limit the size of the pieces of material thrown against said rear wall portion and to cause the smaller pieces passed through the screen to overlie the larger pieces at the strike-off.

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