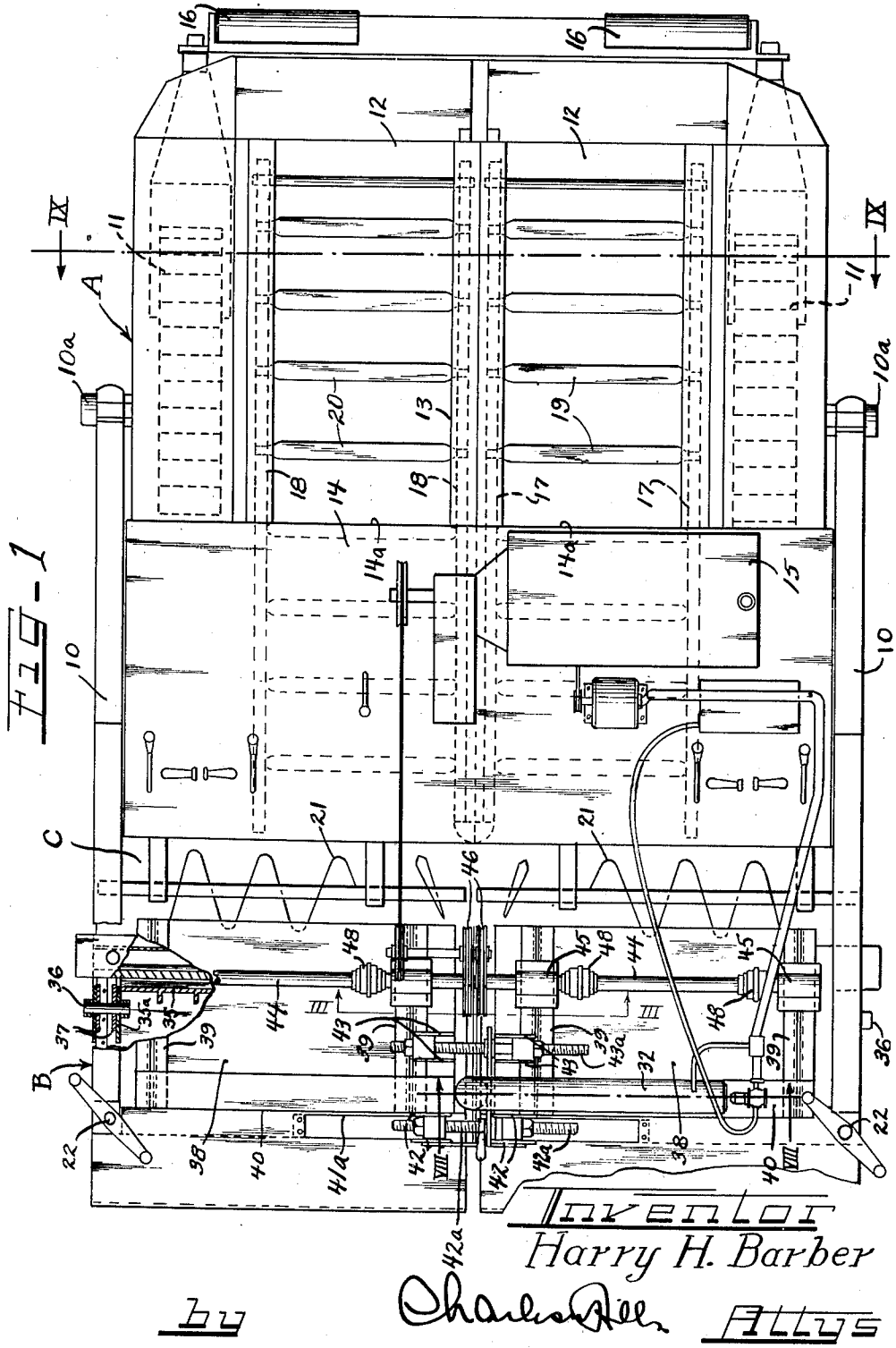
June 20, 1944. H. H. BARBER 2,351,592

TAMPER, SCREED AND DEFLECTOR CONSTRUCTION FOR ROAD FINISHING MACHINES

Filed Aug. 1, 1940 4 Sheets-Sheet 1



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TAMPER, SCREED AND DEFLECTOR CONSTRUCTION FOR ROAD FINISHING MACHINES

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Fig. 2

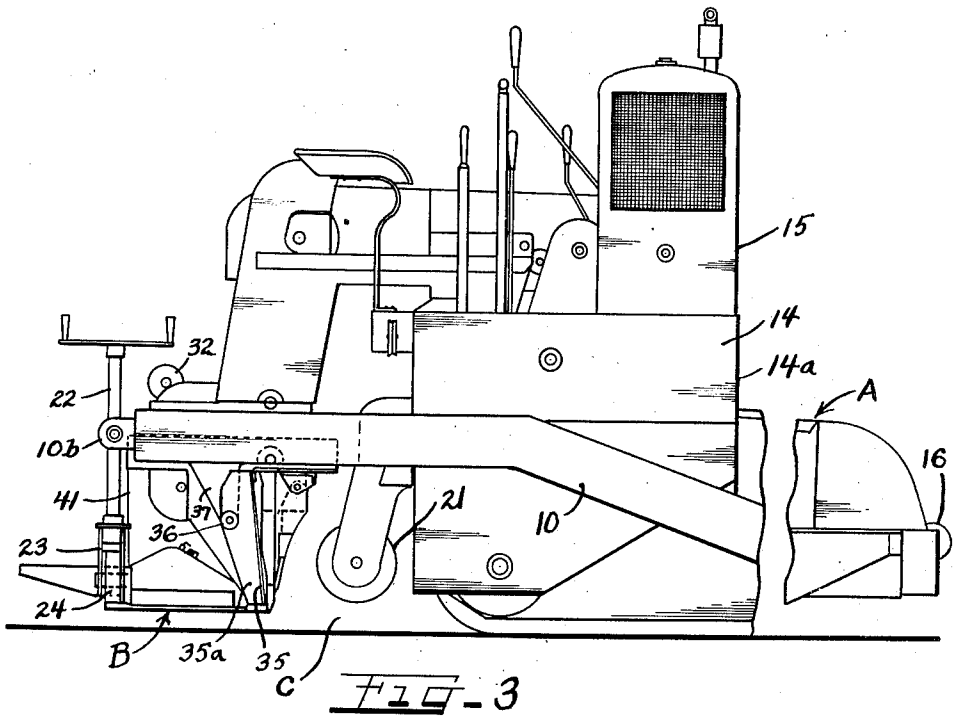
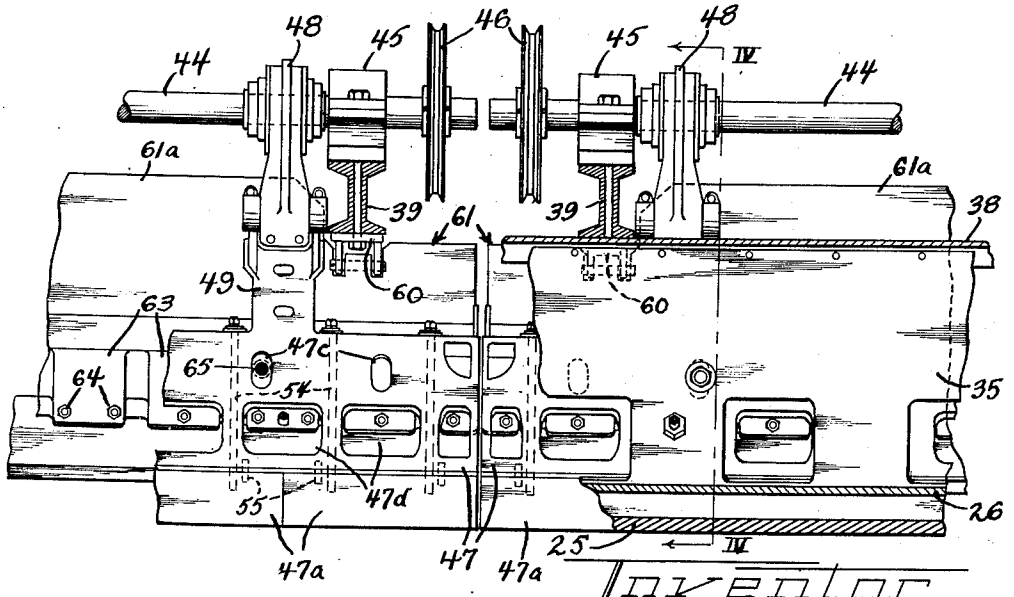


Fig. 3



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TAMPER, SCREED AND DEFLECTOR CONSTRUCTION FOR ROAD FINISHING MACHINES

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Fig-6

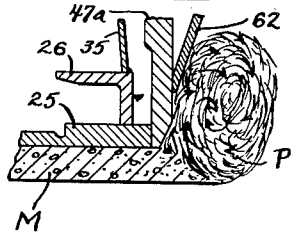


Fig-5

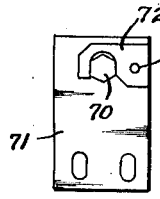


Fig-4

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TAMPER, SCREED AND DEFLECTOR CONSTRUCTION FOR ROAD FINISHING MACHINES

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Fig. 7

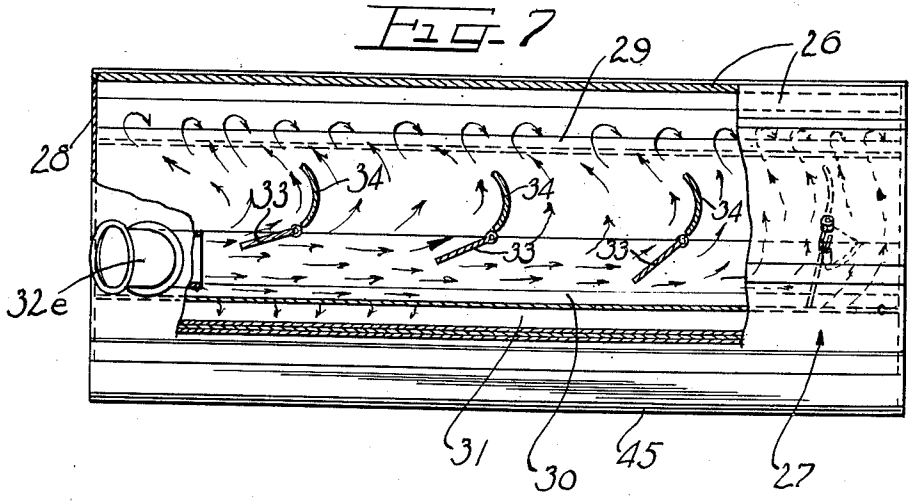


Fig. 8

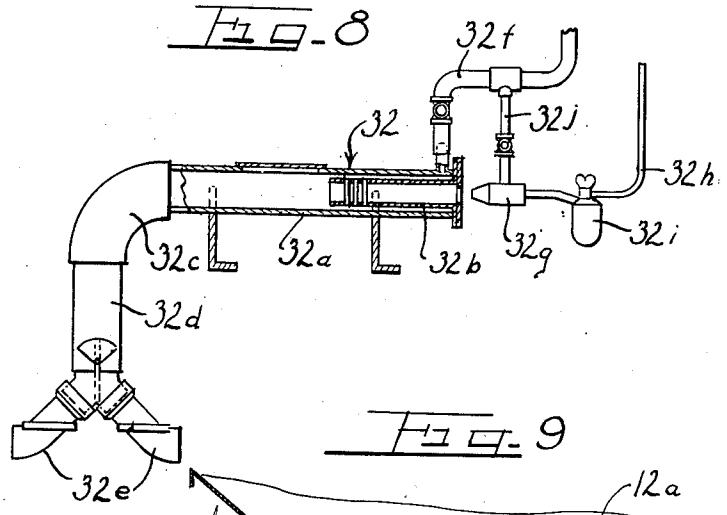
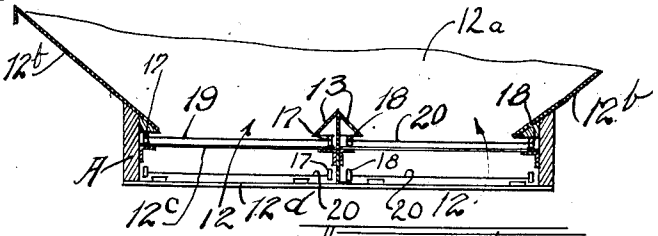


Fig. 9



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Patented June 20, 1944

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UNITED STATES PATENT OFFICE

2,351,592

TAMPER, SCREED, AND DEFLECTOR CONSTRUCTION FOR ROAD FINISHING MACHINES

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Application August 1, 1940, Serial No. 349,037

13 Claims. (Cl. 94—46)

This invention relates to improvements in road finishing machines having tamper and screed assembies whereby adjustments of the tamper are readily made. More specifically, this invention includes the provision of a deflector plate in a road finishing machine and the floating of a tamper between the deflector plate and the screed assembly of the machine.

The invention will be hereinafter specifically described in connection with road finishing machines of the type disclosed in my United States Letters Patent Nos. 2,138,828 and 2,168,507, although it should be understood that the invention is useful on other types of road finishing machines or materials laying machines.

Machines for rapidly laying finished mats of pavement such as pavements of the bituminous aggregate type, generally include a self-propelled unit for laying and spreading the paving material on the roadbed. This unit is trailed by an assembly which acts on the deposited paving material to form a finished mat therefrom. The trailing assembly usually includes reciprocal tampers for compressing the road material and screed assemblies for smoothing and ironing out the compressed material to provide a finished surface thereon.

The tamper acts on the paving material with a high speed vertical tamping action. The present invention now provides a curved deflector plate mounted in front of the tamper to direct the excess paving material squeezed up in front of the tamper so as to impart a rolling motion to the mass of paving material ahead of the tamper. This keeps the paving material ahead of the tamper in a live condition and eliminates the sticking of paving material to sections of the machine above the tamper. The deflector plate of this invention has increased the efficiency of road finishing machines tremendously, especially when the machines are acting on sticky asphaltic or bituminous material.

The high speed vertical stroke of the tamper on road finishing machines has a tendency to impart a pumping action to the paving material at its contact point with the leading edge of the screed, which immediately follows the tamper. When the tamper is equipped with a deflector plate this pumping action also occurs between the deflector plate and the tamper.

The present invention now provides a method of suspending the tamper, the screed and the deflector plate so that the same work together in definite fixed relationship for any particular adjustment, to seal against the pumping of paving material therebetween. The invention also provides easily accessible constructions for spacing the tamper, the screed and the deflector plate, in order to clean out any material that may lodge therebetween.

For initially adjusting the tamper, screed and deflector plate relationship, the tamper is allowed to float between the deflector plate and the screed. Spring tensioned hold-back bolts are provided for pulling the deflector plate toward the screed frame to wedge the tampers therebetween. Compression bolts are also provided on the screed frame to bear against the deflector plate. By adjustment of the compression bolts the deflector plate can be held away from the tampers just sufficient to prevent binding therewith. As wear develops on any of the surfaces contact point clearances can be readily maintained by adjusting the compression bolts.

It is then an object of the invention to provide a deflector plate for the tamper of a road finishing machine.

Another object of the invention is to provide a member immediately in front of the tamper of a road finishing machine to cause paving material ahead of the tamper to roll over and be fed back to the tamper.

A further object of the invention is to provide a road finishing machine which maintains road paving material deposited on the roadbed in a live condition until the same is compressed into finished mat form.

A further object of the invention is to suspend the tampers of road finishing machines between deflector plates and screed assemblies and provide readily adjustable clearance maintaining members to hold the parts in close relation for eliminating leakage of paving material therebetween.

Another object of the invention is to float the tampers of road finishing machines between deflector plates and screed assemblies.

Other objects of the invention will become apparent to those skilled in the art from the following detailed description of the annexed sheets of drawings, which disclose a preferred embodiment of the invention, and in which:

Figure 1 is a top plan view of a road finishing machine including the improvements of this invention and with parts broken away and shown in horizontal cross section.

Figure 2 is a broken side elevational view of the machine shown in Figure 1.

Figure 3 is a fragmentary cross sectional view taken along the line III—III of Figure 1 and more specifically taken along the line III—III of

Figure 4, with parts further broken away to show other parts lying ahead of the broken away parts.

Figure 4 is a vertical cross-sectional view taken along the line IV—IV of Figure 3.

Figure 5 is an elevational view along the line V—V of Figure 4.

Figure 6 is a fragmentary diagrammatic view illustrating the operation of the deflector plate to keep the paving material ahead of the tamper in a live rolling condition.

Figure 7 is a top plan view of the screed housing shown in Figure 4, with parts broken away and shown in horizontal cross section.

Figure 8 is a vertical cross sectional view of the heater, taken along the line VIII—VIII of Figure 1 and showing parts in elevation.

Figure 9 is a vertical cross sectional view of the conveyor platform, taken along the line IX—IX of Figure 1.

As shown on the drawings:

In Figures 1 and 2 the letter A designates generally a self-propelled unit receiving road paving material for depositing on the roadbed. The letter B designates a screed and tamper assembly in trailing relation from the unit A and pivotally connected thereto through side-arms 10. An open bottomed space C is thus provided between the units A and B.

The unit A is mounted on a pair of crawlers 11 and includes a framework defining a paving material receiving platform 12 which, as shown in Figure 9, is bounded by a sloping front wall 12*a*, sloping side walls 12*b*, and a bottom wall 12*c*. The platform is divided centrally by means of a longitudinal wall or skirt 13. An engine platform 14 supporting an engine 15 bridges the platform 12 at the rear end of a unit A. Rollers 16 are rotatably mounted at the forward end of the unit A to engage the rear tires of a truck in order that the unit can push the truck ahead of it as the truck is depositing paving material onto the platform A. Spaced opposed pairs of separately driven conveyor chains 17 and 18 trained between the front and rear ends of the platform 12 carry flights 19 and 20 across the bottom of the platform. The pair of chains 17 carry the flights 19 therebetween while the pair of chains 18 carry the flights 20 therebetween. Thus each flight 19 and 20 extends from one side of the platform to the central portion thereof under the dividing skirt 13. The pairs of chains 17 and 18 have upper runs over the bottom 12*c* and lower runs over a drag pan 12*d* (Figure 9) spaced below the bottom 12*c*. The flights can be driven at different speeds for feeding material out of the rear end of the unit A into the space C at different rates of delivery on opposite sides of the machine if desired. This control is desirable when the roadbed requires the building up of a mat thereon having one side thicker than the other side. The forward wall 14*a* of the platform 14 can have adjustable vertical gates thereon to act as slicers for leveling off paving material conveyed under the platform by the flights.

Spreader screws 21 are mounted at the rear end of the unit A above the bottom of the space C to spread out the material dumped into the chamber by the flight conveyors 19 and 20.

The forward ends of the arms 10 are pivoted to the unit A as at 10*a*. The rear ends of the arms 10 have rearwardly projecting brackets 10*b* thereon receiving vertical screw rods 22 therethrough. The lower ends of these screw rods are pivotally linked, as at 23 (Figure 2) to a channel beam 24 forming the rear wall of the screed assembly B.

The screed assembly B is composed of two units pivotally connected together at the transverse center of the assembly and pivoted at their outward rear ends, as at 23, to the screw rods 22. Each screed assembly includes a flat screed plate 25 (Figures 3 and 4) adapted to ride on the pavement laid by the machine and to smooth and iron out the pavement surface. The rear ends of the screed plates have rear walls provided by channel beams such as 24. The fore-ends of the screed plates have angle beams 26 forming front walls therefor.

Housings including top walls 27 and side walls 28 bridge the spaces between the beams 24 and 26 to provide a heating chamber above each screed plate 25. Each chamber is divided longitudinally by a dividing wall 29 into an upper compartment 30 and a lower compartment 31. Hot air from a screed heater 32 is supplied to the inner ends of upper compartments 30 in streams directed toward the outer ends of the compartments. Adjustable baffles, such as 33 (Figures 4 and 9) and fixed baffles, such as 34, spaced along the length of the upper compartment 30 slice off hot air from the heater 32 and deflect the same forwardly around the leading end of the dividing wall 29. The baffles 23 are mounted on turn shafts pivoted in the top wall 27 and in the dividing wall 29 as shown on Figure 4 and can be swung like dampers in the chamber 30 to slice off a desired amount of the air stream to deflect the same along an adjacent fixed baffle 34 to the leading end of the wall 29. The air then passes directly over the screed plate 25 and out of holes 24*a* in the rear wall beam 24.

The heater 32, as shown in Figure 8, is composed of an outer pipe 32*a* and an inner pipe 32*b* telescoped into one end thereof. The other end of the pipe 32*a* receives an elbow 32*c* on a vertical pipe 32*d* receiving branch pipes 32*e* in the lower end thereof. Each branch pipe 32*e* is joined with the upper compartment 30 of a housing as shown in Figure 7 to supply the same with hot gases as explained above.

Compressed air is fed from a pipe line 32*f* into the pipe 32*a* around the pipe 32*b*. A flame from an oil atomizer 32*g* is projected into the inner pipe 32*b*, heats the pipe to preheat the air in pipe 32*a*, and is then admixed with the preheated air to flow therewith into the housing compartments 30.

Oil is fed to atomizer 32*g* through tube 32*h* and filtered through filter 32*i*. Atomizing air can be fed through branch pipe 32*j*.

A front wall plate 35 is welded to the angle beam 26 and has rearwardly extending side flanges 35*a* on each side thereof, receiving pivot pins 36 (Figures 1, 2 and 4) therethrough carried by brackets 37 depending from the side arms 10. The screed assemblies B are thus supported from the side arms 10 through the brackets 37, pins 36, and flanges 35*a* of the front wall 35 of the screed.

The front wall plate 35 of each screed unit carries a top wall plate 38 at a level under the side arms 10 (Figure 4). Each top wall 38 supports two short longitudinal beams 39 (Figures 1 and 4). The rear ends of these beams 39 extend into channels formed by the downturned rear ends of other top plates 40. The rear ends of the plates 38 are supported through posts and struts from the rear walls 24 of the screed (Figures 1 and 2). Posts 41 and struts 41*a* support opposed pairs of brackets 42 independently of the walls 38 and 40 (Figure 1).

Opposed pairs of brackets 43 supported on top of the inner pair of beams 39 have plate connections with the inner abutting ends of the screed plates 25 at the hinge joining the plates together (not shown). Screw rods 42a and 43a, respectively, join each opposed pair of brackets 42 and 43 (Figure 1).

From this description it should therefore be understood that the screed assembly consists of right and left hand screed units which are suspended at their outer rear corners from the side arms 10 of the machine through the screw rods 22 and which are suspended at their forward outer ends through pivots such as 36 carried in brackets depending beneath the arms 10. The units are hinged together at their inner abutting ends and are maintained in rigid condition by screw rods 42a and 43a (Figure 1) which bridge the inner ends of the units. These screw rods can be operated to tilt the units on their outer pivots so as to crown or otherwise change the contour of the road being laid.

Tamper drive shafts 44 are rotatably mounted in bearings such as 45 (Figure 1) carried by the beams 39. Two separately driven tamper shafts 44 are provided, one for each screed unit. These shafts are driven through pulley and belt connections such as 46 from the engine 15.

Two tamper plates 47 are provided, one for each screed unit. These tamper plates 47 are hung from eccentric straps 48 on the drive shafts 44. As shown in Figure 4, each tamper plate 47 has arms such as 49 projecting upwardly therefrom and receiving pins such as 50 carried by the eccentric straps 48. The plates 38 have apertures 38a therethrough to receive the arms 49. The top ends of the arms 49 have horizontal leg portions 49a receiving pins such as 50a through the ends thereof. These pins 50a are carried by links such as 51 which are pivoted by means of pins 52 to brackets 53 carried by the top plates 38. This mounting holds the tampers in vertical alignment, since the eccentric straps 48 will raise and lower the pins 50 to vibrate the tamper. At the same time, the legs 49a of the tamper arms will raise the pivots 50a but these pivots 50a are connected through movable links 51 with fixed pivots 52. Since the pivot pin 50 can swing toward the fixed pivot pin 52, and since a flexible link connection is provided between the pin 50 and the pin 52, the tamper 47 can be swung away from the front wall 35 of the screed assembly.

As shown in Figures 3 and 4, each tamper plate 47 carries a plurality of tamper bars 47a on the bottom end thereof. The bars 47a are held rigidly to this bottom end through long bolts 54 extending from the top through the bottom of the tamper plate. Small pins such as 55 (Figure 3) are received in recesses formed in the tops of the bars 47a and in the bottoms of the tamper plates 47 to hold the bars in alignment. As shown in Figure 4, the leading lower edge 47b of each tamper bar is beveled inwardly so that it will progressively compact road material spread thereunder and feed partially compressed material to the flat bottom edge of the tamper bar.

The tamper bars 47a can be replaced with new bars when worn, or the bars 47a can be dismounted for regrinding of the active edges thereof.

The tamper plates 47 have an upper row of spaced apertures 47c therethrough and a lower row of larger apertures 47d therethrough. These apertures, it will be noted, lighten the weight of the tamper plates, serve as cleanout holes, and have a still more important function of permitting passage of adjusting bolts therethrough.

The beams 39 support brackets 60 on the under sides thereof as shown in Figures 3 and 4. Deflector plates 61 are pivotally suspended from the brackets 60 in front of the tamper plate 47. Each deflector plate 61 includes a vertical wall portion 61a extending up between the side arms 10. As shown in Figure 3, the inner ends of the walls 61a are cut down so as to pass under the beams 39. The deflector plates 61 also have curved lower portions 61b (Figure 4) receiving at their bottom end heavier deflector wear plates 62. Brace members 63 are welded to the rear faces of the curved wall portion 61b and depend beneath the lower ends of the wall portion to receive screws 64 therethrough which secure the deflector wear plate 62 to the brace members 63 and position the upper edge of the wear plate against the lower edge of the wall portion 61b.

The top portions of the braces 63 are also apertured to receive long bolts 65 therethrough. These bolts 65 extend through the apertures 47c in the tamper plate in spaced relation from the plate and extend through the front wall plate 35 of the screed assembly, as best shown in Figure 4. Coiled springs such as 66 are disposed around the bolts 65 between the plate 35 and adjusting nuts 65a on the ends of the bolts. The springs 66 pull the deflector plates toward the screed walls 35 and cause the heavy plates 62 to abut against the tamper bars 47a as shown in Figure 4.

Nuts such as 67 are welded to the rear face of the screed wall 35, as at 68, and receive bolts 69 therethrough. These bolts 69 are adapted to be urged against the lower ends 63a of the deflector plate braces 63. Extension rods 70 are secured to the head ends of the bolts 69 and pass through plates 71 carried by the screed housing 27. These rods 70 can be of hexagonal shape for ready gripping with a wrench to turn the same. The rods serve as extensions for the bolts 69 to facilitate rotation of the bolts. As shown in Figure 5, the plate 71 can carry a latch member 72 adapted to be dropped over the rod 70 for holding the same against rotation. The latch 72 is pivoted to the plate 71 as at 72a.

Since the deflector plate 61 and the tamper 47 are swingably mounted and must operate in definite relation to the front edge of the screed plate 25, the above-described adjusting bolt makes possible an easy adjustment of the parts to maintain operative clearances and yet at the same time to prevent road material from being pumped by the tamper between the tamper and front wall of the screed, as well as between the tamper and the deflector.

For example, the tamper is first held tightly between the deflector plate and the forward edge of the screed plate by the springs 66. The adjusting bolts 69 are then rotated to back off the tamper plate 62 from the tamper bars 47a just a sufficient amount to allow for operating clearances without causing excessive wear between the parts. As wear does develop between the parts the adjusting bolts 69 can be reversed to again allow the springs 66 to urge the deflector plate toward the screed wall 35 and thus decrease any clearances between the parts caused by wear.

When it is desired to open up the parts for cleaning, the nuts 65a can be taken off of the bolts 65 so that the deflector plate can be swung forward. Any paving material behind the deflector plate can be then cleared out. The tamper

bar can also be swung forward, to a certain extent, and any material lodged between the tamper bar and the front wall of the screed can be removed through the apertures in the tamper plate.

As shown in Figure 6, the deflector **62** receives paving material P that is forced upwardly by the tamper **47***a* and rolls this material over so that it drops down and is again fed to the operating edge of the tamper. This deflector plate keeps the paving material P in a live condition and prevents the same from adhering to the tamper plate.

From the above description it should therefore be understood that this invention now provides a new member for a road finishing machine which keeps the paving material in a live condition and repeatedly feeds the same to a tamper or compressing means. The invention also provides improved suspensions and adjustments for a tamper of a rod finishing machine and makes possible the floating mounting of the tamper between a deflector plate and a screed.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention, and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. In a road finishing machine, a pair of side arms, a screed assembly pivotally supported from said side arms, a tamper assembly immediately in front of the screed assembly, eccentrics carried by the screed assembly for moving the tamper assembly in a vertical direction, a deflector plate assembly in front of the tamper assembly, pivot supports on the screed assembly for said deflector assembly, spring means engaging the screed assembly and the deflector plate assembly for urging the deflector assembly toward the front end of the screed assembly to mount the tamper assembly therebetween, and clearance control devices between the screed assembly and deflector plate assembly for resisting said spring means to maintain operative clearance between the deflector assembly and the tamper assembly.

2. In a road finishing machine including a self-propelled unit for depositing road paving material on the roadway, a pair of side arms pivotally connected to said self-propelled unit and extending rearwardly therefrom, spaced screed and deflector plate assemblies suspended from the rear end portions of said side arms in spaced trailing relation from the unit to act on the road material deposited by said unit, a tamper assembly suspended from said side arms between the screed and deflector plate assemblies, and readily adjustable means acting between the screed and tamper assemblies for maintaining all of the assemblies in operative relation to each other.

3. In a road finishing machine, the improvement which comprises a tamper plate, a row of abutting tamper bars suspended longitudinally in end to end relation from the bottom of said tamper plate, and bolts extending through the tamper plate into said bars for detachably holding the bars on said bottom whereby the bars can be selectively replaced when worn or damaged.

4. In a road finishing machine, the improvement which comprises a tamper plate, arms extending upwardly from said tamper plate each having a pin receiving aperture at the upper end thereof an eccentrically driven pin in each aperture to reciprocate the plate, an offset leg portion on each arm, a pin receiving aperture in each leg portion, and mounting link carried pins in said leg apertures whereby the plate can be swung as well as reciprocated.

5. In a road finishing machine, a tamper plate, said plate having upper and lower rows of apertures therethrough, bolts extending from the top through the bottom of said plate along the length thereof between the apertures in each row, the bottom end of said plate having recesses therein, pins seated in said recesses and extending beneath the plate, and a row of abutting tamper bars having recesses in their upper ends receiving said pins, the projecting ends of said bolts being threaded into said bars for fixedly suspending the bars on the bottom edge of the plate.

6. In a road finishing machine, a tamper plate, a row of aligned abutting tamper bars fixedly and detachably united along the bottom edge of said plate to extend in end to end relation lengthwise of the plate and each of said bars having a beveled forward bottom edge.

7. In a road finishing machine including a tamper and screed assembly, the improvement which comprises a deflector plate pivotally suspended in front of said tamper assembly, a detachable rigid plate on the lower end of said deflector plate and means holding said rigid plate in sealing relationship with the active bottom end of the tamper assembly.

8. In a road finishing machine including a pair of laterally aligned screed units and a pair of laterally aligned tamper plates each eccentrically mounted in front of a screed unit, the improvement which comprises a pair of deflector units, each pivotally suspended in front of a tamper plate, and spring means acting on the deflector plates for urging said deflector units toward said tamper plates.

9. In a road finishing machine having a self-propelled forward unit for depositing paving material on the roadway and a pair of side arms pivotally mounted on said unit and extending rearwardly into spaced relation from the rear end thereof, the improvements which comprise a screed assembly pivotally supported from said side arms, said screed assembly having a front wall beneath said side arms, an apertured tamper plate eccentrically suspended in front of said front wall, a deflector plate pivotally suspended in front of said tamper plate, bolts extending from said deflector plate through apertures in said tamper plate and through said front wall of the screed unit, coil springs disposed around said bolts rearwardly of said front wall, nuts on said bolts for adjusting the compression of said coil springs, adjusting bolts threaded through said front wall and extending through apertures in said tamper plate for engaging said deflector plate, and means for rotating said adjusting bolts to act against the pressure of said coil springs for maintaining operative clearance between the deflector plate and the tamper plate.

10. In a road finishing machine, a screed unit having a front wall, a deflector plate unit mounted in front of said front wall in spaced relation therefrom, a tamper unit suspended in the space between the front wall and deflector plate, and adjusting bolts carried by said front wall for acting on said tamper and deflector plate units to hold the same in operative relation relative to said front wall and to each other.

11. In a road finishing machine including a tamper mounted on the machine for reciprocal

movement relative thereto, tne improvements which comprise a deflector plate mounted on the machine immediately in front of the tamper, and adjustable means on the machine holding a portion of said deflector plate in sealing relation with the tamper.

12. In a road finishing machine including a tamper and screed assembly having a vertically reciprocable tamper for tamping road material and a screed plate for riding on the tamped road material, the improvements which comprise a deflector plate mounted on said machine immediately in front of the tamper and extending upwardly and forwardly from the active end of the tamper, and means on the machine holding the lower end of the deflector plate in sealing relation with the active end of the tamper to prevent pumping of road material between the tamper and plate whereby excess road material deposited in front of the tamper will be rolled over by said plate and kept in a live condition.

13. In a road finishing machine including a tamper and screed assembly having a reciprocal tamper with an active end for tamping road material and a front face adjacent said active end together with a screed plate for riding on the tamped road material, the improvement which comprises a deflector plate mounted on said machine and converging from a point in spaced relation ahead of the tamper to a point immediately adjacent said front face of the tamper to be in substantial sealing relation with the tamper whereby excess road material deposited in front of the tamper will be rolled over by said plate, fed back to the tamper, and prevented from being pumped between the tamper and plate by the substantial sealing relation therebetween.

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