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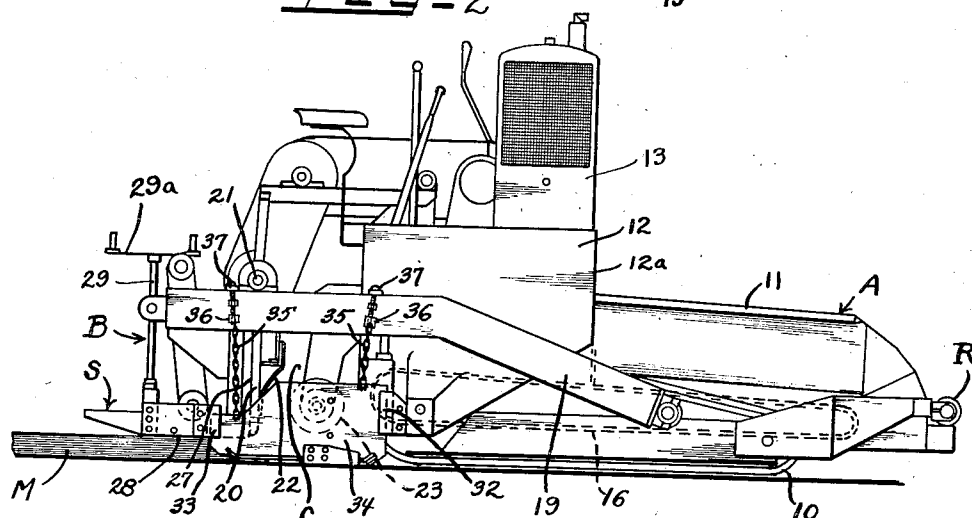
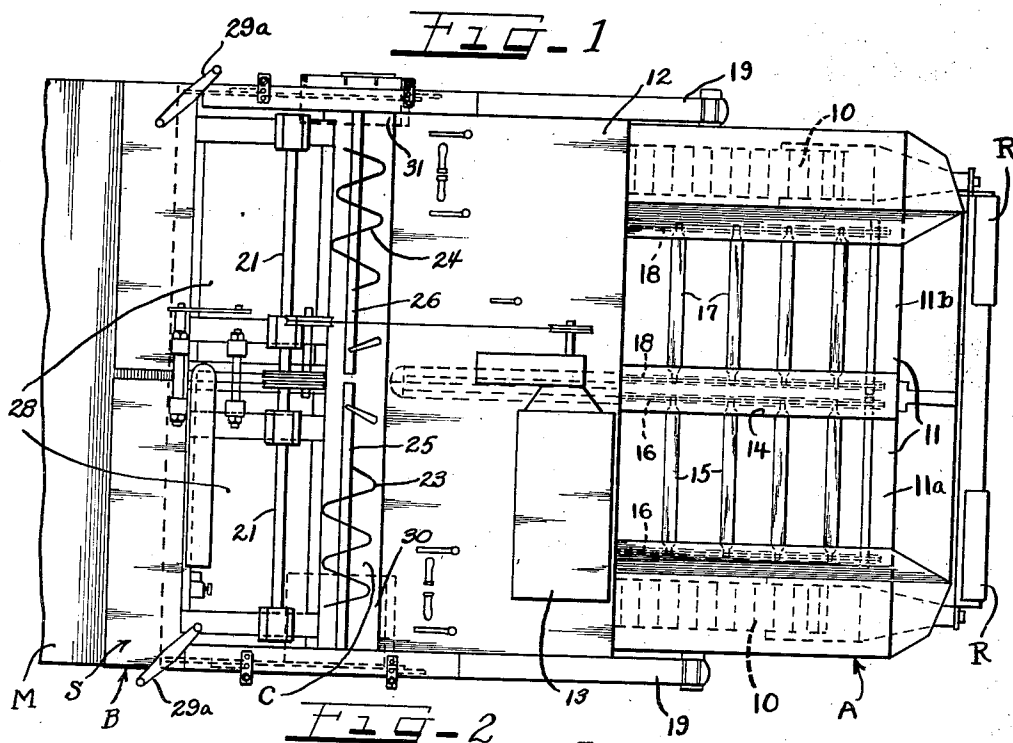
H. H. BARBER

2,289,168

CUT-OFF SHOE FOR ROAD FINISHING MACHINES

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2 Sheets-Sheet 1



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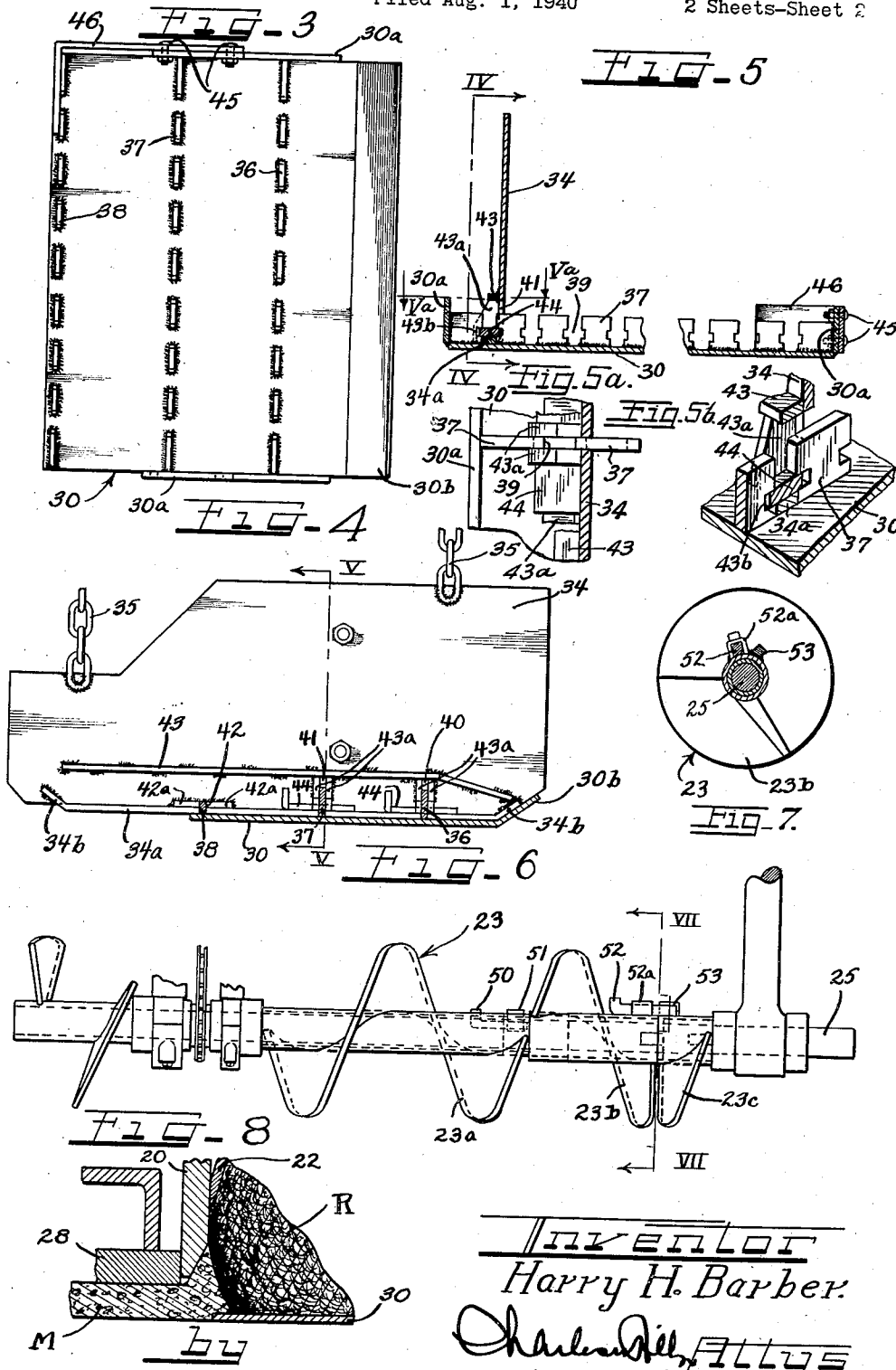
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CUT-OFF SHOE FOR ROAD FINISHING MACHINES

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CUTOFF SHOE FOR ROAD FINISHING
MACHINES

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10 Claims. (Cl. 94—46)

This invention relates to attachments for material laying machines to vary the width of the laid materials. More specifically this invention relates to cut off shoes for road finishing machines adapted to underlie paving material deposited on the roadbed by the machine so as to decrease the width of the finished road or mat made by such machine.

While the invention will be hereinafter specifically described in connection with road finishing machines such as are disclosed in my United States Letters Patent No. 2,138,828 and No. 2,168,507, it should be understood that the devices of this invention are adapted for use on material laying machines in general to vary the width of the laid material.

These material laying machines are adapted to spread a fixed width of material along a surface such as a roadway. Machines equipped with tampers or other compressing means finish the spread material into a smooth mat of constant width. However, it is frequently desirable to narrow down the width of this mat.

For example, in road finishing machines, the machines are constructed to lay a ten foot wide mat of bituminous aggregate. When laying comparatively wide city streets, where variable width strips occur, some of these strips must be less than ten feet to cover the full width of the street without overlapping the mats. According to the invention, this is now accomplished by means of shoes which ride the roadbed or base and cover a predetermined area to prevent depositing of the bituminous aggregate on the roadbed within that predetermined area and thus decrease the width of the mat made from the deposited aggregate. A feature of the invention includes full adjustability of the cut-off shoes for selective control of the width of the mat within narrow increments.

The cut-off shoes of this invention preferably ride on the roadbed and underlie material spread out beyond the edges of the mat being laid.

It is then an object of this invention to provide members cooperating with material laying machines to vary the width of the laid material.

Further objects of the invention are to provide attachments for road finishing machines to vary the width of the road being laid by the machine.

A specific object of the invention is to provide cut-off shoes for road finishing machines adapted to underlie the material deposited on the roadbed by the machine for a predetermined distance to decrease the width of a mat produced by the machine from said material.

Another specific object of this invention is to provide cut-off shoes for road finishing machines adapted to ride on the roadbed for covering predetermined amounts of the roadbed to decrease the width of a mat of finished road being produced by said machine.

A further specific object of this invention is to provide cut-off devices for road surfacing material which devices are inserted at predetermined lengths into the sides of an operating portion of a road finishing machine to vary the width of a road being produced by the machine.

Another object of the invention is to utilize material being laid on a roadbed to act as its own seal on a road finishing machine for decreasing the width of a mat of road material laid by the machine.

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

Figure 1 is a plan view of a road finishing machine equipped with cut-off shoes according to this invention.

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

Figure 3 is a top plan view of a cut-off shoe according to this invention.

Figure 4 is a vertical cross-sectional view taken along the line IV—IV of Figure 5.

Figure 5 is a transverse cross-sectional view taken along the line V—V of Figure 4.

Figure 5a is a fragmentary horizontal cross-sectional view taken substantially along the line Va—Va of Figure 5, with parts broken away to show underlying and overlying structure.

Figure 5b is a fragmentary cross-sectional perspective view further illustrating the structure of Figure 5.

Figure 6 is a fragmentary elevational view of a spreader screw for the road finishing machine shown in Figures 1 and 2, illustrating the manner in which sections of the screw above the cut-off shoes can be rendered inoperative so as to prevent agitation of material on top of the cut-off shoe.

Figure 7 is a cross-sectional view taken along the line VII—VII of Figure 6.

Figure 8 is a fragmentary vertical cross-sectional view taken through the rear end of a cut-off shoe according to this invention and through a mat of road laid by the finishing machine to illustrate the manner in which the road material on the shoe forms its own seal for decreasing the width of the mat.

As shown on the drawings:

The finishing machine shown in Figures 1 and 2 consists of a self-propelled tractor assembly A and a screed assembly B mounted behind the tractor assembly A and movable relative thereto. The tractor assembly A comprises a pair of crawlers 10 on which is mounted suitable framework defining a platform 11 extending from the front to the rear of the assembly A. The front or exposed platform portion receives road finishing material dumped from a truck (not shown) that is pushed ahead of the machine by rollers R which engage the rear tires of the truck. An engine platform 12 is disposed above the rear end portion of the platform 11 and an engine 13 is mounted on the platform 12.

The platform 11 is divided centrally into two portions 11a and 11b by means of a longitudinal skirt 14. Flights 15, driven by conveyor chains 16, are mounted to travel over the bottom of the portion 11a from the front to the rear ends thereof, and likewise flights 17, driven by conveyor chains 18, are mounted in the portion 11b of the platform 11 to travel from the front to the rear ends thereof. The flights 15 and 17 can be driven at different rates and serve to convey material dumped on the front portion of the platform 11 along the rear portion thereof under the platform 12 and onto the roadbed between the rear end of the tractor A and the forward end of the screed assembly B. The front wall 12a of the engine platform can have vertically adjustable strike-off gates thereon for leveling off the material advanced under the engine platform by the flights. The longitudinal division of the platform 11 into two portions and the provision of flights which can be driven at different rates of speed makes possible the feeding of the road material to the screed assembly in different amounts across the width of the machine.

A pair of drawbars or side arms 19 are pivotally connected at the front ends to the tractor assembly A and extend beyond the rear end of the tractor as shown. A pair of laterally aligned tampers, such as 20, are eccentrically suspended and driven by means of shafts such as 21. The shafts 21 are rotated by belt connections to the engine 13 to reciprocate the tampers and cause them to compress and tamp the road material fed to the roadbed by the tractor assembly A. Deflector plates such as 22 are suspended in front of the tampers 20 to define with the rear end of the tractor assembly an open-ended chamber C, bottomed by the roadbed. Screw conveyors or spreaders 23 and 24 are rotatably mounted on shafts 25 and 26 in the chamber C above the roadbed to laterally spread the road material deposited therein by the flights 15 and 17 across the entire width of the machine.

A screed assembly S including a vertical front wall 27 in back of each tamper 20 and a bottom wall such as 28 on top of the mat M of finished road laid by the machine is pivotally attached to the drawbars 19 through the vertical plate 27 and through screw rods 29 having control handles 29a on the tops thereof. A raising and lowering of the screw rods 29 serves to tilt the screed to produce a thinner or a thicker mat M. When the screed is tilted by the screw rods the forward movement of the machine will cause the screed to be leveled off flat, while the arms 19 assume a different height. Since the de-

flector 22, the tampers 20 and the screed 28 are all suspended from the drawbars 19, these parts operate in unison and the tampers are automatically raised or lowered as determined by the screed. Mechanism is also provided for raising and lowering the entire rear end B of the machine off of the roadway, and if desired the machine can be adjusted so that the screed rides very lightly over the mat M. In normal operation, however, the entire weight of the unit B is borne by the screed plates 28 which ride on the mat surface. The purpose of the screeds is to smooth off and control the contour of the mat and to cooperate with the tampers for preventing the tamped road material from boiling up behind the machine.

Since the chamber C between the rear end of the tractor part A and the screed assembly B is open-ended and extends across the entire width of the machine, the machine lays a mat M having the width of the chamber, which is usually 10 feet. Since it is frequently desirable to decrease the width of the mat being laid, this invention now provides a pair of cut-off shoes 30 and 31 (Figure 1). These shoes ride on the roadbed and extend into the ends of the chamber C for a desired distance to underlie the material deposited into the chamber by the flight conveyors. The resulting width of the mat is then exactly controlled by the amount of the extension of the shoes into the chamber, hence the mat will be of a width controlled by the distance between the inner ends of the shoes.

It is preferable to equip each machine with shoes of different cut off width. For example, the shoe 30 can have a maximum effective cut off width of 2 feet while the shoe 31 can have a maximum effective width of only one foot. By extending such shoes fully into the chamber C, a maximum decrease in width of the mat up to 3 feet can be obtained. As will be hereinafter explained, the shoes are insertable for controlled distances into the chamber C so that any decrease in width of the mat up to 3 feet is obtainable.

The shoe 30 will be hereinafter described in detail, but it is to be understood that the shoe 31 is of identical construction except that it is one foot narrower.

As shown in Figure 2, the side of the tractor portion A of the machine is equipped with a rearwardly opening vertical guide 32. The screed assembly B is equipped with a forwardly opening vertical guide 33. A side plate 34 is slidably mounted in the guides 32 and 33 at its front and rear ends and is attached to the drawbar 19 through chains 35 which are connected at their upper ends to adjustable lugs 36 carried by adjusting bolts 37 mounted on the drawbar. The bolts 37 can be raised and lowered to raise and lower the plate 34. In operation of the machine, however, the chains are maintained in a loose condition, so that the plate 34 is carried by the cut-off shoe, as will be hereinafter explained.

As shown in Figures 3 to 5b, the shoe 30 has three longitudinal rows of spaced pegs 36, 37 and 38 projecting from the upper face thereof. Adjacent pegs define open-topped T-slots 39 therebetween, as shown in Figure 5.

The side plate 34 has open-bottomed slots 40, 41 and 42 accommodating the pegs. A plate 43 is welded to the outer face of the side plate 34 above the slots 40, 41 and 42 and has pairs of spaced depending webs 43a welded on each side

of the slots 40 and 41. These webs 43a are apertured as at 43b for receiving therethrough a wedge pin 44. These wedge pins bridge the pair of webs adjacent each slot and extend through the T-grooves in the slots 39 between the rows of pegs 36 and 37 to firmly attach the cut-off shoe to the side plates. In addition, the back row of pegs 38 extends into the slot 42 on the side plate 34. This slot 42 can be reinforced by a plate 42a welded to side plate 34 on each side of the slot.

The bottom of the side plate 34 is bent outwardly to form a horizontal flange 34a underlying the plates 42a and the webs 43a. This flange is slotted to continue the slots 40, 41 and 42, and serves as an abutment for the shoe 30. As shown in Figure 4, the flange 34 has front and rear ends beveled upwardly as at 34b and welded to the side plate.

The side edges of the shoe 30 receive vertical plates 30a which are welded thereto. These plates are apertured to receive bolts 45 therethrough. These bolts 45 are adapted to detachably secure an L-shaped corner plate 46 which forms a cut-off surface at the inward side of the shoe adjacent the tamper. One leg of the L forms a vertical wall parallel with the inner side edge of the shoe while the other leg forms a vertical wall along the rear edge of the shoe adjacent the tamper. The walls dam off flow of road material carried on top of the shoe and prevent feeding of this material under the tamper beyond the width desired for the road. This corner plate 46 can be moved from one side to the other side of the cut-off shoe, since both sides of the shoe are equipped with the side plates 30a. In this manner the shoe is interchangeable from one side of the machine to the other side.

The shoe 30 is thus adapted to project inwardly from the side plate 34 any desired amount, depending upon the slots 39 selected for receiving the wedge pins 44. These slots are preferably spaced at 3 inch increments so that the cut-off effect of the wide cut-off shoe 30 can vary in 3 inch increments from zero to 2 feet. The narrow cut-off shoe 31 can also provide variable cut-off widths obtainable in 3 inch increments from zero to 1 foot. Since shoes 30 and 31 are interchangeable, these cut-off effects can be obtained on either side of the machine. Likewise, the shoes can be used together to decrease the width of the mat being laid by the machine, up to 3 feet.

The front of the shoe 30 is beveled upwardly as at 30b, so that the shoe is adapted to ride over manhole covers and like obstructions in the roadbed. The beveled end 30b preferably underlies a cut-off curtain at the rear end of the tractor portion A of the machine to prevent material being deposited between the front end of the shoe and the machine.

The rear end of the shoe 30 terminates just flush with or slightly ahead of the tampers 20, as best shown in Figure 8, in order that the tampers can operate without striking the shoe. Since the shoe 30 may ride on the roadbed beneath the level of the top of the mat M, as shown in Figure 8, there is a gap between the rear end of the shoe and the bottom of the tamper, even at the end of the downward stroke of the tamper. This gap is sealed by the road paving material R deposited on top of the shoe, and as a result the material will not bleed out under the tamper and screed. The road material thus effects its own seal. Since the shoe 30, however, may in some

instances ride at the level of the top of the mat M when, for example, a mat is being laid in abutting relation to a previously laid mat, it is essential that the rear end of the shoe terminate just flush with or slightly ahead of the tamper, since otherwise the tamper, in its downward stroke, might strike the shoe.

In order to prevent the road material R on top of the shoe 30 from being agitated and thus break the seal as shown in Figure 8, the spreading screws, such as the screw 23 in Figures 6 and 7, are built up in sections 23a, 23b and 23c on the drive shaft 25. The section 23 is affixed to the drive shaft at its inner end and always rotates therewith. The section 23b is driven from the section 23 through a locking pin 50 carried by the outer end of the section 23 and adapted to abut a projection 51 on the inner end of the section 23. Likewise, the section 23c is driven from the section 23b through a locking pin 52 carried on its outer end and adapted to abut a block 53 on the inner end of the section 23c. As best shown in Figure 7, the locking pin 52 is slidably mounted in a strap 52a secured to the screw section 23b and can be slid outwardly so as to abut the block 53 on the screw section 23c.

In order to prevent the road material R on top screw sections 23c and 23b can be rendered inoperative by forcing the locking pins 52 or 50 out of the path of the block 53 or 51. Since one or both of these screw sections may underlie the cut-off shoe, depending upon the extent to which the cut-off shoe is inserted, the road material R on the shoe can be maintained in a quiescent pile to effect its own seal at the tampers.

As road material R is dumped into the chamber C by the flights 15 or 17, the same is spread laterally by the screws 23 and 24 and, of course, some of this material is deposited on top of the shoe. Since the screws do not operate over the shoes, any material built up on the top of the shoes is maintained in an undisturbed pile. Excessive height of material on the shoes is automatically eliminated, since the material from the piles thus built up will, of course, fall down onto the roadbed to the level of the other material deposited on the roadbed in the chamber C.

It is always desirable, in laying roads, that the width of the road being laid by any given machine be capable of quick change, with minimum effort on the part of the operator. The cut-off shoes of this invention provide quick and simple means of change and adjustment. The shoes are merely slipped into the chamber C of the machine for the desired distance, the end plates are then lowered between the particular set of pegs on the shoes to effect the desired cut-off and the plates are clamped in position by insertion of the wedges 44. The end plates or side plates are adapted to float up and down, since they are carried for vertical movement in the brackets 32 and 33. It can be readily seen, therefore, that it is a simple and easy task to quickly install the shoe or to adjust the same for variable width.

After operating, the cut-off shoe becomes filled with material, and when it is desired to remove the shoe the wedges on the side or end plates are driven out, the plates raised, and the machine moved away from the shoe, leaving the shoe exposed on the roadbed. It is then a simple matter to dump out the excess material on the shoe and install the shoe in a new position on the next strip.

If the same width is to be used on the next

strip, the wedges are left in engagement and the side plates are raised throughout the chains 35 so that the shoes can travel with the machine.

The interchangeability of the shoes 30 and 31 from one to the other side of the machine is an important feature.

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. A cut-off shoe for a road finishing machine comprising a horizontal plate rideable on the road to overlies a portion of the roadbed, a vertically floating side plate propelled by said machine for detachable connection to said horizontal plate, and means across the width of said horizontal plate for selective engagement with the side plate to vary the spatial relation between the inner end of the horizontal plate and the side plate to control the amount of cut-off.

2. A cut-off attachment for a road finishing machine comprising a horizontal plate adapted to ride on a roadbed, spaced pegs projecting upward from said horizontal plate across the width thereof, a vertical plate for attaching the horizontal plate to said machine, and releasable locking means cooperating between said vertical plate and said pegs to detachably connect the plates together.

3. In a road finishing machine of the type including spaced fore and aft units defining an open-bottomed chamber therebetween, the improvements which comprise cut-off shoes insertable into the ends of said chamber to form bottoms therefor overlying the roadbed and control the width of the road laid by said machine by the distance between the inner ends of said shoes, side plates propelled by the machine forming end walls for the chamber, and spaced connecting means on said shoes for selective engagement with the plates whereby the effective distance between the shoes can be varied to control the width of materials deposited on the road bed.

4. A cut-off shoe for a road finishing machine comprising a flat plate adapted to ride on the roadbed, a plurality of rows of spaced pegs across the top of said plate, adjacent pairs of pegs in each row defining T-slots therebetween, a vertical side plate for said machine having open-bottomed slots adapted to receive said pegs therein, apertured webs secured to said vertical plate on each side of said slots therein, and wedge pins insertable through the apertures in said webs for engaging the T-slots between the pegs to detachably secure the vertical and horizontal plates together in fixed relation.

5. A cut-off shoe for a road finishing machine comprising a flat plate having an upwardly inclined leading edge, rows of pegs extending across the width of said plate and projecting vertically from the top face thereof, the pegs in each row being in spaced relation defining T-slots therebetween and the T-slots in each row being transversely aligned, an end plate for said machine carrying wedges engageable with said T-slots to secure the horizontal plate in fixed relation to the end plate to space the inner end of the horizontal plate at a desired distance from the end plate, and means allowing free vertical movement connecting said end plate to said machine.

6. In a road finishing machine having an open-bottomed material receiving chamber, cut-off shoes attached to said machine to form partial bottoms for said chamber, a plurality of sections of spreading screws in said chamber to move the road material across the width of the chamber, and pins connecting said screw sections together, said pins being retractible to render inoperative those screw sections overlying the shoes.

7. In a road finishing machine having a self-propelled unit for depositing road material on the roadbed at the rear end of the unit, a screed and tamper assembly in spaced trailing relation from said self-propelled unit adapted to act on the road material deposited by the unit on the roadbed, a cut-off shoe adapted to ride on the roadbed under a portion of the deposited material and extending from the rear end of the self-propelled unit to substantially flush relation with the tamper for a desired distance inwardly from the side of the machine, a side plate extending between the unit and assembly attached to said machine in free vertically floating relation thereto, and spaced means on the shoe for selective attachment to the plate whereby the desired inward projection of the shoe is obtained.

8. In a road finishing machine including a self-propelled unit for feeding road material to the roadbed, a tamper and screed assembly pivotally connected to said self-propelled unit and disposed in spaced relation from the rear end of the unit for acting on road material deposited on the roadbed by the self-propelled unit, a sectioned spreading screw between the rear end of the unit and the tamper, means for driving the screw sections to laterally spread the road material deposited by the self-propelled unit across the width of the tamper, a side plate bridging the space between the unit and tamper, a cut-off plate detachably connected to said side plate and adapted to ride on the roadbed under the road material deposited by the unit to decrease the width of the road material fed to the tamper and screed assembly, and means for disconnecting from said driving means a spreading screw section above the cut-off plate.

9. In combination with a road laying machine having means for depositing road paving material on a road bed and means spaced rearwardly from said depositing means to act on the deposited road paving material for forming a road therefrom, a cut off shoe mounted on the machine to project into the space between the depositing means and rearwardly spaced means for forming a partial bottom for said space receiving thereon road paving material from the depositing means, said shoe adapted to ride flatwise to overlies an area of the roadbed to control the width of the deposited road paving material acted on by the rearwardly spaced means.

10. In a road finishing machine of the type including a fore unit for depositing paving material on a road bed and a road finishing trailing unit acting on the deposited road material defining with the fore unit an open bottomed space therebetween, the improvements which comprise cut off shoes floatingly mounted on said machine to project into the opposite ends of said space for forming partial bottoms therefor overlying areas of the road bed and receiving paving material thereon from said fore unit whereby the width of the deposited paving material received by the trailing unit will be gauged by the inner ends of said shoes.

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