

Jan. 27, 1942.

J. D. FARRELL

2,271,333

HEATED CUTTER BAR FOR ROAD PAVERS

Filed May 8, 1939

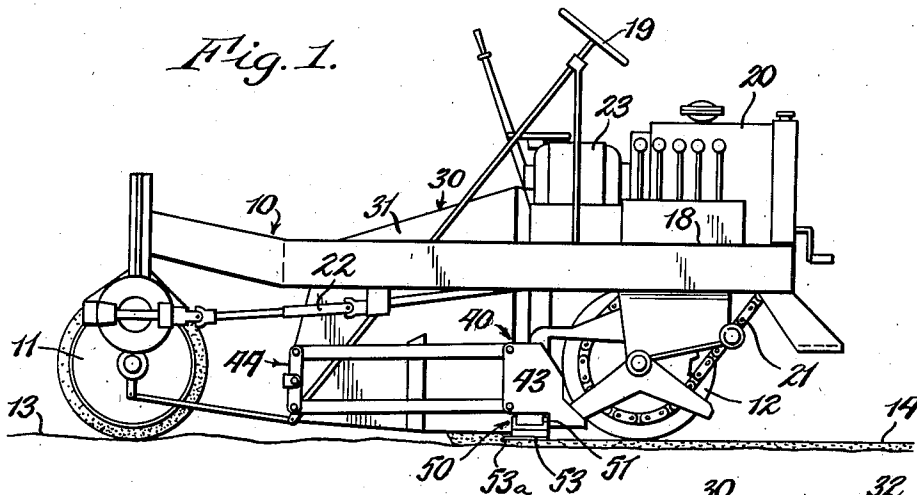


Fig. 2.

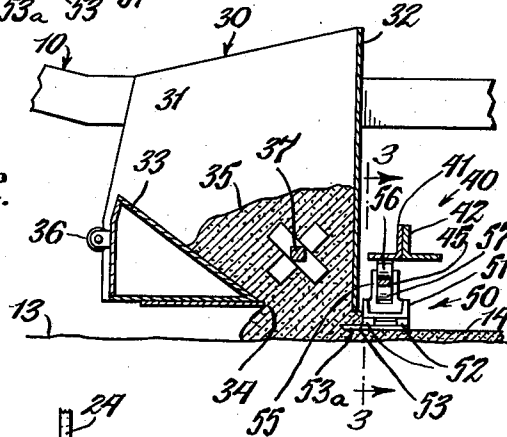


Fig. 3.

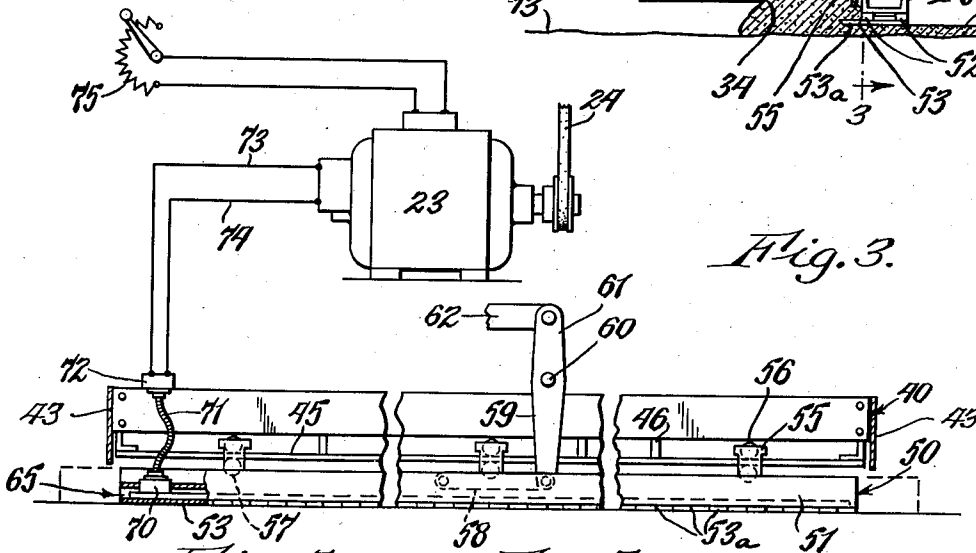
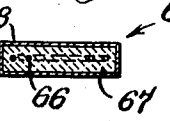


Fig. 4.



Fig. 5.



INVENTOR
John D. Farrell
BY
Pope and Pope
ATTORNEYS

UNITED STATES PATENT OFFICE

2,271,333

HEATED CUTTER BAR FOR ROAD PAVERS

John D. Farrell, Nunda, N. Y., assignor to Adnun Engineering Corporation, Wilmington, Del., a corporation of Delaware

Application May 8, 1939, Serial No. 272,313

4 Claims. (Cl. 94—46)

This invention relates to a heated cutter bar for use in conjunction with road pavers for laying mixtures of asphalt and aggregate in which use the heating of the cutter bar assists in the deposit of a smooth finished course, such road pavers being more particularly shown and described in the patent to Clyde G. Abernathy, No. 1,994,082, granted March 12, 1935.

The principal object of this invention is to provide a simple and reliable means for heating a reciprocating cutter bar of this character, such cutter bar being also vertically adjustable at either or both ends so as to provide the desired type of course being laid, the heating means and its connections in no way interfering with the movement of the cutter bar.

Another object of the invention is to apply the heat directly to the plate which is formed to provide the cutting teeth, the heat being thereby directly applied to the cutting edges of the cutter bar so as to facilitate the laying of a uniform finished course.

Another object of the invention is to provide such a heating means which is readily adapted to a self-propelled paving machine and which requires no substantial alteration in the form of cutter bars now used in conjunction with such pavers.

Another aim of the invention is to provide such a heating means which comprises an electrical resistance element built into the cutter bar itself and supplied through flexible cables with electrical energy generated by a generator which can be driven by the prime mover which propels the paver.

In the accompanying drawing;

Fig. 1 is a side elevation of the paver embodying my invention.

Fig. 2 is a fragmentary vertical longitudinal section through the hopper thereof.

Fig. 3 is a fragmentary elevation, taken on line 3—3, Fig. 2.

Fig. 4 is a fragmentary top elevation, partly in section, of the cutter bar forming the subject of my invention.

Fig. 5 is a vertical enlarged section, taken on line 5—5, Fig. 4.

The paving machine illustrated in the accompanying drawing is adapted to deposit a course of mixed asphalt and aggregate upon the roadway to be resurfaced and for this purpose is shown as comprising a frame 10 supported at its front end by a pair of steering wheels 11 and at its rear end by one or more rollers 12, the front steering wheels 11 being adapted to ride

upon the relatively rough subgrade 13 of the road to be paved and the rear rollers 12 riding upon the surface of the strip 14 being laid by the paver. The operator stands upon a platform 18 at the rear end of the frame 10 and steers the paver by means of a steering wheel 19 which can be operatively connected to the front steering wheels 11 in any suitable manner. The paver is propelled by a prime mover 20 on the main frame 10 which drives the rear rollers 12 through a chain drive 21 and the front steering wheels 11 through a flexible drive shaft 22. The prime mover 20 is shown as also driving a generator 23 which can be of either the direct current or alternating current type, this generator being shown as being driven through a belt drive 24.

Intermediate the front steering wheels 11 and the rear rollers 12 the frame 10 carries a hopper 30 which is composed of side walls 31 secured to the longitudinal members of the frame 10, a relatively high rear wall 32 connecting the rear edges of the side walls 31 and a relatively low inclined front wall 33, these walls providing an elongated opening 34 at the bottom of the hopper through which the paving material 35 dumped into the hopper 30 is deposited upon the relatively rough surface 13 of the subgrade to be paved. The paving material is dumped into the hopper 30 from its front end by truck, which truck in turn is pushed by the paver as it receives the load, rollers 36 being provided at the front end of the hopper 30 to engage the rear tires of the truck for this purpose.

The material 35 so deposited in the hopper 30 is broken up by a power rotated raker bar 37, this raker bar having a pug mill action and feeding the material through the opening 34 to the subgrade 13 to be paved.

The material so pushed along in the form of a column over the subgrade to be paved, is cut to predetermined height and formed by a cutter bar assembly 40 arranged immediately in rear of the rear wall 32 of the hopper. This cutter bar assembly includes a cutter bar 50 which is reciprocated transversely of the machine and is also capable of being crowned to different degrees, the cutter bar assembly being also capable of being vertically adjusted at either end to provide any desired form in the course or layer of material being laid. This cutter bar is heated by the means forming the subject of the present invention.

The cutter bar assembly includes a pair of angles 41, 42 arranged transversely of the paver and secured to end plates 43. Either end of this

assembly can be adjustably raised or lowered by any suitable means (not shown) and this assembly is also preferably capable of being tilted by the parallelogram linkage indicated at 44 and which also can be adjusted by any suitable mechanism (not shown). The cross bar 41 carries a suspended track 45, this track being carried by hangers 46 which are preferably of such form that the track 45 can be crowned to any desired degree.

The cutter bar 50 is mounted for reciprocation lengthwise of the track 45 and for this purpose is shown as including a channel 51 which is horizontally arranged so that it can be flexed vertically to adapt itself to the crowning of the track 45. To the bottom of this channel are welded a pair of strips 52 and to the bottom of these strips is removably secured, in any suitable manner, a flat plate 53 which projects forwardly beyond the front strip 52. This forwardly projecting part of the plate 53 is serrated to provide a continuous series of V-shaped teeth 53a which cut into the column of material supported on the subgrade 13 to form the finished strip 14 as the paver moves along. It will be understood that this toothed plate 53 is rendered removable so that it can be replaced as its teeth wear and that the toothed plate 53 can be made in a number of sections, if desired, for convenience in shipping. It is desirable, however, to make it of one piece to avoid the danger of moisture entering the space between the plate 53, channel 51 and spacing strips 52.

The cutter bar structure, as described, is reciprocated along the track 45, the connection between the cutter bar and the track 45 including a plurality of bearing brackets 55 which, as best shown in Fig. 2, are secured at spaced intervals to the upper face of the channel 51 and each of which carries a pair of rollers 56, 57 which engage the upper and lower sides, respectively, of the track 45. The cutter bar is reciprocated in any suitable manner, as by a link 58 secured to the lower arm 59 of a lever pivoted to the paver frame at 60, the upper arm 61 of this lever being connected to a link 62 which can be reciprocated by the prime mover 20 in any suitable manner.

The present invention is directed to providing a simple and effective means for heating the toothed plate 53, such heating facilitating the cutting effect of the teeth in cutting through the base of the column of paving material carried by the hopper 30 to provide a uniform smooth strip of material on the subgrade and such heating also serving to provide an improved surface on this strip. For this purpose an electrical strip heater 65 is arranged in the space between the channel 51, side strips 52 and toothed plate 53 and against the upper faces of this plate. This strip heater can be of any suitable form and is shown as comprising an electrical resistance element 66 embedded in a suitable insulating material 67 which can be encased in a metal housing 68, this housing being secured directly to the upper faces of the toothed plate 53 and extending substantially the full length of the cutter bar, as best shown in Fig. 3. At one end the strip heater 65 is provided with an outlet box 70 which extends through the web of the channel 51 and is connected by a flexible cable 71 to a box 72 mounted on the angle bars 40, 41. It will be seen that the flexible electrical cable 71 permits the reciprocation of the cutter bar 50, while at the

same time supplying electrical energy to the strip heater 65 for heating the toothed plate 53. Current is supplied from the generator 23 through power lines 73 and 74. The generator shown is of the direct current type and to regulate the heat supplied to the toothed plate 53 a variable resistance 75 is provided in the field coils of the generator 23. It will be understood, however, that the generator 23 can be of any type and that the control of its heating effect upon the toothed plate 53 can be obtained in any usual and well known manner. It will also be understood that the generator could be driven by a separate gas engine.

From the foregoing it will be seen that the present invention provides a very simple and effective means for supplying any desired amount of heat directly to the cutting plate 53 of the cutter bar 40 and inasmuch as the flexible connections merely comprise power lines, such connections in no way interfere with the reciprocation of the cutter bar by the prime mover 20 and also in no way interfere with the vertical adjustment of the cutter bar assembly. It will further be seen that the type of strip heater shown in no way interferes with adjustable crowning of the cutter bar 40 and that the heat can be supplied by the simple expedient of employing a generator driven by the prime mover itself.

I claim as my invention:

1. In a road paver of the character described for laying a course of mixed asphalt and aggregate, a carriage adapted to traverse the surface to be paved, an elongated cutter bar operatively connected with said carriage and extending transversely of the direction of movement of said carriage, said cutter bar including a removable member extending forwardly to provide a cutting edge on said cutter bar, means for reciprocating said cutter bar, means for depositing the mixed paving material in advance of said cutting edge to be graded thereby, an electrical resistance element secured to said removable member and means for supplying electrical energy to said resistance element to heat said cutting edge.

2. In a road paver of the character described for laying a course of mixed asphalt and aggregate, a carriage adapted to traverse the surface to be paved, an elongated cutter bar operatively connected with said carriage and extending transversely of the direction of movement of said carriage, means for reciprocating said cutter bar, means for depositing the mixed paving material in advance of said cutter bar to be graded thereby, said cutter bar comprising an upper elongated bar, side spacer bars depending from the longitudinal edges of said upper bar, a plate removably secured across the bottoms of said spacer bars and formed to provide teeth which grade the mixed paving material so deposited, an electrical resistance element disposed in the space between said upper bar, spacer bars and plate and in contact with said plate, and means for supplying electrical energy to said resistance element to heat said plate.

3. In a road paver of the character described for laying a course of mixed asphalt and aggregate, a carriage adapted to traverse the surface to be paved, an elongated cutter bar operatively connected with said carriage and extending transversely of the direction of movement of said carriage, means for reciprocating said cutter bar, means for depositing the mixed

paving material in advance of said cutter bar to be graded thereby, said cutter bar comprising an upper elongated bar, side spacer bars depending from the longitudinal edges of said upper bar, a plate removably secured across the bottoms of said spacer bars and formed to provide teeth which grade the mixed paving material so deposited, an electrical resistance element disposed in the space between said upper bar, spacer bars and plate and in contact with said plate, and means for supplying electrical energy to said resistance element to heat said plate comprising a generator on said carriage and a flexible conduit connecting said generator and resistance element.

4. In a road paver of the character described for laying a course of mixed asphalt and aggregate, a carriage adapted to traverse the surface to be paved, an elongated flexible cutter bar operatively connected with said carriage and extending transversely of the direction of move-

ment of said carriage, means for reciprocating said cutter bar, means for depositing the mixed paving material in advance of said cutter bar to be graded thereby, said cutter bar comprising a flexible bar, a pair of spacing strips secured along the opposite sides of said flexible bar and projecting downwardly therefrom in spaced relation to each other to provide a downwardly facing channel extending the full length of said flexible bar and a plurality of teeth each secured to the underside of each of said spacing strips and closing the space provided by said channel, means for adjustably elevating said elongated cutter bar, means for adjustably flexing said elongated cutter bar, an electric heating resistance element disposed in said space and in contact with said teeth, and means for supplying electrical energy to said resistance element to heat said teeth.

JOHN D. FARRELL.