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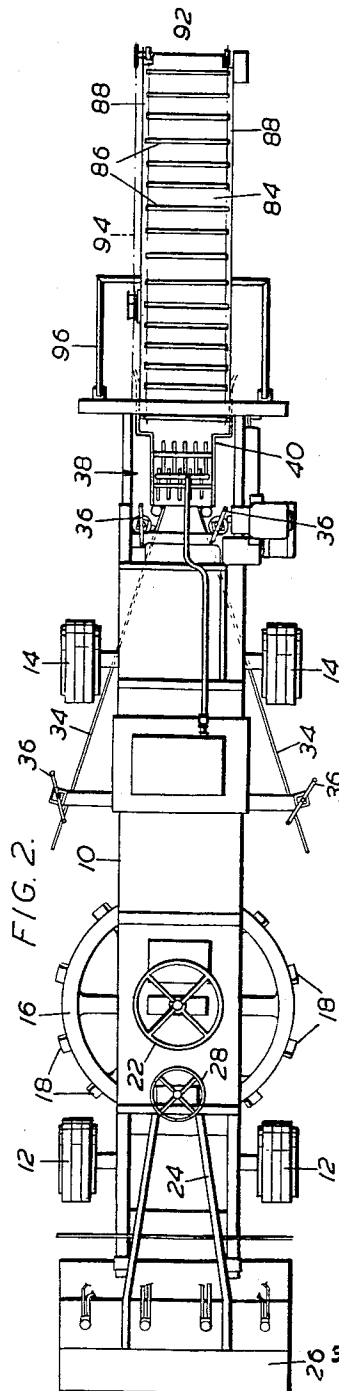
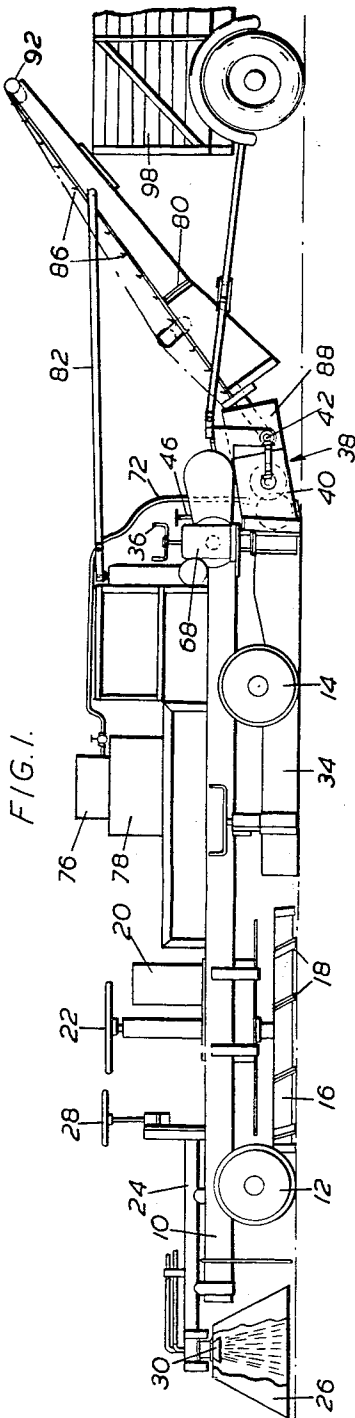
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ROAD PLANING MACHINES

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3 Sheets-Sheet 1



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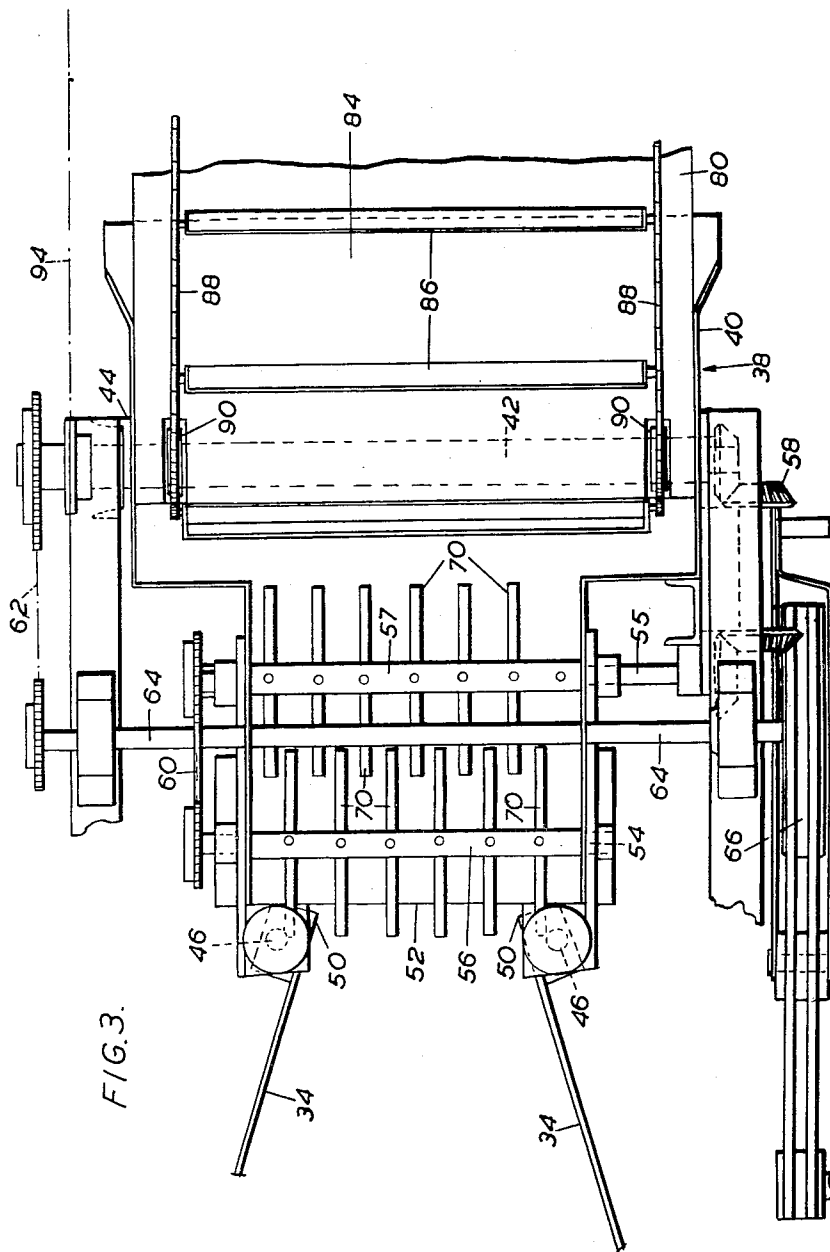
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ROAD PLANING MACHINES

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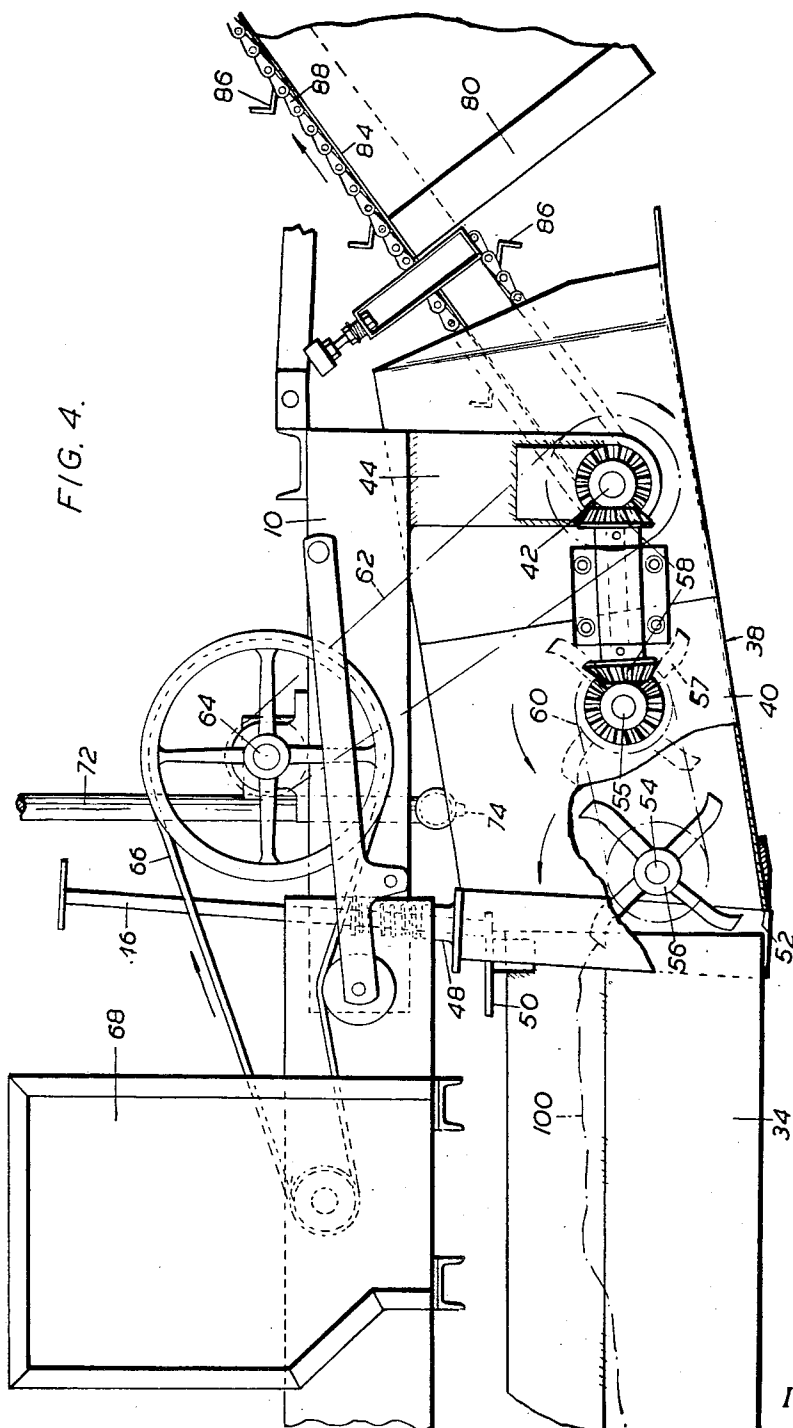
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3 Sheets-Sheet 3



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ROAD PLANING MACHINES

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1 Claim. (Cl. 94—40)

This invention relates to heating and planing machines for the levelling of roads having a bituminous or like surface.

Such machines scrape or cut from the surface of a road the material which has been softened by the application of heat. Much of the removed material is fit for re-use or can be made fit for re-use but little has been done in this connection because of difficulties in handling the removed material. The commonest method of collecting the material is to allow it to gather in the form of a windrow as a result of the forward movement of the machine and subsequently to lift it by shovelling. To make the material fit for re-use, it has, generally, to be re-heated; but bitumen ages, and with the passage of time, can become oxydized and polymerised to such an extent that mere re-heating will not cause it to regain a satisfactory degree of plasticity. Also, the somewhat intense heating to which it is subjected to enable it to be removed from the road surface by the planing tools has the effect of driving off valuable volatile constituents and the volatilisation goes on while the material is cooling down after having been planed off. Generally, the removed material needs to have added to it a quantity of fresh bituminous binder in the form of an emulsion or flux and this necessarily involves heating the collected material to a fairly high temperature.

So far, it has not been found satisfactory to regenerate the removed material except in a special plant to which the material has to be transported.

According to the invention, a heating and planing machine is provided with a mixer into which the planed-off material is gathered and in which it is treated with a fluxing oil and with an elevator which picks up the regenerated material and discharges it into a storage receptacle.

The mixer is preferably arranged as near as possible to the point at which the material is planed off the road so that the material receives the flux while it is at the highest possible temperature.

The invention has been particularly satisfactorily used in connection with a planing machine in which the planing tools are carried by a rotor having a vertical axis of rotation. Such a machine modified in accordance with the invention will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1 is a somewhat diagrammatic side elevation of the machine.

Fig. 2 is a plan of Fig. 1.

Fig. 3 is an enlarged view of part of Fig. 1 and

Fig. 4 is a side elevation of Fig. 3.

The machine comprises a chassis 10 supported fore and aft by two pairs of road wheels, 12, 14. Depending from the chassis between the two pairs of road wheels is a rotor 16 of large diameter arranged to rotate about a vertical axis and having chisel-like planing tools 18 depending from its rim. The rotor is driven (through gearing not shown) by an engine 20 carried by the chassis and is arranged so that it can be adjusted up and down by means of a hand-wheel 22 to bring the tools 18 further from or nearer to

2

the road surface. At the forward end, the chassis is provided with a jib 24 which carries a cowl 26 which can be raised from and lowered towards the road surface by means of a hand-wheel 28 at the rear end of the jib. Within the cowls are arranged a number of burners 30 which project their flames onto the road surface.

The arrangement so far described is known in itself and as it does not form an essential part of this invention, it need not be described in greater detail.

As the chassis is driven forward, the road surface is heated and softened by the burners 30 and is then planed by the tools 18 carried by the rotor 16.

The material planed off by the tools is gathered into a single central windrow by oblique blades 34 depending from the chassis to the rear of the rotor. The blades 34 are adjustable towards and away from the road surface by hand-wheels 36.

Immediately beyond the rear end of the gathering blades 34, a mixer 38 is suspended from the chassis.

The mixer (see particularly Figs. 3 and 4) is in the form of a trough 40 supported at its rear end on a shaft 42 carried in bearings in arms 44 depending from the chassis 10. The front end of the trough is supported on the rear ends of the blades 34 through screws 46 which pass through flanges 48 on the trough and rest on flanges 50 on the blades 34. The trough is thus angularly adjustable about the shaft 42 by adjustment of the height of the rear ends of the blades 34 and also, independently of the blades, by means of the screws 46. By such adjustment, the lower forward edge 52 of the trough can be brought to any desired height above the ground so that the trough can act as a scoop which receives the planed-off material which has been gathered by the blades 34.

In the side walls of the trough 40 are journaled a pair of shafts 54, 55 to which are keyed two sets of paddle wheels 56, 57. The shaft 55 is connected to the shaft 42 by bevel gearing 58 and the two shafts 54, 55 are connected together by a chain and sprocket drive 60. The shaft 42 is arranged so as to be driven by a chain and sprocket drive 62 from an intermediate shaft 64 itself driven through a belt drive 66 by an engine 68 on the chassis 10.

The paddle wheels are driven in the direction of the arrows shown in Fig. 3. The paddles 70 are shaped (as shown) so that they will bite into the mass of planed-off material presented to them and drive it backwards.

Above the trough 40 is arranged a pipe 72 having an outlet nozzle 74 directed into the trough and connected to a pump 76 on an oil tank 78 carried by the chassis. The shaft 42 also carries an elevator jib 80 which is tied to the chassis 10 by ties 82. The elevator jib has a flat base plate 84 which supports lifting angles 86 attached at their ends to a chain 88 passing over sprockets 90 on the shaft 42 and sprockets 92 at the upper end of the jib. The sprockets 92 are driven from the shaft 42 by a chain and sprocket drive 94.

As can be seen in Fig. 4, the angles 86 are shaped so that as they are carried round the sprockets 90, they will scoop up material lying in the rear end of the trough 40 and carry it upwards over the plate 84.

At the rear end, the chassis 10 has a towing attachment 96 allowing a trailer 98 to be towed so as to be always in a position to receive the material discharged from the upper end of the elevator.

The machine is operated as follows:

The burners 30 in the cowl 26 having been lit, the machine is driven slowly over the road surface to be planed, the surface thus being softened. The height of the rotor 16 is adjusted so that as the machine advances and the rotor rotates, the tools 18 plane off high spots in the road surface. The material thus planed off is gathered by the blades 34 and presented as a heap indicated by the

line 100 in Fig. 4 to the forward end of the trough 40. The paddles of the paddle wheel 56 bite into the heap 100 and urge the material backwards in the trough into the range of action of the paddle wheel 57.

Fluxing oil is delivered into the trough 40 through the pipe 72 and is thoroughly mixed with the planed-off material, thus regenerating it and rendering it fit for re-use.

In the condition in which the material is received by the trough 40, it is not fit for re-use without further treatment. Also, it is in a condition in which it is not easy to handle. Hitherto, it has been the practice to leave it on the road surface until it has cooled and then to shovel it up and send it to a regenerating plant.

By treating the material with a fluxing oil in the trough 40 as is done in accordance with the invention, several important advantages are obtained. In the first place, the regeneration is effected while the material is still hot and a substantial economy is thus obtained. Secondly, a supply of regenerated material is made available for immediate re-use if required. Thirdly, and this is most important, the material is brought to a condition in which it can be readily dealt with by the elevator. When, therefore, the material is brought by the paddle wheels into the range of action of the angles 86 on the elevator chains, it is taken upwards and discharged over the top end of the jib 80, into the trailer 98 evenly and without objectionable sticking.

The rate of supply of the fluxing oil must, of course, be suited to the nature of the material removed from the road surface, the rate at which the material is removed and the temperature of the material. If desired, the mixing trough 40 can be provided with heating means of the same character as those used for heating the road surface but, in general, no such means are required. Means may also be provided for heating the fluxing oil before supplying it to the trough.

Although the invention has been described in connection with a planing machine in which the tools are carried by a single large rotor, it will be understood that it can be applied to all forms of planing machines such, for example, as machines having a number of horizontal rotors or machines in which the planing is effected by horizontal reciprocation of cutting tools. Also, although the machine shown and described carries a heater, the road surface may, if desired be heated by a heater forming a unit independent of the planer.

I claim:

In a road machine, a wheeled chassis having a front end and a rear end, a heating hood supported adjacent the front end of the chassis for directing heat against a worn bituminous road surface, a planing device depending from the chassis rearwardly of the heating hood for planing the heated bituminous surface, a trough depending from the chassis and arranged transversely thereof and having an open front end to receive the planed off material while the material is still hot, a pair of blades depending from the chassis and extending between the planing device and the trough, said blades converging rearwardly to the trough to direct the heated material into the trough as soon as it is planed off and while it is still hot, a pipe overlying the trough and having downwardly directed outlet means for directing fluxing oil onto the heated bituminous material in the trough, a plurality of mixing paddles rotatably mounted in the trough, means mounting the paddles for rotation about an axis transverse to the longitudinal axis of the chassis, means for rotating the paddles to mix the fluxing oil with the heated material and thereby regenerate the material and render it fit for reuse, a transverse pivot support for the rear end of the trough connected to the chassis and about which the trough is vertically adjustable, said front end of the trough being carried by the blades, means vertically adjusting the blades, an elevator extending rearwardly and upwardly from the trough and having a lower end positioned within the trough to receive the material, as it is forced in being mixed with the fluxing oil rearwardly in the trough, and to remove the regenerated material from the trough.

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