United States Patent

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[33] **Great Britain**
[31] **44350/68**

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[54] **CONCRETE-PAVING MACHINES**
7 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **94/44,** 94/46
[51] **Int. Cl.** **E01c 19/12**
[50] **Field of Search** 94/44, 45, 46

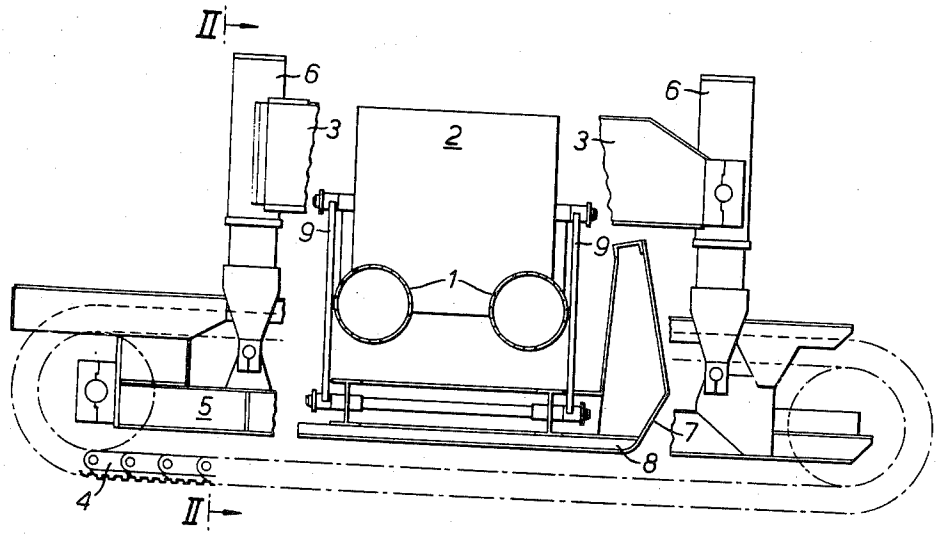
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ABSTRACT: A concrete-paving machine of the kind embodying a conforming plate which, as the machine advances, levels plastic concrete preplaced in front of the machine, has the conforming plate mounted for controlled lateral displacement on the machine so providing supplementary control over its path of travel independent of the machine's steered course.



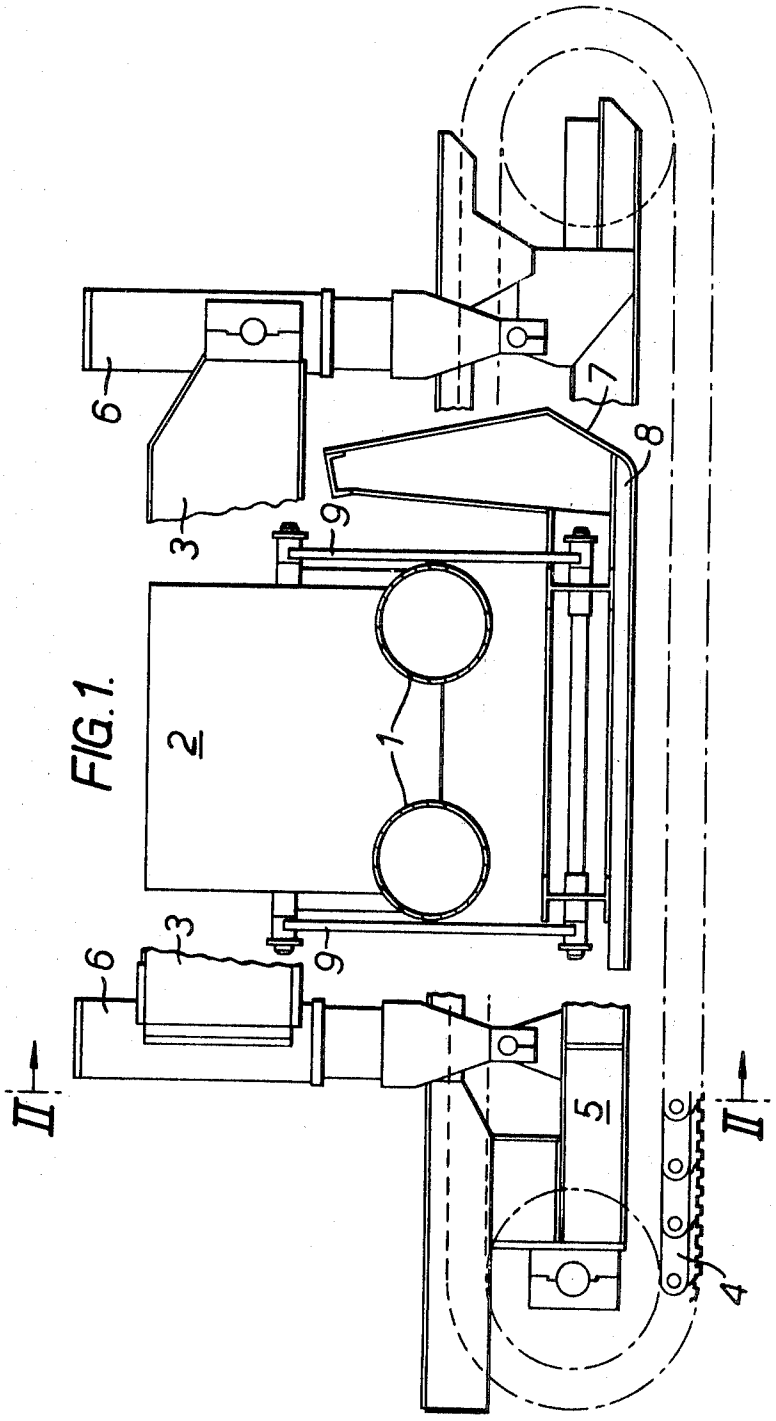
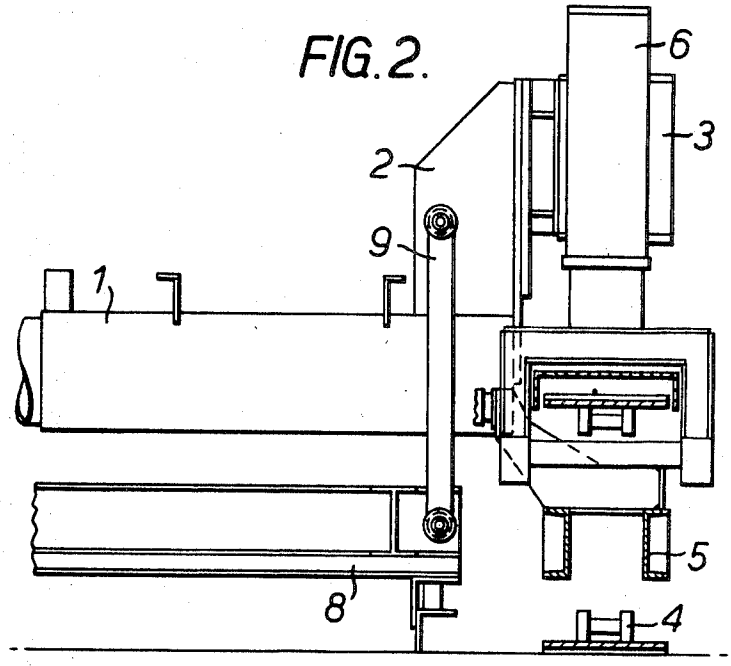


FIG. 1.

FIG. 2.



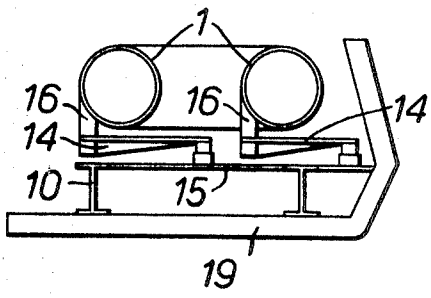


FIG. 5.

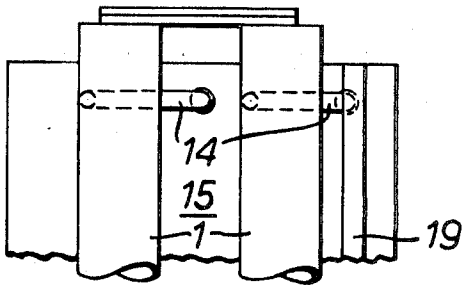


FIG. 6.

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FIG. 4.

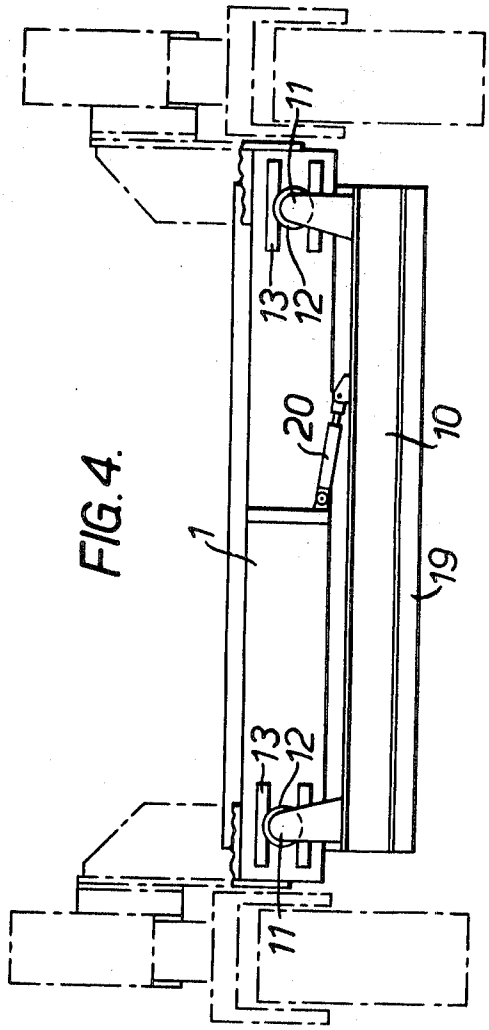
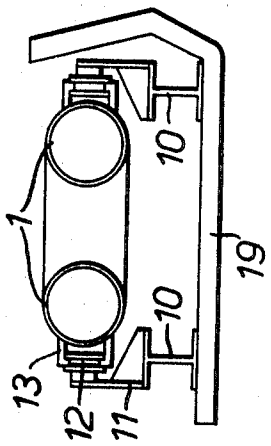


FIG. 3.



CONCRETE-PAVING MACHINES

This invention relates to concrete-paving machines as used in the construction of roads, paths, runways and similar surfaces.

A common form of paving machine at present in use comprises a conforming plate rigidly supported on the machine frame and which, as the machine advances, levels the plastic concrete preplaced in front of the machine. Such machines are usually mounted on wheels or endless tracks and are steered to follow a preset course with the aid of probes carried on the machine and cooperating with preplaced guide or control wires alongside the surface to be paved. However, this arrangement tends to create a degree of overcorrection to the steering with the result that the machine, instead of following the path indicated by the guide or control wires, tends to deviate from this. Whilst this minor deviation is of lesser importance in the laying of large concrete areas such as motorways, for estate and similar work involving smaller radiussed curves, this defect is often accentuated and it is the object of the present invention to provide an improved paving machine which enables a set curve to be followed more accurately than with the known machines.

According to the invention on a paving machine embodying the conventional steering control, the conforming plate is displacable laterally on the machine frame under independent control. Thus any tendency of the machine to oversteer can be corrected or compensated by a separate transverse movement of the conforming plate in the opposite direction whereby the plate can be caused to follow closely and accurately a desired curve or other path.

Reference will now be made to the accompanying drawings which illustrate several methods of carrying the invention into effect and wherein:

FIG. 1 is a part sectional side elevation of a paving machine incorporating a first embodiment, parts of the machine having been omitted for clarity,

FIG. 2 is a cross-sectional view on the line II—II of FIG. 1,

FIG. 3 is a fragmentary side elevation showing a second form of the invention,

FIG. 4 is a rear elevation of the arrangement shown in FIG. 3,

FIG. 5 is a view similar to FIG. 3 but showing a third embodiment, and

FIG. 6 is a fragmentary plan view of FIG. 5.

Referring first to FIGS. 1 and 2, the machine shown comprises a main frame structure including transverse tubular members 1 rigidly connected by bracket structures 2 to longitudinal girders 3, the machine in this instance being supported on endless tracks 4 carried by a subunit 5 which is vertically adjustable on the main frame by means of hydraulic jacks 6. The machine is steered in the manner of endless track vehicles by varying relative speed of the two tracks, and under control of probes on the machine coacting with preplaced guide wires, but as such control means form no part of the present invention it has been omitted for clarity.

The conforming plate is of conventional form, comprising a substantially vertically vertically extending front plate portion 7 merging along its lower edge into a horizontal plate portion 8, the arrangement being such that as the machine moves forward plastic concrete deposited ahead of the conforming plate is protruded beneath the base portion 8 and formed on the subbase into a layer of a depth determined by the relative heights of the main frame and subunit. For the purpose of the present invention the conforming plate is suspended at its front and rear ends on two sets of swinging arms 9 pivotally or hingedly attached to the main frame such that the conforming plate can swing transversely of the machine. Although with this arrangement the conforming plate moves in an arc, the degree of movement is relatively small having regard to the length of the arms such that said plate movement is substantially horizontal. The arms 9 abut the tubular frame members 1 so restraining the arms and thereby the conforming plate against longitudinal movement but rigidly supported rollers or any equivalent guide means may be provided for the conforming plate or the arms to prevent strain being imparted to the arms or their pivots.

In a modification of the above described arrangement, the swinging arms are horizontally disposed, or are inclined to the horizontal, appropriate guiding and supporting means being provided for the conforming plate and these means also serving to prevent strain being transmitted to the arms or their pivots.

FIGS. 3 and 4 illustrate another construction in which the swinging arms are dispensed with, the conforming plate 19 in this instance being attached to a pair of girders 10 constituting a subframe and to which are attached brackets 11 carrying rollers, shoes or equivalent means 12 riding in horizontal channel or guide structures 13 welded to the main frame members 1. The arrangement of rollers and guide means may of course be reversed, the rollers being mounted on the main frame and the brackets being attached to a channel member or members guided and supported for horizontal displacement on the rollers.

In yet another embodiment shown in FIGS. 5 and 6, the conforming plate 19 is carried by a subframe 10 as before but in this instance the subframe is suspended from the main frame by sets of horizontally disposed and longitudinally directed swinging arms 14, said arms being pivotally attached at their forward ends to a plate 15 forming part of the subframe structure and at their rearward ends to bosses 16 welded onto the main frame members 1 such that the conforming plate is supported for horizontal parallel movement.

Displacement of the conforming plate upon the machine can be effected in any desired manner, power actuation being preferably employed. In FIG. 4 we have shown a double-acting hydraulic ram 20 disposed laterally of the machine and connected at its ends to the main frame and to the conforming plate respectively but any equivalent means may be employed, for example, a linear electric actuator, or an electric, pneumatic or hydraulic rotary actuator operating a winch having rope or chain connection with the conforming plate. Alternatively, a power takeoff from the engine of the machine may be used, acting on the conforming plate either directly or through lever mechanism, spur gearing or equivalent means with overriding manual control if desired.

I claim:

1. A concrete-paving machine for placing plastic concrete material along a longitudinal path comprising a main support frame movable along said path, a transverse conforming plate connected to said main frame and extending across said longitudinal path, said plate being adjustably mounted on said main frame for controlled lateral displacement across said longitudinal path and being operable as said machine advances along said path to level plastic concrete material which is placed in front of the advancing machine.

2. A paving machine as claimed in claim 1, wherein the conforming plate is suspended on sets of arms which are pivotally attached to the main frame for swinging movement transversely of the main frame across the longitudinal path.

3. A paving machine as claimed in claim 2, wherein the swinging arms are vertically disposed.

4. A paving machine as claimed in claim 2, wherein the swinging arms are horizontally disposed or are inclined to the horizontal.

5. A paving machine as claimed in claim 2 including guiding means on the main frame for engaging the swinging arms or the conforming plate and preventing strain being transmitted to the arms and their pivots.

6. A paving machine as claimed in claim 1, comprising a subframe on which said conforming plate is carried, and means supporting said subframe on said main frame for horizontal movement in a direction transverse of said longitudinal path.

7. A paving machine as claimed in claim 1, comprising a subframe on which said conforming plate is carried, said subframe being suspended from said main frame by sets of horizontally disposed, longitudinally directed swinging arms having pivotal connections with said main frame and said subframe so that said conforming plate is capable of horizontal movement in a direction transverse of said longitudinal path.