Dec. 30, 1941. P. D. IONIDES 2,267,978

APPARATUS FOR APPLYING SURFACING MATERIAL TO ROADS

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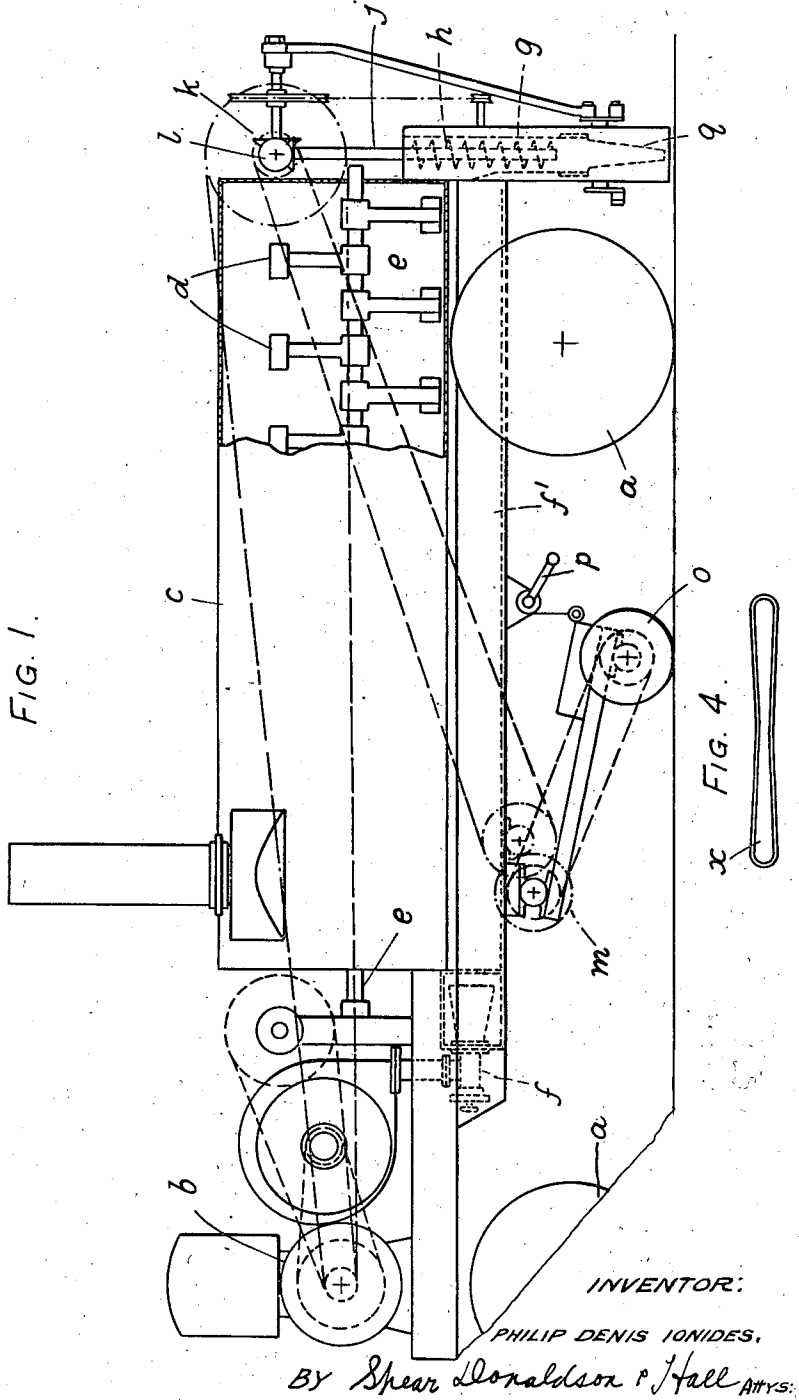

FIG. 1.

FIG. 4.

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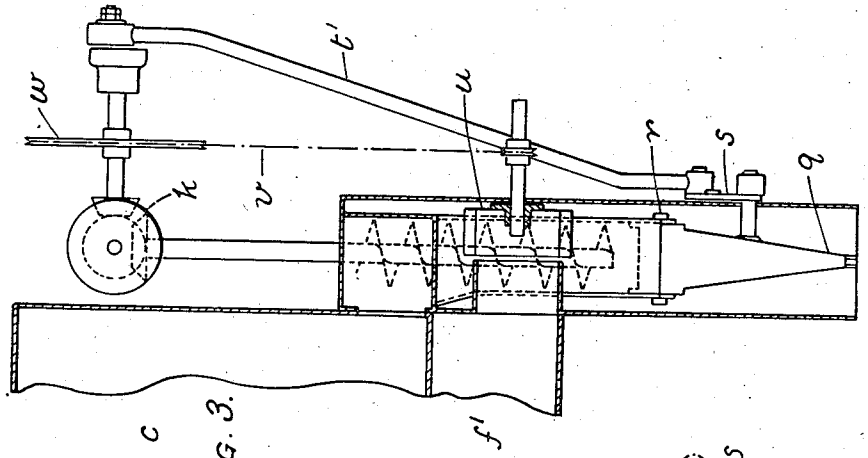

FIG. 3.

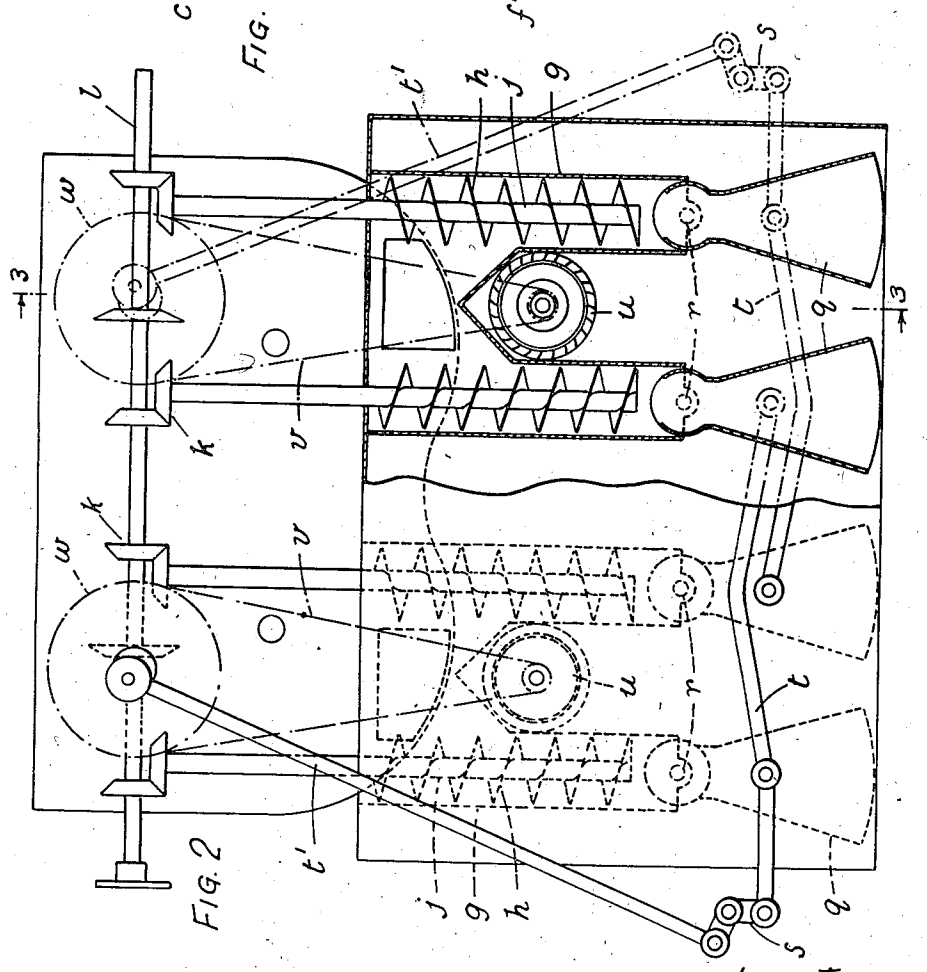

FIG. 2

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UNITED STATES PATENT OFFICE

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APPARATUS FOR APPLYING SURFACING MATERIAL TO ROADS

Philip Denis Ionides, London, England

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In Great Britain January 26, 1938

3 Claims. (Cl. 94—40)

The present invention relates to the application of a surfacing material of uniform thickness to roads, such material being preferably what is known as "mastic," that is a suitable mineral substance to which bitumen has been added, the mastic being applied in a plastic state.

According to the present invention the mastic or other surfacing material, which will hereinafter be referred to as the mastic, is adapted to be mechanically extruded from a suitable vessel and deposited on the road surface in accordance with the movements of a vehicle on which the container is mounted, means being provided whereby the flow of mastic may be discontinued, if desired, during travel of the vehicle, as for example during transit of the vehicle from one locality to another.

The material is extruded through one or more tapering nozzles, and consequently the distance to be travelled by the mastic is less at the centre of a nozzle than at the periphery, and this applies more particularly in the case of nozzles in which the shape of the passage is circular at the top and changes gradually to a long narrow slot. It has been found that in such cases the mastic will always choose the shortest path, probably owing to the resistance due to friction, with resulting loss in uniformity of thickness of the issuing mastic and consequently of the surfacing layer.

To overcome this difficulty the nozzle or nozzles is or are, according to this invention, caused to oscillate rapidly through a comparatively small angle, say for example 25°, so that the internal friction is reduced, and greater evenness of distribution obtained.

In order still further to increase the even distribution of the layer of mastic the slot at the delivery end of a nozzle is, according to this invention, of unsymmetrical shape, the slot being relatively wide at the ends, and gradually narrowing towards the centre.

According to a modified form of construction of the invention it is intended to discharge the mastic in a heated condition from insulated containers into the extruding apparatus, the material having been heated at some convenient place away from the position where road work is in progress The insulated containers filled with heated mastic are loaded on to lorries, and conveyed to the place of operation, the containers, after having been emptied, being returned to the filling position.

Compressed air is used to assist in the process of emptying the containers, and compressed air is also employed to assist in forcing the material through the extrusion nozzles as described.

A convenient form of container, which is adapted to be filled by gravity, is provided with a valve controlled opening at the top and an inlet for compressed air at the bottom, the container being of barrel form with all its walls insulated. The filled containers are loaded on to vehicles with the filling opening at the bottom so that during the emptying process the denser material will be at the bottom of the container and therefore will be the first to be evacuated. The compressed air, on the other hand, will be at the top.

The container into which the mastic is poured is fitted with a door which is readily closed against pressure, and may be provided with a joint of the "bayonet" type.

One form of construction of the invention is illustrated somewhat diagrammatically in the annexed drawings, in which:

Fig. 1 is a side elevation.

Fig. 2 is an end view.

Fig. 3 is a section on the line 3—3 of Fig. 2, and

Fig. 4 is a detail view showing the shape of the delivery end of a nozzle.

In these drawings, the apparatus consists of a vehicle having road wheels *a* of ordinary type and an internal combustion engine *b* on the chassis of which the apparatus is mounted. This comprises a boiler *c* in which mastic is heated, and which contains a number of agitators *d* mounted on a shaft *e* driven from the engine *b*. The boiler *c* is heated by hot gases from an oil-fired furnace *f*, the gases traversing a passage *f'* beneath the boiler. The heated mastic flows from the boiler into a number of containers *g*, of which four are shown. Each of these containers is provided with a worm *h* mounted on a shaft *j* driven by bevel gearing *k* through a further shaft *l*, which is in turn driven by the engine or, alternatively, by gearing *m* connected to one of a pair of centrally disposed road wheels *o*, which can be raised by a hand lever *p* out of contact with the road when surfacing operations are to be temporarily suspended. At the lower end of each container *g* a nozzle *q* is pivotally mounted at *r*. These nozzles receive the mastic flowing from the container, and cause it to be deposited in an even layer on the road. The nozzles are arranged alternately in pairs as shown in Fig. 2, and are adapted to be oscillated through an angle of about 25° by means of cranks *s* and connecting rods *t*, the cranks being driven through further rods *t'* from the shaft *l*, which is operated by the road wheel *o*. Fans *u* serve to extract the

hot gases from the passages around the boiler *c* and to circulate the gases so extracted around the containers *g*, and the nozzles *q*, these gases finally escaping at the bottom of the casing which encloses the nozzles, these fans being driven by belts *v* and pulleys *w* mounted on the shaft *l*.

The nozzles *q* are provided at their lower ends with openings *x*, of which the shape is as shown in Fig. 4, that is broadest at the ends, and decreases gradually towards the centre.

Having thus described the nature of the said invention and the best means I know of carrying the same into practical effect, I claim:

1. In apparatus for applying surfacing material to roads, means for delivering the material to the roadway comprising at least one nozzle through which the material is extruded, said nozzle being mounted for oscillation, means for oscillating the nozzle, and said nozzle at the delivery end thereof having a discharge opening of elongated shape, said elongated opening in the nozzle being relatively wider at the ends of said elongated opening than at the center of said opening, and narrowing gradually towards the center of said opening, whereby a layer of surfacing material of even thickness is applied to the roadway.

2. In apparatus for applying surfacing material to roads, a boiler containing the surfacing material, means for heating the boiler and the material therein by hot gases, a container for receiving the heated material ejected from the boiler, fans for circulating hot gases intended for heating the surfacing material in the boiler for heating the said container, and means for delivering the material to the roadway comprising a nozzle below the container and pivotally connected to the container and through which nozzle the material delivered from said container, is extruded, said nozzle being mounted for oscillation, and means for oscillating the said nozzle.

3. In apparatus for applying surfacing material to roads, means for delivering the material to the roadway comprising at least one nozzle through which the material is extruded, said nozzle being mounted for oscillation, means for oscillating the nozzle, and means employing compressed air to assist in forcing the material through the extrusion nozzle.

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