June 6, 1933. A. HUET 1,912,897

ROAD MACHINE

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Fig. 1

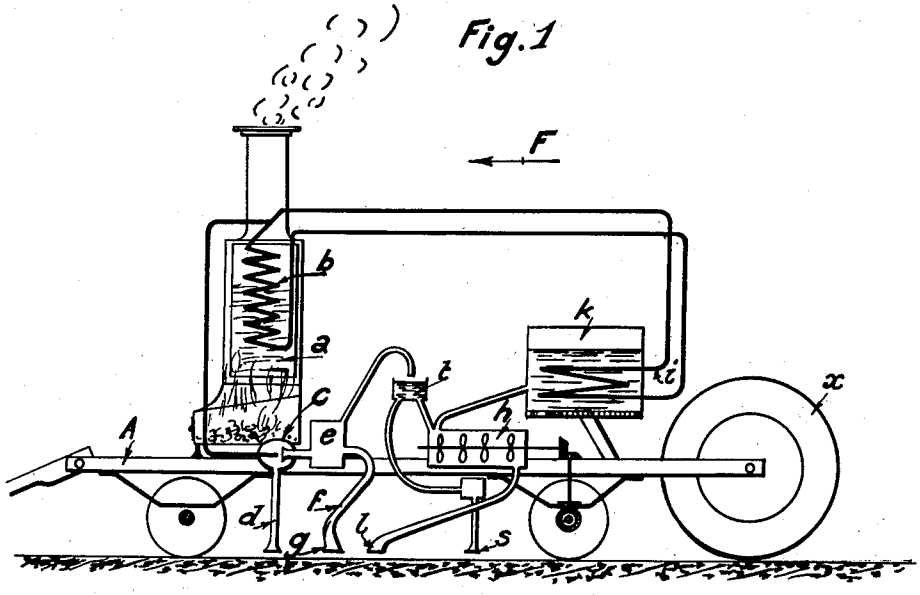


Fig. 2

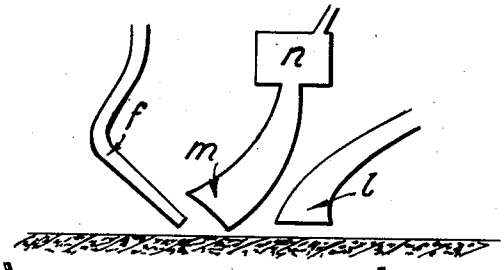


Fig. 3

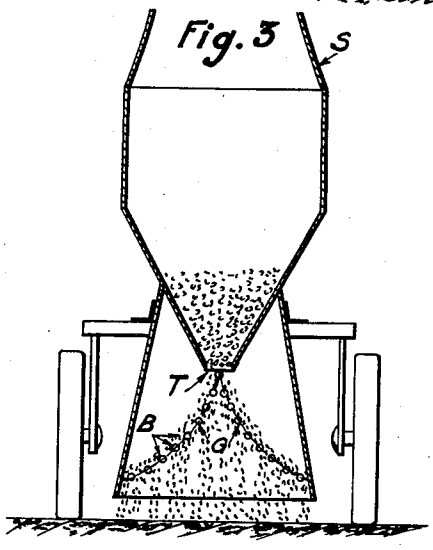
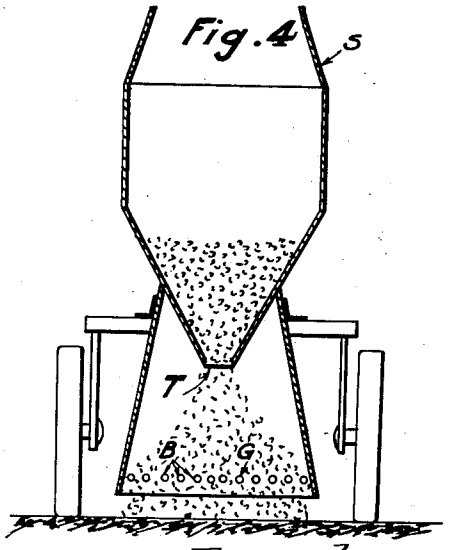


Fig. 4



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Fig. 5

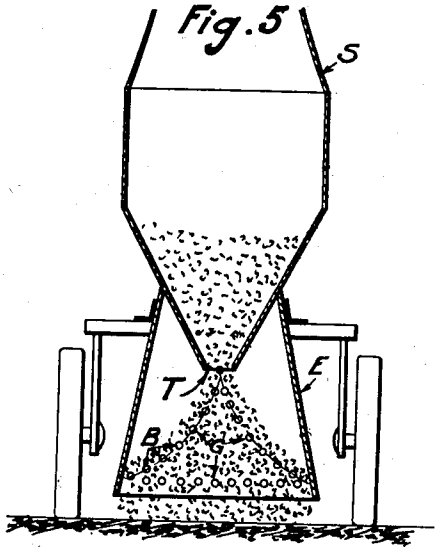


Fig. 6

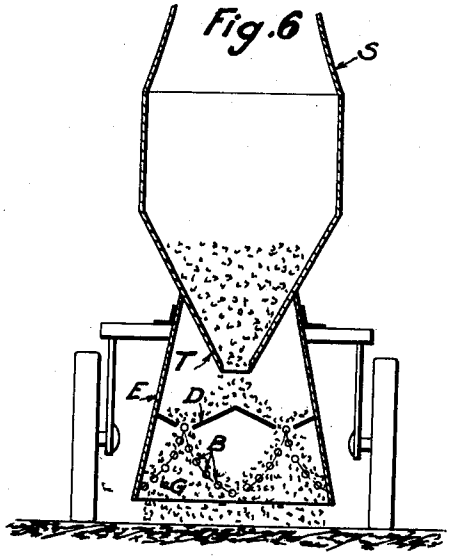


Fig. 7

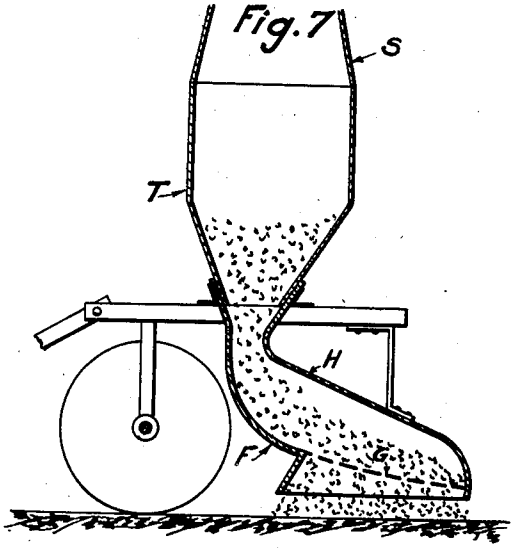
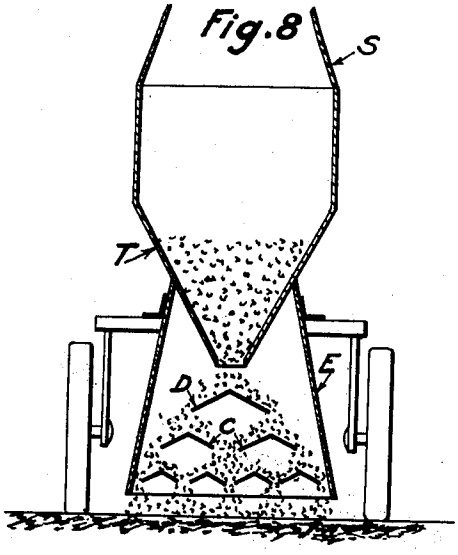


Fig. 8



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UNITED STATES PATENT OFFICE

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ROAD MACHINE

Application filed June 9, 1928, Serial No. 284,143, and in France June 20, 1927.

My invention relates to improvements in road surfacing machines and has for its object to provide such a machine adapted to perform in succession the several operations required for preparing a road surface. These operations, as contemplated herein, consist in cleaning the road, heating its surface, coating with a suitable material, and rolling it. According to my invention, the steam furnished by a steam generator may be used, both for sweeping the road and for forcing the material thus swept into a receiver, after which it may be sorted, partly incorporated into the road coating material, and partly distributed over the road after the latter has been coated and before the coating has been rolled.

I prefer to separate the coating by means of a perforated tube disposed between the receiver for the material which has been picked up from the road and the part which serves to distribute the road coating material.

The several operations performed by my improved machine may be accomplished substantially simultaneously and over a very small length of the road at a time.

Another object consists in providing certain improvements in the form, construction and arrangement of the apparatus, whereby the above named and other objects may effectively be attained.

A practical embodiment of the invention is shown in the accompanying drawings, in which

Fig. 1 is a diagrammatic side elevation of my improved machine, certain parts being shown in section;

Fig. 2 represents in detail a modification of Fig. 1, in which the steam jet serves both for heating and cleaning the road;

Fig. 3 is a detail vertical section of a device for uniformly distributing the gravel and stones along the road;

Figs. 4 to 8, inclusive, show various modifications of the structure shown in Fig. 3.

In Fig. 1 may be found the various elements which go to make up my novel road surfacing machine. It will be assumed that the machine is normally moved over the road in the direction of the arrow F. The frame of the machine is represented conventionally at A. In said machine steam is formed in a boiler *a*, is superheated by a superheater *b*, and is conducted to an ejector *c* where it is caused to expand so as to suck up dust, stones and gravel from the road through the tube *d*, which has its lower open end near the surface of the rod.

The mixture of dust and other material contained in the mixture of steam and air from the ejector *c* is caused to settle in a special separator *e*. The purified mixture of air and steam is blown against the road at a very high temperature through the pipe *f* and the nozzle *g*, so as to heat the road at the point of contact. The steam may also serve to disturb the dust and other material on the road so that it will more readily be drawn up through the tube *d*.

Dust is driven from the separator *e* into a bin *t* from which it is drawn off to a mixing chamber *h*, operated mechanically by any suitable means, and into which is also poured the material to be spread on the road, such, for instance, as tar or asphaltum. This material is maintained at a high temperature by means of steam which circulates through the heating coil *i* in the vat *k*, which contains said material.

The mixture of dust and other material from the mixing chamber *h* may be spread upon the road through a suitable pipe *l* disposed adjacent to, and slightly behind, the stem nozzle *g*.

It will be apparent that it is not necessary to mix all of the dust and other material collected in the bin *t* with the tar or asphaltum, and a distributor *s* is provided from which a portion of said dust and other material may be spread uniformly upon the road after the coating material has been placed thereon.

In the case of a tar road, for example, it will be seen that this road surfacing machine will serve to clean, heat and, if necessary, melt a surface to be treated. The operation of spreading the coating takes place immediately after the sweeping and heating, hence perfect adherence of the coat-

ing material is assured, since the additional material forms an intimate mixture with the coating already on the road.

A roller *x* may be provided for rolling the road after it has undergone the various treatments above set forth.

In some instances I may, as shown in Fig. 2, project the superheated steam through the pipe *f* at an angle to a surface of the road in order to cause a very effective sweeping thereof. The mixture of dust, air and steam is projected into a tube *m* of special form adapted to convey said mixture to a separator *n* in which the dust and other solid material is caused to settle. Said tube *m* is disposed before pipe *l* through which the mixture of dust and tar or similar material is spread upon the road.

It will be understood that I may, if desired, use a steam blast simply for cleaning purposes; as, for instance, when the material from the road surface is of a quality which renders it unsuitable for mixing with the new surfacing material to be applied, in which case it may be sufficient simply to blow the dust off to the side of the road so as to thoroughly clean the portion to be treated.

The gravel or like material picked up from the road is preferably first sorted on a grid or similar device and is then distributed on a road surface immediately after the latter has received its coating. Some or all of the gravel may also be mixed directly with the material forming the coating before it is spread upon the road surface, as hereinabove described.

I have indicated in a general way in Fig. 1 the provision of device *s* for ensuring a regular distribution of stones and gravel from container *t* over the road surface. It is known that if these stones and gravel are allowed to fall freely onto the road they distribute themselves according to the law of probabilities, so that the density of the particles around each point of distribution decreases as the point considered is further removed from the mean point of impact of the falling material. In order to distribute the material regularly and in accordance with a predetermined law, I may dispose underneath the hopper T of distributer *s*, a grid or sieve having openings proportioned with regard to the area and shape of said grid or sieve.

Several embodiments of this structure are illustrated in Figs. 3 to 8, inclusive.

The apparatus shown in section in Fig. 3 is adapted to give uniform distribution of the granular material, and to this end the bars of the grid G are disposed horizontally under hopper G of distributor *s* at equal distances from each other in a downwardly and outwardly sloping relationship.

If the housing E (Figs. 5, 6 and 8) is not too large, I may arrange the bars of the grid in the form of cylindrical surface sections, the generatrices being constituted by short cross bars; thus the theoretical surface of revolution is replaced by a cylinder tangent thereto along a meridian line thereof.

The same sort of uniform distribution may be obtained by disposing the bars of the grid as shown in Fig. 4, said bars being themselves distributed according to the law of probabilities. In this case, however, there is a possibility of an accumulation of materials at those parts where the density of the bars is greatest.

In addition to the foregoing, it is apparent that I may combine inclined planes D and grids or sieves, the latter having surfaces which pass through curves similar to the above mentioned evolutes, or having their bars distributed along straight lines in accordance with the above mentioned laws, so as to obtain the desired results as indicated in Figs. 5 and 6.

In the modification shown in Fig. 7, the hopper T of distributor *s* is connected with a duct H, the underside F of which has a longitudinal cross sectional form coinciding with the normals to the probability curve, and this part F has an extension forming a grid or sieve G formed in cross section as an evolute of the above described type.

A somewhat simpler, but less accurate, arrangement for distributing the gravel includes a provision of any desired number of elementary obstacles, such as inclined planes in staggered relationship, such that they will serve to divide the initial flow of material into a number of smaller streams. The height of these obstacles above the surface of the road may advantageously be determined at such a point that the zones of dispersion of the material from the various obstacles will be substantially tangent at the road surface. An example of such an arrangement is represented diagrammatically in Fig. 8, wherein T designates the hopper of distributor *s*, D a first obstacle, and C a number of smaller obstacles.

It will be understood that various changes may be resorted to in the form, construction and arrangement of the apparatus, without departing from the spirit and scope of my invention; and hence I do not intend to be limited to the details herein shown and described, except as they may be included in the claims.

What I claim is:—

1. A road surfacing machine of the character described comprising, a wheeled frame, a steam generator carried by said frame, means for directing the steam from the generator against the road surface, means for collecting dust and other loose material from the road surface, means carried by the frame for applying road coating material to

the road, and means for mixing dust and other loose material into the road coating material.

2. A road surfacing machine of the character described comprising, a wheeled frame, a steam generator carried by said frame, means for directing the steam from the generator against the road surface, means for collecting dust and other loose material from the road surface, a reservoir for the road coating material, means for causing the steam from the generator to heat said road coating material, means carried by the frame for applying the road coating material to the road, and means for mixing dust and other loose material into the road coating material.

3. A road surfacing machine of the character described comprising, a wheeled frame, a steam generator carried by said frame, a reservoir for road coating material, means for causing the steam from the generator to heat said road coating material, an ejector adapted to project part of the steam against the road surface, a container carried by the frame, a collecting pipe in front of the ejector for conducting dust and other loose material from the road surface into the container, means carried by the frame for applying the road coating material to the road, and means for mixing dust and other loose material into the road coating material from the container.

4. A road surfacing machine of the character described comprising, a wheeled frame, a steam generator carried by said frame, a reservoir for road coating material, means for causing the steam from the generator to heat said road coating material, an ejector adapted to project part of the steam against the road surface, a container carried by the frame, a collecting pipe in front of the ejector for conducting dust and other loose material from the road surface into the container, means carried by the frame for applying the road coating material to the road, and means for distributing uniformly dust and other loose material from the container onto the surface of the road coated with the coating material.

5. A road surfacing machine of the character described comprising, a wheeled frame, a steam generator carried by said frame, a reservoir for road coating material, means for causing the steam from the generator to heat said road coating material, an ejector adapted to project part of the steam against the road surface, a container carried by the frame, a collecting pipe in front of the ejector for conducting dust and other loose material from the road surface into the container, means carried by the frame for applying the road coating material to the road, and a grid, the bars of which are so disposed as to distribute uniformly dust and other loose material from the container onto the surface of the road coated with the coating material.

6. A road surfacing machine of the character described comprising, a wheeled frame, a steam generator carried by said frame, a reservoir for road coating material, means for causing the steam from the generator to heat said road coating material, an ejector adapted to project part of the steam against the road surface, a container carried by the frame, a collecting pipe in front of the ejector for conducting dust and other loose material from the road surface into the container, means carried by the frame for applying the road coating material to the road, means for mixing dust and other loose material from the container into the road coating material, and means for distributing uniformly dust and other loose material from the container onto the surface of the road coated with the coating material.

7. A road surfacing machine of the character described comprising, a wheeled frame, a steam generator carried by said frame, a reservoir for road coating material, means for causing the steam from the generator to heat said road coating material, an ejector adapted to project part of the steam against the road surface at a certain angle to said surface, a container carried by the frame, a collecting pipe in front of the ejector for conducting dust or other loose material from the road surface into the container, means carried by the frame for applying the road coating material to the road, means for mixing dust and other loose material from the container into the road coating material, and means for distributing uniformly dust and other loose material from the container onto the surface of the road coated with the coating material.

In testimony whereof I hereunto affix my signature.

ANDRÉ HUET.