

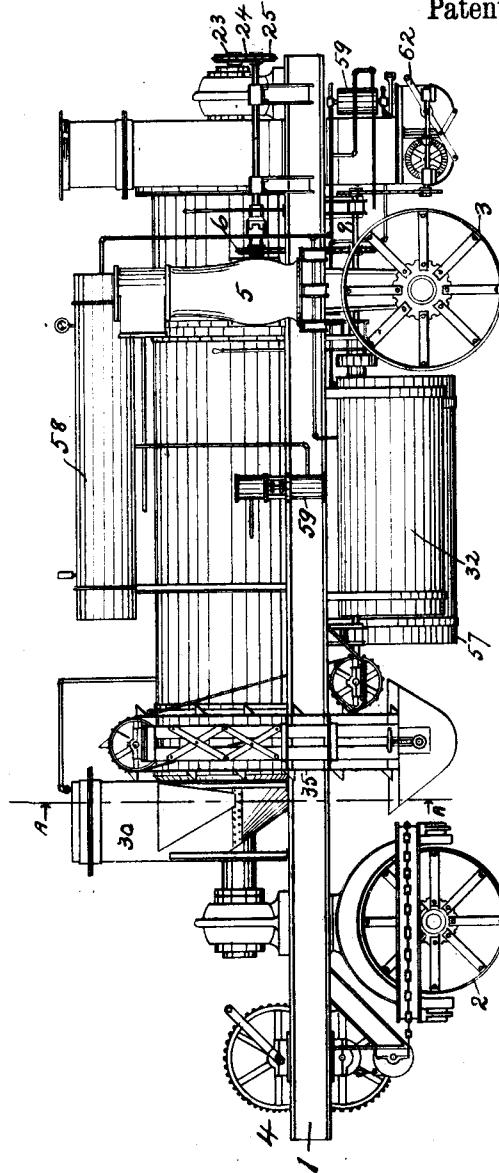
M. A. POPKESS.  
ROAD SURFACING MACHINE.  
APPLICATION FILED AUG. 21, 1911.

1,062,552.

Patented May 20, 1913.

6 SHEETS—SHEET 1.

Fig. 1.



Witnesses  
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by Edward A. Coombs  
his Attorney

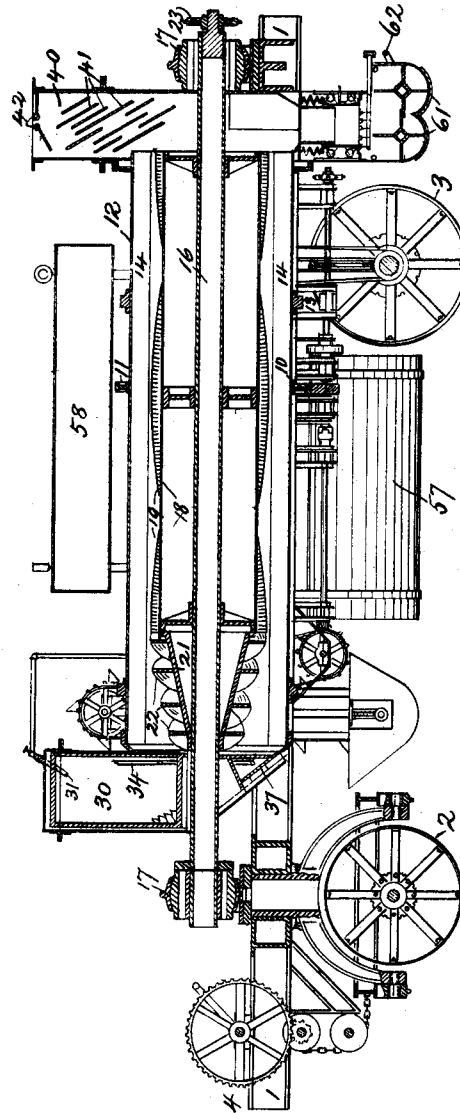
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6 SHEETS-SHEET 2.

Fig. 2.



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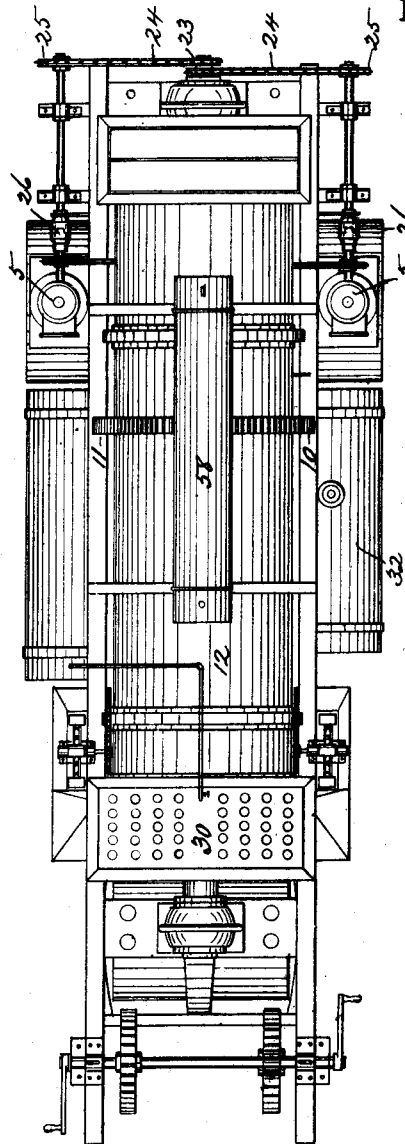
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6 SHEETS—SHEET 3.

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Fig. 3.



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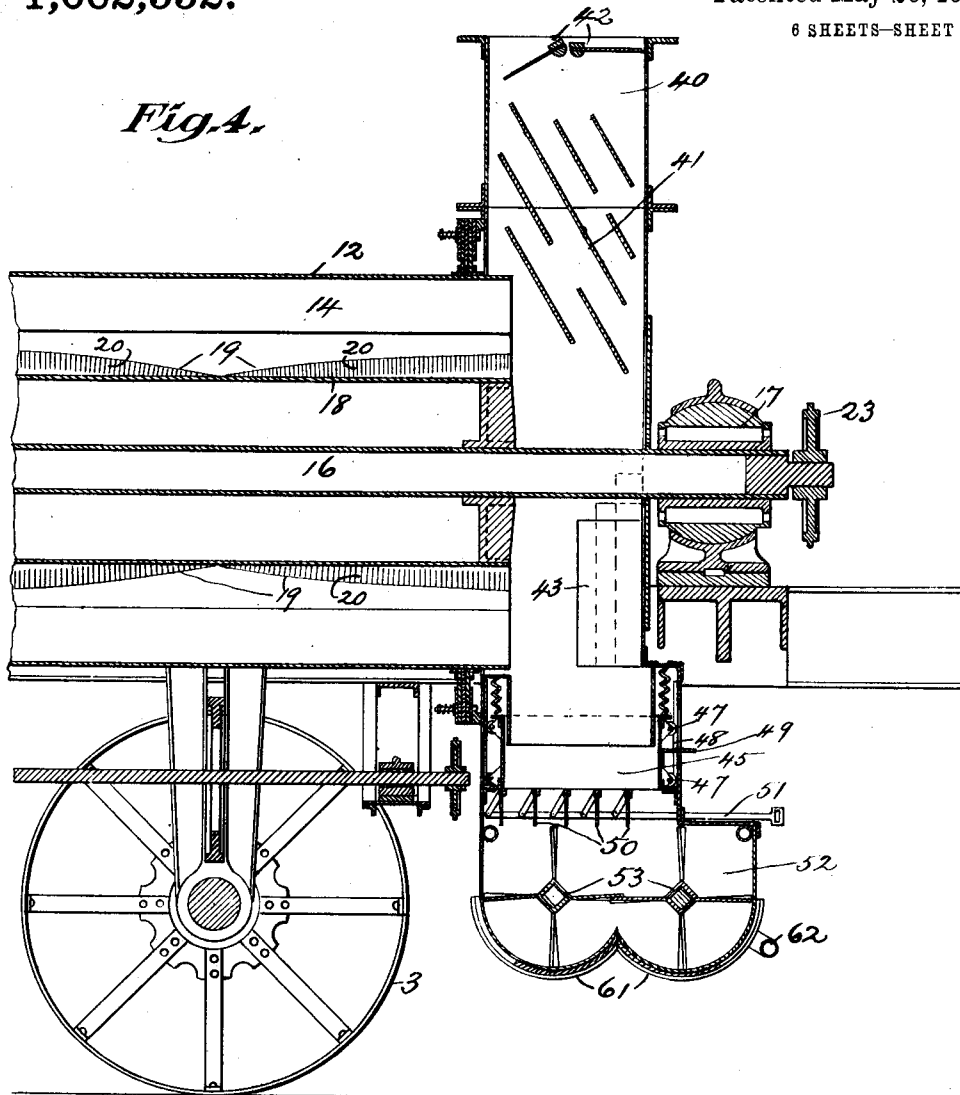
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6 SHEETS—SHEET 4.

Fig. 4.



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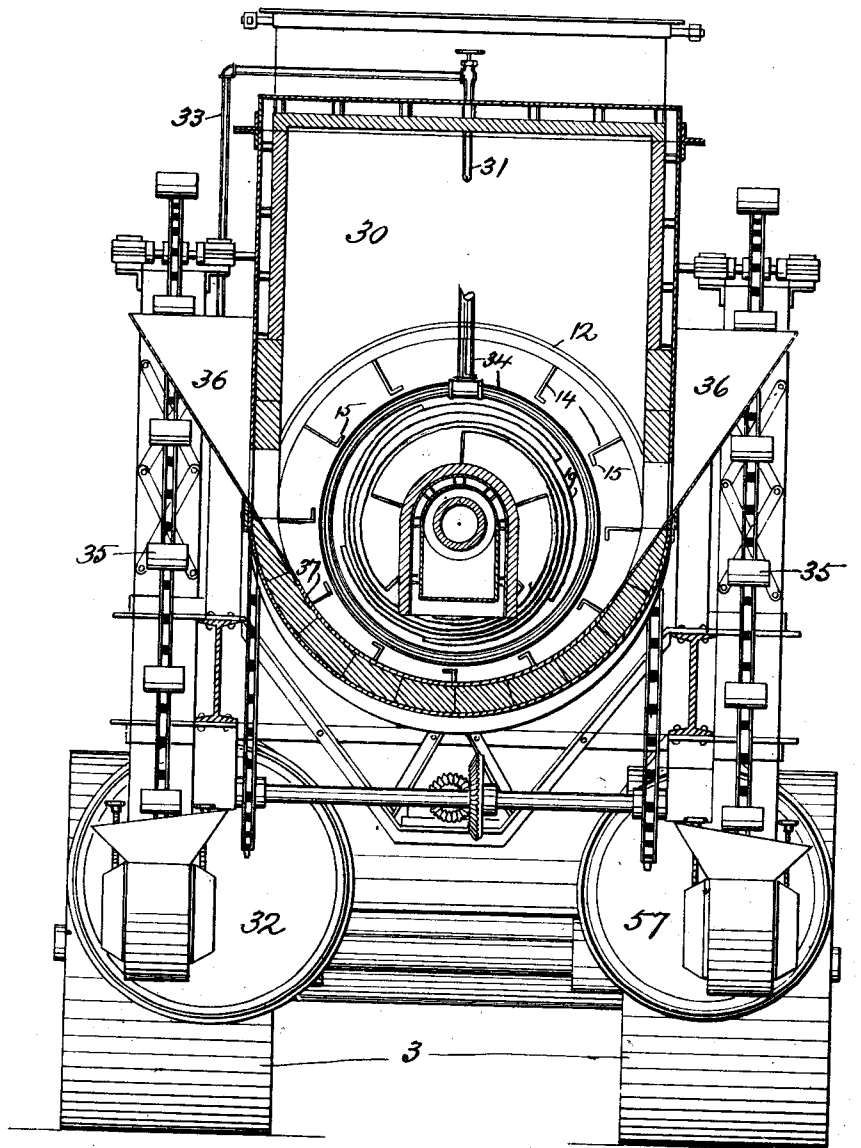
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6 SHEETS—SHEET 5.

*Fig. 5.*



Witnesses  
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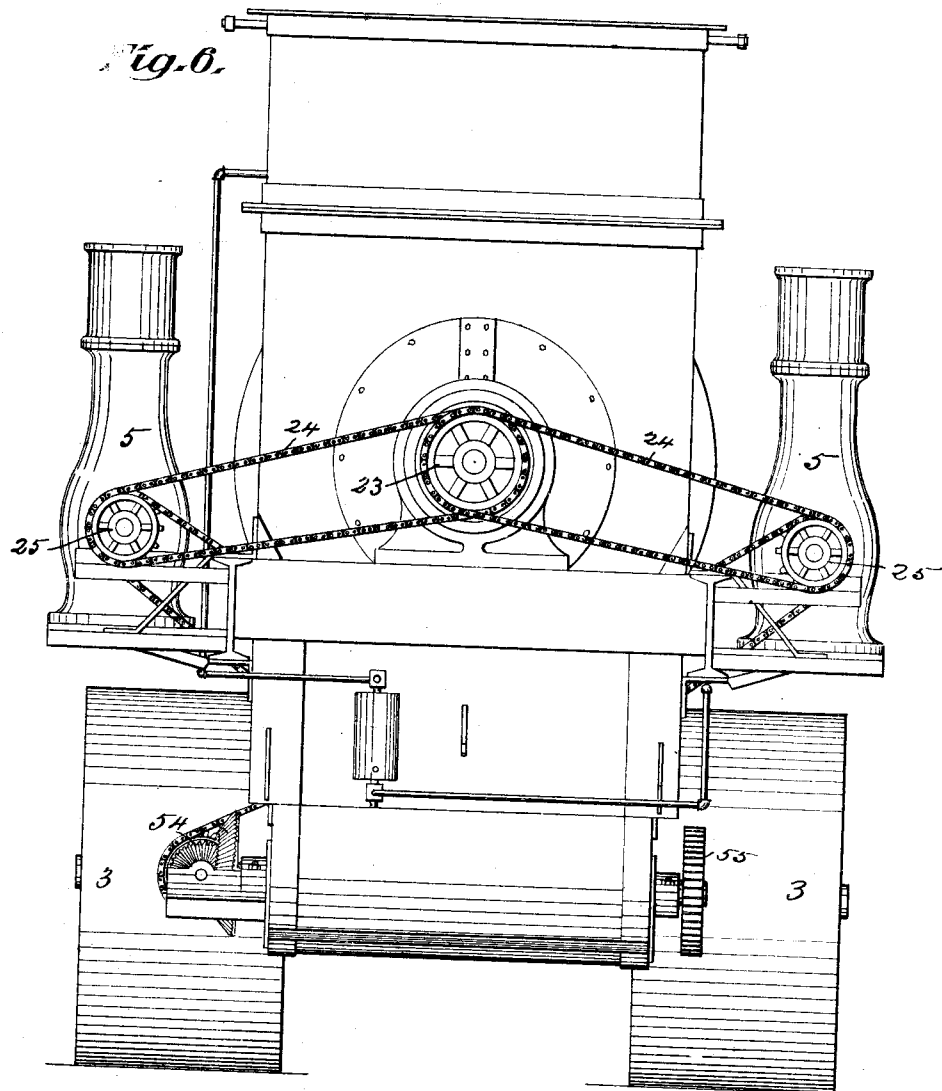
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6 SHEETS—SHEET 6.



Witnesses

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# UNITED STATES PATENT OFFICE.

MICHAEL A. POPKESS, OF KANSAS CITY, MISSOURI.

## ROAD-SURFACING MACHINE.

1,062,552.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed August 21, 1911. Serial No. 645,229.

*To all whom it may concern:*

Be it known that I, MICHAEL A. POPKESS, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented new and useful Improvements in Road-Surfacing Machines, of which the following is a specification.

My invention relates to machines for surfacing roadways and the like and consists in a number of improvements I have made to the machine shown in my Patent, No. 942,866. These improvements will now be described, reference being had to the accompanying drawings, in which,

Figure 1 is a side elevation of the machine. Fig. 2 is a central vertical section through the same. Fig. 3 is a plan view of the same. Fig. 4 is an enlarged view of the right-hand end of Fig. 2. Fig. 5 is an enlarged cross-section taken on the line A—A in Fig. 1, and Fig. 6 is a rear elevation of the machine.

The machine, the frame of which is shown at 1, is carried by front and rear wheels 2 and 3, and is intended to be drawn along over the surface to be treated. It is steered through the front wheels 2 by the gearing indicated as a whole by 4. On each side of the frame is mounted an engine 5, by which the moving parts to be described are driven. These engines may be supplied with steam from the boiler of the traction engine used to haul the machine. Each engine-shaft carries a sprocket-wheel 6, the chains of which drive a countershaft 9, located in the center line of the machine and carrying a pinion 10 in mesh with the ring gear 11, carried by the long cylindrical shell or drum 12, which is rotatably supported on roller bearings 13, as is common. The inner periphery of the shell 12 carries radial shelves or cleats 14, see Fig. 5, which may be bent or flanged at their inner ends, as at 15, to retain the material thereon as the shelves travel up to the top.

A hollow shaft 16, journaled in bearings 17, runs axially through the shell 12, and supports a drum 18, provided on its outer periphery with spiral blades 19, which are notched or slotted in their free edges, as indicated at 20. The front end of the drum 18 is made tapering, as shown at 21, and this portion carries spiral blades 22 of steeper pitch than the blades 19 on the cylindrical portion of the drum. The shaft and drum

are rotated, at considerably higher speed than the shell 12, by the sprockets 23 on the end of the shaft 16, driven by the chains 24, from the sprockets 25 on the ends of the engine shafts. Each of the latter is provided with a clutch 26, so that one of the engines can be used alone to drive the drum 18.

This machine is designed to treat earthy material, as distinguished from stone, gravel or sand, the function of the parts above described being to pulverize or break up the material by violent impact into fine dust which is whirled about by the action of the spiral blades upon which the material is repeatedly dropped, during its travel through the shell, from the cleats on the latter. At the same time the material is subjected to heat to dry it, 30 representing a combustion chamber, communicating with the front end of the shell and containing an oil burner 31, supplied with oil from the tank 32 through the pipe 33. 34, Figs. 2 and 5, represents a coil of pipe through which superheated steam may be fed into the combustion chamber to assist in maintaining the flow of heated air and gases through the shell.

The material to be treated is raised by the bucket elevators 35, 35, into hoppers 36, 36, mounted on the sides of the combustion chamber and leading into the bottom of the same where the material slides over apron 37 into the end of the shell 12, and is fed through the same while being pulverized and dried. At the rear or outlet end of the shell is placed what I term the dust-collector 40, the function of which is to act as a chimney for the hot air and gases passing through the shell while preventing the pulverized dust-like material from being carried off with the same. For this purpose, it contains a number of inclined baffle-plates 41, and the adjustable dampers 42 at its top. With a slow draft, the material settles on the upper sides of the baffle-plate and slides off therefrom onto the dividing plates 43, by which it is delivered evenly to the weighing-box 45. This box is suspended by springs 46 and is guided in its vertical movement by rollers 47, running on guides 48.

49 represents an indicator secured to the box 45, which indicates the weight of the material in the same, and the bottom of the box is provided with a number of pivoted gates 50, manually operable by the rod 51. When the desired weight of dust has collected in the weighing-box, the gates are

opened and the material is allowed to fall into the mixer 52, which contains the oppositely rotating paddles or stirrers 53, driven from the engines by the gearing shown at 54, 55, in Fig. 6.

56, 56, represent pipes which supply the asphaltic binder from the tank 57 to the mixer, the desired quantity being forced out of said tank, by air pressure maintained in the receiver 58 by the air-pump 59, into the mixer through the measuring-vessel 60, manually operable valves being provided, as usual, in the pipe lines.

On the bottom of the mixer are two pivoted, gates 61, concentrically mounted relatively to the shafts of the stirrers 53, and operable manually by lever 62.

The thoroughly mixed material thus deposited on the sub-grade is rolled and compacted in the usual way, the result being that the sub-grade is covered with an absolutely water-proof, non-brittle and dustless protective coating, which will not crack or disintegrate in use.

Having thus described my invention, what I claim is:—

1. A machine for treating earthy material to form a waterproof surface for roadways and the like, comprising in combination, a combined pulverizer and drier, comprising a shell containing pulverizing means adapted to feed the material through the same, means to introduce the material into the front end of the shell and means to cause a current of heated gases to flow through the same in the same direction as the material travels, means at the rear end of the shell to allow the gases to escape while retaining the pulverized material, a mixer below said rear end into which the material is delivered, and means to introduce a liquefied binder into said mixer.

2. A machine for treating earthy material to form a waterproof surface for roadways and the like, comprising in combination, a combined pulverizer and drier, comprising a shell containing pulverizing means adapted to feed the material through the same, means to introduce the material into the front end of the shell and means to cause a current of heated gases to flow through the same in the

same direction as the material travels, means at the rear end of the shell to allow the gases to escape while retaining the pulverized material, a mixer below said rear end, a weighing box above said mixer into which the pulverized material falls and which, in turn, delivers predetermined quantities of the material into said mixer, and means to introduce measured quantities of a liquefied binder into said mixer.

3. In a machine for treating earthy material to form a waterproof surface for roadways and the like, the combination of a combined pulverizer and drier, comprising a shell containing pulverizing means adapted to feed the material through the same, means to introduce the material into the front end of the shell and means to cause a current of heated gases to flow through the same in the same direction as the material travels, means connected to the discharge end of the shell to allow the gases to escape while retaining the pulverized material, a mixer into which the material from said last mentioned means is delivered, and means to introduce a liquefied binder into said mixer.

4. In a machine for treating earthy material to form a waterproof surface for roadways and the like, the combination of a combined pulverizer and drier, comprising a shell containing pulverizing means adapted to feed the material through the same, means to introduce the material into the front end of the shell and means to cause a current of heated gases to flow through the same in the same direction as the material travels, a dust collector connected to the rear end of the shell to allow the gases to escape while retaining the pulverized material, a mixer, a weighing box between said mixer and said dust collector, and means to introduce measured quantities of a liquefied binder into said mixer.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MICHAEL A. POPKESS.

Witnesses:

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GEORGE W. BAHRENBURG.