

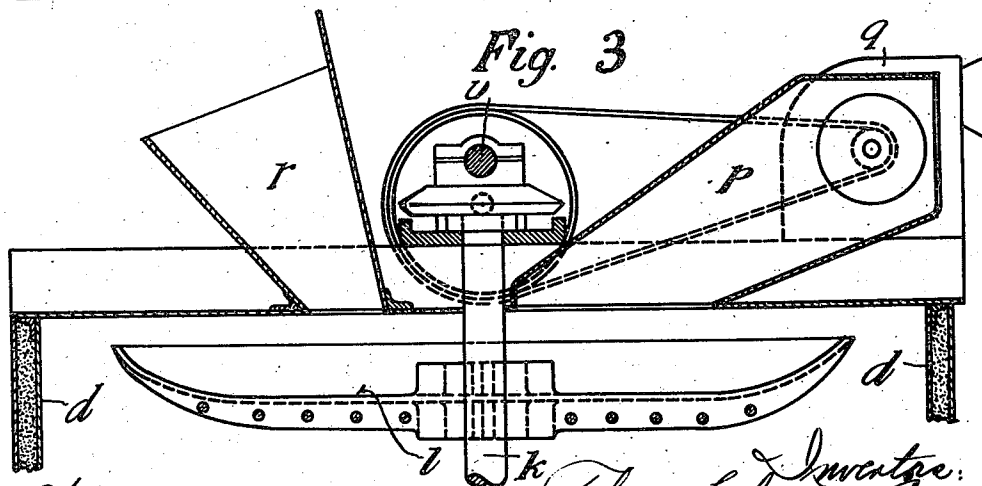
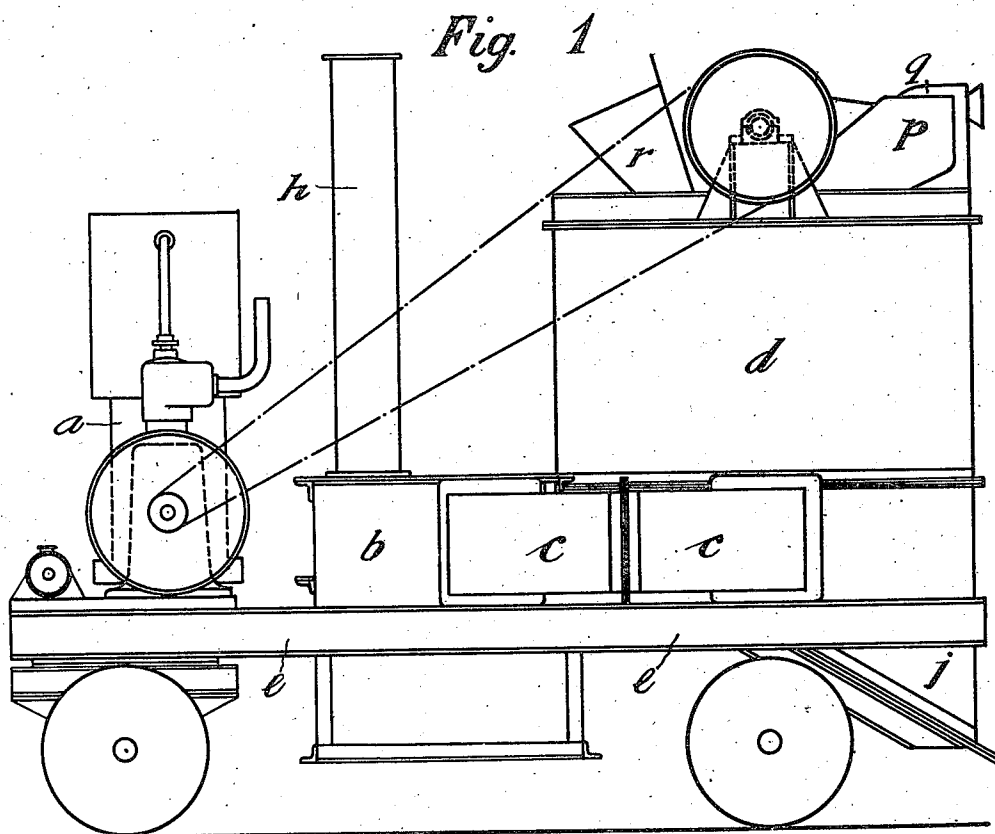
T. COLEMAN, SR., A. COLEMAN, T. COLEMAN, JR. & F. COLEMAN.
 DRYING AND HEATING OF STONE, GRIT, SAND, OR OTHER MATERIALS.

APPLICATION FILED JULY 28, 1914.

1,147,211.

Patented July 20, 1915.

2 SHEETS—SHEET 1.



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 Thomas Coleman, Junior,
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 by D. M. Jones, atty.

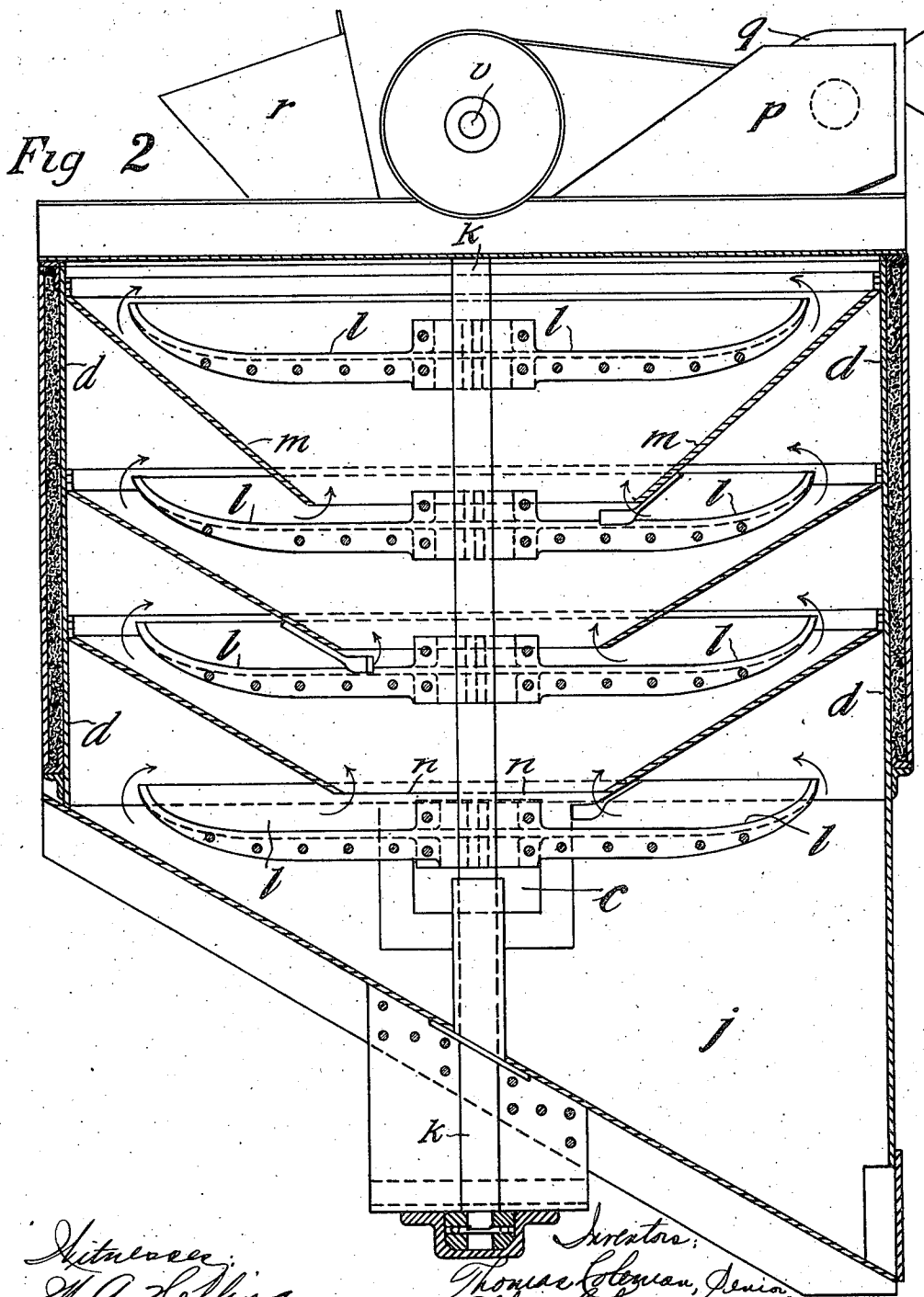
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UNITED STATES PATENT OFFICE.

THOMAS COLEMAN, SR., ALFRED COLEMAN, THOMAS COLEMAN, JR., AND FRANK COLEMAN, OF DERBY, ENGLAND.

DRYING AND HEATING OF STONE, GRIT, SAND, OR OTHER MATERIALS.

1,147,211.

Specification of Letters Patent.

Patented July 20, 1915.

Application filed July 28, 1914. Serial No. 853,756.

To all whom it may concern:

Be it known that we, THOMAS COLEMAN, Sr., ALFRED COLEMAN, THOMAS COLEMAN, Jr., and FRANK COLEMAN, citizens of Great Britain, all residing at Alferton Road, Derby, county of Derby, England, manufacturers, have invented new and useful Improvements in or Relating to the Drying and Heating of Stone, Grit, Sand, or other Materials; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention comprises an improved process for the production of materials for the formation of roads or surfaces for same.

It is well known to construct roads and like surfaces of stone coated with bitumen or other binding agent, the object being to provide a durable and well bound road surface which will not crumble and form fine dust.

The object of the present invention is to provide a new or improved process for treating sand, stone, grit, stone chippings or like materials with the object of producing a bitumen or like bound material, which when laid down to form a road or a wearing surface, possesses great advantages in durability and dustlessness. Moreover the process enables the material to be much more cheaply produced; if desired at the situation at which the road construction or repair is to be carried out.

In accordance with the invention the material employed for example sand, stone, grit, or limestone chippings, is first submitted to the action of centrifugal force, under the influence of which it is whirled against fixed surfaces which break it up or separate its component pieces while it is under the influence of hot gases or heated air, sufficient to heat its component pieces uniformly to a temperature which will enable it to mix with bitumen or like binding agent without coagulating such material, or without burning it, the prepared material then being mixed with the binding agent.

The appended drawing shows one form of apparatus which may be used for carrying out the process but it will be understood that the invention is not limited to the use of this apparatus and this apparatus is not specifically claimed herein.

On the drawings: Figure 1 is a general elevation of the apparatus that may be used

for heating the material. Fig. 2 is a sectional view of the container portion. Fig. 3 is a sectional elevation of the upper portion of the container shown in Fig. 2.

In this apparatus as shown on the drawing *a* represents any suitable engine or motor, the one here shown being a petrol engine, and it will be understood that any other driving power may be employed.

b represents a furnace, the hot gases from which are passed through a side passage *c* into the container *d*. The engine or motor and the furnace and the container may be mounted as shown upon the running frame *e* provided with wheels to render it readily portable. The furnace may comprise any suitable form of grate *f* with charging door *g* and an outlet or drafting chimney *h* and is suitably lined with fire resisting material to prevent conduction of heat through the furnace walls. The hot gases from the combustion of fuel on the grate *f* when the apparatus is desired for operation, may be prevented from passing up the chimney *h* by a damper like device and are then, by the opening of a damper controlling the passage *c* permitted to pass along that passage into the container *d* where the materials are treated.

The container *d* comprises a cylindrical casing which may have an inclined or hopper bottom portion *j*. Within the cylindrical casing is arranged a vertical shaft *k* upon which a series of rotary plate members *l* are secured. These plate members are shown as formed with flat central portions and curved perimeters as set forth in our application which has been serially numbered 844596.

Projecting downwardly from the cylindrical casing *d* are a series of inverted hollow cones *m*, each cone finishing in a central opening *n*, which is immediately above the flat center of the next adjacent rotary plate member *l*.

The inlet for the hot gases or heated air is in the lower portion of the apparatus where indicated at *c* and the gases rise up from under the bottom plate member, and are drawn toward the center over the upper surface of that plate member passing up through the opening *n* of the cone *m* and outwardly to the perimeter of the next plate member *l* and so on inwardly and outwardly until the upper portion of the apparatus is

reached, where the gases are drawn off through an exhaust chamber *p* by a discharge fan or the like *q*. Material is fed into this container by a hopper of any suitable form *r* and falls onto the flat center of the top plate member *l* and is forced outwardly under the action of centrifugal force until it encounters the upwardly curved perimeter of the plate member, which resists its further movement until it is pushed forward by further material impelled outwardly from the center of the plate. The material leaving the perimeter of the disk is flung outward under centrifugal force and strikes against a surrounding surface constituted by the wall of the container or the upper part of the surrounding inverted cone member *n*, the impact against which surface separates or breaks up the material into its component pieces or particles, and as the material is in thorough contact with the hot gases or heated air traveling through the apparatus as above described it is, owing to this separation, very rapidly heated.

The material falls down the cone member *m* which is heated by the gases and passes out at the opening *n* onto the next rotary plate member, where the operation is repeated. By this means the material is constantly urged outwardly and broken up or separated and in this broken or separated state has to travel over hot surfaces so that a very thorough heating action is obtained. The material then passes down the hopper bottom portion of the apparatus and may be discharged into a suitable bin or direct into a mixer.

The proportions and grading of the material used will depend very largely on the nature of the road surface it is desired to form. For example for a wearing surface or carpet for a road, sand and bitumen with a "filler" comprised for example of finely powdered limestone may be mixed in some such proportions as the following: Bitumen, 12%; filler, 10%; sand, 78%. Sand or other material during its treatment for forming a surface of this character should be heated to about 360-380° F.

The application of the principle of whirling the material rapidly against fixed surfaces, which break it up or separate it, and then permit the broken or separated particles to roll down the heated surfaces has a very useful effect in this art as stone, sand and like material, particularly sand and small material, offer very great resistance to uniform heating, which is essential to make a successful and durable mixture for road repair or construction.

What we claim then is:

1. The hereindescribed method of drying and heating road making materials which consists in projecting the same against a material breaking surface, while subjecting the material to a heating medium and in forcing the passage of the heating medium through the material prior to projection of the latter against said breaking surface.

2. The hereindescribed method of drying and heating road making materials which consists in rotating a body of material to centrifugally project the material against a material breaking surface, in supplying a heating medium to said body, and in restricting the passage of said medium to leakage discharge through said body.

3. The hereindescribed method of drying and heating road making materials which consists in repeatedly projecting the material in attenuated bulk against a material breaking surface, while subjecting the material to a heating and drying medium, and in forcing the passage of the heating and drying medium through the material prior to projection of the latter against said breaking surface.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS COLEMAN, SENR.
ALFRED COLEMAN.
THOMAS COLEMAN, JUNIOR.
FRANK COLEMAN.

Witnesses:

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