No. 804,990. PATENTED NOV. 21, 1905.

W. H. WORSWICK.

MACHINE FOR MANUFACTURING PAVING COMPOUNDS.

APPLICATION FILED FEB. 18, 1905.

2 SHEETS—SHEET 1.

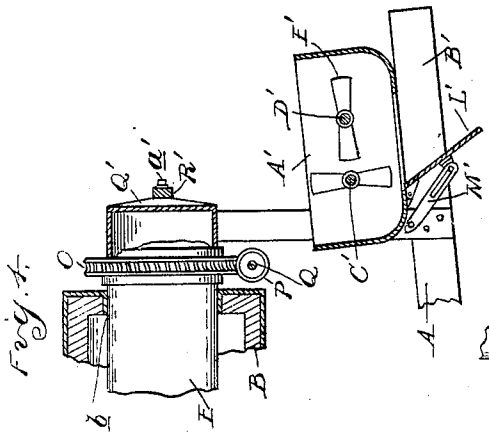


Fig. 4.

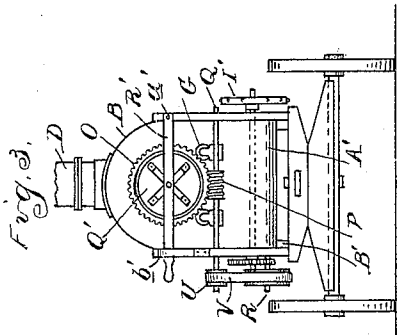


Fig. 3.

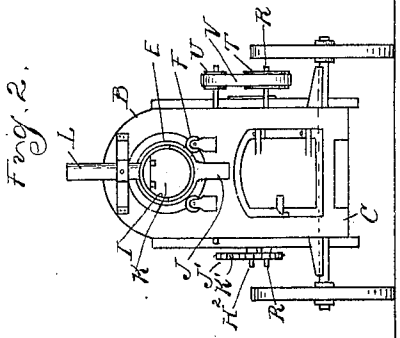


Fig. 2.

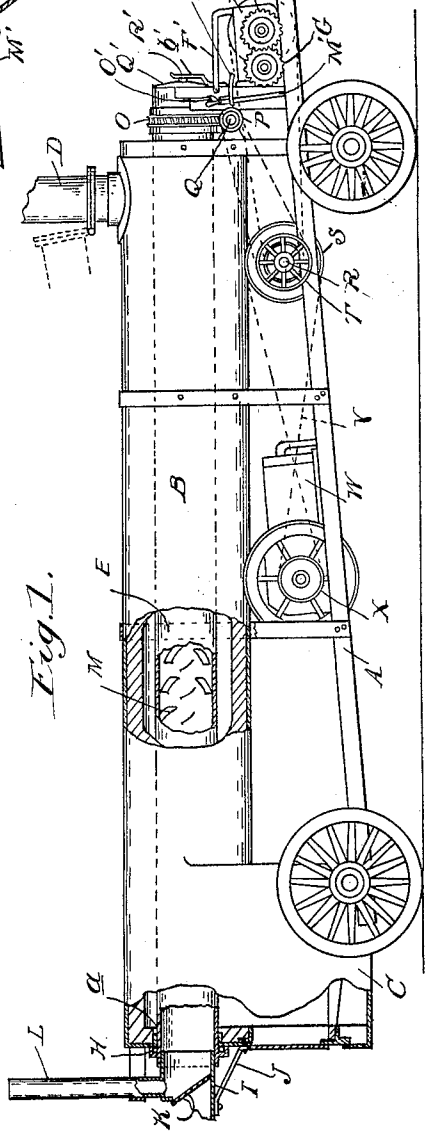


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 6.

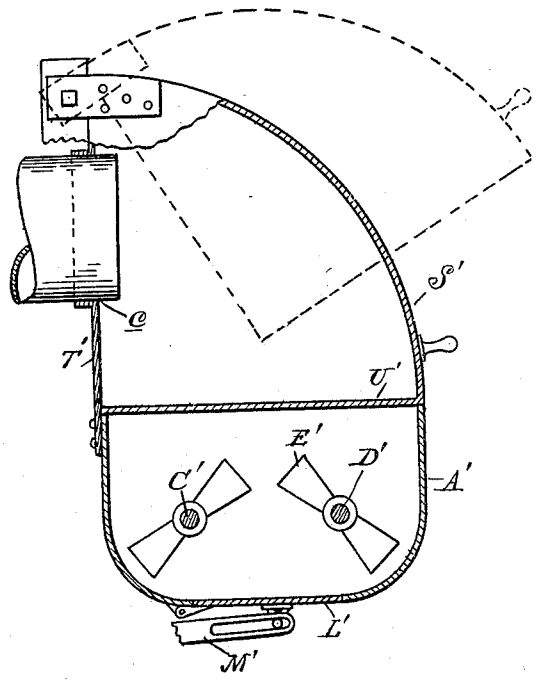
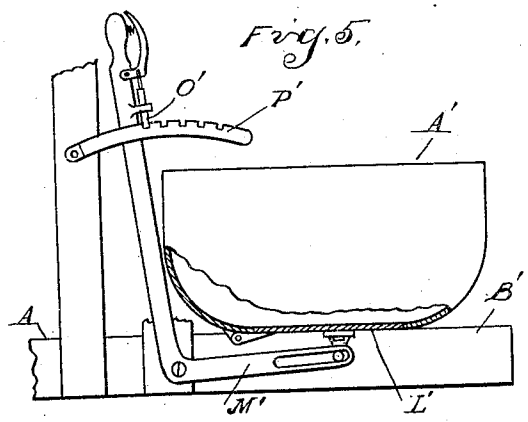


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM H. WORSWICK, OF ALMA, MICHIGAN, ASSIGNOR TO GEORGE S. YOUNG COMPANY, OF ALMA, MICHIGAN, A CORPORATION OF MICHIGAN.

MACHINE FOR MANUFACTURING PAVING COMPOUNDS.

No. 804,990. Specification of Letters Patent. Patented Nov. 21, 1905.

Application filed February 18, 1905. Serial No. 246,312.

To all whom it may concern:

Be it known that I, WILLIAM H. WORSWICK, a citizen of the United States, residing at Alma, in the county of Gratiot and State of Michigan, have invented certain new and useful Improvements in Machines for Manufacturing Paving Compounds, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates particularly to heating and mixing machines especially designed for manufacturing asphalt or mastic pavements; and it consists of a portable apparatus of this character which may be moved directly to the place where the pavement is to be laid, thus dispensing with the necessity of drawing the asphalt or mastic long distances from the plant.

The invention consists in the novel and peculiar construction of the machine, and, still further, in the arrangement and combination of its various parts, as more fully hereinafter set forth.

In the drawings illustrating my invention, Figure 1 is a view in side elevation of my improved machine. Fig. 2 is a rear view thereof. Fig. 3 is a front elevation. Fig. 4 is a detached and enlarged sectional view of the front of the machine, showing the relation of the mixer to the heating-cylinder. Fig. 5 is an enlarged detached view of the mixer, and Fig. 6 is a detached sectional view of a modified form of closure for the cylinder and mixer.

In the drawings thus briefly described the reference-letter A designates the wheeled frame of any suitable construction, adapted to be drawn by horses. Upon the frame and extending, preferably, the entire length thereof is an inclosing casing B, secured in any suitable manner, having at its rear end a depending section C, the interior of which constitutes the furnace, and an opening at the top in proximity to the front for the exit of products of combustion, with which the stack D communicates, the stack being preferably of the hinged type, as indicated in Fig. 1.

The interior of the casing described, including the fire-box section, is lined with firebrick and is provided with circular openings *a* and *b* in its rear and front ends, respectively.

E represents a cylinder within the casing, extending through the openings in the end walls of the latter and slightly beyond the same and supported at each end by pairs of rollers F and G upon the casing ends, as indicated in Figs. 2 and 3. An antifriction-bearing H is also provided for the rear end of the cylinder, which serves to hold the latter against longitudinal movement in a forward direction.

I represents a tubular section secured by brackets J to the casing at the rear of the cylinder and fitting the inlet thereof, and K is a gravity-door controlling the opening of the fixed section.

L represents an exhaust-pipe upon the extension described, through which the vapor rising from the material within the cylinder may escape, and M represents blades arranged, preferably, upon the interior of the cylinder, which serve upon the rotation of the latter, as hereinafter described, to thoroughly mix the material.

Upon the forwardly-projecting end of the cylinder is arranged an annular gear O, which meshes with a worm P upon a transverse shaft Q, journaled in bearings in the framework.

R is a driven shaft journaled in the framework rearwardly of the shaft Q, carrying pulleys S and T.

U is a pulley on the end of the shaft Q, connected to the pulley T by a suitable belt V, and W is a motor of any suitable type mounted upon the wheeled frame midway of its length beneath the casing and provided with a pulley X, connected to the pulley S by a cross-belt Y.

Upon the operation of the motor it will be obvious from the connections described that rotary movement is imparted to the cylinder, and as the latter turns the material therein is intimately mixed through the agency of the stirrer-blades M upon its interior.

A′ designates a mixer of any suitable type supported upon an extension B′ of the wheeled frame beneath the discharge end of the cylinder. The mixer is provided with parallel shafts C′ and D′, having suitable stirrer-blades E′ thereon, projecting into proximity to the mixer-bottom, thus preventing the formation of sediment and causing the ingredients to be intimately mixed.

F′ designates auxiliary supports in the form of bracket-arms for the mixer, connecting the front end of the latter to the framework, as plainly indicated in Fig. 1.

The mixer is operated, preferably, simultaneously with the rotation of the cylinder by means of intermeshing gears G′ and H′ upon the mixer-shafts, which extend beyond one side of the mixer for that purpose, and sprocket-wheels I′ J′ upon the opposite ends of shafts H^2 and R, connected by a sprocket-chain K′.

A hinged bottom L′ is provided for the mixer, through which the contents may be discharged, operated through the agency of a slotted bell-crank lever M′, pivoted to the wheeled frame, as indicated in Fig. 5, the bottom being being adapted to be locked in its closed position through the agency of a spring-latch O′ upon the lever and a suitable rack P′ of any ordinary construction.

In the operation of heating and mixing the material within the rotating cylinder it is desirable to retain to as great an extent as possible the heat within the cylinder, and, further, to prevent the continuous discharge of the cylinder contents within the mixer. I therefore provide a closure for the discharge end of the cylinder intermediate the latter and the mixer, which is preferably constructed to fulfil this double function referred to.

In Figs. 1 to 4, inclusive, this closure is in the form of a disk Q′, pivoted centrally to a lever R′, which in turn is pivoted to one side of the wheeled frame at the point *a*. *b*′ is a bracket upon the frame-front, between which and the frame the free end of the lever is adapted to engage for the purpose of holding the disk over the end of the cylinder in the manner indicated in Figs. 3 and 4.

In Fig. 6 a modified form of closure is illustrated adapted for use where measured quantities of the cylinder contents are to be mixed with definite quantities of the asphalt or mastic. The closure in this instance is in the form of a hood S′, pivoted at its upper end upon a plate T′ upon the framework, apertured at *c* to permit of the admission of the discharge end of the cylinder E. The hood carries a bottom section U′, which forms a cover when the hopper is down for the mixer and rests normally upon the walls of the mixer in the manner indicated in Fig. 6, (full lines.)

In operation the material to be dried and mixed, usually sand and gravel, is placed in the rotating cylinder, preferably by shoveling it in against the gravity-door K, which rises to admit the material and closes automatically, thus preventing the heat from the interior of the cylinder from striking the workmen. The heat from the furnace, with the products of combustion, pass upwardly from the furnace-section and forwardly through the casing in the space between the walls of the latter and the rotating cylinder and is discharged out through the stack, thus heating the cylinder contents to the desired degree. The cylinder may be downwardly inclined in a forward direction upon the framework, or if of the type illustrated in the drawings the front wheels of the machine may be dropped slightly below the surface of the ground, giving the desired angle of inclination. As the cylinder rotates the material is carried forward to its discharge end, at which point it is properly mixed and dried. A quantity of asphalt or mastic is then placed within the mixer, with the desired amount of hot sand and gravel, which is discharged into the mixer by the removal of the closure from the cylinder end. After the ingredients have been properly stirred the mixture is discharged through the mixer-bottom, usually into wheelbarrows, and carried to the place where the pavement is to be laid.

When it is desired to use definite proportions of sand and gravel with the asphalt, the hood form of closure described is employed in place of the disk. As the hood fills it is raised by the operator, its contents discharged into the mixer, and then allowed to drop into its normal position upon the mixer. It will be obvious from the construction of hood that in addition to performing the function of a measure it likewise serves to retain the heat within the cylinder and also within the mixing-receptacle, the hood-bottom forming the cover for the latter.

What I claim as my invention is—

1. In a portable heating and mixing apparatus, the combination with a supporting-frame, of a casing thereon provided with an exit for the products of combustion, a furnace having communication with said casing, a rotary cylinder within the casing spaced from the casing-walls, a mixer in operative relation to the discharge end of said casing, a pivoted hood inclosing the discharge end of the cylinder and having a bottom section resting normally upon and covering the mixer, and driving means upon the frame for operating said mixer and cylinder.

2. In a portable heating and mixing apparatus, the combination with a wheeled frame, of a mixing vessel mounted thereon having a hinged bottom section, mixing means in said vessel, a motor mounted on said frame, a cylindrical casing having a depending connected fire-box and mounted on said frame and extending over said motor, a cylinder rotatably mounted within and projecting from the ends of said casing, and operable connections between said motor and said cylinder, and mixing means, respectively.

3. In a portable heating and mixing vessel, the combination with a wheeled frame, of a mixing vessel having a hinged bottom section, mixing means in said vessel, a motor

mounted on said frame, a cylindrical casing extending over said motor and mounted on said frame and having a depending connected fire-box at one end and an outlet for the products of combustion at the other end, a cylinder rotatably mounted within and projecting from the ends of said casing, one end of said cylinder overhanging said mixing vessel, and operable connections between said motor and said cylinder and mixing means respectively, for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. WORSWICK.

Witnesses:
ELY BREWBAKER,
J. S. KNAUTZER.