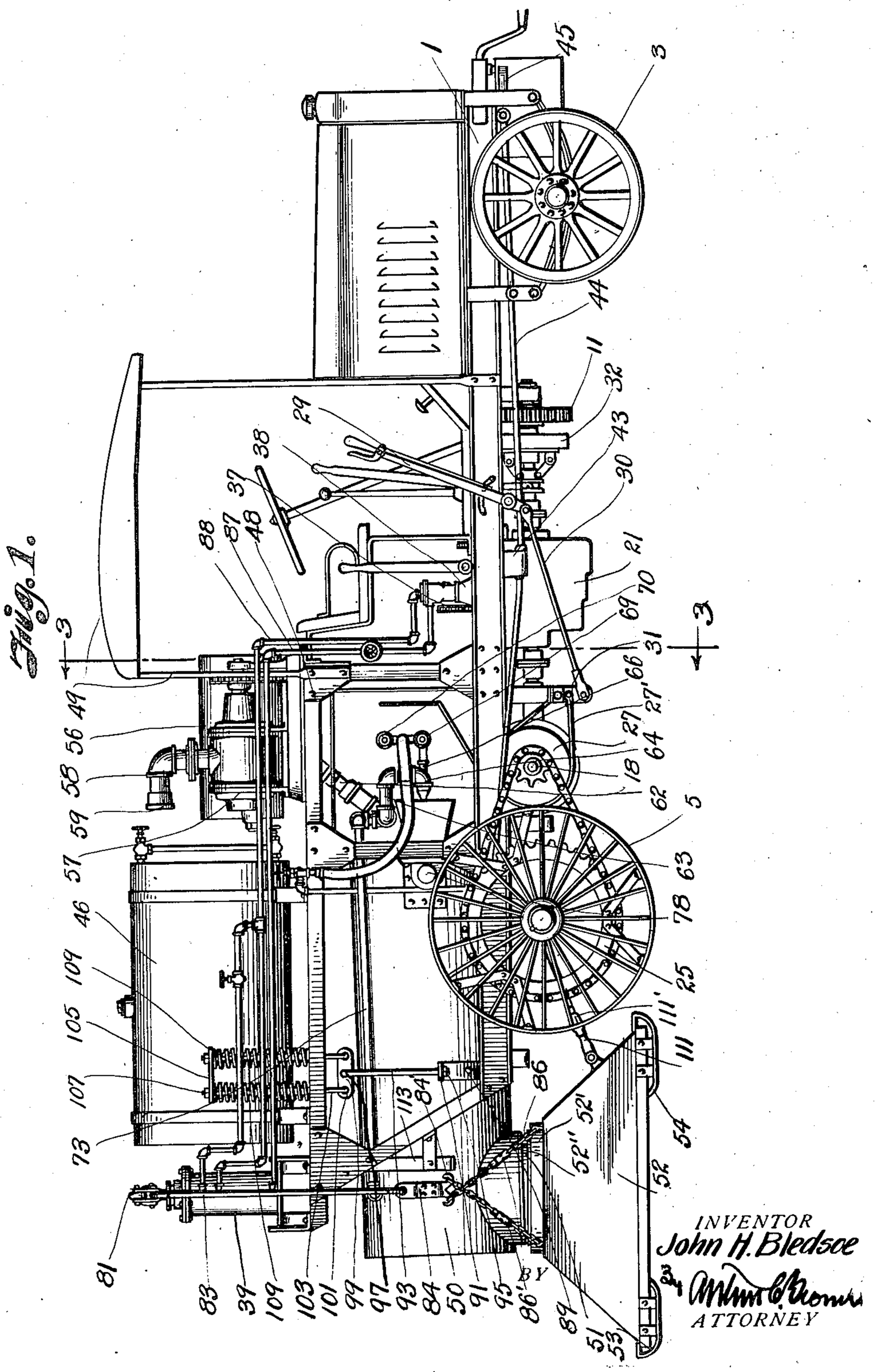
Nov. 18, 1924. 1,516,141

J. H. BLEDSOE

ASPHALT HEATER

Filed Oct. 7, 1922 4 Sheets-Sheet 1

Fig. 1.



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Filed Oct. 7, 1922 4 Sheets-Sheet 2

Fig. 3.

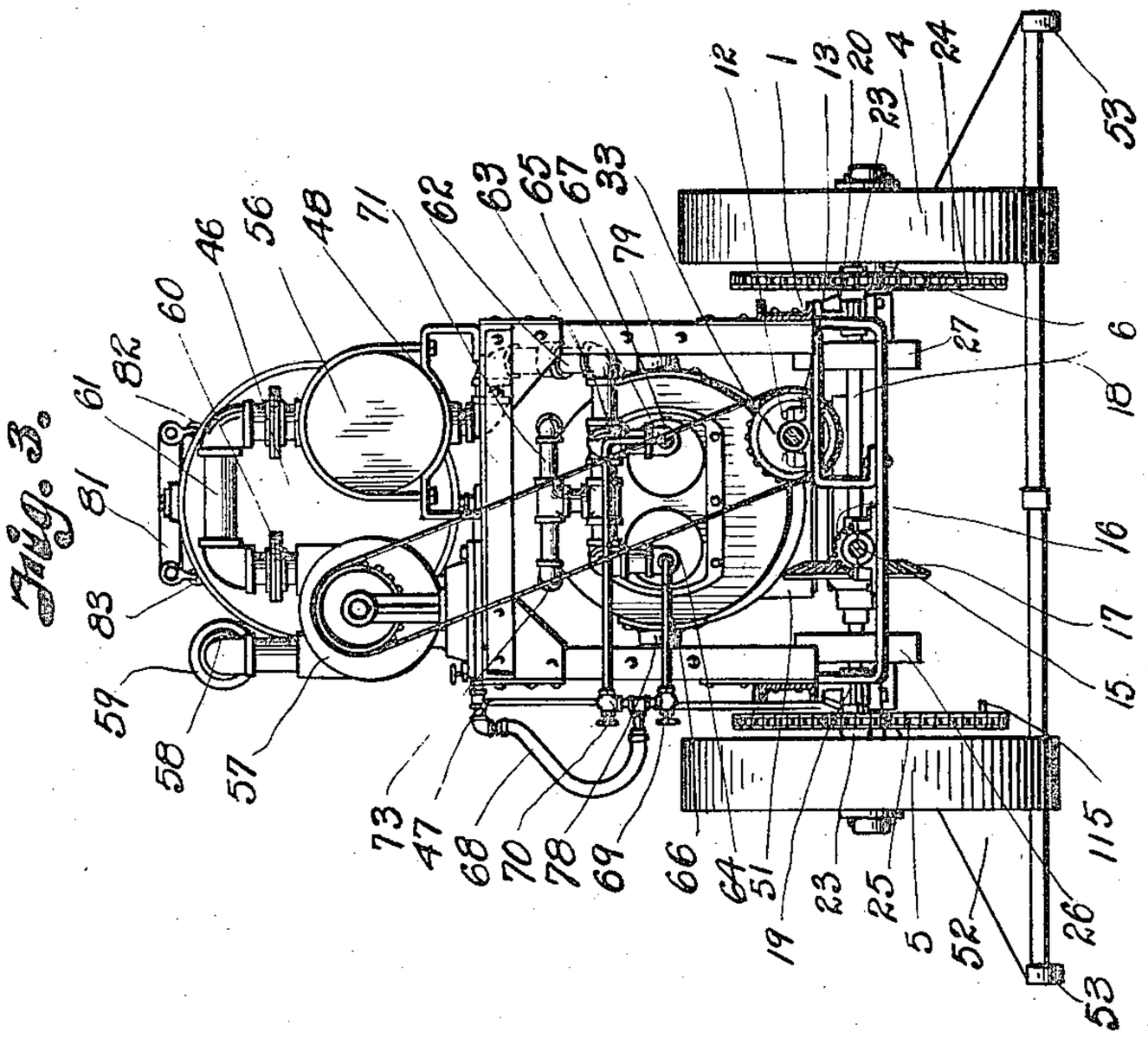
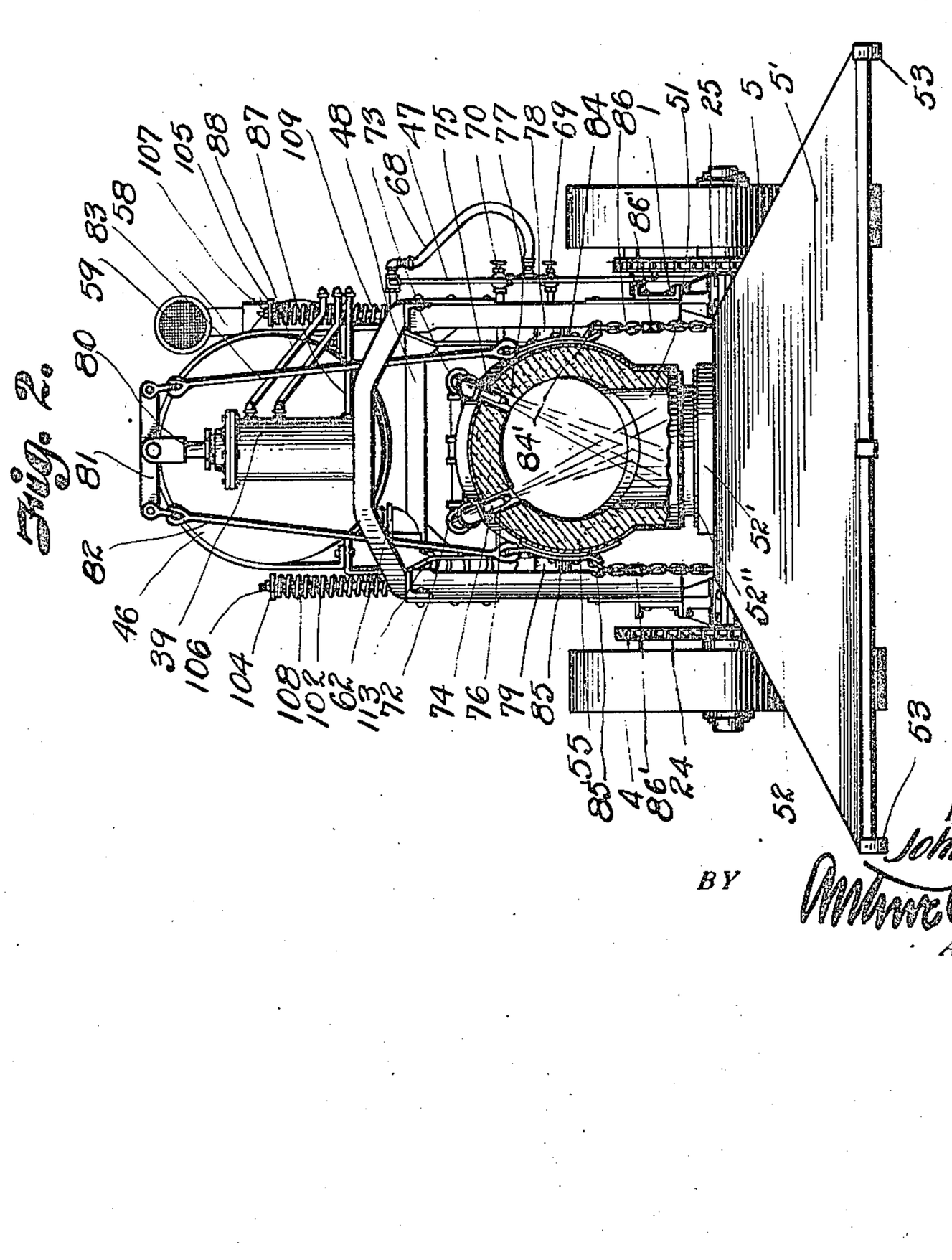


Fig. 2.



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1,516,141

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ASPHALT HEATER

Filed Oct. 7, 1922

4 Sheets-Sheet 3

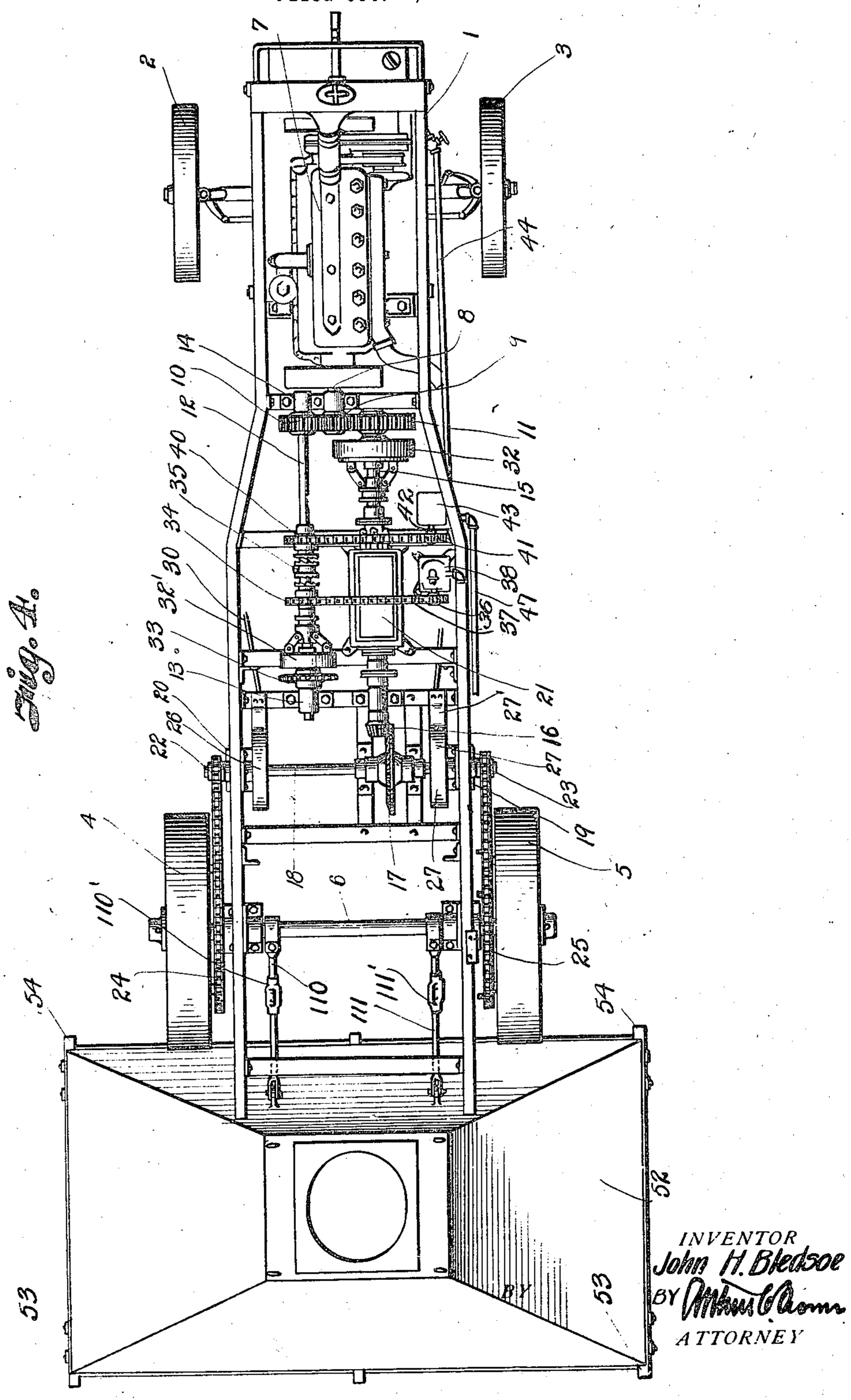

Fig. 4.

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Fig. 6.

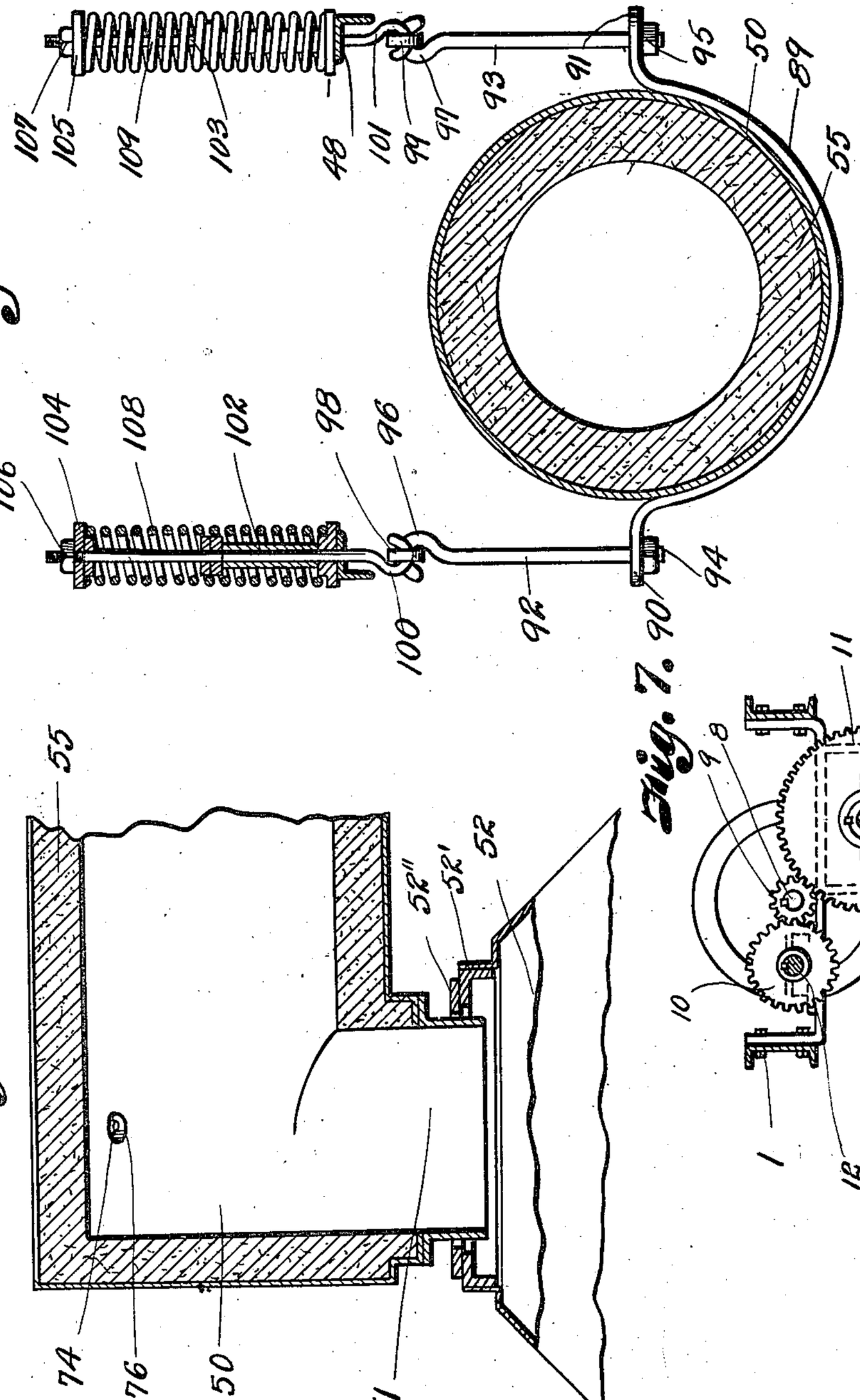

Fig. 5.

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN H. BLEDSOE, OF KANSAS CITY, MISSOURI, ASSIGNOR TO EQUITABLE ASPHALT MAINTENANCE COMPANY, OF KANSAS CITY, MISSOURI, A CORPORATION OF MISSOURI.

ASPHALT HEATER.

Application filed October 7, 1922. Serial No. 593,081.

To all whom it may concern:

Be it known that I, JOHN H. BLEDSOE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Asphalt Heaters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to surface heaters and more particularly to a machine for softening the top coat of asphalt pavement as an initial step in re-surfacing the pavement, the principal object of the invention being to provide a strong, light machine including heat generating and applying means easily controllable and adjustable from the driver's position.

Asphalt softening machines heretofore used have been propelled by steam, necessitating heavy, cumbersome organizations. My invention contemplates the provision of means whereby the machine can employ in its own make-up a motor vehicle propelled by an explosion motor as the prime mover, and further contemplates the provision of means for making the machine comparatively light while at the same time rendering it highly efficient and easy to operate.

The novel construction of the invention as well as its manifold advantages will be understood by reference to the following description in connection with the accompanying drawings, in which—

Fig. 1 is a side elevational view of an asphalt softener constructed in accordance with my invention.

Fig. 2 is a rear view of the machine, the furnace being broken away to show the air nozzles.

Fig. 3 is a vertical sectional view of the machine on the line 3—3, Fig. 1.

Fig. 4 is a top plan view of the chassis of the motor vehicle, showing the driving mechanism carried thereby.

Fig. 5 is an enlarged, sectional view through part of the furnace.

Fig. 6 is a cross sectional view through the furnace showing the cradle for supporting it and the springs for supporting the cradle, one of the springs being shown in section, and

Fig. 7 is an enlarged view of the gearing for transmitting motion from the drive shaft of the motor to certain pumping mechanism.

Referring now to the drawings by numerals of reference:

1 designates the chassis of the motor vehicle supported by the front wheels 2 and 3 and the rear wheels 4 and 5, the latter being rotatable about the axle 6.

The engine 7 may be suitably supported by the chassis and it, of course, will have all the necessary coordinating parts such as the carburetor, ignition system, water cooling system including the radiator, and the like, but these specifically form no part of my invention so it is thought it is quite unnecessary to illustrate them in detail.

The drive shaft 8 of the motor carries a pinion 9, which meshes with a gear 10 and a gear 11, the gears 10 and 11 being on opposite sides of the longitudinal center of the motor. The gear 10 is fastened to a shaft 12, mounted in bearings 13 and 14 on the chassis frame and the gear 11 is keyed or fastened to the shaft 15, mounted in bearings on the chassis frame. The shaft 15 is provided at one end with a beveled pinion gear 16, which meshes with a beveled gear 17 on the shaft 18, mounted in bearings 19 and 20 transversely of the chassis so that the shaft 18 may be driven from the engine, there being, of course, a transmission gear 21 intermediate the ends of the shaft 15, as will be well understood.

The shaft 18 carries sprockets 22 and 23, which communicate motion to the sprockets 24 and 25, rigid on the wheels 4 and 5 whereby the wheels will be driven in the usual way.

Instead of providing the brake drums on the axle 6 I prefer to arrange them on the shaft 18 and they are designated 26 and 27. They are adapted to be operated by a brake lever conveniently adjacent to the driving seat of the vehicle.

In Fig. 1 I have shown the brake drum 27 in elevation with the brake band 27′ about it, the band 27′ being adapted to be applied

through the medium of a lever 29 and a link 30 having a brake link 31. This construction is old and any means may be employed for applying the brakes.

The shaft 15 can be connected to and disconnected from the gear 11 by a clutch 32 appropriately operated. On the shaft 12 is a clutch 32′ adapted to clutch and disconnect the sprocket 33 from the shaft 12 and there is a sprocket 34 loose on the shaft 12 adapted to be clutched to and disconnected from the shaft 12 through the clutch 35. When the clutch 32′ is out and the clutch 35 is out, the shaft 12 will rotate idly. When the clutch 32′ is in, however, the sprocket 33 will be rotated and when the clutch 35 is in, the sprocket 34 will be rotated. When the sprocket 34 is rotated, it will drive a sprocket 36 through the medium of a chain 37. The sprocket 36 is on the shaft of the hoist pump 38, which supplies liquid to the hoist cylinder 39 on the rear of the machine, as will be explained more fully hereinafter.

When the clutch 35 is disconnected from the hub of the sprocket 34, it may be drawn into engagement with the hub of a sprocket 40, loose on shaft 12 and by means of a sprocket chain 41, drive a sprocket 42, which is on the shaft of a liquid fuel pump 43; the inlet of which is connected to a pipe 44 having its inlet end 45 at the front of the machine so that the pump can draw oil from a supply tank or barrel through the pipe 44 and discharge it into the fuel reservoir 46 through the pipe 47. The fuel reservoir 46 is supported by a superstructure consisting of an appropriately constructed frame 48, carried by the chassis of the vehicle in rear of the cab 49 in which the operator sits. The tank may be of any appropriate size and construction.

Below the tank or reservoir 46 is a furnace consisting of an elongated member or cylinder 50, closed at its respective ends and having a down-port 51 to which is connected a hood or canopy 52 of appropriate construction adapted to be supported from the chains 86 (hereinafter described) and by the skids 53 and 54 on the lower edges of the hood.

The furnace is provided with a lining 55 of vitrified or refractory material whereby heat will be retained within the furnace and conserved to become most effective within the hood so as to have a high melting effect on the asphalt.

The fuel is supplied for the furnace both from the reservoir 46 and from the air tank 56. The air tank receives its compression from an impeller or pump 57, the intake of which is at 58 and which is provided with a screen 59. The outlet for the impeller or pump 57 is at 60 and it discharges into the drum or tank 56 through the pipe 61. The air from the tank 56 is discharged through a pipe 62 (see Figs. 1 and 3) into a manifold 63, having nozzles 64 and 65 which enter the front of the furnace and which surround injector nozzles 66 and 67, to which the hydrocarbon content of the fuel mixture is carried from the fuel tank 46 through a pipe 68. The hydrocarbon nozzles can be controlled through the medium of the valves 69 and 70, it being apparent by reference to Fig. 3 that the pipe or hose is between the nozzles so that one nozzle 64 can be closed while fluid is admitted through valve 70 to nozzle 65 or valve 70 can be closed while valve 69 is open or both valves can be open. The air combines with the hydrocarbon content to make a combustible mixture, the oxygen in the air supporting combustion as is well understood.

The manifold 63 is connected to a superposed manifold 71 which has pipe connections 72 and 73 running longitudinally of the furnace and which terminate in discharge nozzles 74 and 75, discharging through openings 76 and 77 in the furnace above the down-pipe 51 so that the air directed through the opening 51 will create a draft to cause heated air to be drawn through the furnace and directed against the asphalt beneath the hood.

The furnace is supported at one end by trunnions 78 and 79, which are mounted in brackets on the frame 48. Only one bracket is shown in Fig. 1, there being a corresponding bracket on the other side of the frame.

The rear end of the furnace 50 is suspended from the piston rod 80 of the hoist cylinder 39. The piston rod 80 (see Fig. 2) has a cross bar 81, from the respective ends of which hang rods 82 and 83. These are connected at their lower ends to straps 84 and 85, which are fastened to the side of the furnace and the lower ends of the straps carry chains 86, which are fastened to the hood 52 so that the hood will be raised when the rear end of the furnace is raised. The chains 86 are crossed, those connected with the forward corners of the hood collar 52′ having links seated in rearwardly projecting seats 84′ and 85′ on the straps 84 and 85, and the rear chains having links seated in corresponding forwardly projecting seats on said straps. With this arrangement, when the furnace is swung on its trunnions, the front end of the hood will be lifted from a point further from the furnace axis than that from which the rear end of the hood is lifted, thereby equalizing the tilting of the hood which would otherwise occur. The equalization of movement of the hood is positively assured by the spacing rods 110 and 111 presently described.

I prefer to provide the chains 86 with turnbuckles 86′ whereby the hood may be levelled to hang evenly.

The hoist receives oil from the pump 38

through the pipe 87, to raise the piston (not shown), supporting the rod 80. Oil from the top of the piston will return through the pipe 88 to the pump 38.

When it is desired to lower the rear end of the furnace 50, the oil will pass back into the pump through the pipe 87 and back into the cylinder through the pipe 88.

The specific construction of the hoist constitutes no part of the invention except in so far as it is associated with the method of raising and lowering the rear end of the furnace and controlling the hood.

In order to resiliently support the rear end of the furnace I provide a sling 89 which consists of a strap having oppositely extending ends 90 and 91, through which rods 92 and 93 project, the lower ends of the rods having nuts 94 and 95, upon which rest the ends 90 and 91 of the strap 89. The upper ends of the rods 92 and 93 are hooked, as at 96 and 97, to engage the links 98 and 99 carried by the hooked ends 100 and 101 of the rods 102 and 103. The upper ends of the rods 102 and 103 carry butt plates 104 and 105, through each of which the rods on one side of the furnace extend, there being nuts 106 and 107 on the ends of the rods resting on the plates.

The upper ends of the springs 108 and 109 abut against the abutments 104 and 105 and the lower ends rest on the top bar of the superposed frame 48 so that the springs constitute resilient or cushioning means for the sling in which the otherwise unsupported end of the furnace 50 rests.

It will, therefore, be noted that there is a resilient means provided for supporting the furnace and particularly the hood so that the skids 53 and 54 will be practically on the ground but so that the device can travel over the ground without having the weight of the furnace bearing directly upon the skids. Of course, the nuts on the ends of the rods 102 and 103 can be adjusted so that the skids will barely touch the ground.

The hood, besides being fastened to or supported by the straps 85 and 86, is connected to the axle 6 by the spacing rods 110 and 111 whereby the hood is drawn forwardly on its skids when the machine is advanced and is pushed rearwardly when the machine is backed. As the rods 110 and 111 are rigid, they have the effect of radius rods, and as they have shorter radii than the furnace proper, they accelerate movement of the rear end of the hood, merely maintaining the level of the hood during its vertical movement. This acceleration of the hood changes the angle of the hood collar 52′ relative to the furnace down-port 51. To permit this movement on a variable angle, I give the collar 52′ an interior diameter sufficiently greater than the diameter of the down-port to afford the necessary clearances, and to minimize loss of heat from the hood I provide the collar 52′ with an overlying collar 52″ having an interior diameter less than that of the collar 52′ but also affording proper clearance.

The rods 110—111 also comprise turnbuckles 110—111′ so that should it be necessary to replace a hood, any variations in dimensions may be taken care of by adjustment in the turn-buckles.

To avoid lateral strain on the furnace trunnions should the machine be turned while the hood is in contact with the ground, I provide guides 113 (Fig. 2) which are mounted on the chassis 1 and frame 48 and lie alongside the rear end of the frame so that in the event that the machine is turned as described, the guides will contact the frame and relieve the trunnions from strain.

From the foregoing it will be observed that the machine is light, that it can be readily operated so as to take on fuel, feed it to the furnace, direct the heated air against the surface of the asphalt, that the furnace can be properly fed with the fuel or the fuel cut off when desired, that the furnace portion of the mechanism need not operate when the machine is moving but can operate when the machine is moving if desired, that the power parts of the plant can absorb the power of the prime mover of the motor vehicle, that the hood may be positively advanced or backed with the furnace, and that all of the parts are under the control of the driver in the cab. Therefore, the device is simple in construction and well adapted to perform the function for which it is intended.

What I claim and desire to secure by Letters-Patent is:

1. A surface heater comprising a furnace having pivotal mounting and resilient support, and a hood in communication with the furnace.

2. In combination with a vehicle frame, a furnace having pivotal mounting on the frame at one side of the longitudinal center of the frame, means resiliently supporting the furnace at the other side of said longitudinal center, and a hood in communication with the furnace.

3. In combination with a vehicle frame, a furnace having pivotal mounting on the frame at one side of the longitudinal center of the frame, means resiliently supporting the furnace at the other side of said longitudinal center, guides on the frame for engaging the resiliently supported end of the furnace, and a hood in communication with the furnace.

4. In combination with a motor vehicle, a furnace pivotally secured to the motor vehicle, means independent of the pivotal connection for resiliently supporting the fur-

nace, means for supplying heat to the furnace, and a hood communicating with the furnace.

5. In combination with a portable support, a furnace having a closed end and an outlet opening, a hood in communication with the opening, means for pivoting the furnace near its closed end to the support, and means for resiliently supporting the other end of the furnace.

6. In combination with a portable support, a furnace having a closed end and an outlet opening, a hood in communication with the opening, means for pivoting the furnace near its closed end to the support, means for resiliently supporting the other end of the furnace, and a hoist for swinging the furnace about its pivot.

7. In combination with a motor vehicle, a superstructure carried by the chassis of the motor vehicle, a furnace pivotally supported by the superstructure and having a downwardly directed opening, means for resiliently supporting the end of the furnace distant from its pivotal portion, means for swinging the furnace about its pivotal connection, and a hood in communication with said opening and adapted for confining hot gases to heat a surface.

8. In combination with a vehicle frame, a furnace pivotally mounted on said frame and having a down-port, a hood flexibly suspended below the furnace and having a collar surrounding the down-port, and rods pivotally connecting the hood and frame, the hood radius being shorter than the furnace radius and the hood collar having clearance on the down-port, for the purpose set forth.

9. In combination with a vehicle frame, a furnace pivotally mounted on said frame and having a down-port, a hood flexibly suspended from said furnace and having a collar surrounding the down-port, the collar spaced from the down-port to afford clearance, a collar superimposed on and having less clearance than the first named collar, and rods connecting the hood and frame to push or pull the hood with said frame.

In testimony whereof I affix my signature.

JOHN H. BLEDSOE.