(No Model.) 2 Sheets—Sheet 1.

R. W. FURNAS.

STREET CLEANING MACHINE.

No. 484,191. Patented Oct. 11, 1892.

FIG. 1.

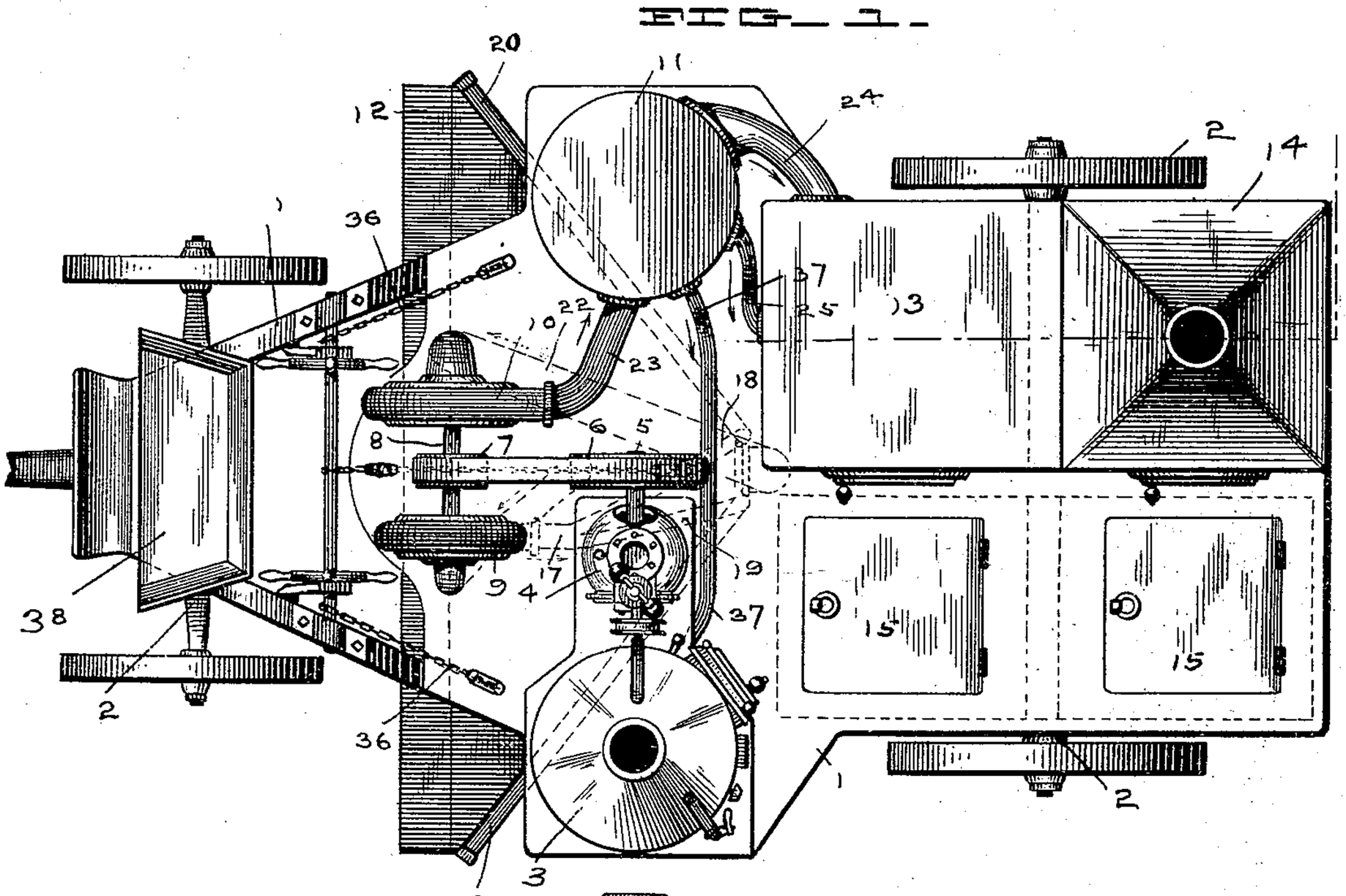
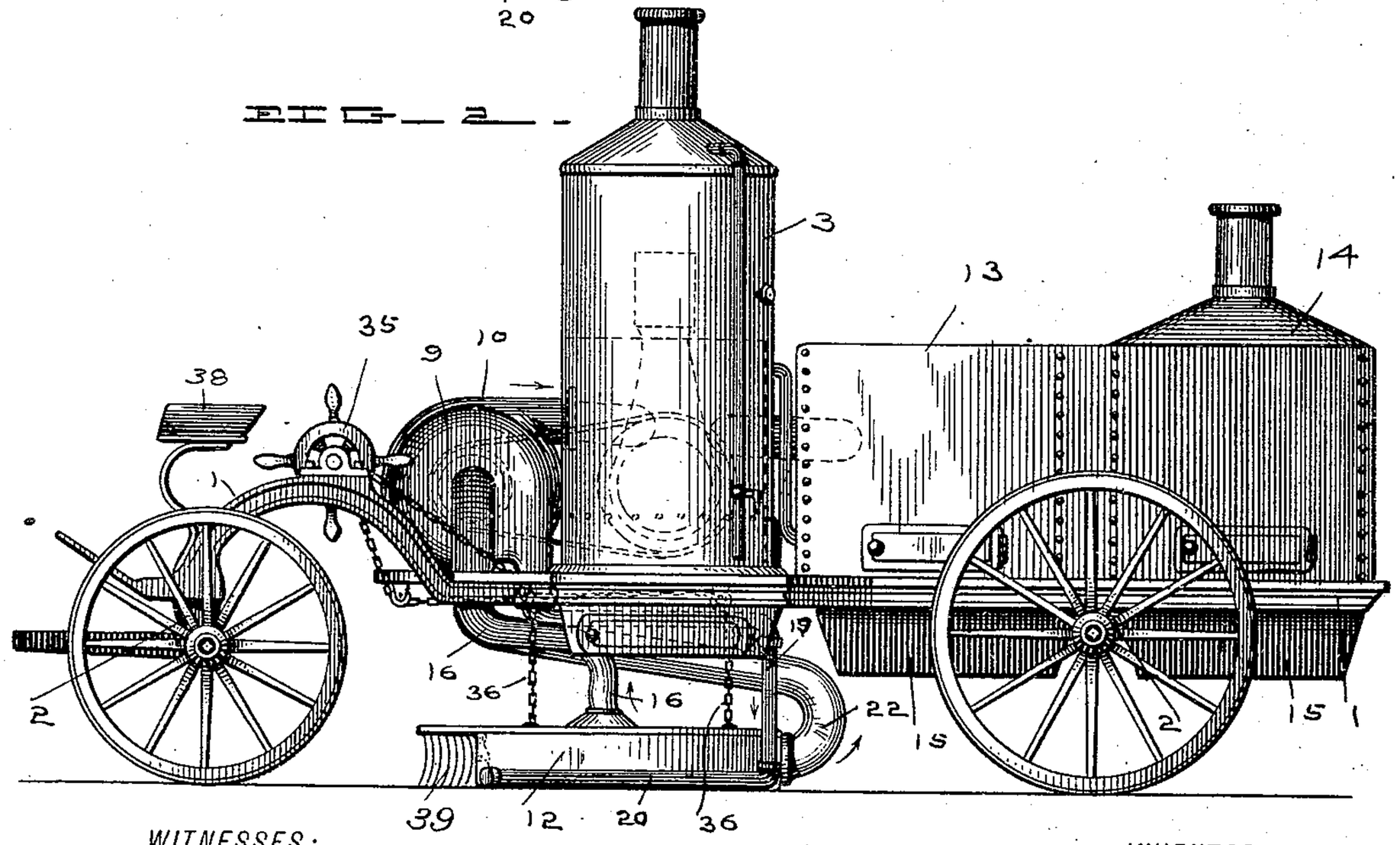


FIG. 2.



WITNESSES:

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

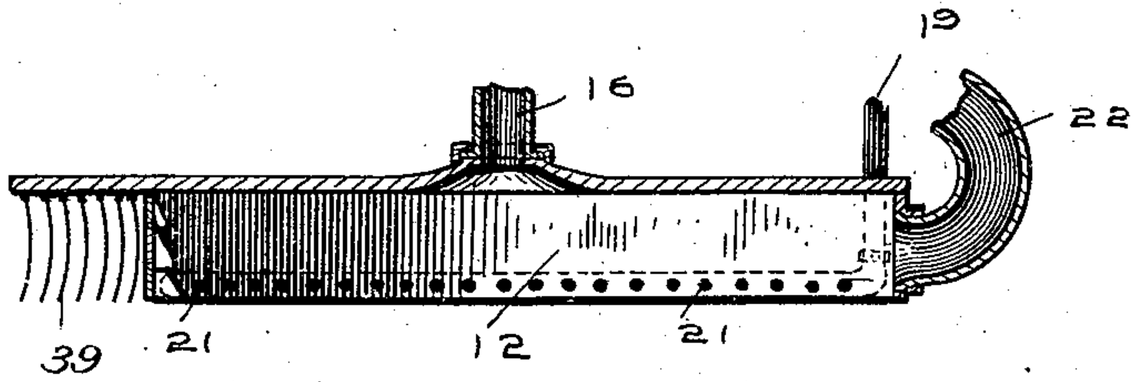


FIG. 4.

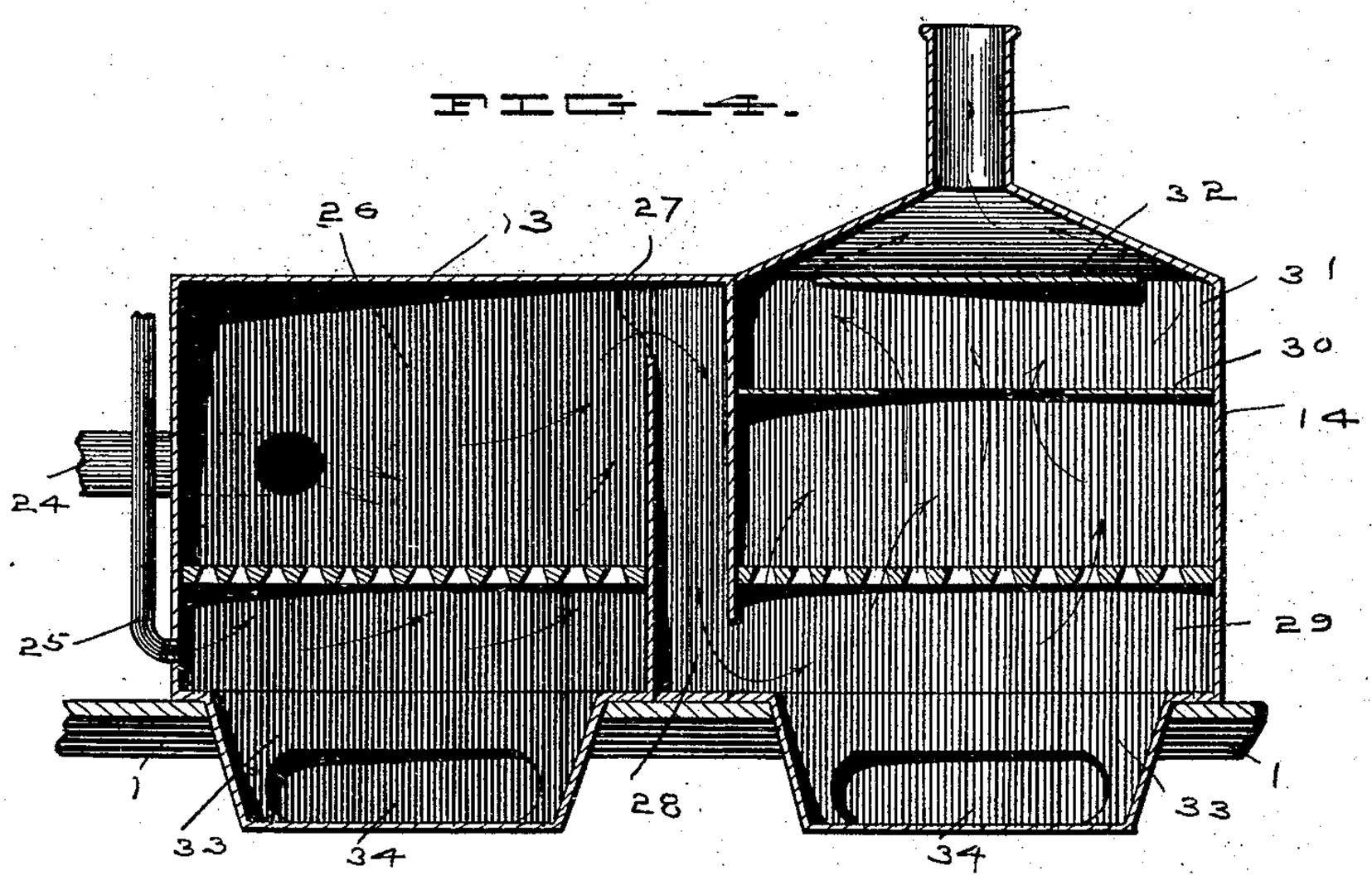
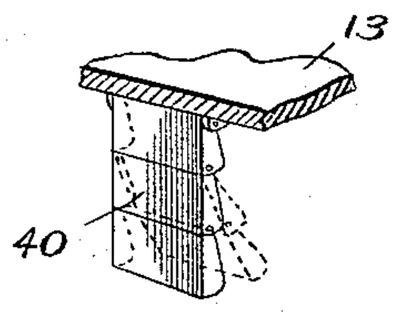


FIG. 5.



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ROBERT W. FURNAS, OF INDIANAPOLIS, INDIANA.

STREET-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 484,191, dated October 11, 1892.

Application filed December 21, 1891. Serial No. 415,805. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. FURNAS, of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Street-Cleaning Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like figures refer to like parts.

My invention relates to improvements in the construction of street-cleaning machines; and it consists in the arrangement of mechanism for taking up the dirt from streets by means of suction created by fans carrying the dirt so taken up into a separating-reservoir and from thence into the combustion-chambers of a furnace, where it is substantially consumed and will be understood from the following description.

In the drawings, Figure 1 is a top plan view of my device. Fig. 2 is a side elevation of the same. Fig. 3 is a central horizontal section through the gathering-hood and connected pipes. Fig. 4 is a section through the combustion-chambers of the furnace on the line *x x*, Fig. 1. Fig. 5 is a detail of one of the hinged sections, forming the front curtain of the hood.

The machine comprises a suitable framework 1. Mounted upon trucks 2 and supported upon the framework is a boiler 3 and steam-engine 4, of any suitable pattern. Upon the outer end of its main shaft 5 is a driving-pulley 6, connected by a belt with a smaller pulley 7, mounted on the shaft 8 of the suction-fans 9 and 10.

11 is a separating-reservoir to receive the dirt that is taken up.

12 is a gathering-hood adjustably carried below the framework, having a flexible or yielding front 40, and provided with scratching-teeth 39 for loosening the dirt in advance.

13 is the shell of the first combustion-chamber, and 14 that of the second, the latter provided with the usual smoke-stack.

15 are bunkers for carrying coal and water or any other material.

9 is the gathering-fan and is connected by an elastic pipe 16 directly to the top of the hood, as shown in Figs. 2 and 3, and the air is drawn up through the pipe 16 by the action of the fan and discharged through the branch pipe 17, which is divided into two parts 18 and 19, these being connected directly with the pipes 20, which are secured to the walls of the V-shaped rear of the hood, and have small openings 21 below, so that the air is carried directly back into the hood, the object being to huddle or collect the material. Very little dirt is carried up and over by the fan, but it creates a current which brings the dirt near the center of the hood, and at this point the main fan 10 begins its work and draws the dirt thus collected up through the elastic pipe or hose 22 and discharges it through the pipe 23 into the reservoir 11, which really acts as a separator, allowing the heavier dirt and material to fall by gravity toward the bottom, near which point the discharge-pipe 24 connects to the separator, and the heavier material is carried away through this pipe 24 into the first combustion-chamber 26, directly over the fire, while the lighter material, which has remained near the top of the separator, is carried away by a smaller pipe 25 into the same combustion-chamber, but below the grate, as shown in Fig. 4, where it passes upward through the fire, mingling with that above, and the products of combustion are then carried over the bridge-wall 27 and down the throat or passage 28 into the second combustion-chamber 29, but beneath the grate, and there subjected to the action of the fire in that chamber, where it is still further consumed and practically all smoke is destroyed, and the remaining products of combustion are drawn upward through the central opening in the diaphragm 30 into the chamber 31, where it is deflected by the plate 32 and carried around on each side thereof and out the smoke-stack of the furnace. Below the grate are ash-pits 33, having doors 34 for allowing the removal of the unconsumed material and ashes from the outside of the machine.

35 is a double windless having spokes and connected to the hood by chains 36, whereby it may be raised up completely out of the ground when desired.

37 is a pipe which leads from the top of the separator downward to the combustion-chamber of the boiler for the purpose of supplying air for combustion.

As will be observed, the principal object of the fan 9 is to create a current of air which will huddle the dirt below the hood near the center thereof, so that it may be more directly affected by the action of the main fan. The hood itself, as will be observed, is preferably triangular in shape, having connections on its V-shaped rear end through small openings in the pipes leading to the smaller fan with a direct connection to the elastic hose through the main forcing-fan. The front side 40 is made flexible or in sections, as shown in Fig. 5, so as to allow it to pass easily over obstacles.

I preferably use two combustion-chambers, as shown in Fig. 4, for the purpose of securing as completely as possible the consumption of the entire material; but if one chamber and its grate-surface were made large enough it might perhaps be sufficient, and I do not intend to limit myself to the use of two such chambers.

It will further be observed that there is but one delivery-pipe leading to the reservoir or separator—namely, the pipe 23, connected to the main suction-fan—while it has three different discharge-pipes, the lower and larger one 24 for carrying heavier material, the shorter and smaller one 25 for carrying lighter material to the combustion-chamber, and the longer pipe 37 for carrying fresh air directly to the combustion-chamber of the boiler. I thus secure a constant and free circulation throughout the several parts of the mechanism, and the disposition upon the trucks of the framework is such that the parts of the machine will largely counterbalance each other, so that it will prevent racking or any undue strain upon one part more than upon another.

38 is a seat for the driver, and the truck is provided with the usual pole for horses.

What I claim as my invention, and desire to secure by Letters Patent, is the following:

1. In a street-cleaning machine, a collecting mechanism, a furnace, and a conveyer leading from the collecting mechanism to the combustion-chamber of such furnace, where the dirt and refuse collected are consumed, the whole mounted upon a movable framework, substantially as shown and described.

2. In a street-cleaning machine, a framework mounted upon trucks or wheels, a gathering-hood adjustably suspended beneath suction-fans, and a furnace carried on the framework, pipes connecting the gathering-hood with the suction-fans, and connections between the suction-fans and the furnace, whereby the refuse collected by the gathering-hood is drawn therefrom by the fans and discharged into the furnace, where it is consumed, substantially as shown and described.

3. In a street-cleaning machine, a framework mounted upon trucks, a gathering-hood adjustably suspended beneath suction-fans, and a separator carried on the framework, and suitable connections from such fans with the hood and the separator, a furnace, also carried upon the framework, pipes connected therewith and from the fans, and means for operating such fans, whereby the dirt and refuse are drawn up through the hood by such fans and thence through the separator and discharged into the combustion-chamber of the furnace, the heavier particles above the grate and the lighter below it, whereby they are consumed, substantially as shown and described.

4. In a street-cleaning machine, a framework mounted upon trucks, a gathering-hood adjustably suspended beneath suction-fans carried on the framework and connected by a suitable shaft, a reservoir or separator, also carried on the framework, and a pipe connected to one of such fans discharging into such separator, a furnace carried upon the framework, a pipe connected near the bottom of such separator for carrying the heavier material into such furnace above its grate, and a second pipe connected near the top of the separator and discharging the finer material into the furnace below the grate, in combination with suitable motive power for driving the fans, substantially as shown and described.

5. In a street-cleaning machine, a portable framework, a gathering-hood adjustably suspended below such framework and above the pavement to be cleaned, its front end flexible to avoid breakage, its rear sides provided with air-chambers, gathering-fans located above the hood and connected to the top thereof by an elastic suction-pipe, branch discharge-pipes leading from such fans to the air-chambers in the sides of such hood, a second suction-fan carried upon the framework and having a draft-pipe connected centrally to the rear of such hood for taking up the dirt collected by the action of the first fan, a delivery-pipe connected to the second fan and discharging into a separating-reservoir, and a furnace contiguous to and connected with the separating-reservoir by discharge-pipes, in combination with mechanism for driving the several fans, substantially as shown and described.

In witness whereof I have hereunto set my hand this 14th day of December, 1891.

ROBERT W. FURNAS.

Witnesses:
E. B. GRIFFITH,
H. D. NEALY.