

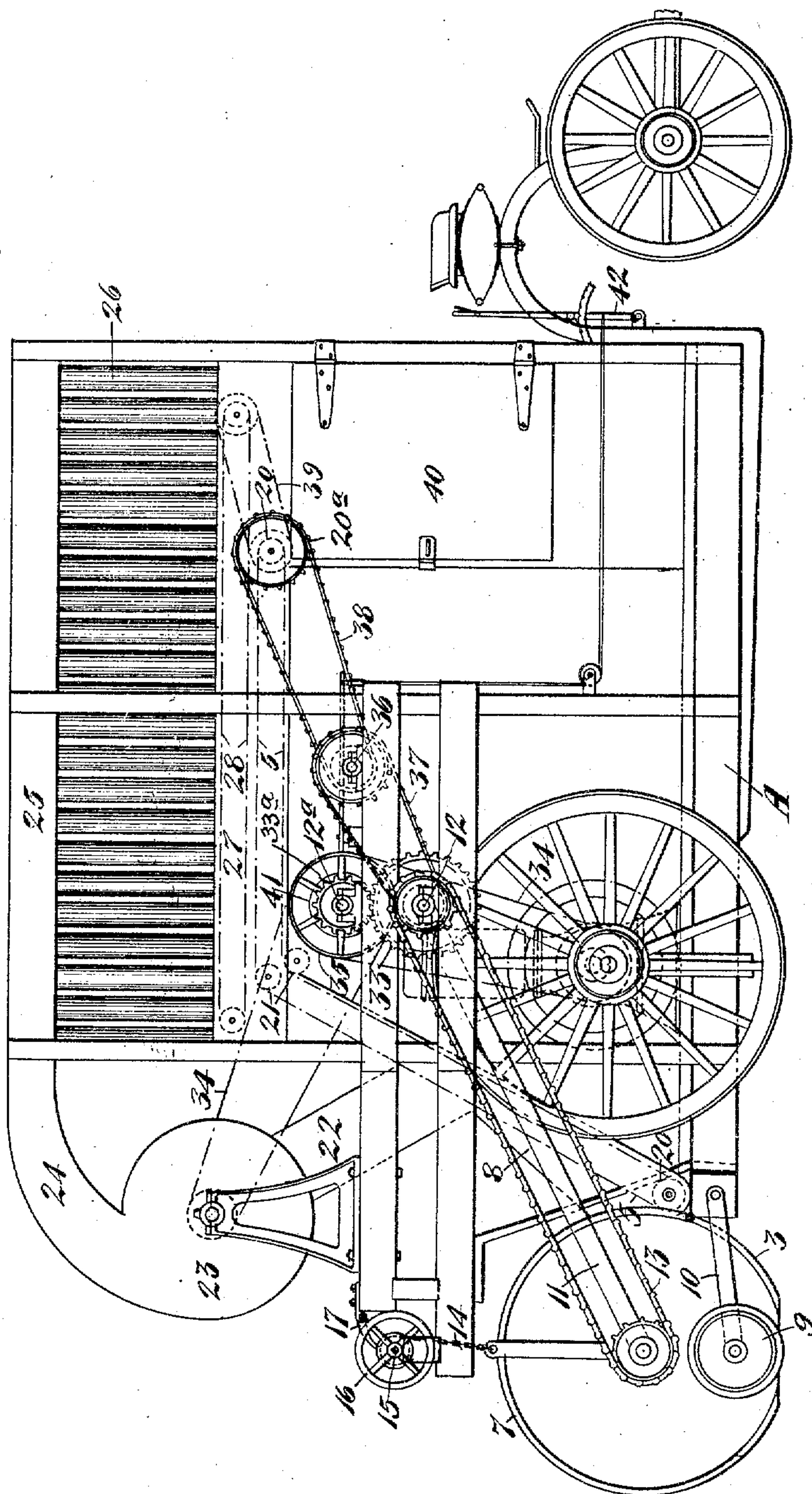
No. 880,124.

C. H. BUTLER.  
STREET CLEANING APPARATUS.  
APPLICATION FILED OCT. 20, 1904.

PATENTED FEB. 25, 1908.

4 SHEETS—SHEET 1.

FIG. 1.



WITNESSES,  
Chas. E. Chapin.

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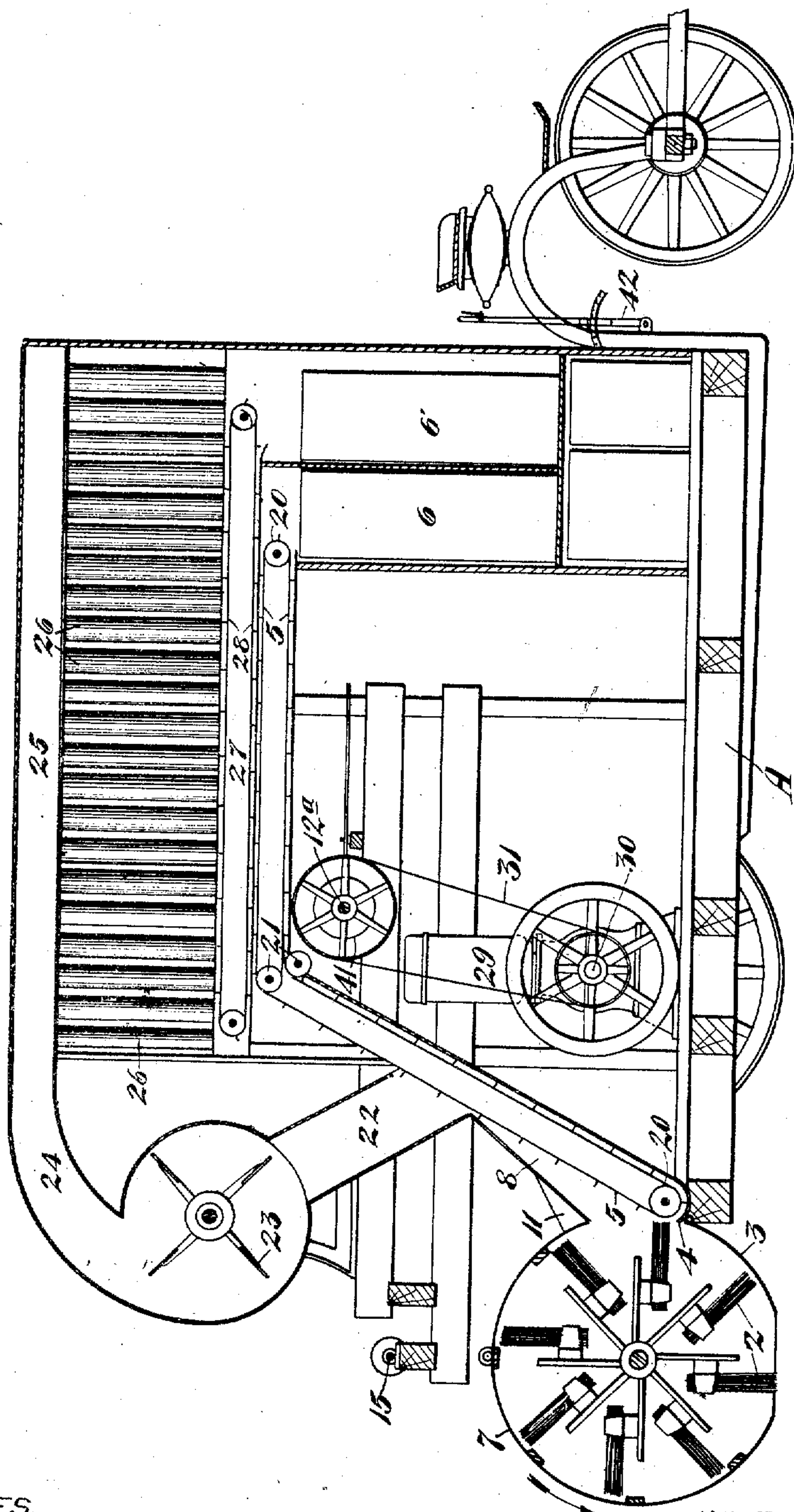
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4 SHEETS—SHEET 2.

FIG. 2.



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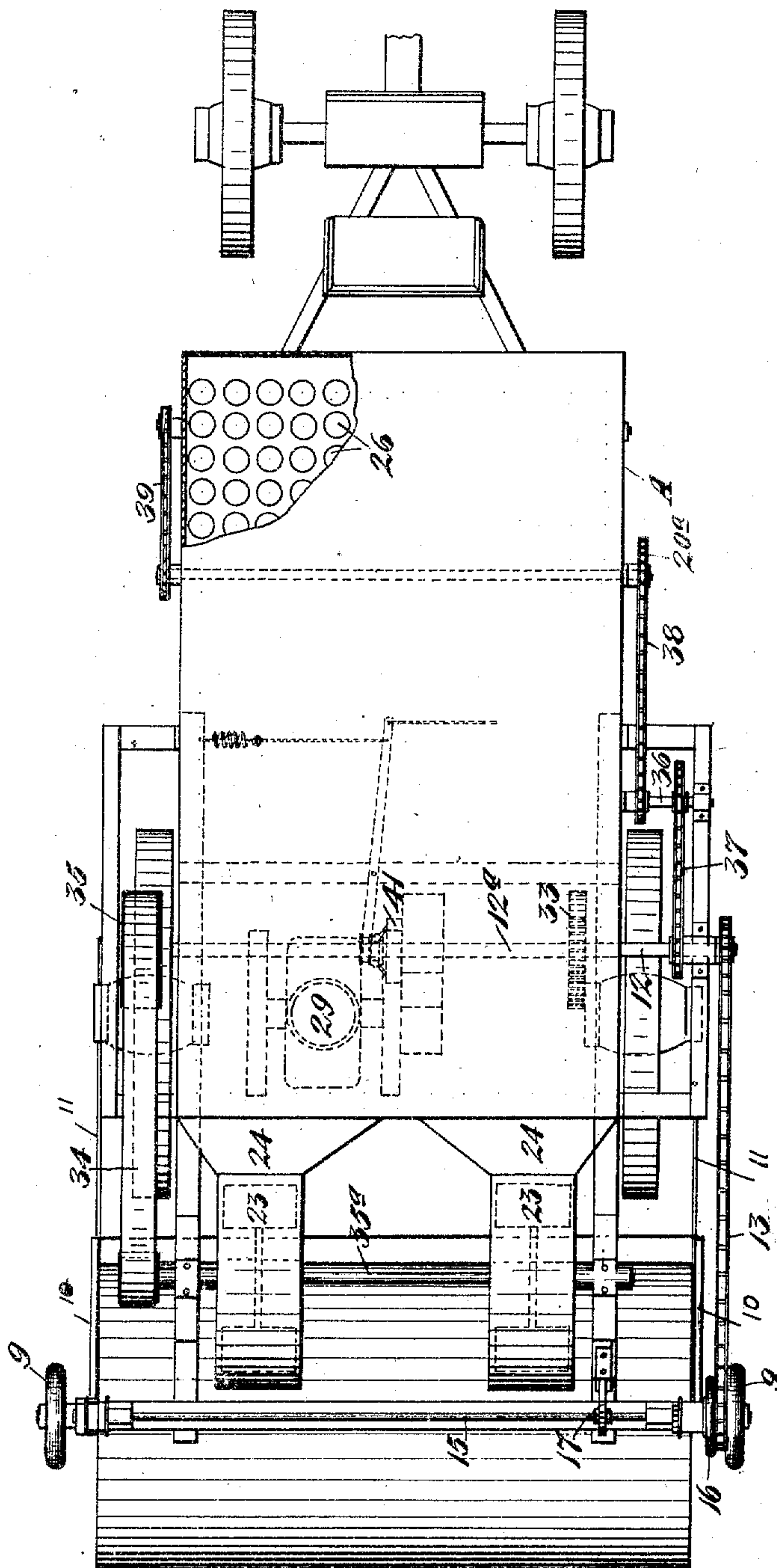
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4 SHEETS—SHEET 3.

FIG. 3.



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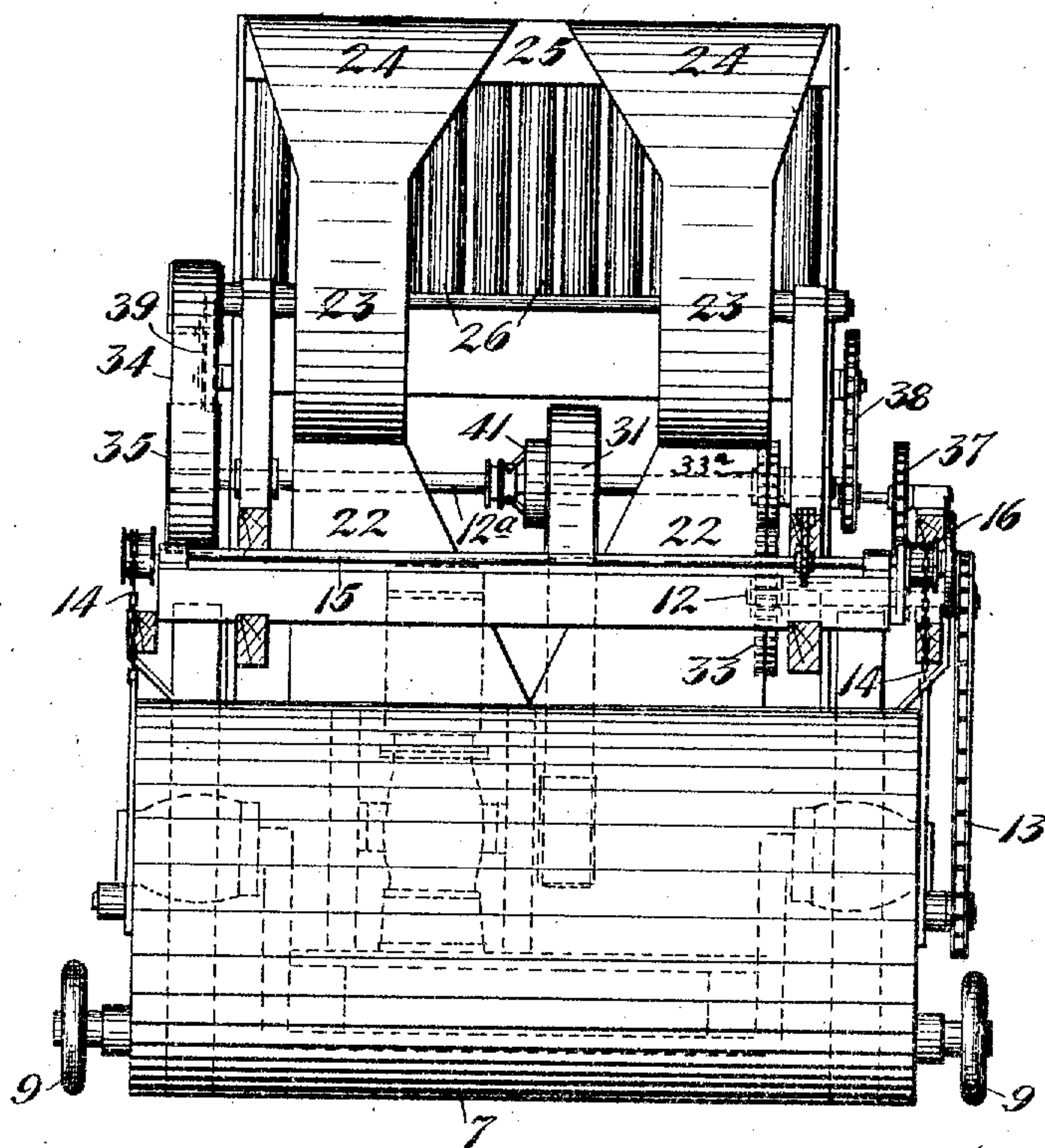
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4 SHEETS—SHEET 4.

FIG. 4.



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# UNITED STATES PATENT OFFICE.

CHARLES H. BUTLER, OF OAKLAND, CALIFORNIA.

## STREET-CLEANING APPARATUS.

No. 880,124.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed October 20, 1904. Serial No. 229,266.

*To all whom it may concern:*

Be it known that I, CHARLES H. BUTLER, citizen of United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Street-Cleaning Apparatus, of which the following is a specification.

My invention relates to an improved street cleaning apparatus.

10 The object of my invention is to provide a practical, sanitary dustless machine that will thoroughly clean the street of every particle of fine dust or dirt and of all rubbish however coarse, without necessitating the wetting of the street, and which can be operated at any time of day regardless of traffic and without injury to the health of or inconvenience to the public.

20 The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

25 Figure 1 is a side elevation of my machine.

Fig. 2 is a longitudinal section of same.

Fig. 3 is a top plan view of same, with top partly broken away, showing settling tubes.

Fig. 4 is a rear elevation of my machine.

30 A represents a suitable wheeled truck or carriage adapted to be propelled or moved over the ground by any suitable means.

2 is a rotary brush or cylindrical broom of suitable construction mounted at the rear of the vehicle, and at right angles to the line of draft and arranged contiguous to the ground, with its under side adapted to turn in the direction of travel to brush up the dirt directly ahead of it upon a hinged apron or dust pan 3 and into a trough 4 whence the dirt which finds lodgment there, is conveyed upward and forward by a suitable endless conveyer 5 to be deposited in suitable removable boxes or like receptacles 6 at the forward end of the machine.

45 The brush has its axle journaled in the heads of a suitable cylindrical or hollow casing 7 open at the front and bottom and around which is stretched a canvas or like covering. This casing prevents any dirt that is picked up by the brush escaping except through the forward opening which communicates with the passage 8 in which the conveyer 5 operates. The weight of the casing 7 and brush when in working position is supported on the ground by the small wheels or rollers 9 journaled on the outside of the heads

of the casing. If desired these rollers may be rubber shod to prevent rattle and to lessen jar to the brush and casing. The brush is adapted to act on the ground in the space between the lower rear edge of the casing, and the adjacent lower edge of the dust-pan or apron 3. The latter is hinged to a fixed part of the vehicle frame and is free to drag along the ground at all times. The casing 7, however is supported in such fashion that while it may travel with the brush acting on the surface in the proper manner of sweeping and with the lower edge of the casing reasonably close to the ground for the ingress of air as will be described, it is adjustable vertically so that it can be raised on occasion to lift the brush entirely clear of the ground, as where the vehicle is to be moved and it is not desired or it is not necessary to operate the brush. Any suitable means may be employed to attach the casing to the rest of the vehicle and to raise and lower it. In the present instance I have shown the casing as connected with the vehicle frame and arranged to trail behind the same by means of radius rods 10—11. The rods 10 are connected to the casing near its lower edge and serve to hold the brush in operative position on the ground. The rods 11 serve to maintain the axle of the brush always at a uniform distance from the shaft 12 so that the tension of chain 13 which operates the brush will be maintained uniform.

The casing is suspended by flexible connections 14 from small drums on the transverse shaft 15, the latter being rotated by any suitable means as the hand-wheel 16. A suitable pawl and ratchet 17 limits the movement of shaft 15 in one direction. By turning the hand-wheel 16 in one direction the brush and casing may be raised clear of the ground turning about the pivots of the rods 10—11. Turning the hand-wheel in the opposite direction lowers the brush into operative position with the principal weight of the brush and casing supported on the rollers 9. By imparting motion to the shaft 12 to rotate the brush rapidly in the direction of the arrow Fig. 2, and moving the vehicle over the ground, the dirt from the street is swept up ahead of the brush and upon the apron 3 into the passage-way 8; the heavier particles, stones, newspapers, bricks, horse shoes and the like being removed by means of the carrier 5 and delivered into the boxes 6. The carrier 5 may be of any suitable de-



scription adapted for the purpose. The finer and lighter particles of dust swept up by the brush and into the passage-way 8 are drawn therefrom through the air trunks 22 by means of suitable fans or aspirators 23 mounted on the apparatus, and delivered through passages 24 into the dust chamber 25 located at the top of the vehicle. The air pressure in the chamber 25 being reduced allows the dust to spread out and to settle into the open-ended cloth tubes 26 which connect chamber 25 with an underneath passage-way 27. A conveyer 28 similar to conveyer 5 operates in passage 27 to carry the settled particles of the dust forward into a second set of removable receptacles 6' similar to receptacles 6.

Any suitable means desired, mounted on the vehicle, may be employed to operate the brush, the fans and the several conveyers; but preferably these several instrumentalities are operated independently of the traction power, since both the brush and fans should be revolved at a very high speed while the rate of travel of the vehicle would be comparatively slow.

While any usual and well known means may be employed to operate the conveyers I prefer to drive them by the same means which operate the brush and blowers. Accordingly I have shown a motor 29 of the explosive engine type, suitably supported on the vehicle frame and having its shaft 30 connected with the shaft 12<sup>a</sup> by a belt 31. The brush is revolved through the medium of the chain 13 passing over suitable sprockets on the brush axle and shaft 12, which latter is driven from shaft 12<sup>a</sup> by gears 33 and 33<sup>a</sup>. The fans are run from shaft 12<sup>a</sup> by means of a belt or equivalent connection 34 passing around the pulley 35 on shaft 12<sup>a</sup> and a corresponding pulley on the fan shaft 35<sup>a</sup>.

The conveyers 5 and 28 are run from shaft 12 by suitable connections as indicated by the countershaft 36; chain 37 passing over sprockets on shafts 12 and 36; a second chain 38 running from shaft 36 to a sprocket 20<sup>a</sup> on the shaft of upper conveyer. From the shaft of the sprocket 20<sup>a</sup> power is transmitted to operate conveyer 28 by means of a belt 39 and suitable connections.

The receptacles 6--6' are of such shape and size as to conveniently fit in the vehicle and to be easily handled and may be inserted into a chamber in the vehicle frame, which chamber is closed by a suitable door 40 to prevent the escape of any dust once it enters the machine during the operation of the latter. A suitable clutch mechanism 41 operated from the driver's seat by means of a lever 42, and convenient connections may be provided whereby the shaft 12<sup>a</sup> can be disconnected from the engine without stopping the latter. The fans 23 are sufficiently powerful to cause a strong suction not only through the apparatus, but underneath the

edges of the casing 7 so that every particle of dust that is loosened or agitated by the brush will be drawn into the apparatus.

The hinging of the dust pan 3 to the vehicle frame and the pivotal attachment of the brush and casing to the vehicle allows the brush and dust-pan to adapt themselves to every inequality of surface and for the brush to clean out all the holes, car tracks and the like, carrying all the heavy matter including bricks, stones, horse shoes, etc., into the trough 4 whence the same are removed by the slowly traveling carrier 5; at the same time the suction device coöperates in the manner described so that absolutely no dust escapes.

While the apparatus may be operated successfully on wetted pavements, it is preferred to use it with the pavement perfectly dry, actual practice having demonstrated that by so doing the usual street litter and practically every particle of fine dust, is taken up into and retained in the apparatus.

By disposing the brush straight across the vehicle, it operates directly on the ground to lift the dirt ahead of it and into the apparatus.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a street cleaning apparatus, the combination of a wheeled-vehicle-frame, a rotary brush carried thereby, a casing for said brush, an endless conveyer extending upwardly and forwardly and traveling in a passage-way formed in the vehicle frame, a receiving chamber for the material lifted by said conveyer, an air trunk intersecting said conveyer passage-way, air induction means in said air trunk coöperating with the brush to cleanse the roadway, said air-trunk extending forward of the vehicle, settling tubes connected with the air trunk, a conveyer receiving the collections from said settling tubes, a receptacle into which said conveyer discharges, means for rotating the brush and means for operating said air induction means.

2. In a street cleaning apparatus, the combination of a wheeled-vehicle-frame a rotary brush carried thereby, said frame having a passage-way into which the material raised by the brush is discharged, said passage-way having two branches, an endless conveyer operating in one branch to carry the coarser deposits from the brush, air induction means in the other branch to convey the lighter particles raised by the brush, dry settling devices to which the material is delivered by said air induction means, and separate receptacles for receiving the deposits from said conveyer and said air induction means, and means for operating the brush and the said air induction means.

3. In a street cleaning apparatus, the combination of a wheeled-vehicle, a rotary brush carried thereby, an endless carrier operating



in a passage-way in the vehicle-frame, means for operating the brush to deliver material on to said conveyer, an air trunk connected with said passage-way intermediate of its ends, air  
5 induction means interposed in said air trunk, settling tubes connected with said air trunk, and dust receptacles carried by the vehicle.

4. In a street cleaning apparatus, the combination of a wheeled-vehicle-frame, a rotary brush carried thereby, an endless conveyer operating in a passage-way in the vehicle frame, means for operating the brush for delivering material onto said conveyer, an  
10 air trunk connected with the said passage-way, air induction means in said air trunk, settling tubes connected with said air trunk, a separate conveyer receiving the collections  
15 from said settling tubes, and dirt receptacles into which said conveyers discharge.

20 5. In a street cleaning machine of the character described, the combination of a wheeled vehicle, a rotary brush, a casing therefor, a conveyer receiving the heavier deposits from the brush, means on the vehicle  
25 for storing said deposits, air induction means

on the vehicle for conveying the finer sweepings of the brush, a receiver for said sweepings from the air induction means, means on the vehicle for settling in a dry condition the sweepings of the brush, and means for oper- 30  
ating the brush, the conveyer and the air induction means.

6. In a street sweeping machine of the character described, the combination of a wheeled vehicle, a rotary brush, a casing 35  
therefor, means for operating the brush, an air induction means coöperating with the brush to gather the sweepings raised thereby, a receiver on the vehicle for said sweepings, and means on the vehicle for settling in a dry 40  
condition the sweepings conveyed by said air induction means.

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

CHARLES H. BUTLER.

Witnesses:

WILLIAM DUNSTAN,  
JOHN E. GUSTAFSON.