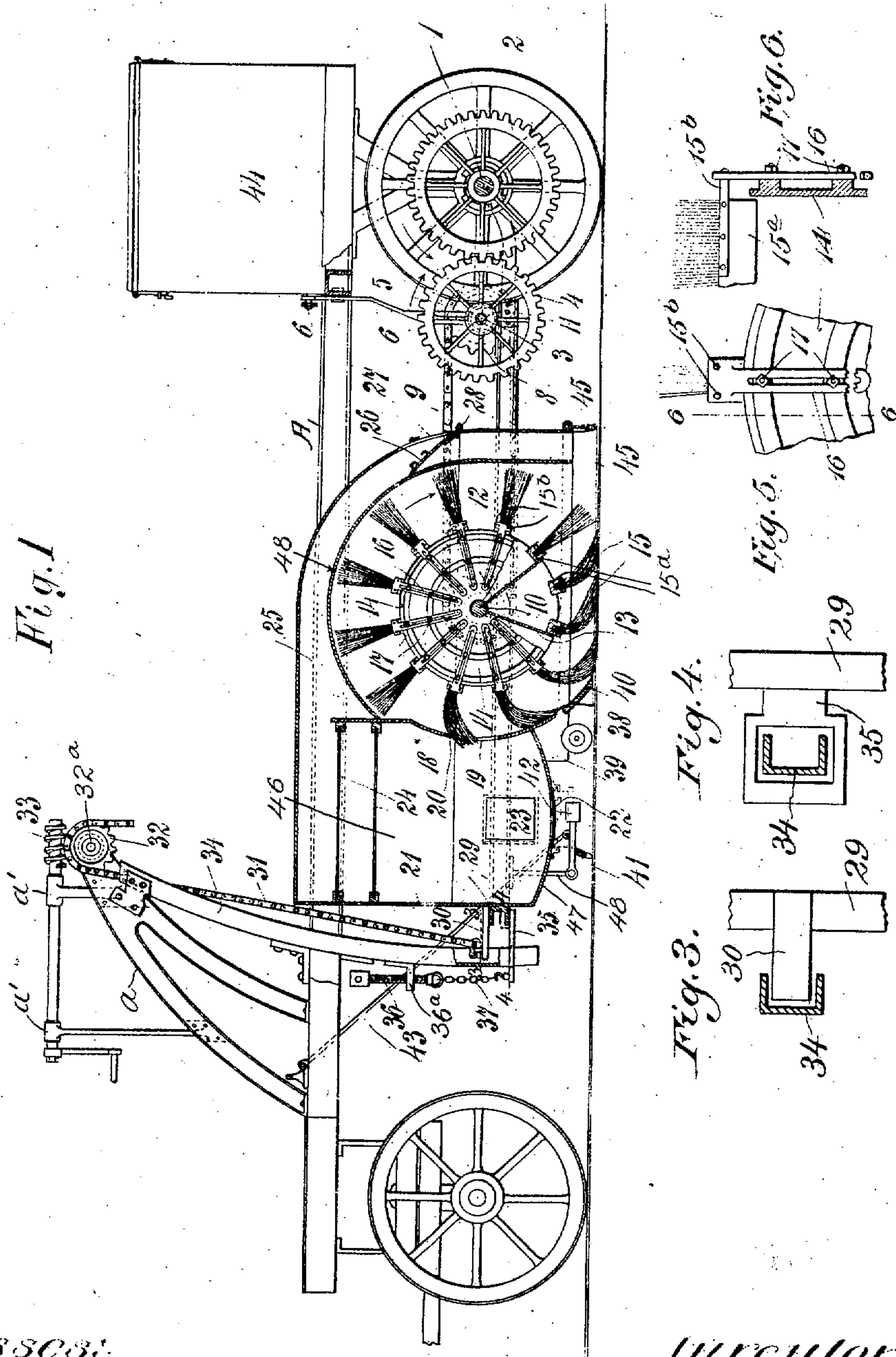


G. PUM.
STREET SWEEPING MACHINE.
APPLICATION FILED OCT. 19, 1905.

2 SHEETS—SHEET 1.



WITNESSES:
C. Heyman
C. H. Crawford

INVENTOR:
GEORGE PUM
by R. Singer
Attorney

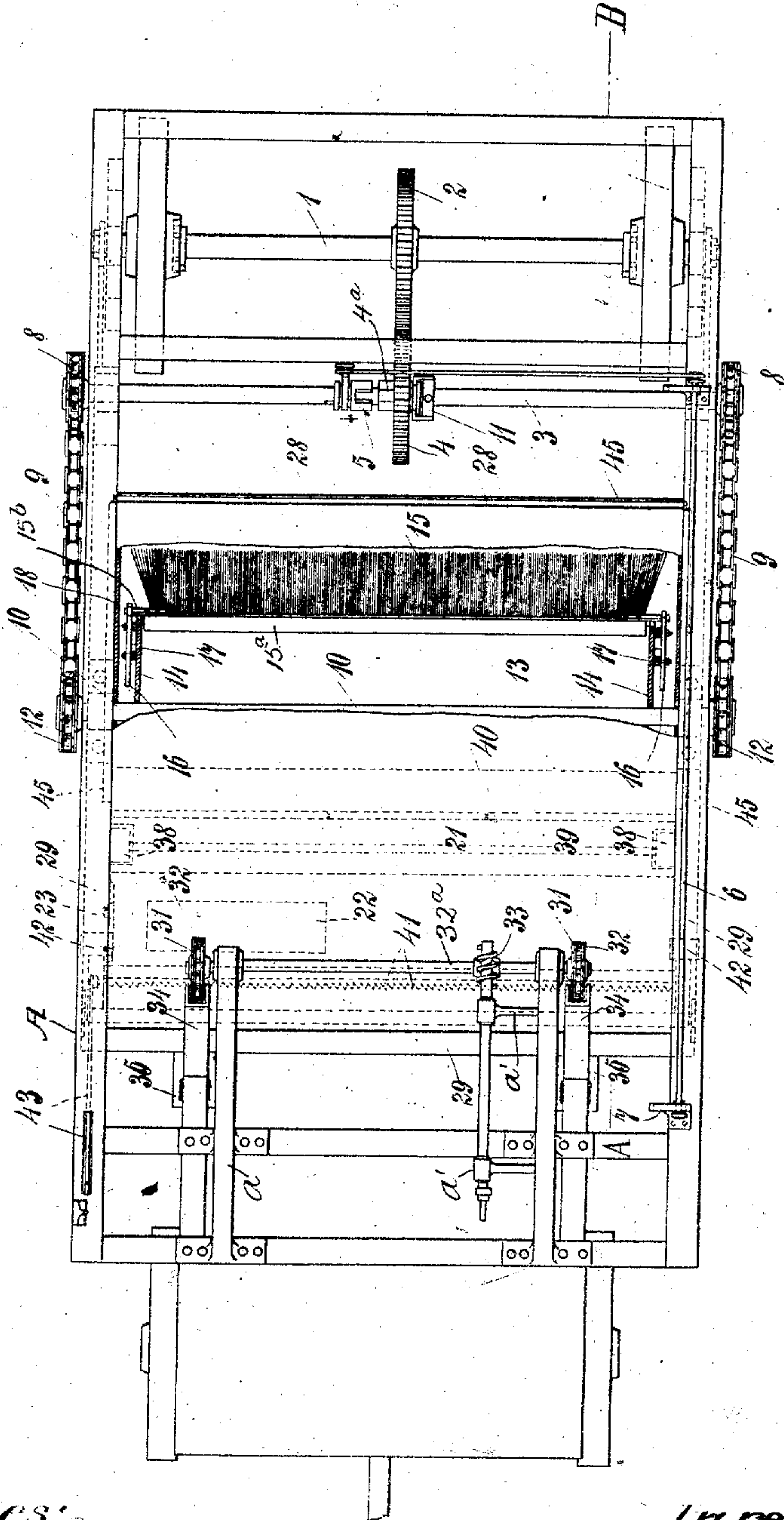
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PATENTED JUNE 18, 1907.

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2 SHEETS—SHEET 2.

Fig. 2



WITNESSES:
C. Hermann
C. H. Crawford

Inventor:
GEO. PUM
by P. Singer
Attorney

UNITED STATES PATENT OFFICE.

GEORG PUM, OF VIENNA, AUSTRIA-HUNGARY.

STREET-SWEEPING MACHINE.

No. 857,415.

Specification of Letters Patent.

Patented June 18, 1907.

Application filed October 19, 1905. Serial No. 283,471.

To all whom it may concern:

Be it known that I, GEORG PUM, of the city of Vienna, Province of Lower Austria, and Empire of Austria-Hungary, merchant, having invented certain new and useful Improvements in Street-Sweeping Machines, do hereby declare that the following is a full, clear, and exact description of the same.

The invention relates to an improvement in street sweeping machines of that class wherein a revolving brush is employed to sweep the dust particles into a suitable dust receptacle, the brush being geared to and rotated by one axle of a supporting vehicle.

The object of the present invention is the provision of a street sweeper whereby the sweepings of the road-bed may be delivered to a sweeping or dust receptacle and whereby the usual clouds of dust accompanying the sweeping operation may be entirely avoided and the cost and extra labor attending the preliminary sprinkling operation likewise dispensed with.

To this end the invention consists in the provision of a casing adapted to completely surround the brush from the level of the surface swept upwardly, and in further providing a dust receptacle adjacent to and forming one of the walls of said casing and so arranged with respect to the brush that the sweepings are carried by the brush upwardly upon the wall of the casing or receptacle to a predetermined point whereupon it is delivered through an aperture or opening into the receptacle, the latter being provided with a suitable air discharge and also with means preventing the lighter dust particles from being carried off by the discharging air.

The invention further contemplates improved means whereby the brush may be adjusted relatively to the road-bed.

The invention will be described in connection with the accompanying drawings and will be more particularly set forth and ascertained in and by the appended claims.

In the drawings:—Figure 1 is a sectional elevation on line A—B of Fig. 2, showing a street sweeper embodying the main features of my invention. Fig. 2 is a plan view thereof with parts in section. Fig. 3 is a detail sectional view on line 3—3 of Fig. 1. Fig. 4 is a detail sectional view on line 4—4 of Fig. 1. Fig. 5 is a fragmentary end elevation of one of the brush supports showing the adjustable mounting therefor. Fig. 6 is a section on line 6—6 of Fig. 5.

Referring to the specific construction shown, the frame of the vehicle, designated by A, is supported in the usual manner upon front and rear wheels, the axle 1 of the rear wheels being utilized as a driver for the sweeping mechanism. First describing the construction of the sweeping mechanism and the manner in which the same is mounted there is shown a supporting frame 29, pivotally secured, at its rear end, to the axle 1 and adjustably secured at its forward end in a manner to permit a vertical adjustment about the rear axle 1 as a center. The adjusting means at the forward end as shown comprises chains 31 secured at their lower ends to arms 30 rigidly anchored upon the frame 29, said chains at their opposite ends being trained about wheels 32, mounted upon a shaft 32^a. Said shaft is mounted in bearings formed in standards *a* rising from the frame A, said shaft carrying a worm wheel operated by a worm 33. The shaft of the worm 33 is rotatably supported in bearing *a'* and may be operated by a crank or other suitable means. In order to guide the frame 29 during vertical adjustment and to prevent the same from swaying laterally after adjustment, I provide curved guides 34. The guides 34 are preferably made of channel iron and the arms 30 project between the lateral flanges of said guides 34 as clearly shown in Fig. 3. The said guides are rigidly secured upon the frame A of the carriage in such a manner that the center of their curvature coincides with the axis of the axle 1 so that as the frame 29 is adjusted about the axle the arms 30 will freely move adjacent the guides without binding thereon. In order to limit the downward adjustment of frame 29 and in order to assist in supporting said frame in its lowermost adjustment I provide supporting arms 35 which are apertured to have a sliding fit about the guides 34 and which project forwardly from beneath the frame 29, said arms 35 at their outer ends are connected by chains 37 with the threaded supporting rods 36, the latter having threaded engagement with lugs 36^a, secured to the guides 34. It will be obvious from the foregoing that rods 36 may be adjusted vertically to lengthen or shorten the chain 37, to vary the normal vertical position of the arms 35 and thereby limit downward adjustment of the supporting frame.

Next describing the sweeping mechanism and referring more specifically to the struc-

ture thereof the same consists of the following parts. A brush axle 10 is mounted in bearings upon the frame 29 and carries supporting end disks 14 connected by a series of radial partitions 13. The sweeper consists of a plurality of brushes 15 mounted upon bases 15^a, which latter are provided at each end with a pair of trunnions 15^b. Said trunnions are mounted in arms 16 which are slotted to receive bolts 17 projecting from the disks 14. The bases of said brushes are somewhat shorter than the distance between the disks 14 so that, when the brushes occupy the adjusted position shown in Fig. 2, the disks permit the bases to be radially adjusted between the disks as far as the slots in the disk arms permit. It will be obvious that by means of the foregoing construction these several brushes may be individually adjusted radially in accordance with the character of the work to be performed. The independent adjustment is an important feature in the performance of work where the dust accumulation or sweepings are relatively heavy and where they have been allowed to accumulate, such as in the case of roads which are infrequently swept, in which case it is desirable to provide brushes which contact with the road-bed with relatively great pressure in order to loosen the dust-particles or sweepings and also brushes which contact lightly with the road-bed in order to sweep the loosened particles which the preceding brush has left behind. By means of the improved construction just described alternate brushes could be adjusted to effect such light and heavy contact with the road-bed for the purpose just set forth.

Next describing the improved sweepings or dust-receptacles, the air discharge therefor and the casing in which the brush operates, the same consists as follows: The dust receptacle comprises a front wall 21, a rear wall 18, side walls 46 and a bottom wall 47. One side wall is provided with an opening closed by a door 23 and the bottom wall is provided with a dump slide 22, either of which may be operated by any suitable means to remove the sweepings. The said receptacle extends preferably throughout the width of the frame 29 and is rigidly secured thereto so that when said frame is adjusted, like adjustment of the receptacle is effected. The receptacle is located adjacent the sweeper and the wall 18 is curved so that the several brushes have wiping contact therewith as clearly shown in Fig. 1. The wall 18 extends downwardly somewhat below the receptacle but not a sufficient length to come in contact with the road-bed. In order to form a continuation of the wall 18 adapted to come in close contact with the road-bed and to provide a continuous wiping surface for the brushes from said road-bed upwardly, I provide a sweeping plate 40 which is pref-

erably pivotally mounted. In order to render the plate 40 noiseless during the operation of the sweeper the same is preferably constructed of a central strip of leather or like material adapted to be seated in a metallic casing of U-shaped cross-section. As shown the wall 18 is provided with an opening 19 through which the sweepings may be delivered to the receptacle.

From the foregoing and by reference to Fig. 1 it will be seen that the brushes 15 engage the road-bed with a wiping contact and have like engagement with plate 40 and the wall 18, thereby carrying the sweepings up to the opening 19 whereupon the brush is suddenly released and, projecting through the opening 19, throws or delivers the sweepings therethrough into the receptacle, the sudden release and the engagement of the brush with the upper wall of the opening 19 serving to clean each of the brushes. At a point slightly above the opening 19 the wall 18 is abruptly bent and extends vertically from said bent portion a suitable distance. It will be obvious that as the brush leaves the curved portion of the wall 18 it will quickly assume a normal position thereby serving to further release or throw off any clogs or other matter which the brushes may have collected and which have not been released by engagement of the brush with the upper wall of the opening 19. The wall 18 therefore not only serves as a wiping surface for the brush but by means of the upper wall of the opening 19 and the abruptly bent portion it likewise serves to clean the brushes at each revolution thereof.

In order to prevent the fine dust particles which are not delivered to the receptacle from being thrown into the air I provide a casing 48 which extends from the vertical portion of the wall 18 rearwardly and downwardly to a point adjacent the road-bed thereby substantially inclosing the brush on its upper, rear and end portions.

It will be obvious that as the sweepings enter the receptacle through the opening 19 there will follow a considerable agitation of air caused by the action of the brushes 15. I provide an air discharge conduit 25 to which the receptacle delivers at its upper end; said air discharge passing rearwardly and downwardly from the casing 48 to a point adjacent the lower end thereof where it delivers to a point adjacent the road-bed. In order to prevent the lighter dust particles from being discharged with the air through the conduit 25 I provide perforated walls 24 in the upper part of the receptacle.

It will be understood that the walls 24 cannot practically be made with sufficiently fine openings to entirely prevent the escape of all of the dust particles but said openings are made fine enough to prevent the escape of most of the dust particles. When the

sweeper is operating upon a road bed which is in a very dry condition a comparatively large amount of dust particles will escape through the wall 24 but when the sweeper is operating upon a dampened road bed the dust particles will obviously unite and will be of a much coarser character and will be almost wholly retained by the walls 24 in the receptacle. In cases where the sweeper is operating upon a dry roadbed wherein a comparatively large quantity of the dust particles escape I prefer to discharge the dust laden air escaping from the receptacle at a point adjacent the street's surface and brush and within the inclosure formed by the curtain 45 so as to prevent clouds of dust filling the air as the result of the sweeping operation. However this last point of discharge retards the egress of air through the conduit 25 to some extent and therefore when the sweeper is operating upon a dampened roadbed where comparatively none of the dust particles escape through the walls 24 I wish to avoid retarding egress of the air and to this end I provide an outlet for the conduit 25 at a point above the bottom thereof in the form of an opening 27 adapted to be closed by a valve 26 hinged at 28. I preferably use material of different mesh for said walls, the first wall being of a relatively open mesh and the second having a somewhat finer mesh. The said valve 26 preferably opens inwardly and thereby serves to shut off the discharge 25 when it is desired to have the air pass outwardly through the opening 27, the door remaining in its open position by gravity. When it is desired to close the door suitable catches may be provided.

The opening 27 and the valve or shutter 26 comprise, in the preferred construction means for discharging the dust laden air from the casing at a point above the street surface. To perform this function the shutter 26 is turned backwardly to close the discharge conduit 25 and open the outlet 27. In order to discharge at a point adjacent the street surface the shutter 26 is thrown in a position to close the opening 27 in which position it opens the discharge conduit 25 thus the shutter 26 and opening 27 comprise means capable of performing the two functions.

Upon the lower, rear wall of the discharge or conduit 25 and upon the side walls of the casing 48 I provide a flexible curtain 45 which extends forwardly to a point adjacent the plate 40 and which is adapted to come in contact with the road-bed or surface to be swept and together with the plate 40 entirely incloses the brushes at points adjacent the road-bed and below the casing, thereby preventing sweepings from being discharged rearwardly and forwardly from beneath the same. In order to render the curtain more effective and to insure uniform engagement

with the road-bed I provide the same with weights which may be of any desirable form.

When the sweeper is used upon roads wherein the sweepings are in a firm and compact condition and it is desired to loosen the same prior to contact therewith of the brushes 15, I provide a scraper 41 which is held in contact with the road-bed by a weight 42 or other suitable means and which is connected with a rod 43, whereby it may be thrown into and out of an operative position. The said scraper is pivotally mounted upon pendent arms 48 secured to frame 29, the scraper 41 being free to drop into engagement with the road-bed irrespective of the adjustment of the frame 29. If through accident the means for supporting the frame 29 should give way I provide rollers 38 secured in blocks 39 and adapted to engage the road-bed to prevent injury to the other parts of the sweeping mechanism.

The sweeper is driven from the rear axle 1 in the following manner. Sprocket wheels 12 are mounted on the outer ends of the shaft 10 in alinement with sprocket wheels 8, chains 9 being trained about said wheels. The wheels 8 are mounted upon a shaft 3 which carries a loosely mounted gear pinion 4 provided with a clutch member 4^a. A clutch member 5 is provided which is non-rotatably mounted on the shaft 3 and adapted to be thrown into and out of engagement with the clutch member 4^a by any suitable means. As herein shown the clutch member 5 is controlled by means of rods 6 and 7, Fig. 2, from the forward end of the vehicle. The pinion 4 meshes with the pinion 2 which is rigidly secured to the axle 1. When it is desired to rotate the brushes the clutch 5 is thrown into engagement with the clutch member 4^a thereby driving the shaft 3 and through the chains 9 the brush shaft 10 and brush.

Having now described the nature of the invention what I desire to secure by Letters Patent and claim is:

1. A street sweeper comprising in combination, a carriage having a rear axle, a frame pivotally mounted thereon, means for raising and lowering the forward end of said frame, curved guides for said forward end whose center of curvature coincides with the rear axle, said guides comprising channel irons, said frame having lifting arms projecting into said channel guides and supporting arms embracing said channel guides, a brush rotatably mounted on said frame and adapted to be lowered into and raised out of engagement with the street surface, gearing mounted on said frame and driven by said rear axle to operate the brush in a direction opposite to the wheels of the vehicle, and a receiver on said frame located in delivering proximity to said brush.

2. In a street sweeper, the combination of

a rotating brush, a dust receptacle in delivering proximity thereto, an air discharge for said receptacle, and perforated walls retaining the larger particles of the discharged air, the perforations of one wall being larger than those of the adjacent wall, and a discharge conduit receiving the smaller dust particles from said receptacle and delivering the same to a point adjacent the street surface and the brush.

3. In a street sweeper, the combination of a rotating brush, a receptacle in delivering proximity thereto, a casing inclosing said brush and extending approximately to the sweeping surface, a sweeping plate extending to said sweeping surface forwardly of the brush, a weighted curtain of flexible material extending to said surface laterally and rearwardly of the brush, and a discharge conduit receiving from said receptacle and extending to a point within said weighted curtain.

4. In a street sweeper, the combination of a rotating brush, a receptacle in delivering proximity thereto, a casing inclosing said brush and extending approximately to the sweeping surface, a sweeping plate extending to said sweeping surface forward of the brush, a weighted curtain of flexible material extending to said surface laterally and rearwardly of the brush, and an air discharge conduit leading from said receptacle and delivering within said casing and curtain at a point adjacent the latter, said conduit having a discharge opening at a point above the bottom of said casing.

5. In a street sweeper, the combination of a rotating brush, a housing therefor, a dust receptacle in delivering proximity to said brush, a discharge conduit communicating with said receptacle and extending to a point adjacent to the street surface and inside of said housing, said conduit having an opening above the lower end thereof, and outside the housing, and a valve adapted to close either said opening or the conduit below said opening.

6. In a street sweeper, the combination of

a carriage having a rear axle, a frame pivotally mounted thereon, means for raising and lowering the forward end of said frame, a brush carried by said frame, curved guides for said forward end of the frame whose centers of curvature coincide with said rear axle, said guides being formed of channel iron, and arms projecting from said frame into the channels of said guides, and arms projecting from said frame embracing said guides, said first mentioned arms being connected with said means for raising the frame and said second mentioned arms being connected to stationary parts for limiting downward movement of the frame.

7. In a street sweeper, the combination of a carriage having a rear axle, a frame pivotally mounted thereon, means for raising and lowering the forward end of said frame, a brush carried by said frame, curved guides for said forward end of the frame whose centers of curvature coincide with said rear axle, said guides being formed of channel iron, arms projecting from said frame into the channels in said guides, said arms being connected with said means for raising the frame, and arms projecting from said frame and embracing said guides.

8. In a street sweeper, the combination of a carriage having a rear axle, a frame pivotally mounted on said axle, a brush carried by said frame, means for raising and lowering one end of the same, curved guides for said frame whose centers of curvature coincide with said rear axle, arms projecting from said frame and engaging said guides and connected with said means, arms projecting from said frame and engaging said guides, and means connected with said last mentioned arms for limiting movement of said frame.

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

GEORG PUM.

Witnesses:

ANTON BRIDERMANN,
ALVESTO S. HOGUE.