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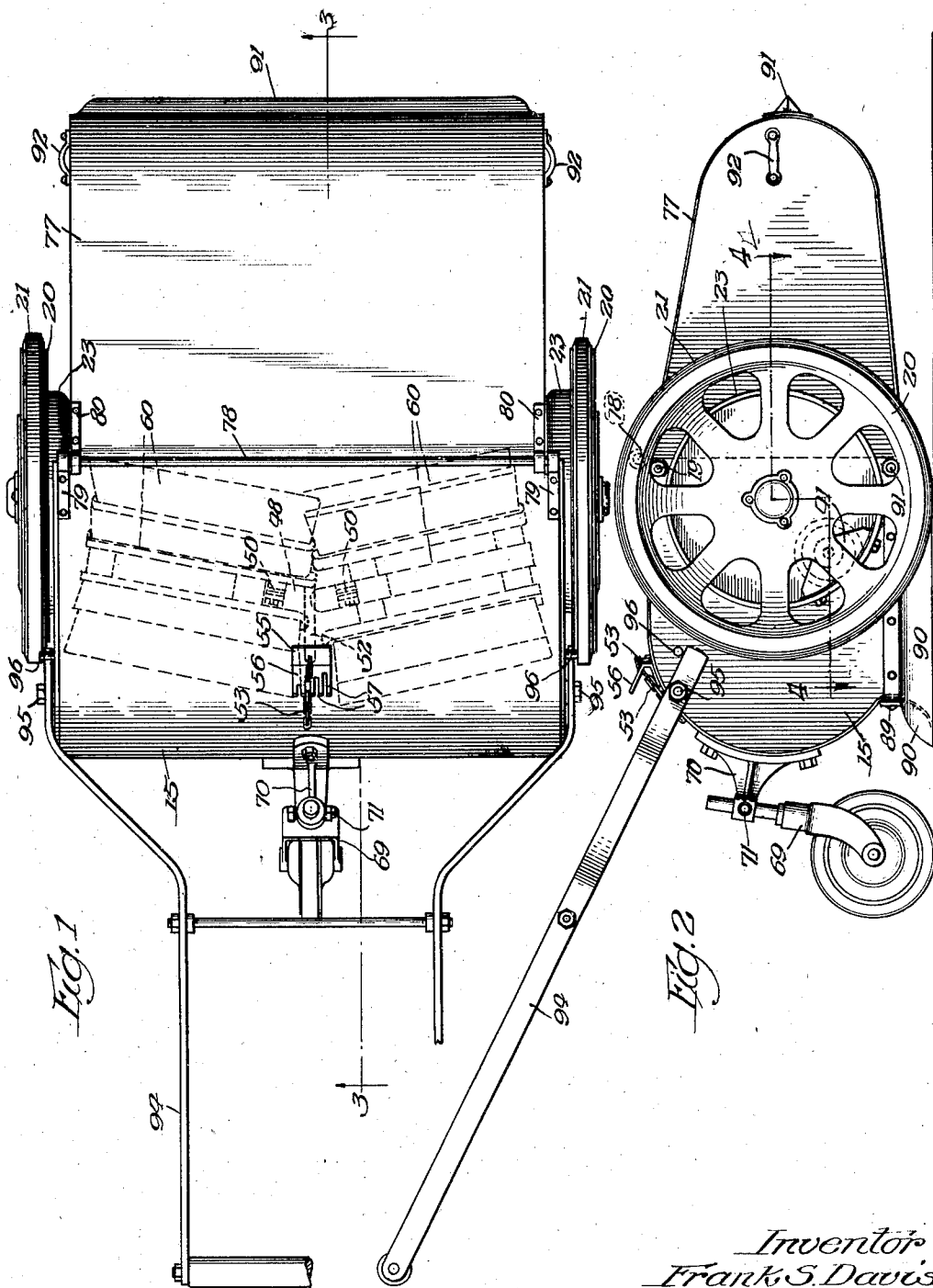
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2,136,676

SWEEPER

Filed May 23, 1935

4 Sheets-Sheet 1



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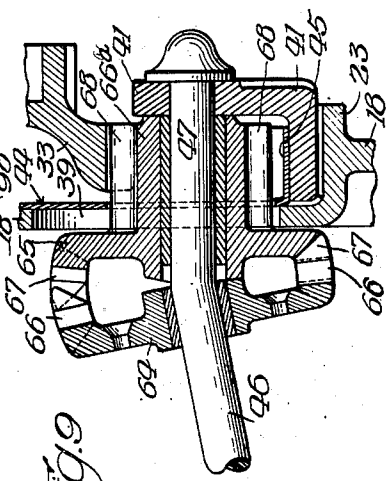
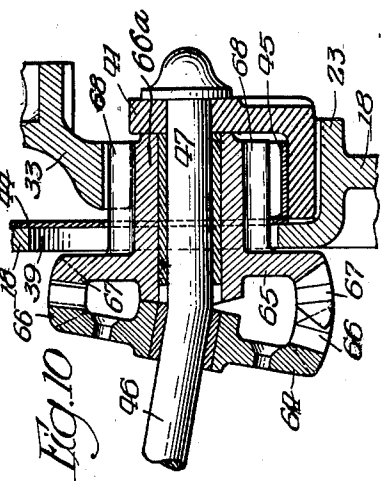
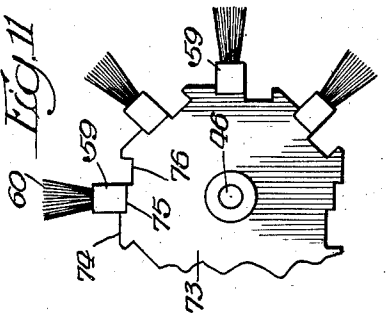
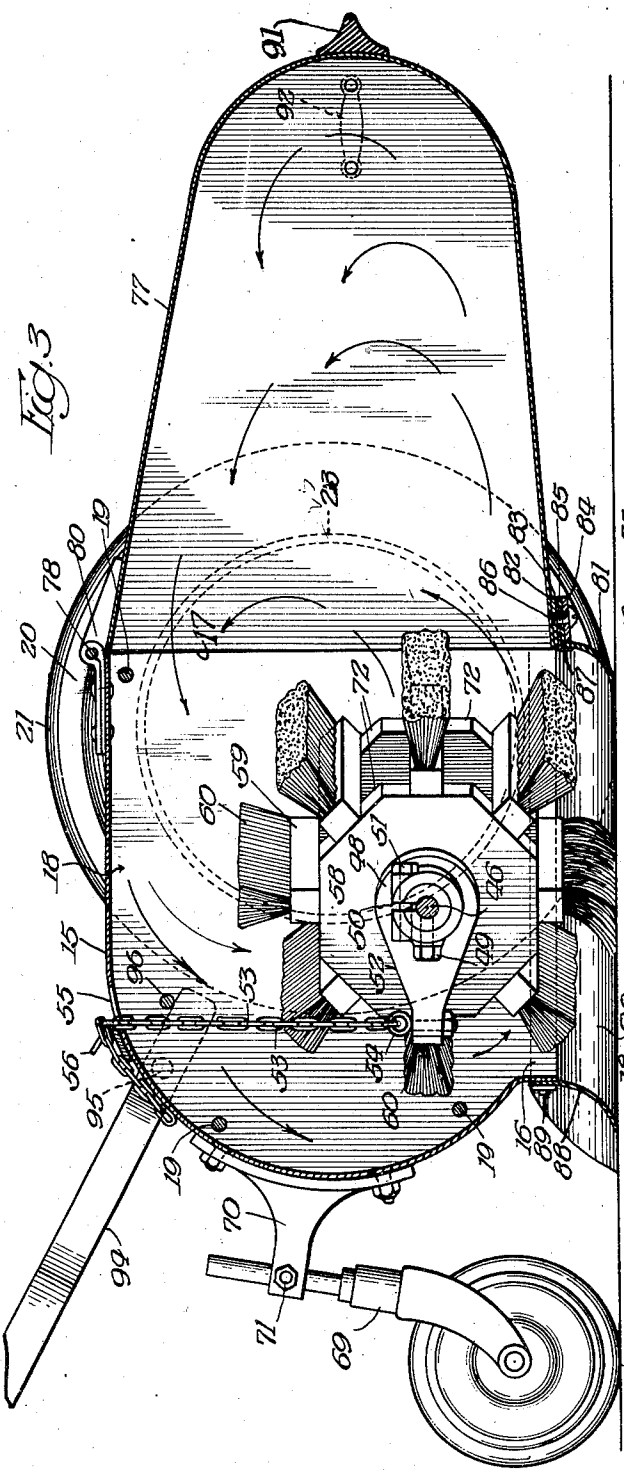
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4 Sheets-Sheet 2



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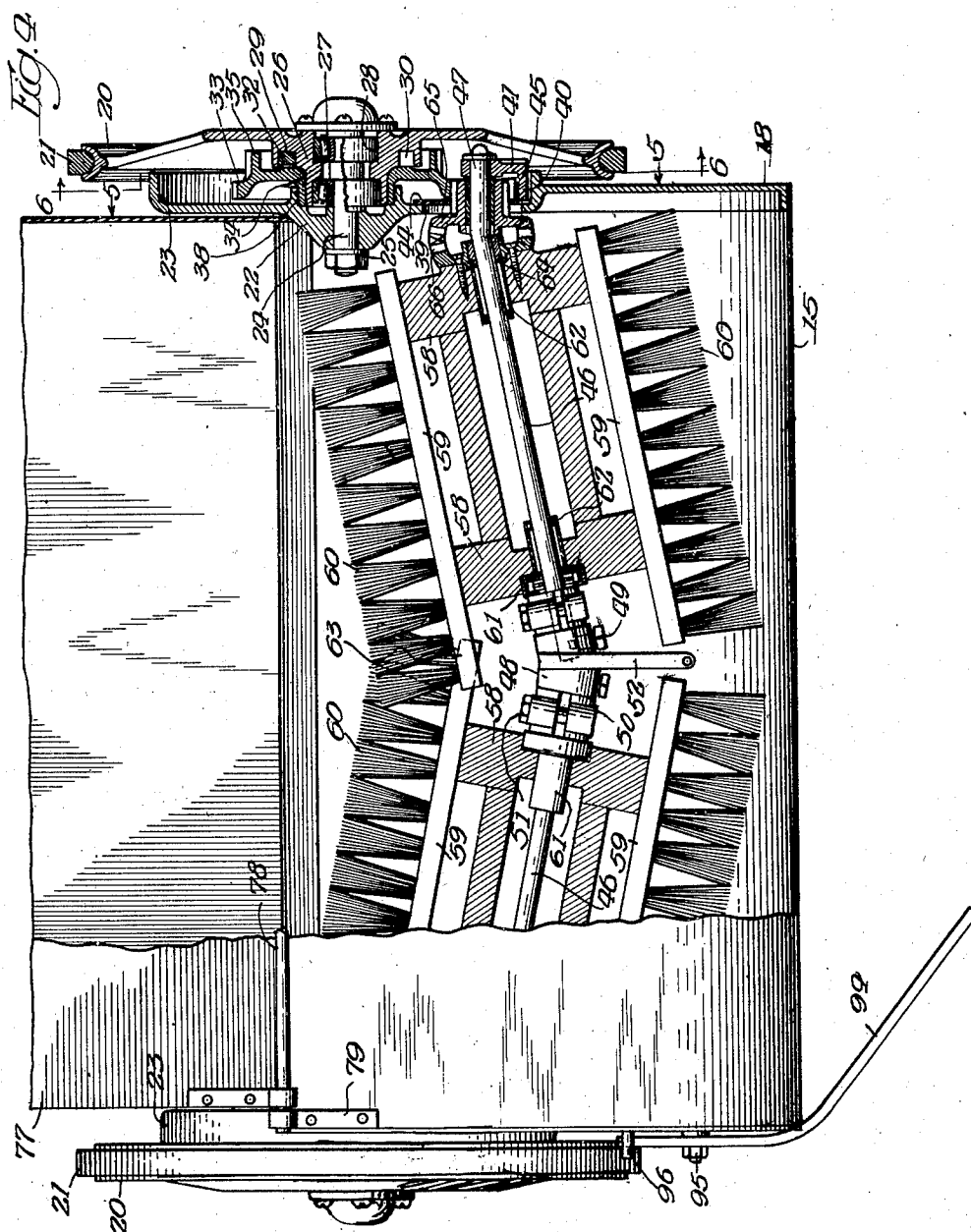
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SWEEPER

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4 Sheets-Sheet 3



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2,136,676

SWEPPER

Filed May 23, 1935

4 Sheets-Sheet 4

Fig. 6

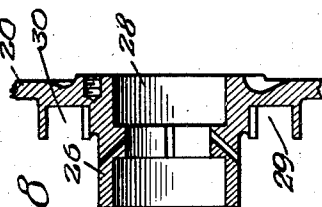
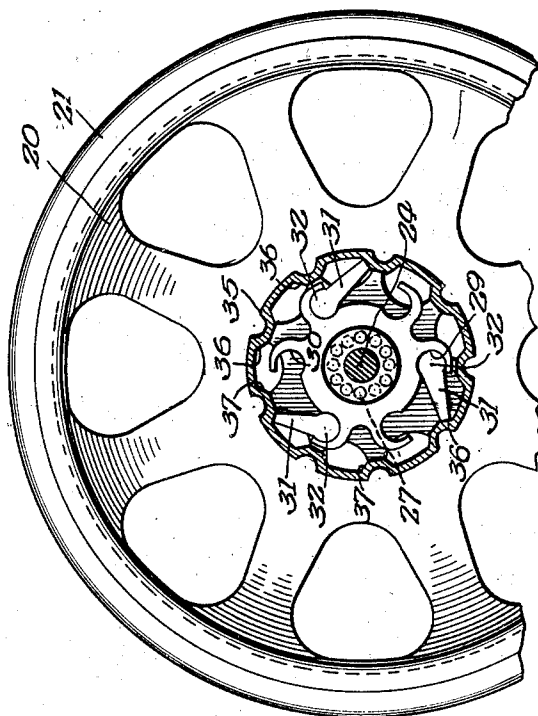


Fig. 8

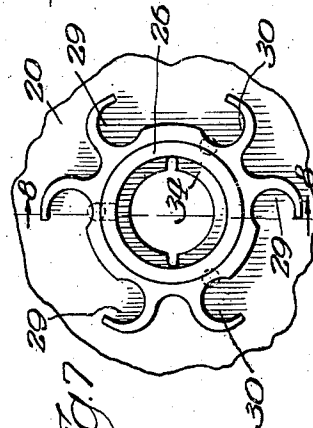
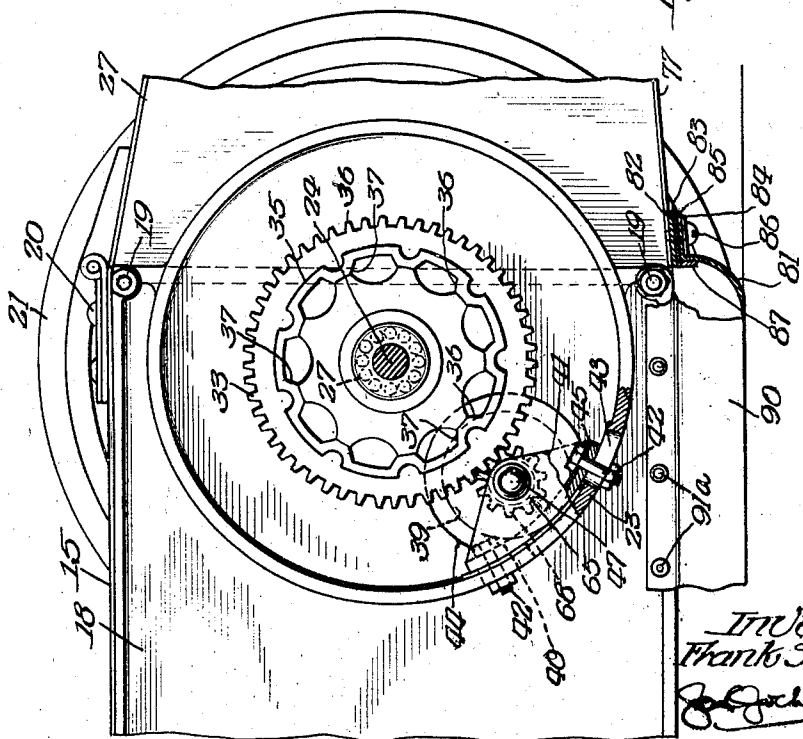


Fig. 7

Fig. 5



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UNITED STATES PATENT OFFICE

2,136,676

SWEEPER

Frank S. Davis, Flossmoor, Ill.

Application May 23, 1935, Serial No. 23,065

18 Claims. (Cl. 15—32)

This invention relates to improvements in sweepers of the type wherein a revolving brush is employed to sweep the dirt, or refuse into a suitable receptacle, the brush having an operative driving connection with a traction wheel of the machine, and one of the objects of the invention is to improve and simplify the construction of a sweeper of this character, in which there are employed two rotary brushes arranged with their axes inclined or obliquely disposed with respect to each other so as to converge in a direction from the front to the rear of the machine, and a receptacle into which the dirt is delivered by the brushes, to be subsequently dumped therefrom at will, the inner ends of the brushes overlapping, or intermeshing, so as not to leave streaks of unremoved dirt along the path of movement of the sweeper.

A further object is to provide in a machine of this character an improved dirt receptacle arranged in proximity to the brushes, and constructed to co-operate with other portions of the casing of the machine, that any air currents which may be created by the rotating brushes, will be confined and circulated within the machine, and the clouds of dust usually accompanying a sweeping operation, will be entirely avoided.

A further object is to provide improved means for adjustably supporting the brushes, whereby the brushes may be raised or lowered so that the position of the brushes with respect to the surface to be cleaned, may be readily varied to meet the existing or required conditions, and at the same time rendering it possible to vary at will the pressure with which the brushes engage the surface to be cleaned.

A further object is to provide an improved form of driving connection between the traction wheels and the brush, whereby when the machine is moved in one direction, the brush will be rotated, but when the machine is moved in the opposite direction, the connection will ratchet or slip without rotating the brush, and by means of which connection the movement of one end of the machine about the other end thereof will be compensated, the driving connection between one of the traction wheels and one of the brushes (when two brushes are employed) during such movement, being rendered inactive, one brush being then rotated by the intermeshing or overlapping ends of the other brush.

A further object is to provide an improved flexible joint between the driving and driven parts, embodying intermeshing beveled gears adapted to be rocked with respect to each other during

the raising and lowering of the brush, and which gears will always remain in mesh during such rocking movement and will not interfere with the raising or lowering of the brushes by the rotation of the obliquely disposed shafts of the brushes in their fixed outer bearings.

A further object is to provide an improved sweeper of this character which will be of simple, durable and compact construction and effective and efficient in operation.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, in which

Figure 1 is a top plan view of a sweeper of this character constructed in accordance with the principles of this invention.

Figure 2 is a side elevation of Figure 1.

Figure 3 is a longitudinal, vertical sectional view as taken on line 3—3, Figure 1, on a larger scale.

Figure 4 is a detail, sectional view, partly in elevation, partly broken away, and partly in section, taken on line 4—4, Fig. 2, on an enlarged scale.

Figure 5 is a detail sectional view taken on line 5—5, Figure 4.

Figure 6 is a detail view, partly in section, partly in elevation, partly broken away and with parts omitted, taken on line 6—6, Figure 4.

Figure 7 is a view partly in elevation and partly in section, of a portion of the pawl and ratchet mechanism.

Figure 8 is a sectional view taken on line 8—8, Figure 7.

Figure 9 is a detail view, on an enlarged scale, showing one of the flexible connections between the traction driving mechanism and one of the brushes, with the parts in one position.

Figure 10 is a view similar to Figure 9, showing the parts in another position.

Figure 11 is a detail view, partly in elevation and partly broken away, of one end of a modified form of brush.

Referring more particularly to the drawings, the numeral 15 designates generally a housing constructed of any suitable material and of any suitable size and configuration. The bottom of the housing is open as at 16 and the front of the housing is also open. This hood may be formed in any suitable manner, such as by means of end

members 18 and the body portion secured together in any suitable manner, and tie rods 19 suitably located are provided for imparting rigidity to the structure.

5 The housing thus formed constitutes the body portion of the machine and is supported by means of suitable traction wheels 20, preferably of substantial diameter and of any desired or suitable construction, preferably being provided
10 with tires 21 seated in the grooved periphery of the wheels. Each of the side members 18 of the housing is preferably provided (see particularly Figure 4) with bearing portions 22 preferably of enlarged thickness, and a recessed portion pro-
15 viding a circumferential flange 23 spaced from and extending about the bearing for a purpose to be set forth.

As the construction, operation and mounting of each of the traction wheels together with the
20 driving mechanism and the flexible connection between the driving mechanism and the brushes, on both sides of the machine are the same, the specific description of one will apply equally as well to both.

25 Mounted in the bearing 22 is a stub shaft 24 which is secured in position in any suitable manner, such as by means of fastening nuts 25, and disposed between the shaft 24 and the hub 26 of the wheel, are bearings 27, preferably of the cone
30 type and of any well known construction, the bearings being seated in suitable recesses 28 in the hub of the wheel (shown more clearly in Figure 8).

Encompassing the hub 26 are a plurality of
35 seats 29 which (shown more clearly in Figure 7) are provided with an open side, and intermediate the seats 29 are seats 30 which open in the opposite direction. These seats are provided for the reception of pawls 31 having enlarged por-
40 tions 32 at one end adapted to enter the seat and to extend through the open sides of the respective seats.

The seats 29 and 30 are open in the opposite direction so as to provide for what might be
45 termed right and left. That is, when the pawls are in one set of the seats the ratchet mechanism, to be hereinafter described, will be operative when the traction wheel rotates in one direction, and when the pawls are seated in the other
50 set of seats, the pawl and ratchet mechanism will be rendered active when the traction wheel rotates in the opposite direction. Only one set of seats, however, is employed in each traction wheel.

55 The numeral 33 designates a gear wheel, which is itself provided with a hub 34 that is sleeved upon the hub 26 of the traction wheel, and these parts are adjusted for free rotation with respect to each other under certain conditions, but nor-
60 mally in a forward drive they will be rotated together. A portion of the gear 33 is disposed in close proximity to the lateral face of the seats 29 and 30 so as to hold the pawls 31 against lateral displacement.

65 The gear 33 is provided with a laterally projecting annular flange 35 which encompasses the seats 29—30 and is shaped to form oppositely disposed ratchet teeth 36—37, one set of teeth, 36, being provided for the pawls 31 to co-operate
70 with when the pawls are seated in the seats 29, and the other set of teeth or shoulders 37 being provided for the pawls 31 to co-operate with when the pawls are seated in the other seats 30.

75 That is to say, on one side of the machine the pawls must be seated in the seats 29, where-

as on the other side of the machine, the pawls must be seated in the seats 30 so that both of the traction wheels when rotating in the same direction will impart the same direction of rotation to the brushes, to be hereinafter described, as the wheels or machine is advanced.

When, however, the machine is moved back-wardly, the pawls will ride over the teeth to effect a ratchet movement in a manner to be described.

Oil sealing grooves 38 (see particularly Figure 4) may be provided between the inner face of the hub 22 and the outer face of the hub 34 of the gear 33.

The end wall 18 of the housing 15 is provided with an opening 39 (see particularly Figure 4) 15 of substantial diameter. Supported by the flange 23 of the end member and by means of a flange 40, is a bearing 41 secured in position in any suitable manner, such as by means of bolts 42 (see particularly Figure 5) passing through the
20 flange 40 and through openings 43 in the flange 23 so as to permit the bearing 41 to be adjusted with respect to the end member 18 and in directions about the axis of the traction wheel.

A closure plate 44 is provided to close the open- 25 ing 39 and this closure plate 44 is itself provided with a flange 45 adapted to rest upon the flange 40 of the bearing 41, the fastening bolts 42 passing through the flange 45 for adjustably securing the closure plate 44 in position.

In the present exemplification of this inven- 30 tion two oblique brush shafts are provided which converge toward the rear of the machine and the shafts extend in general directions across the machine with their inner ends terminating in proximity to each other. Each of the shafts 35 comprises a main or body portion 46 and the end 47 the axis of which latter is disposed at an angle with respect to the axis of the body portion so that the body portion will be disposed obliquely with respect to the end portion 47. The end 47 of the
40 shaft passes through the opening 39 in the end member 18 of the housing and also through the closure plate 44 and is mounted in the bearing 41. The axes of the outer portions 47 of these shafts are in axial alignment. The inner ends of the shafts 46 are seated in a weighted union 48 and are secured against rotation with respect thereto in any suitable manner, such as by means of a fastening screw 49. The union 48 is preferably split as at 50 (see particularly Figures 3 and 4) and a clamp screw 51 is provided for clamping the bearing about the shaft. Projecting from the bearing 48 is an arm 52 to which one end of a flexible member 53 is secured in any
55 suitable manner, such as by means of an eye 54. This flexible member 53 passes through an opening 55 in the top of the housing 15, and the numeral 56 designates an anchor member to which the free end of the flexible member 53
60 is fastened. This may be accomplished in any suitable manner, such as by means of the provision of a series of open slots 57 in the anchor member 56. The slots are preferably of different depths so that one of the links of the chain or flexible member may be inserted into one of the slots for holding the flexible member. The flexi-
65 ble member 53, compensates any unevenness of the surface being cleaned, and also any adjustment or change of position of the brushes.

70 With this construction it will be manifest that the shafts 46 will be held against oscillation in the bearings 41, except when the union 48 is raised or lowered by lengthening or shortening the flexible member 53. In this manner it will 75

be manifest that the position of the shafts 46 with respect to the surface to be cleaned may be varied.

Brushes are rotatably supported by each of the shafts 46, and these brushes may be of any suitable construction, but preferably comprise end members 58 to which the body portion 59 of the brushes 60 are secured, and through which end members the shaft 46 passes. A thrust bearing 81 may be provided at one end of the brush and roller bearings 62 may also be provided between the brush and the shaft 46.

The brushes are mounted upon the body or obliquely disposed portions 46 of the shafts, and the brushes are of such a length that the inner ends of the brushes will overlap or intermesh as at 63 so as not to leave a streak of dirt between the proximate edges of the brushes and also to serve as a means whereby one of the brushes will rotate the other brush when the machine is moved in a direction to cause one of the traction wheels to travel around the other traction wheel as a pivot.

Each of the brushes is driven from one of the traction wheels 20, and to that end there is provided a beveled gear 64 (see particularly Figures 9 and 10) which is secured to the end of the brush to rotate about the shaft 46 with the brush. Another beveled gear 65 is provided with a hub 66^a which passes through the opening 39 in the end member 18 of the housing and also through the closure plate 44, and is journaled upon the end portion 47 of the shaft, so that these two beveled gears 64—65 will be disposed with their faces adjacent each other, but with their axes disposed obliquely with respect to each other, and both of the gears 64—65 rotate respectively about the portions 46—47 of the shaft. The teeth 66 of the gear 64 as well as the teeth 67 of the gear 65, are of abnormal length so as to cause these teeth to be always maintained in mesh.

Inasmuch as the shaft 46 as well as the brush 59 is adapted to be adjusted toward and away from the surface to be cleaned, by the lengthening or shortening of the flexible member 53, it will be manifest that the union 48 will be correspondingly moved. As this union 48 is raised or lowered, the end 47 of the shaft 46 will turn or oscillate in the bearing or bracket 41 and this adjustment of the brushes will cause the gears 64 and 65 to rock with respect to each other. That is to say, for instance, from the position shown in Figure 9 to the position shown in Figure 10, or vice versa.

By the provision of the teeth 66—67 which are of abnormal length, there is provided a flexible connection which permits adjustment of the brushes and also provides free floating of the brushes, but the gears are so designed that none of the teeth are ever completely disengaged. Thus there will be provided a flexible joint or coupling between the traction wheel and the brush, and at the same time the teeth of the gears 64—65 will not only be maintained in mesh during all positions and movements of the shafts 46—47, but by the continuous intermeshing and overlapping of the teeth with respect to each other, a guard will be formed to prevent the entrance of string, sticks, or other foreign matter between the gears 64—65, and the intermeshing teeth of such length will keep the spaces therebetween clean.

Connected to the hub 66—A of the gear 65 is a pinion gear 68 which may be formed in any suitable manner, but preferably by forming teeth in

the periphery of the hub 66^a. The gear 33 meshes with the teeth 68, and inasmuch as the gear 33 is secured to the traction wheel 20 for rotation therewith, it will be manifest that when the traction wheel is rotated, this motion will be imparted to the gear 65 through the medium of the pinion 68, and the gear 65 will in turn rotate the gear 64 and consequently the brush 59 to rotate them about the shaft 46—47.

In order to provide for a proper adjustment or positioning of the brushes at their outer ends, the outer end 47 of the shaft 46—47 is adapted to be adjusted by loosening the fastening bolts 42 of the bearing or bracket 41 and then sliding the bearing or bracket upon the flange 23 of the end member 18 until the end of the shaft has been moved to the desired position. The fastening bolts 42 are then tightened and the parts will be secured in their adjusted position.

Inasmuch as the closure or shield 44 is secured to the bracket 41 and by the same fastening bolts 42, it will be manifest that when the bracket or bearing 41 is adjusted, the closure or shield plate 44 will be correspondingly adjusted so as not to interfere with the adjustment of the shaft, and at the same time the opening 39 in the end member 18 of the housing will be maintained closed so as to prevent the escape of any dust laden air through the opening 39 during the operation of the machine.

A suitable caster wheel 69 may be adjustably mounted in a bracket 70 by means of an adjustable fastening device 71, to co-operate with the traction wheels 20 for supporting the machine and operates when the machine is pulled backward, to turn around and thereby raise the rear of the housing 15 to cause the brushes to clear the surface being cleaned.

The body portions 58 of the brushes are provided with a plurality of faces 72 arranged at an angle with respect to each other, and to which faces the body portions 59 of the brushes 60 are secured.

In Figure 11, there is shown a modified form of brush which consists of end members 73 having angularly disposed faces about their peripheries, and in each of the faces there is provided a plurality of seats 74—75—76 arranged at different distances from the axis of the end members so that the brushes 59—60 may be adjusted when desired so as to be secured against either one or the other of the faces 74—75—76 to compensate wear of the brushes.

Arranged adjacent the open front of the housing is a dirt receptacle 77, of any suitable size and configuration which will permit a free flow or circulation of the air currents created by the brush, and at the same time be able to carry a maximum load of dirt, without undue restriction to the air flow, and this receptacle is provided with an open end. The dirt receptacle 77 is pivotally connected to the housing 15 by means of a bar or rod 78 passing through eyes 79 secured to the hood member and co-operating eyes 80 secured to the dirt receptacle at the top thereof. The open end of the dirt receptacle is of a size and configuration to conform to the open adjacent front of the housing member and when in position will form a closure for such portion of the housing, portions of the dirt receptacle abutting portions of the end member of the housing.

The dirt receptacle 77 is of substantial area and secured to the lower edge of the open side thereof is an apron 81 constructed of any desired or

suitable flexible material. This apron is preferably secured on the outside of and beneath the dirt receptacle and in contact with a reinforcing strip 82 and between a clip 83 and a cooperating member 84, a portion of the apron being deflected between the elements 83 and 84, all of the parts being secured together by suitable fastening screws 86. The element 82 is preferably provided with a depending flange 87 so as to clamp a portion of the apron 81 between the edge of the element 84 and the flange 87. The apron 81 is of such a length that when it contacts with the surface to be cleaned, it will be deflected rearwardly as shown in Figure 3, and will be disposed in close proximity to the extremities of the brushes 60, preventing the dirt from being kicked by the brush under the dirt receptacle, and at the same time preventing the escape of any dust laden air between the edge of the apron and the surface being cleaned. This apron 81, also serves as a means to guide the air currents from the brush into the dirt receptacle, and which air currents are then directed over and behind as well as around the ends of the brush, and this will prevent any increase in air pressure in the machine.

Another apron 88 constructed of any suitable material is secured by means of a suitable fastening device 89, to the lower edge of the housing to extend across the rear thereof, and being arranged substantially parallel with the apron 81. This apron 88 is also of a length that when it contacts with the surface being cleaned, it will be deflected rearwardly by contact with the surface being cleaned and will prevent ingress or egress of air into or from under the housing.

Arranged along the sides of the housing and between the aprons 88 and 81, are additional aprons 90 (see also Figure 5) which are secured in position in any suitable manner by any suitable fastening devices 91—A, and these aprons 90 are preferably disposed outside of the ends of the aprons 81—88 and are of a length to terminate in close proximity to the surface being cleaned.

With this construction it will be manifest that the aprons 81, 88 and 90 will form shields or guards to confine any air currents which may be generated by the rotation of the brushes and any dust laden air, entirely within the machine. That is to say, any air currents which may be generated by the rotation of the brushes and any dust laden air which may be circulated by the brushes will be confined and circulated entirely within the housing and the dirt receptacle 77, without building up any pressure and the cloud of dust usually created heretofore by machines of this character, and outside of the machines, will be completely eliminated with the present invention.

A bumper 91 may be provided on the front end of the dirt receptacle 77, and handles 92 by means of which the dirt receptacle 77 may be swung about its pivot 78 so as to empty the contents of the dirt receptacle, may be provided and secured in any suitable position.

The device is propelled by means of a handle 94 pivotally connected as at 95 with the housing, and stops 96 may also be provided on the side members of the housing to be engaged by the lower end of the handle so as to limit the swinging movement of the handle in one direction.

It is thought that the operation of the machine will be clearly understood from the foregoing,

but briefly stated it is as follows. The brushes 60 may be adjusted to any desired position with respect to the surface to be cleaned, by lengthening or shortening the flexible member 53.

When the machine is advanced, the rotation of the traction wheels 20 will cause the pawls 31 on one of the wheels to successively engage the ratchet teeth 36 (see Figure 6) and on the other wheel, to cause the respective pawls 31 to engage the ratchet teeth 37 to correspondingly rotate the brushes, but when the machine is drawn backwardly, causing the traction wheels 20 to rotate in the opposite direction, the pawls 31 will move away from their respective teeth 36—37 and ratchet over these teeth.

Should the machine be moved in a direction to cause one of the traction wheels to travel about the other traction wheel as a pivot, that is by reason of turning the machine around on one end, the connection between the traction wheel constituting the pivot will ratchet with respect to the brush while the pawl and ratchet connection between the outer wheel will remain active to drive one of the brushes. During this operation the intermeshing or overlapping adjacent ends of the brushes will cause the positively driven brush to rotate the other brush.

Whenever any adjustment of the brushes is desired, this is accomplished by lengthening or shortening the flexible member 53, causing the shafts 46—47 to rock in their outer bearing 41, during which time the gears 64—65 will move laterally and rotatively with respect to each other, but will always remain in mesh, thereby forming a flexible coupling between each of the traction wheels and the adjacent end of one of the brushes.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. A sweeper embodying a housing, traction wheels for the housing, a pair of shafts extending transversely of the housing, said shafts extending inwardly from opposite sides of the housing and being disposed obliquely to the axes of the traction wheels, said shafts terminating in a union for fixedly securing the inner ends of the shafts together, fixed bearings for the outer ends of the shafts, the axes of said bearings being disposed in proximity to and substantially parallel with the respective axes of said traction wheels, brushes individual to and rotatable about said shafts, and means supporting said union for vertical adjustment, said shafts being movable upon the axes of their outer ends to raise and lower the brushes.

2. A sweeper embodying a housing, traction wheels for the housing, a pair of shafts extending transversely of the housing, said shafts extending inwardly from opposite sides of the housing and being disposed obliquely to the axes of the traction wheels, said shafts terminating short of each other and in a union for fixedly securing the ends of the shafts together, fixed bearings for the outer ends of the shafts, the axes of said bearings being disposed in proximity to and substantially parallel with the respective axes of said traction wheels, brushes individual to and rotatable about said shafts, means supporting the said union for vertical adjustment, said shafts being movable

upon the axes of their outer ends to raise and lower the brushes, and a flexible connection between the said traction wheels and the brushes to provide for floating as well as adjustment of said brushes toward and away from the surface to be cleaned.

3. A sweeper embodying a wheel supported housing having an open front and an open bottom, brushes rotatable within said housing, the lower edges of said housing being disposed in close proximity to the surface to be cleaned, aprons secured to and depending from the lower edges of the sides and back of the housing, a dirt receptacle the top of which is connected to said housing adjacent the top of the latter, said receptacle having an open end adjacent to the said open front of the housing, and an apron depending from the lower edge of the open end of the dirt receptacle and of a length to be deflected by contact with the surface being cleaned, for directing the air currents into said receptacle, said housing and dirt receptacle being shaped to provide an unrestricted passage to relieve the air currents from compression, the air currents created by the rotation of said brushes being confined and circulated within said housing and dirt receptacle.

4. A sweeper embodying a wheel supported housing, a pair of shafts extending transversely of the housing, said shafts extending inwardly from opposite sides of the housing and being disposed obliquely to the axes of the traction wheels, said shafts terminating in a union for rigidly connecting the inner ends of the shafts, fixed bearings for the outer ends of the shafts, the axes of the outer ends of the shafts being disposed in proximity to and substantially parallel with the axes of the housing supporting wheels, brushes individual to and rotatable about said shafts, flexible means for supporting said union and by means of which flexible means the union may be adjusted toward and away from the surface to be cleaned to move the shafts in the bearings for the outer ends thereof, means for anchoring said flexible means, and operative connections individual to one end of each of said brushes and the respective adjacent supporting wheel to rotate the brushes.

5. A sweeper embodying a wheel supported housing, a pair of shafts extending inwardly from opposite sides and transversely of said housing obliquely to the axes of said wheels and towards each other, a union rigidly securing together the inner ends of the shafts, means for supporting and for adjusting said union in directions toward and away from the surface being cleaned, there being openings in the housing walls through which the ends of the shafts that are adjacent thereto project, closures individual to said openings and through which closures the respective shafts pass, bearings for the outer ends of the respective shafts adjacent said closures, means for securing said closures and said bearings in position, the last said means permitting a fixed bodily adjustment of the said bearings and said closures in directions about the axes of said housing supporting wheels, brushes rotatable about said shafts, and means for rotating the brushes.

6. A sweeper embodying a wheel supported housing, a pair of shafts extending transversely of said housing, said shafts extending inwardly from opposite sides of the housing and being disposed adjacent and obliquely to the axes of the said wheels, a union for rigidly connecting the inner ends of the shafts, means for supporting and adjusting said union in directions toward and away

from the surface being cleaned, there being openings in the housing walls through which the respective ends of the shafts project, closures individual to said openings and through which closures the respective shafts pass, bearings for the outer ends of the respective shafts adjacent said closures, means for securing said closures and said bearings in position, said means also permitting a fixed and bodily adjustment of the said bearings and said closures in directions about the axes of the housing supporting wheels, brushes rotatable about said shafts, and means for rotating said brushes.

7. A sweeper embodying a wheel supported housing, a pair of brush supporting shafts extending inwardly from opposite sides toward each other and transversely of said housing, a union for rigidly connecting the inner ends of the shafts, means for supporting and for adjusting said union in directions toward and away from the surface being cleaned and operating to turn the shafts in their outer bearings, there being openings in the housing walls through which the respective outer ends of the shafts project, bearings for the said outer ends of the respective shafts, the axes of the portions of said shafts that are journaled in said bearings being disposed adjacent to and substantially parallel with the axes of said wheels, and means for securing said bearings in position, the last said means permitting a fixed bodily adjustment of said bearings in directions about the axes of said wheels.

8. In a sweeper, a wheel supported housing, a pair of shafts extending transversely of said housing toward each other and obliquely to the axes of the housing supporting wheels and terminating in a union for rigidly connecting the inner ends of the shafts, means for supporting and for adjusting said union in directions towards and away from the surface to be cleaned, the axes of the outer ends of the shafts being disposed adjacent and substantially parallel with the axes of said housing supporting wheels, a bearing for the other end of each of the said shafts, said bearings being supported by the housing, means securing the said bearings in position and for bodily adjustment in directions about the axes of the respective shafts, brushes rotatable upon said shafts, and means for rotating the brushes.

9. In a sweeper, a wheel supported housing, a pair of shafts extending transversely of the housing toward each other and obliquely to the axes of the housing supporting wheels and terminating in a union in which the inner ends of the shafts are rigidly secured, means for supporting and for adjusting said union in directions toward and away from the surface to be cleaned, the axes of the outer ends of the shafts being disposed in proximity to and substantially parallel with the axes of said housing supporting wheels, a bearing supported by the housing for said outer end of each of the shafts, means securing the said bearings in position and for bodily adjustment in directions about the axes of the respective shafts, the axes of the outer ends of the shafts being in axial alignment, and brushes rotatable upon said shafts.

10. A sweeper embodying a wheel supported housing, a pair of shafts extending transversely of the housing towards each other obliquely to the axes of the housing supporting wheels and terminating in a union for rigidly connecting the inner ends of the shafts, means for supporting said union and for adjusting the same towards and away from the surface to be cleaned and for mov-

ing the shafts in their outer bearings, fixed bearings for the outer ends of the shafts, the axes of the outer ends of said shafts being disposed at an angle to the axes of the respective inner ends thereof, brushes rotatable about the shafts, and means operatively connecting the brushes with the traction wheels to be rotated thereby, said connecting means embodying a flexible coupling disposed between the traction wheels and the brushes.

11. A support embodying a housing, traction wheels therefor, a pair of shafts extending inwardly from opposite sides and arranged transversely of the housing, said shafts being disposed obliquely to the axes of the traction wheels, the inner ends of the shafts terminating in a union, means for supporting said union and for adjusting it toward and away from the surface to be cleaned and for moving the shafts in their outer bearings, fixed bearings for the outer ends of the shafts, brushes rotatable about the shafts, and means operatively connecting the brushes with the traction wheels to be rotated thereby, said connecting means embodying flexible couplings disposed between the traction wheels and the respective adjacent ends of the brushes, said couplings embodying two intermeshing gears, the axis of one of the gears being inclined with respect to the axis of the other gear, some of the teeth of said gears remaining in mesh and all of the teeth of the co-operating gears overlapping at all times during rotation of the brushes and the adjustment of said shafts, and in any position of the shafts with respect to the surface to be cleaned.

12. A sweeper embodying traction wheels, a pair of shafts extending transversely of the sweeper obliquely with respect to the axes of said traction wheels, the inner ends of the shafts terminating in a union for rigidly connecting them, means for supporting said union and for adjusting the same toward and away from the surface to be cleaned and for moving the shafts in their outer bearings, fixed bearings for the outer ends of the shafts, the axes of the outer ends of the shafts being disposed at an angle to the axes of the respective inner ends of the shafts, brushes rotatable about the shafts, means operatively connecting the brushes with the traction wheels to be rotated thereby, said connecting means embodying flexible couplings disposed between the traction wheels and the respective adjacent ends of the brushes, said couplings each embodying two beveled gears, each gear rotating about an axis which is inclined with respect to the axis of the other co-operating gear, all of the teeth of the respective pairs of gears overlapping at all times, some of the teeth of the co-operating gears remaining in driving mesh at all times during adjustment of said shafts and in any position of the shafts with respect to the surface being cleaned, and means for rotating one of said gears.

13. In a sweeper a housing, traction wheels for the housing, a brush shaft, a bearing supporting one end of the shaft, a portion of the shaft beyond said bearing being oblique to the portion which is journaled in the bearing, the axis of the portion of the shaft which is in said bearing being disposed adjacent and substantially parallel with the axes of said traction wheels, a support for the other end of said shaft, means for supporting the said support and for adjusting the same whereby the shaft will be moved in the first said bearing, a brush rotatable upon said shaft, and a flexible

driving connection between one end of said brush and the traction wheel, said connection embodying intermeshing beveled gears rotatable about axes arranged oblique to each other.

14. In a sweeper, a housing, traction wheels supporting the housing, a brush shaft, a bearing supporting one end of the shaft, a portion of the shaft beyond said bearing being oblique to the portion which is journaled in the bearing, a support for the other end of the shaft, means for supporting the said support and for adjusting the same whereby the shaft will be moved in the said bearing, a brush rotatable upon said shaft, and a flexible driving connection between one of said brushes and one of said traction wheels, said connection embodying intermeshing beveled gears rotatable upon the said portions of the shafts which are oblique to each other, whereby the axes of the gears will be arranged oblique to each other, said beveled gears providing a free floating movement of the brushes, the teeth of the gears being of abnormal length whereby all of the teeth of the gears will overlap at all times and in any position of the shaft with respect to the surface being cleaned.

15. In a sweeper, a housing, traction wheels supporting the housing, brush supporting shafts extending inwardly from opposite sides and transversely of the housing, brushes rotatably mounted upon the shafts and arranged with their inner ends adjacent each other, and means individual to the brushes for rotating them only when the respective traction wheels are rotating in one direction, the inner ends of adjacent brushes overlapping, whereby when one of the traction wheels is inactive to drive its brush, one of said brushes will be rotated by the other brush.

16. In a sweeper, a wheel supported housing, brush supporting shafts extending inwardly from opposite sides and transversely of the housing, brushes rotatably mounted upon the shafts and arranged with their inner ends adjacent each other, and means individual to the brushes for rotating each by one of the traction wheels only when the respective wheels rotate in one direction, the inner ends of adjacent brushes intermeshing, whereby one of said brushes will be rotated by the other brush when one of the traction wheels is inactive to drive its brush, the brushes being provided with converging longitudinal axes.

17. In a sweeper, a wheel supported housing, a rotatable brush in the housing, a driving connection between the brush and one of the said supporting wheels, said connection embodying a pair of intermeshing beveled gears, the axes of said gears being arranged at an angle to each other, the teeth of the gears having extensions thereon, all of said extensions overlapping at all times, and some of the teeth remaining in driving mesh at all times during rotation of the brush.

18. In a sweeper, a housing, traction wheels supporting the housing, a rotatable brush in the housing, means supporting the brush for adjustment toward and away from the surface to be cleaned, a flexible connection between the brush and one of said traction wheels, said connection embodying two beveled gears the axis of one of said gears being inclined to the axis of the other gear, all of the teeth of the gears overlapping at all times in any position of the brush, and some of the teeth of the gears being at all times in intermeshing driving relation.

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