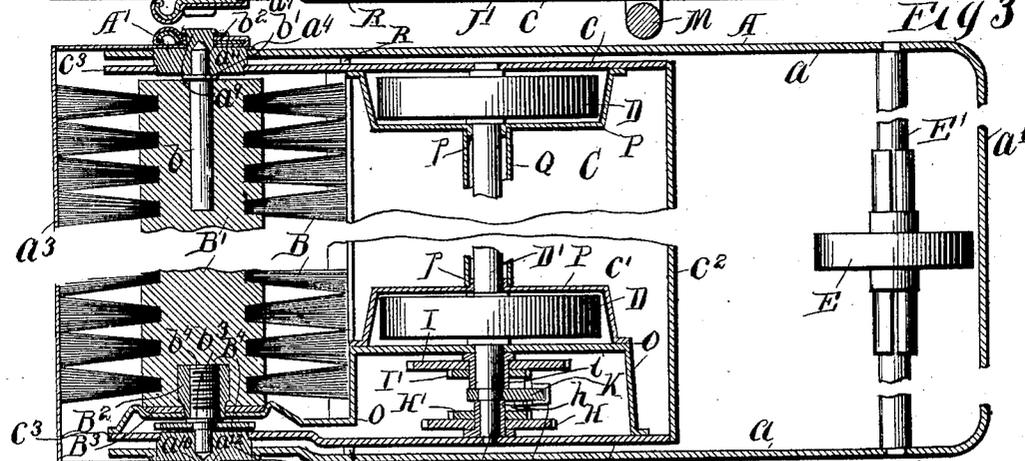
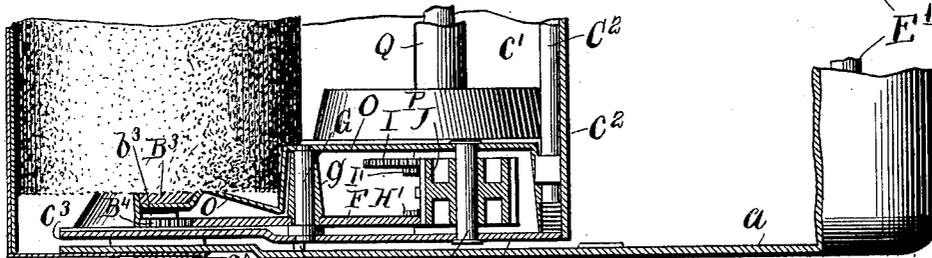
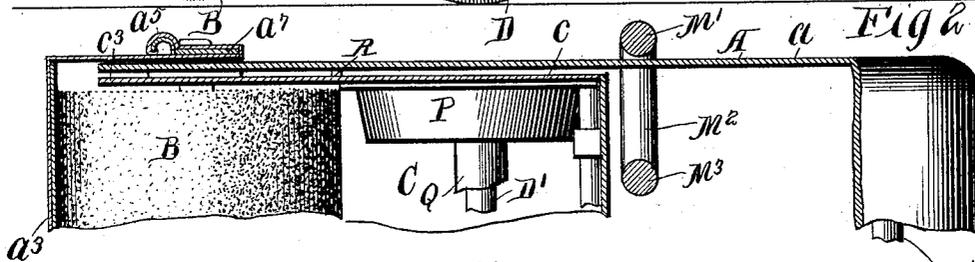
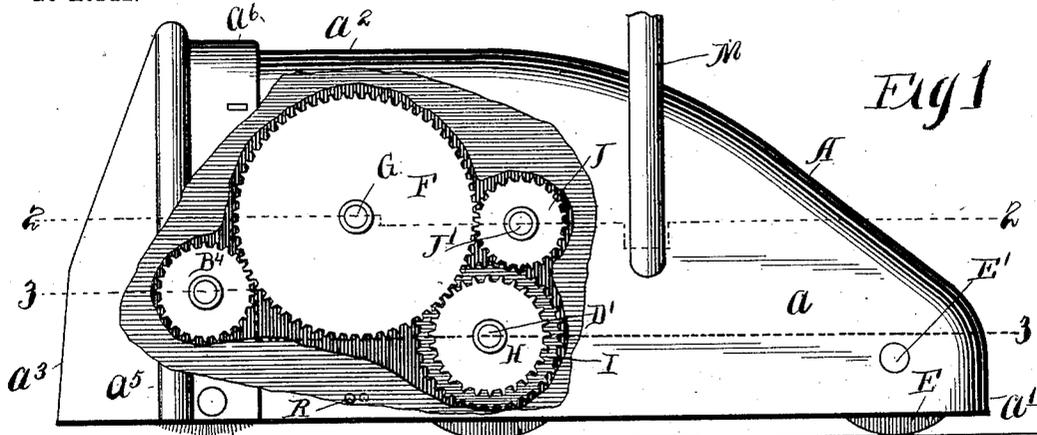


J. F. HARDY.
CARPET SWEEPER.
APPLICATION FILED DEC. 29, 1899.

NO MODEL.

3 SHEETS—SHEET 1.



Witness
Wm. Crawford
William Hall

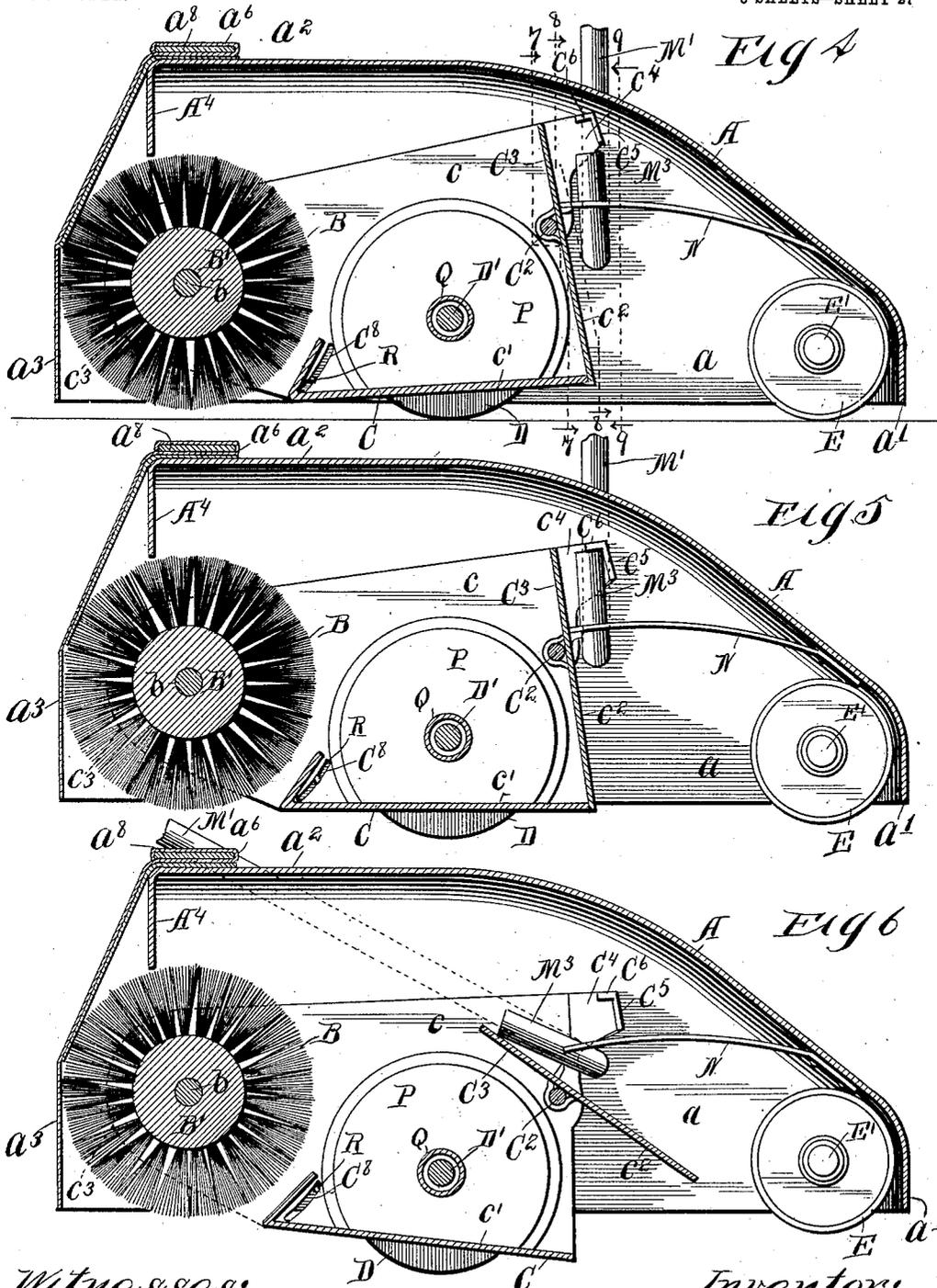
Inventor:
John F. Hardy
 by *Poole & Brown* his Attorneys

J. F. HARDY.
CARPET SWEEPER.

APPLICATION FILED DEC. 29, 1899.

NO MODEL.

3 SHEETS—SHEET 2.



Witnesses:
C. H. Crawford
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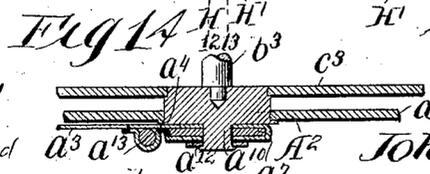
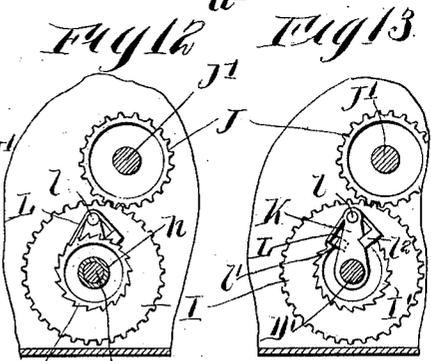
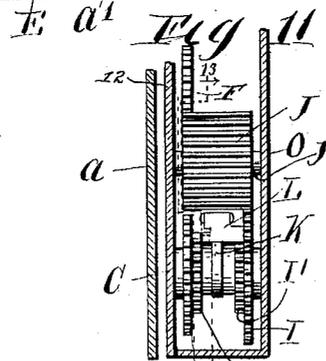
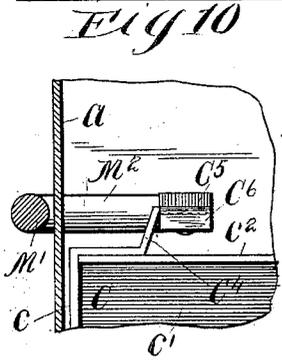
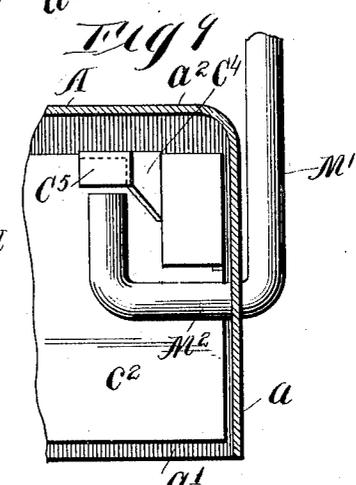
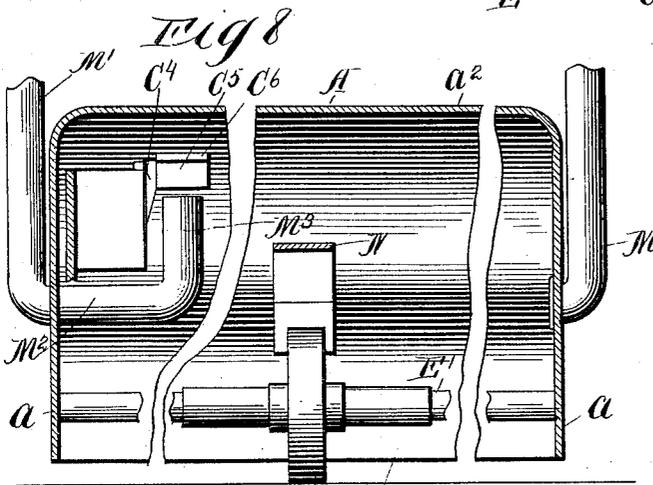
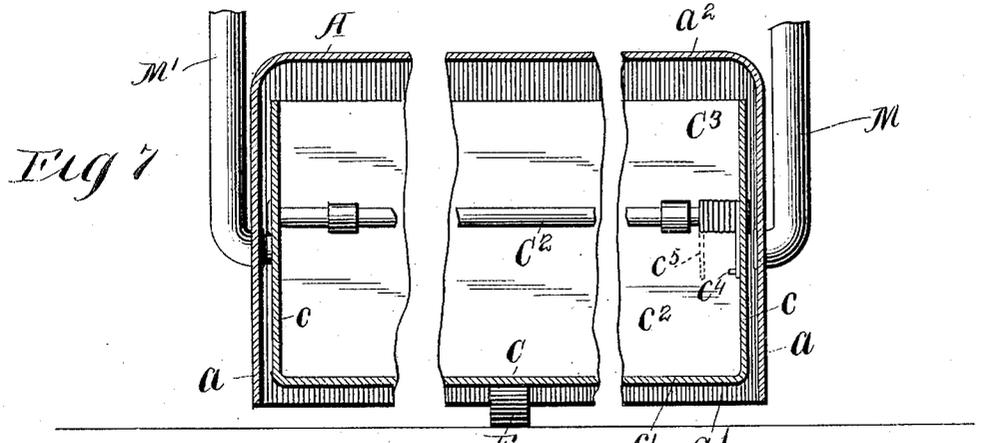
his Attorneys

J. F. HARDY.
CARPET SWEEPER.

APPLICATION FILED DEC. 29, 1899.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:
 Carl M. Crawford
 William H. Hall

Inventor:
 John T. Hardy

by Poole & Brown his Attorneys

UNITED STATES PATENT OFFICE.

JOHN F. HARDY, OF CHICAGO, ILLINOIS.

CARPET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 756,358, dated April 5, 1904.

Application filed December 29, 1899. Serial No. 742,017. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. HARDY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carpet-Sweepers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention embraces certain improvements in carpet-sweepers of that class embracing a casing, a brush rotatively mounted therein, and a pan which is located inside the casing and in a position to receive the sweepings of the brush.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

As shown in the drawings, Figure 1 is a side elevation of a carpet-sweeper embodying my invention with parts of the casing broken away to show some of the interior mechanism. Fig. 2 is a horizontal section taken on line 2 2 of Fig. 1 with parts broken away and showing the brush in plan view. Fig. 3 is a horizontal section taken on line 3 3 of Fig. 1 with parts broken away. Fig. 4 is a longitudinal vertical section of the sweeper when supported on the floor with the brush out of contact with the floor. Fig. 5 is a similar section showing the position of the parts when the sweeper is lifted from the floor by the handle. Fig. 6 is a longitudinal vertical section of the sweeper with the parts in position for dumping the pan. Fig. 7 is a transverse vertical section broken away on line 7 7 of Fig. 4 looking rearwardly. Fig. 8 is a similar view on line 8 8 of Fig. 4. Fig. 9 is a vertical section of one side of the casing, showing the actuating-crank of the handle and associated parts on the line 9 9 of Fig. 4 looking toward the front of the sweeper. Fig. 10 is a top plan view of some of the parts shown in Fig. 9. Figs. 11, 12, and 13 are detail views of the reversing-gear mechanism employed to maintain a constant direction of rotation of the brush, the last two figures being taken on lines 12 12 and 13 13, respectively, of Fig. 11 and omitting certain of the parts shown in Fig. 11. Fig.

14 is a detail horizontal section of the casing, showing a modified form of cushioning-strip.

As shown in said drawings, A designates the casing which incloses the operative parts of the sweeper. Said casing consists of side walls $a a$, a rear wall a' , a top wall a^2 , and a front wall a^3 . The top, sides, and rear walls of the casing will desirably be made from a single piece of sheet metal bent to proper form, while the front wall is shown as made collapsible and similar in this respect to the construction shown in my prior application for patent, Serial No. 738,297, filed November 27, 1899. The rear part of the top wall of the casing and the rear part of the upper edges of the side walls are herein shown as inclined toward the rear of the casing.

B designates a brush, which is rotatively mounted in the front part of the casing adjacent to the collapsible end thereof.

C designates a sweepings-pan, which is located inside of the casing in rear of the brush. The sweepings-pan is made generally rectangular and consists of side walls $c c$ and a bottom wall c' and a rear pivoted wall c^2 , having the form of a gate which closes the rear end of the sweepings-pan and through which the sweepings may be emptied from the pan. The said sweepings-pan in this construction is pivoted at its forward end to the casing in line with the axis of the brush and is supported at its rear end on wheels D D, which have contact with the floor. Said wheels in the construction shown constitute the driving-wheels of the sweeper, and suitable operative connections are interposed between said driving-wheels and the brush, whereby motion is transmitted from the former to the latter. Said mechanism may be so constructed that said brush will be given a constant forward rotation during both the backward and forward movements of the sweeper, as set forth in my above-mentioned application. The rear end of the casing of the sweeper is supported on a trailing wheel E, which is rotatively mounted on a transverse shaft E', which latter is secured at its ends to the side walls of the casing. The shaft E' is somewhat resilient, so that the wheel E is yieldingly connected with the casing. Other forms of yield-

ing connection may, however, be employed. The driving-wheels D are non-rotatively mounted on a shaft D', which is located transversely of the casing and has bearing at its opposite ends in the side walls of the pan and constitutes a driving-shaft.

N designates a spring, shown as having the form of a flat leaf-spring, which is attached at one end to the upper wall of the casing and bears at its other end downwardly on the rear end of the sweepings-pan and affords yielding connections between the rear end of the pan and the casing. When the sweeper is resting on the floor, but little downward pressure is exerted thereon. The brush will be out of contact with the carpet, and the weight of the sweeper is carried by the driving-wheels D and the rear supporting or trailing wheel E. When pressure is exerted on the casing, it will cause the casing and the brush carried thereby to move downwardly with respect to the pan against the tension of said spring and bring said brush in contact with the floor, or carpet being swept. The degree of downward pressure exerted on said casing will determine the pressure exerted on the surface being swept by said brush. When the pressure is relieved from the casing, the spring N acts to move the casing and brush upward and the brush out of contact with the floor in the position shown in Fig. 4.

Next referring to the construction of the brush and the manner of mounting the same in the casing, these parts are made as follows: B' designates the central core of the brush, to the opposite ends of which are attached short stud-shafts by which the said brush is rotatively mounted in the casing. The shaft at one end consists of a short shaft-section b, which is driven tightly into one end of said core and provided with a shoulder b', which limits the movement therein. The outer end b² of said shaft-section is made cylindric and constitutes the bearing-surface thereof. Such shaft-section directly engages and has bearing in a bushing A', which, as herein shown, has the form of a disk. Said disk is shown as made detachable from the wall of the sweeper and secured in an opening therein in any suitable manner. Said disk may be provided at its outer end with an annular shoulder a⁴ to limit its inward movement in the opening in said casing. b³ designates the stub-shaft for the opposite end of the brush-core. Said stub-shaft is made cylindric on its outer end and has bearing in a bushing A², which is herein shown as having the form of a disk and made separate from the casing and fitting into a suitably-shaped opening in the side wall of the casing. The inner end b⁴ of said shaft is screw-threaded and has screw-threaded engagement with a sleeve B², which is driven tightly into the end of the core of the brush. Said sleeve projects slightly beyond the end of the brush-core and is pro-

vided with a washer B³, which fits over the end of the sleeve and against the end of the core. The bearing-apertures in the bushings A' A² do not extend entirely therethrough, thereby preventing access of dust from the exterior of the said casing to the bearings. The said bushings A' A² extend at their inner ends inside the walls of the casing and are constructed at their inner ends to afford a pivotal bearing for the sweepings-pan. As herein shown, the side walls of said pan are extended forwardly beyond the bottom wall thereof to form pivotal bearing-arms c³ c³, which are suitably apertured to fit over the inner ends of the bushings A' A². The part of said bushings engaged by said arms of the pan are reduced, thereby forming shoulders exterior to said bearing-arms to hold said arms separated from the casing.

The front wall a³ of the casing, as before stated, is made collapsible and is shown as made of a flexible material, such as canvas. In the latter case said canvas front end of the casing is provided on its rear margin with side hems a⁵ a⁵ and a top hem a⁶. Within said side hems are contained rigid strips a⁷ a⁷, which are attached to the side walls of the casing and serve to hold the rear margin of the flexible front wall in place. Within the hem a⁶ is located a like rigid strip a⁸, which is similarly connected with the upper wall of the casing and serves to hold this part of the flexible front wall in place. The said side strips and the hem supporting the same are perforated in their parts opposite to the bushings A' A², and the said bushings are provided centrally thereof with outwardly-extending studs a⁹ a¹⁰, which pass through said apertures in the strip and hem and fit snugly therein. The said studs are surrounded outside of said strips and hems with washers a¹¹ a¹², and the outer ends of said studs are upset or riveted over said washers, thereby securing said strips to the bushings. The said strips will be further fastened to the walls of the casing in any preferred manner, so as to hold the same securely in place thereon and therethrough hold the bushings in place. As a means of preventing the said upset ends of the lugs a⁹ a¹⁰ and washers thereon from coming in contact with articles on the floor which is being swept the forward edges of the strips a⁷ a⁷ are shown in Figs. 2 and 3 as bent laterally outwardly, and the cloth of the hem covering the same extends to planes laterally outside of the ends of the projections a⁹ a¹⁰, thereby forming a shield or cushion-strip which prevents said washers and the studs marring articles of furniture on the floor being swept or the mop-board of such floor. In Fig. 14 is shown another construction for this purpose, which consists in inserting a large cord a¹³ or the like into the front side of the side hem or another and smaller hem, thereby forming a yielding projection or cushion which

extends outside of the plane of the outer ends of the extended parts of said bushings.

The connections between the driving-wheels D D and the brush, whereby the rotation of the latter is transmitted to the former, are made as follows:

B¹ designates a gear-pinion, which is mounted on the brush-shaft adjacent to the left side of the sweeper-casing.

F designates an idle gear-wheel inside the pan, which is mounted to turn loosely on a short shaft G, which is secured at its outer end in the side wall of the sweepings-pan and projects inwardly therefrom parallel with the driving-shaft. The hub *g* of said gear-wheel is made of considerable length to afford the desired lateral stability to said gear-wheel.

H designates a driving gear-wheel which is mounted to turn loosely on the driving-shaft D', adjacent to the side wall of the sweepings-pan, and which meshes with said gear-wheel F. I designates a second driving gear-wheel, which is also loosely located on said driving-shaft D' adjacent to the wheel H.

J designates an idle gear-pinion which turns loosely on a short shaft J', parallel with the driving-shaft. Said gear-pinion J is made of considerable length and engages at one end with the driving gear-wheel I and at its other end with the gear-wheel F.

H' designates a ratchet-wheel which is mounted on the hub *h* of the driving gear-wheel H, and I' designates a similar ratchet-wheel which is mounted on the hub *i* of the gear driving-wheel I. The teeth of said ratchet-wheels face in opposite directions.

K designates an arm which rotates with the driving-shaft D' and is provided at its outer end with a pawl L. Said pawl is pivoted between its ends to the outer end of said arm by means of a pivot-pin *l*, which passes through pivot-lugs on the pawl. One end of said pawl is adapted for engagement with the ratchet-wheel H', while the other end is adapted for engagement with the ratchet-wheel I', the opposite ends of the pawl for this purpose being offset from each other. As the said ratchet-wheels have oppositely-facing teeth, when the pawl is engaged with one of said wheels to drive the same it is out of operative engagement and entirely free from the other ratchet-wheel, and vice versa. Said pawl is provided on one end with a bent-down portion or lug L', which engages one side of the arm which supports the same and on its opposite end with a similar lug L'', which engages the opposite side of said arm. Said lugs are provided for the purpose of holding said pawl from being twisted laterally upon its engagement with either of the ratchet-wheels, the tendency of each ratchet-wheel by reason of its engagement with one side of said pawl being to move said pawl laterally out of its proper alignment. The forward end of the pawl with respect to the front end of the casing engages

the ratchet-wheel H', while the rear end engages the ratchet-wheel I'. Said pawl and ratchet-wheels constitute a reversing mechanism, whereby constant forward rotation of the brush is effected in both the forward and rearward movements of the sweeper. With this construction when the driving-shaft is being rotated forwardly the pawl will engage the ratchet-wheel H', and thereby rotate the driving gear-wheel, which in turn rotates the idle gear-wheel F and therethrough the brush-pinion B¹, and turns the brush in a forward direction. When the direction of rotation of the driving-shaft is reversed, the rear end of the pawl becomes engaged with the ratchet-wheel I' and by reason of the shape of the ratchet-teeth at the same time disengages the forward end of the pawl from the ratchet-wheel H'. Said driving-shaft acts through said pawl and ratchet-wheel to rotate the driving gear-wheel rearwardly, which meshes with the idle pinion J and acts through the said pinion the idler F, and the brush-pinion to rotate the brush in a forward direction. When the sweeper is being moved rearwardly and the brush is being driven through said idler J, it still remains in mesh with the idler F and drives the same and the driving gear-wheel H; but said wheel H is at this time released from the driving-shaft and merely rotates loosely thereon. Similarly when the driving gear-wheel H is locked to the shaft the pinion J and driving gear-wheel I are turned through their connection with the idle gear-wheel F, but rotate loosely on their bearings. The pan in this construction affords a support for the driving-wheels, which permits them to be oscillated about a center coincident with the axis of the brush and to be yieldingly connected with the casing. Obviously the support for the wheels need not have the form of a sweepings-pan and said pan may be otherwise made.

As in my said prior application above referred to, the sweepings-pan is connected with the operating-handle in such manner that said pan may be dumped of its contents by a proper manipulation of the handle. The construction by which this result is effected is as follows: The rear wall *c*¹ of the sweepings-pan is pivoted upon a transverse rod C², which is rigidly connected at its outer ends in the side walls of the sweepings-pan. Said pivoted wall forms a gate for closing the rear end of the pan and affords means for readily dumping the sweepings therefrom. C³ designates an upward extension of said gate, which extends almost to the upper wall of the casing and affords a partition above the pan which prevents sweepings from being thrown backwardly over the pan. Said gate is held in its closed position by means of a spiral spring which is wound around the rod C² and secured at one end to the pan by means of a pin *c*⁴ and with the other end *c*⁵ thereof engaging the outer surface of said gate in a manner to hold the same

in its closed position. The handle is made of the usual form and is provided at its lower end with forked arms $M M'$, which are pivoted to the side walls of the casing. The arm M' is extended inwardly through the wall of the casing in the rear of the sweepings-pan and provided on its inner end with a horizontal part M^2 and a right-angle part M^3 , forming a crank. The right-angle part of said crank is located opposite the upward extension C^3 of the gate of the sweepings-pan and in position to engage the same when the handle is moved forwardly beyond a perpendicular. With this construction when the said handle is thrown toward the brush end of the casing the said crank portion M^3 engages said extension C^3 and acts to move the same forwardly and the lower end of the gate rearwardly, as shown in Fig. 6, thereby opening the rear end of the pan. The crank-arm and the adjacent parts of the pan are so constructed that at this time the rear end of the pan is free to fall downwardly to permit the proper inclination of the pan for dumping the same. The rear end of the pan is provided, on the inner part thereof adjacent to said crank-handle, with a rearwardly-projecting arm C^4 , which projects over the horizontal part of the crank-arm. Said arm, as shown in Fig. 4, stands normally above the horizontal part of the crank a distance to permit the proper drop of the pan to give the proper inclination thereto to dump the same and strikes said horizontal part of the crank to limit the movement of the pan. Said arm C^4 is herein shown as having the rear end bent inwardly away from the side wall of the casing for the purpose of preventing the same from coming in contact with the curved wall of the casing between the top and side walls thereof as here constructed. In case the angle between the top and side walls is a right angle the shape of said arm may be modified accordingly. The horizontal portion of the crank affords a convenient stop; but it is to be understood that another form of stop may be employed which will answer the same purpose. Said arm C^4 is so formed that it coacts with the crank when the handle is in a substantially vertical position and the sweeper is lifted from the floor, whereby it holds the casing and the pan in a substantially horizontal position, so it may be carried without danger of the contents of the pan being dumped or the sweeper-casing getting out of its proper relation with respect to the handle. The construction by which this result is secured is as follows: Said arm C^4 is provided on its rear end with a bend forming a lateral stop C^5 , which is perpendicular to the side wall of the casing, and said stop C^5 is provided on its upper edge with a forwardly-directed stop C^6 . Said stop C^5 is just in rear of the upper end of the crank-arm M^3 , and the stop C^6 when the sweeper is resting on the floor is located above and out of

contact with the upper end of said crank-arm, but in position to engage said arm when said pan drops a short distance. The stop C^5 , which is in rear of the upper end of the crank-arm when the sweeper is resting on the floor, as shown in Fig. 5, is cut away or inclined as to permit the crank-arm and operating-handle to be swung rearwardly into the operative position for the handle. With this construction when the handle is moved to a substantially vertical position and the sweeper lifted off the floor thereby the pan will drop until it is arrested by contact of the forwardly-directed stop C^6 with the upper end of the crank-arm, as shown in Fig. 5. Said stop-arm will prevent the pan from dropping farther, and the pan and the sweeper will be prevented from tilting forwardly by engagement of the laterally-directed stop C^5 with the rear surface of the crank M^3 . The sweeper may then be carried in this position, and when it is desired to dump the same the handle will be moved toward the front end of the sweeper until it is out of line with the stop C^6 , when the pan may further drop until arrested by engagement of the stop-arm C^4 with the horizontal portion of the crank. This operation of dumping the pan may be effected by grasping the lower front corner of the casing and the handle and bringing the same together.

A dust-shield O is attached to the inner wall of the sweepings-pan over the gear connection between the driving-shaft and the brush, and said shield is continued forwardly so as to cover the gear-pinion, which is attached to the brush, and prevents access of the dust to any part of said train of gears. The part of said shield engaged by the washer B^3 , which fits over the end of the brush-core, is depressed, as shown in Fig. 3, to form a socket within which the end of the brush-core fits, which increases the effectiveness of the shield to prevent access of dust to said train of gears. Shields $P P$ are attached to the inner wall of the pan on one side and to said shield O on the other side and cover the driving-wheels, which extend into the pan through the bottom wall thereof. The part of the driving-shaft between said wheels is also protected by a tube Q , which surrounds the shaft and is attached in its ends to bosses p in the shields P , surrounding said driving-shaft.

A tie-rod R extends transversely across the casing near the lower margin of the side walls to form a connection between said lower margins of the walls and strengthen the casing at this part. Said tie-rod passes through slots C^8 in the walls of the pan, which permits free movement of the pan when the same is being dumped. The said tie-rod normally rests in the lower ends of said slot.

The upper wall of the casing is bent downwardly to form scraper A^4 , which engages at its lower end the brush to prevent accumulations of dust on the brush.

When the brush is to be inserted into place, the shaft-section b is first driven into the core of the brush and the sleeve B' inserted into the other end thereof. After the pan is placed in the casing, the brush, with the shaft and sleeve, is placed into the front end of the casing and the shaft b inserted through the pivot-aperture in the bearing-arm of the pan and through the opening in the casing-wall in which the bushing fits, said bushing being at this time detached from the casing. Said bushing is then placed over the stub-shaft b and fastened in place. To secure the other end, the core of the brush is held so as to bring the sleeve opposite to the bearing-aperture in the adjacent bearing-arm of the pan and the opening into which the bushing fits, the bearing-arm being held at this time in its proper position by the person assembling the sweeper. The shaft b^3 , to which the brush-gear pinion has been previously fastened, is then inserted into the sleeve and screw-threaded therein, the openings in the wall and pan-arm being of sufficient diameter to permit the passage of the pinion therethrough. The presence of the idle gear-wheel F does not interfere with this operation, as when the pinion engages the same it will merely turn said train of gears, which at this time may be easily rotated. The screw-threads on the sleeve B' are so made that the forward rotation of the brush tends to tighten the shaft therein.

I claim as my invention—

1. The combination with a casing and a brush journaled in the casing, of a driving-wheel, a support for the driving-wheel pivoted to the casing in line with the axis of the brush, and a spring attached to said casing which tends to project the wheel from the casing.

2. The combination with a casing, a brush journaled therein, a sweepings-pan pivoted at one end to the casing in line with the axis of the brush and adapted to be supported at its other end on the floor by a part which extends below the casing and yielding connections between said sweepings-pan and the casing.

3. The combination with a casing and a brush journaled therein, of a sweepings-pan pivoted at one end to the casing in line with the axis of the brush, a wheel supporting the other end of the pan, and a spring attached to the casing which tends to project the wheel from the casing.

4. The combination with a casing and a brush journaled therein, of a sweepings-pan pivoted at one end to the casing, a driving-wheel supporting the other end of the pan, and operative connections between the driving-wheel and brush.

5. The combination with a casing and a brush journaled therein, of a sweepings-pan pivoted at one end to the casing in line with the axis of the brush, a driving-wheel sup-

porting the other end of the said pan, and operative connections between said driving-wheel and brush.

6. The combination with the casing, a brush journaled therein and an operating-handle, of a sweepings-pan which is pivoted at its front end to the casing in line with the axis of the brush and is supported at its rear end upon the floor by a part which extends below the casing and operative connections between said pan and the handle of said sweeper comprising a part on the handle which holds the pan elevated in one position of the handle and which is moved out of the path of the cooperating part of the pan in another position to permit the pan to be dumped.

7. The combination with a casing, a brush journaled therein and an operating-handle, of a sweepings-pan pivoted at its forward end to the casing in line with the axis of the brush, a gate pivoted to and closing the rear end of the pan, and operative connections between the said gate and said handle.

8. The combination with a casing, a brush journaled therein and an operating-handle, of a sweepings-pan pivoted at its forward end to the casing in line with the axis of the brush, a driving-wheel supporting the rear end of the pan, operative connections between the driving-wheel and the brush, a gate pivoted to and closing the rear end of the pan and operative connections between said gate and the handle.

9. The combination with a casing, a brush journaled therein, and an operating-handle, of a pan pivoted at one end to the casing and adapted to be supported at its other end from the floor by a part which extends below the casing, a crank on the end of said handle, a gate pivoted to and closing the rear end of the pan, and a part rigid with said gate adapted for engagement by said crank.

10. The combination with the casing, an operating-handle, and a brush journaled in said casing, of a sweepings-pan pivoted at its forward end to the casing and supported at its rear end upon the floor by a part which extends below the casing, and operative connections between the operating-handle and the pan permitting the pan to be dumped by manipulation of the handle, said connections being adapted to form a lock to prevent the sweeper tilting forwardly from a substantially horizontal position when the handle is substantially vertical, and the sweeper is lifted from the floor thereby.

11. The combination with a casing, a brush journaled therein, and an operating-handle, of a sweepings-pan pivoted at one end to the casing and adapted to be supported at its other end on the floor by a part which extends below the casing, a crank on the end of the handle, and a cooperating stop on the pan, said parts being so arranged that when the handle is moved past the perpendicular toward the

front end of the casing, it will permit the rear end of the pan to be depressed into its dumping position, and when occupying another position will prevent the pan from dumping.

5 12. The combination with a casing, a brush journaled therein, and an operating-handle, of a sweepings-pan pivoted to the casing and adapted to be supported at its rear end from the floor by a part which extends below the casing, a gate pivoted to and closing the rear end of the pan, a crank on said handle which, when the handle is moved past the perpendicular toward the front end of the casing, permits the rear end of the pan to be depressed into its dumping position, and opens the gate, and a stop on the pan adapted to engage the crank to prevent the pan dropping to its dumping position when the handle occupies a perpendicular or substantially perpendicular position.

13. The combination with a casing, a brush journaled therein, and an operating-handle, of a sweepings-pan pivoted at one end to the casing in line with the axis of the brush and adapted to be supported at its other end upon the floor by a part which extends below the casing, a crank on the handle, a cooperating stop on the pan, said parts being so constructed that when the handle is moved past the perpendicular toward the front end of the sweeper, it permits the rear end of the pan to be depressed into its dumping position, and when occupying another position prevents such depression, a gate pivoted to and closing the rear end of the pan, and a part rigid with said pan adapted for actuation by said crank.

14. The combination with a casing, a brush journaled therein, and an operating-handle, of a sweepings-pan pivoted at one end to the casing, a crank on the handle, and a stop on the rear end of the pan, which is located over the crank when the handle is in its vertical position, and which engages the crank when the sweeper is lifted by the handle, to hold said sweeper in a substantially horizontal position.

15. The combination with a casing, a brush in the forward end thereof, of two laterally-separated driving-wheels near the longitudinal center of said casing, a support for said wheels, yielding connections between said support and the casing, operative connections between said driving-wheels and the brush, and a supporting-wheel located centrally of the casing in the rear end thereof.

16. The combination with a casing, a brush in the forward end thereof, laterally-separated driving-wheels located between the ends of the casing, a support therefor which is yieldingly connected with the casing in a manner to oscillate about a center coincident with the axis of the brush, operative connections between said driving-wheels and brush, and a supporting-wheel located centrally between the sides of the casing at the rear end thereof.

17. The combination with a casing and a

brush therein, of a driving-wheel, a support therefor which is connected with the casing, a driving-shaft connected with the wheel and connections between said brush and driving-shaft, a gear-pinion on the brush which rotates therewith, two driving gear-wheels which rotate loosely on said driving-shaft, means for alternately locking said driving gear-wheels to the driving-shaft, an idle gear-wheel which meshes with said brush-pinion and with one of the driving gear-wheels, and an idle pinion which meshes with said idle gear-wheel and the other of said driving gear-wheels.

18. The combination with a casing and a brush in the front end thereof, of a driving-wheel mounted in a frame which is pivoted to the casing in line with the brush-axis, a driving-shaft connected with said wheel, two driving gear-wheels which rotate loosely on said shaft, externally-facing ratchet-wheels connected with said driving gear-wheels, a pawl rotating with said shaft and adapted for alternate engagement with said ratchet-wheels, a gear-pinion on the brush-shaft, an idle gear-wheel meshing with said gear-pinion and one of the driving gear-wheels, and an idle pinion meshing with said idle gear-wheel and the other of said driving gear-wheels.

19. The combination with a casing, a brush therein, a driving-wheel, a support therefor connected with the casing, a shaft connected with said wheel, two driving gear-wheels which rotate loosely on said shaft and provided with oppositely-facing ratchet-wheels, an arm rigid with said shaft which carries on its outer end a pivoted pawl adapted for alternate engagement with said ratchet-wheels, connections between said driving gear-wheels and the brush, and bearing-lugs on said pawl adapted for engagement with said arm to prevent the pawl from twisting thereon.

20. The combination with a casing the rear end of which is made rigid and the front end of which is made flexible, and a brush which is journaled in the forward end of the rigid part of the casing, of bushings in the casing-walls in which the ends of the brush-shaft are journaled, outwardly-projecting studs on said bushings, strips attached to the side walls of the casing and connected with the rear margin of the flexible front wall to hold the same in place, the attaching-strips and the rear margins of the flexible material being perforated for the passage of the studs of said bushings therethrough, and washers on the outer ends of said studs outside of said strip and riveted to said studs.

21. The combination with a casing the rear end of which is made rigid and the brush end of which is made flexible, and a brush journaled in the brush end of the rigid part of the casing, of detachable bushings in the casing in which the ends of the brush-shaft are journaled, outwardly-projecting studs on said bushings, strips attached to the side walls of

the casing which overlies said bushings, and are connected with the rear margin of the flexible end, and to hold the same in place, said attaching-strips being perforated for the passage of the studs of said bushings there-
 5 through, washers riveted on the outer end of said studs outside of said strips, and yielding projections on the casing in front of said studs, which project laterally outside of the planes
 10 of the studs.

22. The combination with a casing the rear end of which is made rigid and the brush end of which is made flexible of a strip attached to the side wall of the casing and engaging the
 15 rear margin of said flexible brush end to fasten the same to the rigid part of the casing, a detachable bushing secured in a suitable opening in the side wall of the casing and provided with a bearing - aperture within which the
 20 brush-shaft is journaled, said bushing being provided with a laterally-projecting stud and the strip being apertured for the passage of the stud therethrough, a washer on the outer
 25 end of said stud which is riveted to the stud, a hem on the rear margin of the flexible-brush end of the casing in advance of said stud, and a cord inserted into said hem.

23. The combination with a casing and a brush therein, of a sleeve driven into one end of the brush-core, and internally screw-threaded, a stub-shaft which has screw-threaded engagement at one end with said sleeve, a removable bushing in the side wall of the casing with which the other end of said shaft has bearing,
 30 means for securing said bushing in place, a sweepings-pan in the casing, one side wall of which is pivoted to an inward extension in said bushing, and a gear-pinion rigid on the shaft, said bushing being of such size that
 40 when removed from the wall of the casing and said side wall of the pan the shaft and attached pinion may be removed through the openings in the casing and pan-walls.

24. The combination with a casing and a brush in the front end thereof, of a sweepings-pan which is pivoted at its forward end to the casing in line with the axis of the brush, driving-wheels supporting the rear end of the pan and projecting downwardly through openings
 50 in the bottom of the pan, a driving-shaft extending between said wheels, operative connections between said wheels and the brush, shields on the inner walls of the pan covering said driving-wheels, and centrally apertured
 55 for the passage of the driving-shaft therethrough, bosses on said shields surrounding said shaft, and a tube surrounding said shaft and attached at its opposite ends to said bosses.

25. The combination with a casing and a brush in the forward end thereof, of a sweepings-pan pivoted at its forward end to the casing, driving-wheels supporting the rear end of the pan, operative connections between the driving-wheels and the brush, and a tie-rod
 65 extending between the lower margins of the

side walls of the casing and extending through slots in the side walls of the pan.

26. The combination with a casing and a brush journaled therein, of a sweepings-pan pivoted at one end on the axis of the brush,
 70 driving-wheels supporting the other end of the pan and projecting through the bottom wall thereof, operative connections between said driving-wheel and said brush comprising laterally-separated driving gear-wheels on the
 75 driving-shaft, a gear-pinion on the brush-shaft, an idle gear-wheel which meshes with said gear-pinion on the brush-shaft and with one of the driving gear-wheels, an idle gear-pinion which meshes with the other driving
 80 gear-wheel and with said idle gear-wheel, means for alternately locking said driving gear-wheels to the shaft, and a casing on the inner wall of the sweepings-pan which covers the said train of gears and extends between
 85 said brush and the side wall of the pan, said casing being recessed in its part engaged by the brush-core to form a socket in which the end of the brush-core rests.

27. The combination with a casing and a brush in the forward end thereof, of a sweepings-pan pivoted at its forward end to the casing, driving-wheels supporting the rear end of said sweepings-pan, operative connections between said driving-wheels and the
 95 brush, and a leaf-spring which is attached at its rear end to the sweeper-casing and bears at its forward end against the rear portion of the sweepings-pan.

28. The combination with a casing and an operating-handle, of a sweepings-pan pivoted at one end in the casing, a crank on the handle, a horizontal stop on the rear end of the pan which engages the end of the crank when the pan falls below its normal position, and
 105 a lateral stop also on the pan adapted at this time to engage with the rear side of the crank.

29. The combination with a casing, of a sweepings-pan pivoted at its forward end in the casing and supported at its other end independently of the casing by means permitting vertical movement thereof, means permitting the depression of the rear end of the pan to dump the same, a stop-arm on the rear end of the pan, and a stop stationary with the
 115 casing adapted for engagement by the stop-arm to limit the depression of the pan.

30. The combination with a casing and an operating-handle, of a sweepings-pan pivoted at the forward end in the casing, a gate closing the rear end of the pan, a crank on the handle adapted to engage the gate to open the same, means permitting depression of the rear end of the pan to dump the same and a stop-arm on the pan adapted to engage the crank
 125 to limit the depression of the pan.

31. The combination with a casing, and an operating-handle, of a sweepings-pan pivoted at its forward end in the casing, means permitting the depression of the rear end of the
 130

pan to dump the same, a crank on the handle, a stop on the rear end of the pan which engages the crank to hold the pan and casing substantially horizontal when the handle is
5 substantially vertical and the sweeper is carried thereby, and a stop on the pan adapted to engage a stop stationary with the casing to limit the depression.

32. The combination with the casing of a
10 carpet-sweeper, the front end of which is made of flexible material, of a cushioning device which projects beyond the plane of the casing-

wall comprising a cord and a hem in the margin of said flexible material in which said cord is contained and which holds the cord in place. 15

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 26th day of December, A. D. 1899.

JOHN F. HARDY.

Witnesses:

WILLIAM L. HALL,
DOROTHY MARMON.