

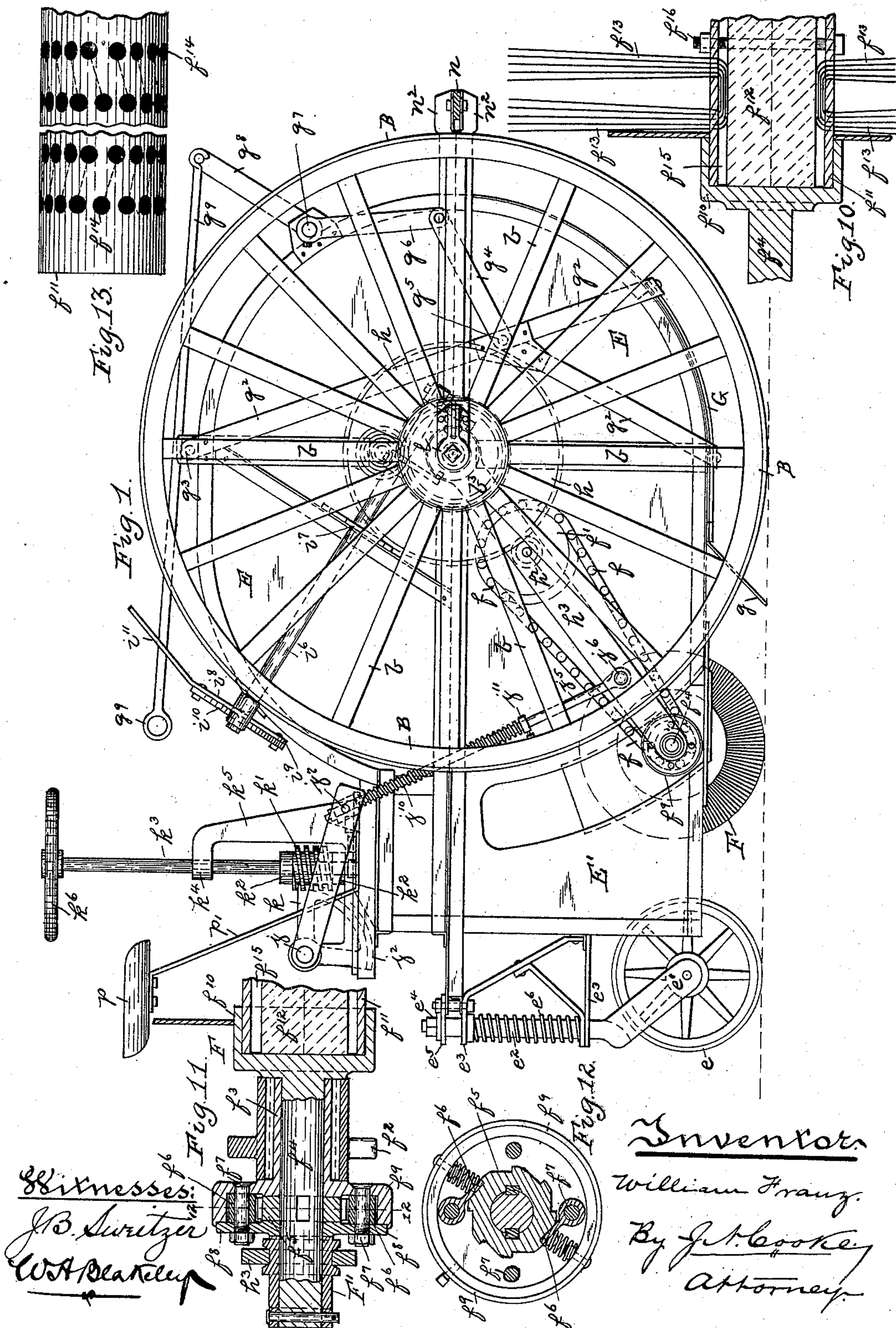
(No Model.)

4 Sheets—Sheet 1.

W. FRANZ.
STREET SWEEPER.

No. 605,415.

Patented June 7, 1898.



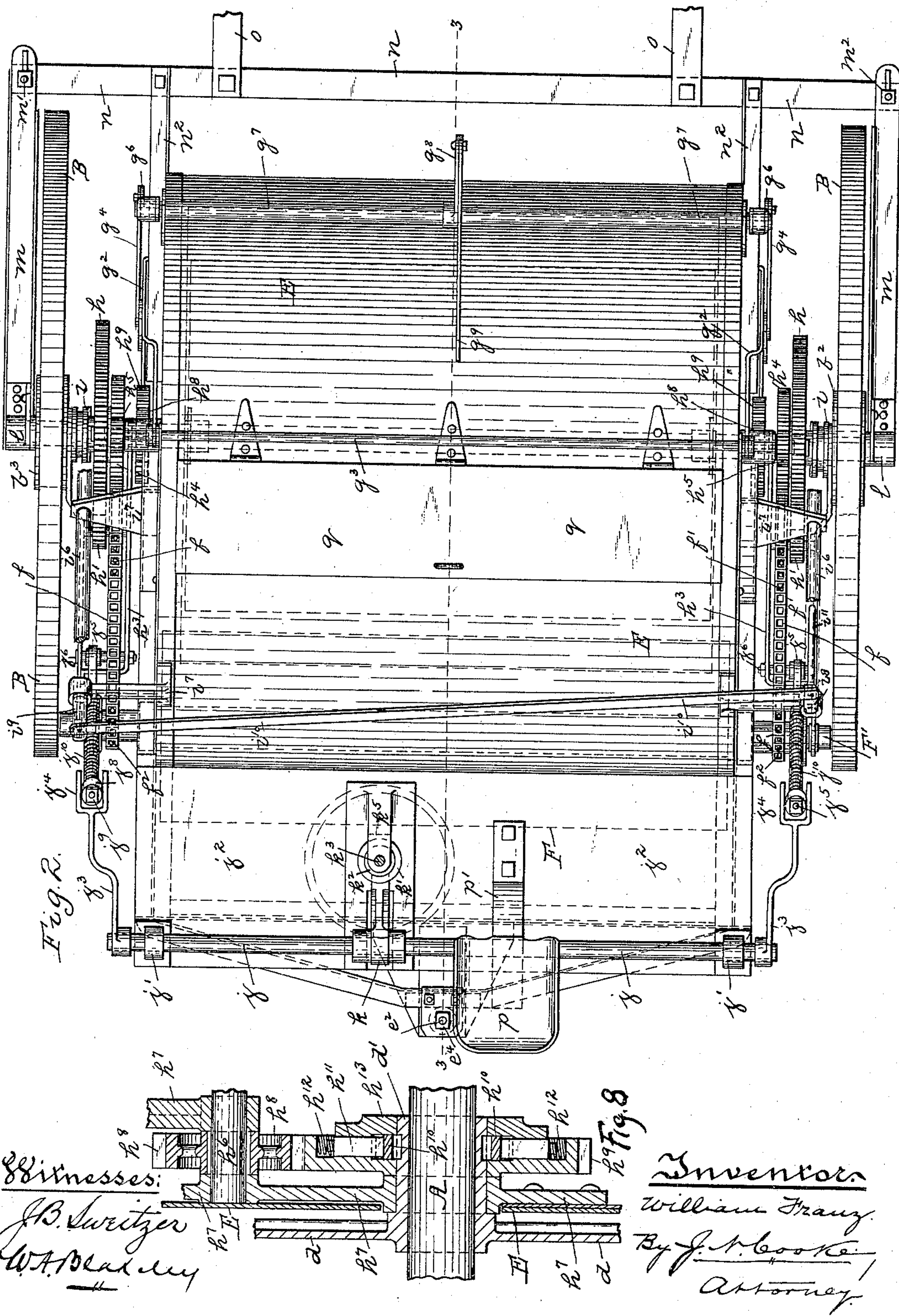
(No Model.)

4 Sheets—Sheet 2.

W. FRANZ.
STREET SWEEPER.

No. 605,415.

Patented June 7, 1898.



Witnesses:

J. B. Switzer
W. A. Blaney

Fig. 8

Inventor:
William Franz
By J. H. Brooke
Attorney

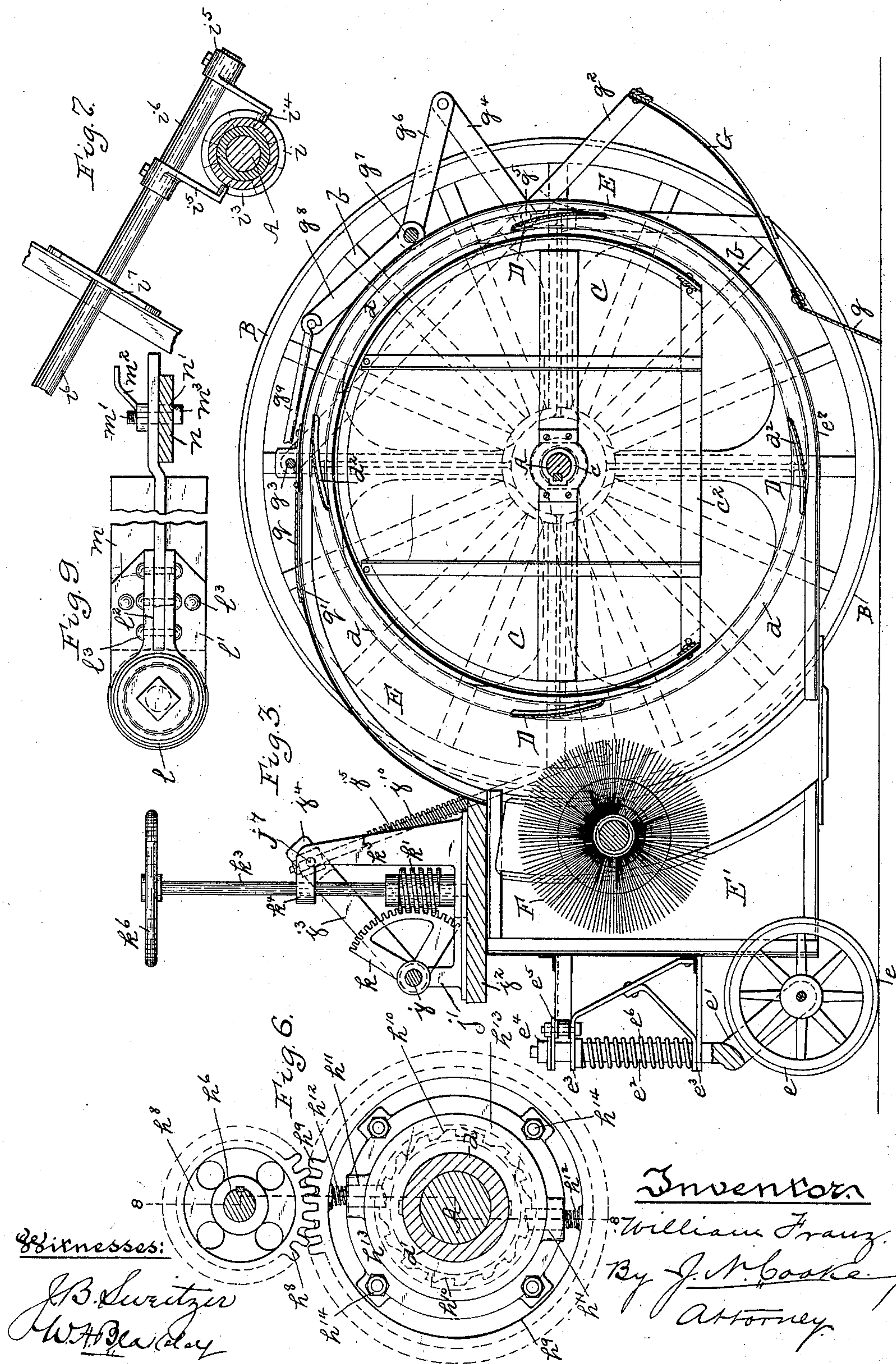
(No Model.)

4 Sheets—Sheet 3.

W. FRANZ.
STREET SWEEPER.

No. 605,415.

Patented June 7, 1898.



Witnesses:

J. B. Switzer
W. A. Barclay

Inventor
William Franz.
By J. M. Cooke
Attorney.

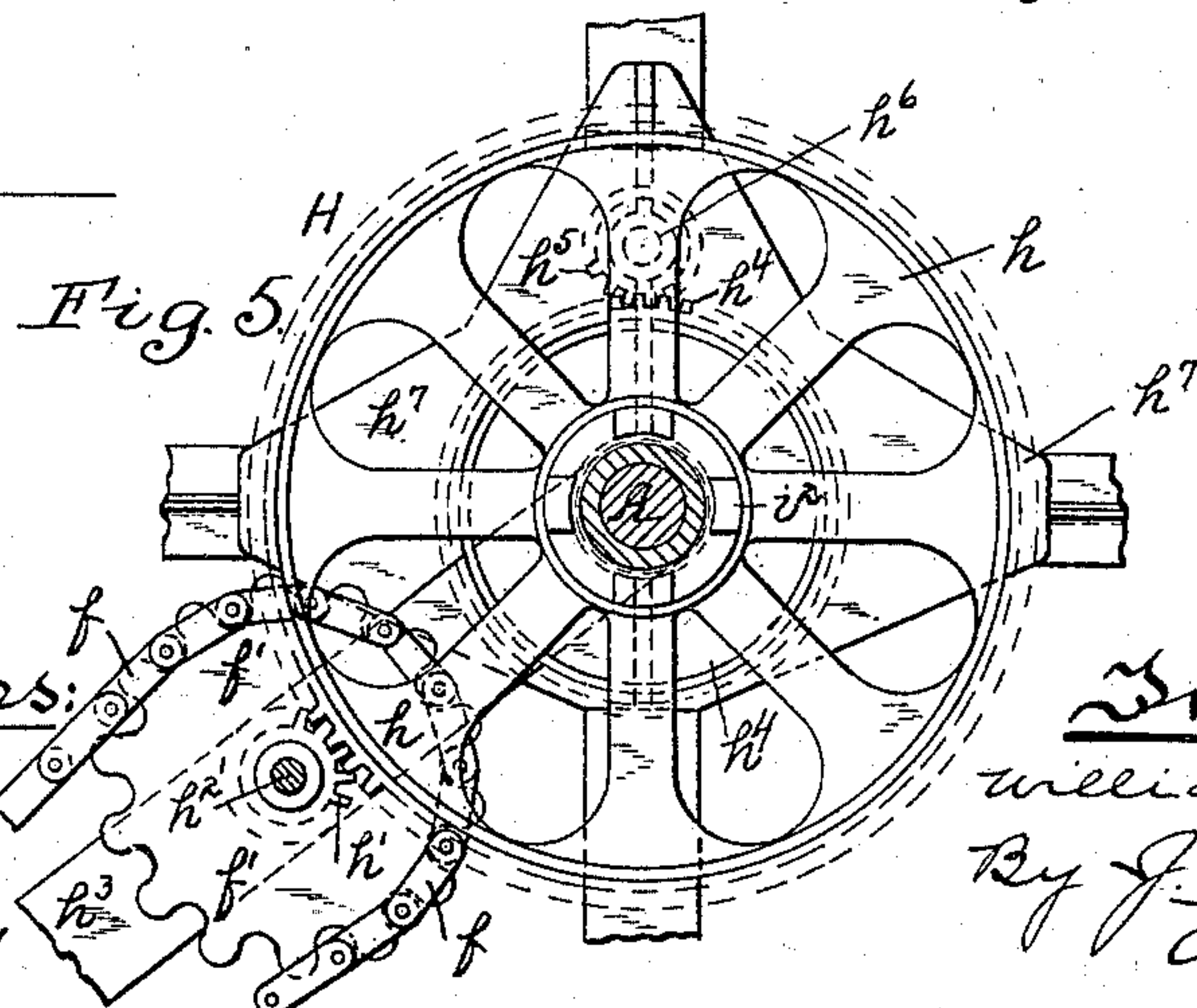
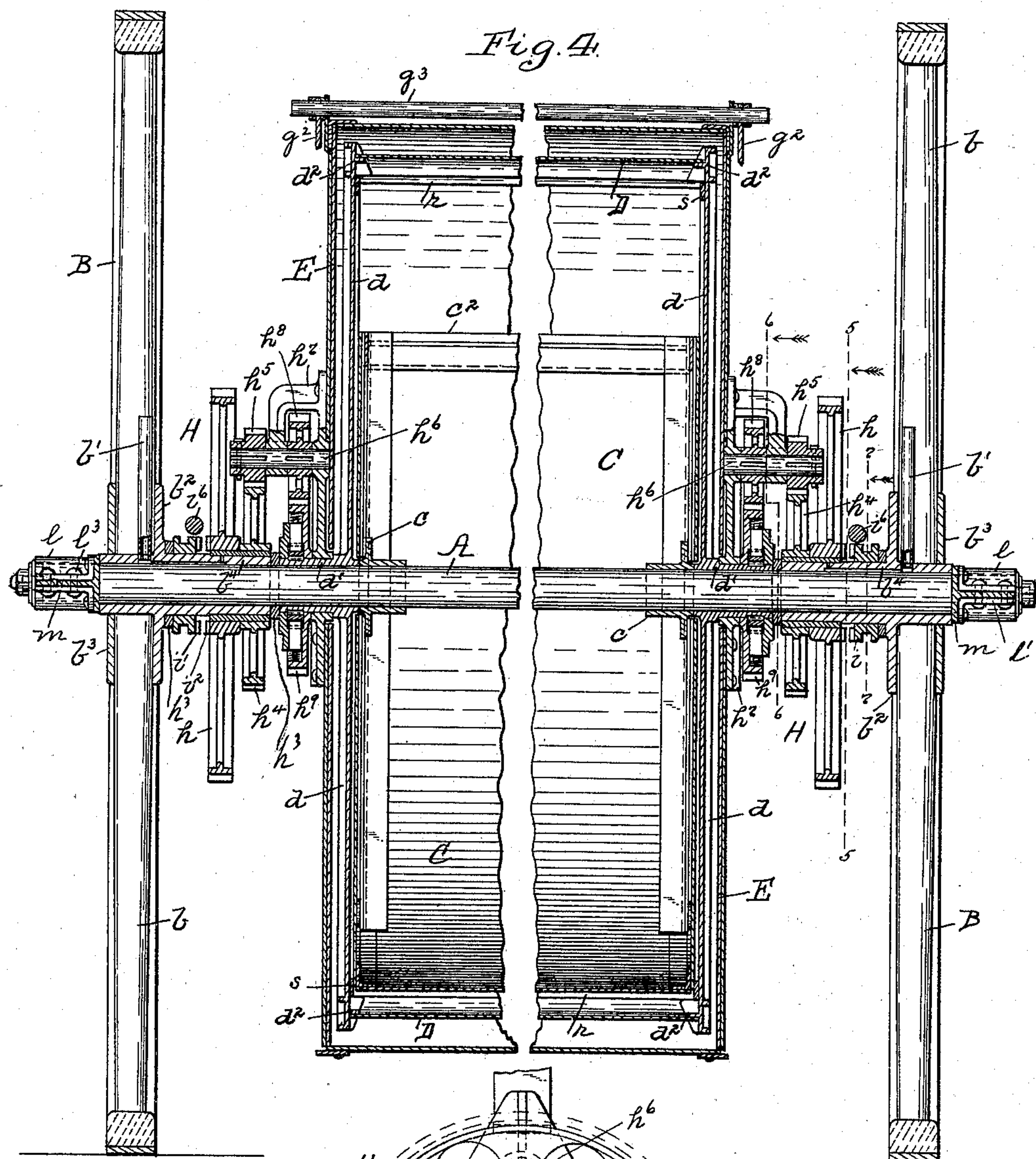
(No Model.)

4 Sheets—Sheet 4.

W. FRANZ.
STREET SWEEPER.

No. 605,415.

Patented June 7, 1898.



Witnesses:
J. B. Switzer
W. A. Blakey

Inventor:
William Franz.
By J. M. Cooke
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM FRANZ, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE IMPROVED STREET SWEEPER COMPANY, OF PITTSBURG, PENNSYLVANIA.

STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 605,415, dated June 7, 1898.

Application filed November 27, 1897. Serial No. 659,964. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FRANZ, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Street-Sweepers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to street-sweepers.

10 The main object of my invention is to provide a street-sweeper which will sweep while turning around or in turning corners of streets and at the same time will allow the broom to sweep all ruts and crevices in the
15 streets.

A further object of my invention is to provide such a form of broom as will prevent any dust or sweepings being swept out to the ends of said broom.

20 My invention consists, generally stated, in the novel construction, arrangement, and combination of parts, as hereinafter more specifically set forth and described, and particularly pointed out in the claims.

25 To enable others skilled in the art to which my invention appertains to construct and use the sweeper, I will describe the same more fully, referring to the accompanying drawings, in which—

30 Figure 1 is a side view of my improved street-sweeper, showing the parts in their normal position and the broom in position for sweeping. Fig. 2 is a top or plan view of the same. Fig. 3 is a longitudinal central section of the same on the line 3 3, Fig. 2. Fig.
35 4 is a vertical central section of the same at right angles to Fig. 3. Fig. 5 is a detail section on the line 5 5, Fig. 4, showing the mechanism for driving the broom. Fig. 6 is a like
40 view on the line 6 6, Fig. 4, showing the gearing mechanism. Fig. 7 is a detail section of the clutch and operating means on the line 7 7, Fig. 4. Fig. 8 is an enlarged detail sectional view on the line 8 8, Fig. 6. Fig. 9 is
45 a detail view of the end of the axle. Fig. 10 is a detail sectional view showing the manner of attaching the splints to the broom. Fig. 11 is a longitudinal central section of one end of the broom. Fig. 12 is a vertical

central section of the broom on the line 12 12, 50 Fig. 11; and Fig. 13 is a detail view of a portion of the broom.

Like letters herein indicate like parts in each of the figures of the drawings.

My improved street-sweeper is provided 55 with an axle A, upon which are loosely mounted the two driving-wheels B, and between the spokes *b* on each wheel is an oil-pipe *b'* for the passage of lubricant to the axle A. The spokes *b* on each wheel B are clamped to- 60 gether by means of plates *b²b³*, and the plates *b²* are provided with a sleeve *b⁴*, which encircles the axle A. A tank C is preferably counterbalanced and is rigidly secured to the axle A between the wheels B by means of the 65 collar *c* on each side thereof, and the tank C is provided with an opening *c²* therein. Fitting around the axle A are the circular conveyer-frames *d*, which are located on the outside and on each side of the tank C and are 70 provided with sleeves *d'* thereon for engaging with said axle A. Buckets D are secured to the conveyer-frames *d* and pass over and across the tank C, being secured to lugs or flanges *d²* on the inner faces of the outer edges 75 of the frames *d*. Between the wheels B and fitting over and around the tank C and buckets D is the casing E, which is secured around the axle A and has a rear portion E' extending over a broom F, located in the rear of the 80 axle A and operated therefrom, as hereinafter described. The casing E is supported at its rear by means of the wheel *e*, which is adapted to turn at will and in any direction and is secured between the forks *e'* on the 85 end of a shaft *e²*, which passes up through bearings *e³*, secured to said casing E, and is held therein by means of the nut *e⁴*, secured on the upper end thereof and fitting against a plate *e⁵*, secured to the casing E. A spiral 90 spring *e⁶* is secured around the vertical shaft *e²* between the bearings *e³* to allow the wheel *e* to take up any unevenness in the streets, &c. The casing E is provided on its bottom with a swinging portion or door G, which cov- 95 ers a portion of the opening *e⁷* in the casing E and carries at its rear end the apron *g*, which is preferably formed of rubber and is

secured to the door G in any suitable manner. The door G is supported on each side in the swinging frames g^2 , secured thereto on the outside of the casing E, and the frames g^2 are pivoted at their upper ends to a rod g^3 , extending across the casing E, on the upper exterior surface thereof. Levers g^4 are pivoted to the swinging frames g^2 at g^5 and are pivoted to levers g^6 , which are pivoted at their opposite ends around a shaft g^7 , which extends across the exterior surface of the casing E and has a lever g^8 secured thereto, which is operated by means of a rod g^9 , connected to its opposite end and extending back to the rear of the sweeper.

Two sets of gearing mechanism for operating the broom F are shown, one on each side of the sweeper between the wheels B and the casing E, as at H, and each set has gear-wheels h , rigidly secured to the sleeves b^4 on the plates b^3 , secured to the wheels B. The gear-wheels h are adapted to mesh with pinions h' , mounted on shafts h^2 , supported in the forked frames h^3 , which are loosely mounted around the axle A and sleeves b^4 and are also loosely mounted at their opposite ends around sleeves F' on the broom F. Gear-wheels h^4 are keyed or rigidly secured to each of the sleeves b^4 and are adapted to mesh with pinions h^5 , rigidly secured on shafts h^6 , supported in brackets h^7 , secured to the casing E. Pinions h^8 are rigidly secured to the shafts h^6 and are adapted to engage with gear-wheels h^9 , loosely mounted around the sleeves d' on the bucket-frames d . The gear-wheels h^9 are provided on the interior thereof with ratchet-wheels h^{10} , which are keyed or rigidly secured to the sleeves d' on the bucket-frames d , and pawls h^{11} are adapted to engage with the ratchet-wheels h^{10} , which are held in place or engagement by means of springs h^{12} between the pawls h^{11} and the inner face of the gear-wheels h^9 . The ratchet-wheels h^{10} and pawls h^{11} are held within the gear-wheels h^9 by means of clamping-plates h^{13} , which are bolted to the gear-wheels h^9 by means of bolts h^{14} and are loosely mounted around the sleeves d' of the frames d . The broom F is connected to the two gearing mechanisms H above described by means of sprocket-chains f , which pass around sprocket-wheels f^1 , rigidly mounted on the shafts h^2 in the forked frames h^3 , and the sprocket-wheels f^2 , rigidly secured to sleeves f^3 , which surround the shafts f^4 of the broom F. Secured to the shafts f^4 of the broom F are the ratchet-wheels f^5 , which are adapted to be engaged by pawls f^6 , mounted upon the bolts f^7 , which secure the clamping-plates f^8 and the cup-shaped flanges f^9 , formed on the ends of the sleeves f^3 and extending over the pawls f^6 , together. The shafts f^4 are provided with cup-shaped ends f^{10} for confining the perforated hollow shaft f^{11} , formed in semicircles, and the solid wooden shaft f^{12} therein. The splints f^{13} on the broom F are formed of metal, preferably of steel, and are passed through the perforations f^{14} in the hollow shaft from

one to the other through the space f^{15} between the hollow shaft f^{11} and the wooden shaft f^{12} and are held together and against displacement by bolts f^{16} , passing through the shafts f^8 and f^9 . The splints f^{13} are placed through the perforations f^{14} at an angle, as shown in Fig. 13, for a short distance from each end of the broom F in order to drive all the dirt or sweepings into the center of the tank C and will not be liable to be thrown out to the side of the broom F.

Mounted around the axle A, on each side thereof, between the wheels B and the gear-wheels h , are the clutches i , which are provided with engaging faces i' thereon for engaging with engaging faces i^2 on the gear-wheels h , and the clutches i are provided with annular seats i^3 on their exterior surfaces, with which projections i^4 on the ends of crank-arms i^5 , secured to inclined shafts i^6 , are adapted to engage for operating the clutches i . The two inclined shafts i^6 extend upwardly toward the rear of the sweeper and are supported in bearings i^7 , secured on each side of the casing E. An upwardly-extending arm i^8 is secured on the end of one of the inclined shafts i^6 , and a downwardly-extending arm i^9 is secured on the end of the other inclined shaft i^6 . A bar i^{10} extends across the exterior of the casing E and connects the free ends of the arms i^8 and i^9 , and a handle or lever i^{11} is secured on the arm i^8 for convenience in operating the clutches i .

Mounted in bearings j' on a platform j^2 in the rear of the sweeper and supported on the casing E is the shaft j , which is provided with the arms j^3 , secured at each end thereof, having forked ends j^4 for engaging with a rod j^5 , passing down on each side of the casing E and being pivotally mounted around a bar j^6 , secured in each of the forked frames h^3 . The rods j^5 are pivoted within the forked ends j^4 on the arms j^3 by means of the pivot-pins j^7 , mounted within the forked ends j^4 and secured within a sleeve j^8 , fitting around the rods j^5 . The rods j^5 are held in place within the sleeves j^8 by means of a nut j^9 , engaging with the upper ends of the rods j^5 , and a spiral spring j^{10} is secured around each of the rods j^5 between the sleeves j^8 and a collar j^{11} , removably secured around each of said rods j^5 . Secured to the shaft j is the segmental worm-gear k , which is adapted to engage with a worm-wheel k' , mounted between the collars k^2 on an upright shaft k^3 , held in bearings k^4 , formed as part of a bracket k^5 , secured on the platform j^2 . An operating-wheel k^6 is secured upon the upper ends of the upright shaft k^3 for raising and lowering the broom F.

Rigidly secured to each end of the axle A, beyond the wheels B, is the collar l , which is provided with a flanged portion l' therein, having a seat l^2 therein for the reception of an angle-bar m , which is held therein by means of bolts l^3 . The angle-bars m extend out to the front of the sweeper and are re-

movably secured by means of bolts m' to a cross-bar n , located in front of the wheels B, said bolts m' having handle-nuts m^2 secured thereto. The bolts have elongated heads m^3 thereon, working through slotted holes n' in the cross-bar n . The cross-bar n is supported by means of braces n^2 , secured to the casing E and acts to have the tongue or shafts o secured thereto for hauling the sweeper. A seat p for the operator is secured on the end of a spring supporting-bar p' , which is connected to the platform j^2 in the rear of the sweeper, and a door q is hinged to the top of the casing E, over an opening q' therein, for an examination of the tank or interior of the casing E at any time. Rubber strips r are secured to the buckets D and bear against the tank C, and rubber strips s are secured on the bucket-frames d to bear against the sides of the tank C to prevent the lodging of obstacles between the tank C, buckets D, and frames d during the revolution of the buckets D. If desired, slotted holes can be formed in the bars m at right angles to the slotted holes n' in the cross-bar m for allowing play or movement of these parts.

The operation of my improved street-sweeper is as follows: When it is desired to use the machine to sweep and the broom F is lowered against the street-surface, the operator grasps the lever i^{11} and throws the same to the right, which, through the bar i^{10} , will turn the inclined shafts i^6 and throw the clutches i into engagement with the gear-wheels h on the axle A. As the machine is hauled the driving-wheels B will revolve and turn the gear-wheels h , which are meshing with the pinions h' on the shafts h^2 in the forked frames h^3 , and will act to turn sprocket-wheels f' on said shafts h^2 , and through the sprocket-chains f , engaging with the sprocket-wheels f' and the sprocket-wheels f^2 on the shafts f^4 of the broom F, will act to revolve the broom F to sweep the dirt or other material onto the buckets D as they are revolved. By the movement of the gear-wheels h the gear-wheels h^4 are revolved, and, meshing with the pinions h^5 on the shafts h^6 , will act to turn the pinions h^8 on the shafts h^6 , which, meshing with the gear-wheels h^9 , will revolve the buckets D, secured to the bucket-frames d , through the ratchet-wheels h^{10} , being connected to the gear-wheels h^9 by their pawls h^{11} , and the ratchet-wheels h^{10} being rigidly connected to the sleeves d' on the frames d . As the buckets D are revolved over the tank C, the dirt or other sweepings thrown up by the broom F will be caught by the buckets D and deposited in the tank C, through its opening c^2 , when the buckets D pass over the opening c^2 of the tank C.

When the broom F is in operation, the sweepings will be insured to pass on to the buckets D by the apron g on the swinging door G, which comes in contact and drags on the street, so as to prevent the dirt or other sweepings from being thrown forward of the

broom F. When the tank C has been sufficiently filled with sweepings and it is desired to dump the same, all that is necessary is to grasp the rod g^9 and pull the same back or rearward, which will turn the shaft g^7 and through the levers g^4 and lever g^6 will raise the door G, on account of its swinging frames g^2 being pivoted around the rod g^3 . The handle-nuts m^2 are then unscrewed sufficiently from the bolts m' and the heads m^3 on the bolts m' turned so as to pass through the slots n' in the cross-bar n , so releasing the angle-bars m from the cross-bar n , when the angle-bars m can be raised by the operators and the tank C turned backward, which will allow the dirt or sweepings to pass out of the tank C through the opening c^2 therein and through the opening e^7 in the casing E onto the street or dumping-place, as desired. After the sweepings are removed from the tank C it can be returned to place by pulling down on the angle-bars m and connecting them to cross-bar n by passing the headed bolts m' through the slots n' in the cross-bar n and screwing down the handle-nuts m^2 against the bars m . The door G can then be returned to place over the opening e^7 in the casing E by pushing forward the rod g^9 , which will allow the swinging frames g^2 to swing back on the rod g^3 through the levers g^4 and g^6 , being pivotally connected to the shaft g^7 and swinging frames g^2 .

In case it is desired to raise the broom F for any cause or purpose all that is necessary is to turn the vertical shaft k^3 by means of the operating-wheel k^7 , which will turn the shaft j through the gear k thereon, meshing with the worm-wheels k^2 on the upright shaft k^3 , and raise the forked arms j^3 . The spring-rods j^5 , being connected to the forked frames h^3 h^3 and held within the forked arms j^3 by a swivel pivoted joint, are permitted to rise with the forked arms j^3 and so raise the broom F. The broom F can be lowered by reversing the operating-wheel k^7 and with it the worm-wheel k' on upright shaft k^3 and gear-wheel k on the shaft j , so lowering the forked arms j^3 and rods j^5 and permitting the lowering of the broom F, connected thereto.

In case it is desired that the broom F operate and sweep in turning corners, the outer ratchet-wheel h^{10} on the axle A and the outer ratchet-wheel f^5 on the broom F will revolve to operate the buckets D and broom F, while the inner ratchet-wheel h^{10} on the axle A and the inner ratchet-wheel f^5 on the broom F will revolve or turn backward, and their pawls h^{11} and f^6 , respectively, will slip over the ratchet-wheels in order to allow the gearing mechanism on the inner side of the sweeper to remain stationary, while the gearing mechanism on the outer side of the sweeper is operating the broom F and conveys buckets D, so that the sweeper will relieve itself in turning corners or around either to the right or left. It is evident that the gearing mechanisms shown at H and the ratchet mechanism on the broom

F may be used on any form of sweeper for permitting the broom F to operate in turning corners or around without the use of the tank C, conveyer-buckets D, or the casing E.

5 The gearing mechanism H on each side of the sweeper is to distribute the power evenly on both horses when the machine is in operation, as well as to obtain speed and make the broom work easier, and by the gearing mechanism H being connected to the conveyer-
10 buckets D it enables the conveyer to be driven evenly and obtain the speed desired. It also enables the power to be directed on the horses evenly and to make the conveyer
15 work true at all times.

It will thus be seen that my improved sweeper is cheap and simple in its construction and operation and that the broom will always operate to sweep in turning corners
20 and will not necessitate the raising of the same in order to allow the machine to be hauled around corners. The broom can be rapidly and easily raised at any and all times when desired without any great force exerted
25 or application of strength. The sweepings will always be thrown into the buckets from the broom and will be carried thereby and deposited into the tank, and when the tank is filled it can be dumped quickly and easily and
30 returned to place without any great strength or complicated mechanism. The broom can be easily and rapidly operated by the gearing mechanism, the parts will not get out of order, and the streets will be cleanly and evenly
35 swept by the machine.

The machine is light, strong, and durable, and practical experience with it has proven it to be a useful and practical sweeper and one that will reduce the cost of labor, time,
40 and expense in this kind of work.

Various modifications in the construction and design of the various parts of the machine may be resorted to without departing from the spirit of the invention or sacrificing
45 any of its advantages.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely
50 mounted around the axle, a casing supported around the axle, a tank or dirt-receptacle rigidly secured to the axle, a conveyer between the casing and the tank carrying buckets thereon, a rotatable broom adjustably
55 mounted in the rear of the axle, connections from the driving-wheels to the rotatable broom, and gearing mechanism connected to the driving-wheels and to gear-wheels loosely mounted around the axle and rigidly con-
60 nected to the conveyer, substantially as and for the purposes set forth.

2. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely
65 mounted around the axle, a casing supported around the axle, a tank or dirt-receptacle rigidly secured to the axle, a conveyer between the casing and the tank carrying buck-

ets thereon, a rotatable broom adjustably mounted in the rear of the axle, connections from the driving-wheels to the rotatable
70 broom, gearing mechanism connected to the driving-wheels and adapted to operate gear-wheels loosely mounted around the axle, and ratchet-wheels having pawls engaging therewith connected to said gear-wheels and rigidly
75 connected to the conveyer or frame, substantially as and for the purposes set forth.

3. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely
80 mounted around the axle, a casing supported around the axle, a tank or dirt-receptacle rigidly secured to the axle, a conveyer between the casing and tank carrying buckets thereon, a rotatable broom adjustably mount-
85 ed in the rear of the axle, connections from the driving-wheels to the rotatable broom, gear-wheels connected to the driving-wheels and meshing with pinions mounted on shafts supported on said casing, pinions on said
90 shafts and meshing with gear-wheels loosely mounted around the axle, and ratchet-wheels having pawls engaging therewith connected to said last-named gear-wheels and rigidly
95 connected to the conveyer, substantially as and for the purposes set forth.

4. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely
mounted around the axle, a casing supported around the axle, a tank or dirt-receptacle
100 rigidly secured to said axle, a conveyer-frame between the casing and tank carrying buckets thereon, a rotatable broom adjustably mounted in the rear of said axle, connections from the driving-wheels to the broom, a cross-
105 bar supported by and in front of said casing, and bars removably secured to said cross-bar and having collars thereon rigidly secured to the axle for dumping and holding the tank or dirt-receptacle in place, substantially as set
110 forth.

5. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely
mounted around the axle, a casing supported around the axle, a tank or dirt-receptacle rigidly
115 secured to said axle, a conveyer-frame between the casing and tank carrying buckets thereon, a rotatable broom adjustably mounted in the rear of the axle, connections from the driving-wheels to the broom, a cross-
120 bar supported by and in front of said casing, bars removably secured to said cross-bar having collars thereon rigidly secured to the axle, and bolts removably connected to the cross-bars and bars for dumping and holding the tank or dirt-receptacle in place, substantially
125 as set forth.

6. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely
130 mounted around the axle, a casing supported around the axle, a tank or dirt-receptacle rigidly secured to said axle, a conveyer-frame between the casing and tank carrying buckets thereon, a rotatable broom adjustably
135 mounted in the rear of the axle, connections

from the driving-wheels to the broom, a cross-bar supported by and in front of said casing, bars removably secured to said cross-bar having collars thereon rigidly secured to the axle, slots in said cross-bars, and bolts removably connected to the cross-bars and bars having elongated heads thereon engaging the said slots in the cross-bars for dumping and holding the tank or dirt-receptacle in place, substantially as set forth.

7. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely mounted around the axle, a casing supported around the axle, a tank or dirt-receptacle rigidly secured to said axle, a conveyer-frame between the casing and tank carrying buckets thereon, a rotatable broom adjustably mounted in the rear of the axle, connections from the driving-wheels to the broom, a cross-bar supported by and in front of said casing, bars removably secured to said cross-bar having collars thereon rigidly secured to the axle, bolts removably connected to the cross-bar and bars having elongated heads thereon engaging with said slots in the cross-bar, and wrench-nuts engaging the said bolts for dumping and holding the tank or dirt-receptacle in place, substantially as set forth.

8. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely mounted around the axle, a rotatable broom mounted in the rear of the axle, connections from the driving-wheels to the broom, and adjustable spring-rods secured to the said rotatable broom and pivotally swiveled in sleeves pivoted in arms secured to a shaft supported above the rotatable broom, substantially as set forth.

9. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely mounted around the axle, a rotatable broom mounted in the rear of the axle, connections from the driving-wheels to the broom, adjustable spring-rods secured to said broom and pivotally swiveled in arms secured to a shaft supported above the broom, and a worm gear-wheel on said shaft meshing with a worm on an upright shaft having an operating-wheel thereon for raising and lowering the broom, substantially as set forth.

10. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely mounted around the axle, a casing supported around the axle and provided with an opening in the bottom thereof, a tank or dirt-receptacle rigidly secured to said axle, a conveyer-frame between the casing and tank carrying buckets thereon, a rotatable broom adjustably mounted in the rear of the axle, connections from the driving-wheels to the broom, means on said axle for dumping and holding the tank in place, and a removable

door pivoted to said casing and fitting over the opening in the bottom of the casing to allow the tank to be emptied, substantially as set forth.

11. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely mounted around the axle, a casing supported around the axle and provided with an opening in the bottom thereof, a tank or dirt-receptacle rigidly secured to said axle, a conveyer-frame between the casing and tank carrying buckets thereon, a rotatable broom adjustably mounted in the rear of the axle, connections from the driving-wheels to the broom, means on said axle for dumping and holding the tank in place, a removable door pivoted to said casing and fitting over the opening in the bottom of the casing to allow the tank to be emptied, and means connected to said door for raising and lowering the same, substantially as set forth.

12. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely mounted around the axle, a casing supported around the axle and provided with an opening in the bottom thereof, a tank or dirt-receptacle rigidly secured to said axle, a conveyer-frame between the casing and tank carrying buckets thereon, a rotatable broom adjustably mounted in the rear of the axle, connections from the driving-wheels to the broom, means on said axle for dumping and holding the tank in place, a removable door pivoted to said casing and fitting over the opening in the bottom of the casing to allow the tank to be emptied, and a series of levers pivoted to the door and casing for raising and lowering the door, substantially as set forth.

13. In a street-sweeper, the combination of an axle, supporting and driving wheels loosely mounted around the axle and provided with an opening in the bottom thereof, a tank or dirt-receptacle rigidly secured to said axle, a conveyer-frame between the casing and tank carrying buckets thereon, a rotatable broom adjustably mounted in the rear of said axle, connections from the driving-wheels to the broom, means on said axle for dumping and holding the tank in place, a removable door pivoted to said casing and fitting over the opening in the bottom of the casing to allow the tank to be emptied, and a flexible apron secured to the rear end of said removable door to direct the sweepings into the buckets, substantially as set forth.

In testimony whereof I, the said WILLIAM FRANZ, have hereunto set my hand.

WILLIAM FRANZ.

Witnesses:

J. N. COOKE,
A. BLAKELEY.