





No. 775,569.

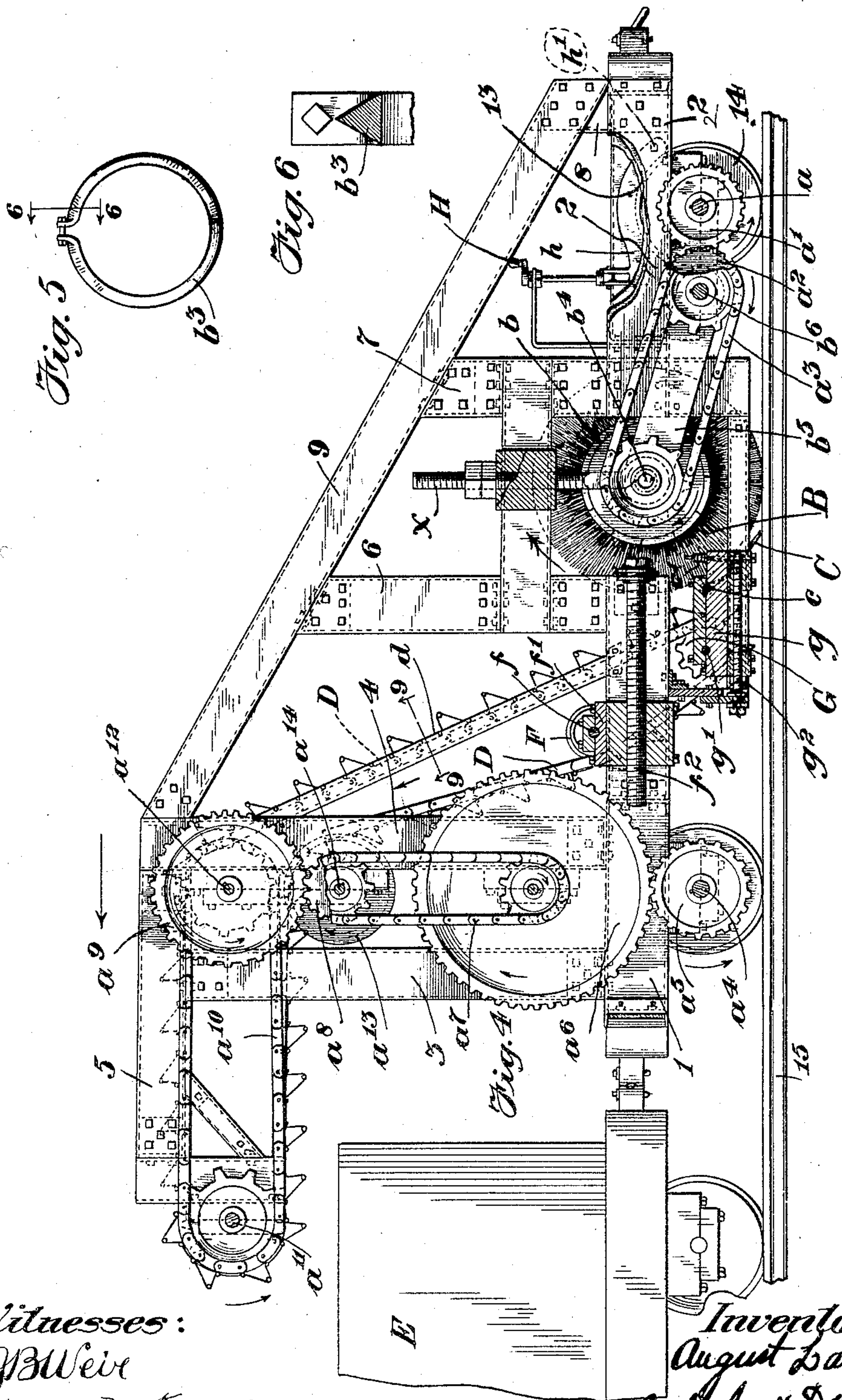
PATENTED NOV. 22, 1904.

A. LARSON.  
STREET SWEEPER.

APPLICATION FILED NOV. 24, 1902.

NO MODEL.

4 SHEETS—SHEET 2.



Witnesses:

J. B. Weir

Herman M. Krueger

Inventor:

August Larson

By Bulkley & Durand



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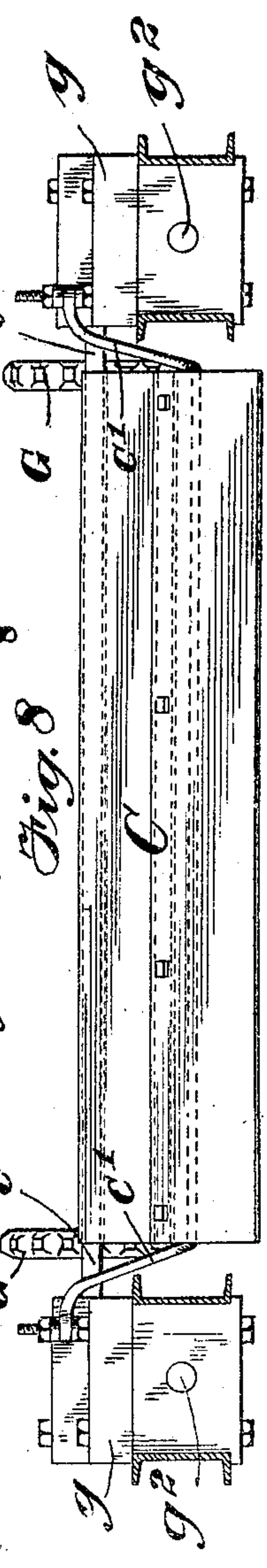
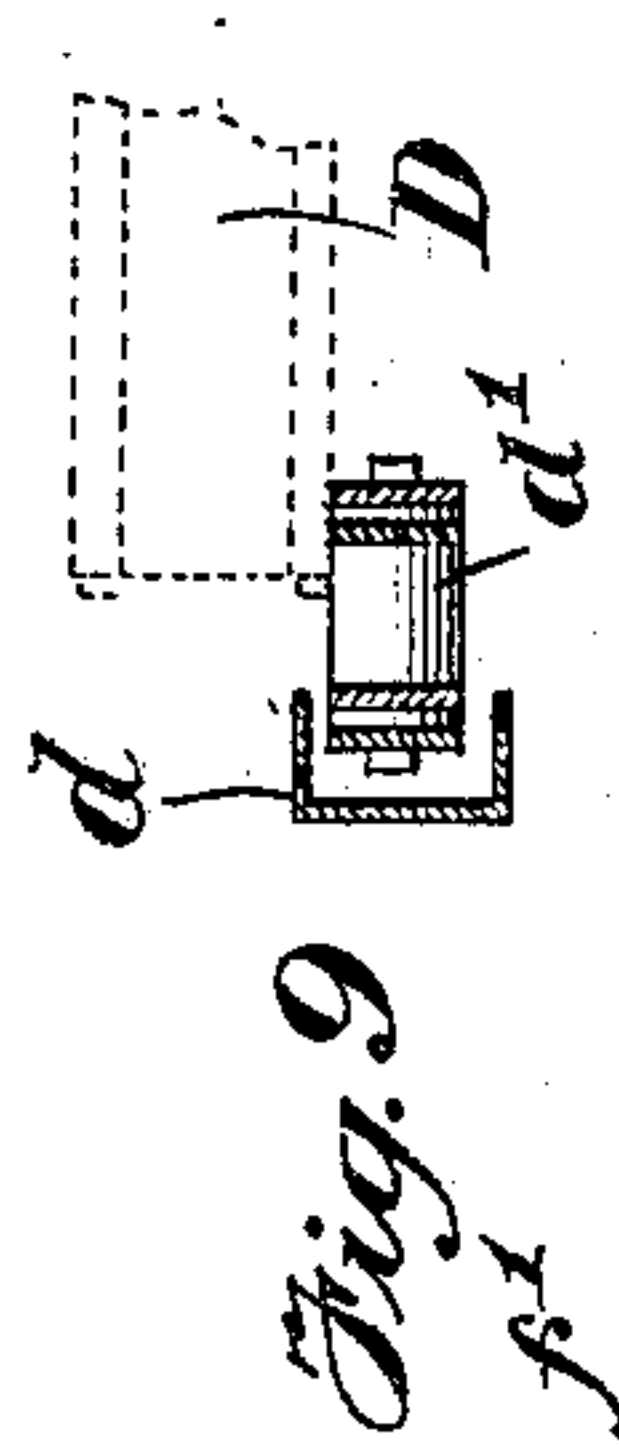
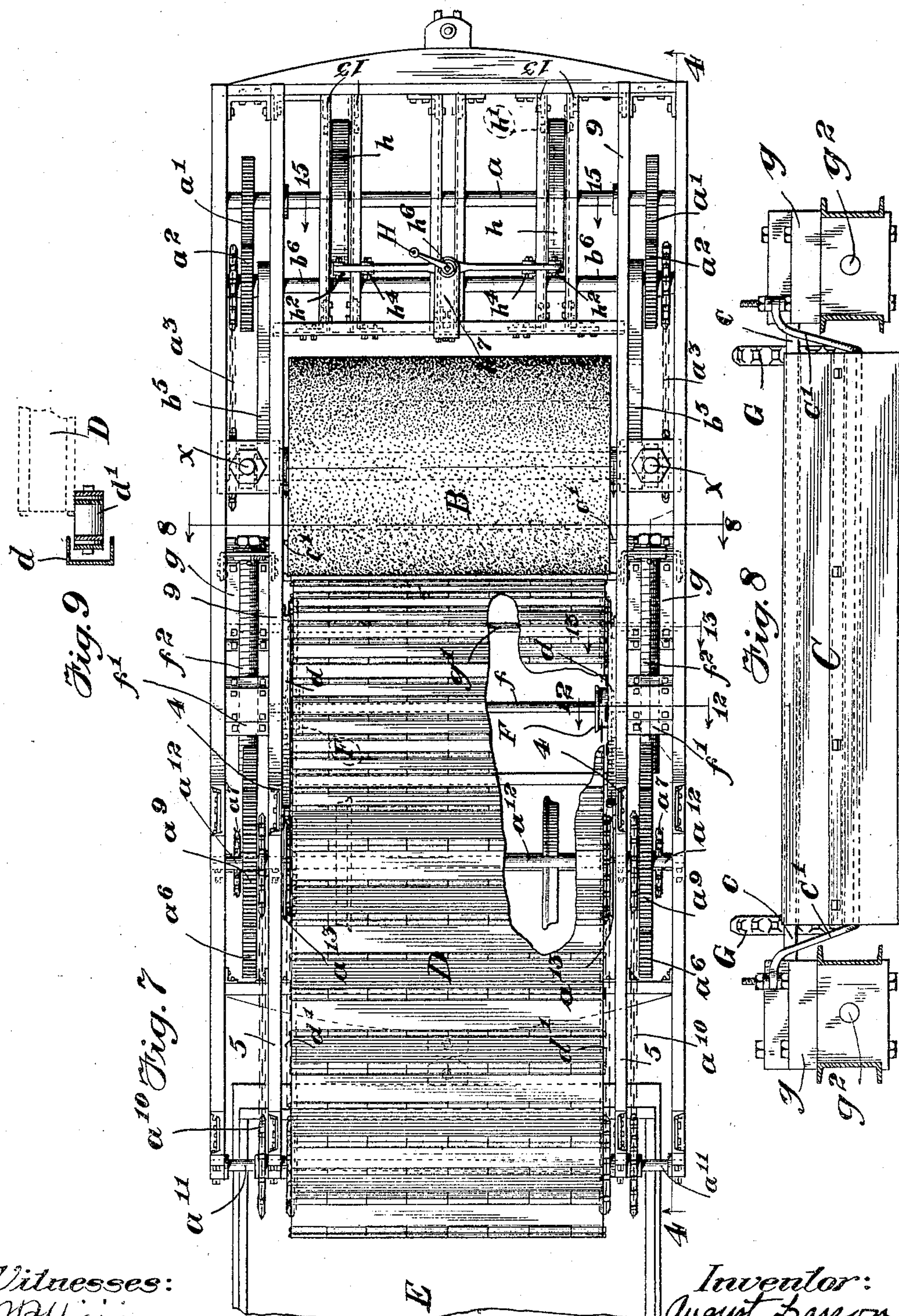
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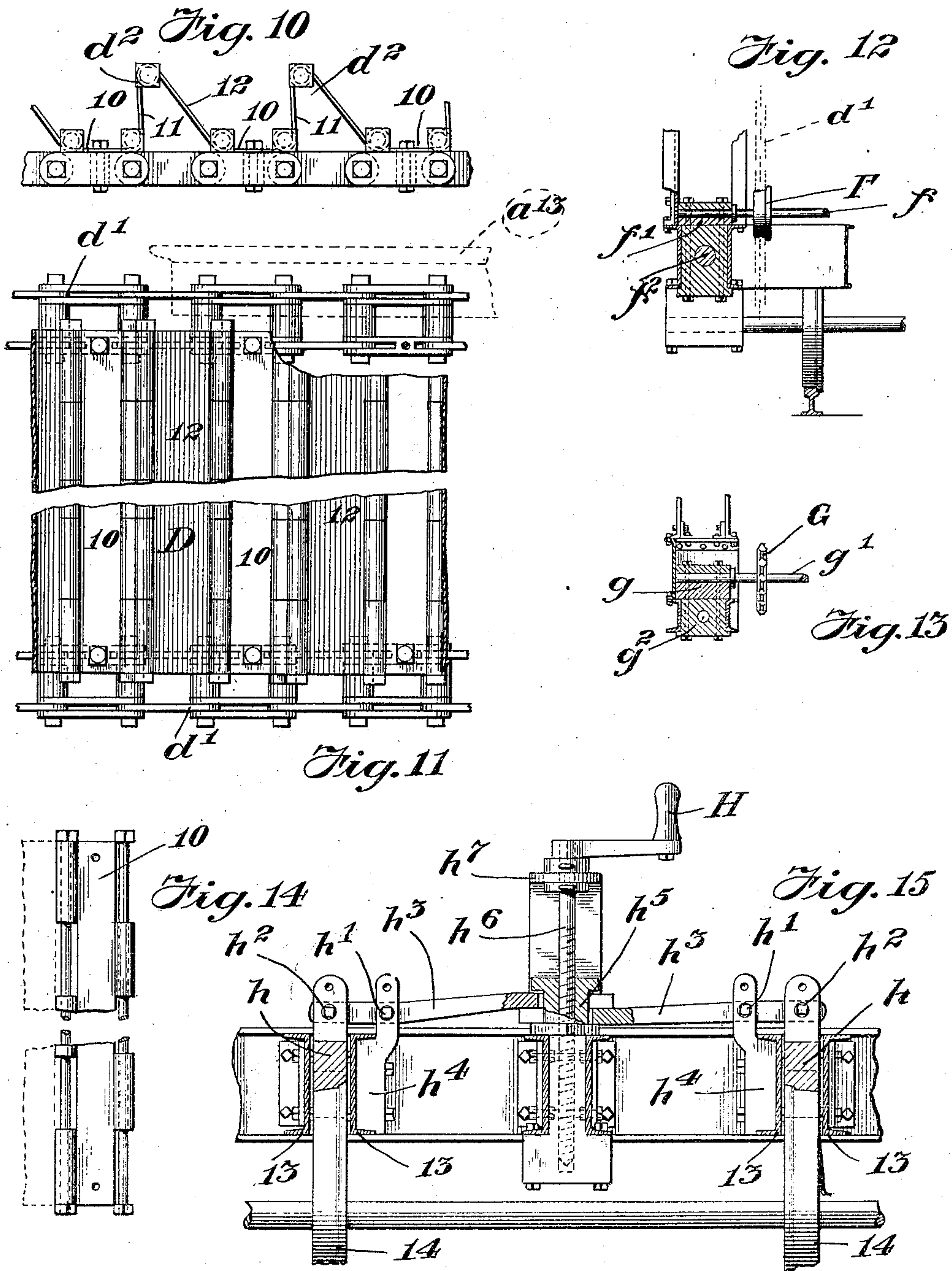
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Witnesses:

J. B. Weir  
Herman M. Krueger

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# UNITED STATES PATENT OFFICE.

AUGUST LARSON, OF CHICAGO, ILLINOIS.

## STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 775,569, dated November 22, 1904.

Application filed November 24, 1902. Serial No. 132,632. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST LARSON, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have  
5 invented a certain new and useful Improvement in Street-Sweepers, of which the following is a specification.

My invention relates to street-sweepers in general, but more particularly to sweepers of  
10 that class adapted for use on street-railways, and especially to sweepers of that class in which the dust and dirt is swept up from the ground and then conveyed to and delivered into a car or other receptacle.

15 Generally stated, the object of my invention is to provide a thoroughly-efficient street-sweeper.

A special object is to provide an improved form of street-sweeper which will sweep up  
20 the dust and dirt and convey the same to a vehicle or receptacle.

Another object is to provide a sweeper adapted especially for cleaning the tracks of street-railways and which can be drawn along  
25 the track like an ordinary car.

A further object is to provide means for effectually adjusting the different parts with respect to wear and the character of the work.

It is also an object to provide certain details and features of improvement tending to increase the general efficiency and serviceability of a street-sweeper of this particular character and construction.

To the foregoing and other useful ends my  
35 invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a street-sweeper constructed in accordance with my invention and showing also the rear end of a car or traveling receptacle to which the sweeper is coupled. Fig. 2 is a longitudinal section of the improved rotary broom which I employ for sweeping up the dirt and dust. Fig. 3 is an enlarged  
40 detail view showing the method of attaching the bunches of broom-straw or wooden bristles to the drum portion of the rotary broom. Fig. 4 is a view similar to Fig. 1, but showing the sweeper in vertical section on line 4-4  
50 in Fig. 7. Figs. 5 and 6 are detail views

illustrating one of the rings for clamping the strips or broom corn or bristles upon the rotary broom. Fig. 7 is a plan of the railway street-sweeper shown in Figs. 1 and 4. Fig. 8 is an enlarged cross-section of the lower  
55 portion of the frame on line 8-8 in Fig. 7. Fig. 9 is a detail cross-section on line 9-9 in Fig. 4. Fig. 10 is an enlarged side elevation of a portion of the conveyer-belt. Fig. 11 is a plan of a portion of the conveyer-belt. Fig. 12 is a detail section on line 12-12 in Fig. 7. Fig. 13 is a detail cross-section on line 13-13 in Fig. 7. Fig. 14 is a detail of the pintle-bearing joints or articulations involved in the construction of the belt conveyer. Fig. 15 is  
65 a detail cross-section on line 15-15 in Fig. 7.

As thus illustrated, my improved street-sweeper may comprise a suitable frame or body A, composed, preferably, of vertically and horizontally disposed sections of channel-  
70 iron. In order to inclose the operative parts, the spaces between these sections of channel-iron may be filled up or closed by plates or sheeting or by strips of sheet-iron, as shown in Fig. 1.

Referring now to Fig. 4, it will be seen that the operative portion of my improved street-sweeper involves a rotary broom B, mounted at substantially the center of the body-frame and arranged to rotate in bearings which are  
80 mounted upon the adjustable hangers  $x$ . The sweeper preferably moves in the direction indicated by the arrow. During such movement the broom is rotated in the direction indicated, this rotary motion of the broom  
85 being transmitted from the rear car-axle  $a$  through the medium of the gear-wheels  $a'$  and  $a''$  and the chain-and-sprocket gearing  $a^3$ . The rapid rotary motion thus given the broom enables it to gather and throw the dust and dirt  
90 upward upon the apron C, and from the latter the dust and dirt are then received by the traveling belt conveyer D. This belt conveyer travels in the direction indicated and is driven from the forward car-axle  $a^4$  through  
95 the medium of the gear-wheels  $a^5$  and  $a^6$ , the chain-and-sprocket gearing  $a^7$ , the gear-wheels  $a^8$  and  $a^9$ , and thence through the chain-and-sprocket gearing  $a^{10}$  to the forward supporting-shaft  $a^{11}$ . Thus the rotary broom is ad-  
100



vantageously driven from the rear car-axle, while the traveling belt conveyer is likewise driven from the forward car-axle. As will be observed, this belt conveyer extends upwardly and then forwardly to a point overhanging the car or traveling receptacle E. The upper leaf of the belt conveyer is preferably supported at its bend by sprockets mounted on the shaft  $a^{12}$ , while at substantially this same point the lower conveyer of the belt is preferably supported by rolls  $a^{13}$ , mounted on the shaft  $a^{14}$ , one at each side. The belt-tightening rolls F are preferably mounted upon its shaft  $f$ , which is mounted to turn in the adjustable bearings  $f'$ . These bearings are readily adjustable by means of the screws  $f^2$ . In this way any slack in the belt can be readily taken up. If desired, the rear traveling leaf of the belt conveyer can be arranged to have its edges or marginal portions slide in trough-like guides  $d$ . The lower end of the belt conveyer is arranged to travel around sprockets G, mounted on a shaft  $g$ , which rotates in adjustable bearings  $g'$ . These bearing-blocks for the lower shaft  $g$  are readily adjustable by means of a screw  $g^2$ . Thus both the bearing-blocks  $f'$  and the similar blocks  $g'$  can be adjusted horizontally for the purpose of giving the belt the desired tension and for the purpose of adjusting the lower end of the belt conveyer either toward or away from the broom.

It will be observed that the apron C is also mounted upon the blocks  $g'$ , preferably through the medium of a rotary shaft  $c$ . With this arrangement a vertically-adjustable strap or stirrup  $c'$ , also carried by the blocks  $g'$ , can be employed for changing or varying the angle of the said apron. Thus the sweeping or gathering up of the dirt or dust and its transfer to the belt conveyer are effectually insured. With respect to the general construction and arrangement it will be seen that the forward portion of the body or frame is of a character to support the horizontal portion of the belt conveyer in a sufficiently elevated position to discharge the dirt and dust into the car E. Each side of the body or frame then tapers rearwardly, as shown in Figs. 1 and 4. The specific construction of the body or frame thus provided involves, it will be seen, the forward and rear sill members 1 and 2, separated sufficiently to provide a gap for the ends of the broom-shaft and provided with suitable bearings for the car-axles  $a$  and  $a^4$ . At the forward end of the body or frame are the uprights 3 and 4, which support the elevated horizontal portion of the body-frame 5. This portion 5 extends forwardly and separates the bearings for the shaft  $a^{11}$ . The construction of the frame also involves uprights 6, 7, and 8, adapted to supporting the inclined upper rails 9. In this way the frame is both light and strong and of a character to support the various operative parts and effectually sustain

the various strains incident to the operation of the sweeper.

The belt conveyer can be of any suitable or approved construction. For the broader purposes of the invention it is only necessary that this belt shall be strong and durable and provided with suitable means for catching and retaining the dust and dirt. For example, it may consist of the parallel chains  $d'$ , adapted to travel over the previously-described sprockets and supporting-rollers. To these chains may be secured a sheet-metal facing composed of sections connected by hinges or pintle-bearings. The various sections of this sheet-metal facing may be of such character so as to provide the outwardly-extending cleats or buckets  $d^2$ . The sheet-metal facing thus constructed does not, it will be seen, entirely cover the two chains. In this way a marginal portion is left at each side of the belt, which is free to travel upon the rolls and in the trough-like guides  $d$ . The sheet-metal facing thus composed of sections which are hinged together provides the conveyer not only with the aforesaid cleats or buckets, which catch the dirt and carry the same upward, but also with intervening walls, which prevent the dust and dirt from falling off or passing through the conveyer. Preferably each bucket is composed of the sheet-metal sections 11 and 12, the former constituting the carrying member of the bucket or cleat, while the latter serves merely as a brace. In other words, the sheet-metal section 11 performs the function of a shelf upon which the dirt and dust is supported, and the weight of this shelf and the dirt it carries is sustained by the brace 12. As explained, the sections 10, 11 and 12 are connected by hinges or pintle-bearings. Hence the conveyer is rendered impervious to dirt and dust without taking away from it the flexibility necessary for its operation—that is to say, the belt presents a continuous and unbroken surface and is at the same time sufficiently flexible to enable it to travel freely over the various sprocket-wheels and rolls.

The rotary broom can be of any suitable or approved construction. Preferably, however, and with a view to providing an unusually strong and serviceable broom, I provide a number of strips  $b$ , upon which the bunches of broom-corn or thick wooden bristles are mounted and which are secured to the body or core of the broom by screws  $b'$ . Each bunch of broom-corn or wooden bristles is preferably held in place by a small wedge  $b^2$ . When the bunches of bristles or broom-corn are assembled in place, they provide a rotary broom, which can be easily and quickly repaired or altered. Furthermore, and in order to preclude any possibility of one of the strips becoming loosened, the strips are preferably clamped on the core of the broom by means of clamping-rings  $b^3$ . Thus when a particular



bunch or cluster of wooden bristles gives out the strip to which this bunch is allotted can be quickly removed by simply taking off the clamping-ring and then removing the screws which secure the strip to the core of the broom. Furthermore, this construction permits the broom to be driven at high speed without danger of loosening the bristles.

The attendant, if any, can stand on the horizontal rear portion of the body or frame. At such a point the crank-handle H for setting and releasing the brakes *h* can be readily reached and operated. These brakes, it will be seen, preferably consist of levers, pivoted at *h'* and provided at their rear ends with ears *h''*. The levers *h'*, which are fulcrumed upon the brackets *h'*, connect with these ears *h''* at their outer ends and engage the vertically-disposed sleeve *h'* at their inner ends. These brackets are of course secured to the body-frame. The sleeve *h'* is preferably in the form of a nut adapted to travel up and down on the rotary adjusting-screw *h'*. It is to the upper end of this screw that the crank-handle is secured. A brake *h'* provides a supporting-bearing for the upper end of the said screw. With this arrangement the brakes can be readily and powerfully set by simply rotating the crank-handle in one direction and can then be as readily released by rotating the crank-handle in the opposite direction. These brake-shoes are arranged to work between the channel-irons 13 and to bear upon the rear car-wheels 14. Thus the sweeper is equipped with conveniently-operated means for applying brakes to its wheels.

Referring to Figs. 1 and 4, it will be seen that the car-wheels are adapted to travel upon the rails 15. Thus the sweeper and its receiving-car E can be drawn along the track in the manner of an ordinary car. It will be readily understood, however, that I do not limit myself to this particular operation of my invention. If desired, the sweeper may be mounted on ordinary wheels—that is to say, wheels capable of traveling along an ordinary street or roadway. Thus it will be seen that my invention is adapted to be employed in different ways, either in connection with the road-bed of a street-railway or as an ordinary street-sweeper.

If desired, and in order to relieve the hangers of as much strain as possible, the shaft *b'* of the broom can be mounted to turn in the forward ends of the swinging bars *b'*. As illustrated, these bars are mounted to swing about the shaft *b'* as an axis. With this provision the bars *b'* sustain most of the backward or rearward thrust of the broom as it is drawn rapidly forward. At the same time the broom is capable of being vertically adjusted without interfering with its power-transmitting connection with the rear car-axle.

What I claim as my invention is—

65 1. A street-sweeper, comprising a rotary

broom, an upwardly and forwardly extending belt conveyer, the lower end of said belt conveyer being adjustable toward and away from said broom, and a receptacle arranged to receive the dust and dirt from the forward end of said conveyer. 70

2. A street-sweeper comprising a wheeled body or frame, a rotary broom located between the forward and the rear wheels and extending at right angles to the line of travel, power-transmitting connection between the said broom and the said rear wheels, an upwardly and forwardly extending belt conveyer adapted to receive the dirt and dust from said broom, power-transmitting connection between said conveyer and the forward wheels, and a receptacle adapted to receive the dust and dirt from the forward end of said conveyer. 80

3. A street-sweeper comprising a suitable body or frame mounted on wheels, a rotary broom extending at right angles to the line of travel, power-transmitting connection between said broom and the wheels at one end of said body or frame, a belt conveyer arranged to receive the dust and dirt from said broom, and power-transmitting connection between said conveyer and the wheels at the other end of said body or frame. 85

4. A street-sweeper comprising a rotary broom, a wheeled body-frame upon which said broom is mounted for vertical adjustment, means for driving said broom, a belt conveyer having its lower end adapted to receive the dirt and dust from said conveyer, a belt-tightener for said conveyer having a screw adjustment, and means for driving said belt conveyer. 90

5. A street-sweeper comprising a body mounted on car-wheels adapted to travel on rails, a rotary broom driven from the rear car-wheels, a pair of brake-shoes adapted to be applied to the rear car-wheels, a screw and a pair of levers arranged for effecting the operation of said brakes, and a belt conveyer adapted to receive the dirt and dust from said broom. 100

6. A street-sweeper comprising a suitable body-frame, a pair of swinging bars, a rotary broom mounted upon the forward ends of said bars, rear supporting-wheels for said body-frame, power-transmitting connection between said supporting-wheels and said broom, said power-transmitting connection including a gear-wheel having its axis coincident with the axis about which the said bars swing, front supporting-wheels for said body-frame, an upwardly and forwardly extending conveyer arranged to receive the dust and dirt from said broom, power-transmitting connection between said conveyer and said front supporting-wheels, and a traveling receptacle adapted to receive the dust and dirt from said conveyer. 105

7. A street-sweeper comprising a suitable 130



body-frame, a pair of swinging bars, a rotary broom mounted on the forward ends of said bars, power-transmitting connections for driving said broom, adjusting devices for raising  
5 and lowering the broom, and means in front of said broom for disposing of the dust and dirt swept up by the broom.

8. A street-sweeper comprising a suitable body-frame mounted on wheels, a rotary  
10 broom, an upwardly and forwardly extending belt conveyer, said broom being arranged to deliver the dust and dirt directly to the upper leaf of said conveyer, and suitable power-transmitting connections for driving said  
15 broom and conveyer.

9. A street-sweeper comprising a wheeled body-frame, a rotary broom, an upwardly and forwardly extending belt conveyer arranged to receive the dust and dirt from said broom,  
20 said belt conveyer having suitable marginal portions, and rotary supporting members for supporting the lower leaf of the conveyer and adapted to engage the said marginal portions of the latter.

10. A street-sweeper comprising a wheeled body-frame, a rotary broom carried by said body-frame, a belt conveyer arranged to receive the dust and dirt from said broom, said conveyer having suitable marginal portions,  
30 rotary members for supporting the lower leaf of said belt conveyer and adapted to engage the said marginal portions of the latter, and suitable power-transmitting connections for driving said broom and conveyer.

11. A street-sweeper comprising a wheeled body-frame, a pair of vertically-arranged members mounted on said body-frame, the upper end portions of said members being threaded, a rotary broom carried by the lower  
40 ends of said members, swinging bars having their ends also connected with said broom, power-transmitting connections for driving said broom, a suitable conveyer, and power-transmitting connections for driving said con-  
45 veyer.

12. A street-sweeper comprising a suitable body mounted on wheels, a rotary broom, gearing connecting the broom with the wheels and whereby the broom and wheels rotate in  
50 opposite directions, said gearing being arranged outside of the wheels, and means in front of the broom for catching and disposing of the dust and dirt.

13. A street-sweeper comprising a wheeled body-frame, a conveyer, a pivotally-mounted apron arranged immediately in rear of the lower end of said conveyer, and a sweeping-  
55 broom mounted directly in rear of said apron, said conveyer being adapted to receive the dust and dirt swept directly onto the apron by the broom.  
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14. A street-sweeper comprising a wheeled body-frame, a rotary broom, an apron, a conveyer adapted to receive the dust and dirt  
65 swept directly onto the apron by the broom,

and means for adjusting the apron toward and away from the broom.

15. A street-sweeper comprising a wheeled body-frame, a rotary broom, an apron, a conveyer adapted to receive the dust and dirt  
70 swept directly onto the apron by the broom, and means for adjusting the apron and conveyer toward and away from the broom.

16. A street-sweeper comprising a wheeled body-frame, a rotary broom, an apron, a conveyer adapted to receive the dust and dirt  
75 swept directly onto the apron by the broom, and screw-threaded members for raising and lowering the free end of said apron.

17. A street-sweeper comprising a wheeled body-frame, a rotary broom, a pivotally-mounted apron, a conveyer adapted to receive the dust and dirt swept directly onto the apron  
80 by the broom, and horizontally-disposed screws for giving the apron a pivotal adjustment toward and away from the broom.  
85

18. A street-sweeper comprising a wheeled body-frame, a rotary broom, a conveyer for receiving and disposing of the dust and dirt swept up by the broom, and means for adjust-  
90 ing the lower end of said conveyer toward and away from the broom.

19. A street-sweeper comprising a wheeled body-frame, a rotary broom and suitable conveying means, pivoted brake-shoes adapted to  
95 engage the supporting-wheels, pivoted levers connected with said shoes, a rotary screw, and a traveling nut on said screw adapted to engage said levers to operate said brake-shoes.

20. A street-sweeper comprising a body-frame, a rotary broom, a conveyer mounted in front of the broom, and gearing connections between the front wheels of the body-frame and the said conveyer, said gearing being connected with an intermediate part of said con-  
100 veyer.  
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21. A street-sweeper comprising a wheeled body-frame, a rotary broom, an upwardly and forwardly and horizontally extending belt conveyer mounted in front of the broom, means  
110 for driving the conveyer, and rotary members supporting the upper and lower leaves of said conveyer at the bends of points of change of direction or movement thereof.

22. A street-sweeper comprising a wheeled body-frame, a rotary broom, an upwardly and forwardly extending conveyer arranged in front of the broom, and power-transmitting connection between the upper end of the conveyer and the front wheels of the body-frame.  
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23. A street-sweeper comprising a wheeled body-frame, a rotary broom, a belt conveyer for disposing of the dust and dirt swept up by the broom, and screw-adjusting devices for moving the conveyer toward and away from  
125 the broom.

24. A street-sweeper comprising a rotary broom, means for disposing of the dust and dirt swept up by the broom, a wheeled body-frame on which the foregoing elements are  
130



supported, and a pair of vertically-adjustable screws provided at their lower ends with bearings for the said brush, and having their upper end portions provided with adjusting-nuts for  
5 raising and lowering the broom.

25. A street-sweeper comprising a wheeled body-frame, a rotary broom having power-transmitting connection with the wheels at each side of the machine, swinging bars connecting the broom with the frame, and vertically-disposed screws having their lower ends provided with bearings for the rotary broom, and having also rotary adjusting-nuts where-  
10 by the broom may be raised and lowered.

26. A street-sweeper comprising a wheeled 15 body-frame, a rotary broom, a belt conveyer adapted to receive and dispose of the dust and dirt swept up by the broom, idler-rolls for tightening the conveyer, and horizontally-disposed rotary screws for bodily adjusting said 20 rolls to tighten the conveyer.

Signed by me at Chicago, Cook county, Illinois, this 22d day of November, 1902.

AUGUST LARSON.

Witnesses:

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