Q. FAUSTINI.

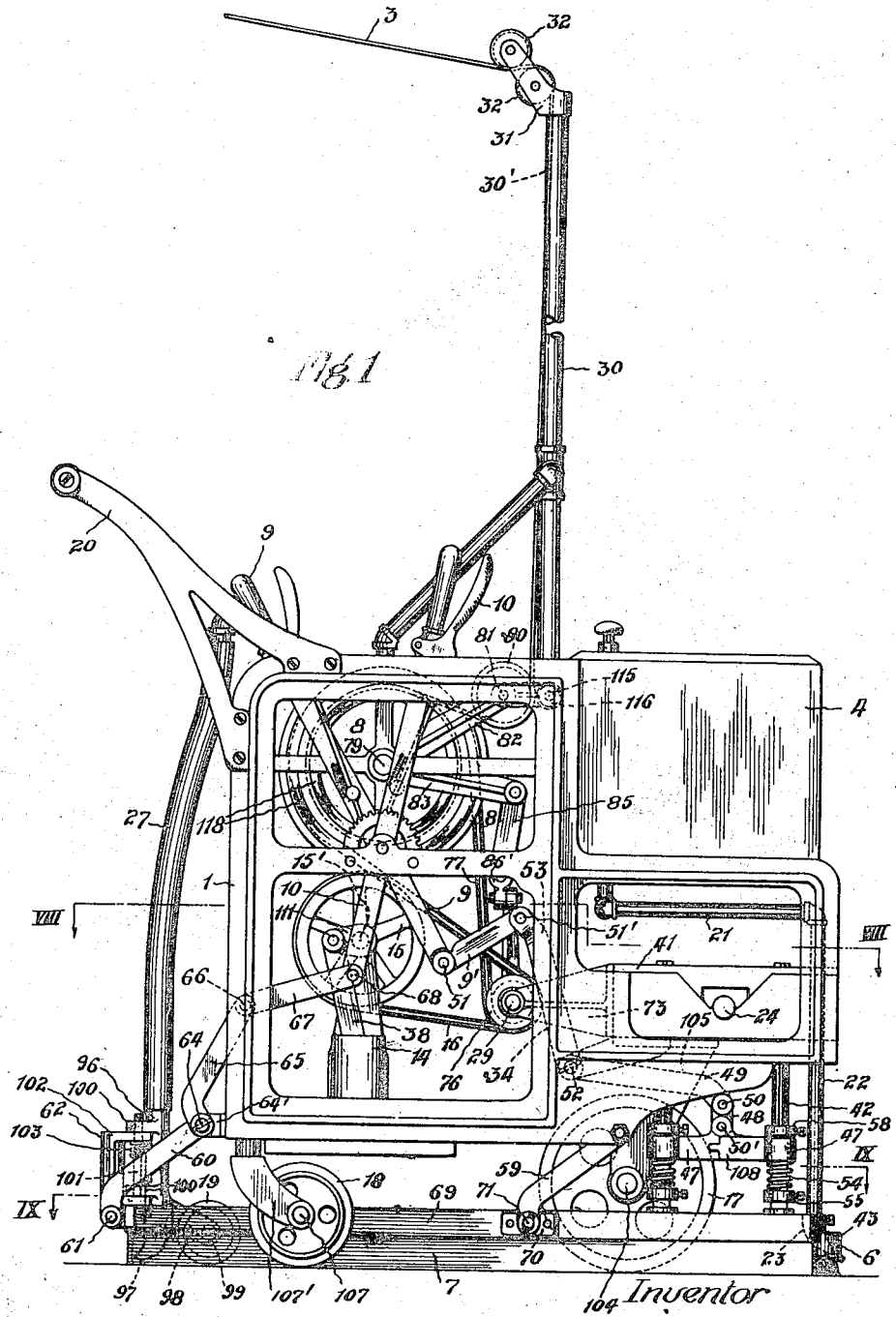
SCRUBBING MACHINE.

APPLICATION FILED JUNE 21, 1917.

1,263,396.

Patented Apr. 23, 1918.

6 SHEETS—SHEET 1.



O. FAUSTINI.

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6 SHEETS—SHEET 2.

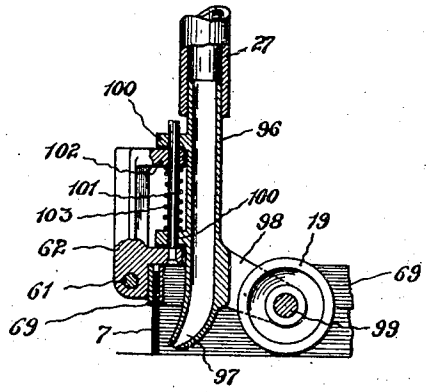


Fig. 3

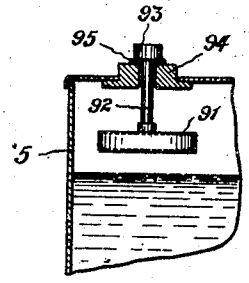


Fig. 4

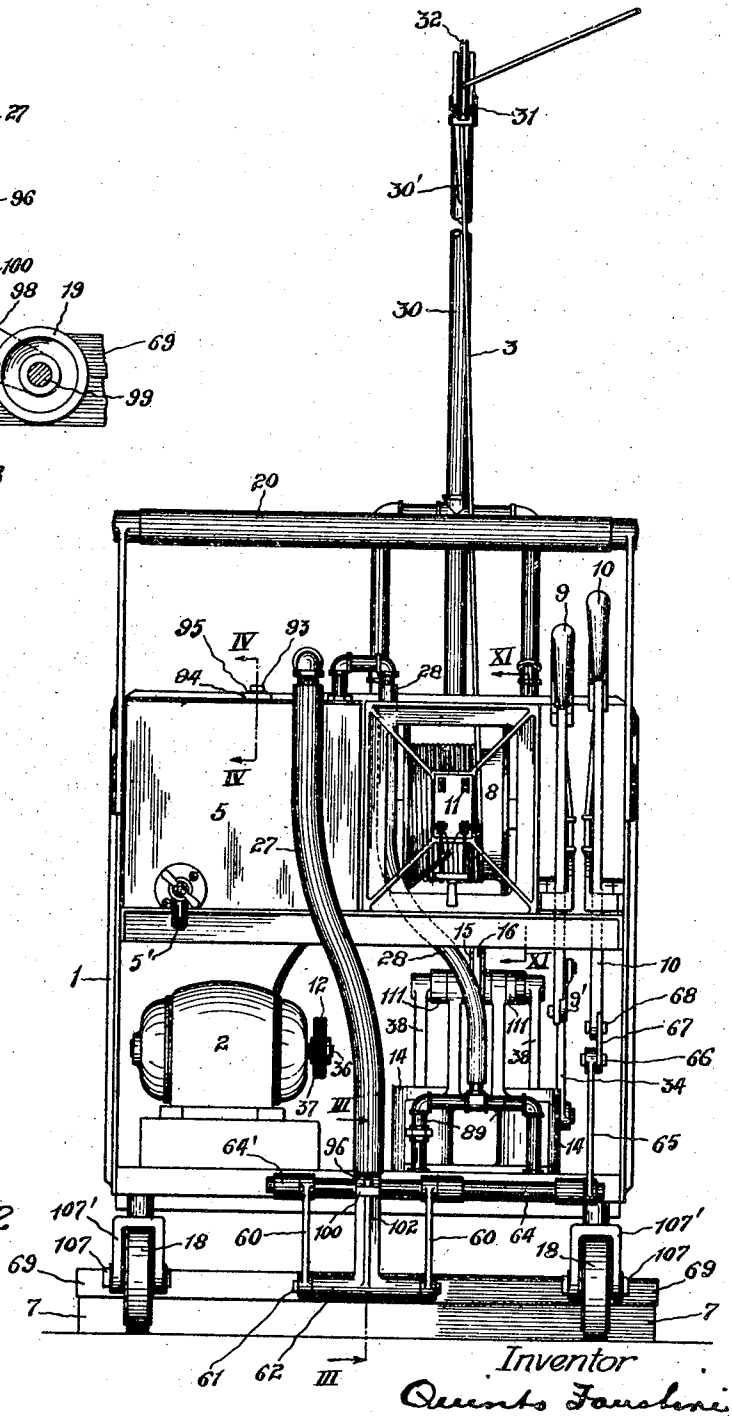


Fig. 2

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6 SHEETS—SHEET 3.

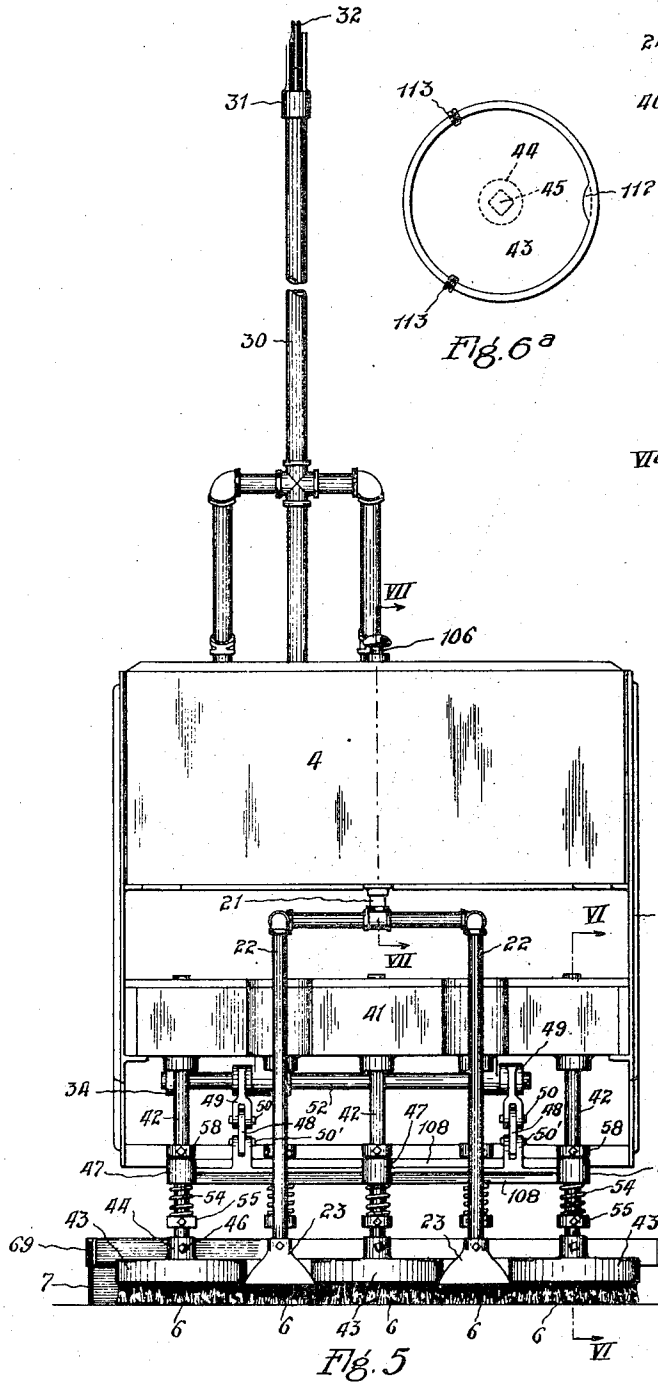


Fig. 5

Fig. 6a

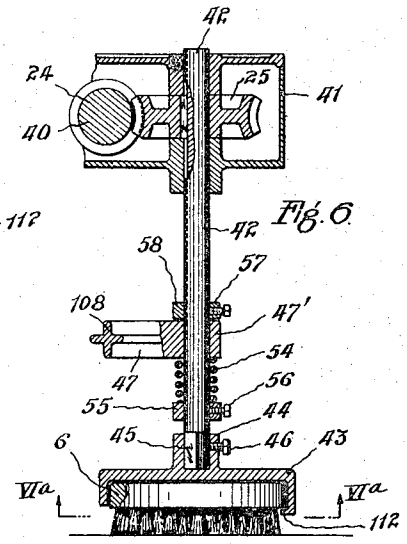


Fig. 6

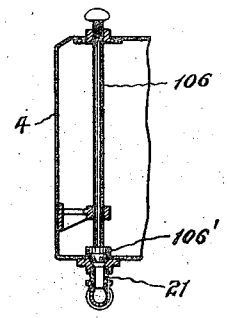


Fig. 7

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6 SHEETS—SHEET 4.

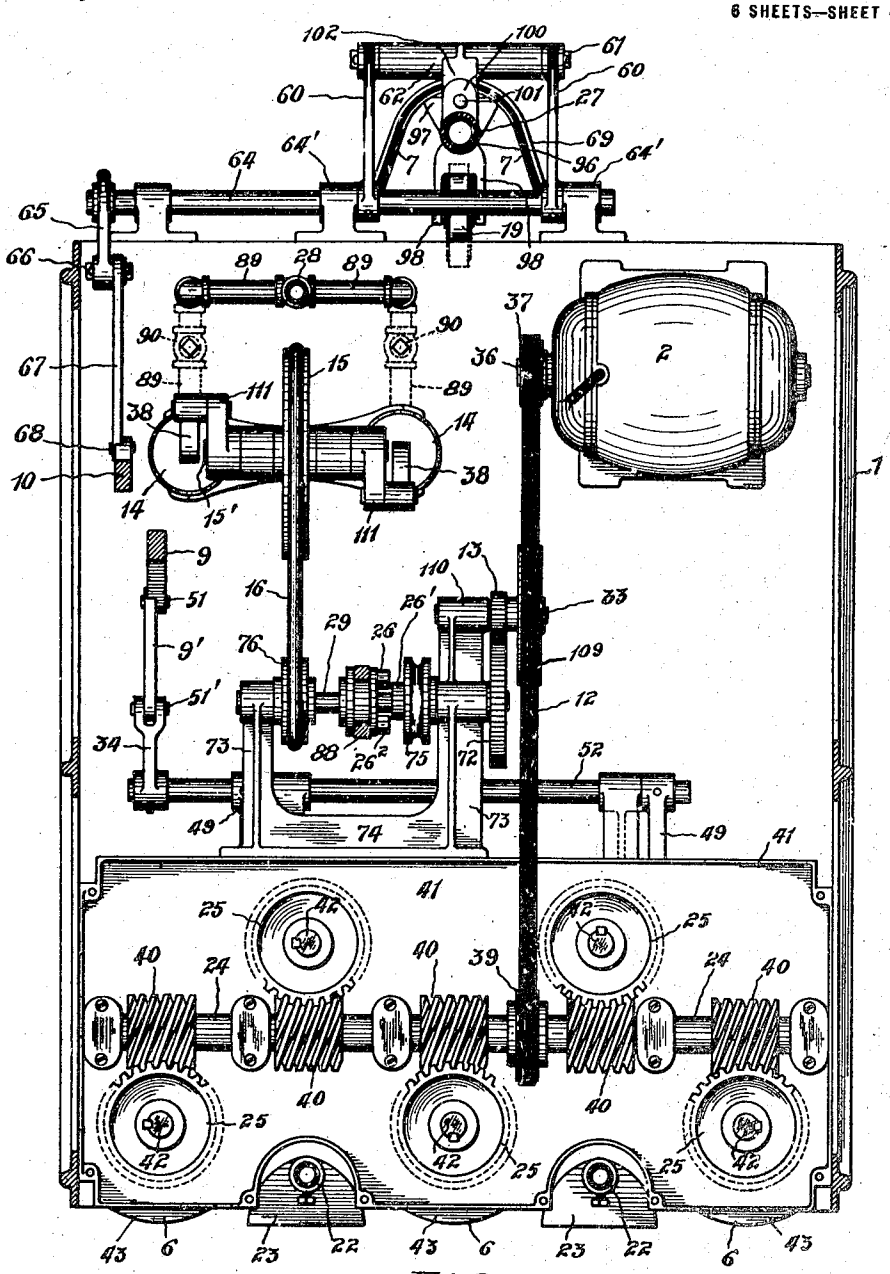


Fig. 8

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6 SHEETS—SHEET 5.

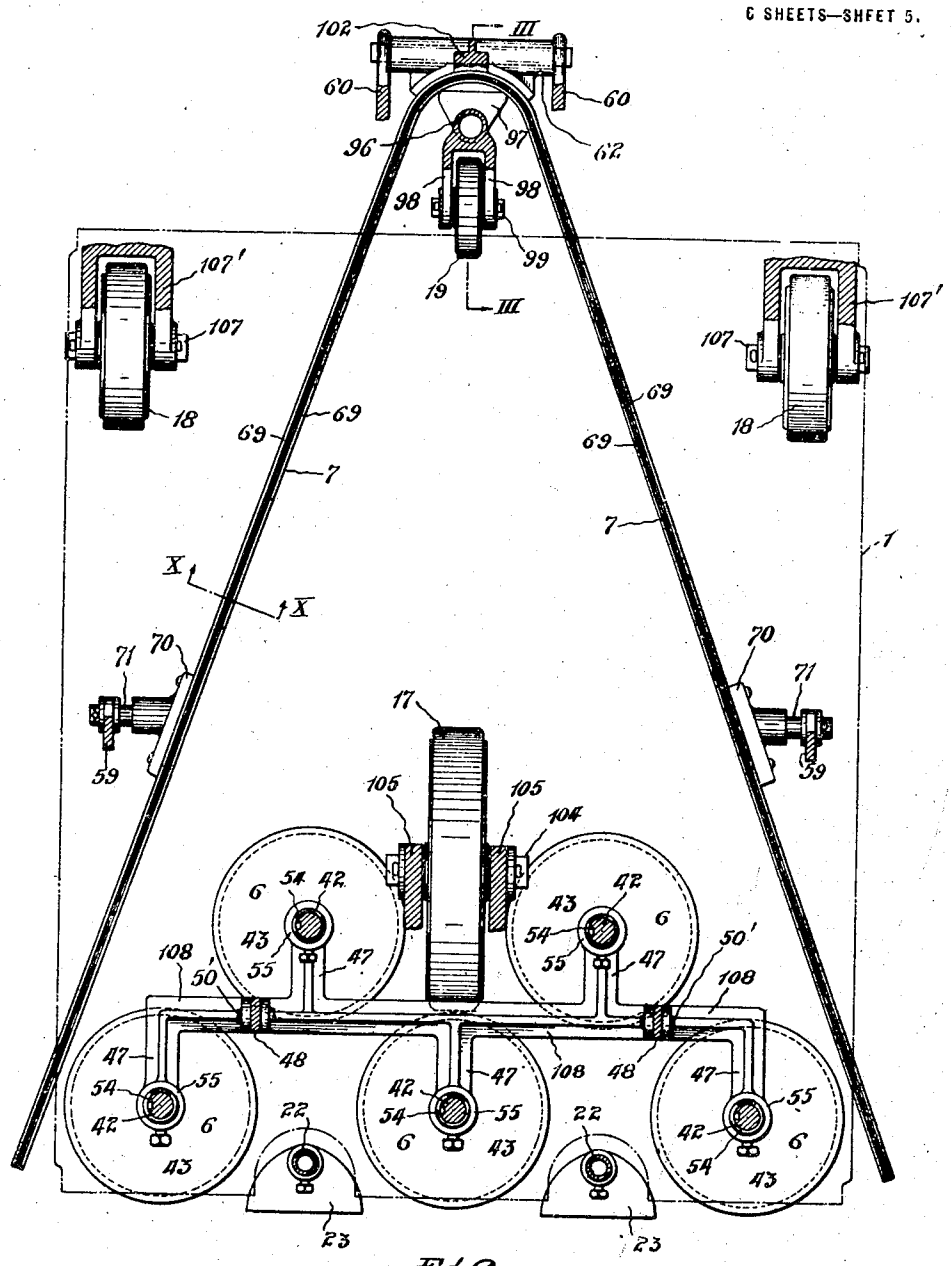


Fig. 9

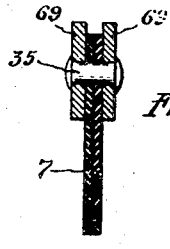


Fig. 10

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6 SHEETS—SHEET 6.

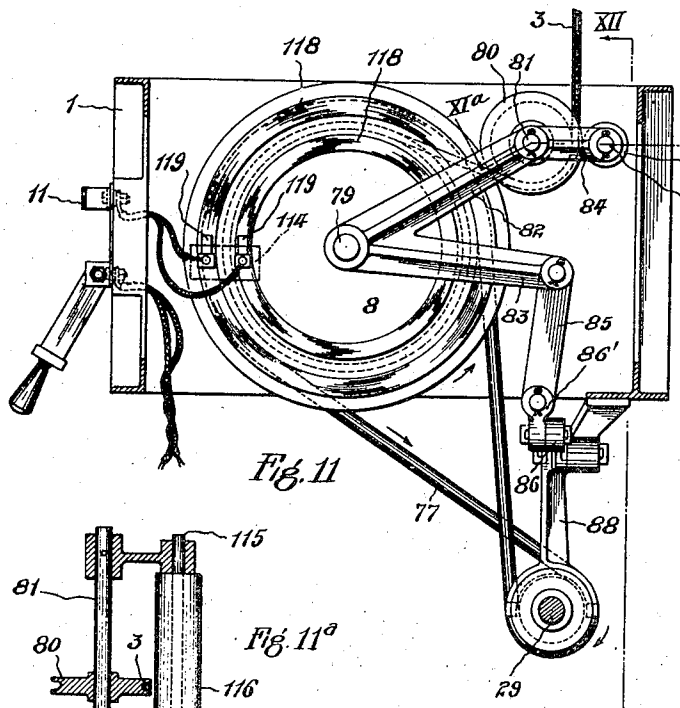


Fig. 11

Fig. 11a

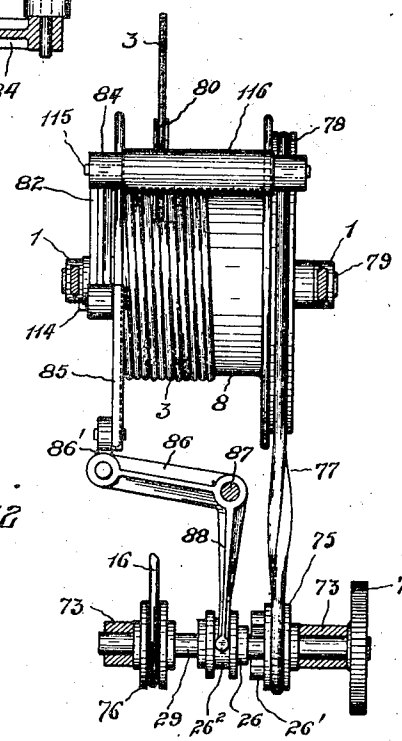


Fig. 12

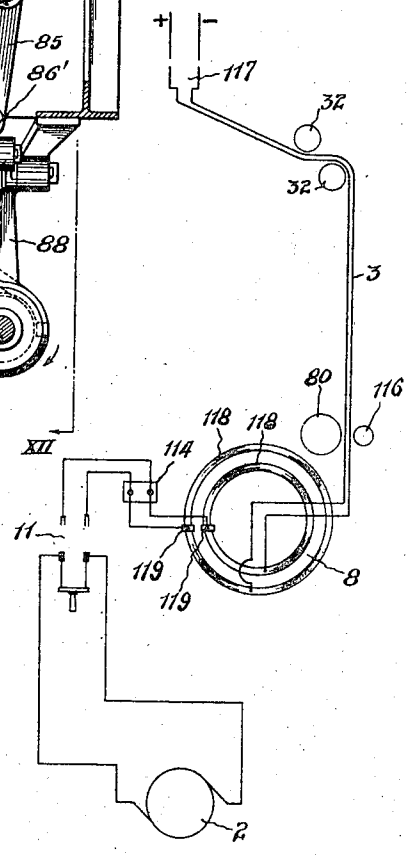


Fig. 13

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UNITED STATES PATENT OFFICE.

QUINTO FAUSTINI, OF CLEVELAND, OHIO.

SCRUBBING-MACHINE.

1,263,396. Specification of Letters Patent. Patented Apr. 23, 1918.

Application filed June 21, 1917. Serial No. 176,002.

To all whom it may concern:

Be it known that I, QUINTO FAUSTINI, a subject of the King of Italy, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented new and useful Improvements in Scrubbing-Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to scrubbing machines and particularly to that class of such machines which are electrically driven and are designed for duty in hotels, office buildings, apartments and other buildings having large floor spaces. More particularly, this improved machine is designed to be self-contained as to all of the functions required of such a machine and to be very efficient in its operation and economical in cost of operating the same.

The annexed drawings and the following description set forth in detail certain means embodying my invention, the disclosed means, however, constituting but one of various mechanical forms in which the principle of the invention may be applied.

In said annexed drawings:

Figure 1 represents a side elevation of my improved machine; Fig. 2 represents a rear elevation; Fig. 3 represents a vertical longitudinal section taken in the plane indicated by the lines III—III, Figs. 2 and 9; Fig. 4 represents a vertical section of a fragmentary portion, taken in the plane indicated by the lines IV—IV, Fig. 2; Fig. 5 represents a front elevation of the machine; Fig. 6 represents a vertical longitudinal section taken in the plane indicated by the line VI—VI, Fig. 5; Fig. 6ª represents a bottom view of a brush-holder shown in Fig. 6; Fig. 7 represents a vertical longitudinal section taken in the plane indicated by the line VII—VII, Fig. 5; Fig. 8 represents a horizontal section taken in the plane indicated by the lines VIII—VIII, Fig. 1; Fig. 9 represents a horizontal section taken in the plane indicated by the lines IX—IX, Fig. 1; Fig. 10 represents a vertical section of a fragmentary portion taken in the plane indicated by the line X—X, Fig. 9: Fig. 11 represents a vertical section of a fragmentary portion taken in the plane indicated by line XI—XI, Fig. 2; Fig. 11ª represents a horizontal section taken in the plane indicated by line XIª—XIª, Fig. 11: Fig. 12 represents a transverse vertical section taken in the plane indicated by the line XII—XII, Fig. 11, and Fig. 13 represents a diagrammatic view of the electrical circuit. Fig. 1, Fig. 2 and Fig. 5 are shown to a smaller scale than the balance of the figures.

Referring to the annexed drawings, I shall first refer by reference numerals to a number of main parts of my improved machine which are a frame 1 with suitable subdivisions properly designed to support and aline the various operating parts, as will be hereinafter fully explained, a motor 2; an extension cord or power cable 3; a fresh water tank 4; a tank 5 for used or dirty water; a plurality of scrubbing brushes 6; a wiper 7; a drum 8 upon which the power cable is automatically wound or from which it is automatically unwound; a lever 9 for raising and lowering the scrubbing brushes from the floor being cleaned; a lever 10 for raising or lowering the wiper from the floor; a switch 11 for throwing the motor into circuit; a chain 12 for driving the scrubbing devices and a pump 14 from the motor; a pulley 15 utilized in the pump drive; a belt 16 for said pump; a comparatively large front wheel 17 and two comparatively small casters 18 for supporting the front and rear of the machine, respectively, and upon which wheel and casters the machine is designed to be rolled about easily by means of a handle 20; a small caster 19 for the wiper frame; a main pipe 21 from the fresh water tank 4, branch pipes 22 from said main pipe 21 and fresh water distributers 23; a main scrubber shaft 24; a worm gear drive 25 for each scrubbing device 6; a clutch 26 designed to automatically let out or automatically wind up the extension cord 3; a main pipe 27 leading into the tank 5 designed to receive the dirty

water; a suction air pipe 28 leading from the used water tank to the pump 14; a shaft 29 from which the cable drum 8 and the pump pulley 15 are driven; a trolley pole 30 with the swiveled arm 31 carrying trolley wheels 32, said pole 30 being mounted upon the top of frame 1.

Other features with various details will now be filled into the several main parts hereinbefore mentioned to connect the same up into an operative whole comprising my improved scrubbing device.

The motor 2 is provided with the motor shaft 36 upon which is mounted sprocket 37 over which the chain 12 runs to a sprocket 39 on the main scrubbing shaft 24. The shaft 29 from which the cable drum 8 and the pump pulley 15 are driven, rotates in bearings on brackets 73, 73, secured to the gear case 41. On this shaft 29 is mounted a gear 72 which is driven by a pinion 13. This pinion is secured on a shaft 33 journaled in a bracket 110 extending from one of the brackets 73. This shaft 33 also carries a sprocket 109 disposed in line with the sprockets 37 and 39 so that it is also engaged and actuated by the chain 12.

The main scrubbing shaft 24 is provided with five worm portions 40, respectively, meshing with the worm gears 25 to rotate the scrubbing devices 6. This main scrubbing shaft 24 and the several worm portions and worm gears and connected parts are contained within a gear case 41. The several worm gears 25 are splined to shafts 42 to the bottom of which are secured the scrubbing brushes 6 by means of a brush-holder 43, said scrubbing devices 6 being secured in said brush-holders 43 by lug 112 and two screws 113, as plainly shown in Figs. 6 and 6a. Said brush-holder 43 is secured to the squared bottom end 45 of the shaft 42 by means of a hub portion 44 and the screw 46, as plainly shown in Fig. 6. Shafts 42 and hence the scrubbing devices 6 are raised and lowered by a frame 108, Fig. 9, provided with lateral extensions 47 for each of the scrubbing devices 6, each of these extensions having a boss 47'. Said extensions 47 are mounted on shaft 42 between a collar 58 adjustably secured to the shaft 42, and a spiral spring 54 whose lower end bears upon a second collar 55 adjustably secured to the shaft 42, the tension of said spring 54 being such that the scrubbing device 6 is resiliently held to contact with the floor and thus compensation is made for the irregularities of the floor. The main frame 108 is in turn raised and lowered by means of the operating lever 9, which is shown in Fig. 1, in that position in which the scrubbing devices 6 are in contact with the floor, the connections between said operating lever 9 and said main frame 108 being link 9', pins 51 and 51', lever 34, main shaft 52, the pair of levers 49, pins 50 and 50' and the pair of short links 48, all as plainly shown in Figs. 1, 2 and 8.

The wiper 7 is of the construction and shape plainly shown in Figs. 9 and 10, and as plainly shown in said Fig. 9, is widened out to comprehend a space somewhat more than the width of the machine and narrowing back to quite a sharp angle at the rear of the machine, into which angle the water is gathered and segregated as the machine is propelled. Said wiper comprises a lower two-ply rubber portion, as shown in Fig. 10, held in position by rivets 35 between two bars 69 and its upper end. To these bars are secured short brackets 70 by means of rivets. Pivot pins 71 are fastened in these brackets on which lateral supporting links 59 are oscillatorily mounted. These links 59 in turn are pivoted to the main frame 1, as plainly shown in Fig. 1. The wiper 7 is raised and lowered by two levers 60 secured to the shaft 64. These levers are pivotally connected to a casing 62, said casing also supporting the rear of the wiper 7. The shaft 64 is journaled in brackets 64' fastened to the main frame. To the shaft 64 is also secured an arm 65 operatively connected to the lower end of the lever 10 by means of a short link 67 and pins 66 and 68, said lever being shown in Fig. 1 in that position in which the wiper 7 is in contact with the floor.

Secured in the lower end of the tube 27 which leads into the dirty water tank 5 is a hollow member 96, having a mouth 97 disposed adjacently to the floor when the machine is in operation and contiguously to the sharp angle formed by the two arms of the wiper 7, so that the dirty water gathered and segregated in said angle is adapted to be picked up by said mouth 97, as hereinafter fully explained. Said hollow member 96 is provided with a bracket portion comprising two arms 98 forming a support for an axle 99 upon which the caster 19 for the wiper frame is mounted. Said hollow member 96 is also formed with two lugs 100 formed with suitable holes for the reception of a pin 101, said pin also passing through a suitably alined hole of an upward extension 102 of the member 62, a compression spring 103 being secured upon said pin 101 and of a tension such as to bring the angle of the wiper 7 to bear with the necessary pressure upon the floor and to compensate for any wear upon said angle in the wiper.

The shaft 29 from which the cable drum 8 and the pump pulley 15 are driven, carries two pulleys 75 and 76, pulley 75 being loose

upon the shaft 29. Secured to pulley 75 are clutch teeth 26′ of the clutch 26, and splined to shaft 29 is another member 26^2 of said clutch 26. Running over the pulley 75 is a round belt 77 which also runs over a pulley 78 secured to one side of the cable drum 8, said drum being rotatably mounted on a shaft 79. The extension cord or power cable 3 after passing between the two trolley wheels 32 and into the trolley pole 30, emerges from a slot 30′ in said pole and is passed to and under a wheel 80 loosely mounted upon a shaft 81 and thence said power cable is wound upon the cable drum 8. Said shaft 81 and hence the wheel 80 is free to have a limited up and down movement, as will be hereinafter fully explained. Said shaft and wheel are supported by a pivoted arm 82 of the construction plainly shown in Fig. 11 which is pivoted to and supported by the shaft 79. Secured to the lower member 83 of said arm is a link 85 which is in turn pivotally connected by means of a link 86′ to a member having arms 86 and 88 pivoted at 87 on a bracket fixed to the main frame 1. The lower arm 88 of this member is formed into a forked end serving as a shifting yoke for the clutch member 26^2. An integral extension 84 of the arm 82 forms a bearing for a shaft 115 loosely supporting a roller 116, Figs. 11^a and 12, and this roller is so disposed with reference to the pulley 80 that the power cable 3 passes between said pulley 80 and said roller 116, the purpose being to prevent the separation of the cable from said pulley 80, the latter traveling longitudinally of the shaft 81 upon which it is loosely mounted and along the whole face of the roller 116 accordingly as the cable 3 is wound around and across the drum 8. The limited downward movement of the pulley 80, shaft 81, extension 84, shaft 115 and roller 116 is effected by gravity and the same takes place whenever there is any slack cord. It will be evident that this downward movement of the pulley 80 will, through the connecting devices shown in Fig. 11, effect the junction of the clutch members 26′ and 26^2 so as to allow the belt 77 to turn the cable drum 8 to wind up such slack cord. Now, as soon as said slack is entirely wound up, the tension in the cord, that is, the upward pull of the cord will lift the pulley 80, and connected parts, which through the connecting devices hereinbefore mentioned will disengage the clutch parts 26′ and 26^2 and stop the rotation of the cable drum 80.

The pump pulley 15 is supported upon a shaft 15′ to which are connected crank arms 111 which actuate the pistons of the double acting pump 14 by means of the connecting rods 38. This pump through suitable connections 89 provided with check valves 90, is connected with the air pipe 28 leading from the dirty water tank 5. The structure is thus designed to create a suction in said tank 5 sufficiently strong to elevate the dirty water from the angle at the rear of the wiper 7. Said tank 5 is provided with a float 91 fastened to a rod 92 having a head 93 and passing through a suitable hole in the flange member 94 secured to the top of the tank 5. A rubber disk 95 is secured to the bottom of the head 93. When the tank 5 is filled with dirty water to a level which will raise the float 91, a visible signal will be thereby given to the operator and in addition air will be admitted to the tank 5 so that by no chance will the pump 14 be flooded with water. A faucet 5′ is provided for emptying this tank 5.

As shown in Fig. 7, the fresh water tank 4 is fitted with a valve 106 having a plug 106′. This valve is provided as a simple means of shutting off the steady flow of fresh water into the main pipe 21 from which the water regularly passes through the branches 22 to the pair of distributers 23 plainly shown in Fig. 5. The valve is held in the up position during the operation of the machine by a wedge under the head or other suitable means.

The front wheel 17 is mounted upon an axle 104 which is journaled in brackets 105 extending up to and supporting the gear case 41. The rear wheels 18 are supported on axles 107 which are mounted in swivel brackets 107′. These brackets support the main frame 1 at the rear.

The electrical current for operating my improved scrubbing machine is taken from any convenient lamp socket usually found in the ceiling or wall of the room in which the machine is to be used. For this purpose the cord 3 is provided at its upper end with a usual plug 117. The lower end of the two conductors in this cord 3 are each fastened to a collector ring 118, 118, mounted on the drum 8. In contact with each collector ring is a brush 119, 119. From each brush the current is carried to a binding post on an insulated block 114 and thence to one end of the switch 11. These means permit the winding or unwinding of the drum 8 without interfering with the passage of the current to the switch. When the switch 11 is closed it is evident that the current passes through the motor, thus causing the brushes 6 to rotate and the pump 14 to create a vacuum for sucking the dirty water into the tank 5.

What I claim is:

In a scrubbing machine, the combination of a main frame; a motor mounted therein; scrubbing devices actuated by said motor; a water storage tank carried by said frame; a pump actuated by said motor for creating

a vacuum in said tank; a float disposed in said tank; a rod secured to said float and extending upwardly therefrom; said tank being provided with an opening of larger diameter than the diameter of said rod and through which opening said rod extends; a closure for said opening secured to said rod and adapted to be removed from said opening by the upward movement of said rod; and a conduit leading from a point adjacent the floor to said tank for conveying dirty water to the latter.

Signed by me, this 19th day of June, 1917.

QUINTO FAUSTINI.