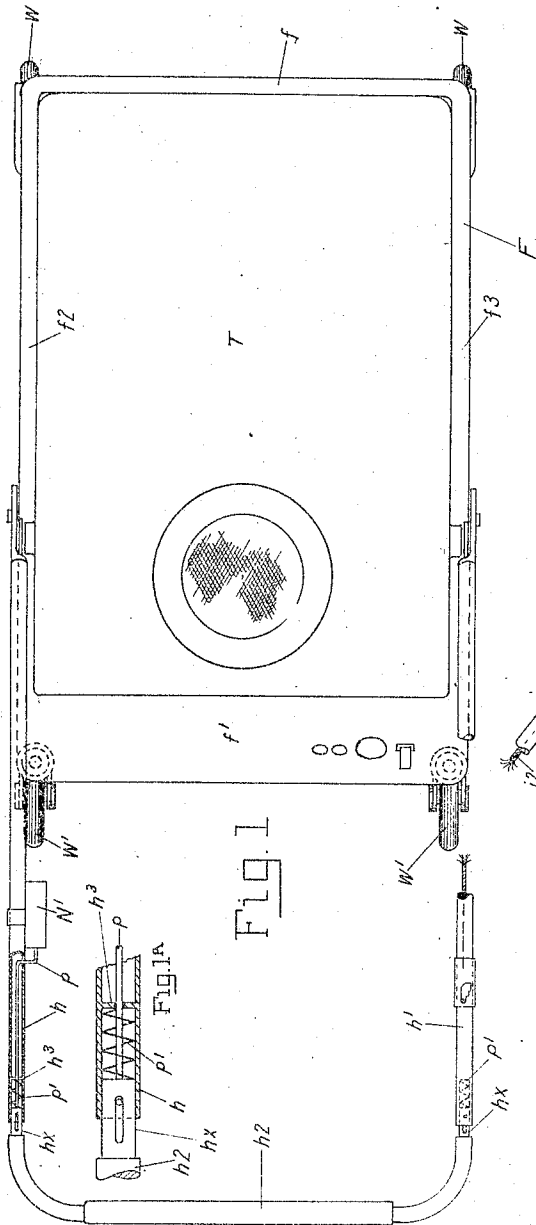
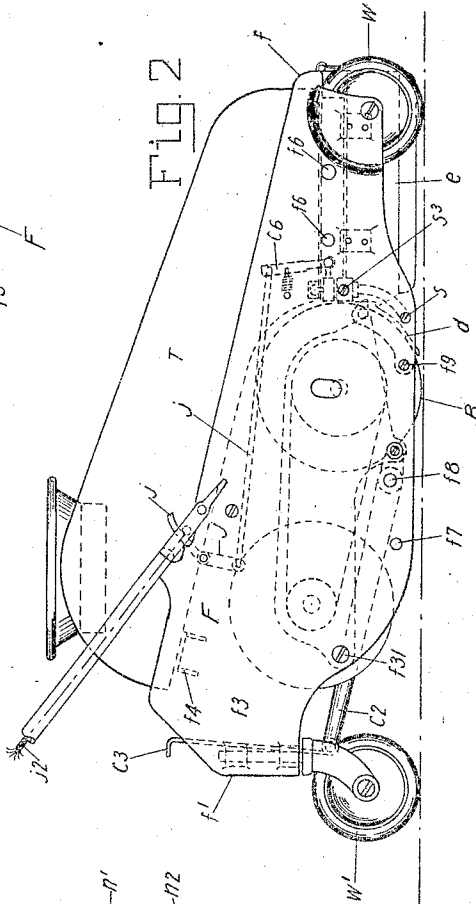
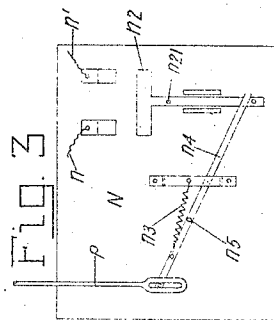


M. H. CRAPSER.
FLOOR SCRUBBING MACHINE.
APPLICATION FILED MAY 29, 1915.

1,214,513.

Patented Feb. 6, 1917.
4 SHEETS--SHEET 1.



Witnesses:
Dorothy Muatt
Frank W. Pierson

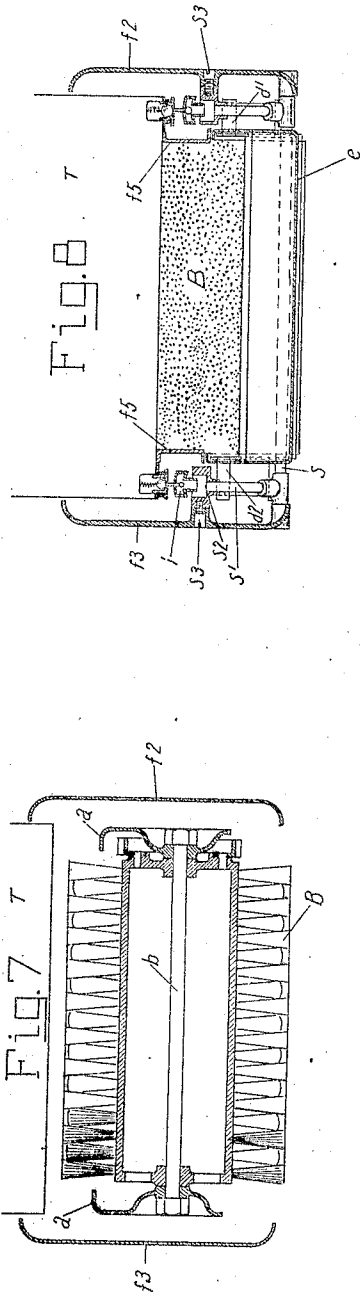
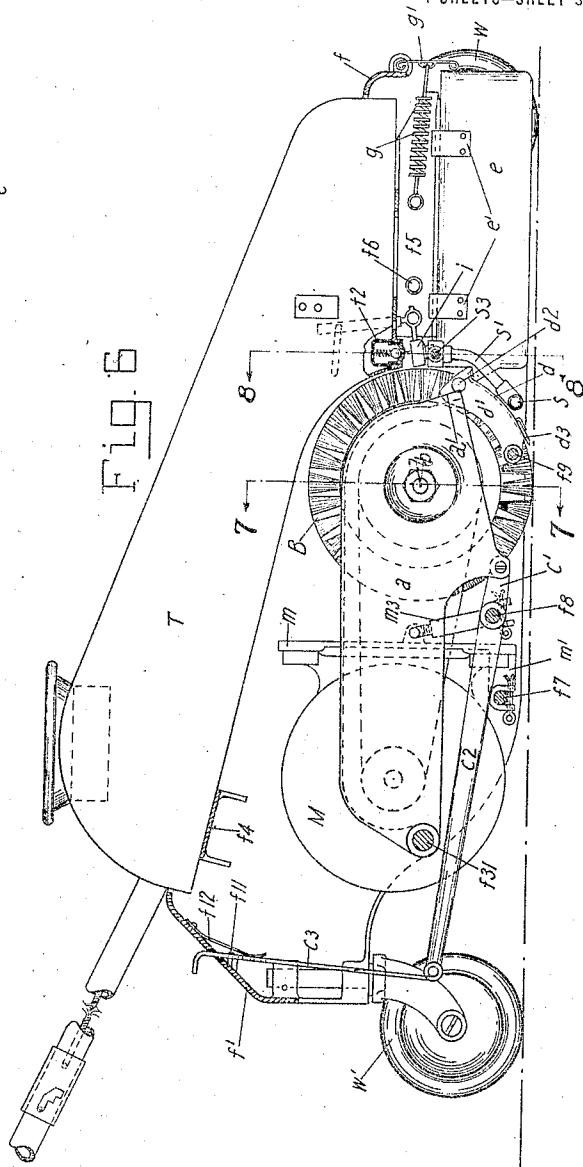
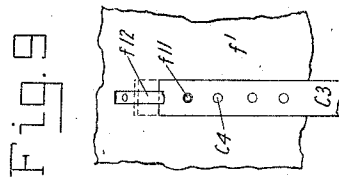
Inventor
Morris L. Crapser
By his Attorney
Geo. H. Muatt

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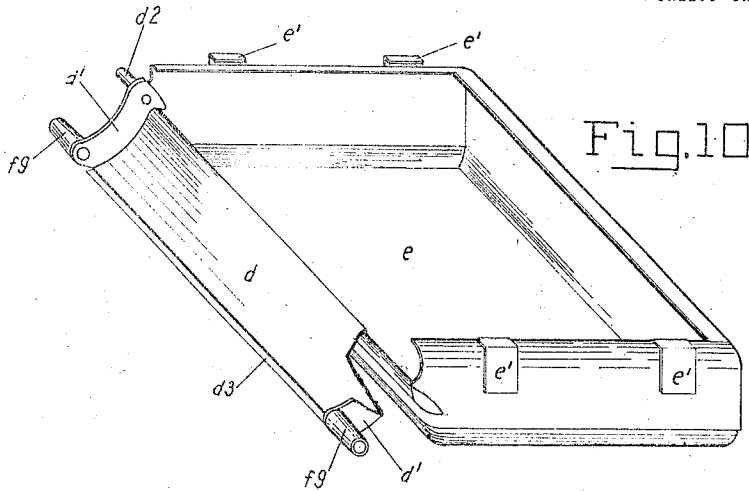


Fig. 10

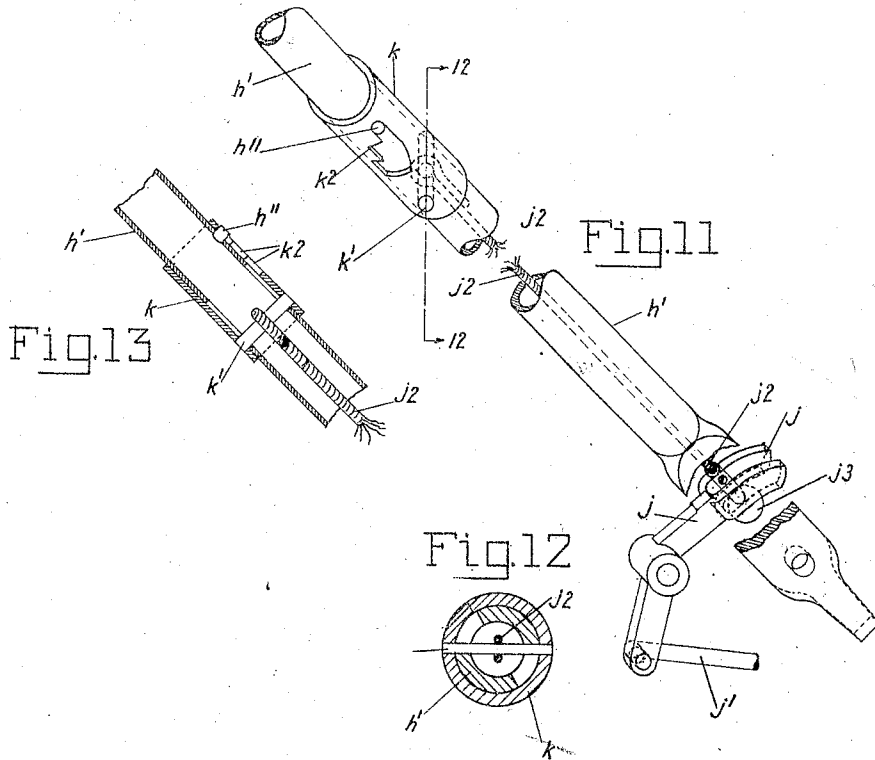


Fig. 11

Fig. 12

Fig. 13

Witnesses:
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UNITED STATES PATENT OFFICE.

MORRIS H. CRAPSER, OF NEW YORK, N. Y., ASSIGNOR TO EMMOR J. STEWART, OF NEW YORK, N. Y.

FLOOR-SCRUBBING MACHINE.

1,214,513.

Specification of Letters Patent.

Patented Feb. 6, 1917.

Application filed May 29, 1915. Serial No. 31,099.

To all whom it may concern:

Be it known that I, MORRIS H. CRAPSER, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Floor-Scrubbing Machines, of which the following is a specification.

My improvements relate to floor scrubbing apparatus of the rotary cylindrical brush type, and more particularly to those in which electricity is utilized as the motive power.

The main object of the invention is to afford a non-reversible, one way, floor scrubbing machine of relatively light weight and simplicity of structure, adapted to conditions and situations where the use of the heavier reversible machines is inexpedient.

The invention consists essentially in the specific construction and arrangement of parts described and claimed, distinctive features being the use of means whereby the motor is stopped automatically when the propulsion of the machine is stopped, and started automatically just prior to the beginning of the forward movement of the machine; whereby the wear of the brush is compensated for, and the aprons held in slight peripheral contact therewith under all conditions of use; whereby the supply of water to the brush is regulated and controlled; and other details hereinafter more fully set forth.

In the accompanying drawings, Figure 1, is a top view of my improved scrubbing machine, parts being shown as broken away and in section; Fig. 1^a, is an enlarged sectional detail view of interlocking parts of the handle; Fig. 2, is a side elevation, with most of the handle omitted; Fig. 3, is a detail view of electric switch mechanism suitable for use in the automatic control of the motor; Fig. 4, is a top view of the apparatus with the tank removed; Fig. 5, sectional elevation upon a larger scale showing the apron control, water supply mechanism, &c., in detail; Fig. 6, sectional elevation upon a scale larger than Fig. 2, with parts broken away; Fig. 7, a sectional elevation taken upon plane of line 7—7, Fig. 6; Fig. 8, a sectional elevation taken upon plane of line 8—8, Fig. 6; Fig. 9, is a detail of the brush manipulating handle; Fig. 10, a perspective view of the splash apron and receptacle;

Fig. 11, a detail perspective of the water control. Fig. 12, is a transverse section taken upon plane of line 12—12, Fig. 11. Fig. 13, is a longitudinal sectional elevation of the structure shown in the upper portion 60 of Fig. 11.

The carriage frame of the machine is essentially rectangular in general configuration, consisting of the front member f , the rear member f' , and the side members f^2 , f^3 . 65 This frame is supported on front rollers or wheels w , w , and on rear rollers or wheels w' , w' , which latter are caster-mounted.

The tank T, rests at the rear on a cross beam f^4 , secured to and extending between 70 the side members f^2 , f^3 , of the carriage frame F,—and at the front on top of the two parallel channel angle irons f^5 , f^5 , which are rigidly supported on the cross bars f^6 , f^6 , secured to and between said side members f^2 , f^3 , of the frame F,—the body of the tank T, fitting the space between the upper edges 75 of the end and side members of the frame F, and acting as a cover to the motor M, brush B, and other operative parts below, as will 80 be seen more particularly by reference to Figs. 1, 4, and 5. f^7 , is also a cross bar rigidly secured to and between the side members f^2 , f^3 , of the carriage frame F, near the lower medial portion thereof, and f^8 , 85 a rock shaft similarly situated and mounted in and between said side members f^2 , f^3 . The motor M, is supported on the cross bar f^7 , and rock shaft f^8 , as will be understood by reference more particularly to Figs. 5, 90 and 6. That is to say the base plate m , on which the motor M, is mounted is formed with bifurcated arms m' , m' , which straddle the cross bar f^7 , and with lugs m^2 , m^2 , to which is pivotally connected a brace rod m^3 , 95 the lower bifurcated end of which straddles the rock shaft f^8 . The brace rod m^3 , is preferably made adjustable in length so as to afford a small margin of lateral adjustment for the base plate m , and motor M, 100 for the purpose of taking up any undue slack of the sprocket chain (represented by the line m^4 .) which transmits motion from the motor M, to the brush B, which is also adjustable within certain limits in the arc of a circle 105 of which the cross bar f^7 , is the center.

The brush B, is mounted to turn loosely on an axial rod b , secured to and between the forward portions of the parallel suspenders a , a , (as shown particularly in Fig. 11)

7,) the rear portions of which are respectively and pivotally supported on studs f^{21} , and f^{31} , on the inner sides of the side members f^2 , f^3 , of the carriage frame F. The forward portions of the parallel brush suspenders a , a , are pivotally supported on arms c' , c' , rigidly attached to the rock shaft f^3 , which latter also acts as the fulcrum for the rearwardly projecting lever c^2 , by which the position of the brush B, as related to the floor, is regulated. To facilitate this adjustment the rear end of the lever c^2 , may be pivotally connected with a manipulating handle c^3 , the upper end of which protrudes through the rear member f' , of the carriage frame F, as shown more particularly in Fig. 6. It is evident that as this manipulating handle c^3 , is lowered the brush suspenders a , a , through the medium of the lever c^2 , rock shaft f^3 , and arms c' , c' , will be rocked on their supporting pivots f^{21} , f^{31} , to raise the forward portions of said suspenders a , a , and vice versa; and for this reason means are provided for adjustably securing the manipulating link c^3 , in prescribed positions, so as to control the peripheral juxtaposition and contact of the cylindrical brush B, with relation to the floor, or other surface to be scrubbed.

Various mechanical expedients may be resorted to for holding the handle c^3 , in different positions, and I do not wish to limit myself in this respect. As shown in the drawings the handle c^3 , is formed with a series of holes or notches c^4 , for engagement with a stud f'' , on the inner side of the rear member f' , of the carriage frame F, a spring f^{12} , also attached to the inner side of said rear member f' , of the frame, being utilized to yieldably maintain engagement between stud f'' , and handle c^3 , while allowing the latter to be rocked forward against the resistance of said spring to disconnect the handle from the stud f'' , for purposes of adjustment. By this means the brush may be raised from contact with the floor, or the extent of contact therewith may be changed or varied to meet requirements, and to compensate for peripheral wear of the brush,—all important functions in the practical and effective operation of the apparatus.

Another important function in connection with the suspenders a , arms c' , rock shaft f^3 , lever c^2 , and manipulating handle c^3 , is their utilization as a means of controlling and insuring suitable peripheral contact of the brush B, with the splash apron d , interposed between said brush and the splash receptacle e , it having been found through practical investigation that a slight, delicate, but positive contact between brush and apron is essential to prevent drip, and to otherwise attain the best results. To this end the side flanges d' , d' , of the splash apron d , are pivotally supported at their lower ends on studs f^{21} , on the inner sides of the side members f^2 , f^3 , of the carriage frame F, said side flanges d' , d' , being also formed with protuberances or shoulders d^2 , d^2 , for contactual engagement with the inclined planes a' , a' , on the fronts of the suspenders a , a , as shown in Figs. 5, 6, and 8. These controlling surfaces a' , a' , are inclined upward and backward from the forward extremity of each suspender a , so that as the latter are lowered to compensate, say, for the peripheral wear of the brush B, the upper portion of the splash apron d , will be allowed to approach and contact with the brush more closely, which it does by reason of elastic resilient pressure applied to the upper part of the apron, which pressure tends constantly to thrust the apron against the periphery of the brush, thereby (the brush rotating from right to left, or inversely as related to the direction of travel of the apparatus) insuring the sweeping up over the apron d , and into the receptacle e , of all water, dirt, splash, &c. In this connection it is to be noted that the side or end flanges d' , of the apron d , prevent side wash.

The elastic resilient pressure applied against the upper part of the apron d , to insure contact with the periphery of the brush may be maintained by the use of various mechanical expedients, either directly or indirectly. In the arrangement disclosed in the drawings I show this pressure as applied indirectly to the apron d , through the medium of the splash receptacle e , the rear edge of which bears against the forward edge or side of the apron, and the elastic resilient pressure being afforded by retractile springs g , g , interposed between stationary parts of the apparatus and the said splash receptacle e , which latter is movably supported upon the framework. Thus, in the construction shown in the drawings, the splash receptacle e , is slidably mounted upon and between the parallel channel plates f^5 , f^5 , (heretofore referred to as rigidly attached to the cross bars f^6 , f^6 ,) by means of side straps c' , c' , which engage with the lower flanges of the channel plates f^5 , f^5 , so as to support the weight of the receptacle while permitting it to obey the impulse of the springs g , g , and impinge with its rear edge against the apron d , as will be understood more particularly by reference to Figs. 5, and 6, of the drawings. The extent of this impingement is however limited and controlled by the inclined surfaces a' , a' , on the brush suspenders a , a , as heretofore set forth,—said controlling surfaces being sufficient in extent and pitch to afford the requisite extent of adjustment to compensate for the available life or wear of the cylindrical brush used,—the object being to in-

sure a delicate but positive contact between apron and brush periphery, while at the same time the thrust of the springs g , g , is limited and sustained by the suspenders a , a .

5 The splash apron d , is provided at its lower edge with the flexible scraper d^2 , for contact with the floor; and is otherwise constructed to act as a medium of transfer of water, dirt, &c., from the floor into the splash
10 receptacle e , as will be seen by reference more particularly to Fig. 5. The springs g , g , may be attached either directly to the splash receptacle e , or indirectly thereto, as shown in Fig. 6, through the medium of
15 a link g' , pivotally attached to the receptacle e , and to the forward member f , of the carriage frame F . The sprinkling pipe s , is supported upon and between the side members f^2 , f^2 , of the carriage
20 frame, so as to extend in front of and in close proximity to, the splash apron d . It may be supplied with water from the tank T , on one or both sides of the apparatus. I herein show the means of supply
25 arranged on the right hand side of the apparatus adjacent to the side member f^3 , of the carriage frame, with the understanding that the same or equivalent means may be duplicated on the opposite side of the appa-
30 ratus adjacent to the side member f^2 , if desired.

As shown particularly in Figs. 5, and 6, the sprinkler s , is connected by a pipe s' , with a stationary funnel s^2 , attached to stud
35 s^3 , or other support on the inner side of the side member f^3 , of the frame F . An intermediate movable funnel i , telescopes with this stationary funnel s^2 , and is supported on a rocker arm i' , extending radially from
40 the rock fulcrum i^2 , pivotally supported on the side member f^3 , of the frame F . The rocker arm i' , carries a valve stem i^3 , to which is attached the valve i^4 , which is seated normally on the outlet port t , of the tank
45 T , by means of a spring t' , interposed between said valve i^4 , and the valve cage t^2 . The arm i' , and fulcrum i^2 , are rocked against the resistance of the valve spring t' , and of the auxiliary spring i^5 , by means of a
50 lever arm i^6 , rigidly attached to the rock fulcrum i^2 ,—said auxiliary retractile spring i^5 , being attached to said lever arm i^6 , and to the side member f^3 , of the frame, or other stationary part. The lever arm i^6 , is in turn
55 actuated by the bell crank lever j , through the medium of the connection rod j' ; and the bell crank lever j , is controlled in position by means of a cord, wire, or equivalent
60 j^2 . To this end, the upper arm of the bell crank lever may be bifurcated as shown in Fig. 11, to straddle a ball or shoulder j^3 , on the pull cord j^2 , and the upper end of the
65 latter may be attached to a cross rod h' , upon a sleeve h , slidable on the member h' , of the handle, which latter is provided with a

pin h'' , adapted to engage with any one of a series of shoulders or offsets h^2 , on the sleeve h , as illustrated in Fig. 11. Thus by pulling upon the cord j^2 , the valve i^4 , may be raised from its seat to admit water through
70 the intermediate funnel i , to the main funnel s^2 , and hence through pipe s' , to sprinkler s ; and by means of the offset shoulders h , (or equivalent means) the flow may be varied and regulated to meet requirements of use. 75

The electric motor M , is controlled by a switch N , interposed in the circuit n , n' , by which the said motor is supplied with an actuating current in a manner well known in the art, it not being deemed necessary herein
80 to show the actual connections with the motor,—the main point in this connection being the method in which the electric circuit n , n' , is automatically closed when the propulsion of the machine is begun and auto-
85 matically opened when propulsion ceases, so that the brush is in operation only during the actual travel of the machine, thus avoiding the wear and marking of the floor by the continuous rotation of the brush after the
90 travel of the machine has stopped. This is an important functional improvement since it has been found that otherwise the continuous rotation of the brush is apt to produce a perceptible effect upon the floor or other
95 surface under treatment if the machine is not kept constantly on the move, which of course is not always practicable. Hence I provide elastic resilient means for opening and closing the electric switch N , and this
100 may obviously be accomplished by resort to well known mechanical and electrical expedients. Thus, by way of illustrating the principle involved, and without desiring to limit myself to this particular construction
105 and arrangement of parts, I show herein diagrammatically a switch adapted for the purpose and actuated by a rod p , controlled by a retractile spring p' , and by the handle of the machine. The side members h , h' ,
110 of the handle are preferably formed of hollow tubes, into the upper ends of which fit telescopically the ends h^x , of the transverse member h^2 , of said handle considered as a whole. The ends h^x , may be slotted
115 longitudinally and coupled to the side members h , h' , by pins as indicated in Fig. 1, or any other mechanical expedient may be resorted to to connect the intumed ends h^x , of the transverse member h^2 , slidably with and
120 upon said side members h , h' . The spring p' , may be duplicated on both sides of the handle, being interposed between the extreme inner faces of the ends h^x , of the transverse member h^2 , and annular shoulders h^3 ,
125 in the side tubes h , h' , as shown in Fig. 1, so that the pressure will be equalized on both sides of the handle.

The switch rod p , is attached, for instance, to the end h^x of the transverse mem- 130

ber h^2 , that fits into the left hand member h , of the handle, so that the spring p' , (or springs p' , p'), tend constantly to push the transverse section h^2 , and said switch rod outward, in which position the component parts of the switch N. will be in the position shown in Fig. 3. That is to say, the bridge blade n^2 , is held out of engagement with the contacts n , n' , by the spring n^3 , acting on the thrust lever n^1 , and the motor M, is at rest. The thrust lever n^1 , fulcrumed at n^2 , engages with the slotted end of the switch rod p , so that when the transverse member h^2 , of the handle is pressed forward to effect the propulsion of the machine, it will compress the springs p' , and cause the switch rod p , to shift the thrust rod over into the reverse position against the resistance of the spring n^3 , which latter however, tends to hold the thrust lever in either position as soon as carried past the fulcrum n^2 , in the manner well known in the art. This reversal of the thrust lever n^1 , causes its free end, by reason of its contact with the projection n^2 , on the bridge member n^2 , to thrust the latter into engagement with the contacts n , n' , thereby closing the electric circuit, and rotating the motor M, and hence the brush B. On the release of the transverse member h^2 , of the handle, the springs p' , return the parts to their normal positions, again opening the circuit n , n' , and cutting out the motor M, and brush B. The quick thrust switch mechanism shown in Fig. 3, or the equivalent thereof, is preferably used to prevent sparking, &c., and may be included in a switch box N', attached to the side member of the handle, as indicated in Fig. 1.

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

1. In scrubbing apparatus of the character designated the combination with the wheeled carriage frame, of a motor mounted thereon, a scrubbing brush actuated by said motor, suspender members upon and between the forward portions of which said brush is mounted, said suspenders being pivotally supported upon and between the side members of said carriage frame, a rock shaft mounted upon and between the said members of the carriage, rocker arms rigidly attached thereto, and pivotally supporting the forward portions of said brush suspenders, and a lever for rocking said rock shaft, for the purpose described.

2. In scrubbing apparatus of the character designated the combination with the wheeled carriage frame, of a motor mounted thereon, a scrubbing brush actuated by said motor, suspender members upon and between the forward portions of which said brush is mounted, said suspenders being pivotally supported at their rear portions upon and between the side members of said carriage

frame, a rock shaft mounted upon and between the side members of the carriage, rocker arms rigidly attached thereto and pivotally supporting the forward portions of said brush suspenders, and a lever for rocking said rock shaft, for the purpose described.

3. In scrubbing apparatus of the character designated, the combination with the wheeled carriage frame, of a motor mounted thereon, a scrubbing brush actuated by said motor, suspender members upon and between the forward portions of which said brush is mounted, said suspenders being pivotally supported at their rear portions upon and between the side members of said carriage frame, a rock shaft mounted upon and between the side members of the carriage, rocker arms rigidly attached thereto and pivotally supporting the forward portions of said brush suspenders, a lever for rocking said rock shaft, and means for securing said lever in a prescribed position, comprising an adjustable manipulating link and latch mechanism, for the purpose described.

4. In scrubbing apparatus of the character designated, the combination with the wheeled carriage frame, of a motor mounted thereon, a scrubbing brush actuated by said motor, suspender members upon and between the forward portions of which said brush is mounted, said suspenders being pivotally supported at their rear portions upon and between the side members of said carriage frame, and means for adjustably supporting the forward portions of the suspenders for the purpose of regulating the peripheral contact of the brush and compensating for wear thereof, substantially as set forth.

5. In scrubbing apparatus of the character designated, the combination with the wheeled carriage frame, of a cylindrical brush, a motor for actuating the same, suspender members upon and between the forward portions of which said brush is mounted, said suspenders being pivotally supported at their rear upon and between the side members of the carriage frame, means for adjustably supporting the forward portions of said suspenders, said suspenders being formed with frontal inclined surfaces, a splash apron the lower portion of which is pivotally supported upon and between the side members of the carriage frame, said apron being arranged to contact with the frontal inclined surfaces on the suspenders, and means for holding said splash apron against said frontal inclined surface on the suspenders by elastic resilient pressure, for the purpose set forth.

6. In scrubbing apparatus of the character designated, the combination with the cylindrical brush and motor for rotating the same, of a splash apron pivotally supported

in close proximity to the brush and adapted to contact with the periphery thereof, a slidable splash receptacle contacting with the upper portion of said splash apron, and
5 elastic resilient means for pressing said splash receptacle against said splash apron, for the purpose described.

7. In scrubbing apparatus of the character designated, the combination of a cylindrical brush, a motor for rotating the same,
10 a splash apron and a splash receptacle arranged in conjunction with said brush to receive the splash therefrom, a liquid reservoir, a sprinkler positioned in front of said brush

and means for effecting and controlling the supply of liquid from said reservoir to said
15 sprinkler, consisting essentially of a stationary funnel attached to said sprinkler, a movable intermediate funnel mounted on a rock shaft, and a valve the stem of which
20 is mounted on the same rock shaft and adapted to control the flow of liquid from the reservoir, and means for rocking said shaft.

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Witnesses:

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