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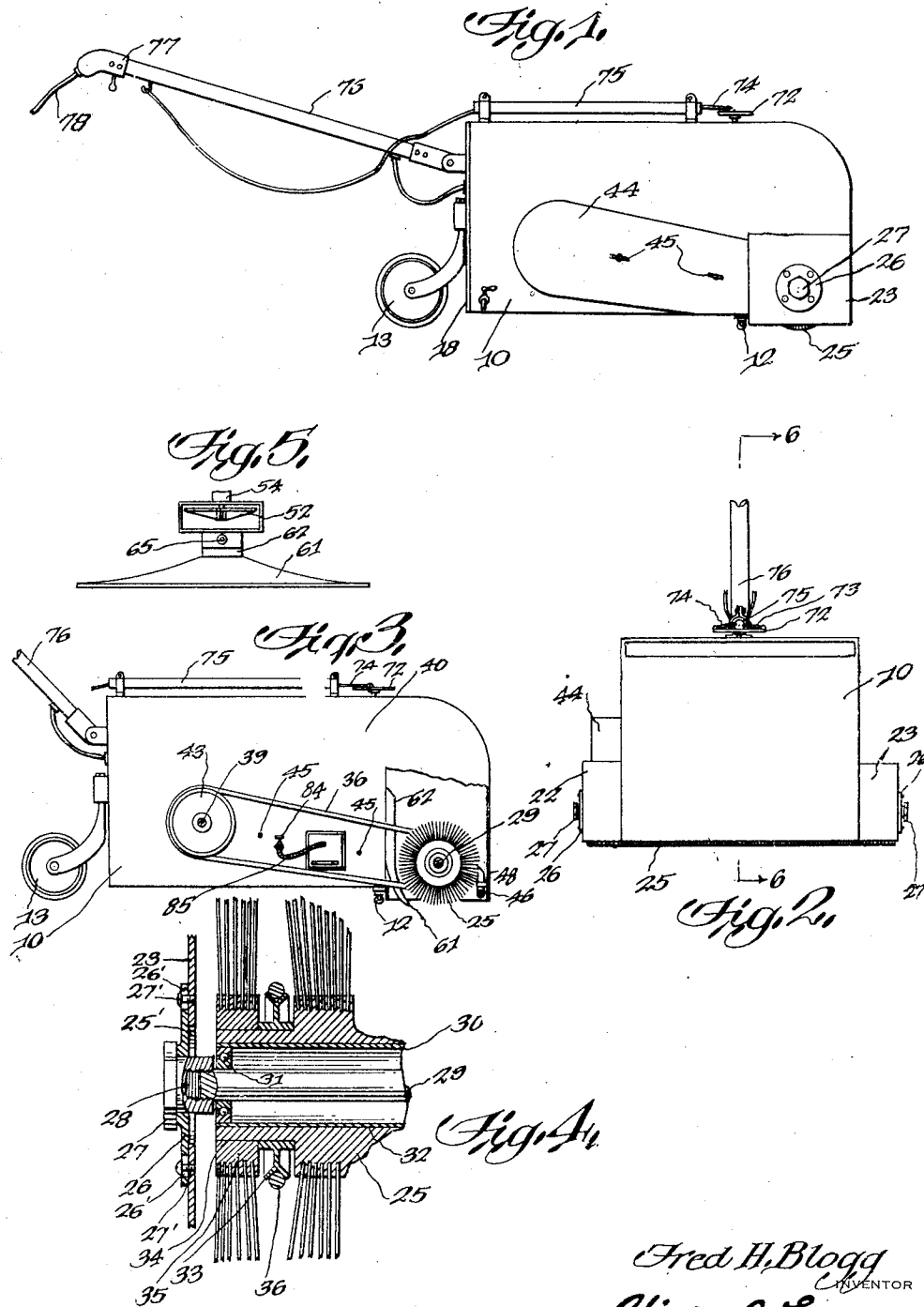
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FLOOR SCRUBBING MACHINE

Filed June 20, 1927

2 Sheets-Sheet 1



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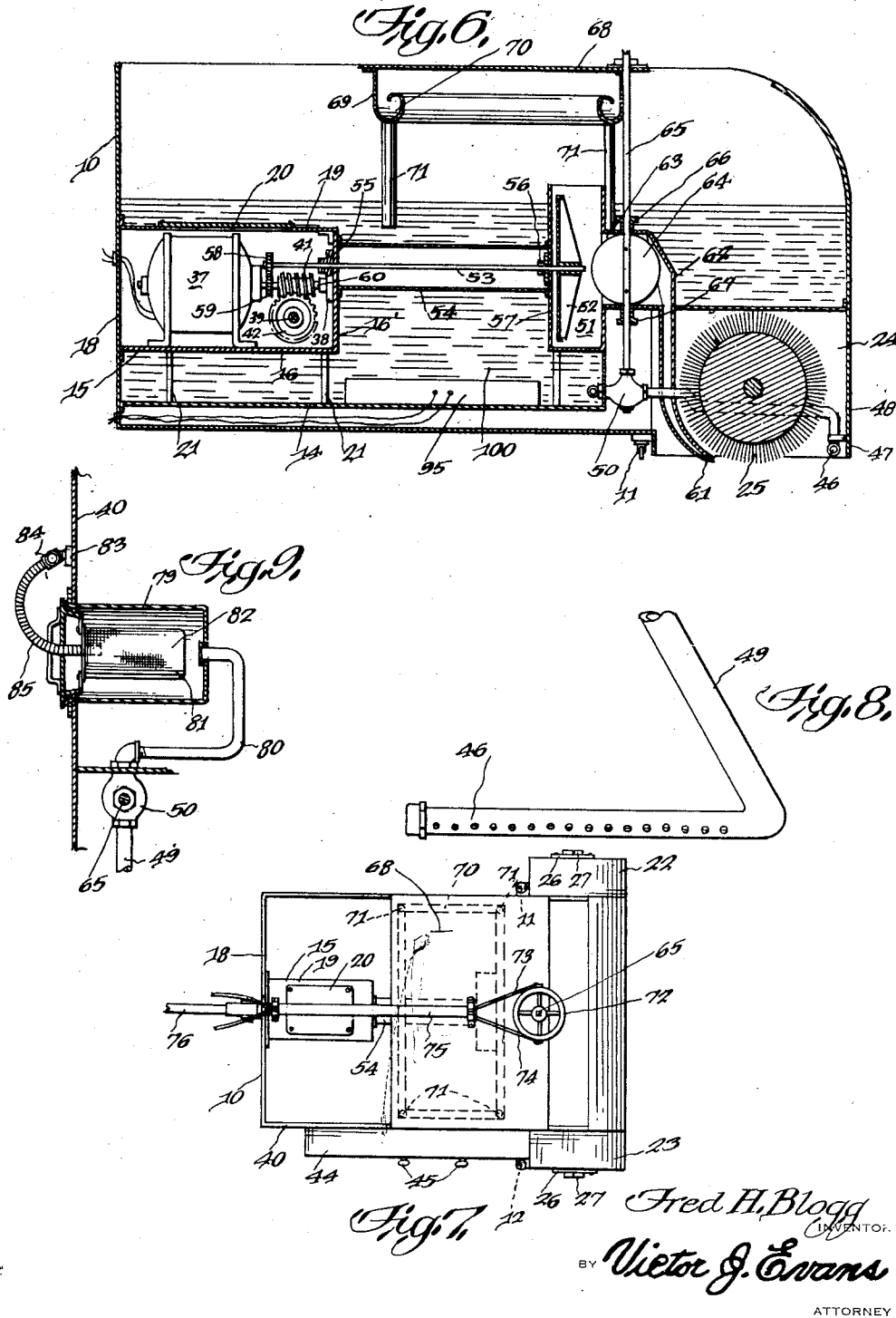
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UNITED STATES PATENT OFFICE

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FLOOR-SCRUBBING MACHINE

Application filed June 20, 1927. Serial No. 200,129.

This invention relates to certain novel improvements in floor scrubbing machines and the principal object of the invention is to provide such a machine which will be simple in construction, efficient in operation, and economical to manufacture.

Floor scrubbing machines of the prior art have been constructed in such a way that it was difficult to run them into corners in order to clean the floor adjacent to said corners and therefore it is a further object of my invention to provide a floor scrubbing machine which will overcome this difficulty.

A still further object of the invention is to provide a floor scrubbing machine which will embody a relatively large water storage space in comparison to its size.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings, showing the preferred form of construction and in which:

Fig. 1 is a side elevational view of my improved machine;

Fig. 2 is a view looking in at the right hand end of Fig. 1;

Fig. 3 is a view of a machine looking in the same direction as Fig. 1, certain portions thereof having been broken away;

Fig. 4 is a detail view of the brush employed in the device;

Fig. 5 is a detail view of a suction nozzle employed in the device to remove water from the floor after action of the brush;

Fig. 6 is a longitudinal sectional view taken substantially in the plane of the line 6—6 on Fig. 2;

Fig. 7 is a plan of the device;

Fig. 8 is a detail view of the water supplying nozzle; and

Fig. 9 is a detail view of a filter arrangement used in the device.

Referring to the drawings wherein the preferred embodiment of my invention is illustrated it may be seen that I provide a housing 10 which is mounted for movement on a wheel structure which includes the castor like rollers 11 and 12 and the swivelly mounted wheel 13. The castor like rollers 11 and 12 are mounted near the front end of the machine and the swivel wheel 13 is mounted at the rear end of the device.

In the housing 10, a false bottom 14 is provided which serves as the bottom for the water storage tank. A plurality of compartments are provided in this water storage tank and certain of said compartments are arranged so as to be water tight. A compartment 15 is provided in the tank, said compartment being defined by the partitions 16 and 16' in the rear wall 18 of the housing 10, and an upper wall 19 which includes a detachable cover 20 which permits access to the interior of the compartment is also provided. The compartment 15 is supported by the wall 18 of the housing 10 and the supporting members 21 which are carried by the bottom wall 14.

At the front end of the device the housing 10 is arranged so as to include extending portions 22 and 23 and the wall 14 is arranged so as to define a compartment 24 of which the extensions 22 and 23 form a part. A rotatable brush 25 is adapted to be mounted in the compartment 24, said brush being mounted and constructed in the following manner. Secured to the side walls of the extensions 22 and 23 are members defining bearing portions 26. Extending through the bearing portions 26 are nuts such as 27 in which recesses such as 28 are provided. Referring to Fig. 4 it may be seen that the surface of the recess 28 is screw threaded and that the screw threaded end of the shaft 29 is secured therein. It is to be understood that such a structure is provided in the side walls of both the extensions 22 and 23 and therefore the shaft 29 is removably secured in the compartment.

The walls of the extensions 22 and 23 embody annular openings such as 25' and the nuts 27 extend therethrough. Slots 26' are provided in the members 26 and the screws 27' extend through these slots so as to secure the members 26 for vertical adjustment, this structure permitting adjustment of the brush 25. Adapted to surround the shaft 24 is a

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sleeve 30, said sleeve being spaced from said shaft in order that bearing structures such as the ball bearing 31 may be interposed therebetween so as to permit free rotation of the sleeve 30 about the shaft 29. The brush structure 25 embodies an axial opening 32 which is disposed around the sleeve 30 and which is removably secured thereto in any desired manner. In order that the brush structure may be removed from the compartment 24 the nuts 27 are run out until the threaded ends of the shaft 29 disengage the threaded recesses 28. This allows the shaft 29 to fall from the compartment 24 and then the brush structure 25 is removed from the sleeve 30.

In order to rotate the brush structure 25 a pulley such as 33 is mounted adjacent one end of the brush 25. Since it is desirable to have the brush extend as close as possible to the walls of the compartment 24, I have arranged the brush 25 so as to include a reduced neck portion 34. The pulley 33 is mounted on this reduced neck portion at a point spaced from the end of the brush 25 and ring section 35 is fitted on the neck portion 34 so as to provide a brush portion between said pulley and the end of said brush. An endless belt 36 is directed around the pulley 33 before the brush structure is inserted into the compartment 24.

In the compartment 15 the source of power for the device is mounted which includes an electric motor 37. The shaft of the motor 37 is extended and is journaled in a bearing 38 that is mounted on the wall 16' in said compartment 15. Extending transversely across the compartment 15 is a shaft 39 which includes a portion that extends through the wall 40 of the housing 10. A worm 41 is mounted on the motor shaft and meshing with the worm is a worm gear 42 that is mounted on the shaft 39. A pulley 43 is mounted on the portion of the shaft 39 which extends through the housing 10, said pulley being in alignment with the pulley 33 on the brush structure 25. The belt 36 is directed around the pulley 43 so as to transmit movement from this pulley to the brush structure 25. When the motor 37 is caused to revolve the movement thereof is translated through the worm 41, worm gear 42, shaft 39, pulley 43, belt 36 to pulley 33. A cover 44 is provided over the pulley 43 and the belt 36, said cover 44 being secured to the wall 40 of the housing 10 by securing elements such as 45. It is apparent that a packing gland will be provided around the shaft 39 at the point where it passes through the wall of the compartment 15 since said compartment 15 is adapted to be surrounded by water which will be in the tank.

In order to supply water to the floor upon which the brush 25 is adapted to operate a nozzle structure such as 46 is provided which is supported by clamp structures such as 47

that are secured to the wall 48 of the housing 10. The nozzle structure 46 is connected to the storage tank, which will hereinafter be generally indicated by 100, by the conduit 49. Interposed in the conduit 49 is a valve structure 50 which will be described more fully hereinafter. Mounted in the housing 10 between the compartments 15 and 24 is a compartment 51 which is open at its upper end. Adapted to be mounted in the compartment 51 is a fan 52 which is carried by a shaft 53 that extends between the compartments 15 and 51 through a conduit 54 that is adapted to insulate the shaft 53 from the water in the tank 100. The shaft 53 is journaled in the bearing 55 provided in the wall 16' of the compartment 15 and the bearing 56 provided on the wall 57 of the compartment 51. Near the end of the shaft 53 in the housing 15 a spur gear 58 is mounted which meshes with a spur gear 59 carried on the motor shaft 60. As the motor 37 revolves the rotation thereof is transmitted to the spur gear 58 and through the shaft 53 to the fan 52.

Disposed on the opposite side of the brush from the nozzle 46 is a nozzle 61. The brush 25 is adapted to revolve in a clockwise direction as viewed in Fig. 6 and it will therefore throw the water in the direction of the nozzle 61, said nozzle being disposed very closely to the floor. The portion of the nozzle disposed close to the floor is adapted to be co-extensive with the brush 25. Referring to Fig. 6, it may be seen that the nozzle 61 embodies an upwardly protruding portion 62, this portion being arranged as best shown in Fig. 9 wherein it may be seen that it is of tapered construction so as to embody a substantially circular portion at the upper end thereof. The upper end of the nozzle 61 defines a circular chamber 63 which is in communication with the compartment 51. Disposed so as to close passage through the chamber 63 is a disk valve 64 that is mounted on the shaft 65.

The shaft 65 extends from the top side of the housing 10 down through a packing gland 66 provided in a wall of the chamber 63 and through said chamber, which is the portion on which the disk valve 64 is mounted, and through a packing gland 67 disposed opposite the gland 66, to the valve 50. This construction is such that both the valve 50 and the valve 64 will be operated at the same time, said valve being oppositely disposed.

When the disk valve 64 is disposed in the condition shown in Fig. 6 and when the fan 52 is caused to revolve, air is drawn through the nozzle 61 which creates a suction that draws the water from the floor in the region of the brush 25. The water thus drawn up comes into contact with the fan 52 and is thrown out at the open upper side of the compartment 51 into contact with the baffle plate 68 arranged on the upper side of the housing 10. In the housing 10 disposed

around the periphery of the baffle plate 68 is a member which embodies a downwardly protruding portion 69 that is bent in the manner best shown in Fig. 6, so as to form a trough 70. The water impinged on the baffle plate 69 is deflected into the trough 70 from whence it flows through the outlet 71 into the tank 100.

and back into the tank 100 to be used again, the filter member serving to remove the dirt and other foreign matter therefrom.

Due to the fact that the brush extends beyond the normal side walls of the device, I am enabled to run this machine into corners in order to clean the floor in the region thereof and the machine is mounted on a wheel structure which permits its movement in any desired direction which also facilitates reaching out of the way places with the device. The housing is divided into compartments which are so arranged and spaced that a maximum water storage space is provided which is an obvious advantage.

It is apparent that from time to time it will be necessary to clean the filter device. This is done by removing the flexible connection 85 and withdrawing the member 81 from the container 79 and dumping the dirt from the portion 82. Preferably this filter device is mounted below the cover 44 although this is not necessary. It is apparent that this device is very expeditiously arranged and will function to effectively remove the dirt and foreign matter from the water in order that said water may be used over and over. If so desired, a heating element such as 95 may be installed so as to heat the water in tank 100. In using the device, the operator may release water during the forward stroke, and then, on the rearward stroke, he may close this and thus pick up the water, in the manner described, as these means have been found to be more effective during such rearward movement.

The practice of scrubbing a strip the width of the machine on the forward stroke and drying the same surface on the return stroke does not have to be adhered to as a portion of a floor can be scrubbed and afterwards dried if so desired. It will be seen that the machine will work best as a drier when moved backwards over the scrubbed surface.

It will also be seen that the operator has perfect control over the amount of water desired left on surface while the machine is performing the scrubbing operation, by placing the valve control wheel in a position to partly close the water valve at the same time opening the intake valve.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification, without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention what I claim as new and desire to protect by Letters Patent is:

1. In a scrubbing machine, a housing pro-

On the upper end of the shaft 65 an operating wheel 72 is provided. By referring to Fig. 7, it may be seen that operating cords 73 and 74 are attached to the wheel 72 at diametrically opposed points, said operating cords being directed through conduit 75 provided on the upper side of the device. Secured to the rear wall 18 of the housing 10 is a handle member 76 to which the ends of the operating cords 73 and 74 are secured. A switch structure 77 is provided in the handle 76 that is adapted to control the operation of the motor 37, said handle 76 serving as a conduit for the leads 78 of said motor which are adapted to be connected to a suitable source of electrical energy. A filter structure is provided in the device which includes a container 79 that is carried by the wall 40 of the housing 10. An outlet passage 80 establishes communication between the interior of the container 79 and the valve 50. Removably secured in the container 79 is a filter member 81 which includes a screen member 82. An outlet passage 83 is provided for the tank 100 in which the valve 84 is mounted. A flexible conduit 85 connects the valve 84 with the interior of the filter member 82. The water from the tank 100 flows through the outlet passage 83, valve 84, conduit 85, into the filter member 82 which separates dirt and other foreign matter from the water. The water then flows into the container 79 through the conduit 80, valve 50, conduit 49 to nozzle 46.

In operation the tank 100 is filled with water and if desired a suitable dirt dissolving solution may be added to the water. The switch 77 is closed which causes rotation of the motor 37 and therefore of the fan 52. Then the wheel 72 is turned by pulling on the proper operating cord 73 or 74 to open the valve 50 and close valve 64. Opening the valve 50 permits water to flow from the tank 100 in the manner described, to the nozzle 46 and it will therefore fall upon the floor in front of the brush 25, said brush being revolved in the manner described. The combined action of the brush and water will clean the floor. After this action has been carried on a predetermined length of time, the valve 50 is closed and the valve 64 will therefore be opened. Therefore the suction created by the fan 52 will draw the water into nozzle 61, this action being aided by the brush 25, and it will travel up through the suction fan 52 and be thrown against the baffle plate 68 and down into the trough 70

viding a brush receiving compartment, bearing plates supported at the sides of said brush receiving compartment, shaft supporting units mounted in and extending through said bearing plates and housing into said brush receiving compartment, a shaft in said compartment supported by said unit, a sleeve disposed around said shaft, bearings interposed between said shaft and said sleeve, a substantially cylindrical brush mounted on said sleeve, and means for rotating said brush and sleeve including power transmitting means connected to said brush intermediate the ends thereof.

2. A device of the class described including a rotatable brush adapted to be in engagement with the floor to be scrubbed, a tank adapted to contain a supply of cleaning fluid, means providing a passage for conducting said cleaning fluid to said floor adjacent said brush, means for removing the water from said floor including a nozzle, juxtaposed to said brush, a rotatable fan and a casing for said fan for creating suction through said nozzle, and a conduit for connecting said nozzle and fan casing, means providing a passage interconnecting said nozzle and said fan, means for rotating said brush and said fan, valve means disposed in said passages controlling passage therethrough, and means for simultaneously opening and closing said valves.

3. A scrubbing machine including a housing, a plurality of partitions in said housing defining compartments therein, one of said compartments being adapted to contain a cleaning fluid, a rotatable brush mounted in one of said compartments, a conduit terminating in a nozzle disposed in said brush containing compartment for conducting said cleaning fluid from said fluid containing compartment to the floor engaged by said brush, a rotatable fan mounted in another of said compartments, and a member including a nozzle in said brush containing compartment and an annular passage in communication with said fan containing compartment for conveying fluid from said floor to said fan, means for the rotating of said fan, said fan compartment including an open upper side, a baffle extended across the open upper side of said fan housing and said fluid containing compartment whereby the fluid picked up by the action of said fan will be thrown by said fan into engagement with said baffle, said baffle deflecting said fluid back into said fluid containing compartment.

4. A scrubbing machine including a housing having a partition therein defining a water containing compartment and a brush receiving compartment, a rotatable brush in said brush receiving compartment, means for conducting water from said water containing compartment to said brush containing compartment in front of said brush, valve means

for controlling passage through said last named means, a fan containing compartment arranged in said water containing compartment having an open upper side, a fan in said fan containing compartment, common means for operating said fan and said brush, means providing a passage and comprising a nozzle disposed rearwardly of said brush, valve means for controlling passage through said last named means, and common means for simultaneously operating said valve means.

5. A scrubbing machine including a housing having a partition therein defining a water containing compartment open at the top and a brush receiving compartment, a rotatable brush in said brush receiving compartment, means for conducting water from said water containing compartment to said brush containing compartment in front of said brush, valve means for controlling passage through said last named means, a fan containing compartment arranged in said water containing compartment and having an open upper side, a fan in said fan containing compartment, common means for operating said fan and said brush, means providing a passage and comprising a nozzle disposed rearwardly of said brush, valve means for controlling passage through said last named means, common means for simultaneously operating said valve means, a baffle extended across the open upper side of said water compartment above the open upper side of said fan compartment whereby water thrown through said nozzle by said fan into engagement therewith will be thrown by said fan into engagement with said baffle to be deflected back into said water containing compartment.

In testimony whereof I affix my signature.
FRED H. BLOGG.