

April 21, 1931.

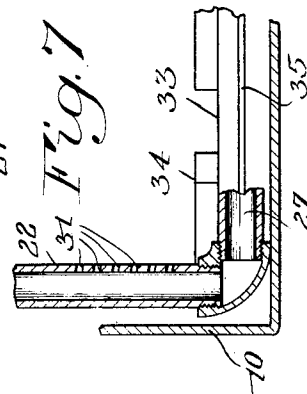
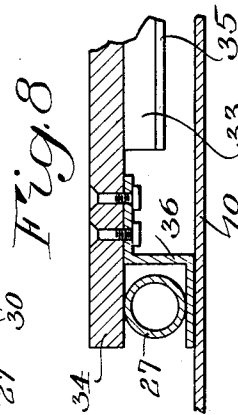
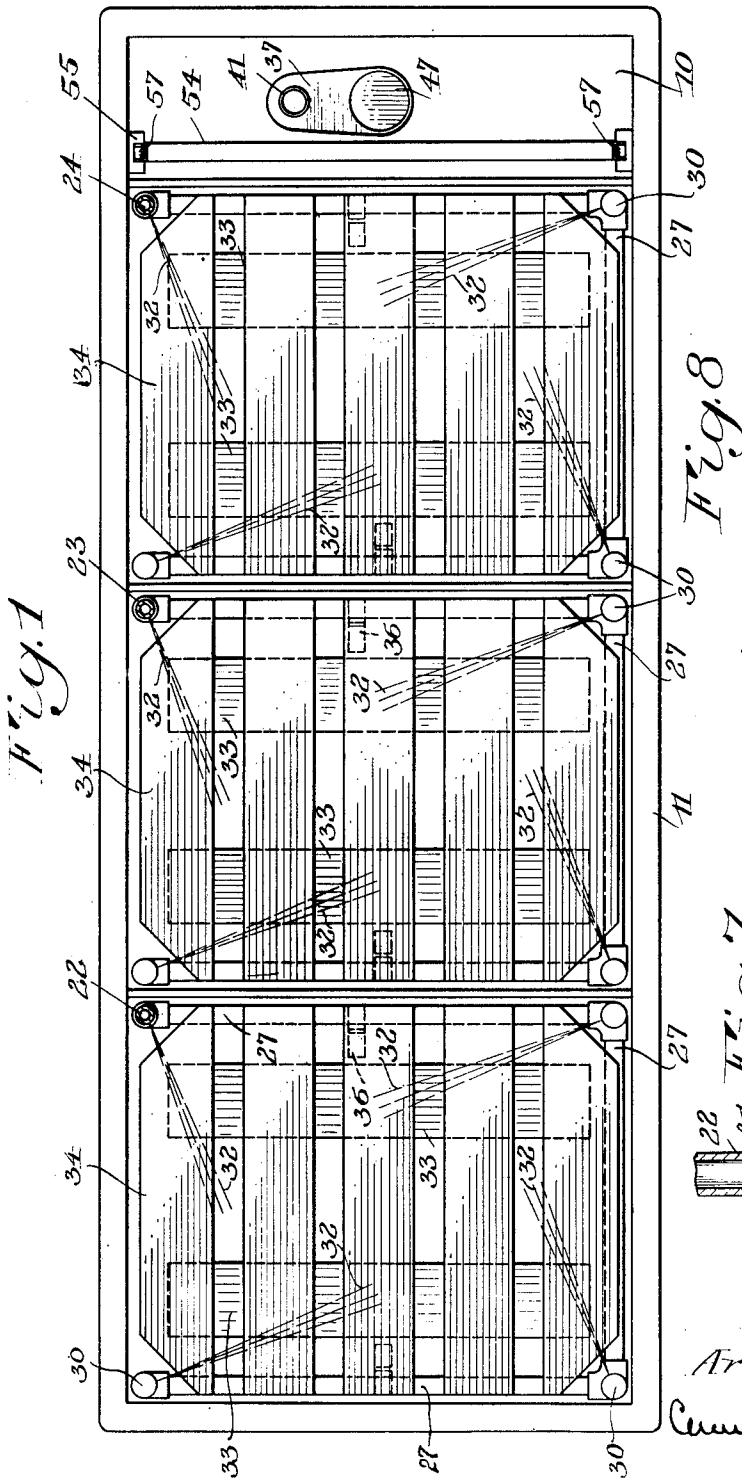
A. W. CAPS

1,802,192

AUTOMATIC PRINT WASHER

Filed Jan. 20, 1927

2 Sheets-Sheet 1



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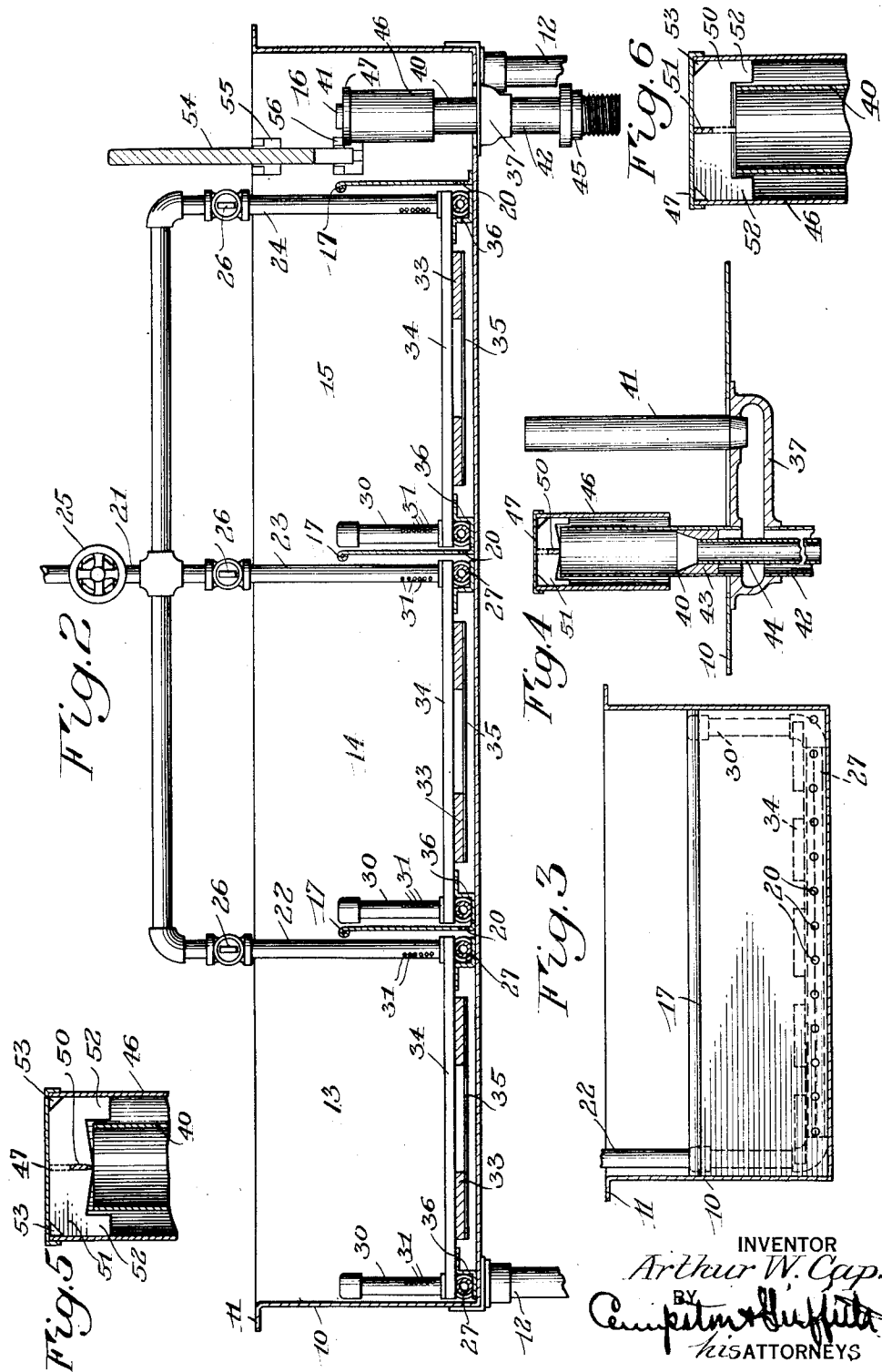
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AUTOMATIC PRINT WASHER

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2 Sheets-Sheet 2



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AUTOMATIC PRINT WASHER

Application filed January 20, 1927. Serial No. 162,258.

This invention relates to photographic print washers and particularly to a continuous print washer.

An object of this invention is to provide an improved device of the above type in which the water or other washing liquid in the various compartments is changed automatically at regular intervals. Another object is to provide a device of the above type in which the various compartments are so arranged that the washing liquid in at least one compartment is always relatively unpolluted. Another object is to provide a device of the above type into which the washing liquid is introduced in a highly efficient manner. Another object is to provide improved means for accomplishing the above objects. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which is shown one of the various possible embodiments of this invention,

Figure 1 is a plan view of the apparatus;

Figure 2 is a sectional side elevation taken substantially through the center of Figure 1;

Figure 3 is a sectional end elevation showing the perforated partition separating two of the compartments;

Figure 4 is a view partly in section of the siphoning and draining means;

Figure 5 is a sectional elevation of a portion of the siphon means;

Figure 6 is a view similar to Figure 5, but taken in a direction substantially transverse of the direction in which the view shown in Figure 5 was taken;

Figure 7 is a sectional elevation of a portion of one of the spray pipes, and

Figure 8 is a sectional elevation showing the means for holding the wooden print supports in position in the tanks.

Similar reference characters refer to sim-

ilar parts throughout the several views of the drawings.

Referring now to the drawings in detail, there is shown a metal tank 10 having an outwardly flanged upper edge portion 11 and supporting members 12. As shown, the tank rests with its bottom in contact with the supporting members 12, but a metal or other frame may be provided which will support the tank by means of the flange 11. The support is preferably higher at one end than at the other and the tank is positioned on the support with the drain end nearest the lower end of the support in order that the bottom of the tank will slope downwardly in the direction of the drain and emptying of the tank will be facilitated.

The tank, as shown, is divided into three washing compartments 13, 14, and 15 and a drain compartment 16 by means of the partitions 17 which extend between the sides and are supported on the bottom of the tank and extend upwardly a little more than half the distance from the bottom to the top of the tank. Each partition is provided with a plurality of holes or openings 20 adjacent the lower edge which permit the liquid in one compartment to flow to the adjacent compartment.

A water supply pipe 21 has vertical branch members 22, 23 and 24 extending to the bottoms of washing compartments 13, 14 and 15 respectively, and a valve 25 for regulating the supply of water to the apparatus. Each of the branch members is provided with a valve 26 by means of which the flow of water to each individual washing compartment may be regulated. The branch pipes are connected to horizontal pipes 27 positioned adjacent the bottoms of the compartments and extending along three sides of each compartment. The pipes 27 have vertically extending spray pipes 30 which are closed at their upper ends by means of ordinary caps, connected thereto at the points where the said pipes extend into the corners of the compartments. The members 30 and the members 22, 23 and 24 are drilled to provide vertical rows of small holes or perforations 31 adjacent their lower ends. The said holes are

drilled at a slight angle so that water issuing therefrom is directed downwardly, and when the apparatus is in operation the holes are so positioned that the water from each spray pipe is directed along a line extending between a side wall and the center of the compartment in such a manner as to form a vortex, as indicated at 32, which tends to increase the washing effect on the prints.

Each tank is provided with means for supporting and spacing the prints from the bottoms of the compartments. Such means, in the embodiment shown, are wooden grids comprising cross members 33 and 34 and adapted to rest upon the pipes 27. In order to prevent floating of the wooden grids when the tank contains water, the grids may be provided on their bottom sides with the sheet lead weights 35 or the members 36 each having one end portion attached to a cross member 34 and the opposite end portion extending beneath a pipe 27.

The drain compartment 16 may be smaller than the washing compartments and it is provided with a bottom opening which is sealed by means of a hollow casting 37 which may be soldered or otherwise tightly connected to the bottom of the tank. The upper portion of the casting 37 is provided with a tapered opening which communicates with the hollow interior of the casting 37, and an opening adapted to receive a pipe or hollow tubular member 40 forming part of the siphon device. A hollow plug or overflow pipe 41 has a tapered end which is adapted to fit tightly within the tapered opening in the casting.

The member 40 is rigidly mounted in the casting 37 and has its lower end terminating adjacent the upper inner wall of the casting. The upper end of the pipe 40 is positioned slightly below the top of the partition 17 which is immediately adjacent thereto. Immediately below and substantially concentric with the pipe 40 a pipe 42 of substantially the same size as pipe 40 is rigidly mounted within an opening in the lower wall of the casting and has communication with the interior thereof. A tubular member 43 having relatively thick walls and an inwardly beveled end portion is mounted for sliding movement in the pipe 40 and carries a pipe 44 which extends downwardly through the casting and pipe 42. The member 43 fits snugly within the pipe 40 to provide an air tight connection while permitting sliding adjustment and its frictional retention in its adjusted position. The members 40, 43 and 44 constitute in effect a funnel with the members 40 and 43 forming the body and the member 44 the discharge spout. The member 42 is provided with a slip connection 45 for joining it to an ordinary trap or a sewer connection.

A bell member having a tubular portion 46 and an end wall 47 is loosely mounted on

the upper end of the pipe 40 in telescoping relation therewith. The end wall 47 is spaced from the end of the pipe 40 and the bell is centered by means of the crossed and interlocked supports 50 and 51 which are rigidly mounted in the bell. Each of the members 50 and 51 is provided at its opposite end with extensions 52 which extend between the walls of members 40 and 46. The distance between the innermost portions of the oppositely disposed extensions 52 is slightly greater than the outside diameter of the pipe 40 in order to provide for a loose fit of the bell on the member 40. The lower central portion of the support 50 is provided with a straight knife edge which rests on opposite sides of the upper end of the pipe 40 while the lower central portion of the support 51 is beveled in such a manner that the outer ends of the said portion are normally spaced from the upper end of the pipe 40. The upper outer corners of the members 50 and 51 are cut away as at 53 to provide for communication between the adjacent compartments formed by the said members.

The drain compartment of the apparatus is further provided with a drain board 54 removably supported in the upper and lower castings 55 and 56 attached to the opposite side walls of the tank. The drain board comprises a central wooden portion having metal channel members 57 attached thereto at its opposite sides.

At the commencement of print washing operations, water is admitted to the tank by opening the valves 25 and 26. The flow of water to each washing compartment may be regulated by means of its associated valve 26. In this connection it may be noted that after the valves 26 have once been set in their adjusted positions it will not ordinarily be necessary to again disturb them, but the flow of water may be admitted to and cut off from the tank by means of the valve 25. The flow of water to compartment 13 should be slightly greater than the flow to compartment 14 and the flow to compartment 14 should be slightly greater than the flow to compartment 15 to insure a slight continuous flow from 13 to 14 and 14 to 15 through apertures 20 and thus eliminate the possibility of polluted liquid flowing to the final washing tank 13. The entire tank gradually fills and the water also rises in the annular space between the members 40 and 46 of the siphon, the level of the water in the tank before the siphon action has started being substantially the same as the level in the annular space. When the water rises above the top of the pipe 40 it overflows and enters the interior of the said pipe in sufficient volume to quickly fill the smaller pipe 44. The pipe 44 is sufficiently long that when a column of water has been built up the air is withdrawn from the bell thereby and a siphon is made. The entire

tank is thus drained; the water passing from one compartment to another through the apertures 20 provided in the partitions 17. For the proper functioning and quick action of the siphon it is important that any possibility of air becoming trapped in the upper portion of the bell be eliminated by the provision of means of communication between the chambers formed by the members 50 and 51, such as the openings 53. It is also important that the lower end of the pipe 44 should not extend into the water in the trap into which it drains, as such a condition would prevent the operation of the siphon. The position of the pipe 44 is adjustable as pointed out above to permit proper operation of the apparatus for different water levels in the trap and to permit regulation of the flow of water through the siphon.

When the water level in the tank reaches the lower edge of the member 46 of the bell, air will be drawn through the annular chamber between the members 40 and 46 and the siphon broken. The supports 50 and 51 are constructed as above described to facilitate this breaking action. The knife edge of the member 50 and the spaced portions of the member 51 permit a slight tipping or rocking of the bell on the pipe 40 which causes any break in the contact of the water with the bell to tip the bell and further increase the size of the break, thereby preventing a re-sealing and re-establishment of the siphon. The height of the water in the tank at the breaking of the siphon may be varied by providing a bell having a member 46 of suitable length. Also the level at which the siphon will start to function may be varied by varying the length of the member 40. After the siphon is broken the tank again fills with water until the siphon is once more established, when it is again drained as in the first instance. The action is thus automatic and intermittent.

If, for any reason, the siphon fails to operate the water will build up in the tank to the level of the upper edge of the pipe plug 41 which should be slightly lower than the partition 17 when it will flow out through the said pipe plug and the casting 37 and pipe 42 to the sewer. The tank may be drained completely by removing the pipe plug 41 from its seat in the casting 37. The water will thus be permitted to flow through an opening in the lowest part of the tank and through the members 37 and 42 to the sewer.

Prints to be washed are first placed in the compartment 15 where most of the fixing or other chemical is removed. The partly washed prints may then be placed in compartment 14 and subjected to a further washing action and they may be finally treated in compartment 13 to insure the removal of all of the fixing chemicals. The above procedure in washing and the angular position

of the tank whereby the water naturally flows toward the siphon or drain together with proper regulation of the flow of water to the various compartments, insure a practically pure supply of water in compartment 13 at all times. The compartments may all contain prints at the same time and they should be moved progressively from the lowest tank to the highest as explained above. It has been found that three washings are sufficient for most purposes and accordingly three washing compartments have been provided in the apparatus described; however, if desired a larger number of compartments may be provided in series or several rows of compartments in series may be so connected as to be drained by a single siphon.

When the prints have been thoroughly washed they may be taken from the water and placed on the drain board 54 to permit the water to run out. After a sufficient number of prints have been accumulated on the drain board the operator may press out any excess water by pressing his hands against the prints on opposite sides of the board and moving them downwardly simultaneously. The board carrying the prints may then be removed and carried to the dryer and another board applied to the tank to receive additional prints. The prints from which the water has been pressed may be easily removed one by one and passed through the dryer.

From the foregoing it will be seen that there is herein provided an apparatus which embodies the features of this invention and achieves the objects thereof, including many practical advantages. A print washer has been provided by means of which the prints may be quickly and thoroughly washed; which when once regulated will function automatically to change the washing water after predetermined intervals; which may be inexpensively manufactured and installed; and which during its operation requires but a slight amount of attention from the operator.

As many possible embodiments may be made of the above invention, and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. In apparatus of the class described, in combination, a tank comprising a plurality of washing compartments and a drain compartment, all of said compartments being connected in such a manner that liquid contained in one may flow evenly to the next adjacent, means for supporting said tank in such a manner that the bottom of the drain compartment is lower than the bottoms of the washing compartments, means for introducing a continuous supply of liquid into each

of said washing compartments, and a siphon extending into said drain compartment to a level below that of the washing compartments and adapted to automatically function to maintain the height of the liquid in said
5 washing compartments between two predetermined levels.

2. A photographic print washing device comprising, in combination, a plurality of liquid compartments, means connecting said
10 compartments to each other so that liquid may flow from one compartment to another, liquid introducing means creating a separate rotary liquid current in each of a plurality
15 of said compartments, and drainage means associated with one compartment for withdrawing liquid from all of the compartments.

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