June 25, 1929. G. B. WADE 1,718,767

METHOD OF LEVELING THE TOP OF THE GRAVEL LAYER OF FILTER BEDS

Filed July 9, 1928

Fig. 1.

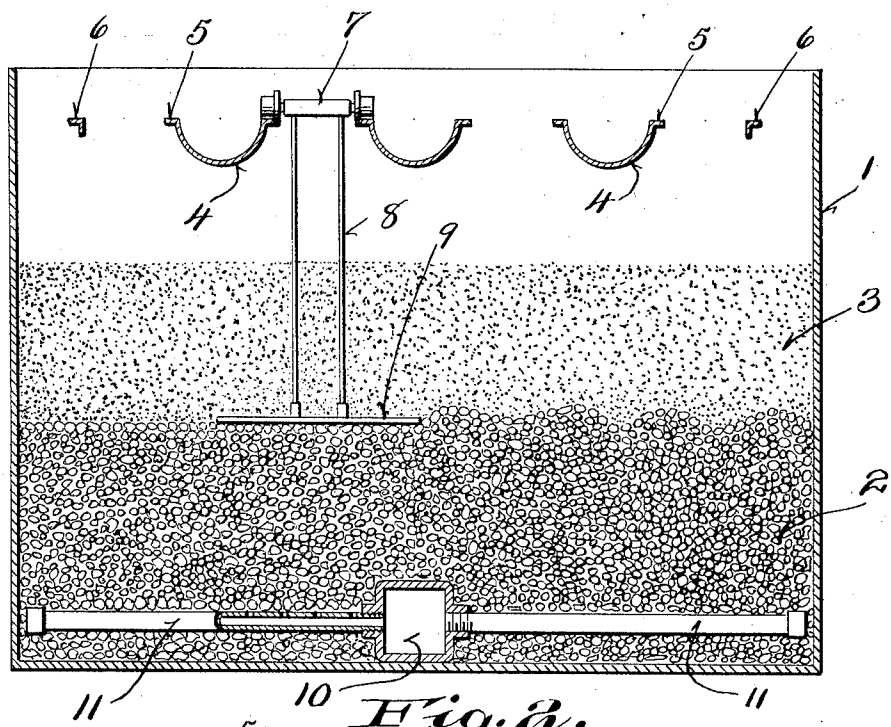
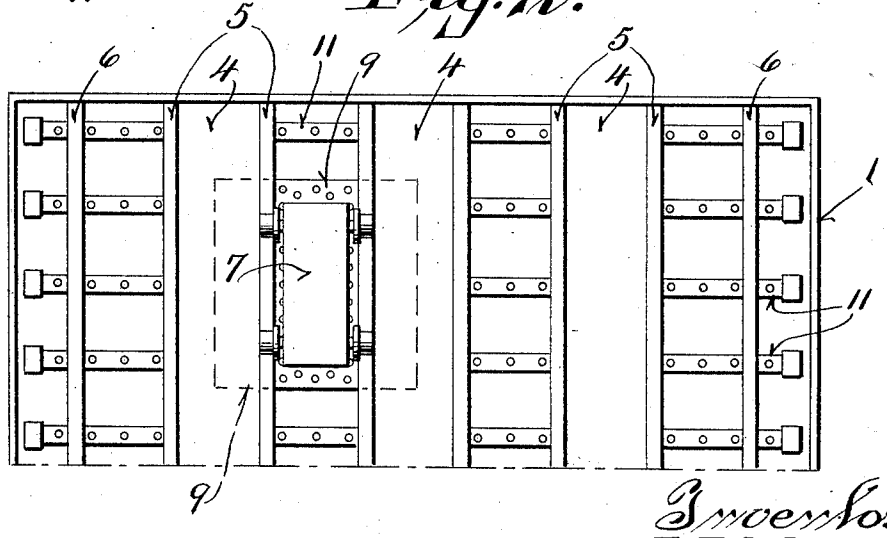


Fig. 2.



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UNITED STATES PATENT OFFICE.

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METHOD OF LEVELING THE TOP OF THE GRAVEL LAYER OF FILTER BEDS.

Application filed July 9, 1928. Serial No. 291,400.

This invention relates to a method of leveling the top of the gravel layer of a filter bed.

In filters having a gravel layer surmounted by a sand layer, it is frequently the case that in the normal operation of the filter, that the upper surface of the gravel layer becomes furrowed or fluted non-uniformly, and that the sand works its way down into the gravel, and that the gravel, at least in the upper portion of the layer, becomes impregnated with sand.

Attempts have been made to level the gravel but these attempts have not proven wholly satisfactory due to the fact that the gravel is well packed with sand and is difficult to level.

This invention is designed to overcome the defects noted above in the method of leveling gravel layers in filter beds, and objects of this invention are to provide a novel method of leveling the gravel layer, in which the gravel and sand are partially supported by the back flow of water, as in back washing, so that their weight is partially counteracted, and the bed is agitated and the sand freed from the gravel while simultaneously with this operation, the leveling is accomplished by passing a leveling screen back and forth across the top of the gravel layer to thus level the gravel layer while it is freely adjustable.

An embodiment of the invention is shown in the accompanying drawings in which:

Figure 1 is a transverse sectional view through a filtering tank showing the leveling in process;

Figure 2 is a plan view of a portion of the tank with, however, the sand and gravel omitted.

Referring to the drawings, it will be seen that the tank is indicated by the reference character 1 and that it contains a filtering bed formed of a bottom layer 2 of gravel and an upper layer 3 of sand. Above the bed and spaced downwardly from the upper edge of the tank are a plurality of wash troughs 4 by means of which the water is brought into the filter. These wash troughs may be formed with tracks 5 at their edges and additional outer tracks 6 may be provided for a truck 7 adapted to travel longitudinally of the tank. This truck carries a plurality of truss rods 8 which carry at their lower ends a leveling screen 9 of any suitable design.

The bottom portion of the tank is provided with a header 10 from which project a plurality of pipes 11 which are apertured and normally receive the filtered water. These pipes are spaced at regular intervals throughout the length of the tank and extend transversely of the tank, as is apparent from the drawings.

In the practice of this invention, when the upper surface of the gravel layer has become furrowed or irregular, the filtering is stopped and the water flow is reversed by forcing water through the header and outwardly through the apertured pipes, so that the water flows upwardly through the filter bed.

This upwardly flowing stream of water causes an agitation of the filter bed and partially supports the gravel and sand and frees the gravel of packed sand. While the filter bed is agitated during the operation of back washing, the leveling progresses by passing the screen 9 back and forth and thereafter transferring the truck to another pair of rails and proceeding with this leveling operation until the entire upper surface of the gravel layer has been leveled.

It will be seen that the leveling of the gravel layer is very easily accomplished under these conditions, as it is not packed with sand and as the filter bed is agitated by the upwardly flowing water, which enters the lower portion of the bed at a multitude of spaced points.

It will be seen, therefore, that a very effective and a highly practical method of leveling the gravel layer of a filter bed has been provided by this invention.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

I claim:

1. The method of leveling the gravel layer of a filter bed consisting of a top layer of sand and a bottom layer of gravel, said method comprising back-washing the bed by causing a flow of water upwardly through the layers to cause agitation of said bed, and simultaneously leveling the top of the gravel layer.

2. The method of leveling the gravel layer of a filter bed consisting of a bottom layer of gravel and an upper layer of sand, said method comprising causing an upward flow of water through the bed from a plu-

rality of spaced points adjacent the bottom of the gravel bed, whereby sand packed in the gravel layer is dislodged and the bed agitated, and simultaneously passing a screen back and forth adjacent the upper portion of the gravel layer to thereby level said gravel layer while portions of the bed are partially supported by the upwardly passing water.

In testimony that I claim the foregoing I have hereunto set my hand at Racine, in the county of Racine and State of Wisconsin.

GEORGE B. WADE.