No. 873,010. PATENTED DEC. 10, 1907.

H. W. BLAISDELL.

MACHINE FOR CLEANING FILTER BEDS.

APPLICATION FILED APR. 6, 1904.

3 SHEETS—SHEET 1.

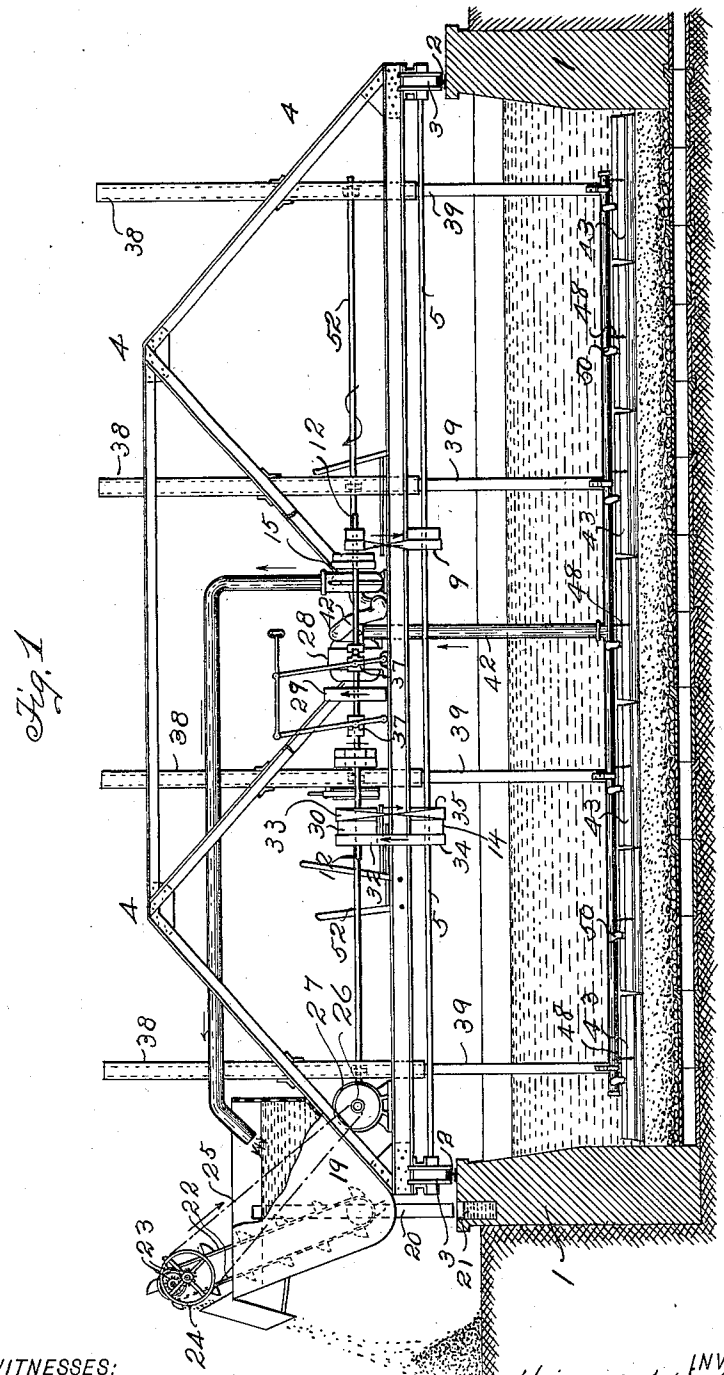

Fig. 1

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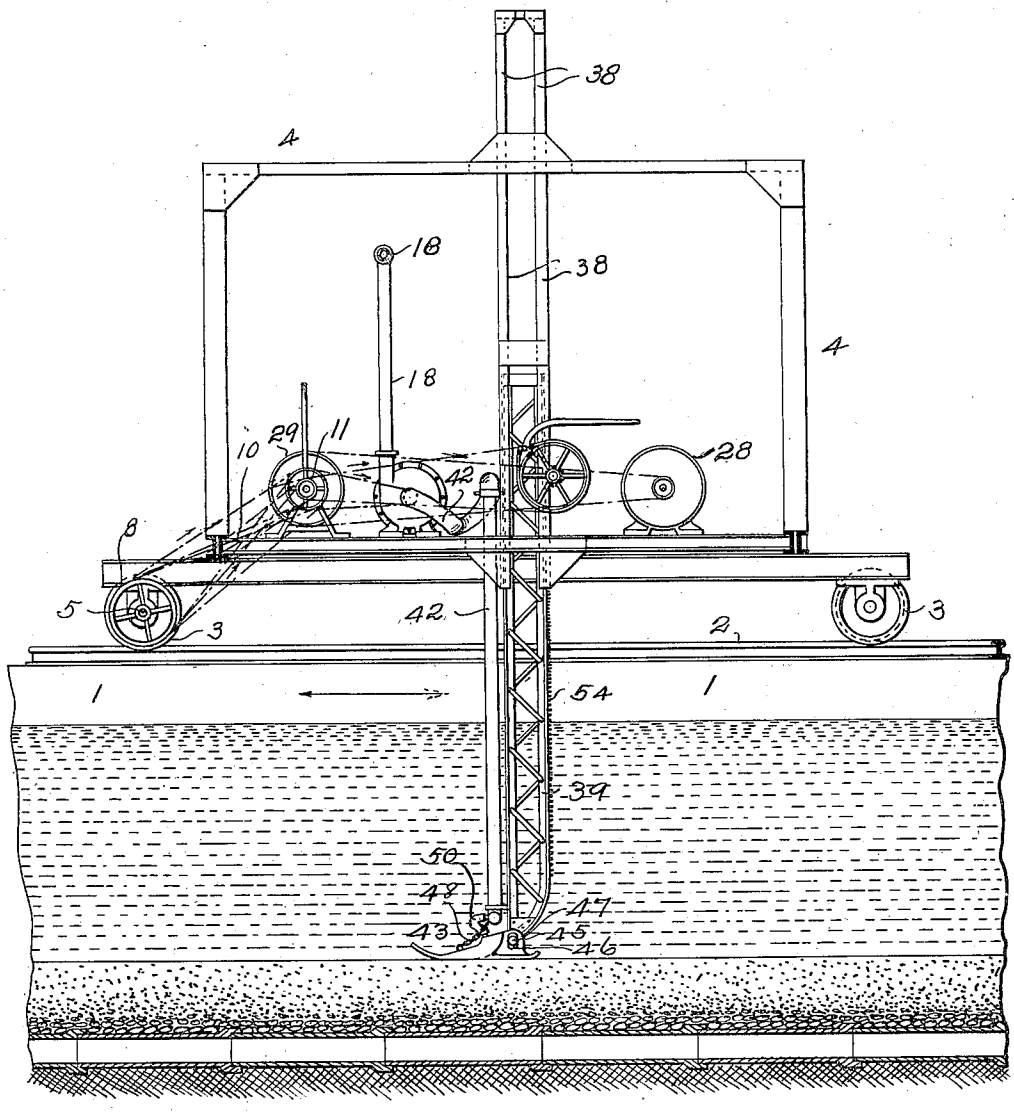
3 SHEETS—SHEET 2.

Fig. 2



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3 SHEETS—SHEET 3.

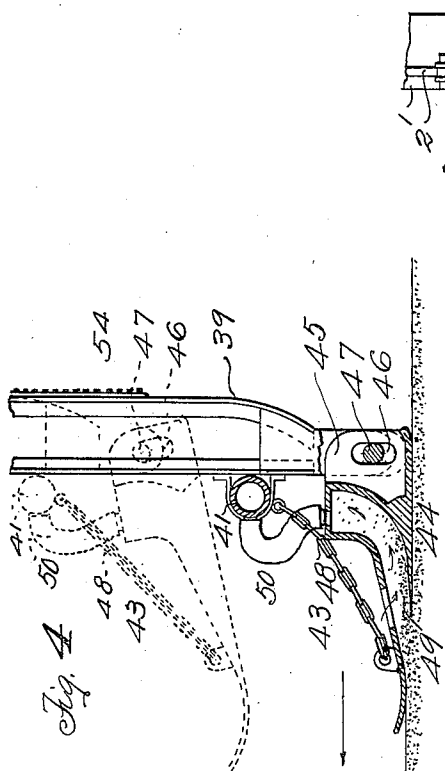

Fig. 4

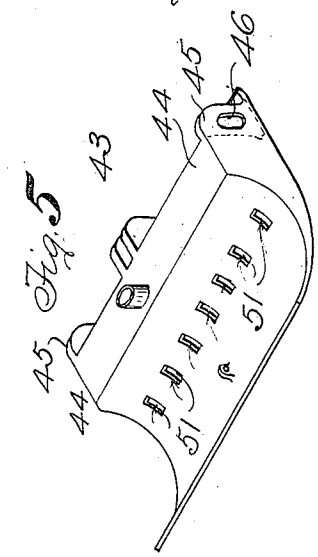

Fig. 5

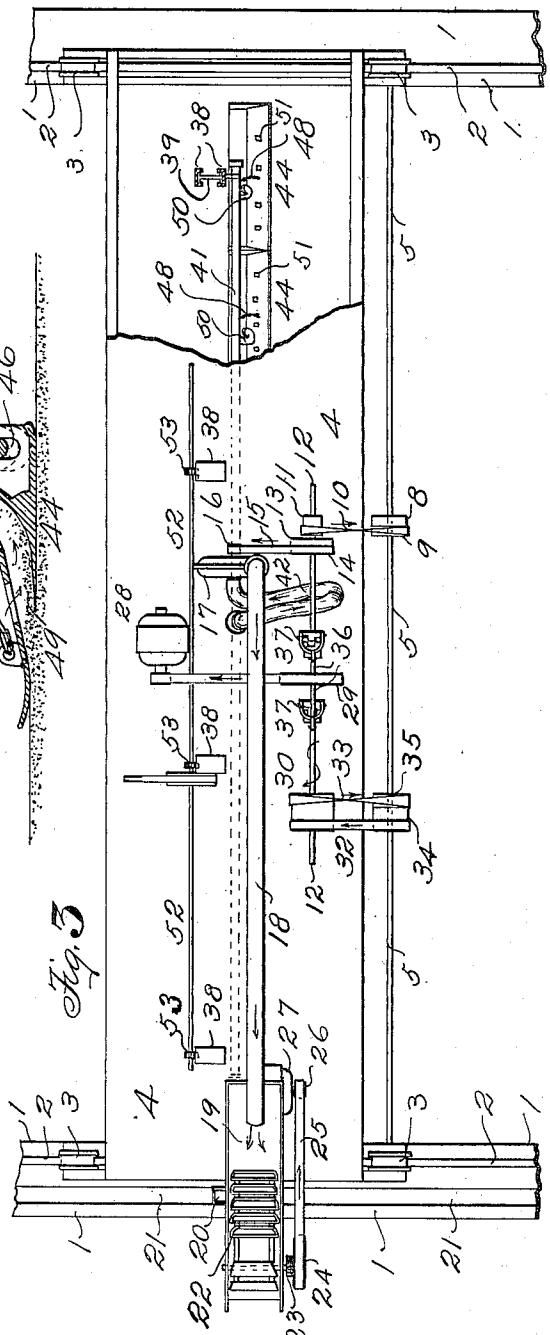

Fig. 3

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UNITED STATES PATENT OFFICE.

HIRAM W. BLAISDELL, OF LOS ANGELES, CALIFORNIA.

MACHINE FOR CLEANING FILTER-BEDS.

No. 873,010. Specification of Letters Patent. Patented Dec. 10, 1907.

Application filed April 6, 1904. Serial No. 201,933.

To all whom it may concern:

Be it known that I, HIRAM W. BLAISDELL, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Machines for Cleaning Filter-Beds; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to means for cleaning material and particularly to machines for cleaning filter beds; and some of the objects of the invention are to provide a simple cheap and efficient machine of this character.

Another object of the invention is to provide means for operating upon the surface of filter beds so constructed as to automatically follow the inequalities or unevenness in the surface of the filter-bed.

It is also an object of this invention to provide means for operating upon the entire width of the filter bed at one time or to provide cleaning means extending entirely across the filter bed, and constructed to be moved thereover.

With these, and other, objects in view the invention consists essentially in the construction, combination and arrangement of parts substantially as more fully described in the following specification and illustrated in the accompanying drawings, forming part of this application, in which

Figure 1 is a front elevational view of one form of the invention; Fig. 2 is an end elevational view of the same; Fig. 3 is a top plan view, thereof, partly broken away; and Figs. 4 and 5 are enlarged detail views of one form of shoe employed.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, and particularly to the construction illustrated in Figs. 1, 2 and 3 thereof, the reference character 1 designates a portion of the walls of one or more filter beds, which may be arranged in any desired manner and may be of any preferred size and formation.

On the walls 1 are secured track rails or ways 2, whereon travel the supporting wheels 3, of a traveling structure or bridge 4, and a propelling shaft 5 is formed on, or connected with, one set of said wheels, and preferably carries fast and loose pulleys 8 and 9 respectively connected by a twist belt 10, with a pulley 11, on a clutch shaft 12, carrying a fast pulley 13 attached by a belt 15, with the driven pulley 16, of a centrifugal or other pump 17, substantially as shown.

The pump 17 is preferably provided with a discharge pipe 18, adapted to empty into the hopper or receiver 19, the material elevated by the pump, as subsequently explained, and an outlet pipe 20 is preferably connected with the receiver 19, so as to discharge the liquid therefrom into a gutter or conduit 21, formed in or upon the wall 1, essentially as shown.

An endless elevator 22 is desirably mounted in the receiver 19 to remove therefrom the solid matter conveyed therein by the action of the pump and the elevator is desirably driven through the mediation of gearing 23, a band wheel 24, belt 25 and pulley 26 on the drive shaft of a motor or engine 27, Figs. 1 and 3.

A motor or engine 28 is connected with a band wheel 29 on the clutch shaft 12, which carries a fast pulley 30, connected by a straight and twist belt 32 and 33 respectively, with loose pulleys 34 and 35, on the propelling shaft 5, before mentioned.

By means of the construction just described the bridge may be progressed in a forward or backward direction according to whether the straight belt 32 or twist belt 33 is on the fast pulley 14 on the propelling shaft 5 of the bridge.

The band wheel 29 is preferably mounted on an intermediate section 36 of the clutch shaft 12, and is desirably connected alternately with one or other end of said shaft by means of clutches 37, one whereof connects the intermediate driving section 36 with the left hand end of the clutch shaft, carrying the pulley 30 and belted to pulleys 34 and 35 on the propelling shaft; whereby the bridge is alternately progressed rapidly in either direction.

When the other clutch is thrown into engagement, the right hand end of the clutch shaft is driven, thereby actuating the pulley 11, thereon, which is belted to a fast pulley 9 on the propelling shaft 5, to progress the bridge at a slow rate; and the rotation of this

end of the clutch shaft operates the fast pulley 14 thereon, belted to the pulley 16 on the shaft of a centrifugal pump 17, as before explained.

Channel irons or guides 38 are preferably vertically in or adjacent to the bridge 4 and movably mounted therein are frames or hanger members 39, connected with a pipe or device 41, with which communicates a pipe tube 42, connected with the pump 17, substantially as shown.

Formed on, or connected with, elevating frame 39 is a collecting device or shoe 43, preferably constructed of a plurality of sections 44, desirably provided with an extension or heel piece 45, having a slot 46, to receive a pin or bolt 47, in the end of each of the frames 39; and chains 48 may be connected with the sections 44 and frames 39, so that the sections are permitted a limited movement in relation to said frames.

The sections 44 are preferably hollow and are provided with a receiving orifice 49, Fig. 4, whereby the material enters the section, passes therethrough and out by way of a flexible connection 50 with the pipe 41; and material and fluid also enters the sections 44 through the openings or inlets 51, in the upper portion thereof, Figs. 3, 4 and 5.

The operation of the invention will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following explanation thereof.

The motor 28 is started, thereby imparting motion to the intermediate driving section 36 of the clutch shaft 12, and the left hand clutch being in engagement, the twist belt 33 is operated to actuate the propelling shaft 5 and progress the bridge in a forward direction until the apparatus shall have reached the place of operation, whereupon the left hand clutch is thrown out of engagement and the right hand clutch is thrown into engagement, thereby actuating the belt 15 connected with the centrifugal pump, and, at the same time, operating the belt 10 to progress the traveling structure automatically during the operation of the apparatus.

The pump being put in operation, and the traveling structure being automatically and slowly progressed, the cleaning device is caused to travel over the bottom of the filter bed, and conform with the inequalities or undulations thereof by the play between the parts, and the deposit or crust on the filter bed is removed therefrom by the action of the sections 44, into which the foreign matter and fluid is taken, and from which the same is removed through the flexible connection 50, horizontal pipe 41 and the vertical pipe 42 to the centrifugal pump, from whence the same is discharged through the pipe 18 into the receiver 19, provided with a discharge pipe 20 for the liquid and the elevator 22 to discharge the solid material from the receiver, substantially as illustrated in Fig. 1 of the drawings.

By reason of the construction of means for elevating and discharging the material, the entire surface or width of a filter bed can be treated in one operation and the construction of the cleaning device in sections permits the devices to more readily conform to the inequalities or unevenness in the surface of the filter-bed, while the movable connection of each section affords a limited independent motion, and the upwardly deflected extremity of each section acts as a gage for regulating the operation of the section.

After a filter-bed shall have been cleaned, and it is desired to move the traveling structure from one filter bed to the other, it is only necessary to operate the elevating shaft 52, carrying pinions 53 engaging racks 54 on the frames 39, until the cleaning devices shall have been elevated a sufficient distance to clear the walls of the filter-bed, as will be readily understood by those skilled in the art to which this invention appertains.

It is not desired to limit or confine this invention to the specific construction, combination and arrangement of parts herein shown and described, and the right is reserved to make all such changes in, and modifications of, the same, as come within the spirit and scope of the invention.

Claims

1. A machine for cleaning filter beds comprising a support adapted to travel lengthwise the filter bed, suction means for elevating and discharging material, a series of independently operating scrapers arranged end to end entirely across the filter and adapted to scrape material from the surface of the filter bed in the direction of travel of the support and a connection between said scraper means and said elevating and discharging means.

2. A machine for cleaning filter beds comprising a support adapted to travel lengthwise the filter bed, suction means for elevating and discharging material, a series of independently operating scrapers arranged end to end entirely across the filter and adapted to scrape material from the surface of the filter bed in the direction of travel of the support, a connection between said scraper means and said elevating and discharging means and means for raising said scraper means and connection.

3. A machine for cleaning filter beds comprising a support adapted to travel lengthwise the filter bed, suction means for elevating and discharging material, a series of independently operating scrapers arranged end to end entirely across the filter and adapted to scrape material from the surface of the filter bed in the direction of travel of the support and a connection between said

scraper means and said elevating and discharging means, said connection comprising a horizontally extending pipe into which each of the scraper means is adapted to discharge.

4. A machine for cleaning filter beds comprising a support adapted to travel lengthwise the filter bed, suction means for elevating and discharging material, guides on said support, frames movable vertically in said guides, a series of independently operating pivotally supported scrapers supported from said frames and arranged end to end entirely across the filter and adapted to scrape material from the surface of the filter bed in the direction of travel of the support and connections on said frame affording communication between said scraper means and said elevating and discharging means.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses at Los Angeles, county of Los Angeles, State of California this 30th day of March 1904.

HIRAM W. BLAISDELL.

Witnesses:

MIGNON FORD,

CHARLES S. ROGERS.