Dec. 30, 1958 E. E. EASTERDAY 2,866,557

SEDIMENTATION BASIN CLEANING APPARATUS

Filed Feb. 24, 1956 6 Sheets-Sheet 1

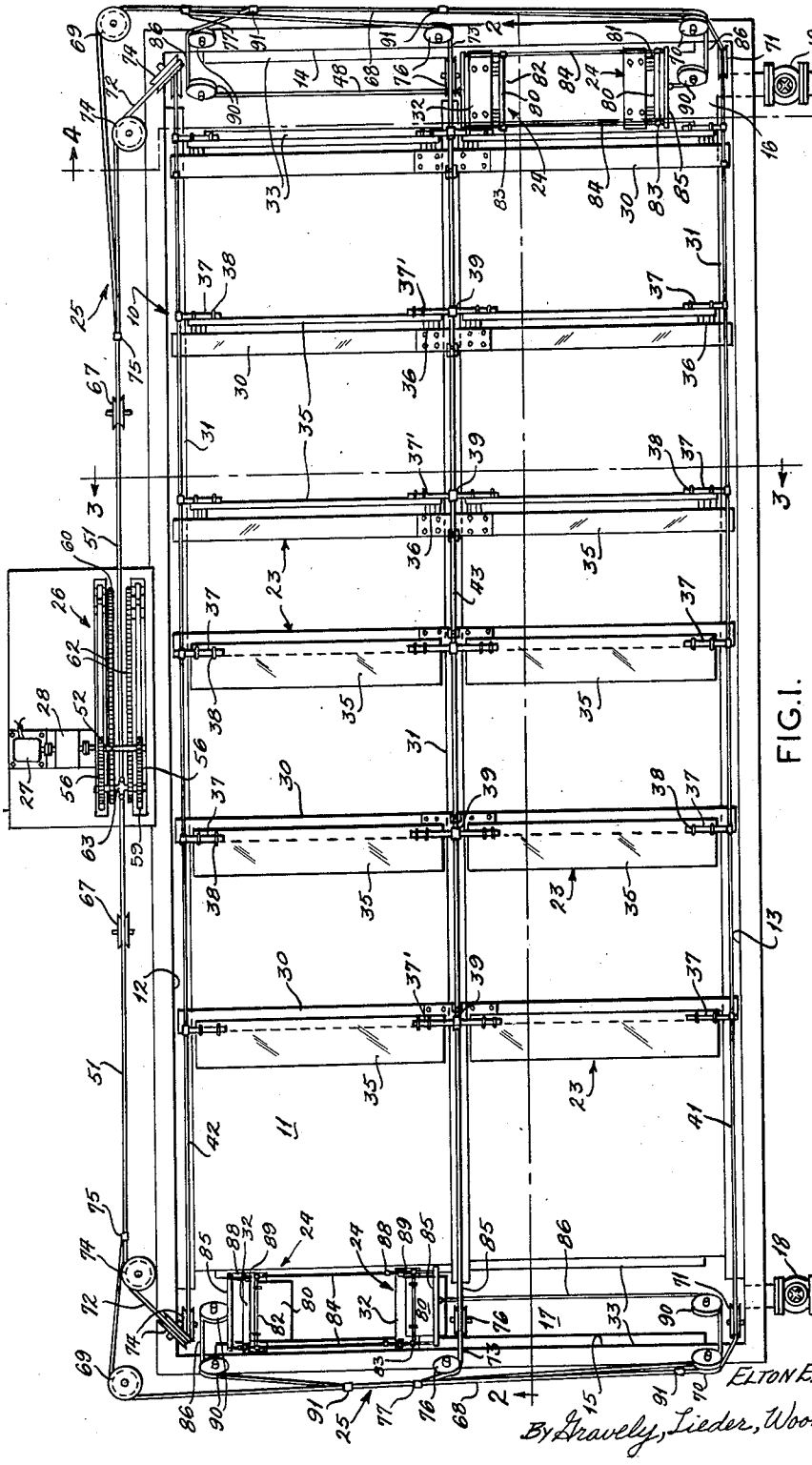


FIG. 1.

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SEDIMENTATION BASIN CLEANING APPARATUS

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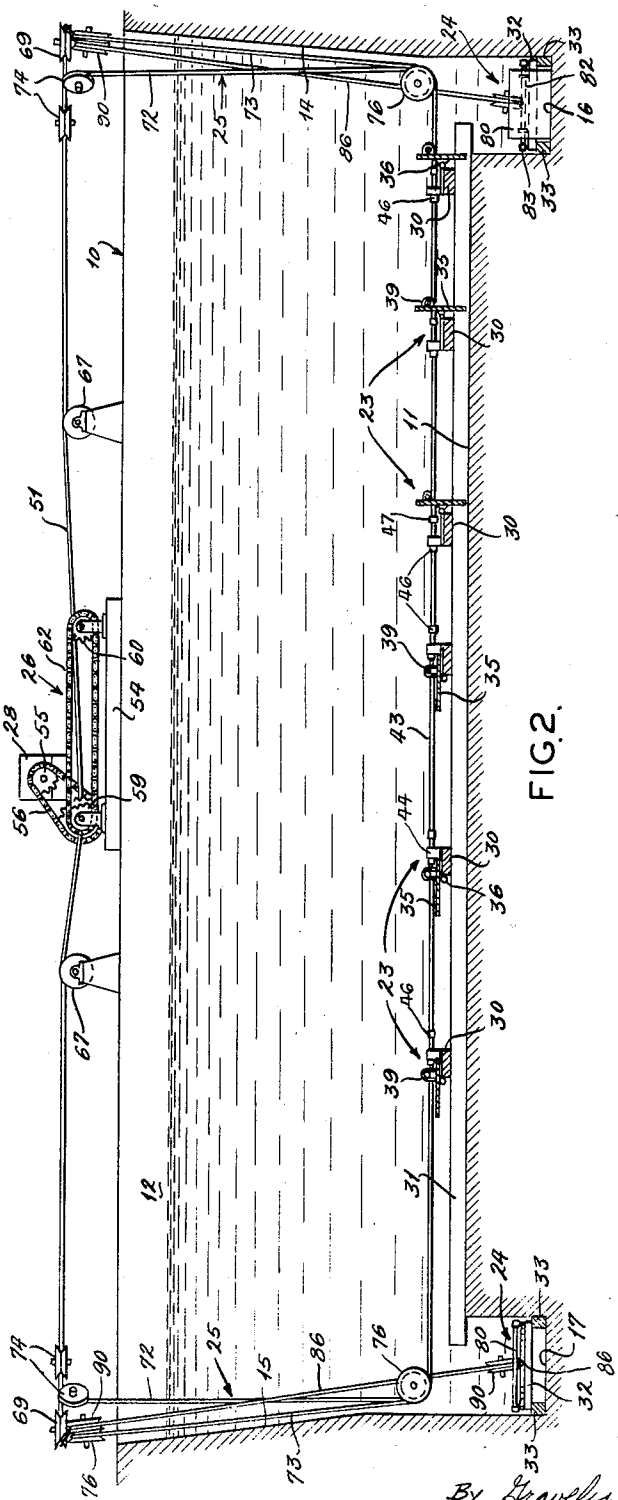


FIG. 2.

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SEDIMENTATION BASIN CLEANING APPARATUS

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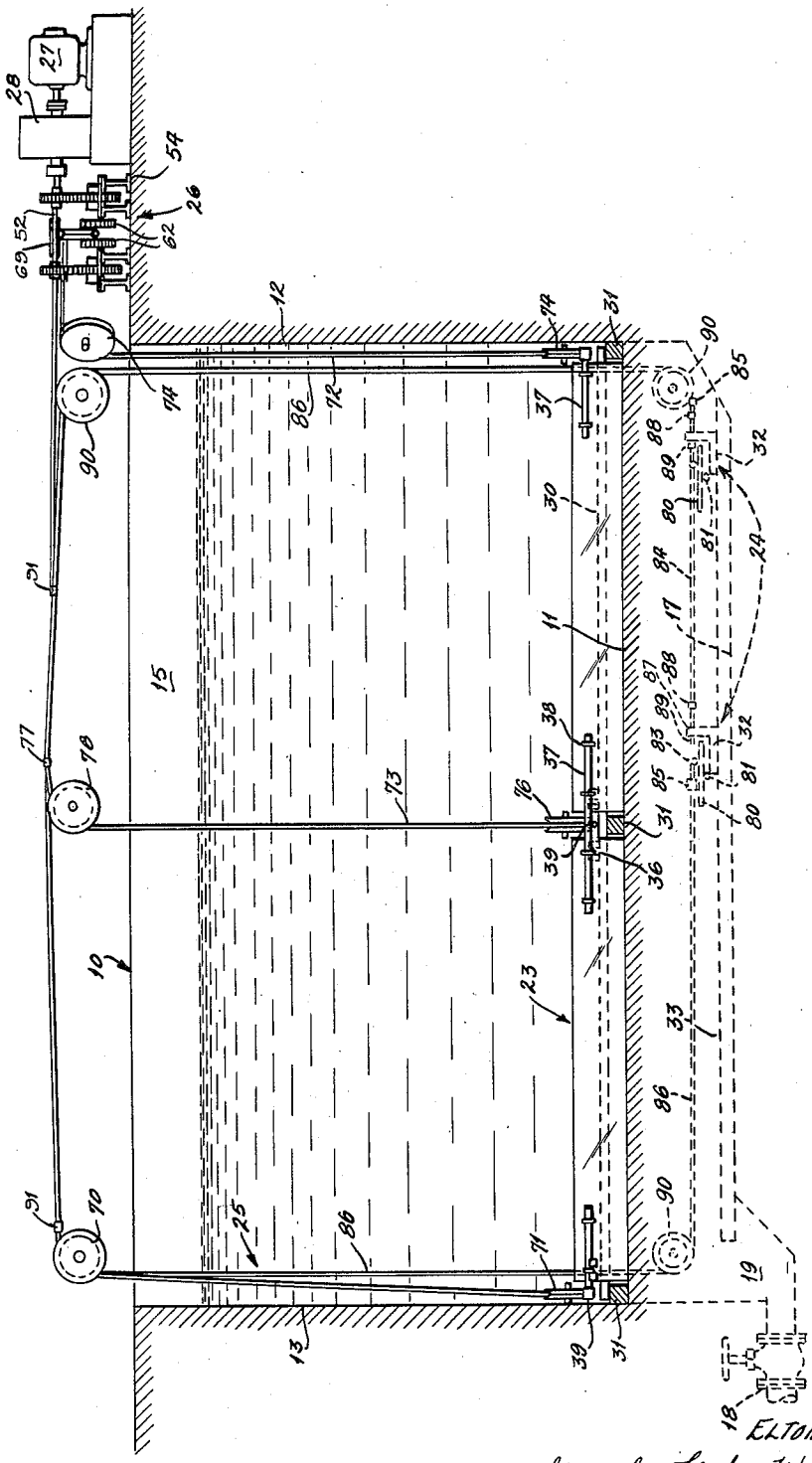


FIG. 3.

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SEDIMENTATION BASIN CLEANING APPARATUS

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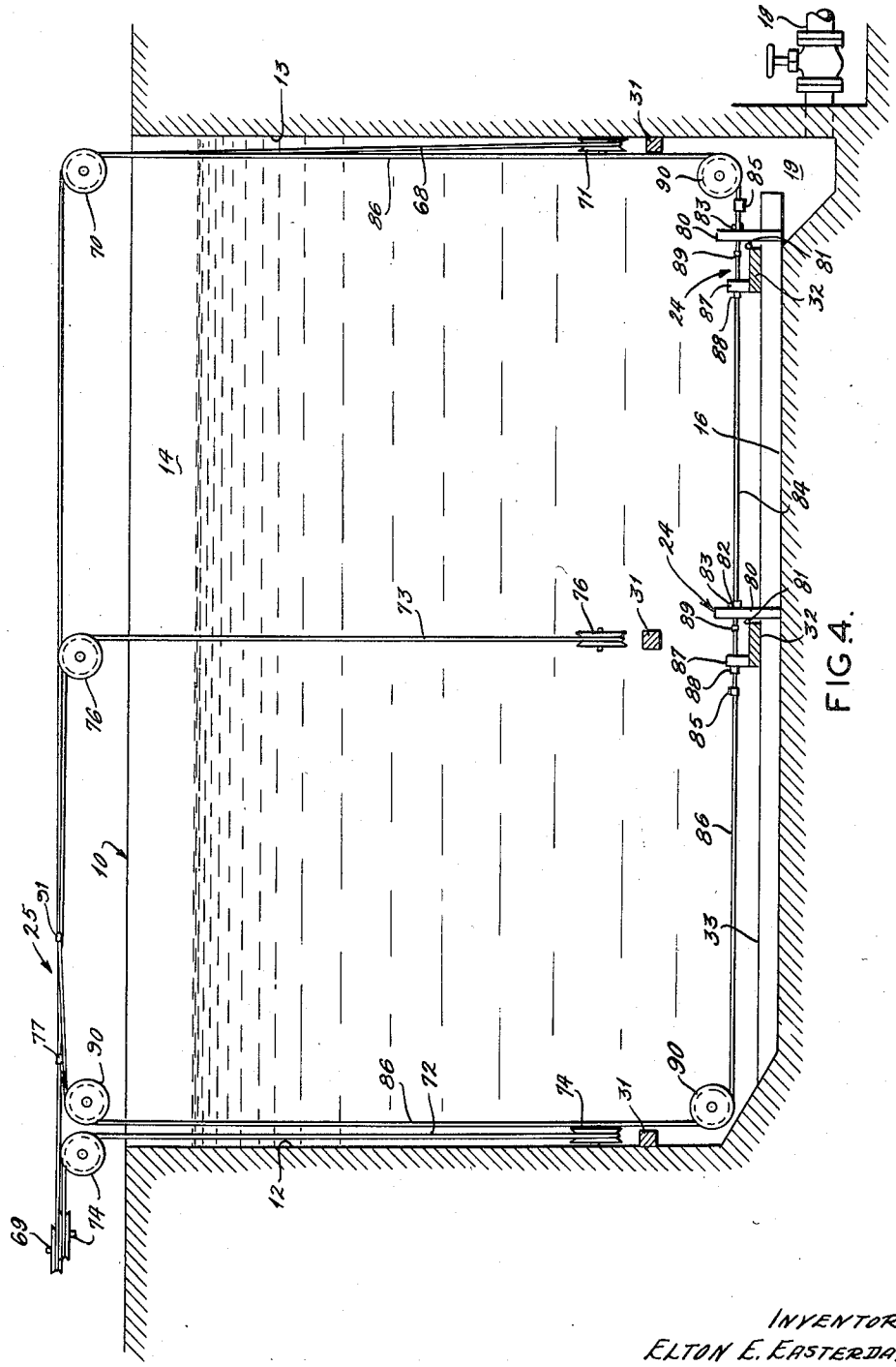



FIG 4.

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SEDIMENTATION BASIN CLEANING APPARATUS

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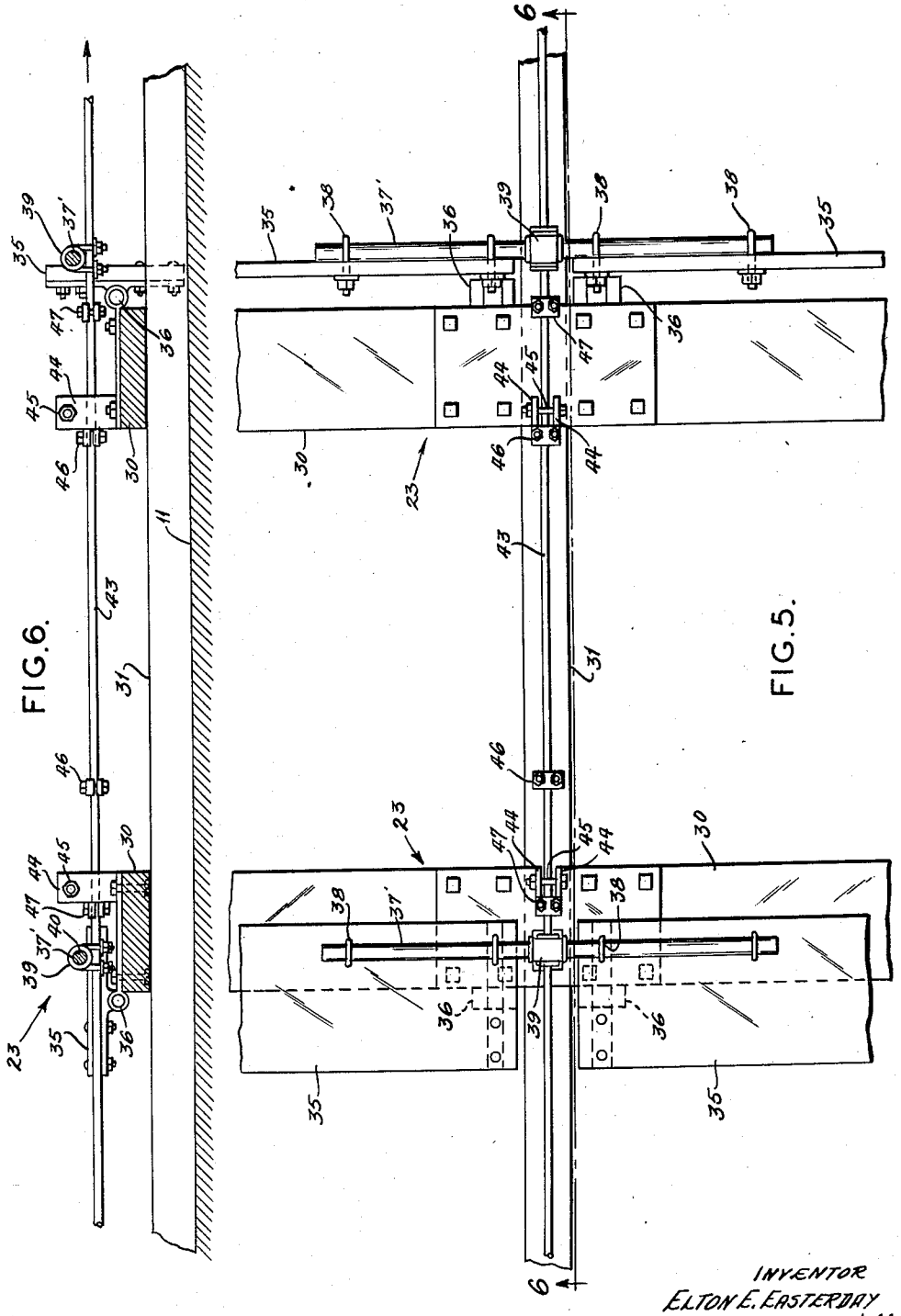


FIG. 6.

FIG. 5.

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SEDIMENTATION BASIN CLEANING APPARATUS

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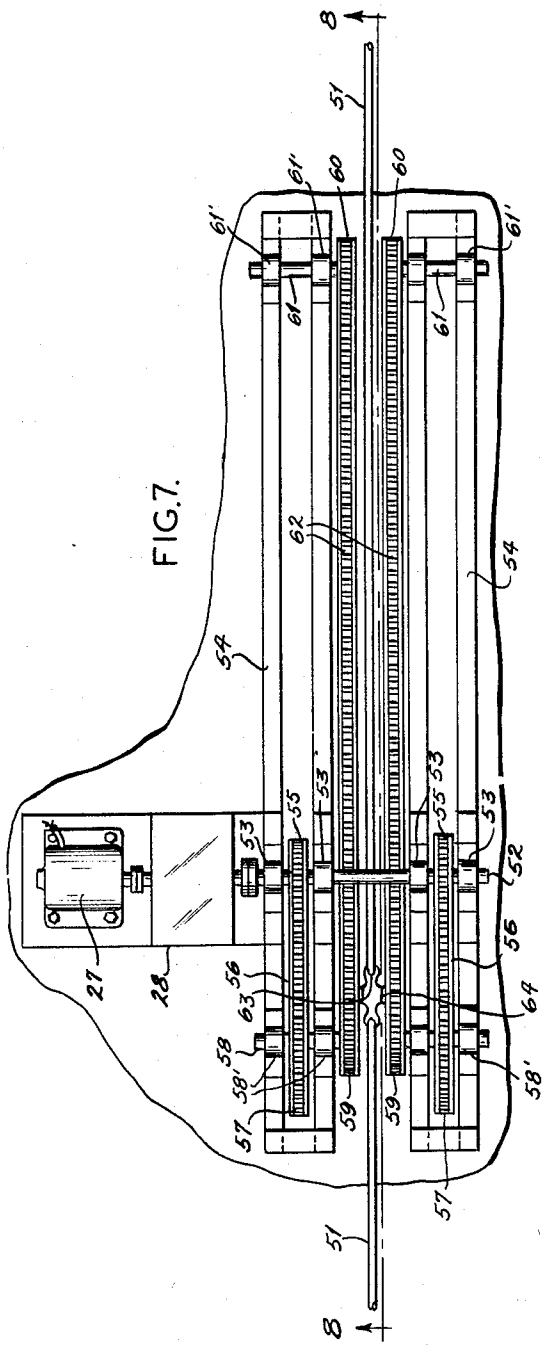


FIG. 7.

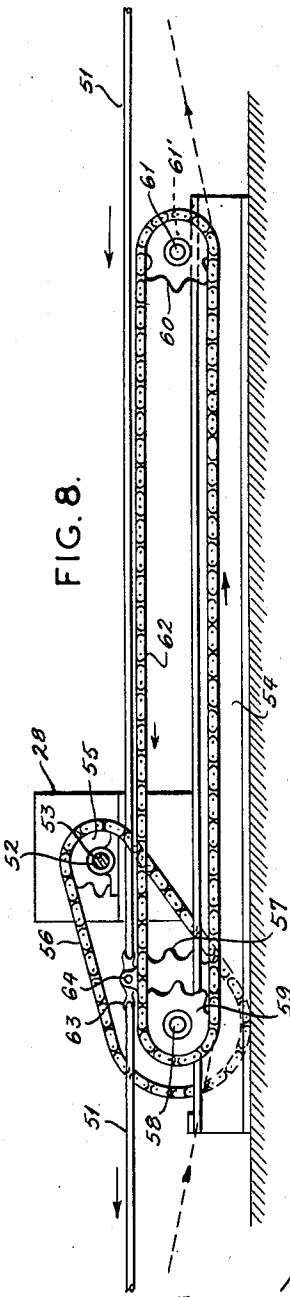


FIG. 8.

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United States Patent Office 2,866,557 Patented Dec. 30, 1958



2,866,557

# SEDIMENTATION BASIN CLEANING APPARATUS

Elton E. Easterday, St. Louis, Mo.

Application February 24, 1956, Serial No. 567,594

6 Claims. (Cl. 210—527)

This invention relates to improvements in sedimentation basin cleaning apparatus for use with water treatment plants, sewage disposal, industrial waste treatment, mining sedimentation and the like.

The principal object of the present invention is to provide cleaning apparatus for moving solid matter or sediment from the floor area of a sedimentation basin into discharge gutters or trenches, and from the discharge gutters into discharge conduits.

A more specific object is to provide basin floor and gutter cleaning means of improved character for moving solid matter from the sedimentation basin in response to the action of towing means therefor.

Another object of the present invention is to provide reciprocable basin floor and gutter cleaning means movable in different areas of a basin and operatively connected to a single prime mover for concurrent sediment moving actuation.

Another object is to provide reciprocating cleaning means for moving sediment from a basin floor into gutters and other reciprocating cleaning means for moving the sediment from the gutters into discharge conduits, the cleaning means being operative in one direction of movement and inoperative in the opposite direction of movement.

It is also an object to provide an improved and greatly simplified apparatus for actuating the basin cleaning means from a central source of power and to obtain reciprocating movement from a unidirectional prime mover.

These and other objects and advantages will become apparent hereinafter.

Briefly, the invention comprises longitudinally reciprocable basin floor cleaning means and transversely reciprocable gutter cleaning means, both of which are operated by towing means actuated by a single continuous drive means having a prime mover. The invention also consists of the cleaning means alternately operable and inoperable depending upon the direction of movement, whereby sediment is moved unidirectionally from the basin floor to the gutter and unidirectionally from the gutter to a discharge conduit, and in apparatus for obtaining alternate motion in a simple manner from a unidirectional prime mover.

The invention also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed. In the accompanying drawings which form a part of this specification and wherein like numerals refer to like parts wherever they occur:

Fig. 1 is a top plan view of a sedimentation basin of rectangular shape and a cleaning apparatus embodying the present invention,

Fig. 2 is a longitudinal sectional view of the basin and cleaning apparatus taken substantially along line 2—2 of Fig. 1,

Fig. 3 is a slightly enlarged transverse sectional view of the basin and cleaning apparatus taken substantially along line 3—3 of Fig. 1,



Fig. 4 is a slightly enlarged transverse sectional view of the basin and gutter and scraper elements therefor taken along line 4—4 of Fig. 1,

Fig. 5 is a greatly enlarged fragmentary top plan view showing the details of a typical cleaning means for the cleaning apparatus,

Fig. 6 is a vertical sectional view of the cleaning means taken along line 6—6 of Fig. 5,

Fig. 7 is a greatly enlarged plan view of continuous drive means and prime mover for the cleaning apparatus, and

Fig. 8 is a side elevational view (partly in section) of the drive means and prime mover taken along line 8—8 in Fig. 7.

Referring to Figs. 1–4 of the drawings, it will be seen that the present invention has been illustrated as applied to a rectangular sedimentation basin **10** having a substantially horizontal floor **11**, opposed vertical side walls **12** and **13** and opposed substantially vertical end walls **14** and **15**. The basin **10** is also provided with transverse gutters **16** and **17** at the ends **14** and **15**, respectively, the gutters being formed below the level of the floor **11** in position to receive sediment therefrom. Each of the gutters **16** and **17** is provided with a suitable valve controlled discharge conduit **18** (Figs. 1, 3 and 4), and a sump **19** is formed intermediate each of the gutters and the conduit therefor. Inlet and outlet means for the basin **10** have not been shown, but any conventional means may be used as it constitutes no part of the invention and is not believed necessary to an understanding of the invention to be described.

Cleaning apparatus embodying the present invention is associated with the sedimentation basin **10**, as shown best in Figs. 1–4. The cleaning apparatus comprises a plurality of sediment moving means **23** for the floor **11** and sediment moving means **24** for the gutters **16** and **17**, both of which are connected by a system of cable towing means **25** to drive means **26**. The drive means **26** is actuated by a prime mover **27**, such as a variable speed motor, through suitable speed reducing means **28**. The floor sediment moving or cleaning means **23** extend transversely of the basin **10** in predetermined longitudinally spaced relation, each of the cleaning means **23** including a beam or supporting member **30** slidably mounted above the floor **11** on longitudinal rails **31**. One of the longitudinal rails **31** is secured to the basin floor **11** along each of the side walls **12** and **13**, and another longitudinal rail **31** may be provided intermediate the side walls or at the center of the basin **10** for supporting the center of the beams **30**. Similarly, the gutter cleaning means **24** are positioned in the gutters **16** and **17** in predetermined transversely spaced relation, each of the cleaning means **24** including a beam or supporting member **32** slidably mounted above the bottom of the gutters **16** and **17** on transverse rails **33**. These transverse rails **33** are positioned along each side of the gutters so that the ends of the beams **32** are mounted thereon.

Referring now to Figs. 1, 5 and 6, the floor cleaning means **23** will be described in detail, a description of one being exemplary of the others. The cleaning means **23** includes one or more (two being shown) similar scraper blades **35** hingedly connected by spaced hinges **36** to the beam **30**. The blades **35** are in position to extend transversely of the basin **10** between the side and center rails **31**, and are swingable on the hinges **36** between operative or vertical sediment moving position and inoperative or horizontal sediment by-passing position. A bar **37** is rigidly secured to each end of the scraper blades **35** by suitable shackle bolts **38** or the like, the center bar **37'** (shown in Fig. 5) connecting the adjacent ends of the scraper blades **35** together. These bars **37** and **37'** are fastened to the blades **35** above the hinges **36** when the

blades are in vertical position, and a clamp 39 having a smooth bore 40 is mounted on each of the bars 37 and 37' and freely rotating thereon. The clamps 39 are provided to secure cables 41 and 42 to the outer ends of the scraper blades 35 of each of the cleaning means 23, and another cable 43 between the adjacent ends of the scraper blades 35 or in the center of the cleaning means 23. The cables 41, 42 and 43 extend longitudinally of the basin 10 in transversely spaced relation and are movable relative to the cleaning means 23 to effect rotation of the scraper blades 35 about the hinges 36 into horizontal or vertical position.

A plurality of pairs of spaced upstanding brackets 44 are provided on each of the beams 30 in position to receive the cables 41, 42 and 43 therebetween, a bolt 45 or the like being secured to each pair of brackets 44 for retaining the cables therebetween. The bolts 45 also assist in preventing spreading of the brackets. Each of the cables 41, 42 and 43 is provided with a pair of stops 46 and 47 in predetermined spaced relation and on each side of the brackets 44. The stops 46 and 47 are movable by the cables 41, 42 and 43 alternately into contact with opposite sides of the brackets 44 for limiting the relative movement between the cables and the cleaning means 23 to a stroke sufficient to allow the blades 35 to pivot. The stops 46 exert pulling forces on the scraper blades 35 for moving sediment from the floor 11, and the stops 47 maintain the scraper blades 35 in horizontal position above the floor 11 for by-passing sediment thereon.

The basin floor cleaning means 23 are arranged in oppositely-acting sets (three being shown in each set), which will be referred to as the left-hand set and the right-hand set for purposes of disclosure. When the cables 41, 42 and 43 are moved in one direction (to the right in Figs. 1 and 2), the scraper blades 35 of the right-hand set of means 23 will be raised or pivoted into operative position and the scraper blades 35 of the left-hand set will be folded or pivoted into inoperative position, as shown in Fig. 1. Reverse movement (to the left in Figs. 1 and 2) of the cables 41, 42 and 43, of course, effects the reversal of positions of the scraper blades 35 of the cleaning means 23 so that the right-hand set will be rendered inoperative and the left-hand set will be raised into operative position.

As will be described more fully hereinafter, the towing means 25 includes the full length cables 41, 42 and 43 for moving the floor cleaning means 23, the cables 41, 42 and 43 being connected together at predetermined points and, in turn, being connected to the opposite parts of principal towing cables 51 for coupling the towing means 25 to the drive means 26.

Referring to Figs. 1, 7 and 8, the drive means 26 is actuated by a drive shaft 52 operatively connected to the prime mover 27 through the speed reduction means 28. The drive shaft 52 is journaled in pairs of spaced bearings 53 carried by spaced apart frame members 54. A sprocket wheel 55 is mounted on the shaft 52 between each pair of bearing 53 to provide take-off means for transmitting power through a pair of sprocket chains 56 to other sprocket wheels 57. Each of the sprocket wheels 57 is mounted on a separate shaft 58 journaled in one of the frame members 54 in suitable bearings 58'. The sprocket wheels 55 and 57 are preferably arranged to provide a reduction in the speed of rotation of the shafts 58 relative to the speed of the drive shaft 52. A pair of drive sprocket wheels 59 (Fig. 8) are mounted on the inboard ends of the shafts 58, and a pair of idler sprocket wheels 60 are mounted on shafts 61, the shafts being carried in bearings 61' on the frame members 54 a predetermined horizontal distance from the sprocket wheels 59. A pair of continuous or closed circuit inboard sprocket chains 62 are mounted on the sprocket wheels 59 and 60, the chains 62 being spaced apart to provide an unrestricted opening in which the towing cables 51 are positioned. The towing cables 51 are connected to a coupler 63 freely rotatable on a shaft or bar 64 extending between and carried by the inboard sprocket chains 62. Accordingly, as the sprocket chains 62 are driven in a continuous path around the sprocket wheels 59 and 60 by the outboard sprocket chains 56, the towing cables 51 are carried first in one direction and then in the opposite direction whereby the cables 41, 42 and 43 are actuated to reciprocate the floor cleaning means 23 to remove sediment from the floor 11. The cable system comprising the towing means 25 will now be described in detail.

Referring to Figs. 1–4, the towing cables 51 are connected to the coupler 63 and extend longitudinally of the basin 10 adjacent to the side wall 12, each of them being supported on a sheave 67 intermediate the drive means 26 and one end of the basin. The towing cables 51 may be connected to the ends of the outer end cable 41 along the side wall 13 by intermediate connecting cables 68 so that an integral or continuous cable is provided. The intermediate cables 68 extend horizontally from the towing cables 51 around horizontally rotatable sheaves 69 at each end of the side wall 12, then horizontally along the ends of the basin 10 to vertically rotatable sheaves 70 at each end of the side wall 13 and downwardly around other vertically rotatable sheaves 71 to the cable 41 near the bottom of the side wall 13. The outer end cable 42 along the side wall 12 and the center cable 43 have end cable portions 72 and 73, respectively. The end cable portions 72 are directed around vertically and horizontally rotatable sheaves 74 at each end of the side wall 12, the ends of the cable portions 72 being connected to the towing cable 51 as at 75. Similarly, the end cable portions 73 are directed around vertically rotatable sheaves 76, and the ends thereof are connected to the intermediate cables 68 as at 77. The length of the cables and the points of connection are all predetermined so that when the towing cables 51 are actuated by the prime mover 27, the towing means 25 and the floor cleaning means 23 will be reciprocated across the floor a predetermined distance. The distance between each of the floor cleaning means 23 is less than the stroke or distance of movement of the means 23 during operation in order to have a certain amount of overlap in the floor area covered. The travel distance or stroke of the cleaning means 23 is determined by the distance between the drive and idler sprocket wheels 59 and 60.

It is now apparent that when the prime mover 27 is operative, the chains 62 are actuated to carry the coupler 63 for the towing cables 51 in a continuous closed path around the drive and idler sprocket wheels 59 and 60. The path defined by the coupler 63 is divided into two portions of substantially equal length, but opposite directions of movement, so that the towing cables 51 are reciprocated to the left and right longitudinally of the basin 10 (as shown by the arrows in Fig. 8) the predetermined distance required for the stroke of the cleaning means 23 on the basin floor 11.

In operation, the towing cables 51 are actuated by the drive means 26 so that the cables 41, 42 and 43 of the towing means 25 will be pulled in reverse directions to effect the reciprocation of the cleaning means 23 longitudinally of the basin 10. When the towing cables 51 are moved to the left in Figs. 1 and 8, the cables 41, 42 and 43 will be pulled to the right to pivot the scraper blades 35 of the right-hand set of cleaning means 23 into vertical position. Simultaneously, the scraper blades 35 of the left-hand set of cleaning means 23 will be pivoted into horizontal non-scraping position. As the cables 41, 42 and 43 pivot the right-hand scraper blades 35 into vertical position, the stops 46 secured to the cables 41, 42 and 43 and associated with the cleaning means in the right-hand set (Figs. 1 and 5) will be moved toward abutting position with the brackets 44 of the right-hand cleaning means 23. The position of the right-hand stops 46 is predetermined so that they abut the brackets 44 when the right-hand scraper blades 35 are in substantially vertical scrap-

ing position. Further relative movement between the right-hand cleaning means 23 and the cables 41, 42 and 43 is prevented. Therefore, as sediment accumulates in front of the right-hand scraper blades 35 during rightward movement toward the gutter 16, the resistance to such movement, which is caused essentially by the weight of the sediment, will be transferred to the cables 41, 42 and 43 through the stops 46 acting on the brackets 44 on the beams 30. Conversely, the cables 41, 42 and 43 acting through the right-hand stops 46 exert pulling forces on the right-hand cleaning means whereby sediment is moved toward the gutter 16. The right-hand scraper blades 35 during this rightward movement are maintained in vertical position by the clamps 39 between the cables 41, 42 and 43 and the tie bars 37 and 37'.

Simultaneous with the pivoting of the right-hand scraper blades toward the vertical position, the left-hand set of scraper blades 35 are pivoted toward the horizontal position by the cable clamp connection 39. The left-hand stops 47 associated with the left-hand cleaning means 23 are adjusted with the right-hand stops 46 to abut the brackets 44 at substantially the same instant that the right-hand stops 46 make contact with the brackets 44 of the right-hand cleaning means 23. Accordingly, the left-hand scraper blades are maintained in horizantal position during rightward movement, and the left-hand set of cleaning means 23 offers little resistance to overall motion, except such as would arise by reason of the base 30 moving through the thick layer of sediment usually accumulated on the floor 11. It is apparent that during rightward movement of the cleaning means 23, the sediment on the right half of the floor 11 is piled up in front of each of the operative (right hand) scraper blades 35 and moved predetermined distances toward the gutter 16. The scraper blade at the right-hand end of the basin 10 moves the sediment carried by it into the gutter 16. Inasmuch as the left-hand blades are horizontally positioned in spaced relation with the floor 11, no sediment will be moved by them.

When the towing cables 51 are moved to the right in Figs. 1 and 5, the scraper blades 35 of the right-hand set of cleaning means 23 will be pivoted into horizontal sediment by-passing position and the scraper blades 35 of the left hand cleaning means 23 will be pivoted into vertical sediment moving position. The initial reversal of the movement of the cables 41, 42 and 43 causes the stops 47 of the left-hand cleaning means 23 and the stops 46 of the right-hand cleaning means 23 to move away from their respective brackets 44, and the scraper blades 35 to pivot, as just described. As the left-hand scraper blades 35 are pivoted toward the vertical position, the left-hand stops 46 are moved into abutment with the brackets 44 of the left-hand cleaning means. Simultaneously, the right-hand stops 47 are moved into abutting relationship with the brackets of the right-hand cleaning means 23. The operation of the left-hand set of cleaning means 23 is similar to the operation of the right-hand set, the scraper blade 35 at the left-hand end of the basin 10 moving sediment into the gutter 17. In either direction of movement the sediment is moved from the center of the basin 10 toward the gutters 16 and 17 in a series of steps, and the sediment moved by one scraper blade 35 is advanced further toward one of the gutters by the next scraper blade 35 in the same set of cleaning means.

Referring again to Figs. 1, 2 and 4, the gutter cleaning means 24 for each of the gutters 16 and 17 will now be described in detail, a description of one being exemplary of the other. The cleaning means 24 in the gutter 16 are similar to the cleaning means 23 for the basin floor 11. Each one of the means 24 has a scraper blade 80 pivotally mounted on hinges 81 to the beam 32 in position to swing into vertical position between the transverse rails 33. A bar 82 is secured to each end of the scraper blade 80 above the hinges 81, and a clamp 83



is rotatably mounted on each bar 82 adjacent to the end of the scraper blade 80. Inasmuch as each of the cleaning means 24 is provided with a single scraper blade 80, mutilation of the blade would be required if the cleaning means 24 were connected by a single center cable. Therefore, parallel cables 84 are provided to inter-connect the cleaning means 24, the cables 84 extending past the ends of the scraper blades 80 to which they are secured by the clamps 83. The ends of the parallel cables 84 are connected to spreader bars or single-trees 85, which are connected to and pulled by single end cables 86 of the towing means 25.

The beams 32 are provided with brackets 87 similar to the brackets 44 of the cleaning means 23 for receiving the cables 84 therebetween, and each of the cables 84 is provided with pairs of spaced stops 88 and 89 on each side of the brackets 87. The stops 88 and 89 are moved with the cables 84 alternately into abutment with opposite sides of the brackets 87, the stops 88 maintaining the scraper blades 80 in vertical position for moving sediment from the gutter 16, and the stops 89 limiting the pivoting of the scraper blades 80 into a horizontal position for by-passing sediment. Obviously, the cleaning means 24 reciprocate in the gutter 16, and are operative in one direction of movement and inoperative while moving in the reverse direction.

Referring to Figs. 3 and 4, it will be seen how the cleaning means 24 for the gutters 16 and 17 are connected to the towing means 25 to be reciprocated by the drive means 26 simultaneously with the cleaning means 23 for the basin floor 11. The end cables 86 for pulling the single-trees 85 are directed around vertically rotatable sheaves 90 at each side of the end walls 14 and 15, the end cables 86 being connected to the intermediate cables 68 as at 91. Accordingly, when the towing cables 51 and intermediate cables 68 are reciprocated by the drive means 26, the cleaning means 24 are reciprocated in the gutters 16 and 17.

The gutter cleaning means 24 in the gutter 17 will be operative to remove sediment therefrom when the left-hand set of floor cleaning means 23 are operative and the gutter cleaning means 24 in the gutter 16 will be operative when the right-hand set of floor cleaning means 23 are operative. The spacing between each of the gutter cleaning means 24 is less than the stroke distance or movement of the means 24 during operation so that a certain amount of overlap in the gutter area is provided. Therefore, sediment is moved progressively from floor 11 of the basin 10 to each of the gutters 16 and 17 in a series of steps by the sets of cleaning means 23, and from the gutters 16 and 17 in a similar series of steps by the cleaning means 24.

When a gutter at each end of the basin is provided, the cleaning apparatus includes an organization of at least two reversely-acting cleaning means 23 adapted to be alternately operative to move sediment from the basin floor 11 to each of the gutters without any waste motion of the towing system 25 therefor. However, the cleaning apparatus is easily adapted to move sediment unidirectionally on the basin floor 11, if only one gutter should be provided. In the latter case, only one floor cleaning means 23 or one set thereof would be required. The preferred arrangement of floor cleaning means for large size basins is to provide two alternately operative sets having at least two cleaning means in each set for moving sediment into gutters at each end of the basin, the means being in predetermined spaced relation and movable a predetermined distance greater than the distance between them so that sediment is moved from the basin floor 11 in a series of steps. At least one cleaning means 24 is required in each gutter of the basin 10, and the preferred arrangement is to provide tandem means 24 for moving sediment from the gutter in a series of steps. When two gutters (16 and 17) are provided, the cleaning means 24 are adapted to be alternately operative to move sediment

into the discharge conduits 18 therefor. If desired, additional cleaning means may be provided, in which case the spacing therebetween will be decreased and the reciprocation of the towing cable will be shortened and the points of connection between the floor and gutter element cables will be changed.

Obviously, the improved cleaning apparatus for a sedimentation basin hereinbefore disclosed admits of considerable changes and modifications without departing from the spirit and scope of the present invention, which is limited only by the claims which follow.

What I claim is:

1. In sedimentation basin cleaning apparatus for a basin having a floor on which sediment deposits collect and sediment receiving gutters along opposite ends of the floor, the improvement of scraper means reciprocable over the floor, said scraper means including a plurality of pivoted scraper blades, certain ones of which are pivoted into scraping position for one direction of movement and the remainder being pivoted into scraping position for the opposite direction of movement, cleaner means movable in the gutters, a cable system connected to said scraper means and extending in opposite directions in the basin and upwardly and out of the basin, other cable systems connected to said cleaner means and extending in opposite directions in the gutters and upwardly and out of the basin, said other cable systems being interconnected with said first mentioned cable system, and actuating means outside the basin connected to said first mentioned cable system to operate all of said cable systems simultaneously and periodically in opposite directions.

2. In sediment moving scraper apparatus, a frame, a scraper blade mounted on a horizontal axis on said frame for rotation between a scraping position and a non-scraping position, towing means for the apparatus connected to said scraper blade adjacent to the horizontal axis thereof, said towing means being reciprocable in a horizontal path and effecting rotation of said scraper blade between said positions, and cooperating abutment means on said frame and towing means adapted to engage and transmit pull on said towing means to said frame, said towing means having lost-motion movement relative to the abutment means on said frame corresponding with movement of said scraper blade between said positions.

3. Reversibly movable scraper means comprising a frame, a scraper blade hingedly connected to said frame to move between a vertical scraping position and a horizontal folded position, an abutment on said frame, frame towing means reversibly movable adjacent to said abutment, spaced stop means mounted on said frame towing means in position to engage said abutment in reverse directions of movement of the towing means, for exerting towing forces on said scraper means, and a connection between said towing means and said scraper blade for changing the towing forces into scraper blade pivoting movement between said scraper blade positions in advance of the engagement of said stop means with said abutment as said towing means is reversed in its direction of movement.

4. In cleaning apparatus for a sedimentation basin having a floor on which sediment is deposited, a base, tracks in the basin to support said base adjacent to the floor for longitudinal movement in the basin, a sediment scraping blade pivoted on said base for movement between scraping and non-scraping positions, a reciprocating towing system for operating said cleaning apparatus, said system including a towing element connected to said blade to effect alternate blade pivoting movement between scraping and non-scraping positions for opposite directions of movement of said towing element, a towing member fixed on said base, and spaced stops fixed on said towing element in position to alternately engage said towing member for limiting blade pivoting movement between scraping and non-scraping positions and carrying said base with said towing element in the reciprocation of said system, the space between said stops being predetermined by the pivoting movement of said blade relative to said base so that said stops engage said towing member at the end of blade pivoting movement and subsequently act to move said towing element, base and scraping blade along said tracks.

5. Sedimentation cleaning apparatus for a basin having a longitudinal floor upon which sediment is deposited and transverse gutters at the ends of the floor, said cleaning apparatus comprising first and second cleaning means in predetermined longitudinally spaced relationship, each of said cleaning means including a transversely-extending base adapted to be reciprocated longitudinally in the basin between a line adjacent to the center of the floor and one of the gutters, a scraper blade hingedly connected to said base for pivotal movement between a vertical sediment moving position and a horizontal sediment by-passing position, said scraper blade of said first cleaning means being in horizontal position when said scraper blade of said second cleaning means is in vertical position, and an abutment secured to said base; a towing system adapted to reciprocate said cleaning means, said towing system including longitudinal means interconnecting each of said scraper blades and having movement relative to said abutments to pivot the scraper blades relative to said bases, spaced stop means on said longitudinal means adapted to alternately contact said abutments during the reciprocation of said cleaning means to limit scraper blade pivoting to one of said vertical and horizontal positions and thereafter transmit towing forces to said abutments; and continuous drive means adapted to be driven in a closed path having equal longitudinal portions in which the drive means moves in opposite directions, said longitudinal means being connected to said drive means and being carried in opposite directions to cause said scraper blades to pivot and said cleaning means to reciprocate in said basin, whereby said scraper blades are alternately operable for moving sediment from the center of the floor to each of the gutters.

6. In sedimentation cleaning apparartus for a basin having a longitudinal floor upon which sediment is deposited and transverse gutterrs at the ends of the floor; first and second sets of floor cleaning means each of which includes a plurality of individual cleaning means positioned in predetermined longitudinally spaced relationship for moving sediment from the center of the floor to one of said gutters, each of said floor cleaning means in each set comprising a base adapted to be reciprocated longitudinally in the basin toward and away from the gutter associated therewith, a scraper blade hingedly connected to said base of said floor cleaning means to pivot between a vertical floor-scraping position and a horizontal sediment by-passing position, and an abutment secured to said base of said floor cleaning means; gutter cleaning means in each of said gutters for moving sediment therefrom, each of said gutter cleaning means comprising a base adapted to be reciprocated in said gutter, a scraper blade hingedly connected to said base of said gutter cleaning means to pivot between a vertical gutter-scraping position and a horizontal sediment by-passing position, and an abutment secured to said base of said gutter cleaning means; a single towing system including a longitudinal portion and a pair of transverse portions, the longitudinal portion being pivotally connected to and extending between each of the scraper blades in each set of said floor cleaning means and each of the transverse portions being pivotally connected to the scraper blade of the gutter cleaning means in one of said gutters, said longitudinal and transverse portions extending past the abutments of the floor and gutter cleaning means, respectively, and carrying a pair of spaced stops on each side of each of said abutments for limiting relative movement between the longitudinal and transverse portions and the cleaning means, the distance between each pair of stops being predetermined to assure the pivotal movement of

the scraper blades between the vertical scraping and horizontal by-passing positions, said longitudinal portion being interconnected with said pair of transverse portions and said towing system also including a common portion extending between the transverse portions to provide a closed circuit; continuous drive means having a driven connection with a prime mover and having a closed path with equal longitudinal portions in which said drive means is adapted to move in opposite directions, said common portion of said towing system being pivotally connected to said drive means whereby the common portion is adapted to be reciprocated to move the longitudinal and transverse portions in a reciprocating action that is shorter than the longitudinal extent of said floor, the movement of the longitudinal portion in one direction carrying the floor cleaning means in one set across the floor toward one gutter with the scraper blades thereof



in vertical scraping position, and the other set of floor cleaning means away from the other gutter with the scraper blades in horizontal by-passing position, reverse movement of the longitudinal portion effecting reverse movement of the floor cleaning means and pivoting the scraper blades in each set thereof into opposite positions, and said transverse portions being reversely acting to move the gutter cleaning means in one gutter in the opposite direction as the gutter cleaning means in the other gutter.

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