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2,742,788

SEWER SAMPLER

Filed July 19, 1955

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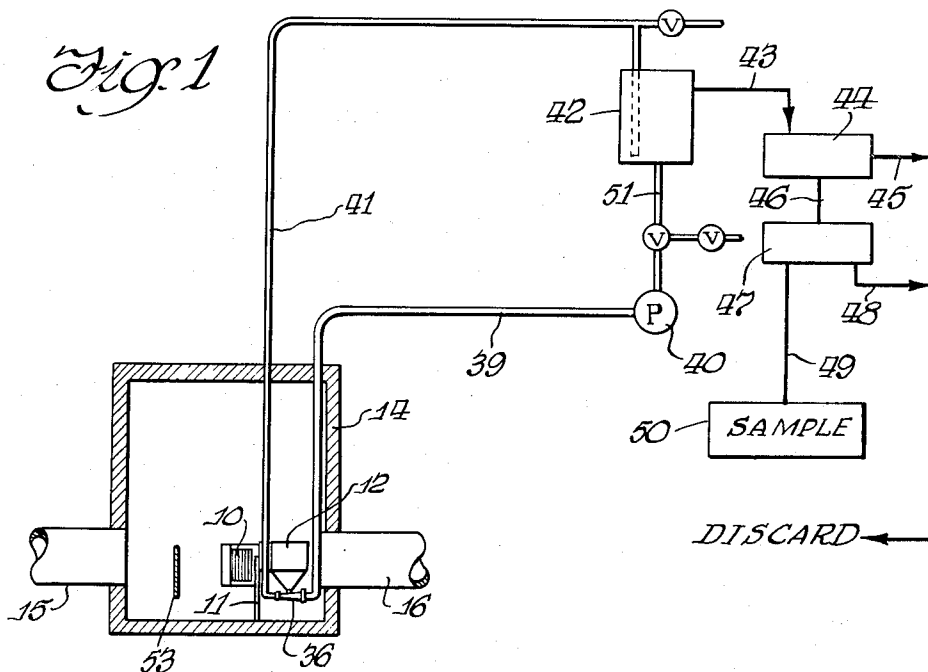
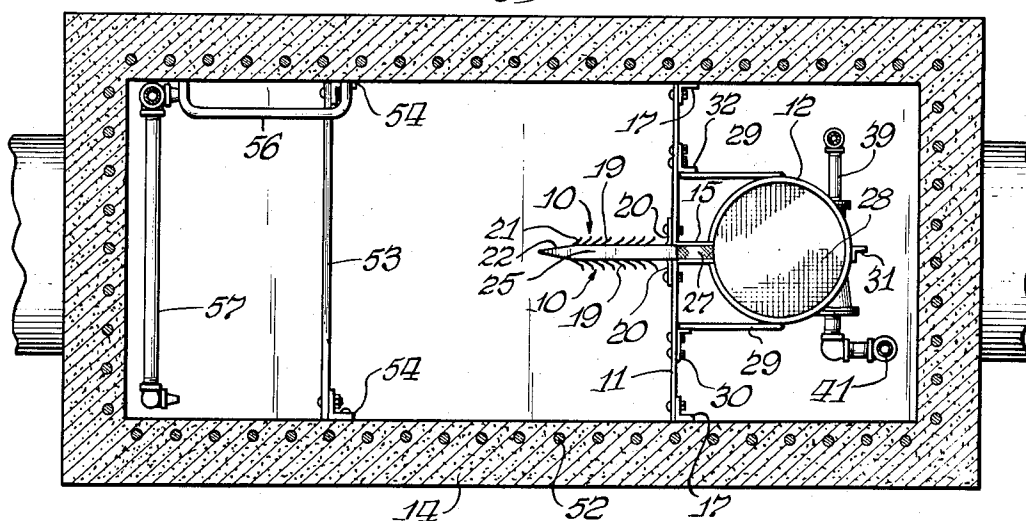


Fig. 3



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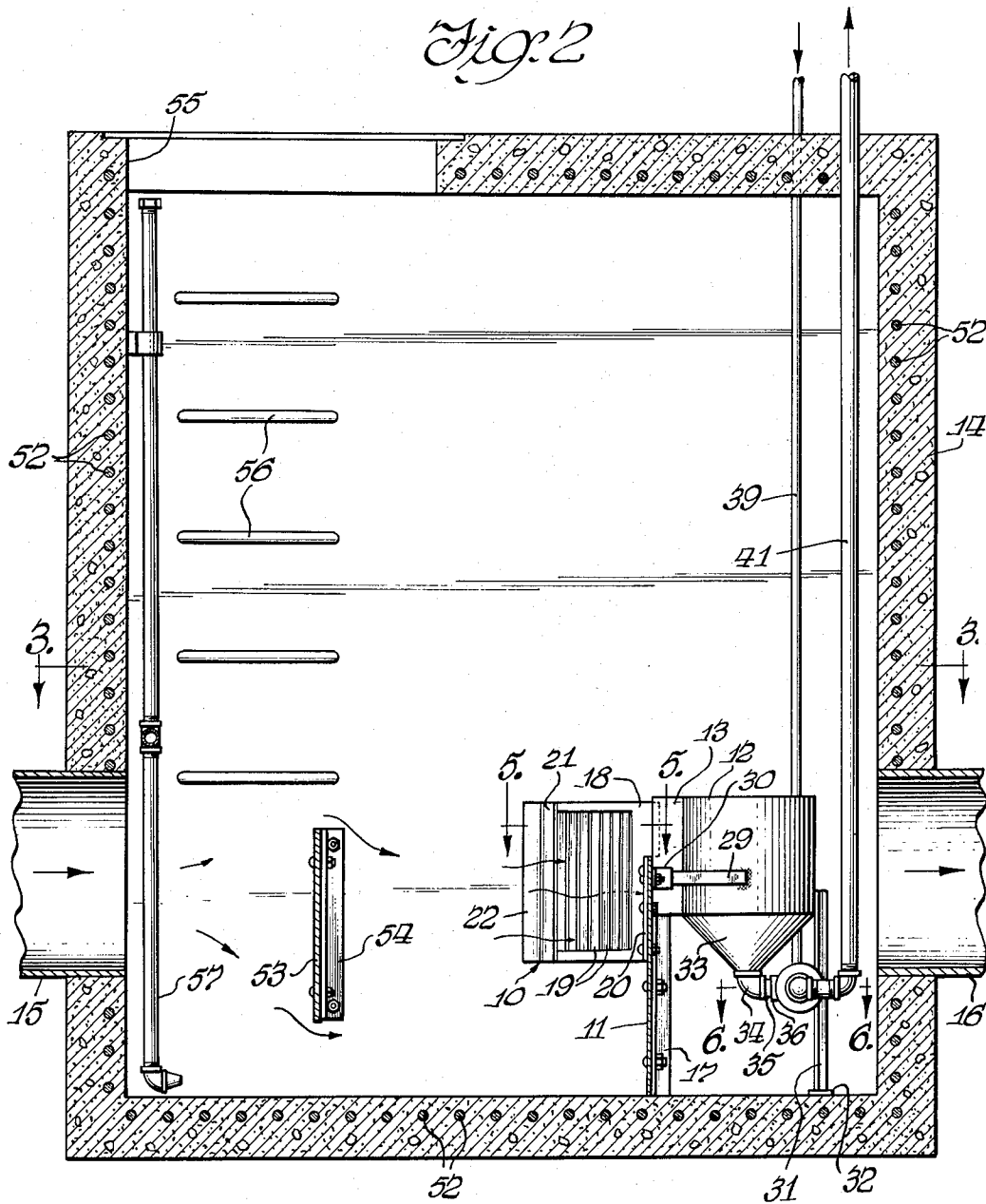
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Fig. 2



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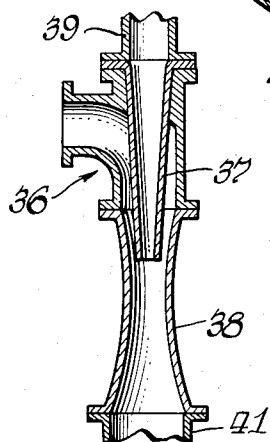
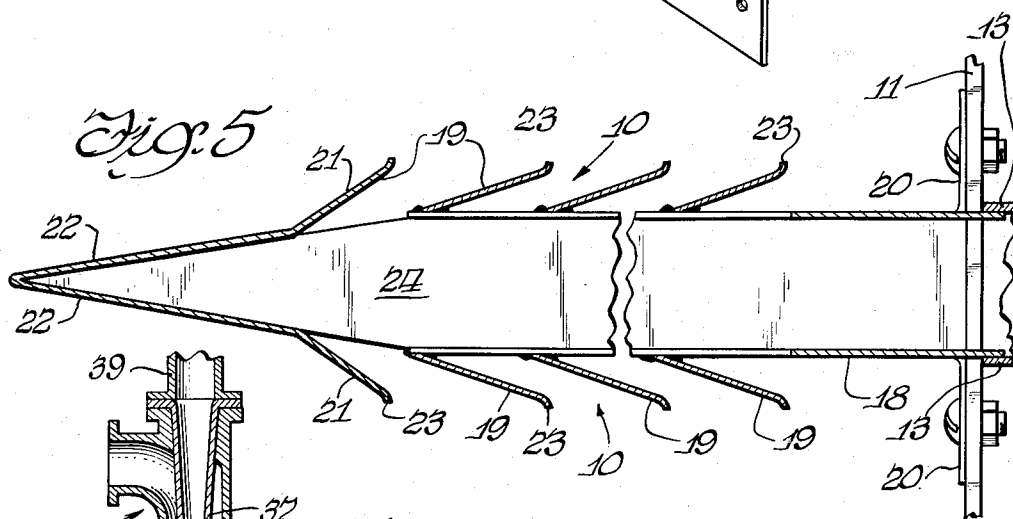
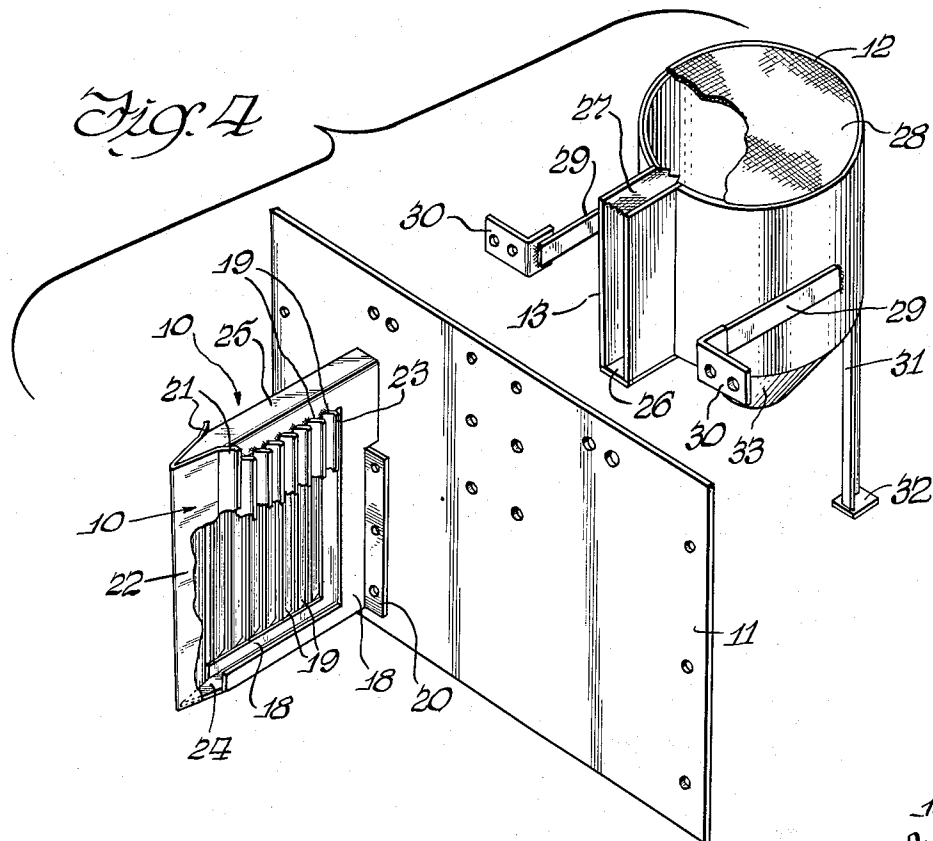
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5 Claims. (Cl. 73-422)

This invention relates to a sampling apparatus. More specifically, it relates to an apparatus for taking a liquid sample from sewage in which there may be solid materials that are to be excluded from the sample.

In the drawings:

Fig. 1 is a diagrammatic view showing the way in which the novel sampling apparatus of the present invention is used;

Fig. 2 is a vertical sectional view of the sampling apparatus;

Fig. 3 is a horizontal sectional view of the sampling apparatus taken on the line 3-3 of Fig. 2;

Fig. 4 is an exploded perspective view of the sampling apparatus;

Fig. 5 is a horizontal sectional view taken on the line 5-5 of Fig. 2; and

Fig. 6 is a horizontal sectional view taken on the line 6-6 of Fig. 2.

The novel sampling apparatus of the present invention comprises essentially a pair of closely spaced screens 10 joined at their forward ends in a point, a weir 11 extending across the rear ends of the screens 10, a large container 12 positioned on the opposite side of the weir 11 from the screens 10, and a narrow channel 13 connecting the screens 10 and the container 12.

The apparatus of the present invention is located in a concrete chamber 14, to opposite ends of which inlet and outlet lines 15 and 16 are connected. The weir 11 extends across the chamber 14 nearer the outlet line 16 than the inlet line 15 and is secured to the side walls of the chamber by means of angle irons 17, to which the weir is bolted and which are bolted to the side walls of the chamber.

The screens 10 are secured to the upstream side of the weir 11 or the side thereof toward the inlet line 15. Each screen comprises a U-shaped frame 18 and a plurality of vertical louvers 19 which are welded or soldered to the legs of the frame and extend therebetween. Each frame 18 has a flange 20 by which the frame is bolted to the weir 11. Each screen further comprises a front louver 21. The two louvers 21 are interconnected by means of a wall 22 with which they are integrally formed and which constitutes the forward ends on the screens 10 which meet in a point. Each of the louvers 19 and 21 has an outwardly directed flange 23 at its free vertical edge.

The frames 18 and the walls 22 are interconnected at their lower sides and ends by means of a piece 24 which may be integrally formed with the frames 18 and closes the space between the screens 10 at the bottom. The frames 18 and the walls 22 are interconnected at their upper sides and ends by a piece 25 which closes the space between screens 10 at the top.

Appreciable portions of the screens 10 lie above the weir 11 and are connected with the channel 13. This channel is closed at its bottom by a piece 26 and is covered at its top by a wire screen 27.

The container 12 is a large cylinder having a diameter a number of times greater than the width of the channel

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13 and the spacing between the screens 10. The top of the container 12 is covered by a wire screen 28. The container 12 is secured to the weir 11 by means of straps 29 and angle pieces 30, the straps being welded or soldered to the container and to the angle pieces, and the angle pieces being bolted to the weir 11. In addition to the support provided by the weir 11, the container 12 is also supported by a post 31 which is in the form of an angle iron and has its upper end bonded to the container 12 and its lower end secured to a piece 32 resting on the base of the concrete chamber 14.

The container 12 has at its lower end a cone 33 which has its upper large end connected to the cylinder of the container and its lower small end connected to an elbow 34 which is connected through a short tubular section 35 with an eductor 36. As shown in Fig. 6, this eductor includes a nozzle or aspirator 37 and a reduced venturi section 38 and is connected between an inlet line 39 connected with a pump 40, and an outlet line 41 leading to a constant-head device 42. The outlet line 41 empties into the constant-head device 42 near the bottom, the device 42 taking the form of a tank from which a sample of liquid is taken near the top through a line 43. The line 43 goes to a sampling device 44 from which a discard line 45 leads and a sampling line 46 leads to another sampling device 47. A discard line 48 leads from the sampling device 47 to the discard line 41, and a sampling line 49 leads to a final container 50 which receives the ultimate sample to be tested.

The bottom of the constant-head device 42 is connected with the pump 40 by a line 51 so that sewer liquor is continually recirculated through the pump 40, the eductor 36, and the device 42. The sewer liquor, by flowing through the eductor 36, pulls sewage from the container 12 through the eductor and the line 41 into the device 42. The sewage in the container 12 will have found its way thereto by flowing between the louvers 19 and 21 into the space between the screens 10 and thence through the channel 13. The outwardly directed flanges 23 on the louvers 19 and 21 prevent solid material such as toilet paper from becoming caught on the louvers and thus from clogging the louvers and screens.

The concrete chamber 14 is reinforced by wire screening 52. A baffle 53 extends across the chamber 14 in spaced relation to the screens 10 on the upstream side thereof and is secured to the side walls of the chamber by angle irons 54 which are bolted to the side walls and the baffle. The top of the baffle is somewhat lower than the upper ends of the louvers 19 and 21. The tops of the screens 10, the channel 13, and the container 12 are below the tops of the inlet and outlet lines 15 and 16. The chamber 14 has a manhole 55 in the top and rungs 56 positioned on one side wall therebelow. The chamber 14 is also provided with piping 57 for flushing.

The above described sampling apparatus is particularly useful for determining the loss in sewage of uranium values as to which there may be requirements for inventory and accountability. The sampling devices 44 and 47 are employed in conjunction with the apparatus of the present invention for reducing the amount of the sample taken from the constant-head device 42 through the line 43.

The intention is to limit the invention only within the scope of the appended claims.

What is claimed is:

1. Apparatus for taking a sewer sample, comprising a pair of closely spaced vertical screens joined at their forward ends in a point and having vertical louvers, a weir attached to the screens at their rear ends and having its upper end at a mid-region of the louvers, a narrow channel leading rearwardly from the screens at the opposite side of the weir from the screens, a large vertical

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cylinder connected with the channel, and a cone connected to the lower end of the cylinder and having a small central discharge opening, whereby when the apparatus is placed in an enlarged chamber in a sewage line with the weir extending across the chamber, sewage to be sampled is drawn through the louvers and thence into the channel, the cylinder, and the cone and out the discharge opening thereof.

2. The combination specified in claim 1 and further comprising an ejector for circulating fluid past a connection with the discharge opening of the cone in order to pull the sewer sample out of the cylinder.

3. The combination specified in claim 1, the louvers having outwardly directed flanges formed on their free edges.

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4. Apparatus for taking a sewer sample, comprising a pair of closely spaced screens joined at their forward ends in a point and having vertical louvers, a weir extending across the walls at their rear ends, a large container positioned on the opposite side of the weir from the walls, and a channel connecting the walls with the container.

5. The apparatus specified in claim 4, the width and breadth of the container being much greater than the width of the channel and the spacing between the walls.

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