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CONSTRUCTION OF SEWERS AND SEWER BASINS AND RECEPTACLES FOR USE IN SEWER BASINS

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Fig. 1

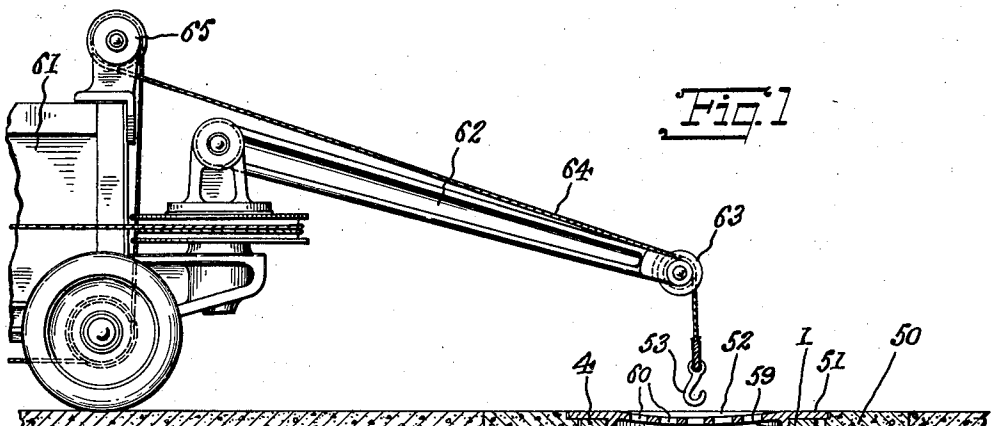


Fig. 2

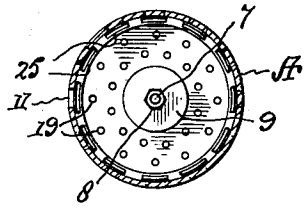


Fig. 3

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CONSTRUCTION OF SEWERS AND SEWER BASINS AND RECEPTACLES FOR USE IN SEWER BASINS

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2 Claims. (Cl. 182—2)

The present invention relates to improvements in the construction of sewers and sewer basins and receptacles for use in sewer basins.

An object of the invention is to provide a sewer basin of such construction that solid matter, sludge and the like may be caught in a receptacle suspended in the basin, which receptacle is subject to easy and quick removal for the purpose of dumping contents of the receptacle.

Another object of the invention is to provide a sewer basin of such construction as to be adapted to receive a removable receptacle, which receptacle will receive anything admitted to the basin and retain solid matter, heavy sludge and the like until contents of the receptacle are dumped after the removal of the receptacle from the basin.

A further object of the invention is to provide a receptacle which may be suspended in a sewer basin, which receptacle contains provision for the exit of liquid and particles of matter suspended in liquid from the receptacle into the basin and for the retention in the receptacle of other matter entering the basin.

Still further objects of the invention are to provide an improved form of sewer, an improved form of sewer basin, and an improved arrangement of conduit lead from a sewer basin to a sewer, together with means for preventing gases passing from a sewer into a sewer basin.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawing, wherein like symbols refer to like or corresponding parts throughout the several views:

Figure 1 is a vertical section taken through a sewer, a sewer basin, and a receptacle constructed in accordance with the present invention;

Figure 2 is a horizontal section taken on the line 2—2 of Figure 1; and

Figure 3 is a vertical section taken on the line 3—3 also of Figure 1.

In the drawing, A designates a receptacle, shown as frusto-conical in shape, that is, having the shape of a part of a cone at least for a portion of its length. The upper portion of the receptacle from the upper edge 1 down to approximately the zone indicated by 2 may be cylindrical, or otherwise shaped, to form a complement of the opening in the basin frame 50. The receptacle A is shown as tapering downwardly and inwardly from the zone indicated by 2. The receptacle may be of any desired size and shape, so long as it is adapted for insertion into, and removal from, a sewer basin in connection with which it is intended that it may be used, and the opening in the frame 50 may be of such size and shape as to permit of the insertion of the receptacle A into the basin in connection with which it is intended that it may be used, and the removal of the receptacle from such basin.

Means will be provided whereby a receptacle, as A, may be suspended in a sewer basin. In the drawing, a collar 3 is shown as surrounding the exterior of the upper end of the receptacle, and this collar is shown as having an outwardly extending flange 4. Instead of such collar, as 3, and flange, as 4, the upper end of the receptacle may have an outwardly turned flange forming part of the receptacle; or the receptacle may have a collar on the inside of the upper end of the receptacle similar to the collar 3, and such collar may have a flange extending outwardly along the upper edge of the receptacle. If a collar with an outwardly turned flange be used, without or within the upper end of the receptacle, such collar may be integral with, or welded, or otherwise secured to, the receptacle.

The frame 50 is shown as provided with a stepped or terraced wall extending about the opening through which the receptacle A is shown as fitted. This terraced construction is shown as comprising shoulders 16, 17 and 18. The lowermost shoulder 16 is shown as of the smallest diameter and as having an annular space adapted to receive a collar, as 3, when such a collar is on the exterior of the upper edge of the receptacle as shown in Figure 1. The second higher shoulder 17 is shown as stepped upwardly and radially outwardly from the shoulder 16 and is adapted to hold seated thereon an outwardly projecting flange 4, or such other flange as may project outwardly at the upper end of the receptacle. In the construction illustrated in Figure 1, the receptacle A may be entirely suspended from the shoulder 17 by reason of the engagement of the flange 4 thereon, or the weight of the receptacle may also be taken up by the lowermost shoulder 16 where the collar 3 is of sufficient depth to simultaneously rest upon said shoulder 16.

The sewer basin is shown as having a cover 52 having marginal portion 51 fitting and resting upon the flange 4 and extending outwardly therebeyond. This marginal portion 51 is shown as also resting upon the uppermost shoulder 18, which shoulder 18 is shown as in stepped rela-

tion upwardly and outwardly from the intermediate shoulder 17. The cover 52 is shown as also provided with a downwardly extending flange 59 for engaging within the collar or its flange 4, or within the upper portion of the receptacle. Perforations, slots, or other openings 60 are shown as provided in the cover 52 above the receptacle A. Liquid and material of a size to pass through such openings 60 are received in the receptacle A. A hook 53 may engage in the openings or slots 60 and interlock with the bars or other solid portions of the cover 52 between such slots or perforations 60, whereby the cover may be raised or lowered, as hereinafter described.

The bottom 5 of the receptacle is shown as provided with perforations 19 through which liquid may pass. The bottom 5 is also shown as fastened to the exterior of the body of the receptacle by rivets 6. If desired, however, the bottom 5 may be welded to the exterior of the body of the receptacle, or the bottom 5 may be welded, riveted or otherwise secured to the interior of the body of the receptacle. A bolt 7, having an eye or ring 10, is shown as extending through the bottom 5. The eye or ring 10 may be integral with the bolt 7, or be so held by the bolt 7 as to be incapable of movement independently of the bolt, or the ring 10 may be so held by the bolt 7 that the ring 10 may rock. The bolt 7 is shown as threaded through a nut 8, and the nut 8 is shown as resting against a washer 9. If desired, the nut 8 may be dispensed with, and the eye-bolt may be riveted or otherwise secured in place, and, if desired, the washer 9 may also be dispensed with and the eye-bolt riveted or otherwise secured to the bottom 5, or a bottom, as 5, may have an eye, as 10, integral therewith.

The receptacle is shown as provided with lateral openings, as 11, 12, 13, 14, 15, etc. One or more of the lateral openings may be so located with reference to the bottom 5 of the receptacle that, unless obstructed, liquid may pass out through such lateral opening or openings into the basin. Each lateral opening may be at any desired distance from the bottom of the receptacle. There may be any desired number of lateral openings and each lateral opening may be of any desired size and/or shape. The lateral openings may be so located with respect to each other that the bottom of one opening may be below the top of another opening. For instance, the bottom of the opening 12 may be below the top of the opening 11, the bottom of the opening 13 may be below the top of the opening 12, and the openings may progress around in a spiral series, if desired, as illustrated in Figure 1. An inwardly-sloping hood 25 is shown as riveted or otherwise secured to the receptacle above each lateral opening. Each such hood 25 will preferably be wider than the opening above which it is secured and will also preferably extend down below the bottom of the opening above which it is secured. The sides and lower end of each hood may be so disposed with reference to the opening above which the hood is secured that, while such hood will not prevent the flow of liquid through such opening, or the flow through such opening of particles of matter suspended in liquid, the entrance into a basin, through the opening, of material which it is desired shall not enter the basin, will be prevented. For instance, a piece of wood might be carried by liquid toward an opening, but the hood secured over such opening may prevent such piece of wood from passing through the opening. In effect, the disposition of a hood, with reference to the opening over which it is secured, will cause the hood to serve as a screen to separate that which it is desired may pass through the opening from that which it is desired may not pass through such opening. Not only may a hood serve to regulate what may pass through an opening, but the hoods, sloping downwardly and inwardly, serve to prevent matter which enters the receptacle through the cover 52 from falling into the lateral openings. If desired, the material of a receptacle may be so cut as to make an opening, and the cut-out portion of the receptacle may be bent inwardly and serve as a hood.

Arms 26 are shown as riveted to the receptacle and as converging towards an eye 27. There may be any desired number of arms, and the arms may be secured to the receptacle in any desired manner.

A basin B is shown as of such shape that liquid and matter suspended in liquid will be directed toward a conduit leading to a sewer. The conduit from the basin B to a sewer may discharge into the sewer where desired. A conduit 55 is shown in dotted lines as discharging into a sewer 56 below the level of the contents of the sewer. While the level of the contents of a sewer is above the mouth of such a conduit as 55, sewage in the sewer may serve as a trap to prevent foul and noxious gases passing from the sewer to the basin. Instead of a conduit, as 55, leading from a basin to below the level of sewage in a sewer, a conduit, as 54, may lead from a basin to any desired point in a sewer, and a valve may be provided to prevent foul and noxious gases entering the basin from the sewer. A valve 58 is shown as hinged on a collar 57. The valve may be mounted in any desired manner and may swing on any suitable kind of hinge. A hinge might, for instance, be in the form of a staple held in a sewer body. The portion of a sewer body adjacent the valve 58 may be cut away or so shaped as not to interfere with the movement of the valve. In the construction shown in the drawing, the valve is so hinged, and that end of the conduit 54 against which it is intended that the valve 58 may normally rest, is shown as of such shape that the valve 58 will be closed when at rest against the conduit. Preferably, the valve will be so turned along its upper side edges that, when the valve is at rest against the conduit, the upper side edges of the valve will loosely fit against the sides of the exterior of the conduit adjacent the valve. Preferably also, the bottom edge, and those parts of the side edges of the valve that are not turned, will be flat in shape, and these flat edges of the valve will rest against the end of the conduit without fitting against the exterior of the sides of the conduit.

The sewer 56 is shown as oval-shaped. Sewers are generally located in roadways over which pass vehicles often of great weight and heavy laden. Such vehicles are liable to cause damage and injury to a sewer. The oval shaped sewer is better able to resist pressure exerted on it from without, than would a circular-shaped or a square-shaped sewer.

Liquid and material entering through openings in the cover 52 will fall into the receptacle A and naturally gravitate toward the bottom 5 of the receptacle. If, at the bottom of the receptacle, there be nothing to obstruct the flow of liquid through the perforations 19 in such bottom, liquid may pass through such perforations into the basin B. If there be solids on the bottom of the receptacle, liquid may percolate through such solids if the solids permit the percolation of liquid

through them, and the liquid percolating through such solids may pass through the perforations 19 in the bottom 5 of the receptacle A, and out into the basin in which the receptacle A is suspended.

If solids at the bottom of the receptacle be of such nature that liquid will not readily percolate through them, or if the amount of solids at the bottom of the receptacle be so great that liquid will not readily percolate through the solids, the liquid may flow out of the receptacle through one or more of the lateral openings in the receptacle and may carry with it such matter as may be suspended in the liquid and be able to pass through such lateral opening or openings. Solids may continue to settle in the receptacle and block the egress of liquid through a lateral opening of the receptacle, but liquid which cannot escape through a blocked lateral opening may flow out of the receptacle through an unblocked lateral opening and carry with it into the basin such matter as may be suspended in the liquid and be able to pass through said last mentioned lateral opening. Under this arrangement no liquid will remain in the receptacle to become stagnant. Solids may fall into the receptacle, but the liquid above the solids will be able to flow through one or more of the lateral openings into the basin in which the receptacle is suspended.

Liquid which passes from a receptacle into a basin constructed as shown in the drawing may, because of the shape of the sides and bottom of the basin be directed toward the conduit leading from the basin to a sewer, and any matter which remains suspended in the liquid may be carried with the liquid to such conduit.

The contents of a sewer are ordinarily in motion toward the point where the sewer discharges into a river, or other place where it is intended that sewage from the sewer may be discharged. If the conduit from a basin lead below the level of sewage in a sewer the moving sewage in the sewer will carry along with it the contents of the conduit. If the conduit from a basin discharge into a sewer above the level of sewage in the sewer, and such a valve as 58 be provided, the contents of the conduit will press against the valve thereby opening it, thus permitting the contents of the conduit to flow into the sewer. Whatever may be in the conduit will tend to cause the valve 58 to open, and in the movement of sewage in the sewer toward the point where the sewer discharges into a river or other place, the moving sewage in the sewer will play about the edges of the valve if the sewage should reach such a level that the sewage comes into contact with the valve. The pressure of the contents of the conduit against the valve, and the movement of moving sewage along the edges of the valve will tend to open the valve, and the moving sewage may draw along with it the contents of the conduit.

The drawing shows a vehicle 61 provided with a swivelly mounted boom 62 having a pulley wheel 63 at its outer end, over which a cable 64 plays, and to this cable the hook 53 is shown as secured. The cable is shown as wound around a drum 65. The hook 53 may be engaged with the cover 52, and the cable 64 so operated as to raise the hook 53 and with it the cover 52. When the cover 52 has been disengaged from the frame 50, the boom 62 may be swung around to any desired position and the cover lowered and rested where desired. The hook 53 may then be disengaged from the cover, and the boom so swung that the hook may be brought into engagement with the eye 27. The boom may then be raised and the receptacle A drawn up so sufficiently high that when swung into position over the vehicle, the receptacle will clear the part of the vehicle over which it is swung. The boom 62 may then be swung around until the receptacle is over the vehicle; the receptacle may be then lowered onto the vehicle; after the receptacle has been lowered onto the vehicle the hook 52 may be removed from the eye 27 and inserted into the eye 10 in the bottom of the receptacle, after which the receptacle may be so raised that the contents thereof may be discharged into the vehicle. After the contents of the receptacle have been discharged the hook may be disengaged from the eye 10 and re-engaged in the eye 27, the receptacle raised sufficiently to clear the vehicle, and the boom 62 swung around to such position that the receptacle will be over the basin in which it is intended that it may be suspended. The receptacle may then be lowered into position in the basin, the hook removed from the eye 27, and caused to engage the basin cover 52. The cover may then be brought into position over the frame 50, and lowered into position on such frame 50.

A vehicle passing over a basin cover may tend to rock the basin cover and a rocking movement of the basin cover might be communicated to the receptacle suspended below such cover, if the receptacle be free to rock. The exterior of the upper part of the receptacle will, however, preferably be in such contact with the inner wall of the opening in the frame 50 that the receptacle will be held against rocking movement while suspended in the frame 50.

The drawing shows the inner wall of the opening in the frame 50 and the bottom of the frame 50 as meeting at substantially a right angle, but the lower part of the inner wall in the opening in the frame 50 may be so shaped as to bevel or spread outwardly. By so beveling the inner wall of the opening in the frame the liability of the receptacle to strike or grind against a sharp edge at the bottom of the frame while being inserted in, or removed from, a basin may be avoided. The exterior of the receptacle may be in such contact with the inner wall of the opening in the frame 50 for such a distance above the point at which the beveling outwardly begins that the receptacle will be held against rocking movement while suspended in the basin.

In cleaning a basin, such as at present ordinarily constructed, the cover of the basin is removed; a workman descends into the basin; another workman, standing at the surface, lowers a hand bucket, and the workman in the basin fills the bucket. After the bucket is filled it is hoisted by hand by one or more workmen to the surface. The bucket is then rested on the surface and unhooked from the rope by which it was lowered, and after being unhooked from such rope the bucket is unloaded into a vehicle. If the contents of a basin have become so solidified that the workman in the basin cannot readily fill buckets lowered to him he must use a pick, shovel, crowbar or other instrument to break up the solid mass. This delays the emptying of the basin and meanwhile the time of the men employed in connection with the emptying of the basin is wasted. The basin must be built sufficiently large to give the workman in the basin room enough to work; the breaking up of material in the basin is attended by danger of damage or injury to the sides and bottom of the basin and to the conduit or conduits leading from the

basin to a sewer. Should the workman or workmen, whose duty it is to pull up the loaded buckets, allow the rope to slip, the workman in the basin is in danger of being injured; if the rope or the handle of the bucket should give away the workman is in danger of having the bucket or its contents, or both, descend upon him; the wearing apparel of men employed in basin cleaning is befouled with muck with which they are obliged to come into contact, particularly the clothing of men entering the basin; buckets covered with filthy slime are placed, after they are hoisted loaded from the basin, and before being dumped into a vehicle, and after they are unloaded awaiting lowering again into the basin, on sidewalks where the filth from the exterior of the buckets trickles down onto the sidewalk to come into contact with shoes of pedestrians, who carry the filth along streets and into shops, offices and homes.

Basins of the construction shown in the drawing need not be made large enough to give workmen sufficient room to break up material and to shovel material into hand buckets. Not only may basins be of smaller dimensions than such basins as are ordinarily in use, thereby decreasing initial cost of construction, but heavily loaded trucks passing over a basin will not be so apt to injure a small basin as a large basin, and the expense of keeping basins in repair is diminished.

By my method whatever enters a basin first goes into a receptacle, and it there remains unless it be a liquid or such particles of material as are suspended in a liquid and as may pass into a basin through the perforations in the bottom or the lateral openings in the receptacle. The contents of a receptacle may be removed from a basin in a fraction of the time required for emptying a basin by methods now ordinarily used, and the number of men required to clean basins is appreciably reduced.

Such liquid and such particles of material as pass from the receptacle into the basin may readily pass from a basin of the construction shown in the drawing into a sewer. The basin has not at any time such an accumulation of filth as is ordinarily present in basins such as are now in general use. In constructing such a basin as is shown in the drawing, cement, concrete or other suitable material may be poured into a suitable form or mold and permitted to harden into the shape of the basin. The basin may be of brick or other suitable material. A finishing coat of enamel or other suitable material may be applied to the sides and bottom of the inside of the basin and the inside of the basin thereby given a smooth surface of any desired color. Glazed brick may be employed in the construction of such a basin. The inside of such a basin may be washed when desired and disinfectant used in the cleaning. No foul or noxious gases would be generated in the basin itself or enter the basin from a sewer to produce discomfort to, or endanger the health of, those employed in or about the basin or passersby along a sidewalk near the basin.

It is obvious that various changes and modifications may be made in the embodiments of the invention herein described and illustrated in the drawing without departing from the spirit thereof. The drawing and description are submitted as illustrative and not in a limiting sense, the scope of the invention being defined in the following claims:

What is claimed is:

1. A receptacle for catching solids for use in a sewer catch basin having a retaining frame, said receptacle fitting in the frame and having side drain ports arranged in a spiral with the distance of the ports from the bottom of the receptacle increasing in successive ports by an amount less than the diameter of a port whereby to effect a constant drain at any height in the receptacle.

2. A receptacle for catching solids for use in a sewer catch basin having a retaining frame, said receptacle fitting in the frame and having side drain ports arranged in an ascending manner with the distance of successive ports from the bottom of the receptacle increasing by an amount not more than the diameter of a port thereby to effect a constant drain at any height in the receptacle, and downwardly opening shields over each of said ports to prevent incoming sewage from entering said ports.

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