Feb. 20, 1934. N. M. WILKE 1,948,016

CATCH BASIN HEADER AND THROAT

Filed Sept. 26, 1932

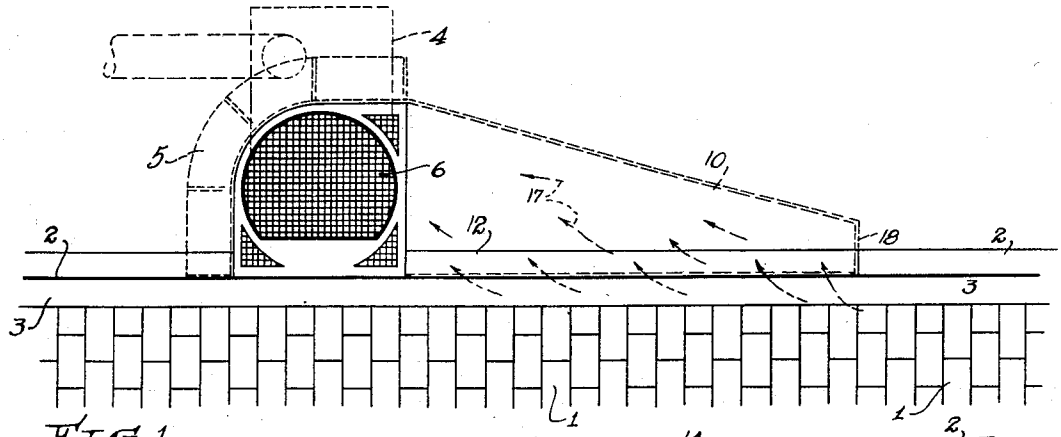


FIG. 1

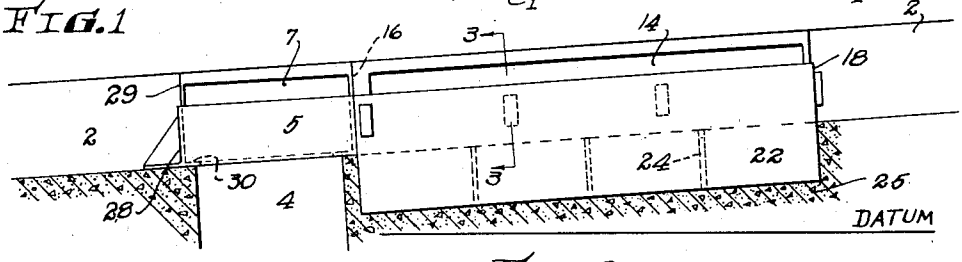


FIG. 2

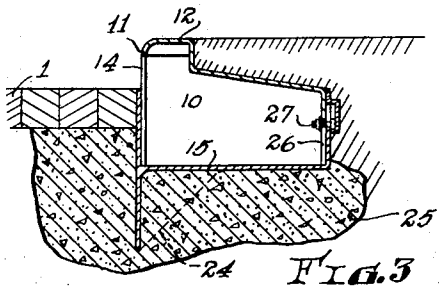


FIG. 3

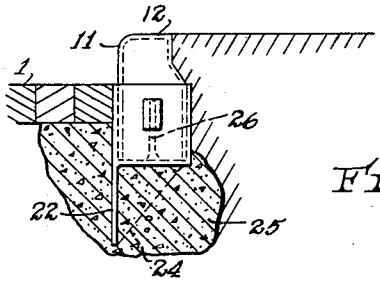


FIG. 4

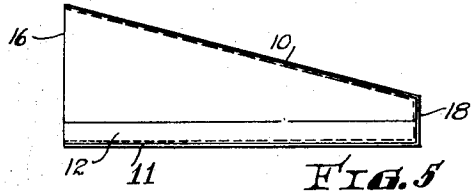


FIG. 5

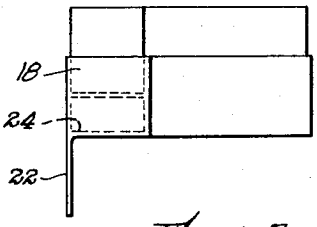


FIG. 7

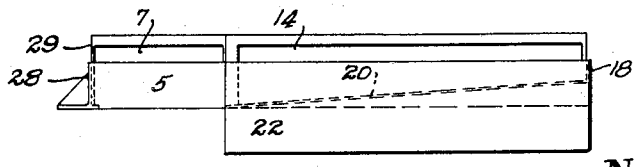


FIG. 6

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CATCH BASIN HEADER AND THROAT

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5 Claims. (Cl. 182—6)

This invention relates to a cover and receiving throat for side hill catch basins and particularly to a receiving throat for removal of sewage or water from the curb of roadways of comparatively steep grade.

It is well known that the usual catch basin opening, located in the vertical face of curbs on sloping roadways is ineffective to receive the water draining along the curb. This is due to the fact that the velocity of the water and its consequent inertia prevent its turning abruptly out of its normal path of flow parallel to the curb. Consequently a large proportion of the water rushes past the opening. The same causes render inefficient the horizontal openings in the curb apron or road surface which extend across the path of flow.

In the latter type of reception openings, the abrupt drop of water into the basin or entrance passage tends to cause considerable surge and backwash which impedes the passage of water thereinto. Such openings are otherwise objectionable for well known reasons.

Attempts have been made to reduce or overcome this objectionable operation, the best known of these being the use of baffles or obstructions extending outwardly from the curb and upwardly from the road surface so as to deflect the water impinging on the baffles into the basin entrance.

Another method employed is installing the basin entrance outside of the curb line and disposing it at an angle of 45° to the curb, a length of curb extending uphill from the entrance being curved gradually outwardly of the roadway and normal curb line so as to more gradually direct the water into the basin. In such case, the lower curb is also deflected toward the basin but at a more abrupt angle. This arrangement is objectionable in that it requires an increased width pavement for a considerable length of the roadway and likewise forms a pocket in which foreign matter may lodge easily. A very undesirable feature also is that the gradual outward curve of the curb is confusing to vehicle drivers inasmuch as it appears as a curve in the roadway which the driver has a tendency to follow, only to find himself trapped in the pocket thus formed with the outer wheels of the vehicle outside of the normal curb line.

The present invention has for its objects the provision of means for efficiently diverting the water outwardly from the hillside curb into a catch basin and at the same time for eliminating the above disadvantages.

Another object is to utilize the hydrostatic and velocity head of the water flowing along the curb for increasing the efficiency of removal of the water from the curb.

Another object is to accomplish these results while retaining an unbroken curb line.

Another object is to provide a comparatively simple and effective device for accomplishing these purposes, which device may be economically manufactured, installed and serviced.

Other objects and advantages of my invention will become apparent from the following specification, wherein reference is made to the drawing.

In the drawing—

Fig. 1 is a plan view of my invention illustrating its installation in connection with a roadway curb.

Fig. 2 is a front elevation of the apparatus illustrated in Fig. 1.

Fig. 3 is a vertical cross sectional view of the invention taken on a plane indicated by the line 3—3 of Fig. 2.

Fig. 4 is an end view of the receiving throat of the conduit illustrated in Fig. 1.

Figs. 5, 6 and 7 are respectively a plan, a front elevation and an end elevation of a modified form of the receiving throat or conduit embodying the principles of my invention.

Referring to the drawing, a preferred form of the invention is shown installed at the side of a paved roadway designated 1, the pavement terminating at a curb 2 which may be provided with a commonly used apron 3. The catch basin proper, indicate at 4, may be of the usual type positioned outside of the curb line and contiguous to the curb. The basin is closed at the top by a heavy iron frame or header 5 having a removable cover plate 6 and is disposed so that its front face lies in the plane of the vertical face of the curb. This front face is open from the roadway surface or curb surface upwardly preferably for the full length of the header 5, and about the full height, as indicated at 7 and better illustrated in Fig. 3, for receiving water and sewage flowing along the curb.

Extending uphill from the header 5 is a receiving throat 10. The throat is preferably a box-like structure disposed with its outer face 11 in the plane of the vertical face of the curb, the throat having a forward head portion 12 which forms a continuation of the curb. The outer face of the conduit is provided with an opening 14 extending substantially the full length of the conduit and from the street surface upwardly about ¾ the height of the curb. The conduit is of sufficient depth so that its floor

15 is below the street surface, preferably downwardly a sufficient depth so that the bottom of the base of the throat is below the frost line when the top of the head is positioned to form a continuation of the curb.

By this arrangement, a trough is formed below and along the opening 14. The end of the throat 10 communicates with the catch basin or the header 5 at the downhill end, thus permitting the water or sewage passing from the throat to enter the catch basin in a direction substantially parallel from the curb or to the normal direction of flow of water along the curb. This opening, designated 16, extends the full width of the header so as to permit an unobstructed flow into the basin.

Obviously water flowing downwardly along the curb 2 will gradually swing outwardly through the opening 14 and drop into the throat 10, as indicated by the arrows 17, whereas if such a conduit were not provided, a large portion of the water would rush past the usual opening 7 of the header 5 due to the abrupt change in direction of flow required to enter such opening. By permitting the water to flow by gradual curve into the throat 10 and then in a direct line into the basin 6, the velocity head of the water is utilized to accelerate the discharge into the basin. In order to accelerate additionally the flow into and through the throat 10, the throat is preferably contracted gradually from the outlet opening 16 to the opposite uphill end wall 18.

More water is necessarily carried at the downhill end of the conduit than at the uphill end, the amount of water carried being progressively increased from the uphill end toward the outlet by additional water entering the opening 14. By contracting the throat in this manner, a full depth of water is maintained along the entire length of the throat. The hydrostatic head resulting from this depth of water is transferred largely into velocity which discharges the contents of the throat very rapidly, instead of dropping abruptly and causing surge and backwash which would retard the water passing into the throat. Consequently, the water flows more evenly and efficiently into the throat.

Furthermore, there is less danger of materials lodging in a conduit which is of increased cross section in the direction of flow. This pressure head could not be utilized effectively were the throat of full width throughout its entire length as the water would be flowing into substantially empty throat at the upper end portion and surging.

In Figs. 5, 6 and 7, I have illustrated a modified form of the throat which is designed to utilize the hydrostatic head more effectively. This throat is similar in all respects to that illustrated in Figs. 1 to 3, except for the fact that the floor, indicated at 20, is inclined upwardly in the uphill direction of the throat, thus more greatly decreasing the abrupt fall of the water.

In this arrangement, the rate of increase of the cross sectional area of the throat in the direction of flow is greater than in the form previously described. Furthermore, the water passes into the throat at substantially the road level and the elevation of the head is utilized for causing the water to flow rapidly through the throat and discharge directly into the catch basin.

As above mentioned, the throat is preferably located so that its bottom surface rests on the ground below the frost line so that it is little affected by changes in temperature and is not otherwise easily displaced. To augment this effect, the forward wall of the throat projects downwardly below the floor of the conduit to form an apron 22 which has rearwardly extending ribs 24 for additional bracing, as better illustrated in Fig. 4. The apron 22 extends downwardly for a depth equal to the depth of the curbing so as to act as a retaining wall for the side of the roadway, thus effecting the same result as the usual stone slab curb.

Another function of the apron 22 and its reinforcing ribs 24 is as an anchor for the throat. In the installation of the conduit, the earth is dug away to the depth of the apron and for substantially the width of the conduit. Sufficient concrete is poured into the trench thus formed to fill the trench to the level of or slightly above the floor of the conduit. This mass of concrete, indicated at 25, grips tightly on the ribs 24 and the adjacent face of the apron 22 and thus forms a suitable anchor, and additional weight to prevent the throat from rising due to freezing and thawing of the moisture in the earth.

In some cases, the upper wall of the throat may be broken due to heavy loads being moved thereacross. Consequently the upper half of the throat is preferably a separate casting from the lower half and is adapted to be lowered telescopically thereinto so that the lower edges of its side walls rest on the floor of the lower casting. In some cases, additional height is required. For this purpose, the upper half of the casting is slotted as indicated at 26, so as to engage bolts 27 projecting inwardly through the outer casting. With this arrangement, the upper casting may be adjusted in a position so that the head 12 will be disposed at the curb level, and secured in this position by bolts 27.

Referring again to the header 5, the header may likewise comprise two separate castings, the lower casting, designated as 28, being adapted to rest on the top of the catch basin walls. The upper casting 29 is telescopically fitted thereinto, a small inwardly extending flange 30 being provided about the base of the casting 28, so as to engage the lower edge of the wall of the casting 29 and support the casting 29 at a fixed level.

Heretofore when separate castings were used, the upper casting has been supported in the lower casting by means of bolts extending inwardly through the walls of the lower casting. However, these bolts rapidly rust and disintegrate due to the conditions to which they are exposed, and consequently allow the upper casting of the header to drop inwardly, thus partially closing the opening into the curb.

The present arrangements eliminates this difficulty resulting from the rusting of such bolts, thus insuring that the upper casting will not drop inwardly and partially close the opening 7. In this manner, I have provided a simple and effective throat and header which accomplishes the objects set forth and which efficiently utilizes the velocity head and hydrostatic head of the water flowing thereinto from the curb and which also maintains an efficient and rapid takeoff of the water for discharge into the catch basin.

Having thus described my invention, I claim:

1. The combination with a sidehill catch basin for roadways having a curb, of an elongated sewage receiving and directing throat extending longitudinally uphill therefrom and arranged to discharge into the catch basin on the uphill side of said basin, said throat comprising a rigid hollow body disposed with its front face in the front ver-

tical face of the curb and having an opening in said face extending from above substantially to the level of the roadway, the floor of said throat being disposed below the road surface elevation and sloped downwardly toward the catch basin at a steeper angle than the curb, both the depth and width of said conduit gradually increasing from the remote end toward said catch basin for maintaining an effective hydrostatic head on the sewage therein.

2. The combination with a sidehill catch basin for roadways having a curb and curb apron, of an elongated sewage reception conduit extending longitudinally uphill from the basin and discharging thereinto substantially parallel to the curb, said conduit being disposed with its forward and front top surface forming a continuation of the curb, the front wall having a sewage receiving opening extending downwardly to the road surface and longitudinally substantially the length of the conduit, the floor of the conduit being below the elevation of the road surface and being sloped downwardly toward the catch basin at a steeper angle than the curb apron.

3. The combination with a sidehill catch basin for roadways having a curb and curb apron, of an elongated sewage reception throat extending longitudinally uphill from the basin and discharging thereinto substantially parallel to the curb, said throat terminating forwardly in a vertical front wall and upwardly forwardly in a top wall, said walls forming a continuation of the curb, the front wall being disposed in the plane of the edge of the curb apron outwardly of the roadway and extending below the level of the apron for bracing the same laterally and having a sewage receiving opening extending downwardly from an elevation above the apron surface to the apron surface and longitudinally substantially the length of the conduit.

4. The combination with a sidehill catch basin for roadways having a curb and curb apron, of an elongated sewage reception throat extending longitudinally therefrom and arranged to discharge into the basin on the uphill side, said throat comprising a rigid hollow body having a front wall disposed with its front face of the curb and having an opening therein at said apron surface, the floor of said throat adjacent the front wall being spaced abruptly below the upper surface of the curb apron for receiving sewage passing thereinto through said opening and for directing the fluid so received into the catch basin in a direction substantially parallel to the curb whereby an abrupt drop off is provided from the curb apron to the floor of the throat and back lash of inflowing water is eliminated, both the depth and width of said throat increasing gradually from the end remote from the basin toward and substantially to the point of discharge of the throat into the basin.

5. A throat for a sidehill catch basin for roadways having a curb and a curb apron, comprising a rigid elongated conduit adapted to be laid parallel to the curb and having a forward upright wall merging with a top wall and cooperating therewith to form a continuation of the exposed portion of the curb and having an entrance passage in said upright wall extending from above substantially to the level of the upper surface of the curb apron, and a floor in said conduit, the portion of the floor adjacent the forward wall being spaced abruptly below the level of the curb apron for effecting free bodily dropping of water off from the apron onto said floor, said conduit having an opening in one end for discharging into the catch basin.

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