

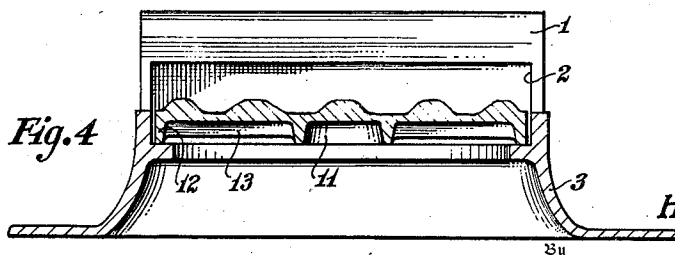
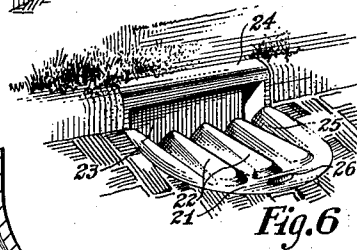
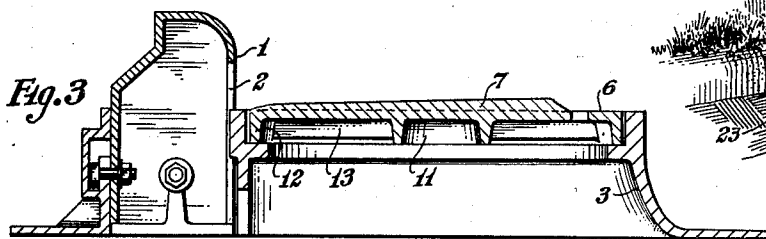
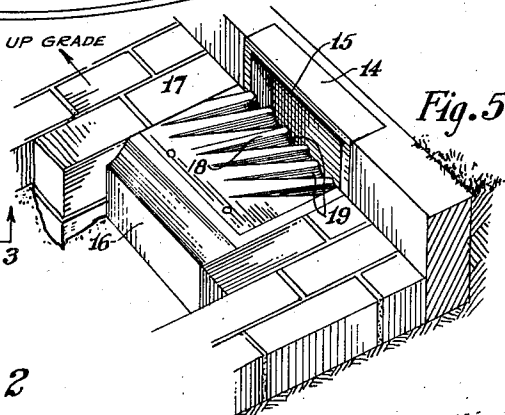
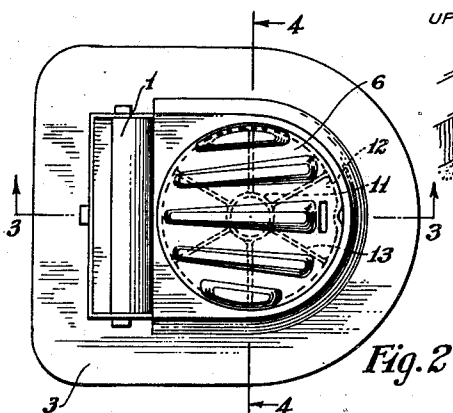
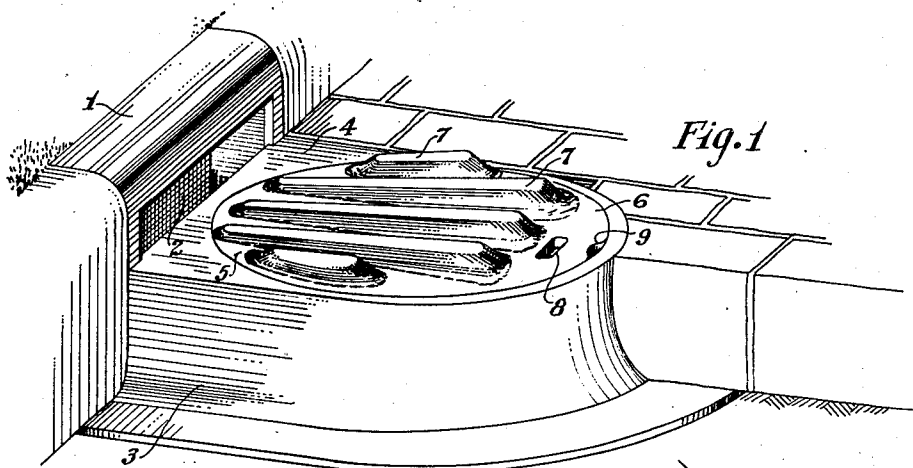
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SELF CLEANING DRAINAGE INTAKE

Filed March 8, 1937



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SELF-CLEANING DRAINAGE INTAKE

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9 Claims. (Cl. 182-6)

This invention, as indicated, relates to a self-cleaning drainage intake. More particularly, it comprises an intake for surface waters to be used along roadways and the like, wherein a specially formed plate or cover is used in conjunction with intake passageways to facilitate the rate of intake in the event of a heavy flow of water, and to prevent obstruction from leaves, twigs, and miscellaneous debris.

Heretofore it has been customary to provide catch basin covers and the like with slots and grooves of various types, but in many such instances, such additional features, instead of facilitating the rate of flow, serve to more firmly impact the intake areas of the passageways and prevent free flow of the excess surface water.

The present invention has in view obviating the difficulties referred to, and providing a device at the intake of the drainage passageways which will be fully self-cleaning in character and avoid clogging or impacting of debris at the intake under the most severe conditions of use.

The principal object of the present invention is to provide a drainage intake which will be self-cleaning.

Another object of the invention is to provide a self-cleaning device adapted for use as a catch basin cover or drainage inlet plate which may be easily installed and which may be manufactured at low cost.

Another object of the invention is to provide a self-cleaning intake for surface drainage systems which is especially adapted for heavy duty and which affords practically no obstruction to the normal traffic over the roadway wherein it is installed.

Another object of the invention is to provide a self-cleaning plate provided with specially shaped ribs and channelways positioned at an up-grade angle to the point of intake so as to more easily divert the flow of drainage water and accompanying material into the intake passageways.

Other and further objects of the invention will appear in the course of the following description.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawing and the following description setting forth in detail certain structures embodying the invention, such disclosed means constituting, however, but several of various forms in which the principle of the invention may be used.

In said annexed drawing:

Figure 1 is a perspective view, with a portion

of the paving omitted, showing a drainage intake installation with a cover plate embodying the principles of the invention;

Figure 2 is a top plan view of the structure shown in Figure 1;

Figure 3 is a central transverse sectional view, taken along the line 3-3, shown in Figure 2, looking in the direction of the arrows;

Figure 4 is a central sectional view, taken at right angles to the view shown in Figure 3, and taken along the line 4-4 shown in Figure 2, looking in the direction of the arrows;

Figure 5 is a perspective view, with a portion of the paving omitted, showing a modified form of construction embodying the principles of the invention; and

Figure 6 is a still further modified form of construction embodying the principles of the invention.

As is clearly shown in Figures 1 to 4 of the drawing, the preferred form of self-cleaning drainage intake comprises a curb plate 1 having a drainage aperture 2 adjacent which is the catch basin casing 3 having a flat upper area 4 provided with a circular aperture 5 adapted to receive a specially shaped cover plate 6. The cover plate 6, as indicated, is provided with a plurality of upstanding ribs 7 of increasing height in accordance with their distance from the point of intake toward the central line of the roadway. The ribs have gently rounded side surfaces which merge with the top surface of the cover plate and provide channelways intermediate said ribs of substantial depth at their outermost portions away from the intake and of very slight depth adjacent the intake opening. The construction thus provides for a series of water wedges in said channelways intermediate said ribs, such wedges being of greater width and less height adjacent their forward edges near the intake opening and being of greater height and less width adjacent their outermost portions toward the center of the roadway. Accordingly, the water wedges have high speed and great lifting power at their outermost portions, and this force is exerted against the entire mass of debris intermediate such outermost portions and the intake, so that such material is moved freely into such intake through the action of the rush of water intermediate the ribs in the manner set forth. Since the ribs at their forward edges are tapered to very shallow depth, merging with the surface of the plate, there is no obstruction to the free flow of water and debris over such area, and the plate thus becomes self-cleaning in its action.

The cover plate 6, as is more clearly shown in Figures 2, 3 and 4, preferably has the ribs directed toward the drainage aperture 2 in the curb plate 1. The central rib is somewhat longer than the two adjacent ribs, and the two end ribs are of still shorter length. The central rib is preferably positioned straight on the center line, and the flanking ribs are directed at a slightly inward angle toward the drainage aperture. The beveled sides of the ribs, as shown very clearly in Figure 2, are preferably of greater area adjacent the rearward portions, thus preventing any clogging of material at such point. A hand hole 3 is provided rearwardly of the central rib and one or more recesses or notches 9 may be provided around the circumference of the cover plate to permit a lifting implement to be inserted at such point.

If the manhole is placed on a hillside, and other conditions require such positioning, the cover plate may be directed at a slight angle downwardly toward the drainage aperture.

The upper faces of the ribs are flattened so as to present no cutting edges to injure the tires of automobiles, and the ribs themselves are of relatively small height so as to be substantially at the level of the roadway and cause no appreciable interference with smooth travel thereover.

The under side of the cover plate is preferably provided with reinforcing webs or ribs, such reinforcements, as shown in Figures 2, 3 and 4, comprising a central web 11 connected with a marginal flange 12 by means of a series of radial ribs 13 on the under side of said plate.

In the form of construction shown in Figure 5, the curb plate 14 is provided with a drainage aperture 15, and the catch basin casing 16 is provided with a rectangular cover plate 17, said cover plate having a series of ribs 18 with intermediate recesses or grooves 19, such ribs being of greater width adjacent their rearward edges and tapering to relatively small width immediately adjacent the drainage aperture, whereas the grooves are complementary to said ribs and have their greatest width adjacent the drainage aperture and thence taper to extremely narrow width and shallow depth adjacent the base of the ribs.

In the plate shown in Figure 5, the ribs are inclined somewhat up-grade toward their rearward ends so as to have the capacity to turn the stream of drainage water flowing down the grade at a gentle angle before discharging the same into the drainage aperture. Where angularly directed ribs are used with a rectangular plate, it is obviously necessary to have different plates for the opposite sides of the roadway in order to have the proper angular direction of the ribs and channels. Where the drainage to be taken care of by the plate is of a normal character, it may be desired to have the ribs extend at substantially right angles to the drainage aperture, in which case only a single type of cover plate need be provided.

In some instances, it is desired to use a plate having a rounded outer marginal portion instead of a rectangular plate embodying the features of construction shown in the plate 17. A plate 21 of this character is illustrated in Figure 6, wherein the ribs 22 are widest at their outer portions and taper inwardly toward the drainage aperture 23 in the curb plate 24. The recesses 25 intermediate the ribs 22 are complementary to said ribs and are widest adjacent the inlet aperture and are of narrow width and shallow

depth adjacent the base of the ribs. A hand hole 26 may be provided to assist in positioning the plate 21. The plate shown in Figure 6 has a straight forward edge closely adjacent the drainage aperture.

In each of the forms illustrated in Figures 5 and 6, a water wedge is formed, such wedge, however, being of greatest area adjacent the drainage aperture. Where inclined ribs are used, as shown in Figure 5, the turbulence created adjacent the drainage aperture is adequate to discharge all debris which may be carried in the drainage water directly into the drainage aperture. The devices illustrated are self-cleaning and are easy to manufacture and install. They are free of the difficulty frequently encountered with open mesh cover plates and grids which become obstructed by the wedging into the openings of small twigs which thereafter accumulate a large mass of debris which is very difficult to remove. With the device herein, the ribs themselves are inclined so as to present no obstruction to the free passage of debris thereover, and in addition the ribs so direct the drainage water as to float the foreign material and carry it with force into the drainage aperture.

Other modes of applying the principle of my invention may be employed instead of those explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A drainage intake comprising a frame having a supporting ledge at its upper edge supported above the drainage passageway, an imperforate removable metal cover plate supported on the ledge of said frame, a drainage aperture adjacent said cover plate, a series of slightly elevated ribs with flat upper surfaces on said cover plate, and means on the upper surface of said cover plate intermediate said ribs for forming a plurality of fluid wedges as the drainage fluid passes over said cover plate.

2. A drainage intake comprising a frame having a supporting ledge at its upper edge supported above the drainage passageway, an imperforate removable metal cover plate supported on the ledge of said frame, a drainage aperture adjacent said cover plate, and a plurality of slightly elevated ribs on the upper surface of said cover plate extending toward said drainage aperture and having wedge shaped recesses intermediate the same to form a plurality of fluid wedges as the drainage fluid passes over said cover plate, such wedges serving to free said cover plate from debris.

3. A drainage intake comprising a frame having a supporting ledge at its upper edge supported above the drainage passageway, an imperforate removable metal cover plate supported on the ledge of said frame, a drainage aperture adjacent said cover plate, a plurality of slightly elevated ribs on the upper surface of said cover plate extending toward said drainage aperture and having wedge shaped recesses intermediate the same to form a plurality of fluid wedges as the drainage fluid passes over said cover plate, such wedges serving to free said cover plate from debris, and a plurality of radially arranged reinforcing webs and flanges on the under side of said cover plate.

4. A drainage intake comprising a frame having a supporting ledge at its upper edge supported

above the drainage passageway, an imperforate removable metal cover plate supported on the ledge of said frame, a drainage aperture adjacent said cover plate, and a plurality of slightly elevated ribs on the upper surface of said cover plate extending toward said drainage aperture at an approaching angle toward the central line of said plate, said ribs being of decreasing height in a direction toward said drainage aperture and of decreasing spread as to their side walls in a direction toward said drainage aperture, whereby fluid wedges of greater height adjacent their rearward ends are formed, such wedges tapering to a shallow wide forward area covering substantially the entire plate, such wedges collectively serving to free said plate from debris when drainage water passes thereover.

5. A drainage intake comprising a frame having a supporting ledge at its upper edge supported above the drainage passageway, an imperforate removable metal cover plate supported on the ledge of said frame, a drainage aperture adjacent said cover plate, a plurality of slightly elevated ribs on the upper surface of said cover plate extending toward said drainage aperture at an angle in an upgrade direction and having wedge shaped recesses intermediate the same to form a plurality of fluid wedges as the drainage fluid passes over said cover plate, such wedges serving to free said cover plate from debris, and a plurality of reinforcing webs and radial flanges on the under side of said cover plate.

6. A drainage intake comprising a frame having a supporting ledge at its upper edge supported above the drainage passageway, an imperforate removable metal cover plate supported on the ledge of said frame, a drainage aperture adjacent said cover plate, a plurality of slightly elevated ribs on the upper surface of said cover plate extending toward said drainage aperture at an angle in an upgrade direction and having wedge shaped recesses intermediate the same to form a plurality of fluid wedges as the drainage fluid passes over said cover plate, such wedges increasing in width and depth in a direction toward said drainage aperture and serving to free said cover plate from debris.

7. A construction of the character described, having in combination a vertical structure providing a drainage passageway, a frame mounted at the top of such drainage passageway, said frame providing a curb plate and drainage aperture and an imperforate removable metal cover plate adjacent thereto, said cover plate being provided with a plurality of slightly elevated ribs and intermediate recesses directed toward said drainage aperture, and said recesses being of greater cross sectional area adjacent one end than adjacent the opposite end and forming water wedges over said plate which serve to keep the upper surface free of debris.

8. A construction of the character described, having in combination a vertical structure providing a drainage passageway, a frame mounted at the top of such drainage passageway, said frame providing a curb plate and drainage aperture and an imperforate removable metal cover plate of circular form adjacent thereto, said cover plate being provided with a plurality of slightly elevated ribs and intermediate recesses directed toward said drainage aperture, said central ribs and recesses being of greater extent than the marginal ribs and recesses and being of different cross sectional areas in a direction toward said drainage aperture and forming water wedges over said plate which serve to keep the upper surface free of debris.

9. A construction of the character described, having in combination a vertical structure providing a drainage passageway, a frame mounted at the top of such drainage passageway, said frame providing a curb plate and drainage aperture and an imperforate removable metal cover plate of substantially rectangular form provided with slightly elevated ribs and intermediate recesses of decreasing height and depth respectively and gradually approaching each other in a direction toward said drainage aperture and each of said ribs and recesses having inclined sides over which the drainage water may freely flow to form water wedges to free said plate from obstruction by debris.

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