D. B. LUTEN.

SURFACE DRAIN.

APPLICATION FILED JAN. 3, 1911.

998,704. Patented July 25, 1911.

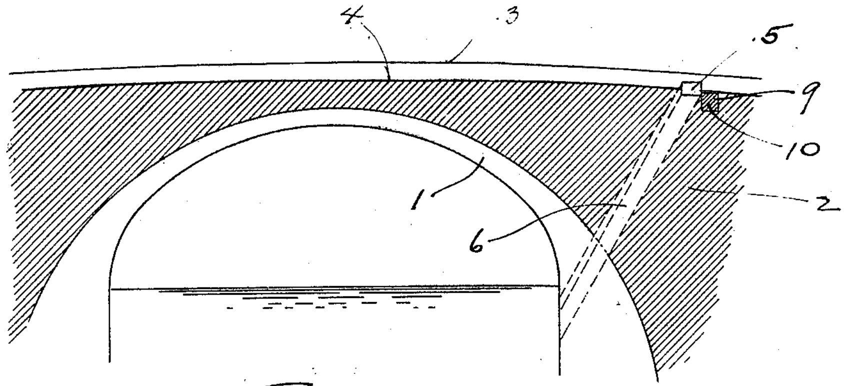

Fig. 1.

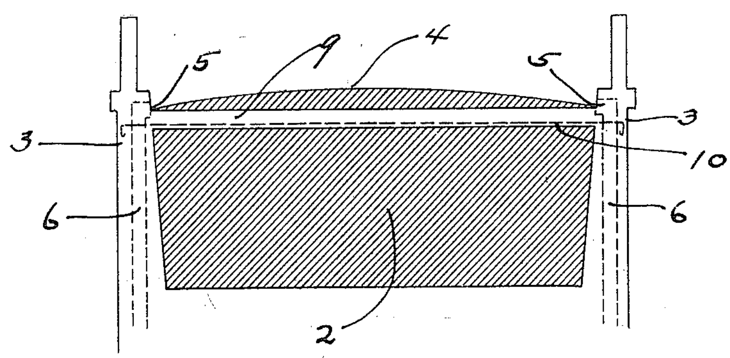

Fig. 2

Witnesses
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UNITED STATES PATENT OFFICE.

DANIEL B. LUTEN, OF INDIANAPOLIS, INDIANA.

SURFACE-DRAIN.

998,704. Specification of Letters Patent. Patented July 25, 1911.

Application filed January 3, 1911. Serial No. 600,480.

To all whom it may concern:

Be it known that I, DANIEL B. LUTEN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Improvement in Surface-Drains, of which the following is a specification.

My invention relates to improvements in surface drains for bridges and has for its purpose to provide an efficient means of diverting the surface water from the roadway and discharging it into the stream below.

The invention is illustrated in the accompanying drawing in which the same reference characters describe like parts throughout both views;—

Figure 1 is a longitudinal section of a bridge showing my improved drain, and Fig. 2 is a transverse section adjacent the drain.

The roadway over a permanent highway bridge is ordinarily made of gravel or earth, easily eroded by running water. The bridge is usually crowned at the middle so that the surface water during a rain, will run toward the ends of the bridge, and it is desirable to provide drains in the gutters to lead the surface water to an outlet, below and prevent its accumulation on the road surface. Such a drain is readily provided by means of a pipe led down through the earth filling and through the masonry abutments: or better by means of an opening formed in the masonry wall or spandrel bordering the roadway. This opening is readily formed by means of a wooden or metal conduit of the desired form embedded in the masonry during erection. It is desirable that such a drain should have its outlet below low water in order that its discharge may be invisible and to prevent discoloration of the masonry. It is also desirable that the drain proceed throughout in a straight line or nearly so in order that it may be readily cleared of any obstruction. Thus in Figs. 1 and 2, the bridge 1 supports an earth fill 2 and spandrel walls 3 bounding the roadway 4. In these walls are formed the drainage opening 5 and channel 6 leading in a straight line to discharge into the stream at 7 below the water surface 8.

The opening 5 should be approximately at the level of the gutter of the roadway or a little below, so that the water may find ready entrance. But even when thus placed, it will not prove effective for any extended length of time because of the tendency of the rushing water to wear away the roadway and rush past the opening to discharge around the end of the wall, ultimately scouring a great rut in the roadway, dangerous to traffic. And no matter how much below the gutter the bottom of the opening may be placed, the first rush of water that chances to pass by the opening, by reason of obstruction or insufficient capacity, will scour the gutter to a lower level than the opening and put an end to its usefulness. This defect is however wholly overcome in my improvement by means of a beam 9 transverse to the roadway and with its upper surface slightly above the lower edge of the opening, placed on the down-grade side of the opening. It effectively dams the current that otherwise might pass the opening. And by embedding in this beam a tie 10 from spandrel to spandrel, they are tied together, the better to resist the thrust of the earth between. By this means the spandrels may be made much lighter with saving of material. And by embedding the tie in the lower portion of the beam, the beam itself may be made self supporting so that it may be placed before the filling is added. The device is of course equally applicable to any retaining wall bordering a roadway, which may be supported by a tie to an anchorage opposite.

I claim;—

1. The combination of a drainage channel in a concrete wall bordered by a roadway above and a stream below, and extending in a substantially straight line from an inlet at the road surface to an outlet below mean water level, with a curb transverse to the roadway at the downgrade side of the inlet and having its upper edge above the lower edge of the inlet, said curb containing an

embedded tension member joining the wall to an anchorage.

2. The combination of a drain inlet in a wall, with a curb transverse to the wall at down-grade side of inlet and with its upper edge opposite the inlet.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 22nd day of December, A. D. one thousand nine hundred and ten.

DANIEL B. LUTEN. [L. S.]

Witnesses:

FRANK A. FAHLE,

THOMAS W. MCMEANS.