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"The Tiber Creek Sewer Flush Gates, Washington, D.C.," Engineering News and American Railway Journal, 8 February 1894.

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ENGINEERING NEWS.

THE TIBER CREEK SEWER FLUSH GATES, WASHINGTON, D. C.

The following description of the method adopted to flush a large sewer at Washington, D. C., was sent us by Capt. Chas. F. Powell, U. S. A., Engineer Commissioner of the District of Columbia:

The Tiber sewer of Washington, so called by reason of its occupancy of the upper portion of the bed of the old-time Tiber Creek, collects storm-water from an area of 1,473 acres and sewage from an even more extended district. Its present outlet, diverted from that of the original Tiber, lies in the course of ancient James Creek, long since occupied as a canal site. It thus happens that the Tiber sewer finds its discharge into the eastern branch of the Potomac River through a walled channel, 57 ft. wide, 7,200 ft. long and with a mean depth of 4 to 6 ft. below low tide level. The sewer itself is also subject to tidal flow for nearly 5,000 ft. of its length above the canal. This portion of the sewer structure consists of a plank bottom 29 ft. wide, submerged 2 ft. at ordinary low tide, battered side walls 3 ft. high, and a flat segmental arch of 30 ft. span, built of brick masonry, the greatest inside height being 10 ft. 10 ins.

The operation of this outlet, when established in 1875, appears not to have been offensive; but in recent years the extension of building improvements in the tributary territory, as well as the reception of sewage from systems heretofore discharging elsewhere, besides the more full occupation of the locality of the canal for dwellings and business purposes, has directed attention to it as a serious public nuisance and a source of disease. During long periods of small rainfall the sluggish flow of the sewage was insufficient to cleanse it and at all times the flow was impeded by the presence of scows and small craft discharging cargoes upon the low canal banks.

A complete remedy for this unhealthful condition was proposed in the report upon the Sewerage of the District of Columbia (1890) which suggests the filling of the canal upon the completion of works for intercepting the sewage and drainage which it conveys, but as these works are not yet under construction the application of this remedy will be

Capt. Chas. F. Powell, upon assuming the duties of Engineer Commissioner of the District of Columbia, directed his attention to improving the condition of this stagnant waterway and projected various methods by which it could be effectively flushed, among which was the building of flushing dams to impound either the tidal water or the sewage itself. The last method was considered of sufficient promise to warrant further study. It was at first deemed expedient to erect, either near the upper end of the canal, or within the sewer, a movable dam composed of small wickets, but this type of structure gave place to a design for simple gates hinged to a common horizontal axis and closing upon the vertical face of masonry with which the sewer terminates.

As constructed and shown in the accompanying illustration, an iron hinge axis is supported by bolts cemented in the wall, upon which swing six gates. When closed these gates are held in position by two bolts in each gate engaging a bracket made of angle iron and fastened to the floor of the sewer. A projecting platform over the mouth of the sewer supports a windlass, which is used in hoisting the gates after they have been opened by disengaging the bolts.

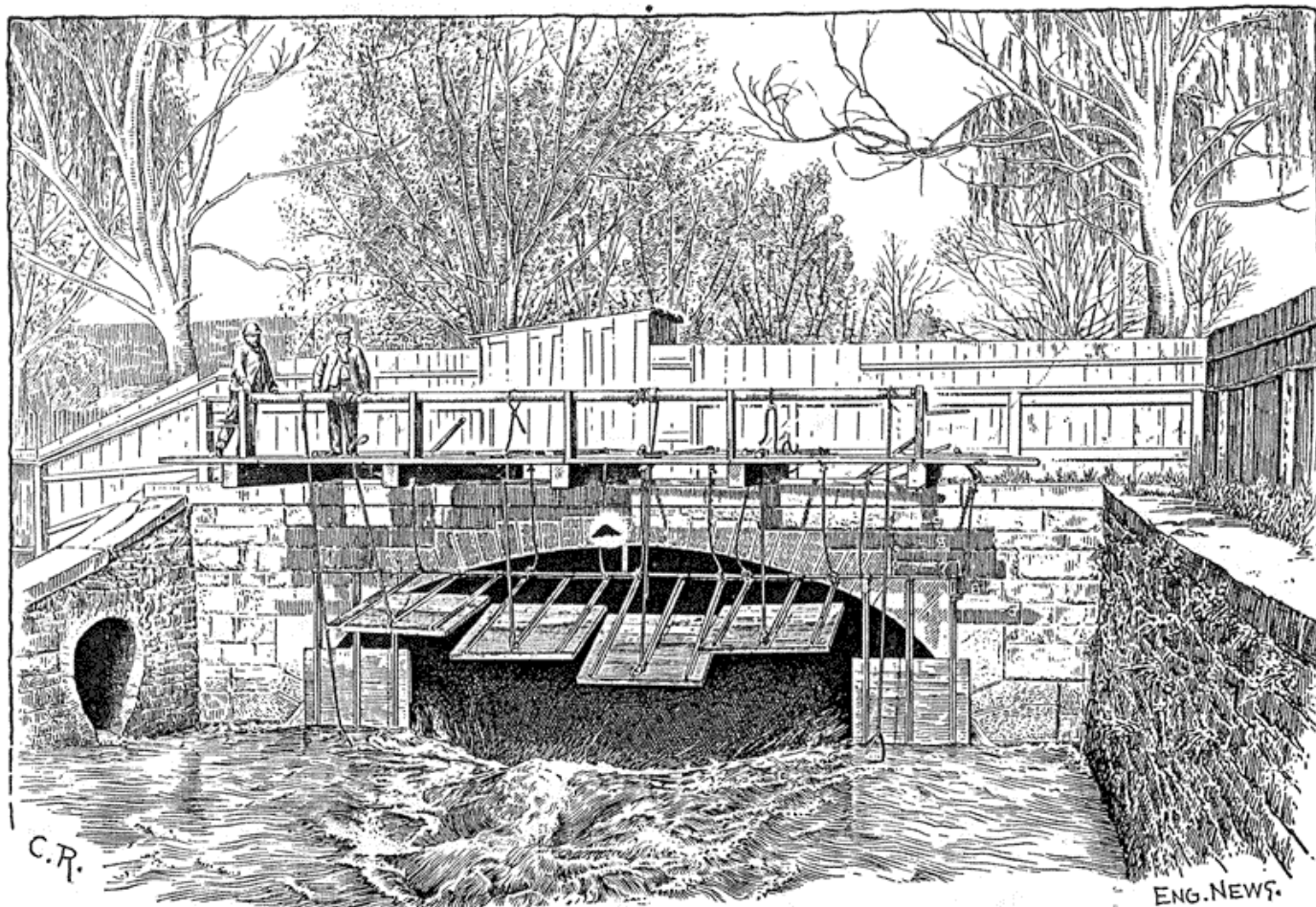
The gates are closed when the tide begins to flood and open about 45 minutes before low tide. At the time of discharge the difference of head obtained is $3\frac{1}{2}$ ft. and the estimated quantity of sewage set free 4,000,000 gallons.

The gates are operated twice each lunar day except at times of heavy rains or storm tides. The result of each operation is to cleanse the lower part of the sewer, to strongly agitate the water of the canal near its head and to make a considerable current throughout its length. The effect is a very noticeable betterment of the condition of the canal. The gates cost less than \$600. They were designed in the office of the superintendent of sewers and principally by Mr. C. B. Ball, Assistant Engineer.

The curve of surface variation during a period of 12 hours was determined on Nov. 12, 1893, by means of a self-registering gage located in the sewer 3,800 ft. from its outlet into the canal. The gates were opened about 3 p. m. and in about a

deferred for a number of years.

When these gates were opened at 9 p. m. the water in the creek at half hour the surface level fell 3 ft. At 10 p. m. the surface had risen to the 4-ft. point.



VIEW OF TIBER CREEK SEWER FLUSHING GATES, WASHINGTON, D. C.