

PROPOSED TUBULAR RAILWAY UNDER THE ENGLISH CHANNEL.

The junction of England with the continent of Europe has already been the subject of numerous projects. Without going back to the project for a subterranean route recommended in 1892 by Mr. Mathieu, engineer of mines, it will suffice to recall the more recent project for a submarine tunnel proposed by Mr. Watkins, and for a gigantic bridge, whose promoters were Messrs. Schneider and Hersent, as well as the modification of the latter proposed by Mr. Bunau-Varilla.

All these projects have been abandoned, as much on account of the objections urged against them as by reason of the incomprehensible hostility that the English have always manifested toward all enterprises of this kind.

But Sir Edward Reed, a member of the English

currents beneath as well as above the tubes. It permits, besides, of so regulating the system that the upward thrust partially balances the weight of the trains in each section. The stresses to which the tube will be submitted by the fact of such passage will be diminished by so much, and, therefore, much better conditions of resistance will be obtained than in an ordinary bridge.

The use of two distinct tubes will prevent all chances of accidents and will have the great advantage of realizing the important problem of the aeration of the tunnel, without any expense and in as satisfactory a manner as possible. In fact, each train will have somewhat the effect of a piston that forces the vitiated air before it and sucks in pure air behind it to take the place of the former.

The total cost of the installation of the tubes is estimated by Mr. Reed at seventy-five million dollars, which is less than half the cost anticipated by Messrs. Schneider and Hersent for the construction of a bridge across the channel.—*Revue Universelle*.

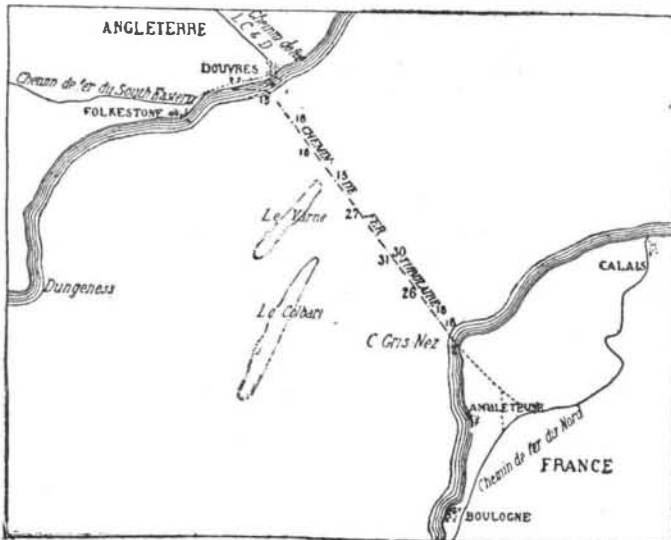


Fig. 1.—MAP SHOWING THE DIRECTION LINE OF THE PROPOSED CHANNEL TUNNEL.

Parliament, former Lord of the Treasury and engineer in chief of the Admiralty, has taken up the question again with a project which has been received with favor by a large number of members of Parliament, and which therefore seems to have serious chances of success, and the more so in that it avoids the difficulties and objections that were urged against its predecessors.

The project consists in simply submerging, between a point of the French coast situated in the vicinity of Cape Gris-Nez and another on the English coast located between Dover and Folkestone, two tubes that would constitute two absolutely separate tunnels, each serving for the passage in one direction of trains drawn by electric locomotives.

Referring to the map (Fig. 1) it will be seen that the configuration of the bottom in this part of the channel presents on each side a regular declivity that ends in a gentle slope at a line of greater depth. The soundings made at distances of a mile apart gave as successive depths, starting from the English coast, 82, 88, 88, 95, 98, 88, 98, 138, 160, 184, 174, 175, 160, 138, 98 and 82 feet. It will be seen, then, that the mean slope of each tunnel would not much exceed 0.08 inch to the foot. There would therefore be found excellent conditions for traction.

The tube would be of steel plate with double walls (Fig. 2), and the intervening space would be re-enforced by I beams and filled in with concrete. The putting in place would be effected by sections of 300 feet, hermetically sealed at each end and floated to the place where they were to be submerged.

One of the extremities of the section having been fixed upon a sort of caisson that will afterward perform the functions of a pier, the caisson is weighted so as to cause it to sink. The other extremity continues to emerge (Fig. 3), and receives the end of the following section, the junction being made by huge hinges. The caisson of this section is sunk, and so on. When all the sections are in place, the formation of the joints is begun.

What we have said about one tube applies also to the other, but, in reality, Sir Edward prefers to sink the sections of the two tubes simultaneously in properly cross-bracing them, in order to form a sort of rigid girder that would present much greater resistance to transverse stresses.

The caissons forming piers are designed to support the tubes at a slight distance from the bottom of the sea. This arrangement possesses the double advantage of doing away with any preliminary dredging, since it will be possible to give the piers the height necessary to avoid the slight changes of level of the bottom and of assuring a free circulation of the marine

Artificial Marbles.

Mixtures suitable for the production of artificial stones having a basis of powdered marble or other stone, and Keen's cement, or Portland cement, are mixed with zinc chloride and zinc oxide, or with magnesium chloride, and separate portions, tinted with as many different colors as may be required, are dashed on to the bottom of a mould so as to produce a veined pattern, which, after filling up the mould, constitutes the ornamental surface of the artificial marble. The block may be veined throughout by the insertion and subsequent withdrawal of silk threads or wires covered with silk soaked in appropriate colors. The product may be polished by treatment with a hardening liquid, e. g., zinc chloride followed by polishing with a mixture of alcohol 75 per cent, oil 5 per cent, plaster 5 per cent, white gum lac 5 per cent, turpentine 5 per cent, and yellow wax 5 per cent.—*P. Grand Montagne, Brussels, Belgium*.

Electrical Sanitation.

A practical application of electricity to sanitation has recently been made. Two systems have been tested upon a very considerable scale, in both of which the electrolytic action of the current has been utilized.

The two methods at present before the public are Mr. William Webster's, which is being carried out by the Electrical Purification Association (Limited), and that ascribed to Mr. Eugene Hermite, and worked by him in conjunction with Messrs. Paterson and Cooper.

As has occurred so frequently before, both these inventors appear to have conceived the same idea about the same time. Each of them took out three patents in the year 1887, but, though each had the same object in view, and although in their early patents they seemed almost to be running on the same rather than on parallel lines, their recent practice is quite distinct.

Mr. Webster treats the sewage directly. He places parallel iron electrodes within a conduit or shoot, through which the sewage is passed, the electrodes being alternately connected with the positive and negative poles of a dynamo. The nascent ammonia thus evolved at the negative electrode produces an alkaline reaction, which effects the precipitation of the solid suspended matter, while at the positive pole nascent oxygen and

every case. It is now being tried at Worthing, where an installation has been set up under the auspices of the mayor and corporation. As in the previous system, an oxygenated compound of chlorine is held to be produced which burns up the sewage matter and absolutely destroys all microbes.

Several questions have to be considered from a scientific and practical point of view, in connection with both these inventions, before their general application can be effected. The scientific view of the subject, after all, resolves itself into the answer to a single question: Is the process quite trustworthy to remove the maximum of organic matter from the sewage, and

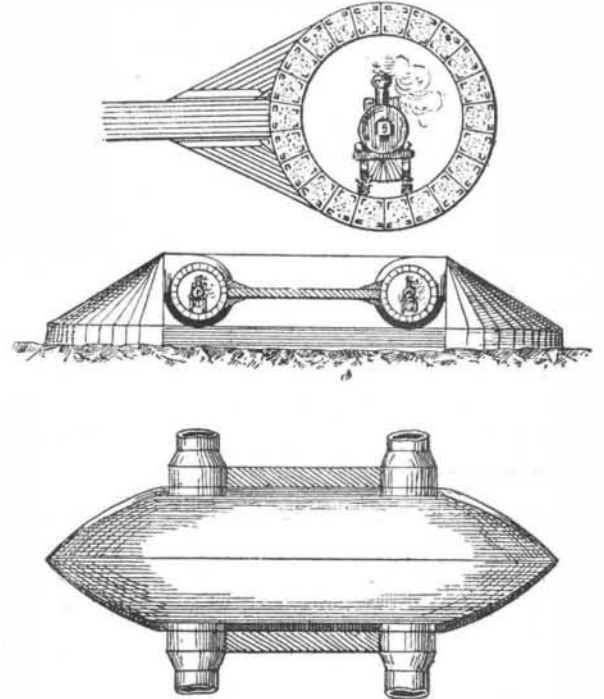


Fig. 2.—TRANSVERSE SECTION AND PLAN OF THE TUBES AND OF A PIER.

thoroughly sterilize it? As regards the practical point of view, the removal and utilization of the sludge will have to be faced, in the first process referred to; while in the second, in which sludge is said not to be produced, a second water supply to houses, and the chemical action of this disinfecting water upon the pipes, tubes, and reservoirs through which it has to pass, will have to be very fully considered before the system can be adopted.—*Nature*.

Banked Fires.

One of the things which is generally overlooked in the management of a factory steam plant is the treatment which the plant receives at night when the fires are banked. In some places, says the *Engineering Record*, the dampers are left wide open, and a current of air is allowed to draw in over the fires through the tubes of the boilers, and thence to the chimney. In other cases the dampers are closed, but they leak to such an extent that a considerable quantity of air finds its way through the boiler. It is needless to say that the effect is to cool the boilers, but the extent to which this operates, even where the leakage of air is comparatively slight, is seldom appreciated. An instance may be noted which shows that the matter is of considerable importance to those who are seeking the highest fuel economy. The case was one where the fires were banked at 6 p. m., and no steam was used from the plant at night save that which was condensed in the main steam pipes, and this was returned to the boiler by means of an automatic pump. The boilers were of the water-tube type and they were fitted with hand dampers in addition to a main damper in the flue. The common practice was to shut the main damper and leave the fire doors open with a pressure of 100 pounds at the time of banking. The main damper was not perfectly tight, and there was sufficient air drawn in to cool the boilers, so that when the fires were opened at 6 the next morning the steam pressure had fallen to 10 pounds. Subsequently the practice was changed by closing the hand dampers as well as the main damper, and closing also the fire and ash doors, no other condition in the operation of the plant being changed. The result was that, instead of having a pressure of 10 pounds at the time of pulling down the fires, there was a pressure of 40 pounds, and the bank of coal, which was previously more or less consumed, was in apparently the same condition as when the banked fire was first covered.

The typewriter prism, to enable the operator to see and read work as it is written, as described in our issue of May 12, was shown applied to a Remington No. 2, and not on the Smith Premier machine.

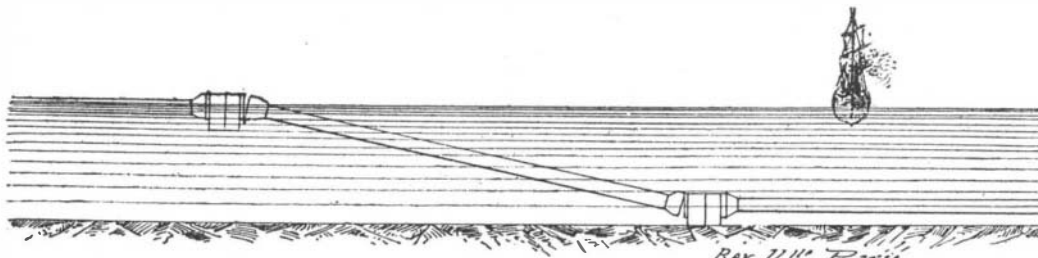


Fig. 3.—PROCESS OF SUBMERGING THE VARIOUS SECTIONS OF A TUBE.

chlorine are evolved, producing an acid reaction, whereby the organic impurities held in suspension or solution are readily decomposed and purified.

This system has been tested on a large scale, both at Crossness and at Salford. The amount of sludge formed is said to be smaller than in any precipitation process, and the effluent so pure as not to require further treatment by filtration. The process has been reported on in the most favorable manner, as regards the chemical tests of the effluent and the ease and uniformity with which the results are obtained.

Mr. Hermite's system consists in the treatment of sea water or other chloride solutions by electrolysis. The water thus electrolyzed in reservoirs is conducted as a disinfecting liquid by suitable pipes to places requiring disinfection, where it is stored in cisterns and used in place of ordinary water. The system has been experimentally tested at Havre, Lorient, Brest, and Nice and has been reported upon most favorably in