THE CHANNEL RAILWAY CONNECTING ENGLAND AND FRANCE

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649272044

The Channel Railway Connecting England and France by James Chalmers

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

www.triestepublishing.com

JAMES CHALMERS

THE CHANNEL RAILWAY CONNECTING ENGLAND AND FRANCE

Trieste

THE CHANNEL RAILWAY

CONNECTING

ENGLAND AND FRANCE.

Illustrated by Chart of Soundings, and Lithographed Plans.

By JAMES CHALMERS,
INVENTOR OF THE "CHALMERS TARGET."

SECOND EDITION.

"We invite the competent authorities to examine his project."—*Times.*

"As an exposition of engineering skill it deserves high consideration."—*Liverpool Albion.*

"The plan of submerged tubes has met with most favour from engineers; it is, undoubtedly, the cheapest, and presents the fewest engineering difficulties. Of this system Mr. Chalmers is the ablest advocate."—*Mechanics' Magazine.*

"We cannot estimate the amount of either passenger or goods traffic that would flow by such a line. It would be limited, we believe, only by the mechanical capabilities of its trains."—*London Review.*

LONDON:
E. & F. N. SPON, 16, BUCKLERSBURY.

1867.

Through the earth, by tunnelling under the bed of the sea; through the water, within submerged tubes; and through the air on a bridge.

Before introducing the present project, it may be well to notice briefly a few of the schemes that have already been before the public; to show how long the idea of roadway communication has existed; how earnestly the accomplishment of this great work is desired on both sides of the Channel; to illustrate the increasing interest that scientific and practical men are taking in the matter; and to enable the reader to compare or contrast the projects of others with the one now before him, in order to judge whether or not too much is claimed for this, in asserting that it is the most practicable method yet proposed for connecting the Railways of England and France. There have been before the world about a dozen projects for this purpose, including the present; three projectors, all French, proposed tunnelling under the Channel; seven, two French and five English, proposed submerged tubes; a Frenchman proposes an arched roadway, or tunnel, on the bottom; and an Englishman, a mammoth bridge.

The idea of tunnelling is much the oldest; a French engineer, Mathieu, sixty-six years ago, considered the work practicable, prepared elaborate plans, and laid them before Napoleon, then First Consul. They were some time exposed in the Luxembourg and other public galleries in Paris; but they have long been lost; and there is now, it appears, no account extant of the then proposed method of accomplishing the work. The project of M. De Gamond, also a tunnel, appeared in 1856, and may be reckoned, along with others that appeared about the same time, as fruit of the international exhibitions of 1851 and 1855. This project received more

than ordinary notice. A commission of eminent engineers, appointed to examine the plans, made a favourable report, and recommended an appropriation of £20,000, to make experimental examinations; and the Emperor is said to have looked upon it with favour; but it was finally rejected, on account of its interference with the navigation of the Straits. The plan, briefly, was to form in the Channel thirteen islands by carrying materials out to sea, dig down through them into *terra firma*, and tunnel east and west. To the advocates of the tunnel may now be added the name of Mr. Hawkshaw, who has been examining the shores and bottom of the Channel during the past year.

The submerged-tube projectors, with one or two exceptions, appear to have given the subject less study than the advocates of the tunnel. There is an easy, gentlemanly indifference about them—an *if*, a *might*, or a *perhaps*, cutting the Gordian knot of every difficulty that comes in their way: let one or two speak for themselves.

In an article, by Mr. Wylson, C.E., in the *Illustrated London News*, in which he gives a *résumé* of the plans of previous projectors, one gentleman says: "My plan is "simply to construct wrought-iron tunnels in separate "divisions; to sink them on the bed of the water; and "then to connect them. * * * It will be admitted that "to construct such a tunnel would be an easier matter than "to build iron vessels, as it would be the same shape "the whole length; then to sink it on the bed of the "water would be the work of only a few hours for each "division of 400 feet in length. Perhaps the part of the "work which will appear the most complicated will be "to connect the divisions under water. * * * The "operation will be attended with *no extraordinary diffi-*

"*culty to those who can remain during half an hour in deep* "*water.* * * * As regards that part of the tunnel "which would be near the shore, it would be sunk under "ground, and covered with stones fastened together, so as "to render them immoveable. * * Then the railway "will be formed in forming the tube; there will be no "hills to cut through, valleys to fill up, or arches to "build; in short, the sum total of the work is comprised "in the tunnel itself.

"Supposing the divisions to be 1,000 feet in length:—

"In that case, only 104 divisions would be required "to join the rails of the South-Eastern Railway with those "of the Calais and Paris. Now, *supposing* each of these "divisions would cost £40,000, the cost of the whole "would be £4,160,000; and if we allow for the "expense of *throwing* them in deep water, of con-"necting them, of building stations, &c., on a magnifi-"cent scale, it will, *I believe, be found*, that the sum of "£8,000,000 sterling would be quite sufficient to complete "this submarine railway." The manner in which this gentleman speaks of *throwing* into *deep* water, iron tubes a thousand feet long, capable of containing a railway, is quite refreshing. This extract gives no idea of his method of keeping them on the bottom after he gets them there.

Another "project consists in crossing the English "Channel, twenty-one miles in extent, by means of a tube "made of strong plate iron, or cast iron, lined and prepared "for that purpose; and which, placed at the bottom of "the sea, should contain the two lines for the trains which "would run within it. *The slope given to the submarine* "*railway would admit of a motion sufficiently powerful to* "*enable the carriages to cross the Channel without a steam-*"*engine.* The greatest depth of the sea at the middle of

" the Channel will admit of the construction of inclined " planes, by means of which the train would be enabled to " reach a point where a stationary engine, or atmospheric " pressure, *might* be employed in propelling the train to the " level of the land railways of France and England."

The next does not place his tube on the bottom, but proposes " to situate it at a uniform depth from the sur- " face, by means of ties below (and *buoys* above, if neces- " sary), at suitable intervals. The continuation of the " tunnel into the shore on either coast *I should dispense* " *with ;* and, in order that it should have a partial freedom " of motion, it should terminate with solid ends before " reaching the shores. To these points, chain piers should " extend ; or, if strict economy (say, in the first instance), " were aimed at in this item, the communication *might be* " *by small steamers.*" As the tunnel or tube in question contains only a single line, the projector proposes " *pushing* one way, and *pulling* the other ; " or, he says, " Electricity should, if at all practicable, be the motive- " power." After proposing, as the principle of construc- tion, something analogous to the cooper's craft, he con- tinues, " when the tube was completed from end to end " * * * favourable weather would be waited for, and the " work of lowering would then be accomplished, nearly as " follows :—The air-tight interior of each pontoon would " be connected by an ample length of flexible pipe to an air- " pump of adequate power, on board a vessel anchored at a " distance corresponding to that intended for the mooring- " weights. The two lines of vessels should be manned by " steady men, each crew under a trustworthy leader. " Athwart the vessels would be laid, from the shore, the " wires of an electric telegraph, communicating with an " apparatus on board of each ; so that, at a preconcerted " signal, the abstraction of the air from the pontoons,

" should be commenced simultaneously at a given time, " and carried on at a given rate. By this means, the pon- " toons, gradually deprived of their buoyancy, would yield " to the pressure of their burden—the buoyancy acquired " by which as it entered its future element would be over- " come by the weights with which, throughout its length, " it was loaded, and which would speedily sink it to its " prescribed depth. It would be when the tube reached " the water that the mooring-weights, having been prepa- " ratorily slung under the vessels above-mentioned, would, " at another signal by the electric telegraph, be *simul-* " *taneously let drop into the sea, and drag down their charge* " *along with them.*"

The proposer of the arched roadway, or tunnel on the bottom, will, with 40 subaqueous boats (of which he is the inventor), 1,500 sailors and navvies, 4,340,000 cubic yards of material, and £10,000,000, undertake to construct a tunnel, by means of which the Straits can be crossed in thirty-three minutes; and the mammoth bridge projector will make in the Channel 190 pedestals, 300 feet square at the bottom, consisting of rocks bolted and lashed together, gradually rising at an angle of 75°, till they form each an insular plain, 150 feet square, 40 feet above the level of the sea; on these, build towers 100 feet diameter, 260 feet high; and crown the whole with a tubular bridge 50 feet deep and 30 feet wide.