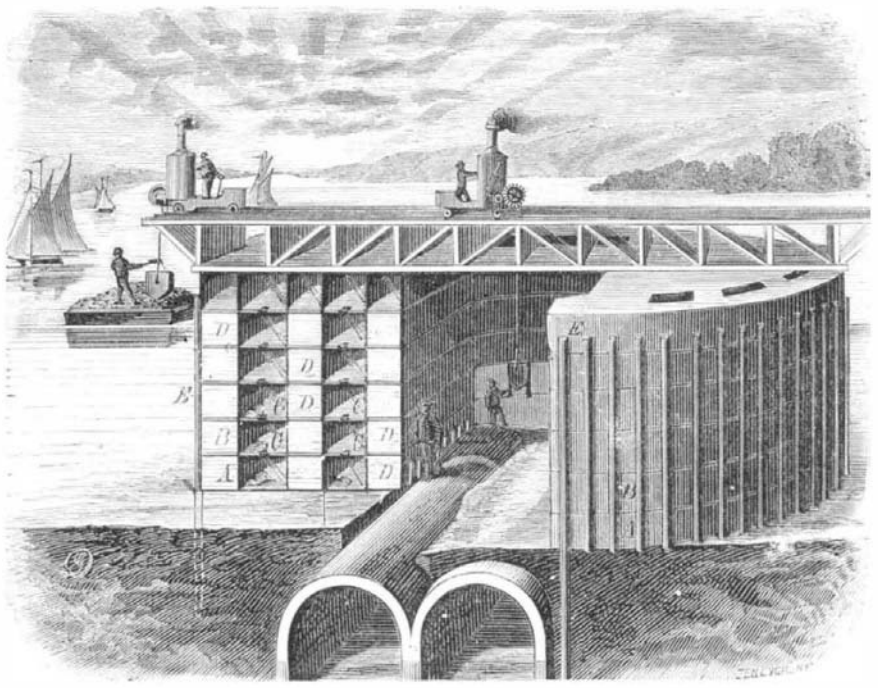
NOVEL PLAN FOR BUILDING SUBMARINE STRUCTURES.

Mr. Jerome Wenmaekers, a Belgian engineer, is the inventor of a new plan for the construction of quays, tunnels, and similar submarine structures, which appears to us to present many meritorious and valuable advantages. The invention has been patented September 8, 1874, through the Scientific American Patent Agency; and from Mr. Wenmaeker's drawings, we have prepared the annexed engraving, which will render the proposed construction readily understood.

A number of caissons are built either in segment or in circular form, but providing for a large opening or shaft in the center when several are superposed. The material is iron, with iron partitions, some of the subdivisions formed by the latter being used to hold ballast, while others are employed for machinery, storage, etc. Each caisson, after being built, is slung to a strong arched structure which extends between two boats, and is thus transported to the place at which the submarine excavation, for a tunnel, for example, is to be begun, or rather to meet a short commencement of the tunnel which is run from the shore in the ordinary manner.

The ballast compartments of the first caisson, A, whether it be composed of several segments or one piece—are loaded, and the tier lowered a short distance below the water surface. Then a second caisson, B, is brought up, placed on top of the first, the whole is allowed to become submerged, and a third tier is added, and so the work progresses until a huge coffer dam is formed, rubber joints at the sections of which render it thoroughly watertight. By opening suitable valves, water is admitted to the ballast compartments, C, and also to water chambers, D, pumping engines being used for the purpose if needed. By this means it is claimed that a resistance is imparted to the entire structure sufficient to insure its standing against storms or heavy currents.



WENMAEKER'S SUBMARINE BUILDING.

For the purpose of preventing the washing off of the bed of the body of water below the dam, a double series of piles, E, guided in staples, is driven around the circumference. The water in the center of the structure is then pumped out, and the earth is excavated in the space exposed. After a quay or tunnel section equal to the inner length of the dam is completed, the water is pumped out of the compartments, the piles are drawn, and the whole structure, which then floats, is towed to another point, where the work is continued in connection with that already done.

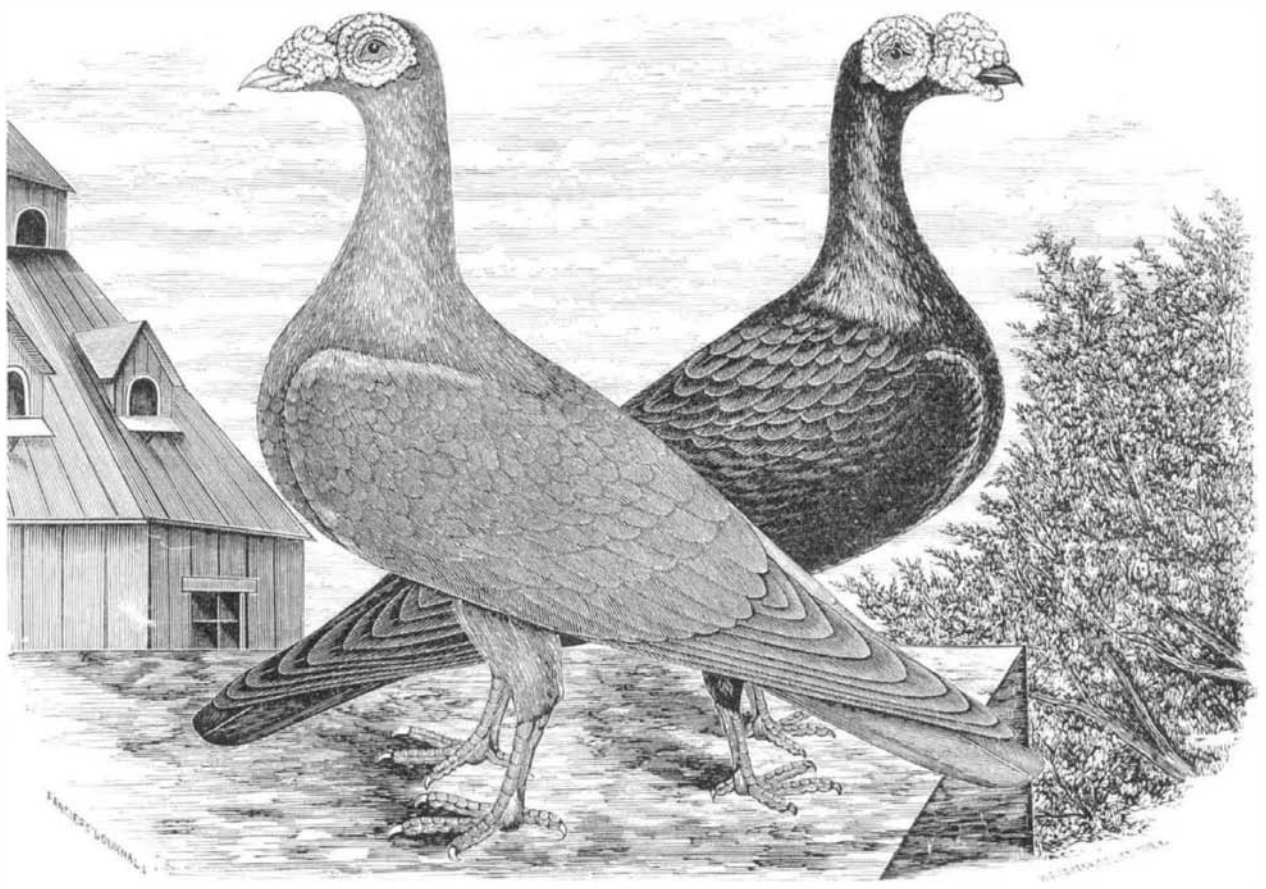
The building of quays is accomplished by not completing the circle of the dam, but leaving an open space which is filled by the masonry, so that the structure keeps moving further into the water as additional length is given to the quay. The invention does not apparently involve so great an expense as many systems which have been devised for similar purposes, while it has the important advantage of capability of being repeatedly used, as the sections maintain their entirety and are not difficult to transport wherever needed.

CARRIER PIGEONS.

The large numbers of carrier pigeons used during the Franco-Prussian war, for the transmission of despatches, and their more recent proposed employment for carrying messages during a transatlantic balloon voyage, have been the means of exciting a wider public interest in in these curious birds than has existed for many years past. In Holland and France, the breed is carefully guarded, and in all the European countries fine specimens of the birds find ready buyers. Prussia has a pigeon communication between her capital city and the fortresses of Metz and Strasbourg. In Paris many of the daily journals receive news of events transpiring in the Legislative Assembly, at Versailles, through the carrier pigeons, in preference to using the telegraph. The birds traverse the distance in from fifteen to twenty minutes, and the intelligence thus reaches the newspaper offices much more quickly than would be the case were the despatches obliged to wait their turn for transmission by the telegraph operators, or otherwise delayed by official formalities.

The long employment of the pigeons as news carriers has been the means of proving conclusively that no instinct guides them back to their cotes. On foggy days they will not attempt to return, nor during the night, except at times when there is a clear atmosphere and a full moon. When released, the bird flies upward and then circles around until it sees certain features of the landscape which it recognizes as being adjacent to its home. These it has learned to know during short flights which it is allowed to make during the training period; and therefore the instant the surroundings of its abode, often extending over a radius of several miles, meet the pigeon's eye, it at once travels with wonderful velocity in their direction. It is said that, when a bird fails to remember any portion of the landscape beneath it, it will fly for some miles without any reference to course, and then circle about again, and this will be repeated until a familiar object is caught sight of; or else the bird becomes exhausted, gives up the search, and never returns.

The accompanying engraving, from the *Fancier's Journal* (a most excellent paper of its class, published in Philadelphia), represents a pair of carrier pigeons, imported from England by Mr. John Yewdall, of the latter city, at a cost of $225. They are probably the finest birds in the country. Fine pigeons like these, are able to travel about 36 miles per hour.



CARRIER PIGEONS.

Telegraphic Cables.

It is evident that a new invention, in connection with the manufacturing of telegraph cables, is needed, and a good opportunity for the exercise of ingenuity in this line now exists. *Engineering* says that portions of a cable laid in 1860, between France and Algiers, were dredged up in 1871 in 400 fathoms off Minorca, and the outer covering of steel and hemp, similar to the Atlantic cable, found to be completely destroyed, so that the piece would only bear a few fathoms of its own weight. This was on a soft muddy bottom. The Falmouth and Gibraltar, laid in 1870 and repaired this year, was found chafed through at a depth of 1,000 fathoms. The Direct Spanish cable failed suddenly in the Bay of Biscay, and was found for a mile to be swallowed up in the ground in a depth of 1,300 fathoms, as if by volcanic action, the bottom being stiff blue clay.

If there is any part of the Atlantic crossed by the Atlantic cables having the same species of bottom as that where the Algiers cable of 1860 was dredged up, there would be a certainty of the cable decaying to such an extent that, if lying also over a ridge, it would eventually break. Nor does it seem so entirely improbable that volcanic action or movements of the ground, similar to that which undoubtedly occurred in the Bay of Biscay and also in the Persian Gulf, may occur on some portions of the route. The question of the *teredo* also arises. Cables in the Mediterranean have been found attacked by these insects at great depths; but in these cases probably from the cables thus examined not having been submerged long enough, the boring was only slightly into the surface. In shallow water, cables have been found with holes bored through the gutta percha down to the copper wire, thus entirely destroying the insulation.

Thus a piece of cable laid in Kurrachee harbor was found bored down to the copper, the insect having got in in places where the outer protecting wires were a little open; more recently, too, the cables in the Irish Channel have been found attacked. Two wires in the Dublin and Holyhead cable, laid in 1871, have just been found thus injured, and are rendered useless. This cable has each of its outer sheathing wires covered with a coating of tape, and thus the actual iron wires do not touch each other, so that the insect is able to pass between them. The Atlantic pattern of cable is still more open to the attack of the insect, as the outer steel wires, being each covered with a thick coating of Manilla hemp, are separated from one another by more than their own diameter. We have no experience yet of this insect having attacked an Atlantic cable; and should this ever occur, the pattern of all future Atlantic cables will have to be entirely revised. The pattern of the cables used on the principal lines in the Mediterranean and on the Direct Spanish, where the steel wires touch each other, would be a much safer one in localities where the attacks of this insect are to be feared.

But should the danger be found to extend to the Atlantic, it is doubtful whether the insulation of such important lines should depend even on the certainty of the outer wires touching one another throughout. In the case of the Wexford cable, where the outer covering consisted of iron wires, supposed to touch throughout, the insect has found out places where they are a little open, and has thus been enabled to insinuate itself, destroying the insulation by boring through the gutta percha. It is evident that, in these localities, at least a more certain protector than the iron wires is required. Some four years ago, Mr. F. C. Webb devised the application of a thin steel armor to the insulated wire, but it has never yet received any practical application. Something of this sort must, however, be adopted wherever the attacks of the *teredo* have to be resisted.

Wet Boots.

What an amount of discomfort wet boots entail, and how well we all recall the painful efforts we have now and then made to draw on a pair of hard-baked ones which were put by the fire overnight to dry! Once on, they are a sort of modern stocks, destructive of all comfort, and entirely demoralizing to the temper. The following plan, it is said, will do away with this discomfort:

When the boots are taken off, fill them quite full with dry oats. This grain has a great fondness for damp, and will rapidly absorb the least vestige of it from the wet leather. As it quickly and completely takes up the moisture, it swells and fills the boot with a tightly fitting last, keeping its form good, and drying the leather without hardening it. In the morning, shake out the oats and hang them in a bag near the fire to dry, ready for the next wet night; draw on the boots, and go happily and comfortably about the day's work.