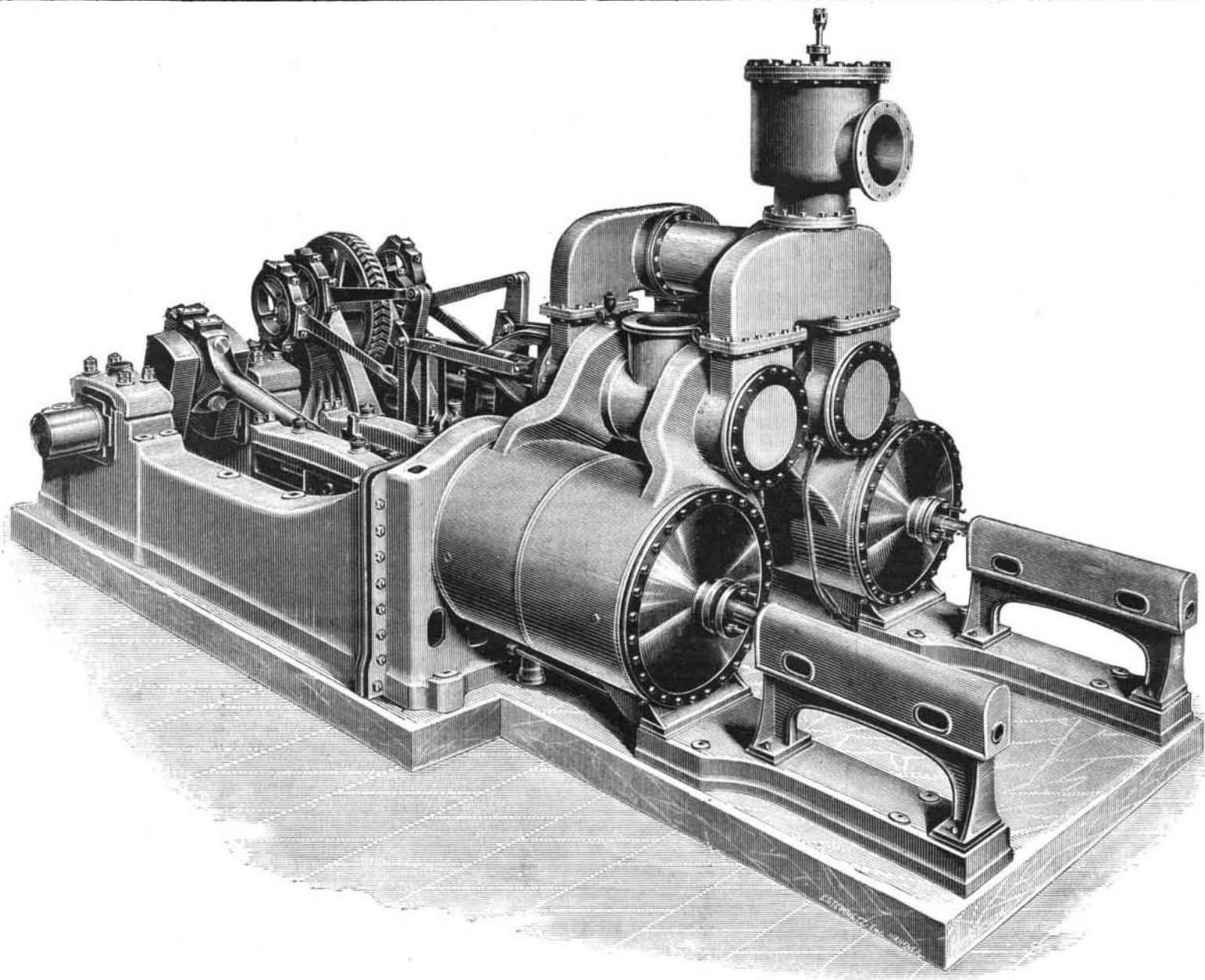




IMPROVED SIXTY INCH RAIL MILL ENGINES.

fatal to the putrefying bacteria, and if so changeable a liquid as milk could be thus preserved, it seems feasible to successfully apply the same process to the preservation of beer. At all events, Crosse's experiments seem to show that galvanic action is not detrimental to the keeping qualities of such liquids as milk and beer.

AN AQUATIC VELOCIPEDE.

The apparatus shown in the accompanying engraving was constructed by quite a young man, Mr. Leon Bollee, one of the sons of a well known constructing engineer of Mans, Mr. Amedee Bollee. The aquatic velocipede in question has been experimented with several times upon the Huisne River, and the results obtained were satisfactory.

The apparatus consists of two spindle-shaped floats, which displace about fifty cubic feet, and which are connected by cross braces that serve to support a deck. Between the two spindles is placed a paddlewheel, which is moved by one or two persons actuating revolving pedals analogous to those found in tricycles. The person situated in front steers the boat, and the latter maneuvers with sufficient ease to turn in a radius equal to double its length. Finally, a railing adds to the security of the passengers.

With this boat there is obtained a mean speed of six miles an hour in stemming the current of the Huisne, which is quite swift. On descending the river the speed is much greater, of course. The power required for propelling the apparatus is so slight that a mere child can run it with the greatest ease.

As the apparatus weighs about 880 pounds, and the volume of water displaced is fifty cubic feet, there remain 2,200 pounds for the load, and the space between the spindles being quite wide, a change of position of those on board does not greatly affect the boat's stability. Our explanatory figure (Fig. 2) allows us to dispense with entering into longer details on the subject

of a very simple arrangement that will interest the numerous friends of velocipeding.—*La Nature*.

The Quarries of Carrara.

The marble used by most of the sculptors in Italy, and preferred to any other by artists the world over, comes from the famous quarries of Carrara, Italy. A correspondent in the Baltimore *Sun* gives the following

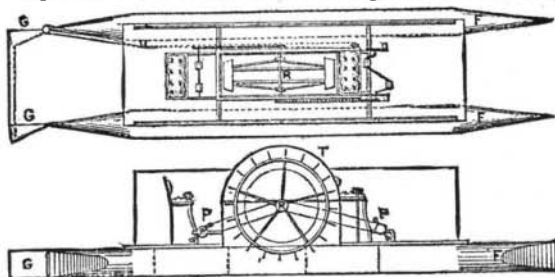


Fig. 2.—PLAN AND SECTION.—VELOCIPEDE.
R. Paddlewheel. T. Paddlebox. F. Floats made of iron plate. G, G. Rudders. P, P. Pedals.

interesting account of his visit to the quarries. He spent several days at Carrara, and, according to his statement, there are some 6,000 men at work in the quarries, and there are 100 studios of sculpture at Carrara, 65 sawmills, and 25 polishing wheels, which brighten dull marble and smooth the slight fortunes of some 400 plodding workers. The hewing of rough rocks, huge in their proportions, is something approaching the marvelous here. The men are hoisted to the height of some 700 feet above the level of the quarry, and up aloft excavate colossal lumps of marble. Each gang, or the foreman of the gang, goes down with and on the lump as it is swung by derrick ropes out into the air and swiftly brought to mother earth.

One of these Italians will sing in lusty tones, "Viva, viva Garibaldi," from his dizzy eminence, and suddenly appear below where you are standing, his bright, big black eyes full of unequalled expressiveness and his white teeth glittering between unapproachable smiles—the inalienable gifts of these people—and say, "Ah, signore, will you go up with me again?" just as if it

were a perfectly ordinary feat. The free, easy, and primitive style of this Carrara flying-trapeze work makes it appear doubly dangerous. Hundreds of accidents occur every year.

Children scarcely out of their swaddling clothes work amid the glare and dust of this lovely white marble, and die with sore eyes and stifled lungs. The food is dry bread, a raw onion, and dirty water. It is the only place in Italy where wine is not drunk. Worn out by incessant, severe toil, these people, insufficiently fed, fall into dissipation, violence, and crime, dying like dogs, and leaving on the white marble the sweat of their wretched lives. We see none of all this under the hand of art.

Fully \$800,000 worth of marble goes out annually from these quarries, the bulk of it to France. The price of it varies according to its beauty. The first quality is priced at \$60 to \$80 per square meter at the seaport. This is what we term statuary marble. The

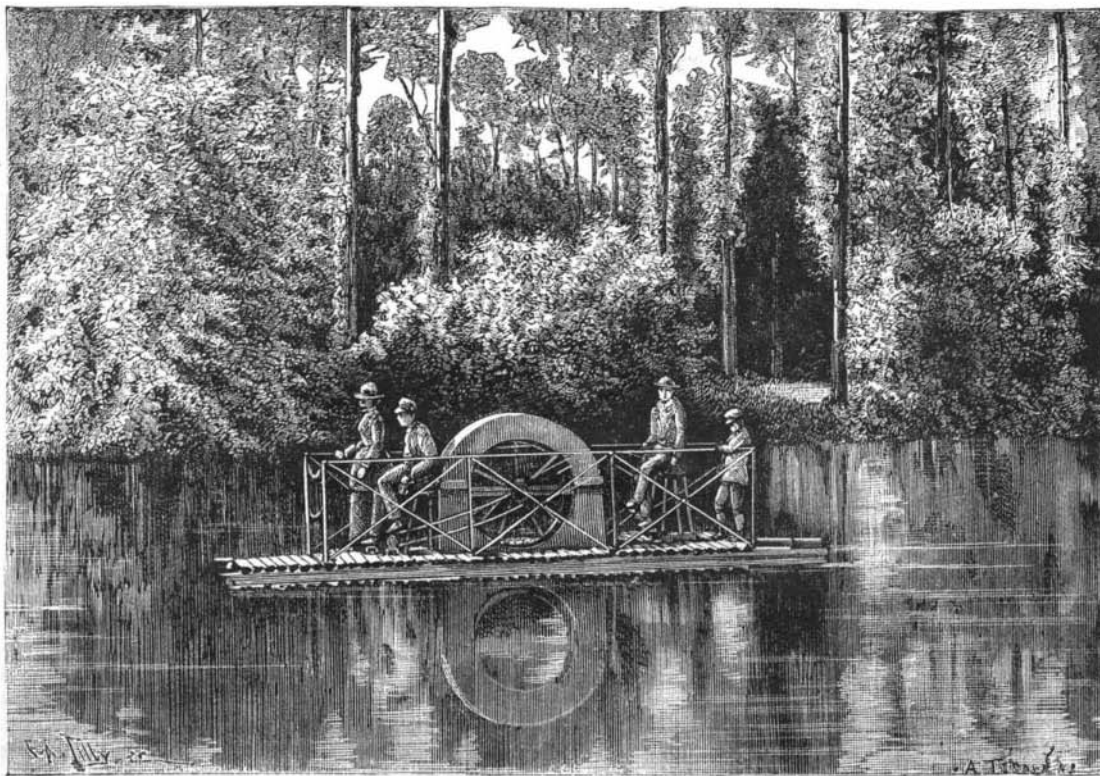


Fig. 1.—BOLLEE'S AQUATIC VELOCIPEDE.

second quality is priced at \$45 to \$62, and the spotted at \$30 to \$59. Then comes pure white, but not statuary marble. The price is \$50 per square meter. The second quality is \$35, and the third is \$30. The veined marble brings on the first quality \$50, and on the second quality \$35. Violet-hued marble brings \$70 to \$100 per square meter. These are the ordinary tariffs, and on them the profits are absurdly high before the marble leaves the quarry.

DECISIONS RELATING TO PATENTS.

U. S. Circuit Court.—Southern District of New York.

TATE *et al.* v. THOMAS.

Wallace, J.:

When the language of the claim explicitly imports a certain arrangement into such claim, it is unnecessary to consider whether that arrangement is essential to the combination for the purpose of producing the result desired, and a machine which does not employ such arrangement is not an infringement of the claim.

The addition of certain elements to a patented construction which does not unfit it for performing its original result, but simply adds the results due to the new elements, does not avoid infringement.

Infringement is alleged of the patent granted August 22, 1871, to William John Tate for an improvement in quilting machines.

It is obvious that Tate was the first to invent a quilting machine which would produce the various complex and elaborate patterns which before his invention were produced by hand work. The nearest advance in the art before his invention had been made by William Muir, whose quilting machine is described in his patent of April 20, 1869. This machine could quilt in straight parallel lines like the stitching of the sewing machine, but it could also quilt in coincident zigzag lines, and thus form patterns defined by such lines. This latter result was effected by a single row of needles combined with devices for feeding the fabric to the needles, which would impart both a forward or longitudinal and a laterally vibrating movement to the fabric, thus causing the stitching to be done in waved or zigzag lines. Tate conceived that by employing two rows of needles and so organizing the feeding devices so that those for each row would operate successively, and not simultaneously, the zigzag lines of stitching of one row of needles could be made to meet those of the other row at the angle of the zigzag, and thus produce the desired diamond shaped pattern.

The defendant has incorporated Tate's alternating needles into the machine and then duplicated Tate's arrangement, and when this has been done each needle in one row is opposite a needle in the other row. No new result is obtained by the change, although an aggregation of results is accomplished. If the additional needles had not been inserted, the defendant's machine would quilt diamond patterns just as it does now. The machine is held to be an infringement. A decree is ordered for the complainants.

The Management of Scarlet Fever.

Scarlet fever is spread by contagion—by the transfer of particles of living matter from a person suffering from the disease. These particles of living matter come from the skin, from the membrane lining the mouth, nose, and throat, and perhaps also from the intestines and urinary organs. It is a disease which it is specially desirable to prevent the occurrence of in young children, partly because the susceptibility to its cause diminishes greatly with increase in age, and partly because it is much less dangerous in adults. There is reason to question the wisdom of using costly and troublesome methods of preventing the spread of measles, because the susceptibility to the cause of this disease remains in adult life, and it is, if anything, more liable to result in dangerous lung complications in advanced age than it is in children; but there can be no doubt as to the wisdom of restricting the spread of scarlet fever as much as possible.

The precautions to be taken when a case occurs in a house are in many respects the same as for a case of diphtheria, viz., to isolate the patient in an airy room having the least possible amount of furniture. The room should have no carpets or curtains, and no upholstered furniture, such as lounges, sofas, stuffed chairs, etc.

All the secretions and excretions, and all articles soiled by them, should be disinfected thoroughly and promptly while they are yet moist. A special and important precaution is to keep the whole surface of the body thoroughly anointed with some bland fatty matter, such as camphorated oil, vaselin, or cosmolin, and especial care should be taken to do this when convalescence has set in, and the peeling off of the skin has commenced. All toys, books, etc., handled by the child are dangerous, and had best be destroyed in the room by fire or by putting them into a vessel containing a strong solution of bichloride of mercury or of chloride of zinc.

No clothing, bedding, towels, or other woven stuffs should be taken from the room while dry; they should

be placed in a tub or wash boiler containing scalding hot water, and thoroughly boiled before they are allowed to dry.

When the peeling of the skin has entirely ceased, the patient should be thoroughly bathed—using warm soap and water—be dressed in entirely fresh clothing, and the room and its contents should be thoroughly disinfected. The average period during which complete isolation of the patient is required, and during which he should not go out of his room or receive any visitor, is five weeks. Usually six weeks will be required to secure absolute freedom from danger.

The walls and ceiling of the rooms should be rubbed with damp cloths, which should be at once burned or boiled. The floor and all woodwork should be thoroughly scrubbed with soap and water.

The windows, fireplace, doors, and all other outlets of the room should be tightly closed, and sulphur be burned in the room in the proportion of one pound of sulphur to each thousand cubic feet—that is, if the room is fifteen feet square and eleven feet high, about two and a half or three pounds of roll brimstone will be required. Put the brimstone in an iron kettle, and place the kettle on a tray of sand three inches thick, or on a platform of bricks; pour a wineglass of alcohol on the brimstone and set fire to it, leaving the room immediately, as the fumes are dangerous. Let the room remain tightly closed for twenty-four hours, then open all windows and the fireplace, and let the fresh air circulate in it for from twenty-four to forty-eight hours.

—*The Sanitary Engineer.*

English Law on Boundaries of Property

In Mr. E. L. Tarbuck's new work on "House Property," we note:

"In the absence of plans, figures, or rebutting circumstances, where a fence or hedge and a ditch are conjoined, the landowner on whose side either of the former stands claims the latter; the theory being that excavated soil was cast on the digger's land as ground-work for his barrier, which thus with the ditch forms the boundary, and the limit being the outer bank from the fence or hedge. Property in a fence or hedge between ditches or without ditch may be joint or rest on acts of ownership of long standing, as executing repairs, especially on demand.

"Posts and rails of paling are presumed to stand wholly on the owner's land, with pales outward and nails driven home.

"Joint proprietors of fences, etc., are not necessarily under obligation one toward another to preserve them, any more than a sole proprietor is similarly bound toward the adjoining owner or the public; but in both cases prudent precautions must be taken to obviate injury to others, as by scouring ditches, inclosing holes next public roads, preventing cattlestraying, etc. Generally, the tenant (who must also usually preserve boundaries), not the landlord, is liable to actions in such cases. The time a fence has existed is one element in considering liability to repair it; and twenty years is the least period.

"Where a stream flows between properties, the presumptive boundary is the central line of water, use of which is shared between opposite owners, neither being entitled to injuriously affect the other or proprietors above or below by obstructing, diverting, diminishing, or polluting it.

"In the case of houses or grounds separated by walls used by both owners and built at joint expense, half on the land of each, and also where it is unknown at whose cost or on whose land such walls were erected, they are practically common to the parties, and either may exercise acts of ownership in building, etc., so that one does not prejudice the other. If a man builds on another's ground, the latter must set up his right within a reasonable period from cognizance of the trespass.

"In London, rights and liabilities of owners of party structures are regulated by the Metropolitan Building Act, 1855.

"At common law, a man has a right of natural support of soil, so that an adjoining owner must not by excavating cause it to fall. If a house has been erected above twenty years, there is usually a special easement of support from adjoining land or houses (as from party structures), the proprietor of which is liable for injury by settlement, etc., caused by him. In other cases general right to support or to notice to take precautions should be proved. Where a row of houses is built by one owner and sold to different parties, there is by implication right to joint support."

W. MILLS, of Bedford, finds the hydraulic or setting qualities of limes and cements are improved by mixing soluble sulphates, carbon, and certain other salts with the calcined material. The patentee prefers to heat silica, iron, and aluminum sulphates, iron oxide, carbon, and chalk, to redness in closed vessels; and then add the product, when cold, to fresh calcined limestone, grinding the whole intimately with some of the following salts, viz., potassium carbonate, ammonium sulphate, sodium carbonate, potassium sulphate, and iron sulphate.

Slipping Down by Sympathy.

The boys who render City Hall Park dangerous by day and night discovered a new diversion, on Christmas, so says the *N. Y. Sun*. A dozen or more of them were gathered at the southeastern corner about noon, tranquilly gazing the passers-by, when a very large man slipped on the curbstone and waved his arms wildly in the air. He also yelled. After twisting himself into a dozen wild positions he regained his equilibrium, and continued on his way without having fallen to the ground.

It is a well known fact that a pedestrian will often fall to the ground in slippery weather out of pure sympathy for some one else who falls directly in front of him. Directly behind the big man who so miraculously escaped a fall was an earnest and sincere-looking woman, who was plodding along with her head bent down. She was in a reverie. Suddenly the big man leaped wildly into the air. As he did so he screamed. When a big man screams, the effect is eerie. At the same instant the woman sat down with a degree of heartiness that caused the bronze statue of Franklin, five hundred feet away, to totter on its base. The woman sat there and watched the man battle with the laws of gravitation until he conquered and went on his way. Then she arose and went on, looking snowy and uncomfortable.

The biggest boy in the gang, whose distinguishing characteristics were huge red hands and an unusually varied assortment of teeth, said to the others:

"Dat's a great steer, dat is. 'Th' nex' dame what comes along here'll do likewise if I bust a lung to show her. Youse bucks stand right here an' yell all your might when I slips. If we don't throw her widout layin' a hair, then I'll kiss a pig for luck. Watch me while I try it on."

The gang stationed itself beside a particularly slippery place on the walk, and the overgrown boys slouched down toward Broadway and loitered on the corner. Presently a nervous little old woman came trotting along. The Fourth-warder waited until she had passed, and then steamed up close behind, walked completely around her, and fell in her wake again. She halted, staggered, and then, with a look of wild surprise, trotted on again. Once more the awkward youth circled around her, and once more she increased her speed. Just as she arrived at the gang her tormentor came up for the third time, and, stepping directly in front of her, sent forth a howl of despair and sprang wildly aloft. At the same instant the gang yelled, "Ah, there? Stay there!" as one voice. It completed the confusion of the nervous little old woman, who clasped her hands over her breast, and went over backward as though struck by a thunderbolt. Chivalrously the gang assisted her to her feet, and sent her on her way, relieved of a few small things, and turned again to enjoy the sports of Christmas Day.

Vaccination against Yellow Fever.

The researches which have during the past two years been made by Dr. Domingos Freire have now reached a new point of departure. This investigator has prepared an attenuated virus with which he proposes to vaccinate individuals, with a view to rendering them proof against the occurrence of yellow fever. The Emperor of Brazil, having regard to the alleged innocuousness of the prepared virus, has authorized the practice of vaccination. Dr. Freire has accordingly vaccinated five hundred individuals. Three captains and all the crews of English vessels have been vaccinated with a view of escaping the infection from yellow fever, which prevails at Rio Janeiro. Thus far none of the vaccinated people have been attacked by the disease, and none of them suffered the least inconvenience from the operation. M. Bouley, who gave the facts to the Academie de Medecine, while implicitly believing the above narrated facts, does not yet implicitly accept the views of Dr. Freire on the *Micrococcus xanthogenicus*.—*Lancet*.

Galvanic Action upon Iron in Sand.

Writing to the *Engineer* on electric light cables, Mr. J. Johnstone, of Edinburgh, mentions the galvanic action set up by natural process between the metallic bases of earths and metals. He says that his attention was first drawn to the subject upward of forty years ago, when he saw an iron water main lifted out of a street in Greenock, where it had lain in a small bed of sand crossing the line of the street. At this part the outside of the pipe was covered with nodules, which were conglomerates of sand and oxide of iron. Inside the pipe, opposite to each of the exterior nodules, was a corresponding nodule of oxide of iron. These interior nodules were shaped like those found in cavities of hematite. It was therefore assumed by Mr. Johnstone that the inner nodules were formed as a result of galvanic action, which was transmitted through the body of the metal of the pipe from the nodules of sand and oxide on its exterior. Mr. Johnstone has never seen sand similarly adhering to lead pipes unless there was also lime in the sand. He considers that galvanic action fully explains the pitting that takes place in iron pipes that have lain long in sand, and which are thereby eventually destroyed.