

Science & Mechanics.

The *Vaderland* of the Hague announces that the project of drying the Zuyder Zee (about 50,000 acres) is again brought on the tapis. The example of the Lake of Haarlem is there to show that, notwithstanding the immense difficulties of the task, the ground gained from the sea by the hand of man and devoted to agriculture largely remunerates the expenses of the acquisition. It is known also that the Zuyder Zee was not always the immense gulf it now is, but was once a thick forest, bathed by a river, which, after traversing several small inland lakes, threw itself into the sea near the Texel. About five centuries back the waters of the ocean, rushing in by the mouth of the stream, produced a general inundation.

A STEAM PAVING TOOL.—A novel apparatus of this kind has lately been tried in Paris, namely, a Steam Rammer. As used from time immemorial the rammer is a heavy iron-shod implement which the workman raises about a foot from the ground and allows to drop, as rapidly as he may, successively upon the boulders or blocks to be set. The object of the invention of Mr. Lignier is to save the labourer the severe physical exertion of raising the heavy tool, an exertion producing in time an injurious effect upon the lungs. In the apparatus of M. Lignier the heavy weight is lifted by a small Lenoir gas engine. To the fly-wheel of the engine is connected the rammer of steel, smaller but heavier than the ordinary instrument. The movement of the machine is controlled by the operator, and the rapidity of the operation, according to the inventor, more than counterbalances the greater cost.

We are promised a novelty in war ship building which—so only it is practicable—must be welcomed with open arms by "My Lords" of the Admiralty. Some genius has, it appears, developed a plan for rendering vessels unsinkable. The invention consists of the interposition of an elastic preparation between two thicknesses of wood in the side of the vessel to be protected. When the ship goes into action, and the enemy's shot pierces the sides, holes will, as a matter of course, be made in her hull, but these perforations will, if the invention proves serviceable, be instantaneously closed by the lateral expansion of the elastic compound, and—in the case of all shot-holes below the water line—the influx of water be prevented. An official trial, on an almost microscopic scale, took place recently at Devonport, a wooden box being substituted for a ship, and rifle bullets being employed in place of shot. Fairly satisfactory results were obtained, the perforations closing with considerable promptitude. It is to be hoped that the Admiralty will close with the inventor in an equally satisfactory manner, if their official minds are convinced of the value of his proposal. Only don't let them close their eyes to its merits, if it has any.

The great marine aquarium at Brighton was formally opened to the public on the 12th of August, on the occasion of the meeting of the British Association for the Advancement of Science at that place. This establishment is the largest and best appointed of its kind in the world, and has been planned with the sole object of presenting the wonders of the sea in the most complete and attractive manner possible. The building is 715 feet in length, with an average width of 100 feet. Its front consists of five circular-headed arches, connected by terra cotta columns. The exterior of the aquarium is highly ornamental, and presents a very striking appearance. The interior is arranged with a view of furnishing accommodations of ample extent for all the varieties of marine life likely to be brought within its inclosures. The aquarium proper is divided into three corridors; the first subdivided into nineteen bays, and covered by a groined roof of brick. Its extreme length is 229 feet, broken by a central square 55 by 45 feet, in the centre of which is to be placed a terra cotta fountain of elegant design. Fourteen tanks are ranged on each side of this corridor, varying in dimensions from 55 by 39 feet to 114 by 20 feet. The largest of all, which occupies the whole north side of the square, is over 100 feet in length, capable of accommodating a whale of considerable size. The front of the tank is composed of Portland stone, ornamental iron, and heavy plate-glass, secured by water-proof cement. The second corridor is 89 by 23 feet. It has no tanks, its main purpose being to serve as an approach to the conservatory, the first corridor, and the terrace. The third corridor is 23 feet wide and 160 feet long, and contains 20 tanks, some to be used with fresh and some with salt water. The conservatory is also 160 feet long, 40 feet wide, and 30 feet high; is intended as a lounging and resting place, and is ornamented with a great variety of marine plants and small aquaria. A series of shallow tanks is to be erected on the north wall for the purpose of illustrating the culture of salmon. The whole basement of the building is occupied by reservoirs for the storage of seawater, which is pumped up as required into the tanks; and an arrangement has been de-

vised by which a constant circulation of the water is kept up. The work on this aquarium was commenced in July, 1870, the first brick laid February 2, 1871, and the entire cost of the work was \$250,000. It is under the direction of Mr. John Keast Lord, a well-known naturalist.

IMPROVED TOOL REST.

The principal defect of the ordinary form of tool rest is its difficulty of adjustment. It is fitted with no appliances for making slight changes in its position, particularly such as are constantly required in the execution of fine work, so that for every needed alteration, in the point of application of the tool, considerable time must be wasted in properly setting the rest. The device herewith illustrated, the invention of Mr. C. F. Hadley, overcomes this disadvantage in a very simple and effective manner.

Fig. 1 is a perspective, and Fig. 2, a sectional view. The tool is shown held in a vertical slot in the upright standard by means of a screw bolt from above. This standard fits in a mortise in the upper portion of the device marked A, in which it freely moves, so that its lateral position may thus be adjusted. Pivoted on its end, as shown, to the interior of the metal sleeve, B, is an arm, C, the upper extremity of which is similarly attached to the movable piece, D. Through the latter, a thread is cut in which works the thumbscrew as represented.

The upper portion, A, of the instrument extends down inside the sleeve, B, in which it slides freely. It is evident that, by turning the thumbscrew, the piece, D, will be moved to the right, the arm, C, will be raised to a nearly perpendicular position, and the upper portion, A, carrying the tool, will be lifted. Opposite motion will, of course, take place by a corresponding reversal of the movement of the screw. The height of the tool in the rest may thus be nicely graduated to any desired position, without necessitating the removal of either tool or rest from the machine.—*Scientific American*.

COMBINED PIPE WRENCH AND VICE.

The device illustrated herewith is an ingenious combination tool, which may be used either as a vice for holding gas pipe while cutting screw threads upon it, as shown in Fig. 1, or it may be detached (Fig. 2) from its stand and employed as a gas pipe wrench, or square wrench for large bolts.

A (Fig. 1) is the bracket secured by bolts to the bench. B is an angle plate pivoted to the bracket by the bolt, C. By the curved slot in the former, through which passes the bolt, D, the tool may be inclined as required. B is the upper and horizontal portion of the angle plate, to which the instrument is detachably secured by the bolt, E, through the bar, F. The forward end of the latter is inclined, and upon it are formed teeth. G is a bar, one end of which is rigidly fastened to the bar, F, and the other pivoted to the double bar, H. By means of the holes shown in H, the position and angle of the bars, H and F, can be altered at pleasure. Pivoted to the bar, H, is a curved bar, K, which passes through a slot in the bar, F, and has several holes in it to receive the pin, L, by which it is suitably adjusted to the lever, M. Upon the inner edge of the bar, K, are also cut teeth. The forward end of the lever, M, is slotted to receive the end of the short bar, N, Fig. 2, to which it is pivoted and which serves as a fulcrum. The other end of the short bar, N, enters a slot in the bar, F, to which it is detachably secured by a bolt. The lever arm, M, passes through a slot in the clevis, P, which has a vice screw, as shown, which, when turned inward, presses together the lever arm and the bar, F. By taking the tool from its support, and also removing the vice screw and other portions, substituting for the former the thumbscrew, Q, it becomes, as before stated, a square or gas pipe wrench.

When used as a vice, this invention can be adjusted for holding pipe of various sizes, from three eighths of an inch to four inches. Employed otherwise, two sizes are all that are required, as it forms a square wrench, square to the diameter of the pipe. The inventor states that the tool is especially valuable in the sinking of pipes forming drive wells, the former, after being driven some time, frequently becomes stopped with fine sand, so that it is necessary to withdraw them. This, although it requires increased leverage, can, it is claimed, be readily done with the wrench by slipping a piece of gas pipe over the lever, while the compression on the pipe need not be increased. Using the wrench in this manner, it is stated that a drawn copper tube can be screwed together without injury.

The device can be used in closer quarters than ordinary gas tongs, as the grip can be loosened and another taken every sixteenth of an inch, around the periphery of the pipe, with absolute certainty. The instrument can be made to answer the purpose of a pipe cutter at a small additional cost. It is made of steel castings, and weighs, complete, seven and a half pounds.—*Scientific American*.

Keep them always near, Dr. Colby's Anti-Costive and Tonic Pills.

Courier des Dames.

FRENCH MARRIAGES.

The youth of England, with its still existing romantic notions on marriage, would be somewhat startled at the prosaic manner in which the generality of French marriages are arranged—yes, arranged; that is the word—and, until this "arrangement" system is done away with, all the sensational pamphlets of Alexander Dumas and his answerers will be written and read in vain! For instance, a *chef de famille* says to his son or nephew, as the case may be, "*Mon garçon*, you are thirty years old to-day, you have had plenty of time to enjoy the fullest sweets of Bohemian life—it is time to *sanser*—the family must have a head—and you must have sons!" Accordingly he is introduced to a young girl, generally fresh from convent. If she be not positively repulsive in appearance, he gives his consent to the affair, since it *must* take place, and this one may no doubt be as good as any other. Besides, he is a man, and, after all, he is not compelled to give up all his old habits, even when he is married. To be sure, he may not be able to dispose of quite so much time as formerly, but still, there will always remain some leisure hours, when *le roi* will be able to amuse himself! With the girl, however, it is wholly different, *she* is sometimes suddenly fetched from convent purposely to be given to this man, without a word of warning, or a question as to whether or no she likes him. He may be repulsive to her in the extreme, but she has not the power to say no. She has been taught that she may have to marry, but it must be only with her parents' consent and at her parents' request. She is not to know what it is to like or to dislike, till afterwards! Fortunately for her, if the man to whom she is given has the heart and feeling of a gentleman, he may then crush some of the thorns in the poor girl's way; and, maybe, a calm, peaceful married life may be the consequence. Too frequently, however, if the husband be ungenial, and he strive not to render happy the young life given thus powerlessly into his keeping, there comes a time when the woman, emerging from her colourless girlhood, looks into the long, loveless life before her, and... a story follows, which may be concluded by a *Darbour d'ennuement*! Let not happy English wives, proud in their consciousness of loving and being loved by husbands of their choice, be too severe on their oft unhappy sisters *d'autre-mer*. Bad, however, as the private marriage system is, the public one is still worse. By public, I mean those marriages consummated by the aid of paid professional agents. Do not think that I am imposing on your confidence, and am asking you to believe in things unheard of. Marriage agencies are general in France, some of the "profession" having been in business for upwards of forty years, and having amassed large fortunes in the interim, and by the sale of their agency! There are women agents and men agents, as there are agents for the poor and agents for the rich. The head of the profession, however, is a gentleman, a count by birth, boasting one of the oldest names of France! He only corresponds with clients in the highest classes of society (and *en ce sens* some families have thus been united who would die of shame if the world knew to whom and to what means they owed their introduction and subsequent union). This "chief" has a large, sumptuous house in Paris, fitted up in the most costly and princely style, and a magnificent country seat in the neighbourhood of Paris. In the town house he "receives" three times a week, and likewise at the country house he holds three weekly "receptions." The system is thus, for a gentleman—he states in full his position, name, fortune, expectations, &c., &c. The *chef*, before proceeding another step, has all this information examined carefully and minutely. If all be found to be correct, then he looks over his correspondence, and if amongst this he finds "that a lady knows of such or such a charming person with so much *tal*" (for a *tal* is indispensable), then he writes to another lady, deputing her to sound No. One, respecting gentleman. If the answer be favourable, then he informs Mr. X. that, if he can entrust a *parente* to call on Madame A, she may there meet a lady who may suit Mr. X. This is done, and if the *parente* approves of Mdlle. an offer is sent by this *parente* to the nearest relation or friend of the young lady, who, all this time, is quite innocent of the conspiracy that is going on against her independence. If the offer is not positively rejected, the gentleman is allowed to call, and if he do not dislike the girl, he renews the offer in person, and, after three days, the contract is drawn up between the notaries of each family, and Monsieur X. and Mdlle. A. become man and wife, and bound by ties which no French law can untie. Each family then pays the *chef* a fee, or percentage on the fortune of the opposite sides, and often it is then alone (that is, when the account is sent in), that the interested parties know to whom they have been indebted for their introduction to each other. Sometimes this fee is therefore disputed, but the *chef* has the protection of the

law on his side, being licensed by Government to carry on this extraordinary business; thus, even when the parties resort to law (which is seldom, for obvious reasons), the *chef* always wins the day, and the opposite side loses caste and somewhat of the prestige of their name—for, though these things are allowed by the best society, they should not be made public. By these occasional lawsuits, however, the world is here and there surprised to learn how such and such a marriage has been brought about. The extent of the *chef's* fortune, gained by the exclusive exercise of his profession, gives, however, some notion of the extent of his connection. Formerly, when rising into fame, he used to advertise to about 150,000 francs a year; now, however, he has, comparatively speaking, retired from the profession, and only undertakes the most difficult, or the richest affairs. Besides the *chef*, however, there are hundreds of other marriage agents in Paris, for every stage of society, some, indeed, belonging to no society at all, and all these have under agents working for them in all parts of the country. (The *chef* has correspondents in all parts of the world!) Now, having told you how a gentleman places his name on an agent's books, I will tell you how a lady does the same. Of course she is supposed not to know anything of the affair, and a letter is written as if from another person, saying: "She knows of such and such a lady," etc., etc. Her *amuse-propre* being thus saved, she trusts entirely to fate, or rather to the *chef's* ability in procuring her a husband of corresponding position and fortune. The rest is but a repetition of what I have already explained. The *chef* himself is a remarkably handsome man, with manners of the old French noblesse school; and looking at him, you wonder now it is he could ever have descended to such a profession. But he does not consider he has lowered himself; on the contrary, he calls himself one of the benefactors of society, and considers he does more good to humanity than any other profession he could name. *Paris*, this short sketch, which has but one merit, truth, may give some idea of how marriages in France are sometimes made, and knowing this, and knowing also that as yet French law does not allow divorce (though it allows parents to dispose of their children like human cattle), we need not be surprised at the frequent consequences of French marriages in general.—*Queen*.

The Michigan University has just admitted 12 young ladies.

The German Emperor has conferred the Cross of Merit on two Alsatian ladies.

There is a question pending in a French court whether false teeth and the various other artificial accessories of the human form divine are liable to seizure for debt.

The *British Medical Journal* contains an item that cannot fail to interest ladies who wear false tresses and enigmata—and where is the lady who does not wear them? Paris is it?—M. Luchman continues his investigation of the parasitic bodies (*Oegrynades*) found on the false tresses and enigmata commonly worn by ladies. They are to be found at the extremity of the hairs, and form their little noisettes, visible, on careful examination, to the naked eye. Each of these noisettes represents a colony of about fifty protozoans. Each protozoan is spherical, but, by the reciprocal pressure of its neighbours, it is flattened, and becomes discoid. Under the influence of heat and moisture, it swells; its granular contents are transformed into little spheres, and then into penicillated—little fast-form corpuscles, with a persistent external membrane, and enclosing one or two nuclei. These penicillated bodies become free in the air, penetrate into the interior of the human organism, reach the circulatory apparatus, and produce, according to this author, various maladies—cardiac affections, especially valvular affections, Bright's disease, pulmonary affections. M. Luchman calculates that, in a ball-room containing fifty ladies, forty-five millions of navies are set free, and he concludes that it is necessary to abolish false hair, which often proceeds from unclean persons.

FROM PENNSYLVANIA.
LANCASTER, Pa., July 31, 1871.

MR. JAMES I. FELLOWS—Sir: I am pleased to inform you that my health is improving under the use of your Hypophosphites. Excessive tax of the brain had so exhausted my body that I could neither work nor enjoy myself, and it was with difficulty that I could sleep at all. I tried rest, and active exercise, various medicinal remedies, and the most popular physicians, and accidentally heard of your syrup in New York. I purchased three bottles at Caswell & Hazard's, and until I used that nothing relieved me. Now I can eat well, sleep well, work well and feel well, and have good reason to consider your syrup a most surprising and capital restorer of the mind and nervous system, and advised all who have much brain work to take it. You are at liberty to use this as you may.

Yours, very truly,
JEROME SHENK, Insurance Agent.