

**The Drinking of Water.**

A physician in the Western Bottler states the necessity which exists for the presence of water in the diet and in the tissues of the body. The fact is well known, but the doctor writer has clearly given the reason for the beneficial action of water on the different organs. The article is of unusual interest and many persons will be the better from adopting its suggestions. Although water is not a food in the sense of directly contributing to the production of force or heat, it is yet a food in the sense that, without its presence in the body, all vital action must come to a standstill, as no change is possible in its absence. Our tissues contain an indispensable proportion of water; we are constantly losing large quantities by breathing, by perspiration and the various excretions, and, as just hinted, its presence is required for the occurrence of those various chemical changes by which we live and move and have our being. This being so, its value as an article of food may be taken as granted, and we may consider more particularly its action and uses when taken not as a food, but as a means to preserve health or to ward off or remove disease.

The effects produced by the drinking of water vary with the manner in which it is drunk. If, for instance, a pint of cold water be swallowed as a large draught, or if it be taken in two portions with a short interval between, certain definite effects follow—effects which differ from those which would have resulted from the same quantity taken by sipping.

**EFFECTS OF SIPPING.**

Sipping is a powerful stimulant to the circulation—a thing which ordinary drinking is not. During the act of sipping the action of the nerve which slows the beats of the heart is abolished, and as a consequence that organ contracts much more rapidly, the pulse beats more quickly and the circulation in various parts of the body is increased. In addition to this, we also find that the pressure under which the bile is secreted is raised by the sipping of fluids—a fact the importance of which we shall notice directly.

Many individuals may have been at times unpleasantly conscious of the fact that a glass of wine or beer sipped gets into the head much quicker than if drunk at a draught. They will now be in a position to understand why this is so; the explanation being that the temporary paralysis of the inhibitory nerve of the heart, and the increased stimulation of the circulation, favor the rapid absorption of the alcohol and the production of its consequent effects. The same thing occurs if the fluid be sucked through a straw, the effects of sipping and sucking being identical.

Swallowing in the usual way has not the stimulant effects of sipping, but it has one or two special effects not produced by sipping, the use of which we shall mention a little later.

**EFFECTS OF DRINKING.**

The effects of drinking cold water are these: If, say, a pint of cold water is swallowed straightaway, the temperature of the body is slightly lowered—about one degree Fahrenheit—the pulse rate is somewhat decreased (not greatly increased, as by sipping), and the respirations are slightly accelerated. The blood vessels in the lining membrane of the stomach are at first contracted; they very soon, however, rapidly dilate, the blood flow in them is increased, and the secretion of gastric juice is stimulated.

**DRINKING WARM WATER.**

There are, on the other hand, many persons who find that these effects are brought about better if they take warm water instead of cold, although at first sight it may appear somewhat strange that like effects are produced by both hot and cold water. The explanation is simple. The warm water acts exactly as does the cold, only without the previous contraction—its action being to at once dilate the vessels after its reception by the stomach. The practice of drinking

**AT MEALS**

large quantities of liquid is bad; but small quantities may be taken without harm, although undoubtedly it is wiser to drink either before or after the meal, if we cannot limit our consumption of fluids to a distinctly small amount. Whenever a meal is particularly rich in fatty material, it is a good plan to drink some time after the meal, as in this way the digestion of fat in the intestines is aided.

**ITS PURGATIVE ACTION.**

That water possesses a purgative action is a thing well known to many people. This particular effect is due to its power of stimulating the secretion of bile and also of increasing the peristaltic action of the intestines; bile being a natural purgative and increased peristalsis being the enemy of constipation and sluggish bowel action. If plain water be taken, its purgative effects are best produced by its being cold; if natural mineral waters are taken, they should be mixed with a small quantity of hot water so as to be at about the same temperature as the stomach. Warm water is more readily absorbed than cold, and moderate quantities than large ones, absorption being retarded if large quantities of either warm or cold water are

taken at once. The best time to obtain the purgative effects of water is on rising in the morning. A glass of cold water taken on rising is often quite sufficient to procure an easy movement of the bowels, and this result will be the more certain if the water be sipped while dressing. This sipping operation should not, however, be hurried, but should be gone through slowly and at short intervals.

**EFFECTS OF FREE DRINKING.**

Free drinking of water produces effects upon the kidneys and tissues of the body generally no less important than those we have been considering. There is every reason to believe, from observations, the nature of which it is unnecessary for me to state, that the increased excretion of urine which follows the drinking of plenty of water not only clears the body of many poisonous and effete substances, but is itself an index of changes within the body which have for their end the enhanced health and comfort of the individual.

Much harmful material which has often to answer for malaise, want of energy, and various aches and pains, is undoubtedly washed out of the tissues and excreted by the kidneys as the result of free water drinking. This alone is decidedly beneficial, but, in addition, the drinking of much water causes the tissues to be changed, with the result that vitality is increased and strength augmented. So great in this direction are the effects of cold water, that persons leading sedentary lives may often obtain, by drinking plenty of water, much of the feeling of health and exhilaration which results from taking exercise—a fact not difficult of belief when we remember that a glass of cold water, slowly sipped, will produce greater acceleration of the pulse for a time than will a glass of wine or spirits taken at a draught. In this connection, too, it may not be out of place to mention the fact that sipping cold water will often

**ALLAY THE CRAVING FOR ALCOHOL**

in those who have been in the habit of taking too much of it, and who may be endeavoring to reform, the effect being probably due to the stimulant action of the sipping.

**AN IMPORTANT DECISION.**

A decision of much importance, owing to the magnitude of the interests affected and the questions of law involved, was handed down by the United States Circuit Court of Appeals for the Second Circuit on the 21st ult. in the suit brought by the Thomson-Houston Electric Company against the Hoosic Railway Company to restrain the infringement of letters patent No. 495,443, granted April 11, 1893, to the administrators of Charles J. Van Depoele for traveling contact for electric railways. This is the well-known trolley patent which its owners claimed covered every practicable form of under-running trolley, and the case was before the court on an appeal from an order of the Circuit Court granting a preliminary injunction against the defendant. The opinion, written by Judge Wallace, holds, upon the authority of *Miller v. Manufacturing Company* (151 U. S. 198), that the claims sued upon are invalid, because the same invention was patented by Mr. Van Depoele in patent No. 424,695, dated April 1, 1890, and the order of the Circuit Court granting the preliminary injunction was reversed.

Both of these patents originated in a single application filed by Van Depoele March 12, 1887. The application was subsequently divided, and patent No. 424,695, containing thirty-five claims, was issued on one of the divisional applications on April 1, 1890. The other divisional application was delayed in its progress through the Patent Office by an interference, and the patent in suit, containing sixteen claims, was issued thereon April 11, 1893.

The features covered by the claims in controversy are all shown in the accompanying drawing, which is identical in both patents.

In each patent there are shown a hinged trolley arm pivotally supported on a post on the car roof, the arm carrying the contact wheel and having at its lower end a spring with a suspended weight.

It will be observed that the construction, arrangement and necessary operation of the trolley, the trolley arm, the post on the car, the means of securing and supporting the arm on the post, the spring and weight, are exactly the same in both patents, not only in construction and arrangement, but in necessary operation.

The earlier patent purports to claim only a certain switch plate, switching devices, and certain details "which are not essential features of the contact device itself, considered without reference to the switch," and disclaimed the contact device which forms the subject of application No. 230,649.

If the claims of this earlier patent had been clearly limited to the details which were not "essential features of the contact device itself," or to the switch plate, the right of the inventor to claim broadly in his later patent the essential features of the contact device would have been unquestioned, but the claims were not all so limited. Among the claims of the earlier

patent are the following among others that are not limited in the respects mentioned:

"15. In an electric railway, the combination of a car, a conductor suspended above the line of travel of the car, a contact carrying arm pivotally supported on top of the car and provided at its outer end with a contact roller engaging the under side of the suspended conductor, and a weighted spring at or near the inner end of the arm for maintaining said upward contact, substantially as described. . . .

"32. In an electric railway, the combination, with an overhead conductor and a vehicle, of a trailing contact arm guided at its outer end by the overhead conductor, and movable laterally relatively to the vehicle, but having a normal centralizing tendency by means of a spring or weight.

"33. In an electric railway, the combination, with an overhead conductor and a vehicle, of an intermediate contact device consisting of an upwardly pressed trailing arm having a grooved contact wheel at its outer end by which it is guided by the conductor, the said arm being free to swing laterally relatively to the vehicle, but tending to remain in its normal central position by means of a spring or weight."

The presence of these claims in the earlier patent alone goes far to justify the decision of Judge Wallace.

The claims of the patent in suit of which infringement was charged were five in number, of which we give two examples, as follows:

"7. In an electric railway, the combination of a car, a conductor suspended above the line of travel of the car, a swinging arm supported on top of the car, a contact device carried by one extremity of the arm and held thereby in contact with the under side of the electric conductor, and a tension device at or near the other end of the swinging arm for maintaining said upward contact, substantially as described.

"8. In an electric railway, the combination of a car, a conductor suspended above the line of travel of the car, an arm pivotally supported on top of the car and provided at its outer end with a contact engaging the under side of the suspended conductor, and a tension spring at or near the inner end of the arm for maintaining said upward pressure contact, substantially as described. . . .

"12. In an electric railway, the combination with a car of a post extending upward therefrom and carrying a suitable bearing, an arm or lever carrying at its outer end a suitable contact roller and pivotally supported in said bearing, and provided at its inner end with a tension spring for pressing the outer end of the lever carrying the contact wheel upward against a suitable suspended conductor, substantially as described."

After holding that the court should undertake to examine and "in a sense to review collaterally" the decision in the previous suit on the same patent, brought in the District of Connecticut, against the Winchester Avenue Railway Company, in which Judge Townsend, holding that the earlier patent did not claim the same invention, sustained the patent at final hearing, from which decision no appeal was taken, Judge Wallace says:

"The operative parts of the contact device are described in identical language in each patent, and the language of the claims aptly describes these parts. While the function of the tension device is stated with more particularity in the earlier patent, the description does not contain a word or hint by which its characteristics can be differentiated from those of the tension device of the later patent. . . . In the later patent, as well as in the earlier, the tension device is a spring and weight, so arranged as to 'permit lateral motion by the arm,' lateral motion being afforded because, as the specification of each patent states, 'the arm is hinged, and should, in most instances, be pivoted to the top of the post, although a reasonable amount of looseness in the hinged joint will answer the purpose of the pivot.' In the earlier as well as in the latter patent, the spring and weight 'are so arranged as to constantly tend to restore the arm to its normal central position,' and thus 'assist it to partake of the lateral movement of the car,' because this is the necessary action of the spring and weight at the short end of the arm. As described in each specification, the tension device is a spring, which is held in its proper place by the weight. . . .

"Of course, if the claims of the earlier patent do not specify such a tension device as is described and claimed in the later, but specify one which embodies only a subordinate improvement upon it, the patents are not for the same invention. . . . Inasmuch as the only tension device, or means for imparting upward pressure to a trolley arm, described in the specification of the later patent, is that which consists of the weight and spring as it is described in the earlier patent, the verbal differences in defining its functions in the several claims are of no significance. The thing itself is the same in the claims of both patents. The spring which tends to retain the arm in its normal position is exactly the same spring and no other than that which maintains upward

contact or pressure between the contact device and the suspended conductor. If any importance is to be attached to these verbal differences, the earlier patent claims a tension device, the chief function of which is to exert a normal centralizing tendency upon the arm, but which of necessity must maintain the upward pressure, while the later patent claims one, the chief function of which is to maintain upward pressure, but must of necessity also exert the normal centralizing tendency. If there had been in the description anything by which it could be ascertained which of the structural features exercises one function and which the other, a different case would be presented. The matter sought to be covered by the second patent is inseparably involved in the matter embraced in the former patent, and this, under the authorities, renders the second patent void.

"It is manifest that both patents are intended to, and do, secure to the patentee the same general inventions. . . . although the earlier patent also covers improvements in the switches, and subordinate combinations between these devices and the elements of the principal combination. . . .

"We are of the opinion that claim 15 of the earlier patent describes and embraces everything of substance which is covered by claim 7 of the patent in suit.

"We are also of opinion that claim 33 of the earlier patent specifies essentially the same combinations embraced in claims 8, 12 and 16 of the patent in suit, and that the 'spring or weight' of claim 33 is the same thing as the 'tension spring' of claims 8, 12 and 16, the 'weight' being only an alternative element."

As the facts which were before the court on this appeal must necessarily be the same on final hearing, and as this decision does not extend the rule laid down in the much cited and much abused decision of the Supreme Court in *Miller v. Manufacturing Company*, it seems to be generally believed that this decision will be followed not only in this circuit, but by the Supreme Court, if the controversy should be carried there.

The patent has been in constant litigation almost since the day of its issue, and injunctions have, on the strength of Judge Townsend's decision, been granted against numerous roads using the under-running trolley, and also against manufacturers who have furnished stands and other parts used in trolley road equipment, on the theory of contributory infringement.

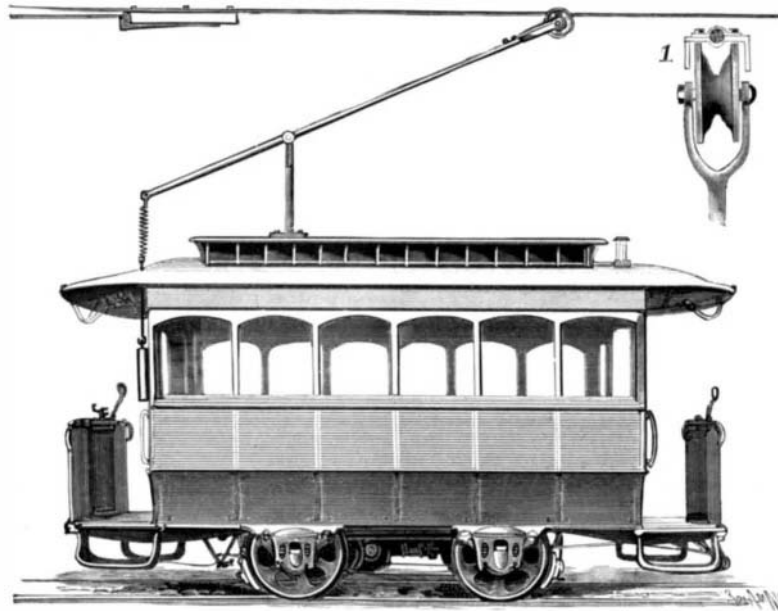
As late as May 17 last, the Circuit Court of Appeals for the Sixth Circuit affirmed an order of the Circuit Court for the Northern District of Ohio, granting a preliminary injunction restraining the Ohio Brass Company, manufacturers of trolley road equipment, from infringing the claims now held to be invalid. Precisely the same question was presented to that court, but the court, while evidently entertaining grave doubts as to the correctness of Judge Townsend's opinion, held that the decision of a circuit court of another circuit sustaining the patent should be of controlling weight in the court below, and that on appeal the case should be reviewed merely to ascertain whether there had been any abuse of discretion in the circuit court. The variance between the two decisions was simply as to whether Judge Townsend's decision should be examined collaterally. Judge Taft, speaking for the Ohio court, thought it should not, and Judge Wallace thought it should. The two decisions on the principal points at issue are therefore not inharmonious.

**Dangerous Inks.**

The London *Lancet* calls attention to the serious injuries which sometimes result from an apparently trifling scratch or puncture made with the pen. The chemical constituents of the ink which is introduced by the pen into the wound are not capable of producing septicemia, but microscopic examination proves that the ill effects are due to the liability of ink to contain pathogenic bacteria. Dr. Marpmann, of Leipsic, has recently published the results of the microscopic examination of sixty-seven samples of ink used in schools. Most of them were made with gall nuts, and contained saprophytes, bacteria, and micrococci. Nigrosin ink, taken from a freshly opened bottle, was found to contain both saprophytes and bacteria. Red and blue ink also yielded numerous bacteria. In two

instances Dr. Marpmann succeeded in cultivating from nigrosin ink a bacillus which proved fatal to mice within four days. This ink had stood in an open bottle for three months, and the inference to be drawn from the inquiry is that ink used in schools should always be kept covered when not in use. The practice of moistening the pen with the tongue is likewise a dangerous one.

**The Bertillon System for Identifying Criminals.**  
H. P. Flower, Mayor of New Orleans, who has been



**VAN DEPOELE UNDER-RUNNING TROLLEY.**

to Paris to study the Bertillon system for the identification of criminals, has just returned. He said that, through the kindness of M. Bertillon, he had had an opportunity to master the system, which will be adopted by the Police Department of New Orleans. The mayor will teach the system to the police captains. The system was described in the *SCIENTIFIC AMERICAN* for April 3, 1897.

**A NEW METHOD OF BUILDING SUBMERGED FOUNDATIONS.**

We recently had an opportunity to inspect a full size working model of the proposed system of building submerged foundations which is shown in the accompanying illustrations. Its author, Mr. D. Jordan, a contractor of 800 Fulton Street, San Francisco, Cal., has for many years been engaged in the construction of various kinds of pier and bulkhead work, and the present method has been devised with a view to expediting the construction and lessening the cost of such work on all sites which offer a suitable foundation.

There are at present in use two or three leading systems of building such work. The first and most common is the pneumatic process, in which a caisson containing a working chamber is sunk to bed rock or other sufficiently firm material, the caisson being filled in with concrete and the masonry pier built upon it

massive blocks of concrete upon a suitable bed at low tide, and transport them suspended beneath a scow at high tide to the site of the work.

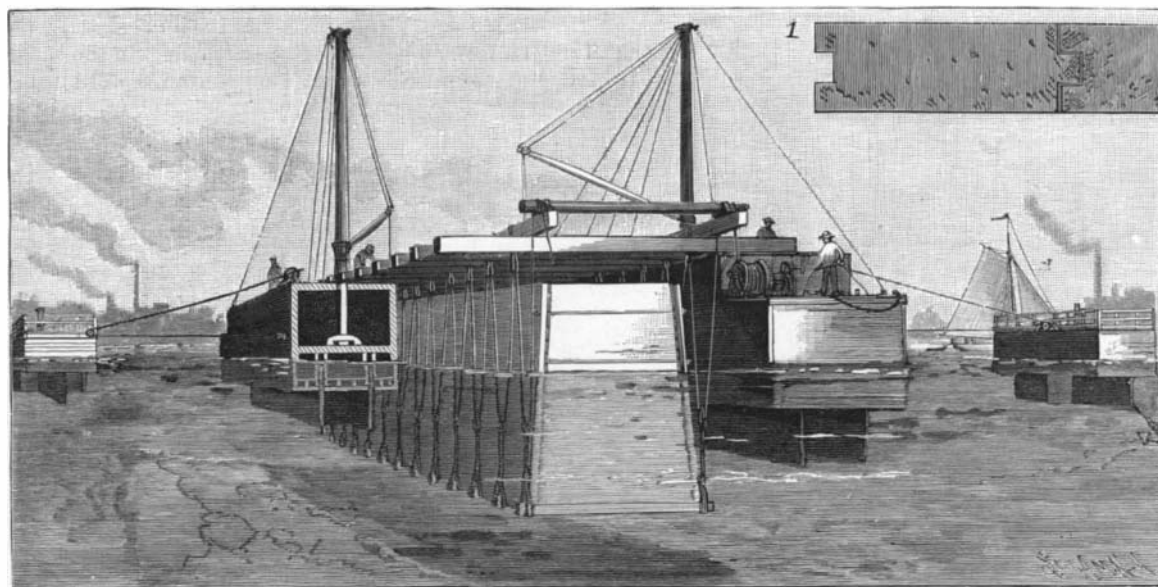
The system herewith illustrated, and which is protected by patents, differs entirely from the foregoing and possesses some points of practical advantage which will commend themselves to the engineer. Unlike the others, the whole of the sea wall, pier or bulkhead is built upon a platform suspended above the level of the water, and lowered as it is built until it rests upon the bottom of the river or harbor. In this way the use of the cofferdam, the pneumatic system, or of piling is unnecessary, and, judged on the face of it, the system should be considerably cheaper than any of those above mentioned. Its range of usefulness would, of course, be limited to those sites which offer a fairly homogeneous bottom, free from large boulders or projecting rock, and capable of being dredged to a true and level surface.

The illustration speaks for itself and needs but little explanation. Two large oblong barges are moored parallel to each other and at a little greater distance apart than the width of the foundation. Massive transverse girders, spaced a few feet apart, are laid across from roof to roof of the barges. Below them and just above the surface of the water is suspended a platform which is carried upon a series of girders spaced the same distance apart as the overhead girders above mentioned. A series of steel sheaves are suspended from two longitudinal stringers laid on the overhead girders, and a similar series is attached by steel straps to the girders of the platform. A wire cable is rove through each set of sheaves and its ends are wound on two winches located at

the ends of the barge. The masonry or concrete wall or pier is then built up on the platform, which is lowered as the building goes on until it rests on the bottom, which has already been dredged out for it. To insure that the rate of lowering shall be even on each side, the cables after leaving the drums are given a double turn around the heavy roller, shown in the engraving, before they pass to the sheaves. To give the barges lateral steadiness they are each provided with a pair of deep centerboards, and they are secured from forward-aft movement by heavy anchors. They are also secured by cables to auxiliary anchor barges, which are themselves provided with longitudinal and transverse centerboards, and are anchored in three directions as shown. The cables which connect the pier barges to the anchorage barges pass from the side of the former through sheaves on the latter and are carried back to the pier barge and drawn taut with a windlass.

It is claimed by Mr. Jordan that by this system he can build a sea wall or bulkhead in lengths with a tongued and grooved joint at the ends (Fig. 1) up to the water level, and from this point up construct them of continuous masonry. In the case of bridge piers which were too massive to be built on a single platform, the pier would be built in two halves up to the water line, and continued up to the desired height as a single block of masonry.

The system is also well adapted to the construction of dry docks. In such structures the blocks of concrete are packed watertight at the end joints. The outer wall surrounding the dock is first built, a temporary cofferdam being constructed at the entrance, then the water is pumped out and the inner concrete floor and abutting steps are made. Another suggestion of its use is the building of a harbor of refuge. The sea wall is first made quite high, and two hundred feet to the rear is a lower wall, the space between the two being filled in with sand, while the surface is arranged in a series of steps adapted for use in supporting artillery and protecting breastworks in case of war. Mr. Jordan's temporary address is Hotel Empire, Sixty-third Street and Boulevard, New York City, from whom further information may be obtained.



**SUSPENSION METHOD OF BUILDING SUBMERGED FOUNDATIONS.**

to the required height. In this system the caisson is surrounded by a cofferdam which permits the masonry to be laid dry until it is well above high water, the weight of the masonry serving to sink the caisson. A common method is to sink an open cofferdam, pump out the water, and excavate the material with dredges. Another plan is to drive piling, cut it off just above the river bottom, sink a grillage of 12 by 12 timbers upon it, building the masonry pier upon the grillage to the required height. Another system, frequently used in the construction of breakwaters, is to build

protecting breastworks in case of war. Mr. Jordan's temporary address is Hotel Empire, Sixty-third Street and Boulevard, New York City, from whom further information may be obtained.

A MONUMENT to the memory of Daguerre has been erected by public subscription at Bry-sur-Marne, and was inaugurated on Sunday, June 27. The memorial is a bronze bust on a stone pedestal, and is the work of Madam Bloch. At the close of the ceremony wreaths were placed upon Daguerre's grave.