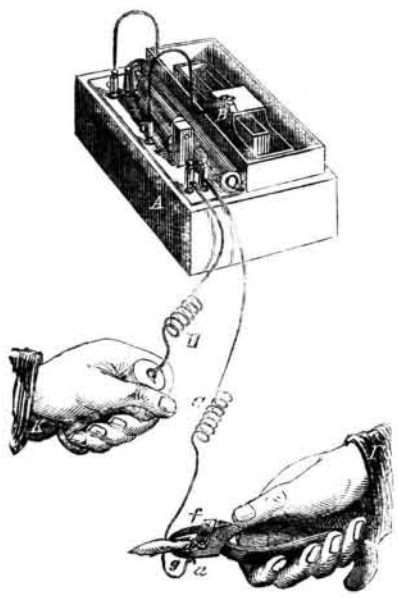
Extracting Teeth by Electricity.

The following description, which we extract from the London *Engineer*, is of an American invention which has been patented recently in England, communicated through Messrs. Newton & Son, of London :—

The object, says the patentee, is to mitigate the severity of the operation of extracting teeth, by rendering the nerves of the teeth required to be removed insensible at the moment the forceps is being applied. The improvement consists in combining with a common dental forceps a magneto-electric machine, so that a wire from one pole of the machine shall form a metallic connection with the forceps that grasps the tooth, while the other pole of the machine is brought into connection with the patient's hand by a second wire. The handles of the forceps, which are held by the operator, are better to be insulated by being covered with gutta percha, or similar non-conducting substance.



In the illustration, A represents, in perspective view, an ordinary magneto-electric machine, with a battery, B, attached; D the ordinary dental forceps. A wire, C, passes from the negative pole of the electro-magnetic machine to the point, *a*, of the forceps, where a close metallic connection is made. On the inner sides of the forceps, at the point, *d*, a small metallic cup is placed, and a small copper stem projects from the opposite sides, *e*, of the forceps. As the parts *f* and *g*, of the forceps close upon the tooth, where it is surrounded by the gum, an induced current from the magneto-electric machine passes through the wire, C, and across from *d* to *e*, and thus applies itself around the whole tooth in the vicinity of the nerves, and so affects the nerves as to render them temporarily insensible. The patient operated upon must hold in one of his hands the extremity of the other wire, H (which is attached to the positive pole of the machine), so as to complete the circuit through his body. I represents the hands of the operator grasping the forceps, and K the hand of the patient grasping the wire passing to the positive pole of the machine. The magneto-electric machine has a sliding rod, by which the induced current may be varied in intensity, as is well understood. The intensity of the current to be passed through the patient's tooth should be graduated by observing in advance how much he can conveniently bear when he grasps the extremity of the wires, H and C, in each hand. A little practice will enable the dentist to determine this readily. The magneto-electric machine, A, is of the ordinary form employed for medical purposes, and consists of a battery of one cell, a primary coil, an inducing coil, a small electro-magnet for breaking and closing the circuit through the wires, C and H, and the patient's body. Any other form of magneto-electric machine may be employed.

Instead of using a little electro-magnet brake circuit in the first helix, as shown in the illustration, a clock-work brake circuit or electrotome may be used, or a rasp may be used in connection with the aid of an assistant for breaking and closing the circuit. So also there are several forms of magneto-electric machines in which permanent magnets are used to induce, by mechanical action, a magneto-electric current in a coil surrounding a revolving soft iron armature. In all these cases the same peculiar effect on the nerve of the patient's tooth would result if either of these machines were combined with the forceps, inasmuch as they are all well known to be equivalents in applying electricity to the body for medical purposes. A direct current from the battery might also be combined with the forceps, and with the aid of an interposed brake circuit the same effect would take place, to a great degree, although the use of such a battery of the proper intensity would probably be found much more inconvenient than the magneto-electric (or, as they are sometimes called, the electro-magnetic) machines above named. So, also, instead of a metallic conductor from the magneto-electric, or other battery, the body of the operator might be employed, he taking hold of the negative pole with his left hand, and grasping the forceps with his right hand.

Tar Oils.

In the process of distilling coal to obtain oils, if the temperature of the retort is suffered to be elevated above a certain degree, a great quantity of tar passes over combined with the crude oil, and as a consequence, the more tar that is driven over, the less oil is obtained. On redistilation, some of this tar passes into the condition of oil ; and this fact leads to the conclusion, that what are now called " coal oils," were obtained from tar by C. B. Mansfield, of Cambridge College, England, in 1847, in which year he secured a patent for his invention. In this patent he states that, in distilling coal tar, there are obtained " ammoniacal water, oil heavier than water (dead oil), and an oil lighter than water, also a large quantity of naphthaline, an oil which is solid at ordinary temperature." He describes six different kinds of oil, which he manufactured from coal tar, their volatility being indicated by their boiling points.

The above oils were obtained by first distilling coal tar, and then redistilling the crude oil or naphtha which passed over, at different temperatures ; the lowest degree giving off the most volatile oils—which were condensed, and kept separate. The first oil which passes over at the lowest temperature was called *alliolé* ; its boiling point was 135°; the second, *benzole*, boiled at 168° ; the third, *tolule*, at 229° ; the fourth, *cumole*, at 291° ; the fifth, *cymole*, at 355° ; and the sixth, *mortule*, at 500° ; the latter was distilled from dead oil. All these oils with the exception of benzole, had a fœtid odor ; this was removed by treating them with weak sulphuric and hydrochloric acids, to precipitate the impurities, then they were washed in clean water. They were afterwards submitted to a redistilation, in which the vapor was passed over dry lime which absorbed the moisture, and they were then obtained in a very pure state. Caustic alkalies and the bicarbonate of potash were also used to purify the oils of an acidulous character ; as tar oils, like coal oils, are divided into acid and alkaline varieties ; the latter oils require acids, and the former need alkalies, to purify them. By submitting benzole to the action of strong nitric acid, in a glass vessel, then pouring it among cold water, a heavy yellow oil falls to the bottom, which when washed, has a fragrance like the oil of almonds, and is very useful for perfuming soap. By treating cymole—the heaviest oil of coal tar—with nitric acid, a fragrant oil resembling cinnamon in its odor, is obtained. The oils obtained from tar are capable of dissolving gutta-percha, india-rubber, and some resins ; they are also capable of mixing with alcohol, for burning in common lamps, like a mixture of turpentine and alcohol.

Mr. Mansfield's discoveries seem to be of a very useful character, but they have had a very limited application, hence we think it may be of considerable benefit to direct the attention of the public to them at this time.]

To Remove Stains.

In certain books we find directions for the removal of stains by one particular process, as if all stains were removable by the same treatment. Previous to the removal of a stain, it is necessary to ascertain the nature of the material by which the stain has been caused. If by an animal or vegetable substance, chloride of lime will be most generally eligible, providing always that the tissue on which the stain exists be not itself dyed with a color removable by chlorine. Here, in this circumstance, generally lurks the difficulty. It is not a stain from a colorless tissue that has to be removed, but a stain from a tissue itself dyed and stained by colors, some of which are not dissimilar in nature to those which have to be removed. Grease stains may sometimes be most conveniently removed by turpentine ; at other times by fuller's earth. Castor oil stains may be removed by spirit of wine, in which liquid that very peculiar oil is soluble ; a property by taking advantage of which, castor oil may be separated from other fixed oils fraudulently or accidentally mixed with it. When paint stains occur upon woolen cloth, they can frequently be removed by no more difficult plan than by rubbing the cloth briskly with a piece of flannel. This process, however, is only successful whilst the paint is wet. If the paint has become somewhat dry, turpentine must be employed, which seldom fails to achieve the desired purpose. Most people who dabble much in chemical operations stain their apparel now and then with acid, which causes discoloration, more or or less, according to the strength and character of the acid. Oil of vitriol and spirit of salt leave red marks upon black and many other tissues. If the redness be touched with hartshorn it disappears on the instant, and provided the hartshorn has been speedily applied after the accident, the tissue usually will not suffer injury.

New Mode of Constructing Boilers.

There has recently been made at one of the railroad works in England an entirely novel boiler, that is to say, in its mode of construction, which is intended to revolutionize the present system. We condense a description extracted from a British exchange. Until very recently, it was believed that the riveted portion of the boiler was as strong as any other part of it, but the experiment of Mr. Fairbairn demonstrated that if the strength of an ordinary boiler plate was assumed to be 100, then a joint secured by a single row of rivets was equal to 56, and, if double riveted 70 ; in other words, if a boiler was made of plates capable of resisting 100 pounds pressure, per square inch, it would only be safe to use 56 pounds of steam in it if single riveted, 70 pounds if double riveted. The new plan is to increase the strength of the plates at this weak point of all the boilers, and instead of riveting the plates on the flat part one to the other, to bend the plates to a right angle and rivet the flanges together, thus angle irons are entirely dispensed with, and the joints instead of being the weakest are the strongest parts. The plates are rolled thicker towards the edges to admit of this, and thus strength is added in the plate itself, and an equilibrium of strength is maintained in all parts of the boiler.

A Podoscapher.

M. Ochsner, of Rotterdam, will stand on record as the first " podoscapher." These " podoscaphs " are a species of *sabot*, about fifteen feet long and nine inches high (or deep). Standing erect, the " podoscapher," provided with a pole flattened at the end (for paddling), and twelve feet long, can advance, turn, or recede with great swiftness in water not deeper than the length of the pole. M. Ochsner won a wager by ascending the Rhine, from Rotterdam to Cologne, in his " podoscaphs," in seven days.

Notes and Queries

*** Persons who write to us expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

C., of N. Y.—The reason why a person must stand upon a stool with glass legs, to be charged with electricity from a machine, is to cut off communication with the earth, which is the great receiver of electricity. There are free currents of electricity passing between the atmosphere and the earth, and whenever this free communication is stopped we have the phenomenon of lightning, which restores the equilibrium.

J. M., of Mich.—The cost of boring artesian wells depends upon the character of the under strata—if hard rock, it will be very great. A bore of three inches will discharge 360 gallons per minute easily. We are not acquainted with any person who makes a business of "prospecting" for artesian well springs. In Vol. VIII, Sci. Am., we published a series of illustrated articles on the subject.

D. M. L., of Cal.—An overshot wheel working pumps will be more effective for your purpose (raising water) than a hydraulic ram; but a turbine wheel will answer your purpose equally well, and it is much cheaper than an overshot.

A. P., Jr, of Mass.—The best imitations of " stub and twist" gun barrels are made by winding thin ribbons of genuine twist around gas-tubing. A partial imitation is made by acids, in browning the barrels. Different makers of rifles and fowling-pieces employ different proportions of bore and length of barrel ; no definite rule is followed. To prevent iron from scaling while being "case-hardened," use a paste to cover it composed of flour mixed with the prussiate of potash. The iron in ships is prevented from rusting by paint—nothing more.

J. McM., of Ky.—The latent heat in steam is necessary to maintain it in that state, otherwise it will condense. You cannot, as you suppose, use the latent heat of steam, by conduction, for any purpose without condensation. The latent heat is taken up in the expansion of the water, and occupies a greater space, hence it is not sensible. The theory is very simple.

S. B. L., of N. Y.—There is no instrument used for testing the strength of vinegar except a hydrometer; but it is valueless in regard to determining its purity, which is the most important consideration, as it is often adulterated. There is no work known to us on the vinegar manufacture.

R. S. B., of Mich.—If the article itself cannot be stamped with the date of the patent—as would be the case with artificial teeth—it would meet the requirements of the law to put the date conspicuously upon the packages containing them.

C. F., of Conn.—There is no special composition used for preventing long thin steel tools from becoming crooked during the hardening process; nor do we believe any composition can effect this object, which is strictly a mechanical result.

W. F. W., of Philadelphia.—Flannel is the best filtering medium for gum mucilage known to us. When it becomes saturated, it can easily be cleaned by washing in hot water.

D. H. M., of Ohio.—Your article on beams and girders is necessarily delayed to prepare the diagrams.

G. H. & H. S., of Iowa.—We do not know anything about the party to whom you refer, and would not advise you to intrust your patent papers in his possession. We thank you for the fine list of names you send us.

I. S. R., of Md.—We do not know where you can purchase the hollow mandrel for turning.

E. H. D., of Mass.—You will find some further information regarding the sub-Alpine tunnel in the London *Atheneum* of the second week in October last.

W. C., of N. Y.—In Arnott's Physics you will find tables of the heat developed by air undergoing compression.

H. A. S., of Vt.—The light to which you refer as having been exhibited at Albany, is the same, we believe, as that we have previously described.

B. T. M., of Mass.—We have been informed that one ounce of alum dissolved in six ounces of hot water, to which is added one ounce of sulphuric acid, makes the "dead dip" for brass to which you refer. The brass after dipping must be washed in hot rain water, then dried in warm clean sawdust. The above proportions will answer for any amount of liquor.

D. B. W., of N. Y.—Mr. P.'s paper is regularly mailed to Wayland Depot, Steuben county, N. Y., and if he does not get it, the fault is due to the thieving propensity of some one. We can account for its failure to reach him in no other way. We can have no possible design in withholding it; and we find his name entered on our books as clear as day. Common starch paste is employed in binding books; but lac varnish is put on the leather and the cloth covers of some books.

L. L., of N. Y.—Your proposed method of carrying the mails, &c., through a tubular railroad, by atmospheric pressure, is quite old. You will find one described and illustrated on page 265, Vol. VIII., Sci. Am.

R. T. K., of Philadelphia.—Could you not give us some positive data in establishing your theory of "ocean currents being the cause of earth electric currents and variations of the compass." The variations of this instrument take place in situations far removed from the sea. This would militate against your theory.

G. A. S., of N. Y.—There is nothing in the English law in reference to putting patented articles on sale within certain specified limits. The decision in the sewing machine case at Hartford was in favor of the plaintiffs—Messrs. Wheeler & Potter. By referring to