Electric Towing on the Bourgogne Canal.

There has just been inaugurated upon the Bourgogne Canal, which connects the Seine and the Saone, the first system of electric towing, properly so called, that is to say the first system in which the motive power is furnished by an electric current. This system, established by Mr. Gaillot, government engineer, has, for about two months past, replaced the old system of steam and chain towing, which has been employed upon the canal since 1867. This canal, 3½ miles in length, connects the two sides of the English Channel and the Mediterranean. The electric energy by which the towing is effected is furnished by water falling from two sluices at each extremity of the junction canal. The fall on the Seine side is 24½ feet in height and discharges one and a half times more than that of the Saone side, whose fall is 26 feet. The powers disposable thus have a ratio of 11 to 8, with a feeble variation according to the needs of the canal's supply—a variation that does not practically affect the ratio.

Each plant actuates a Gramme dynamo, the powers of the dynamos being in the same ratio as that of the powers of the falls. These dynamos are excited in derivation and mounted in tension, that of the Seine side having to furnish normally 380 volts (1,200 revolutions per minute) and that of the Saone side 270 volts (900 revolutions per minute). The mounting in tension is effected through a bronze line three-tenths of an inch in diameter connecting the positive pole of one generator with the negative pole of the other. The two other poles are connected with two wires stretched parallel above the canal and open at their other extremities.

The motive series mounted upon the tow boat is branched between these two wires through the aid of two trolleys mounted upon poles 20 feet in length and that press upward against the wires, as in American tramways. The electric motor, by means of a belt, actuates a train of gear wheels, the last of which controls the chain pulley.

The discharge varies according to the load of the convoy in tow. Use is then made of a second train of gearings of slow speed, giving for the same velocity of the receiver a running speed of nearly half that that would correspond to the high speed gearings.

The receiver of the boat is constructed for making 1,000 revolutions per minute, normally. It does not differ much from this figure in practice.

The current is rendered regular by means of accumulators, which are capable also of storing up the electric energy produced during the stoppage of the towing. The accumulators are of the type of the Societé pour le Travail Electrique des Metaux. There are 250 elements capable of discharging 15 amperes. The regulation of the turbines is done by the generators. The induction current passes through a solenoid whose armature takes a position which is variable according to the intensity of the said current, that is to say, according to the electromotive force of the machine. In changing position it establishes contacts that send the current of a Lalande battery of four elements of wide surface into Bovet magnetic clutches. The gate of the turbine opens or closes according as the dynamo produces too much or too little.

The illumination of the three thousand yard tunnel is effected through a derivation established upon the line, and that is now provided with automatic arrangements for keeping it constant despite the variations in discharge resulting from the towing. Such are the principal arrangements of this original installation, due to the initiative and studies of Mr. Gaillot. It will effect a great saving in the consumption of coal, which is done away with, as well as in the cost of labor, since there is no longer any need of stokers, and the sluice keepers can occupy themselves with the small hydraulic and electric plants situated at each extremity.—*L'Industrie Electrique.*

History of the Calla Lily.

This was first introduced to Europe from Southern Africa in 1687, and has become a great favorite with cultivators all over the world. It does not like a very warm temperature nor a very cold one. It will live out in American waters, provided it is deep enough to be below the reach of absolute ice. It fills the ditches and narrow creeks in Cape of Good Hope, much the same as our spatterdock would here. It was removed, by Kunth, from the genus *Calla*, and called *Richardia Africana*, but it is not easy to get rid of a name which once gets into general use, hence it still goes by the name of *Calla*. The spotted one, common in cultivation during the last few years as the *Richardia albomaculata*, was also introduced from Southern Africa in 1859. This is well known by its spotted leaves. Another one was brought from the same country in 1857, under the name of *Richardia hastata*—the spathe being of a yellowish color, but very small, and is not yet much known. On account of the common calla blooming most freely in the spring of the year, it has come into general use for Easter decorations; and not unfrequently receives, with a number of other plants, the common name of Easter lily.—*Meehans' Monthly.*

Correspondence.

CARRYING LINES ASHORE FROM WRECKED VESSELS.

To the Editor of the Scientific American:

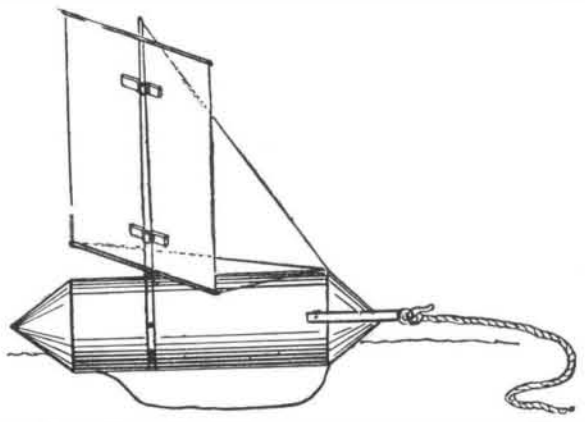
I read an article in your latest paper, that is last week's, on the wreck of the Louise H. Randall, which was cast ashore on Long Island last week. Now, according to the article in your paper, she lay about six hundred yards from shore. The paper says the crew took to the rigging and stayed there. In the meantime the United States life saving crews were exerting their utmost power to get a line to the wreck. According to the account in the paper, they failed. The last resort was a tug from New York to the rescue.

What I want to say is this: I have lived on Jersey's shore for the past twenty years and have experienced the most severe storms. During this time I have witnessed every vessel which struck Jersey's shore from the Highlands to Asbury Park, and in all cases the United States life saving crews have had all they could do to get a line to the stranded vessel, unless she came ashore in fog, when the sea was so smooth one could go off in a flat bottomed boat. In all cases when a vessel is blown ashore on this coast the wind blows so hard that it is almost impossible to stand on the bluff.

Now, when a mortar is placed in position to throw a line, it must and will have to throw straight in the wind, which never blows less than forty miles per hour. Now, it is a hard matter to get a line off under these circumstances.

Now, my idea is this: Why not let vessels carry an arrangement which can be thrown overboard as soon as a vessel strikes, attach a line to it, and let the wind and waves bring it to shore? It can be done. I witnessed the wreck of the Germania off West End, Long Branch, and she was loaded with kerosene barrels. The vessel broke into pieces, and I noticed that the barrels were on shore in a very short space of time.

Now, why not rig an arrangement for vessels to carry on board ship, and in case a crew on shore fails



to get a line off, let this be thrown overboard with a line attached and let wind and wave bring it ashore, which would be in a short space of time?

Referring to the diagram, the main body is a round iron can about the size of a large copper boiler used in connection with a range; it is air tight and the bottom is weighted with lead, so that no matter how rough it is handled it will stand up to wind and sea. It is all made of iron. CHAS. L. HOWLAND.

Long Branch, N. J., December 10, 1893.

Artesian Wells in South Dakota.

To the Editor of the Scientific American:

Thinking something regarding artesian wells in Jim River valley, South Dakota, might be of interest to your readers, and having had about two years' experience in drilling wells in that country, I thought I would inform them of a few points of interest that have come under my observation. I have tested a number in regard to pressure and volume and found the largest volume is an eight inch well at Chamberlain, 640 feet deep; volume, 3,500 gallons per minute, with 90 pounds pressure to the square inch closed, and with a three inch opening it will throw a stream of water 150 feet high and holds 60 pounds pressure.

The well is now used to run a large flouring mill. This well is estimated to develop 60 horse power. This well is shallow for that country, which is accounted for by its being near the bed of the Missouri River. The wells further up the valley have a higher pressure, as high as 175 pounds to the square inch, and run in depth from 800 to 1,000 feet. We have what is called the first or lighter flow, with a pressure from 75 to 145 pounds to the square inch. This water is, as a general thing, soft and first class for domestic purposes. The second flow is the heavier, with a much larger pressure. The geological formations are about as follows: First drift, shale, with layers of iron pyrites from 4 to 12 inches thick. The water-bearing rock is mostly pyrites in the sea shell form, and layers of sand and porous rock. These wells derive their supply from the northwestern mountains.

There is one well at Pierre, S. Dak., which has a volume of 500 gallons, the temperature of the water being 92° and perfectly soft. This well is no doubt fed from the same veins which feed the celebrated geysers in the Yellowstone Park. All these wells could be used for power, irrigation, farm use, etc., and many of them are being utilized right along. Hoping this may prove of interest and profit to some one, I am, respectfully yours, PHIL. EYER.

A Good Suggestion for Short Telephone Lines.

To the Editor of the Scientific American:

The patent covering the use of the permanent magnet in combination in the Bell receiving telephone will expire January 30, 1894.

The use of the magneto-telephone as a transmitter, as at first established, was discontinued because the backward currents from several electromagnets in the same line, as in the bells, rendered the battery transmitter very desirable if not absolutely necessary on account of its greater current.

A plan to remove this difficulty and render the use of the magneto-transmitter available has been devised for a line here about 20 miles long, having about eight offices upon it. This plan is to run an extra line upon the same poles and use one line for the bells and the other for the telephones—transmitters and receivers. All telephones will be automatically, or otherwise, switched out of the talking line and remain so normally. When a call is rung on the independent call line and answered thereon, the two parties, *only*, who desire to communicate will take down their telephones, and thus have a clear line, without either bells or telephones (other than their own) in circuit. The slight resistance of the line will make the magneto-transmitters preferable to the battery transmitter, which latter is still held by the Bell Company by later patents. This segregation of the functions of the telephone into a call-bell line and a talking line, it will be seen at a glance, simplifies the matter. M. L. BAXTER, M.D.

Derby Line, Vt., December 25, 1893.

The Best Preservative Paint for Ironwork.

Mr. W. Thomson recently read a paper before the Manchester Association of Engineers, on "The Influence of Some Chemical Agents in Producing Injury to Iron and Steel," in which reference was made to the effects of different paints and varnishes used for the preservation of structural iron and steel from rust. From experiments made by himself, Mr. Thomson has arrived at the conclusion that red lead paint is the best preservative. This result had struck him as remarkable, because red lead is a highly oxidizing substance; but the reason was found to be that the red lead had the effect of producing a skin of the unoxidizable and protective black or magnetic oxide on the iron itself under the paint. The author has also found that other oxidizing agents, such as manganese dioxide, form a paint which preserves iron from rusting; and this discovery he regards as of great industrial importance. Mr. Thomson explained that, having been required some time ago to make a considerable number of experiments to ascertain the most suitable paint for protecting a large iron structure from the action of sea water spray and rain, he arrived at the conclusion that red lead paint was the best he could find for the purpose. Mr. John West, a vice-president of the society, who presided on the occasion of the reading of the paper, supported the statements and views of Mr. Thomson that red lead is the best preservative paint for iron-work. The chief novelty brought out in the paper was the reason why red lead is so efficient in protecting iron.

How to Preserve the Natural Colors of Flowers.

It is over a quarter of a century since the following appeared in the *Gardeners' Monthly*. Coming back again to America after its long travel, it is still worth republishing.

"The following ancient method, which comes from America as new, may be worth repeating and trying: Take very fine sand, wash it perfectly clean, and when dry sift it through a fine sieve into a pan. When the sand is deep enough to hold the flowers in an upright position, take some more sifted sand and carefully cover them. A spoon is a good thing to take for this, as it fills in every chink and cranny without breaking or bending the leaves. When the pan is filled solidly, leave the flowers to dry for several days. It is a good plan to warm the sand in the oven before using it, as the flowers will then dry more thoroughly. In taking the sand off, great care must be taken not to break the leaves, as they are now dry and brittle. Pansies preserved in this way will keep their shape and brilliancy of color all winter, and many other flowers can be equally successfully treated—anything, in fact, where the full pressure of the sand comes on both sides of the leaf; otherwise they will shrivel. To fill in flowers with cup-like shapes it is better to lay them on the sand, and with small spoon fill in and around each flower. Ferns when preserved in this way have a more natural look than when pressed, and the maiden-hair fern looks almost as well as when it is freshly gathered."