

Additional Water Supply for New York City.

The governor having approved of the new water supply bill, the additional works will be proceeded with as fast as possible. At present the city is supplied from Croton River and Lake, distant 40 miles from the city, by a masonry aqueduct 7 feet in diameter and about forty miles long. The daily delivery is 100,000,000 of gallons, equal to about 75 gallons for each inhabitant. The waste is enormous.

The new water commission will be asked to adopt the Quaker Dam plan, which is to build four and one-half miles below the present Croton Lake a massive dam to span the valley, rising to the height of some 200 feet.

This dam will be constructed of masonry on bed rock, near Quaker Bridge, and raise the water level in Croton Valley to 200 feet above tide, with a storage capacity of about 32,000,000,000 gallons. This will receive the entire drainage of 361 square miles of watershed, and the estimated cost is \$4,000,000. The reservoir will practically be a deep lake with an area of 3,657 acres. Added to the other sources of supply the storage capacity of the reservoirs would be about 46,000,000,000 gallons, and these would give very nearly 200,000,000 gallons per day for 230 days, independent of the natural flow of the Croton.

The line of the new aqueduct will measure 26½ miles to High Bridge. As far as practicable this will be built in tunnel, securing strength and avoiding expensive land damages. It will be circular, of brick, and the question is whether it shall be 12 or 15 feet in diameter. The latter will add 15 per cent to the cost, and yet increase the capacity nine-sixteenths.

The valleys will be crossed by masonry conduits, while siphons may be introduced for the Harlem River and Manhattan Valley. The water will be delivered into the reservoir at Central Park at an altitude of about 119 feet above tidewater, leaving the Quaker Bridge reservoir at an elevation of 142 feet, thus allowing 58 feet of storage water to be drawn from, provided the new Croton Lake was filled to its utmost capacity.

The preliminary estimates are \$4,000,000 for the storage reservoir, and \$10,000,000 to \$12,000,000 for the aqueduct. But these figures only include the delivery of water at High Bridge, and do not take into account the land damages or other injuries occasioned by the passage of an aqueduct with an internal diameter of 15 feet, nor the expenses occasioned by legal delays, etc.

The Electric Wonders of the Age.

Hon. S. S. Cox, in the annual address delivered before the Indiana Asbury University, at Greencastle, on the 19th ult. said:

"The electric monograph transmits messages in the original handwriting. The hektograph multiplies your epistles; the telephone enables people to make contracts through an orifice; but as there is no witness, photography comes in and records the shadow of the sound by curves in vowels and consonants!

"Electricity is an element elusive and subtle, yet it is stored in a box and imprisoned in a metal to be used at pleasure for portraiture, sound, light, or power. I have seen an organ in Berlin played by electricity, but this is simple compared with other experiments. Is it not a marvel that we can telegraph from a moving railroad car or the speeding steamship? A California photographer obtains six photographs in one leap of a clown in six different positions. He catches a horse on the gallop, a rabbit on a run, and a bird on the wing. By means of a wire a circular saw or a locomotive may be—nay, has been—run miles distant from its source of force. Electricity is born of the sun. It may be converted back to its source, so that when one talks by telephone he may see his distant colloquist. It is shrewdly believed that nerve power depends for increased strength on light. It will not be strange if the polyscope illuminates the animal organism, rendering the body transparent. The vast current of liquid force which we call electricity is condensed in boxes like desiccated meats, or spread over continents to convey intelligence. Man can never overdraw from this vast, bankruptless depository of nature.

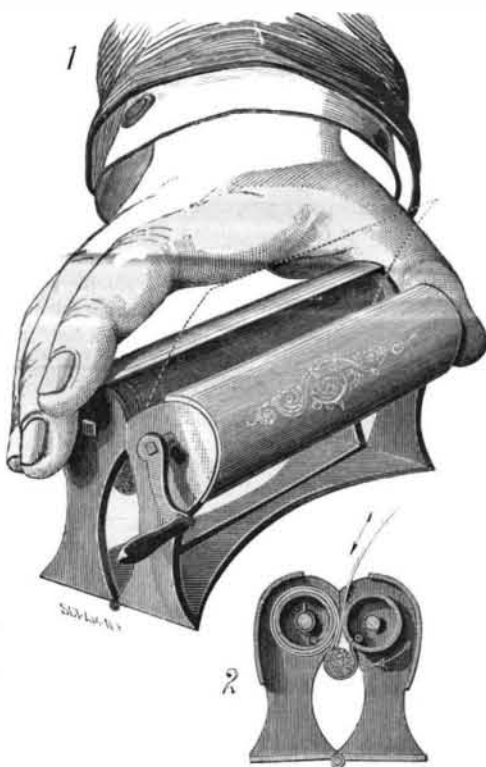
Products from Telegraph Batteries.

Of the 12,350¢ spent during the year 1881-82 upon the 127,166 galvanic cells in use, 2,727¢, or about 22 per cent, were recovered by the sale of the battery residues, consisting of copper, zinc, and lead salts. It has been customary to sell these products by auction twice a year. The Government does not guarantee any fixed percentage of metal in these salts, but the amount varies very slightly. The normal cell of the German telegraph offices is a modified Daniell cell of a simple and cheap kind. The zinc electrode is formed of a ring, hanging down from the edge of a glass vessel to half its depth. On the bottom lies a rectangular plate of lead, to which a vertical stout iron wire, incased in sheet lead, is soldered, making the other electrode.

The glass is filled with sulphate of zinc solution, and a few crystals of sulphate of copper are from time to time dropped into the liquid. Of these materials the zinc ring is of course most subject to deterioration. Thus we find that the above mentioned 127,166 cells required nearly 80,000 new zinc rings, against 7,300 lead sheets and 910 lead plates. The sulphate of copper forms the largest item in the annual expenditure, amounting to 8,000¢. During the four years which the table comprises, from 1878 to 1882, the number of cells had increased by nearly 20,000.

NEW CIGARETTE MACHINE.

The engraving below represents a new cigarette machine, invented by Dr. E. Casgrain, of Quebec, Canada, and patented by him in the United States, Canada, England, France, Spain and Cuba, and Germany. It consists of 2 cylinders joined by a band, journaled in frames binged to each other, one of which is provided with a crank handle, and the other furnished with an internal tension spring. To-



SIMPLE CIGARETTE MACHINE.

bacco and paper are placed on the band, the machine is closed, a turn of the crank handle enrolls the tobacco, and the cigarette is made.

The machine works perfectly and easily and is very well designed and arranged. An inexperienced hand may make over 100 cigarettes an hour with it. It is a great improvement in inventions of the kind, working very rapidly, and it is withal cheap and practical.

M. M. Gaynor & Fitzgerald, of New Haven, Conn., are sole manufacturers for the proprietor.

A NEW CRUTCH.

Doctor James R. Taylor, of New York city, while reading a paper before the American Medical Association, at its recent meeting at Cleveland, on "Fractures of the Long



TAYLOR'S IMPROVED CRUTCH.

Bones," exhibited a novel device of his own invention, for use in combination with the ordinary crutches used by convalescents from fractures of the leg, or other cause of lameness of the lower extremities.

The invention consists of a neat little saddle, which is well shown in the accompanying engraving, and it is so arranged that it can be worn without inconvenience inside of the clothing. Attached to it are a pair of small adjustable suspenders, the free ends of which terminate in steel hooks for fitting upon the tops of the crutches.

When the suspenders are adjusted to fit the patient, the hooks reach up to about two inches below the axillæ, the ends alone coming out under the arms and outside of the clothing.

These ends are the only parts of the device which are visible.

The saddle is well padded to fit the perineum, and is of such form that the patient rests upon it without discomfort when sitting on a chair. Its temporary removal is also nicely provided for, and when the wearer places the crutches in the suspender hooks for the purpose of walking, the weight of his body is carried entirely upon the saddle, without the crutches reaching up to the axillæ, so that no discomfort is experienced even in taking long walks.

The apparatus was received very favorably, and cordially applauded by the large body of surgeons present at the above meeting.

This apparatus has been thoroughly tested by Doctor Taylor on quite a number of his own patients, both male and female, with great satisfaction to both the patient and the doctor.

The Air of Houses.

There is much confusion in the minds of some people, says the *Building News* (London), with respect to the dryness or dampness of houses. An airtight room is more or less damp, though people are generally apt to think it otherwise if there is no draught, and all the air is carefully shut out. As a general rule, we invariably find the most draughty house is the driest, as it will be generally found to be the healthiest, if not the most comfortable, in cold weather. But the air of a room, as that for an invalid, may become too dry; it may be overheated by a stove, which would become injurious to the patient. In certain cases vaporizers are now employed to give the air of the sick chamber its healthful proportion of moisture.

Mr. G. J. Symons, in a paper on meteorology, has remarked that the subject of the hygrometry of the sick room was unknown two generations ago. If, in addition to temperature, the quantity of moisture in a sick room were indicated by the hygrometer, a great deal more might be done for the invalid's comfort. It is just as easy to regulate the hygrometric condition of the sick room as its temperature, and, in many respiratory complaints, the former is even of greater importance than the latter. The hotter the air is the more water can it contain, and this condition does not appear to be apprehended by those who dwell in such rooms, or provide the means of heating and ventilating them.

Prof. Tyndall found that the moisture in the air of an ordinary room absorbs 50 to 70 times as much of the radiant heat as the air does. Moisture is the regulator and conservator of the heat, and in due quantity acts like a blanket, by protecting us from a too sudden cooling or heating. The question is one, we think, worthy more attention by the sanitary builder than has been given to it. Complaints are loud against certain hot air furnaces, as they overheat the air and render it unfit for breathing; they tend to scorch and dry the air, and to this extent they are unhealthy.

Hydrophobia.

For some time M. Pasteur, the French investigator, has been experimenting with a view of discovering whether the fatal infection of rabies can be disarmed of its power by inoculation. It is said that he now possesses four dogs which are proof against the infection, whatever may be the method of inoculation used or the virulence of the matter, while other dogs inoculated with the same virus invariably perish. The experimenter raises the question whether these four animals owe their impunity to spontaneous recovery from a mild attack, which may have escaped observation, or whether they are naturally refractory to the disease. One of the three dogs which he inoculated in 1881 survived, and though twice inoculated in 1882, he did not become rabid. The importance of finding a remedy for all forms of hydrophobia is magnified by two facts brought to light by the researches of M. Bert. One of these is that even if the saliva of a mad dog does not communicate rabies it may prove fatal by producing serious local injuries—in other words, the secretions of rabid animals have poisonous properties over and above the special rabic virus. The second fact is that it does not follow because a dog which has bitten any person does not die, that the animal is free from rabies. These conclusions will add to the terrors of the disease. But there is some consolation in learning from M. Bert that the mere salivas of rabid dogs do not always communicate the deadly virus, and apparently never communicate it unless they contain the mucus from the respiratory organs, which seems to be the fatal portion of the saliva.

Origin of Yellow Fever.

A report has been received at the State Department, at Washington, containing the results of observations and experiments made by Dr. Freize, a Brazilian physician, who believes that he has discovered the cause of yellow fever in a microscopic parasite found in the blood of yellow fever patients. Experiments made by injecting this infected blood into the veins of rabbits and guinea pigs proved its virulence by producing death, the blood of the inoculated animal showing the same characteristics as that from the original yellow fever victim. The doctor's experiments seem to prove, also, that these parasitic germs of death survive in the soil where the subject of the fever is buried, and from thence may again contaminate living organisms, which would appear to favor cremation rather than burial in the case of yellow fever victims.