

Correspondence.

Hedge Trimmer Wanted.

To the Editor of the Scientific American:

A machine is much needed for trimming hedges. It should be mounted on a wagon, midway between front and hind wheels. The cutting part should be capable of guidance independent of the wagon, to an extent of one or two feet, up, down, and sideways. The cutter must run by power independent of the team that pulls the wagon. The cutter may be a sickle or a set of whirling disks, very strong.

The power may be a gas or steam engine, on the wagon, or an electric motor, or anything that will not bother or burst (a tread power might do, but a horse would be heavy to haul around).

The whole business should be cheap, strong and convenient. Such a combination is not impossible these days.

A common farm wagon slightly modified would do. The power could do other work when the hedges were all trimmed.

Can't some of your mechanical readers build such a machine? Not much invention required on it.

J. A. C.

Dangers of Galvanized Iron Water Pails.

To the Editor of the Scientific American:

In Notes and Queries (No. 3545) W. S. inquires about galvanized vessels for water. For the benefit and perhaps the safety of others, I will relate my experience with them. Some few years ago I purchased a new galvanized water bucket and filled it with water to be used for drinking and cooking. I was living alone at the time, so was not using very much water; consequently there was some water in the bucket a few days after it was put in, but it had been used down quite low. One morning I got up early and got my breakfast by lamp light, not thinking to look at the water I was using to mix my batter for griddle cakes and steep my tea. Well, I ate my breakfast with a relish, having a good appetite, but I did not have it down long before it had a strong desire to come up, and up it began to come. I commenced throwing the contents of my stomach up in a way that for power or speed would put to shame any "jet propulsion" ever tried yet. I vomited violently in succession, at short intervals between, about a dozen times, which cleaned my stomach out quite completely. I knew that something I had eaten or drank was the matter. I looked in the water bucket, and behold! the water in there was nearly as white as milk and quite thick. I knew then that I had taken an overdose of zinc poison, and I think that I was lucky that it was such a quantity; for if I had not taken enough to vomit me, it would have, most likely, produced my demise.

I have lately bought another new galvanized bucket and have tested it to see what and how much comes off by the action of water. I filled the bucket with water and let it remain one week, stirring round the inside occasionally with a stick; then I turned off the clear water from the top and found at the bottom, in thick solution, four fluid ounces of carbonate of zinc, dissolved by the water, which, in this section, contains much carbonic acid. But for all this, I think that if such vessels were thoroughly soaked say two or three weeks, scraping the inside occasionally, and thoroughly washed afterward, and the water not allowed to stand long in them, there would not be much danger in using them; but what effect it would have on the general health of the users I am unable to say.

A. JOSSELYN.

Crescent City, Florida, November 5, 1891.

[It is evident that wooden pails would be safer to use for your water.—ED. S. A.]

How to Make a Storage Battery.

To the Editor of the Scientific American:

I have read with interest the communication from Dr. J. E. Stanton, of Boston, Mass., in a recent issue of the SCIENTIFIC AMERICAN on the subject of storage cells charged by primary battery. As you request further correspondence on the subject, I will give you my own results.

A short time ago I arranged a "plant" for a physician of this city, Mr. Wm. E. Moseley, consisting of two storage cells connected in series and charged with six 5 x 8 gravity cells. Each of the storage cells contains six lead plates coated with red lead composition and connected alternately in the usual manner, the total active surface of the plates in the two cells being about 580 square inches. The storage cells are used for operating, through a suitable resistance, a small incandescent lamp, rated at two candles, but giving rather more light when worked to its full capacity; and also for heating the platinum loops of a galvanocautery. It operates perfectly, giving daily, during office hours, all the current required for the lamp and platinum loops, which are used at intervals.

A switch is provided by means of which the circuit of the charging cells may be opened when required,

that they may not do useless work in forcing current through the storage cells after the cells are thoroughly charged.

The gravity cells require little attention save in the matter of adding water lost by evaporation, drawing out at wide intervals a portion of the solution of zinc sulphate at the top of the cells, and dropping in crystals of sulphate of copper from time to time.

This battery, connected experimentally with a sewing machine motor, drove it continuously for two hours; by adding more plates to the storage cells, a greater number of working hours could easily be obtained if required. It is usually advisable to purchase the storage cells, but they can be constructed, and if their manufacture is attempted, the following wrinkle may be of service: Cast the plates rather thick, that they may not bend too easily; roughen them thoroughly and deeply, on both sides of the plates, with a piece of coarse file, or special rough-faced punch, driven into the lead. Punch out half-inch holes through the plates at regular intervals, and cut or trim the holes so that they bevel on each face of the plate. Now coat the plates carefully with a stiff paste of red lead mixed with water two parts, sulphuric acid one part, taking care to fill the holes completely. Allow to dry twenty-four hours, and then wrap the portion of each plate to be immersed in the acid solution with a layer or two of white cotton cloth, bound firmly to the plates with thread. Arrange plates in the cells in the usual manner, separated and held in position by insulating strips; fill up cell with the mixture of sulphuric acid and water; connect the charging battery, and charge well in one direction; discharge through a resistance, and recharge in same direction as before. Keep cells well charged, and at the end of a week carefully remove the cloth coverings, and the paste will be found to adhere strongly to the plates and fill the holes completely. When the cloths are not used, nearly all the paste falls off as soon as the plates are immersed in the fluid previous to charging. Rating each storage cell at two volts, a sufficient number of charging cells must always be used in series to give a voltage at least 10 per cent in excess of the sum of the voltage of the storage cells in series. Bichromate cells are best for forming the paste when the cells are new; afterward the gravity cells answer every purpose.

C. L. WOOLLEY.

413 Robert St., Baltimore, November 14, 1891.

Leprosy: Its Spread and Causation.

To the Editor of the Scientific American:

My attention has been called to an article in the SCIENTIFIC AMERICAN on the subject of "leprosy," and having devoted some attention to the causation and increase of this dreadful and incurable malady in our various colonies and dependencies, as well as in the Pacific islands, I shall be glad, with your permission, to offer to your readers, in the interest of the public and public safety, a brief statement of my conclusions. The belief that leprosy is contagious seems to have taken possession of a certain section of the public mind, and this fact, it is alleged, is clearly demonstrated by the case of Father Damien. While not disposed to contest the possibility of this theory, I will state that it is not in accordance with two inquiries of the Royal College of Physicians or of my recent observation and investigations. A medical resident of sixteen years' standing in British Guiana told me that the disease was being extensively disseminated in some unexplained way, as the infected population had greatly augmented of late years; you encountered them in churches, at balls and public meetings, in the streets and the market place. Several leprosy patients were pointed out to me at the Colonial Hospital, Georgetown, in close proximity to the other inmates, and I may observe that only the worst cases (and these belonging to poor families) are segregated at the leper hospitals. The lazarettos at Gorchum and Mahaica, British Guiana, at Trinidad and Barbadoes, were full to overflowing; new wings were in progress, or had recently been added, and the demand considerably exceeded the present accommodation in every instance. No one, however, appeared to be afraid of contagion, and I could not learn of a single case so communicated. After going through the various buildings of the leper asylum at Mucurapo, Trinidad, and seeing the unfortunate patients in every form of this hideous and mutilative disease, I said to the lady superintendent (of Dominican Sisters), who had been in charge of the institution for seventeen years, "Have you no fear of contagion?" "Not the slightest," she promptly replied. "And you and your assistants do all that conscientious nursing requires?" "Certainly, and feel it a joy and privilege to be of service to these afflicted people." "Has any case of infection by contact to doctor, nurse, attendant, or laundress ever been reported during your superintendence?" "Not one." This experience was confirmed at the lazaretto in Barbadoes, Colombo, Kalili, Honolulu, and elsewhere, and some of the nurses and attendants have been employed from ten to thirty years. The result of my inquiries may be briefly summarized as follows:

1. That evidence from all authorities shows that

leprosy is seriously increasing in India, the Mauritius, Hawaii, the West Indies, Russia, and South America.

2. The theory of contagion put forward to account for this increase is doubtful, and is denied by the highest medical authorities, both at home and abroad, and, if true, would only account for an infinitesimal portion of such increase.

3. All authorities, including the *Lancet* and the *British Medical Journal*, admit that leprosy may be communicated by inoculation.

4. That the only method of inoculation extensively and increasingly practiced is by means of arm-to-arm vaccination, and that leprosy has been distinctly traced to this source by medical practitioners in the West Indies, British Guiana, in Norway, and in the Sandwich Islands; by medical superintendents of the leper asylums; by distinguished authorities, as Dr. Tilbury Fox, Sir Erasmus Wilson, Dr. Gavin Milroy, Professor W. T. Gairdner, of Glasgow, Dr. John D. Hillis, Dr. Edward Arning, Hamburg, Dr. Bourne Swift, Professor Montgomery, Dr. A. M. Brown, Dr. Blanc, Professor of Dermatology, University of New Orleans, Dr. Hall Bakewell, Dr. Bechtinger, and others. Proofs of the spread of leprosy by vaccination in various countries have already been laid before the Royal Vaccination Commission now taking evidence in London. These proofs will be found in the third report of the proceedings.

WILLIAM TEBB.

Devonshire Club, St. James', London, Nov. 6, 1891.

The Electric Headlight.

The use of electric headlights has now become quite general in Indiana, nearly all the roads entering Indianapolis now having several in service.

A representative of the *Railroad Gazette* made a trip over the Indianapolis, Decatur & Western from Indianapolis to Decatur lately on an engine equipped with the light. Its power is approximately 2,500 candle power, and it gives the engineman a light which on a straight track will often reveal objects at a mile or more, and for fully one-half a mile all objects of the size of a cow can be distinctly seen in ordinary weather. The greatest distance at which an object was seen was 2½ miles. This was a window of a station house in which no lamps were burning. When the light was first reflected from the window, the appearance was that of a locomotive headlight about a mile away. The window seemed to increase in size until at a distance of about three-quarters of a mile the effect was that of a burning structure. At this distance the outlines of the building could be distinctly seen. These distances were easily computed by counting the telegraph poles, which are 200 feet apart on this road. A water tank was sighted at nearly a mile, appearing much larger than it really was. Bridges with overhead trusses could be seen at half a mile. The highway crossing fences along the line had been freshly white-washed and with little effort could be seen a mile.

Collisions have been prevented by the use of these lights.

The expense of running the light is nominal. The demand for steam from the locomotive is small, and the carbons, which last eighteen hours, cost but 70 cents per 100.

Fathers of Electrical Science.

At a meeting of the Committee on Electricity, Electrical and Pneumatic Appliances, of the World's Columbian Exposition, the following names were decided upon as those of eminent electricians not now living, to be placed over the Electricity Building at the Exposition, namely:

Franklin,	Page,	Joule,
Galvani,	Weber,	Saussure,
Ampere,	Gilbert,	Cooke,
Faraday,	Davenport,	Varley,
Ohm,	Soemmering,	Steinheil,
Sturgeon,	Don Silva,	Guericke,
Morse,	Arago,	La Place,
Siemens,	Daniell,	Channing,
Davy,	Jacobi,	Priestley,
Volta,	Wheatstone,	Maxwell,
Henry,	Gauss,	Coxe,
Oersted,	Vail,	Thales,
Coulomb,	Bain,	Cavendish,
Ronald,	De la Rive,	

The Hydraulic Stone Crusher.

In a recent article descriptive of the stone-breaking industry, as carried on in Weehawken, N. J., allusion was made to the breaking machine as being of the Blake pattern. This was an error, as the device employed is the Smith hydraulic crusher. This remarkable machine, which, by the way, is on exhibition at the American Institute Fair, this city, has been greatly improved, and is now probably one of the most safe and powerful instruments for the purpose ever produced. In connection with the hydraulic cylinder it carries a relief or safety valve, which is set to open at four tons to the square inch, this enormous pressure being available for crunching the blocks of stone. The relief valve protects the machine from breakage, the result being that the mechanism endures for years, even when run at its full capacity. The Case & Redfield Machinery Co., 16 Court St., Brooklyn, N. Y., makers.