

Electric Telegraph Experiments.VERMONT MEDICAL COLLEGE,
Woodstock, March 27, 1848.

To the Editor of the Sci. American.

In your valuable paper of March 4th, is contained the *great* discovery of the use of water alone in Grove's Battery, instead of sulphuric acid and water, as the motive power. The least acquaintance with this battery or with any of the common forms, must convince you and all, that the zinc must be acted on chemically by means of an acid. If that acid is not mingled with the water which surrounds the zinc, it must be obtained from some other source, and in the case alluded to, was obtained from the passing of the nitric acid through the porous cup to the zinc. It has long been known that nitric acid is an active exciter of electricity on the zinc. As soon as the nitric acid should pass through to the zinc in sufficient quantity, the action would begin, and be increased with the increase, and be diminished with the diminution, of the acid. But, the mercury on the amalgamated zinc would be attacked, and the plates would ere long need re-amalgamation. Well known facts and principles lead to these necessary conclusions.

As I had just received a new Grove's Battery of eighteen cups, I determined to try the experiment, and test the 'hydropathic' discovery. The battery was new and clean and in fine state. I charged the zinc plates with pure water and put strong nitric acid in the porous cups. Aided by an assistant, this filling was done simultaneously and rapidly.—The following were the results:

1. On bringing the copper wires from the poles into water, there was indication of only the slightest decomposition of water.

2. On attaching the poles to an electro-magnetic apparatus, there was not the least development of magnetism at either end of the soft iron. Hence, such a battery of even 18 cups would not move the common Telegraph lever, while three or four cups with the ordinary exciting diluted acid is amply sufficient.

3. Waiting a few moments I tried these same experiments again, and found the power of the battery had somewhat increased.—The decomposition and magnetism were thence as much. Hence the nitric acid had passed in some quantity through the porous cup to the zinc.

4. Repeating the same experiment at the end of half an hour, the activity of the battery had greatly increased, and both the results, already mentioned, were far more manifest.

As I have repeatedly used the same size of Grove's Battery charged in the common way with twelve of water to one of sulphuric acid for the zinc and ordinary nitric for the porous cup, it is evident that the power of the hydropathic solution was far the less efficient of the two.

5. In about an hour and half the "hydropathic system," had attained its maximum efficiency, and I repeated the above experiments before the medical class, and added the following. A large dancing iron in the proper helix was suspended or made to dance in the usual manner. A rod of eight inches length and nearly one-fourth of an inch in diameter was made to play beautifully. Dutch gold leaf was finely deflorated, and both silver leaf and gold leaf burned distinctly.

6. When the circuit had been broken, on closing it, the usual effervescence took place around the platinized platina of the porous cup. Had the porous cup been removed and the nitric acid been mingled with the water about the zinc, and the battery thus have been changed into the form actually of Smea's battery, the same results would doubtless have taken place, only with far more energy.

7. In two or three hours afterwards the power of the battery was greatly diminished. The nitric acid in the porous cup was weaker, and the nitrate of mercury and of zinc in the water had lessened its specific gravity compared with that of the nitric acid so that the nitric acid would pass in much less quantity to the zinc. After several hours more the action nearly ceased, and the plates were taken from the solution and the remaining weak nitric acid was preserved.

8. An examination of the zinc plates showed that the mercury had in part been removed

from them, and especially where the porous cups had been in contact with the zinc plates or nearer to them. The "used up" nitric acid showed that the porous cups must be refilled with that powerful acid, and this process be often repeated. Re-amalgamation must be necessary; how often, it is not easy to determine from these experiments. When the zinc is used with dilute sulphuric acid saturated with sulphate of soda, re-amalgamation is not necessary in two months; that this "hydropathic system" will require it very much oftener, there can be no doubt.

In conclusion I venture to infer, that the cost of sustaining the batteries on the "hydropathic system" will be at least five times as great as by the solution just mentioned.

Your obed't. C. DEWEY.

P. S. I have used the phrase "hydropathic system" with no invidious meaning, but as a happy expression, already made public, of the meaning to be conveyed. I rejoice in any improvement in science and art, especially in that which will disseminate knowledge and facilitate communication between the different parts of our country in a cheaper as well as expeditious manner. Honor to whom honor is due. C. D.

Bell Casting.

The casting of common house bells or hand-bells differs in no wise from the processes relating to small castings in metal generally; but for church-bells the case is otherwise. The production of a *sonorous* quality, in addition to many of those which pertain to all large castings in mixed metal, gives occasion for many scrupulous arrangements in the management of the foundry. A bell foundry must have a furnace which will contain many tons of metal, for the whole of the casting for one bell is made at once. The arrangements as to the central core or mould for casting a large bell are thus made:—Contiguous to the furnace is a pit deeper than the height of the bell. In the centre of this pit is built up a rough mass of brick work, somewhat smaller than the interior of the bell; and this is coated externally with a mixture of earth and horse dung, applied in successive layers, and worked smooth by guages, until the exterior of the core presents exactly the same size and shape as the interior of the intended bell. When the prepared core is thoroughly dried by means of fires, a second coating of the same composition is laid on of the same thickness as the intended bell; this coating, which is called the "model," is formed of earth and hair, and is, like the former, brought to a very smooth and correct surface by guages, the exact counterpart of the exterior of the bell. A third coating is then applied, called the "shell," much thicker than the others, and formed of a somewhat different composition. A little tan-dust is sprinkled on the first coating, or core, before the second, or model is applied; and also on the latter before the outer coating or shell is laid on. When all is well dried, the "shell," is lifted off from the "model," and the model is picked or cut off from the core piecemeal. If we suppose the core the model, and the shell to be three hemispherical cups placed one within another, and the middle one to be removed, it will serve to illustrate how a vacant space comes to be formed between the core and the shell: and when we further bear in mind that the exterior of the core gives the internal form to the bell, and the interior of the shell the external form, the object of the whole arrangement will be very clearly seen.

This internal cavity of the mould, between the core and the shell, is that into which the metal is to be poured. The casting pit is filled up with loam or earth, to the level of the top of the mould; a shallow channel is cut in the loam from the furnace to an orifice communicating with the vacant space in the mould; and two other orifices are left for the escape of air as the melted metal enters. Meanwhile the metal is being melted in the furnace. The tin employed is in the form of blocks, the copper is old ship-sheathing and other fragments. These are melted in a reverberatory furnace, by the heat of billets of wood. All being ready, the earth which stops an orifice in the lower part of the furnace is knocked or dug away, a narrow jet

instantly pours out from the opening, and a stream of liquid fire (for so it seems to the eye) runs along the channel in the loam, and flows into the mould, bubbling and hissing and giving forth greenish sparks. When the mould is full, the metal is allowed to remain till perfectly cool; the loam is then removed the external "shell" lifted or cut from the bell, (the bell lifted off the core, and the core pulled down. If the bell be very large, it alone occupies the pit; out of smaller size such as from three or four to ten or twelve hundred weights, six or eight may be cast in one pit at one time. The tone of a bell depends conjointly on the diameter and the thickness; a small bell or a thick bell giving relatively, a more acute tone than one which is either larger or thinner. Hence the founder regulates the diameter and thickness according to the musical pitch of the tone which the bell is to yield; but as this cannot be rigidly attained by casting only, the bells (say a set to form chimes) are attained by chipping away some of the metal with a sharp-pointed hammer: reducing the diameter at the lower edge when the tone is too low, and reducing the thickness at the part where the hammer strikes when the tone is too acute.

Preserved Potatoes.

An importation of considerable novelty and interest has recently taken place by a vessel arrived from Gottenburg, consisting of some casks of potatoes, in a state of preservation. It is known that this description of vegetable is free from duty when imported into this country in a raw state, the privilege extending to all foreign countries, and for a definite period, without reference to the mode of introduction, and the existing navigation laws, and this parcel was entered as being free of duty. On examination, however, by the officers of the revenue, the contents were found to have undergone a process of preserving by which they were considered to become liable to an *ad valorem* duty of ten per cent, as manufactured goods, the process which they had undergone being the division of the potatoes into small pieces and drying them. We believe that this is a perfect novelty with respect to the importation of the vegetable from foreign countries.

A patent is in existence for a preserved preparation of the potato in this country, which is supplied to the East India Company and Emigrants, and of which an analysis is given by Dr. Ure, the eminent professor of analytical chemistry, to the effect that it is found by chemical analysis to contain the whole nutritious properties of that root in a pure concentrated state, also sixty parts in the hundred at least of starch, nearly thirty of a soluble fibrine of demulcent anti scorbutic quality, five of a vegetable albumen of the nature somewhat of the white of an egg, and five of a lubricating gum—that the fibrine and albumen render it more light of digestion, and the gum more demulcent to the stomach than wheat flour, with which also it may be regarded nearly equally nutritious, and more so than peas, beans, sago, or arrow-root.

It was a matter of some doubt whether this importation was in any way affected by the existing patent alluded to, but we believe it has been decided in the negative, and as of an entirely different character, although similarly designated. Notwithstanding that the importation is a novel one it is understood to be a common preparation of the vegetable in Sweden, from which country this supply took place, and to have been so for a long period, and that the only process in manufacture to which the potatoes have been subjected is that of being dried and forced through a sieve or colander, which, however, is considered to render them liable to the *ad valorem* duty before mentioned.—*London Mining Jour.*

Strength of Cordage.

The strength of ropes and cords depends on the fineness of the strands. Damp cordage is stronger than dry. Silk cords have three times the strength of those of flax of the same diameter, and a remarkable increase of strength is obtained by gluing the threads together. A hempen cord, the threads of which are glued, is stronger than the best wrought iron.

The Mining Population of Scotland.

There are now about one hundred blast furnaces at work in Scotland, each of which will produce on an average five thousand tons of pig-iron a year, or, altogether, about half a million tons. For all the purposes connected with the manufacture of one ton of pig-iron, taking it in round numbers, there will be required about 3 tons of coal, 35 cwt., of calcined iron-stone, and 10 cwt., of lime. According to the restricted "darg" of the Lanarkshire miners and colliers, the labor of one man, supposing him to work the whole, will be equal to the produce of raw material for 50 tons of pig-iron a year. The manufacture of pig-iron in Scotland will therefore give employment to 10,000 colliers and miners. The manufacture of malleable iron in Scotland will be somewhere about 80,000 tons per annum, will give employment to 1000 colliers, each ton requiring about four tons of raw coal for its manufacture. Altogether this will give employment to 11,000 colliers and miners in the manufacture of iron alone in Scotland. For each man employed, the population may be estimated at four which will give a population of between forty and fifty thousand.

For supplying the consumption of Glasgow 5000 colliers are required, and taking the whole of Scotland, the number of colliers and miners absolutely working will be about 30,000, and the population about 120,000. This is altogether independent of oncostmen, laborers, mechanics, and others employed in connection with our collieries and ironstone mines, which will give at least one-half more. The population, therefore, belonging to their coal and ironstone working, cannot be estimated at less than 150,000 and is rapidly increasing every day. The quantity of pig-iron made has doubled within the last seven years which must have added to the mining population above 20,000.

Previous to the year 1775, colliers were treated as slaves belonging to the property where they labored. The British parliament that year passed an act which "declared that colliers and salters were to be no longer transferrable with the collieries and salt works," but upon certain conditions which were then deemed 'reasonable,' they were gradually emancipated and set free, and others prevented from coming into such a state of servitude." Since that time, many laudible efforts have been made for the elevation of this portion of British subjects, but their condition still demands the attention of the friends of degraded humanity.

TO CORRESPONDENTS.

"J. B. of O."—Yes. You seem to appreciate the benefit of publishing engravings of your inventions in the Scientific American.—We could mention hundreds who have made extensive sales and realized large profits by just publishing their inventions in the Scientific American. The cost of a cut for your last improvement will be \$8. It will appear in two or three weeks.

"J. C. Jr. of N. Y."—We feel under obligation to you for the fine list of subscribers with which you favored us last week, and we hope we shall have occasion to tender our thanks to many others for like favors.

"M. S. of Vt."—See fourth page.

"R. M. J. of Mass."—Get an engraving of your machine, it will only cost \$5; better than a caveat.

"S. R. of N. Y."—You say that you can gain power by a larger fly. We say you cannot, you are, however, welcome to your opinion, and would recommend your fly as an easy way to transfer a four horse power engine, to one of 20 horse power.

"A. N. O. of R. I."—We really would be happy to give advice, but scarcely know what to say. The name given was the signature and we thought it was also the name proper.

"A. H. of Ky."—The hardness of the castings, we are afraid is not attributed to the true cause, as some of the softest castings in the world are made from the coke of bituminous coal. Copperas is the sulphate of iron. Sulphur is found but in small proportions in any iron. It may be phosphate that is the cause of the hardness. See that you are not chilling too rapidly by damp sand. We know

of no process to purify the coke, or the impurity in the melting. We can only recommend rapid melting and extreme heat, so that as little carbon as possible may be combined with the iron.

"J. M. H. of Ohio."—Steel bells will not answer for those of large calibre. You can get an eccentric chuck by writing to Joseph Hydes Starbuck's Foundry, Troy, New York.

"G. T. of Oswego."—Your capstan is new in combination.—There is no other of like construction so far as we are aware of, in use. It is good.

"C. L. of Rockville."—The law allows two years. Many speak well of your windlass. We have not been able to answer you by mail.

"B. B. of Me."—Much obliged to you for your interest in the Scientific. We can make a wood cut from a good drawing, equally as well as with the model, though not a perspective from a sectional.

"C. B. W. of Mass."—Gov. Briggs was not very correct in his opinion. According to his views, any person who has seen a drawing or model of another person's invention, can take out a patent for the same.

"J. C. of Mass."—Your model is received. We shall write in a few days.

"E. C. of Ill."—Your communication has just been received.

Spirit Gas.

We frequently hear of accidents from explosions of spirit gas. This is a composition of rectified alcohol and turpentine. It should never be used in families as it is very explosive.

Harrisburg Furnace Burned.

A short time ago the wood work of Gov. Porter's extensive anthracite Furnace at Harrisburg, took fire from the slag running out from the stack against the corner of the building, and in about two hours all the combustible materials of the furnace were entirely destroyed.

Patent Agency.

Applications for Patents made at this office, on the most reasonable terms. Neat drawings, specifications, and engravings of the first character, and cheaper than anywhere else.

Advertisements.

This paper circulates in every State in the Union, and is seen principally by mechanics and manufacturers. Hence it may be considered the best medium of advertising, for those who import or manufacture machinery, mechanics tools, or such wares and materials as are generally used by those classes.

Table with 2 columns: Description of advertisement space and corresponding price. Includes rates for one square of eight lines, one month, three months, six months, and twelve months.

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- List of agents for the Scientific American in various cities including New York, Boston, Philadelphia, Albany, Baltimore, and others.

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CLARK SELLECK, SQUIRE SELLECK. Persons residing in the city or Brooklyn, can have the paper left at their residences regularly, by sending their address to the office, 127 Fulton st., 2d floor.

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PERSONS residing in any part of the United States who are in want of Machines, Engines, Lathes, or any description of machinery, can have their orders promptly executed by addressing the Publishers of this paper.

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FOR sale cheap, a first rate steam engine and boiler of the horse power, in complete running order. Price \$200. It can be shipped to any part of the United States.

HARTSON'S PREMIUM TOOL MANUFACTORY.

WHERE he is now manufacturing his improved Turning Lathes, a very superior article, for which was awarded the First Premium at the late Fair of the American Institute.

THE undersigned respectfully announces his new mode of Propelling Steam Boats, in river, lake or ocean navigation, which he trusts, will be found worthy of the notice and consideration of shipbuilders and proprietors of steamboats.

Having taken the proper means for securing a patent for this new mode, which he has called the Wind Mill Principle, in contradistinction to that of the paddle wheel in general use at this time, he is desirous that its merits may undergo the ordeal of philosophical investigation, mechanical skill and practical experience.

To personal enquiries, or by letter, postage paid, answers will be given and transmitted to any part of the United States, by applying to ABRAM TAYLOR, No. 123 Second street, New York.

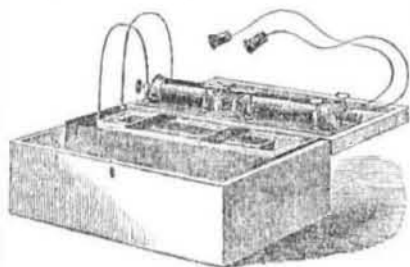
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FOR SALE.—The valuable Mill privilege situated in Roxbury, Mass., formerly known as Wait's Mills, now belonging to the heirs of Richard White, is now offered for sale, together with about 10,000 feet of land, and buildings thereon.

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THE Subscriber has in process of manufacture 150 Steam Engines from 5 to 20 horse power, which will be finished by the 1st of May. Also 50 from 25 to 100 horse power, to be finished in June and July.

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IT is now universally admitted by the learned and scientific, that the mysterious power called Galvanism or Magnetism, is in fact the principle of vitality or life, and that Disease in many of its most painful forms is entirely owing to the absence of this Galvanic or Magnetic power in its healthy proportions.

MOORHEAD'S Graduated Magnetic Machine is an important improvement over all other forms of manufacture, and has been adopted by the Medical Profession generally, as being the most perfect, convenient and effective Magnetic machine in use.

MOORHEAD'S Magnetic Machines are used with positive and permanent success in all cases of Rheumatism, acute or chronic, seated either in the head, joints or limbs; Gout, Tic Doloureux, Nervous and Sick Headache, Paralysis, Palsy, Fits, Epilepsy, Dyspepsia, Palpitation of the Heart, Spinal and Hip Complaints, Stiffness of the Joints, Lumbago, Neuralgia, Nervous Tremors, General Debility, Deficiency of Nerves and Physical Energy, and ALL Nervous Diseases.

Each Machine is compactly arranged with the Battery and all necessary appliances, put up in neat rosewood or black walnut boxes. Accompanying each is a new Manual, containing full and simple directions for its use and application in the various diseases in which it is recommended.

Every family should possess one of these beautiful instruments. It will always be found a valuable companion, and very often the best physician in time of need.

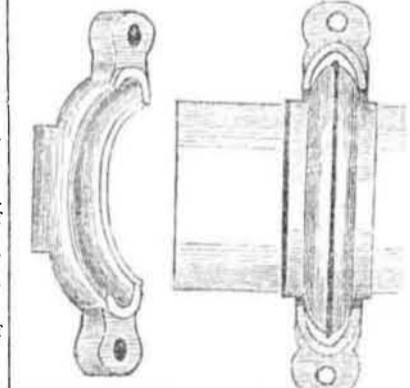
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TWELVE DOLLARS.

The Graduated Magnetic Machines are manufactured and sold wholesale and retail, by D. C. MOORHEAD, 182 Broadway, New York. MUNN & CO. have been appointed Agents for MOORHEAD'S Magnetic Machines, and all Orders addressed to MUNN & Co., accompanied with the Cash, will be promptly and carefully fulfilled.

These Machines can be sent with perfect safety to any part of the country.



Clasp Coupling Joint.

MESSRS. WEST & THOMPSON would respectfully call the attention of Engineers, Owners, or Agents of Steamboats, proprietors of Factories and others, to their new and improved method of jointing steam and other pipes together, by which means any person is enabled to connect them.

This is to certify that I have examined what is called West & Thompson's Clasp Coupling Joint, for pipes to conduct steam and other fluids, and consider it to be a new and most invaluable improvement.

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THE SUBSCRIBER having been engaged in selling American Hardware on commission for 7 years, solicits consignments from manufacturers, and will refer to those who have employed him the above number of years.

WE will pay 10 cents each for 100 copies, No. 16, Vol. 2, Scientific American, delivered at this office, free of expense and in good order.

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CANDELABRA, GIRANDOLES, RICH CHINA AND BOHEMIAN GLASS VASES, HALL LANTERNS, &C.

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Washington Stores, No. 139 William street, New York, (one doorsouth of William st.)

ARE manufacturing and have always on hand, a full assortment of articles in their line, of the following description, which they will sell at wholesale or retail at low prices, for cash:

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Table with 3 columns: Inches, Cents, and Inches, Cents. Lists prices for various sizes of bands.

All Bands of extra thickness will be made by special agreement. Light Bands for Cotton Mills furnished at short notice.

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From 1-4 to 6 inches diameter, and any length, not exceeding 17 feet.

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THOMAS PROSSER, Patentee, 23 Platt street, New York d26

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THE Subscriber having received Letter Patent for an improvement in the Shingle Machine, is now ready to furnish them at short notice, and he would request all those who want a good machine for sawing shingles, to call on him and examine the improvements he has made, as oneighen more shingles can be sawed in the same given time than by any other machine now in use.

Augusta, Maine, Oct. 1, 1847. J. G. JOHNSON.



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Charges moderate, and no charge will be made until the inventor realizes something from his invention.

Letters Patent will be secured upon moderate terms. Applications can be made to the undersigned personally or by letter postpaid.

SAMUEL C. HILLS, Patent Agent.

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The wheels are manufactured and for sale by the FULTON IRON FOUNDRY CO., South Boston, Mass.,—where the wheels can be seen and any information concerning them had.

Patent Rights for different States, Counties, &c. for sale, as above. m25 6m+

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BENTLEY'S Patent Tubular and other Boilers of any size, shape or power, made to order, by SAMUEL C. HILLS, 189 Water st. f8

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J. O. FAY has just received from the manufactory of J. G. Moffett, a full and most splendid assortment of Solar Lamps for Parlors, warranted perfect; unequalled in style and beauty of finish—new patterns, the handsomest ever offered for sale, and the cheapest Lamp Store in New York m26 3m+