

INTERESTING CORRESPONDENCE.

COTTON GINS—ATMOSPHERIC ELECTRICAL CURRENTS.

MESSRS. EDITORS:—I noticed a suggestion in a recent number of the SCIENTIFIC AMERICAN, in reference to a much-needed improvement in the cotton gin. During a late tour through some of the southern States, I was struck with the want of another improvement in the cotton gin, which will enable it to clean the dirty cotton that has fallen and been gathered from the ground.

Allow me to state to you some facts proving, I think, the existence of both ascending and descending currents of atmospheric electricity during the same thunderstorm and near the same time.

During a thunderstorm in May last, the lightning struck a three-story brick block at the corner, threw out perhaps 50 bricks, and tore down the tin conductor standing at that corner. No effect of the lightning could be found below the top of the corner of the building except the prostration of the conductor, and no evidence of fusion upon that. At the same instant, Judge Dickey, who was on the sidewalk more than a quarter of a mile north, very sensibly felt the effects of the current passing from his shoulder down. This last circumstance, I think, proves conclusively that this was a descending current of electricity. My house is situated upon an elevation one hundred feet above the city, and one and a quarter miles north of the brick block spoken of. In my office at the house, I have a telegraph instrument connected with the main circuit, about two hundred miles long. The office wires, very near the table, were, at the time, very near but not quite in contact with the gas pipe, which I use for a ground wire when necessary. I have a cut-off, 12 feet outside the office (which was closed at the time), separating the office wires from the main line two inches. The cut-off is so arranged that the office wires were separated from each other four inches at that point. Both the main circuit and office wires connecting with the cut-off are No. 17 copper, consequently of equal connecting capacity. During the continuance of the storm and, as near as I could judge, about the time the building in town was struck, a member of my family went to the office in search of two small children, and found them looking, as they said, at the fire on the telegraph table. At that time there was a succession of slight reports and flashes about the table, and after the storm was over I found marks of the electricity, both on the gas fixtures and wires where they were nearest in contact, and upon the wires in several other places about the table and in the magnet, and between the office and cut-off, the wire was completely fused and parted. After the storm was over I repaired the damages, opened the cut-off and found the line working actively, and that distant offices on either side had been working regularly through my cut-off with very little interruption from atmospheric electricity. This was clearly ascending electricity.

About one hundred yards west of my house, and say fifteen minutes after the building in town was struck, a cherry tree (four inches in diameter) was struck, which I examined soon after the storm passed. Five feet from the ground the tree forks into two equal parts. On the north side of the tree the bark was torn off from a point fifteen inches from the ground to the forks. The denuded portion was from two to four inches wide. Along the middle of this strip, and extending its whole length, the trunk of the tree was split to an uncertain depth, and from this fracture, along its whole course, were projected splinters of from one to two inches in length, and standing uniformly at right angles to the trunk of the tree. Not a scratch was found upon any of the branches. The tree matured a fair crop of fruit, and is now well set with fruit buds, which are considerably swollen, though not as far advanced as its healthy neighbor. The trunk of the tree below the injury has since increased in diameter more than half an inch. The bark on either side of that thrown off was loosened from the tree, so as to leave a strip not more than from two and a half to four inches uninjured, and on the inside of the bark thus loosened from the tree solid wood has formed, in thickness more than half an inch, and in one place more than two inches. The observations which I made immediately after the storm, and which I have detailed, convince me that a current of electricity passed up the tree and burst out from it before reached the branches: and I have men-

tioned the growth of the tree since as something quite remarkable, so far as my observation extends. I have been tediously minute in every detail; yet, perhaps, not as much so as I ought, as the minutest circumstance is worthy of notice in such observations.

J. D. CATON.

Ottawa, Ill., April 5, 1860.

REPAIRING CRACKED BELLS.

MESSRS. EDITORS:—You are, of course, aware that the usual course pursued with cracked bells is to saw out the crack; but this operation greatly weakens the bell, while the tone is never completely restored. We wish to give you a brief statement of an experiment made by us with a cracked bell, which was entirely successful, namely, the fusing of the injured parts. We conducted the operation as follows:—The bell was buried in the sand, deep enough to make it easy to work upon, leaving the crack and several inches around it exposed. Then the half of a flask or box was placed on the exposed part, which was nearly in a horizontal position. The flask was then filled with molding sand, as in any ordinary mold, leaving the crack and a portion of the bell exposed for several inches around; we then placed parting sand on the mold, as is usually done, and placed another part of a flask to match that already on the bell—usually called the "cope"—which was filled with sand so as to have a body several inches above the topmost portion of the crack. This was then removed, retaining the exact shape of the fractured portion of the bell. A receiving and discharging gate was then cut into the cope at each end of the crack; also, a channel, one inch wide and one inch high, for the metal to flow through from the receiving to the discharging gate, in a line with the crack. The inside of the bell was then filled and well-rammed with sand, so as to support that portion of the bell when in a melted state, and also to support the outer portion of the flask as the sand is filled out further than the edge of the bell. The cope was then dried, and a charcoal fire made on the cracked portion of the bell, while exposed, for the purpose of creating as much expansion as possible and getting the metal into a red heat, so that the metal, when poured, would do its work more quickly and not be as liable to crack the bell further up, or in another direction, as it would be if this precaution were not taken. The fire was then removed, the dust and ashes blown away with bellows, and the crack cleared out clean. The cope was then placed back on the other portion of the mold, on the bell, and weighted down to keep it from rising while the metal was being poured through the channel. The crucible containing the molten metal was then taken from the furnace; it should always be very hot, and ready to use as soon as the cope is placed on the bell. The metal was then poured into the receiving gate, and flowed through the channel over the crack in a continual stream, until the cracked portions, and several inches around it, were in a molten state and completely fused. The bell was then allowed to cool. The amount of metal poured was from 50 to 60 lbs., the weight of the bell was about 200 lbs., and the crack about 7 inches long, from the mouth upwards.

W. T. & J. GARRATT.

San Francisco, Cal., March 30, 1860.

PREVENTING BOILER EXPLOSIONS.

MESSRS. EDITORS:—I notice on page 196 of the present volume of the SCIENTIFIC AMERICAN an article on the above subject, signed by "T. A." He says that "the frequent displacement of water from one boiler to the other can be prevented by the following plan:—The further ends of the boilers from the fire should be connected near the bottom with a pipe for that express purpose," and adds, "this is a sure preventive of explosions from this cause." Last season, we constructed a cylinder boiler to be placed in the arch beside two others, which was 30 feet long and 30 inches in diameter, and under the back end of each, a short boiler was coupled, which was 8 feet long and 30 inches in diameter. The feed-pipe was attached to the front end of these short boilers or heaters entering the head. The steam-pipe connected all the boilers on top, and we found the water would not equalize, sometimes two of them being full, and the other empty. We then connected the long ones in front by a pipe attached to the lower end of the man-hole. This we find to overcome the difficulty in part, but not entirely, and we shall yet connect them on the

top of the forward end. Thus your correspondent can see we have connected these boilers in three places by two water passages and one steam, yet it does not accomplish the purpose. The bore of the pipe for the water connections is three inches, and steam-pipe bore $8\frac{1}{2}$ inches, and none of these passages can possibly be closed up. We think a connection on top of the front end will remedy the difficulty by equalizing the pressure. I mention this to show that there are instances where T. A.'s plan will not accomplish the end sought.

A. G. S.

Owego, N. Y., April 18, 1860.

A PROFITABLE WAY OF BURNING SAWDUST.

MESSRS. EDITORS:—Having noticed several communications in the present volume of the SCIENTIFIC AMERICAN with regard to furnaces for burning sawdust, and knowing it to be a subject of interest to mill-owners, I send you the following. I have had a great deal of experience in constructing such furnaces, and have never failed to construct them so as to burn sawdust of any kind; in many cases the dust being from timber taken from the water, and almost heavy enough to sink.

I never use a fire-front, which I consider an abomination, where a single boiler is used; the reason being as follows:—1st, The conductor and front can never be kept sufficiently tight to insure a good draft, which is the great essential in burning sawdust. 2d, The conductor almost red hot and right in the fireman's face, together with the heat of the iron front, and the inconvenience of the doors, makes it almost impossible to give the fire the proper attention. 3d, With the front arrangement the ash-box doors are in front, and the fuel that may be spilled in filling is apt to catch fire, and has to be swept up at each time, and usually with as much fire as may be among it, which we may safely consider as the manner in which so many sawmills are burned; sawdust being the most treacherous fuel in this respect.

In setting-up single boilers for sawmills, I place the boiler in the stack; the stack being of the same width and a continuation of the furnace walls, the grates being laid across the boiler, the fuel doors being on one side of the furnace, and the ash-bed doors on the other. I use an air-tight slide damper in the stack to regulate the draft and amount of steam, so that the furnace can be kept always full of the fuel. Below I give the dimensions for a furnace for a common sawmill boiler with two flues, each 14 inches in diameter; the boiler being 20 feet in length and 36 in diameter. I hope these figures may prove of use to some of your numerous readers:—

Height of chimney, 50 feet; width at base, 7 feet 9 inches; diameter of flue (square), 24 inches; thickness of furnace walls, 17 inches; clearance on sides of boiler, $4\frac{1}{2}$ inches; area of fuel doors, 15x30 inches; area of ash-bed doors, 6 feet; area of grate surface, 16 feet; area of flue under the boiler, 8 feet; area of throat at the bridge wall, $3\frac{1}{2}$ feet; clearance over the grates, 19 inches; clearance at back end of boiler, 20 inches.

I constructed (for the Ohio Tool Co., at this place) a furnace of proportionate dimensions upon this plan:—Boiler, 30 feet in length and 48 inches diameter; thickness of walls (single), 22 inches. The result has been that, while, during March, 1859, they burned 10 bushels of coal daily, besides the cuttings and shavings from their workshops, during March, 1860, when doing the same amount of work of the same character, they have sold more than 15 cords of wood from their cuttings—worth \$40. This saving is due to the improved construction of the furnace and greater draft, enabling them to burn green sawdust. The walls being very tight, the steam is found at a good pressure in the morning, and the wood that was formerly used to raise steam is now saved.

J. R.

Columbus, Ohio, April 16, 1860.

A CHEAP FISHING-NET MACHINE WANTED.

MESSRS. EDITORS:—The fisheries train a race of hardy men, who are the main support of our commerce in peace and defense in time of war; they also promote shipbuilding and give encouragement to almost every branch of agriculture and manufactures; consequently they are of the first national importance. Every invention therefore, that gives aid and encouragement to the fisherman, should be promoted, hence any machine that would facilitate the making of nets and seines (articles at present very expensive), would operate as a great benefit; but for this purpose the machine must be cheap, simple, and easily worked. I consider that such a

one may be invented upon a similar principle to those for making lace and for knitting. Such a machine would undoubtedly have an extensive and rapid sale, I am told that there are large and expensive machines now used for making seins, but those are not calculated for the purpose, because they are not within the reach of the common fishermen. I reside at the side of a river abounding in fish, and if I could procure a small cheap machine of this kind, I should consider it a great boon, and there are hundreds in this place that would be glad to obtain similar contrivances.

I have taken the liberty of addressing you, as through your valuable paper, possibly some of the long list you weekly give of inventors may be induced to undertake to carry out the plan I propose.

R. G.

Sydney, Cape Breton, April 10, 1860.

[The small knitting machines manufactured by J. B. Aiken, office 429 Broadway, this city, and illustrated on page 328, Vol. XIV., (old series) of the SCIENTIFIC AMERICAN, could be so modified as to answer the purpose of making cheap nets. Of course they would not be so strong or durable as nets that are tied with a knot at the crossing of the meshes, but they would answer very well for most kinds of fishing.—Eds.]

A WOMAN PLEADS FOR NEW INVENTIONS.

MESSESS. EDITORS:—Whatever lightens the labors and cares of the house helps to bring comfort and cheerfulness and elevated tastes to the heart of home. In a former letter, published on page 410, Vol. I. (new series) of the SCIENTIFIC AMERICAN, I suggested to practical artizans some improvements in the kitchen stove, and the kettles to be used thereon. I would further suggest that iron cooking kettles be lined with a material less easily oxidized. No dish of meat or vegetables can, with impunity, be allowed to cool in an iron vessel. Though iron is the most important of all metals in all the various uses to which it is applied—though it be a part of the soil, and a constituent of all plants, fruits and animals—though even the health of the blood depends on the quantity of iron which it contains, and this may yet be found to depend upon its magnetic properties, as one of the moving forces of that electro-magnetic machine, the human body—yet it does not follow that we should leave to ignorant or careless cooks the amount and quality of iron we are to consume, served up in unsavory dishes. Porcelain-lined kettles are all we could desire, but for their liability to crack off with dry heat. For instance, in cooking potatoes, my way is, either to peel or cut off a ring of peeling, and after boiling until the fork easily penetrates, but not till soft, drain off all the water, set the kettle back without the cover, to force the moisture in the potatoes to escape in the form of steam. My servant usually cooked the potatoes according to my instructions; but one day she unluckily used my porcelain fruit kettle for that purpose, and of course ruined it. If any kind of stone, or that peculiar clay used for vessels in glass manufactories, will stand dry heat, would be preferable to metal. If this is impracticable, could not a thin lining of silver or aluminum be brought within the reach of common use? If its influence upon health was properly considered, platinum itself would not be deemed too costly. A cooking kettle acts a most important part in the healthful and cleanly preparation of food. It is to be hoped that our new silver mines will help us to silver tea-kettles, or, at least, to rid us of the copper bottoms.

In the letter above alluded-to, while speaking of a machine for washing dishes, I neglected to specify that the drainer should be placed in a water-tight box, with cover and faucet, and some churning machinery placed within, to splash the water. And in connection with this, we need some simple little apparatus for wringing out a cloth without wetting the hands.

I wish to call the attention of artizans to the working dress of females. The present working dress is a shame to the age of invention in which we live. I am aware of the conscientious efforts of many who have made martyrs of themselves, by trying to introduce a better style of dress for active life. Their experiments show a want in this direction. Women need a dress that will allow a full play of the chest, the free use of the arms, and the unconstrained action of all the blood vessels, nerves and muscles of the body. We want one of many pounds less weight, which shall not drag the body down or knock about the ankles at every step, and which will not "rop

the house," from garret to cellar. The present working dress requires to be carried up stairs. No matter what else is to be carried, one hand is always monopolized by the dress. If any scrubbing or dirty work is to be done, the dress must be taken care of. Outside of the demands of health, buoyancy and cleanliness, time is too important to spend so much in taking care of the working dress, especially when servants' hire is such an item as it is in this country. Some sort of tunic and trousers, made of warm material, forms a desideratum. Such a dress is also needed for out-door exercise, and for active life in general. Witness the calisthenic exercises of school-girls and mark the painful contortions of those in close waists, with arms tied down, when compared with the ease and grace of those in loose tunics. Is there not inventive power enough in the country to get up some shape or fashion of working dress which will better answer the purpose than the one in present use?

As the onward march of machinery is removing the drudgery from the various departments of labor and active life, the constitutions, habits, food and medicine of the people are also undergoing a corresponding change. For instance, the coarser vegetables are yielding place to those less bulky, and more nutritious. In this view, could not the common chestnut, being more palatable and nutritious, take the place of the potato? And could not the chestnut tree be dwarfed and brought forward, in the same manner as the apple and pear?

I would ask practical chemists whether the fermentation of wine and cider can or cannot be stopped at an early period, and before the juice becomes sufficiently alcoholic to be intoxicating? Such stoppage would afford a very healthful and delicious drink for the table and for general use, in place of the various foreign and deleterious drinks which are now poisoning the people. The successful discoverer in this department would indeed be a benefactor to his kind.

MRS. M. L. VARNEY.

San Francisco, Cal., March 31, 1860.

EGG-HATCHING MACHINE.

MESSESS. EDITORS:—Seeing in your paper of the 14th inst. an answer to W. B. O., of California, that you did not know where any machine to artificially hatch poultry could be obtained, I beg to say that I am the inventor of an egg-hatching machine, and I will warrant it to hatch the eggs of all kinds of birds, as well as all kinds of poultry; and the machine has a section in which to rear the same to maturity. Should your correspondent wish such a machine, he can be accommodated by W. J. Cantelo. Address, Box 194 Post-office, Philadelphia, Pa.

[We publish the above for the benefit of our California correspondent. We know nothing about Mr. Cantelo or his egg-hatcher; but we give the inventor's own statement respecting it.—Eds.]

OF INTEREST TO NONE BUT INVENTORS.

While letters like the annexed may not interest that class of our readers who have never taken out patents, and who never expect to do so, there are many thousands of inventors who like to know the experience of others of their craft. To this class the following letters will afford much satisfaction:—

MESSESS. MUNN & Co.—Your polite note of the 2d inst. came to hand yesterday, bearing the news that my last application was granted. You may well imagine the enthusiasm that filled my heart at this result, for the anxiety I have had since the case was in your hands can only be realized by those in similar circumstances. I applied for a patent on my cultivator tooth, and on the hand corn-planter (patented the 6th of last month) nearly six months ago; both cases were rejected. The corn-planter I finally got through myself. The other case my judgment dictated (after the bad luck had been sadly experienced) should be confided to MUNN & Co. The case was energetically prosecuted by your successful agency, and it "passed the Rubicon." I can but again express my heartfelt thanks for your success; had the case been rejected my hopes and happiness would have been greatly blasted.

H. B. HAMMON.

Bristolville, Ohio, April 7, 1860.

MESSESS. MUNN & Co.—Yours' of the 2d inst. has come to hand, and I hereby tender you my sincere thanks for the efficient and energetic manner in which you have carried my case through to a successful termination, and, when opportunity offers, I will take pleasure

in recommending all having business at the Patent Office to employ you, as being safe and honorable men.

J. K. LEMON.

Toledo, Ohio, April 6, 1860.

MESSESS. MUNN & Co.—I feel truly grateful to you for the privilege of informing you that I am in receipt of my Letters Patent, which came to hand on the 10th inst. I was much pleased with their appearance. The drawings are so perfect that they hardly need explanation to enable a person to understand the working and construction of my machine.

W. W. GREEN.

Chelsea, Ill., March 25, 1860.

MESSESS. MUNN & Co.—I am indeed under obligations to you for the promptitude with which you have conducted that business, and trust that your success in obtaining the patent will enable me ere long to show to you my gratitude for the kindness and indulgence you have on former occasions extended.

W. BUSHWICK.

Easton, Pa., March 26, 1860.

MESSESS. MUNN & Co.—On March 26th I received a letter from you, stating that you had been successful in prosecuting the business I entrusted to your care. Yesterday I received the Letters Patent, which confirmed your statements. I was much pleased with the description and claims, and was satisfied that the originators are competent and experienced men. Please accept my thanks for your services in the prosecution of my case at the Patent Office, and be assured that if any of my friends have business to transact in your line, I will recommend them to you.

G. K. BARCOCK.

Utica, N. Y., April 6, 1860.

MESSESS. MUNN & Co.—I have not before had an opportunity of expressing to you my sincere thanks for your prompt and upright way of transacting my patent business, and if I have any other business I will certainly solicit your aid. I have considerably simplified my lock, so as to make it applicable to banks and other places where safety is required. There is one thing in your system of obtaining patents that is alone worth (to an inventor) all your fees; and that is the explanation you give (in the weekly list of claims) at the end of each patent obtained by you. I am astonished at any one employing any other than yourselves; and such as do cannot be constant readers of your valuable paper—the SCIENTIFIC AMERICAN.

C. DUCKWORTH.

North Adams, Mass., April 9, 1860.

MESSESS. MUNN & Co.—Yours' of the 10th inst. was received this morning; please accept my thanks for the information therein, and for the able manner in which you have prosecuted my claims before the Patent Office. Be assured that I shall use every laudable means to further the success of your agency and that of your indispensable paper—the SCIENTIFIC AMERICAN—which I consider should be in every mechanic's house. I have given to three apprentices the paper for one year, and I find, upon inquiry, that they have already improved by the perusal of it.

S. DAGGETT, JR.

Charleston, S. C., March 18, 1860.

MESSESS. MUNN & Co.—Accept my sincere thanks for the promptness and efficiency with which you have conducted my case through the Patent Office. I had scarcely hoped to have heard from it before another month (at least) had passed, seeing the very many applicants that are constantly pressing their claims. I shall certainly recommend others to present their inventions through you. I have now under my eye a very poor man, of some sixty years, or more, who is struggling to get his application considered, but finds himself involved in constant trouble and difficulty. I have not failed to urge him to take the same course, not doubting that you will inform him faithfully whether his invention is as valuable as he supposes, whether it is patentable, and whether likely to clash with other patents. I shall now add the stimulus of your success in my case, and again urge him to confide his claim to you.

I remain yours, with sincere thanks,

S. CHAMBERLAINE.

Philadelphia, Pa., April 4, 1860.

MESSESS. MUNN & Co.—I have received the two patents issued the 10th inst., which makes three that I have received through your agency within the last few weeks. It is indeed gratifying to do business with businessmen who understand their business and have the facilities in every department to accomplish what they undertake. Every case, thus far, which I placed in your charge has been successful. The one now before the Patent Office I trust will meet the same result, as also the one before the English office. Inventors should be doubly cautious in whom they trust their cases. Several years ago I lost one by bad management of an agent in Washington City. Your success has more than met my most sanguine expectations, and hereafter it will afford me the greatest pleasure to recommend you to all my friends and inventors generally. Respectfully yours,

J. F. EMERSON.

Trenton, N. J., April 16, 1860.