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Contents:

(Illustrations are indicated by an asterisk.)

WHAT CAN BE DONE FOR INVENTORS.—ADVICE GRATIS AND ADVICE FOR PAY.

For the information of Inventors, we would state that it is the custom, at the office of this paper, to examine models or drawings and descriptions of alleged new inventions, and to give written or verbal advice as to their patentability, without charge. Persons having made what they consider improvements in any branch of machinery, and contemplate securing the same by Letters Patent, are advised to send a sketch or model of it to this office. An examination will be made and an answer returned by early mail. Through our Branch Office, located directly opposite the Patent Office in Washington, we are enabled to make special examinations into the novelty and patentability of inventions. By having the records of the Patent Office to search, and the models and drawings deposited therein to examine, we are enabled to give an inventor most reliable advice as to the probabilities of his obtaining a patent, and also as to the extent of the claim that it is expedient to set up when the papers for an application are prepared. For this special examination at the Patent Office we make a charge of Five Dollars. It is necessary that a model or drawing and a description of the invention should accompany the remittance.

The publishers of this paper have been engaged in procuring patents for the past eighteen years, during which time they have acted as Attorneys for more than TWENTY THOUSAND patentees. Nearly all the patents taken by American citizens in FOREIGN countries are procured through the agency of this office.

Pamphlets of instructions as to the best mode of obtaining patents in this and all foreign countries are furnished free on application.

For further particulars as to what can be done for Inventors at this office, see advertisement on another page, or address

MUNN & CO.,
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STEAM ENGINES IN COLD WEATHER.

It is a curious fact that steam engines, in general, are put up in situations where no other machines would be: in cold bleak exposure where the winds sweep directly on them; in rough sheds where the rain drops down on the cylinder, and dust flies into the journals, and in all conceivable spots where loss can ensue by their imperfect operation, or damage come from the elements. Where no animal used by man could exist, there shall the steam engine be found. Of course, such a state of things is the result of the grossest ignorance and laxity of management, but these should never have been tolerated, and changes ought to be made where they exist.

From this writing, henceforward, until the return of more genial weather there will be frequent casualties from the circumstances mentioned. Feed pumps and pipes will freeze up and burst, and vertical tubular boilers will meet a like fate. Left over night in cold sheds, the water in them will soon freeze, and the consequent expansion will work the usual destruction. Many instances have occurred of boiler explosions caused by feed pipes freezing solid. No water passes to the boiler, and what remains is soon evaporated. The flues or crown sheet burns, and are forced down, even if no greater injury occurs. When the tubes are not frozen up, much damage ensues from the great extremes of heat and cold the boiler has to sustain; leaks frequently start from this cause. Where steam engines are exposed, the water should be drawn out of the feed pipe, and pump every night. There should be a pet-cock between the two valves, suction and feed, by which to empty the pump barrel and valve chambers, and another cock in the lowest part of the suction pipe; bends sometimes occur which hold water, while the body of the pipe is clear. The pump ought to be boxed up; also the exhaust pipe if it enter or leave a heater. The heater must also be emptied, so that no injury may happen to it. With these simple precautions no damage can occur, and the loss which arises not only from the expense of repairs but also from the stoppage of the factory will be avoided.

WILL PHOSPHORUS SET WOOD ON FIRE?

Professor Doremus having stated in one of his lectures that phosphorus burns with a flame, the heat of which is not sufficiently intense to set wood on fire, some of the daily papers which are advocating the cause of Jeff. Davis, have seized upon the statement, as proving that the recent attempt to burn this city was not directed by men of intelligence, and therefore could not have originated with the arch rebel.

Phosphorus has a strong affinity for oxygen, and is constantly absorbing it from the atmosphere when exposed to its action. The absorption is usually sufficiently rapid to cause a feeble glow, visible in the night, but not in daylight; and persons have been frightened into convulsions by having "Death," or some other startling word, written with phosphorus on the walls of their bedroom—the writing being invisible until the gas was turned off, when it came forth in letters of fire.

If the phosphorus is spread out into an exceedingly thin sheet, so as to expose a large surface to the action of the air, the absorption of the oxygen will be so rapid as to kindle the substance into flame. This extended surface is most readily obtained by dissolving phosphorus in some volatile liquid, and pouring the solution over some surface on which it may spread; then as the liquid evaporates, it will leave the phosphorus very thinly extended. The best liquid for this purpose is bisulphide of carbon, which is a powerful solvent of phosphorus, and exceedingly volatile.

Our readers will remember that a few years since, a good deal was said in the English newspapers about an incendiary shell, filled with a solution of phosphorus in bisulphide of carbon. It was gravely stated that this shell was too destructive for the humanity of the English people!—a humanity that was gratified by blowing the Sepoy rebels from the mouths of cannon, by the destruction of peaceful hamlets along the shores of the gulf of Finland, and by the bombardment of Kagosima.

The truth was that the shells were wholly inefficient, from the property of the phosphorus flame pointed out by Professor Doremus. Whenever the shells burst the liquid itself would take fire and burn up, but it failed to set other substances on fire.

The villains who tried to burn this city provided themselves with phosphorus dissolved in bisulphide of carbon, and if they failed to use sulphur, which the phosphorus will set on fire, and which in its turn will convey the flame to wood, they did not fail to employ an effective substitute for sulphur, as the event showed; for the furniture was set on fire.

The real cause of the failure of this fiendish attempt is that which we have already pointed out. The criminals had not sufficient knowledge to add to their incendiary piles a quantity of some substance containing oxygen which would have been set free by the heat, and would have continued the fire with the greatest violence and intensity.

THE ONE THING TO DO WITH THE CURRENCY.

The high price of gold is no sign of impaired confidence in the credit of the Government; nor is it a necessary result of the war; it is simply an inevitable effect of certain laws of Congress, namely: those laws authorising the issue of four hundred millions of treasury notes for circulation. Had these laws been passed in a period of profound peace, gold would have risen to the same price that it now commands. That the issue of an excessive quantity of paper money will lower its value, as compared with that of the precious metals and other commodities, has been proved by most disastrous experiments in Russia, Austria, and other countries—experiments that were made in times of peace.

In November, 1861, Salmon P. Chase, Secretary of the Treasury, estimated the bank note circulation of the loyal States at $130,000,000, and the specie, including the deposits in the banks, at $210,000,000, making a total of $340,000,000. This was the portion of the currency of the world which fell to the share of these loyal States under its natural distribution by the inexorable laws of trade. As we have repeatedly shown, it is impossible to change the aggregate value of this currency, unless there should be a change in the wealth and commerce of the country as compared with the wealth and commerce of the rest of the world. Consequently, any change in the volume of the paper portion of the currency must be necessarily accompanied by a corresponding change in its price. Our readers will remember that before the change in the price of a single article, we predicted in the plainest language the general advance in prices that has resulted from the inflation of our currency.

Assuming the estimate of the Secretary to be correct, the $200,000,000 of specie might have been displaced by government notes without any considerable advance in the price of gold and other commodities. This, in fact, was the case; there was no great advance in prices when the first $200,000,000 of "legal tenders" were issued. The principal effect of this issue was to drive the gold out of circulation, and out of the country. It converted our mixed currency of gold and paper into one wholly of paper of about the same value—a change of no great importance. But all further issues inflated the currency, and thus lowered its price, or in other words, raised the price of gold.

As the issue of the $200,000,000 of currency in excess of our share of the currency of the world, is the measure that has wrought all the evil, the simple remedy is to withdraw this amount of notes from circulation. The only way of doing this is by funding them. If bonds were offered for this purpose, all that great majority of the people who are interested in lowering the price of gold would be prompted to subscribe for them. If every man who has any money in his pocket would invest half of it in these bonds, the remaining half would become worth just as much as the whole is worth now, and he would have his investment into the bargain. There can be no doubt that there is sufficient public interest felt to secure the success of the measure, and this measure adopted would bring gold to par or very near it. Our whole internal revenue of $300,000,000 would then be in gold or its equivalent. The credit of the Government would be established in Germany and other parts of Enrope beyond all question, securing an unlimited sale of our bonds at nearly par in specie. This would insure our ability to carry on the war for

whatever length of time might be necessary to wear out the rebel armies. The restoration of our currency would diminish by one half the cost of prosecuting the war, and would check the growth of the public debt by an amount equal to $1,000,000 per day. It would double the incomes of that large portion of the people who live upon wages. Finally, it would place our finances in the sound condition, and secure their conduct in the provident spirit, which alone is worthy of a rich and powerful nation.

To make this measure fully operative, an act must also be passed repealing all provisions for making any interest-bearing notes a legal tender for debts. A considerable portion of the $210,000,000 of specie estimated by Secretary Chase as being in the country in 1861, was held by the banks. That portion has been displaced by interest-bearing "legal tenders." But in order that there may be no inflation of the currency with $200,000,000 of government notes in circulation, the banks must be compelled to absorb their share of these notes.

TINDER.

When a piece of paper is set on fire, it all burns up except the tinder—which comes from the hot blaze unburned. And yet, if a spark fall upon this tinder it will catch fire and burn far more readily and surely than paper will. Why does it not burn in the blaze with the other portions of the paper?

Paper is made mostly of vegetable fiber, which is composed principally of carbon, oxygen and hydrogen. The three elements when combined in this substance are all solid, but if they are separated, the oxygen and hydrogen take the gaseous form, while carbon continues solid. By the application of heat the vegetable fiber is decomposed, when the oxygen and hydrogen expand into gases. As the hydrogen at the high temperature comes in contact with the oxygen of the air, it combines with it to form water; in other words, it burns in the form of a blaze.

Could the carbon come in contact with the oxygen of the air at the high temperature of red heat, it also would be burned, but the volume of hydrogen envelopes it, thus preserving it from contact with the air. The body of hydrogen itself burns only upon its outer surface.

The heat absorbed by the hydrogen in its change from the solid to the gaseous state cools down the carbon below the temperature at which it will combine with oxygen, so that as the last of the hydrogen passes away, the fire is extinguished, leaving the carbon in the form of tinder. If paper is kindled in sufficient mass to keep up the temperature of the carbon to the combustion point, it also will combine with the oxygen of the air to form carbonic acid, which will pass off as a gas, leaving only the incombustible ash, which is the small quantity of mineral matter contained in the paper.

PROF. DOREMUS'S LECTURES.

FIRST LECTURE.

According to appointment Prof. Doremus gave the first lecture of a course on Pneumatic Chemistry at the Cooper Institute, on the 10th inst. Owing, doubtless, to the inclemency of the night, the hall was not filled to its capacity, but the audience made up intellectually what it lacked in numbers. The large hall was about two-thirds filled.

Professor Doremus introduced his subject by a general allusion to the importance of science on the world at large, and the variety of themes it offered for investigation and discussion. Through science we learned the structure of the globe, we made great advances in agriculture and the arts, and attained a more perfect state of civilization. Of the several themes, however, none were more attractive than Gases, "the ghosts or spirit form of matter." The peculiar features or properties of these were undiscovered until the last century; they are now known to possess qualities in common with ponderable bodies. The learned lecturer in speaking of the intricacy of chemical science alluded to astronomy, and asked, if this latter were bewildering in its manifold changes and infinite distances, what shall be said of chemistry whose transpositions, complications, combinations and separations are almost inconceivable? Many experiments were made to prove the assertion that gases had properties in common with solids. Thus a number of lighted candles were placed in the bottom of a deep glass jar and suddenly extinguished by pouring gas over them from another jar above, showing that its contents descended upon the flame. The weight of common air was shown by a globe attached to a weighted scale so that the beam was just poised. When the air was pumped out of the globe by an air-pump on the stage the weighted end of the scale preponderated.

SECOND LECTURE.

Among the most striking experiments exhibited at the second lecture was the decomposition of water by sodium. A tall inverted bell glass filled with water was standing in a pneumatic trough on the platform, and the lecturer took some small pieces of sodium from a phial in which the metal was covered with naptha to shield it from contact with the air, and wrapping them in bits of paper to prevent his fingers from being burned, he pushed them under the bell glass. The sodium being lighter than water rose to the surface in the glass, and as oxygen has a stronger affinity for sodium than it has for hydrogen, the water was decomposed; the oxygen of the water combining with the metal sodium to form caustic soda, and the hydrogen being set free as a gas.

Water was also decomposed by potassium. In this case the metal was thrown upon the surface of the water where it swam about in the most lively manner, decomposing the water, combining with its oxygen to form caustic potash, and setting the hydrogen free. The hydrogen as it was set free took fire, combining with the oxygen of the air, again to form water. The experiment being on a very large scale, the action was attended by violent explosions and very brilliant corruscations.

The extreme lightness of hydrogen was shown by holding an inverted jar filled with the gas under a burning gas jet, and suddenly turning the jar over so as to bring the open mouth upward. The gas from the jar immediately floated upward in the air, and as it came in contact with the jet it burned with a loud report.

The novelty of Professor Doremus's experiments consists in the unparalleled scale on which they are conducted. In decomposing water with potassium, he had a tank 5 by 10 feet in size, and blocks of ice weighing 100 pounds.

A NOTICEABLE FACT.

While every other journal in the country has doubled its subscription price, the rates of the Scientific American are the same as last year, so far as relates to our regular mail subscribers. Every intelligent reader can see at a glance that it is only by a large subscription list that we can publish the paper at present rates without incurring a loss. We feel certain that this hint will be enough. The Scientific American is a sufficient recommendation of itself without further comment, and in continuing to furnish it at the usual rates, we count largely on the support of our patrons.

A Large Magnet.

Among the philosophical apparatus belonging to the Free Academy in this city, is an electro magnet weighing 650 pounds, which has held seven men suspended at one time, and how much more weight it would support nobody knows. This magnet was made by Charles T. & J. N. Chester, of 104 Centre street, in this city. It is formed of two round bars of the softest iron, each 4 inches in diameter and 24 inches in length, which are secured at one end by massive screws to a cross piece to form a U magnet. The bars are wound with 200 pounds of No. 13 copper wire, insulated with cotton and shellac, and laid on in eight equal lengths, making the finished bar about eight inches in diameter. The armature is a bar of soft iron weighing 80 lbs. A neat wagon is employed for moving this magnet about the room, or it may be suspended from the ceiling by means of a block and tackle.

Kimball's Screw-holder.—From a misapprehension of the uses of this efficient little article, recently illustrated on page 384 of this volume, it was stated to be a *workholder*. The inventor informs us that he intended it solely as a screw holder, for which purpose it is well adapted. The patent was issued Nov. 8th, 1864, not Aug. 30th, as given.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING DECEMBER 13, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.

45,382.—Potato Masher.—Wm. Ball, of Peru, Mass.:

I claim, first, The standard, b, terminating at its upper end in a horizontal arm, m, for supporting the follower by means of its rack and pinion, and swiveled at its lower end in the ring supporter, f, so as to be capable of being turned horizontally to one side, in combination with the said ring supporter, f, and standard, a, as herein described.

Second, The cylinder or shell, e, provided at its lower edge with lugs, c, in combination with the slots, n, and supporting ring, f, in the manner and for the purpose specified.

45,383.—Harvesters.—Joseph Barnes, of Rockford, Ill.:

I claim, first, The combination of the frame, the driving wheel, the gearing and the tongue, substantially in the manner described.

Second, The bed-plate or gear frame, A, when constructed and arranged to operate as described.

Third, The combination of the driving wheel and gearing with the bed-plate, when arranged for joint operation, as set forth.

Fourth, The combination of the stationary toothed ring, D, with the planetary gear, as described, for the purpose of driving the crank shaft through the tubular axle of the driving wheel, as set forth.

Fifth, The combination of the foot-lever, C, the toothed ring, D, and the flange, b', substantially in the manner described, for the purpose of throwing the mechanism into and out of gear, as set forth.

Sixth, The tongue, constructed substantially as described, for the purpose of allowing it to be changed from a tongue for a harvester to a sweep for a horse-power, or vice versa, as specified.

45,384.—Lamp Wicks.—Thomas Bingham, of Newburgh, N. Y. Ante-dated Jan. 31, 1863:

I claim the substitution of wool, in whole or in part, for wicks to lamps for burning fluids, camphene, kerosene, carbon and other oils, and for all illuminating purposes requiring a wick or conductor, substantially as set forth and described in the foregoing.

45,385.—Hay and Straw Cutters.—C. D. & W. S. Brewer, of Lewisburg, Pa.:

First, We claim the press-board, B, shaft, k, arm, R, connecting rod, Y, and treadle, L, when arranged and operating as and for the purpose specified.

Second, We claim the rake, F, when attached to the press-board, B, operating as and for the purpose set forth.

45,386.—Stitching Horse.—George F. Brockway, of Washington, D. C.:

I claim a stitching horse provided with folding legs, a reach and clamps, all arranged substantially as herein shown and described.

I further claim the toggle, spring strap and treadle, and applied substantially as herein set forth.

[This invention relates to a new and useful improvement in stitching horses, such as are used by saddlers and other workmen in leather for the purpose of holding and clamping the same while being stitched.]

45,387.—Machine for Husking Corn.—A. W. Case, of South Manchester, Conn.:

I claim the revolving hopper, B, composed of a series of boxes, a, at the periphery of a wheel, in combination with the concave of fluted rollers, C, all arranged to operate in the manner substantially as and for the purpose herein set forth.

I also claim the cutter wheel, f, when used in connection with the revolving hopper, B, and concave of fluted rollers, C, for the purpose specified.

I further claim having the boxes, a, of the hopper, B, placed in an oblique position, so that the ears of corn will be prevented from lodging or catching between the rollers, as herein described.

[This invention relates to a new and improved machine for stripping husks from the ears of corn after the latter have been detached from the stalks.]

45,388.—Coal Scuttle.—George Chambers, of Ithaca N. Y.:

I claim the aperture, g, the slide, c, with its handle, and the false inclined bottom, b, when used in connection as described, and equivalents thereunto, for the purposes set forth.

45,389.—Heating Apparatus.—Thomas S. Clogston, of Boston, Mass.:

I claim so constructing and arranging a heating apparatus, in the manner described.

45,390.—Gas-Regulating Valves.—Charles M. Cresson, of Philadelphia, Pa. Ante-dated Dec. 3, 1864:

I claim a valve having a stem or tail, in which are two or more excavations or depressions of different lengths, arranged substantially as and for the purpose described.

45,391.—Inkstand.—David Cumming, Jr., of New York City:

I claim the case, A, with a movable bottom, B, substantially as described and for the purpose set forth.

45,392.—Hoop Skirts.—Theodore D. Day, of New York City:

I claim forming the joints in the front portion of skeleton skirts, in the manner specified, in order that the skirt may be folded or compressed when the person is seated, as set forth.

45,393.—Wardrobe Bedstead.—A. Dietz, of New Orleans, La.:

I claim, first, The hinged bottom, C, and platform, F, with bars, m o, to sustain the musketo net, in combination with the wardrobe, A, constructed as herein shown and described.

Second, The slide, i, links, j, and spring bolts, k, in combination with the catches, g, platform, F, and wardrobe, A, constructed and operating in the manner and for the purpose substantially as set forth.

[This invention consists in a hinged bottom, with legs, and hinged adjustable musketo frame, in combination with a wardrobe, in such a manner that on opening the wardrobe the bed bottom can be readily folded down and the musketo frame up, and locked, and by these means a bed can be fitted up and protected by musketo netting in a few minutes and with little labor. The musketo frame, when raised is fastened by double spring catches, which can be released by an easy and simple motion of the hand.]

45,394.—Machines for Loading Hay.—Leopold De Lacee, of Newark, N. Y.:

I claim, first, The supplemental endless carrier, M, when arranged