# Scientific American.

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NEW YORK, APRIL 7, 1855.

Steam versus Ether

We sometimes receive communications expressing dissent to opinions we have presented, simply, because some works and some professors whom these correspondents have looked up to as first authority, have presented opinions and made statements contrary to our own. We received a letter from a correspondent last week, expressing his dissent from the opinions we expressed on page 214, respecting the use of ether vapor as an economical agent in propelling machinery, in comparison with steam.

"You have scarcely devoted" he says, " sufficient thought to the subject, else you would have perceived that the density of the vapor (that is, the density of ether vapor in comparison with steam,) could have very little bearing upon the question, beyond the variation in the proportion between the volume of the vapor and that of the liquid from whence it is derived." He then quotes an article from Silliman's Journal, November, 1854, which states, that in an experiment with Du Tremblay's boat, by steamalone, 9.51 lbs. of coal per horse power were consumed per hour; while with steam and ether, only 2.24 lbs. of coal were used per hour for each horse power. We must say, that we have not the least confidence in such a statement. The gain stated to have been obtained by Du Tremblay's engine, is simply by the use of ether in a separate cylinder expanded into vapor by the exhaust steam. But how this exhaust steam applied to the ether effected such a gain-more than quadruple the amount of steam alone  $(9.51 \div 2.24 = 4.25)$  — we are not informed.

Our correspondent, in order to enlighten us further, quotes an article of Prof. Apjohn's, on the economy of ether over steam, taken from the Chemical Gazette, Oct. 5th, 1852. Instead of not having, as our correspondent supposes, devoted sufficient thought to this subject, we criticised that very article on page 117, Vol. 9, SCIENTIFIC AMERICAN, and showed that Prof. A. did not know what he was writing about. The following is the

concluding part of our correspondent's letter :--- "The data most to be relied on are, water-specific heat=1.00; latent heat of steam 961.8, boiling point 212°; ether, specific heat 0.50, latent heat 163.8, boiling

Our correspondent must dip a little deepquitoes and flies in summer, when a portion to Alex. Bain. This machine was illustrated er in chemistry than he seems to have done of the window is left open for proper ventilon page 273, Vol. 3, SCIENTIFIC AMERICAN.in taking Prof. Apjohu's reviews for his guide, ation. The inventor is B. B. Webster, of Bos-Respecting it. Dr. Lardner says: "The sys before he can enlighten our readers on this ton; a patent was granted for the improvetem of Bain is to the common telegraph subject. We must tell both him and Prof. A., ment on the 4th of last October. what the steam engine is to the horse-the that equal volumes of the vapor of ether Fig. 1 is an inside view of a window havpower of the hand loom or the stocking and water (steam,) contain equal amounts ing the improved mosquito curtain attached frame to the knitting needle." The Review of heat-there is not the difference, as he -the lower sash being partly elevated, in seems to anticipate a time when the Post Ofstates, of 1129°+5347° in equal volumes. fice will give place to the telegraph, and order to exhibit the curtain. B is a roller though there may be in a volume, but the (moved by a spring in boxes, A A,) around that the former will only be employed for distinction between the two is as great as which the gauze curtain is wound when the sending heavy orders. "When the sixpenny cheese and chalk. Graham (far better auwindow is closed. The spring is indicated or penny telegraph comes into play," it says, thority than Apjohn) says, "the same bulk by the dotted lines in fig. 2 (a perspective "Mr. Bain will stand forth as the greatest of of vapor will be produced from all liquids sectional view) at A. C is a movable bar telegraph inventors." It makes this assertion with the same expenditure of heat; hence that may be easily detached from the sash, upon the authority of Dr. Lardner, who there can be no advantage in substituting D, to allow the window to be easily opened. states, that 20,000 words can be sent in one any other liquid for water, as a source of va when desired, without using the curtain. C hour, by one wire, on the chemical telegraph, por in the steam engine." Why did Graham C, fig. 2, shows this bar detached. When the and to a greater distance than by the magcome to this conclusion? Simply because window is partly open, the space between the netic telegraph. reward.

produce an equal bulk of vapor. Our correspondent and Professor Apjohn repudiate a unit or proper base of measurement, hence they have come to as sensible conclusions as the man who estimated, that of two men, one washead and shoulders taller than the other. because he was standing on a bench, while the other stood on the ground.

If we take 10 lbs. of water and convert it into steam, we find it will occupy a space of 1728 times its former bulk, with an expenditure of 1184° of heat. Now, if we take 10 lbs. of ether, we find that it can be converted into vapor with only an expenditure of 258° of heat. "A vast saving," Prof. A. will say but this is not so, for this vapor having just six times less the elastic force of the steam, will only occupy a space of 288 times its former bulk, for it is six times denser than steam. It will, therefore require 60 lbs. of ether converted into vapor to do the same work of 10 lbs. of water converted into steam. "Equal volumes of vapors possess equal quantities of latent heat." The latent heat of ether vapor is 162°, that of steam 972° therefore a gallon of steam and a gallon of ether vapor, of the same pressure, contain 972° of latent heat. The specific gravity of vapors is in proportion to their latent heat, therefore [s. 972+e.162=6] the vapor of ether is six times heavier than steam. But it may be said, "the boiling point of steam is 212°, that of ether 96°, therefore there must be a gain of 116° in the use of ether." If we reasoned like our correspondent and Prof. Apjohn, we would, indeed, come to such a conclusion ; but be it remembered, that it takes six times the quantity of ether to produce the same amount of vapor as water, therefore it requires more heat to use ether vapor than water vapor as a motive agent. Ether boiling point 96°+latent heat

162°=258×g.6=h.1548°=or 364° more than steam. These figures are very different from those of our correspondent. There are others besides him who have been equally deluded by trusting to unlearned Professors and unsubstantial authorities respecting the economy of the vapors of ether, alcohol, &c., as substitutes for steam. The foregoing, we trust, will cause the scales to drop from their eyes

Mosquito Window Screen. Fig. 1.;

The credit of inventing and constructing makes the gain twice as much as he does. ment in window screens for excluding musthe most rapid working telegraph is given

an equal weight of water and ether do not glass and the bottom of the upper sash is effectually closed by some flexible material, to that way. A like insect curtain may be applied to the upper sash, if desired The common mosquito curtains are fixed to a separate frame made for the lower sash of windows, which has to be removed, and the curtain frame set in. This invention is certainly a neat and convenient improvement over the common kind. This curtain has only its





small spring and roller box, B, secured to the window sole by screws, and the bar, C, to which the upper end of the curtain is attached, clasped upon the lower part, D, of the sash, so that when the window is raised, as shown in fig. 1, the curtain is drawn up and covers the space, to prevent the ingress of insects. When the window is lowered, the springs in the roller box wind the curtain by self-action on the roller, B. The tension of the springs can be regulated in a minute, to suit any window to which a curtain is attached.

More information may be obtained by letter addressed to Mr. Webster, at No. 9 Blackstone street. Boston.

# Progress of the Telegraph,

The last number of the North British Review contains an able article on the "Electric Telegraph," in which the claims of several inventors are criticised. It gives the credit of suggesting the first electric telegraph, and publishing a description of it, to a correspondent of the Scott's Mechanics Magazine, as far back as February, 1753, more than a hundred years since. This communication no doubt describes a working telegraph, the power being frictional electricity, for the voltaic battery was not discovered for fifty years afterwards. For public purposes, this old telegraph could not be used, but it is certainly a scientific curiosity. The merit of inventing the modern elec-

tric telegraph, and applying it on a grand scale, for public use, is awarded, "beyond all controversy," to Prof. Morse, and the reand foreigner with astonishment."

We have always been given to understand that the whole credit of inventing, erecting, prevent insects from entering the room in and introducing the telegraph in England was due to Professor Wheatstone, of London; all the historical accounts of the telegraph award him that honor. But it now comes out that such credit is more justly due to W. F. Cooke, his partner, who has been unjustly robbed of such credit through the connivance of the friends of Prof. W.

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We learn that the Morse telegraph is used in Prussia, but not in England, the signal telegraph being the one principally used there. Switzerland is at present that country of Europe which possesses the most complete net of telegraphs. There is a telegraph office there for every 25,000 inhabitants, in England one for every 56,060 inhabitants, in Sardinia for every 70,000, in Belgium for every 130,000, in France for 290,000, in Prussia for 320,000. The moderate single tax of one franc for a despatch of twenty-five words in the whole territory of the Swiss Union, has thus far found a complete imitation in no other land. No less than 37,000 miles of telegraph wires extend through Britain and Ireland. Our American lines are estimated at 41,392, but the wires, we suppose, are more than double this length. Distant Hindostan now bears testimony to the sway of the telegraph. A line was opened on the 1st of last month (February) between Bombay, Madras, and Calcutta, embracing a distance of more than 2000 miles. It is to be carried through Egypt, and will soon be in communication with the European lines, so that messages will then be transmitted from London to ancient India in a few seconds. The telegraph is one of those inventions which tends to change the social conditions of society, and the habits of mankind. Its power and infuence are now felt in every department of life. The press, the mercantile world, and the administrators of law and justice rely upon it daily for the most important information. When we recollect that ten years ago there were only thirty miles of telegraph lines in our country, and that now there are a thousand times thirty miles in operation, we have no hesitation in asserting that we firmly believe the whole earth-through ocean and overland-in ten years more, will be girdled with the lightning rail, and man will communicate with his fellow man, in a few minutes, from the most distant portions of the globe.

# Testing Lubricating Oils.

H. L. Kendall & Co., of Providence, R. I., point 100.4°, hence, by calculation, we find viewer seems to make this award in a most have a delicate machine for testing oils, &c., the caloric necessary for formation of a volcandid manner. He says, "while men high both as it regards their anti-friction qualiume of the vapor of water is 1129°, that of in office, and even men of science on both ties, and durability when applied to lubriether 534.7°. That is with ether somewhat sides of the Atlantic, entertained doubts of cate machinery. All those who have patent less than one half required for water. To its the applicability and practical use of the and improved oils for such purposes, and practical use, however, there are obvious obtelegraph, Prof. Morse was actively engaged wishing to have them tested, can have this jections, such as its cost, inflammable characin pressing the importance of his invention done by sending samples to Mr. Kendall. ter, difficulty of surface condensation, &c., on the attention of Congress, and though This will confer a favor upon us, and upon which exclude it from its possible usefulonly half convinced by his earnestness and all our railroad superintendents, and manuness." M. P. demonstrations, the Federal Legislature apfacturers, as Mr. Kendall will make a report, Our correspondent is right in his last senpropriated a sum of money for the constructhrough the columns of the SCIENTIFIC AMERtence, respecting its practical application. tion of a telegraph forty miles in length, be-ICAN, of his experiments, and thus spread but he is wrong in all that precedes it. Altween Washington and Baltimore. This may abroad, throughout the length and breadth lowing him to be correct in his statement, be considered the parent telegraph of the of our land, a particular kind of information wherein he alleges that a little less than one trans-atlantic world, from which a system of the most important character. The subhalf the heat only is required for ether vahas sprung, which, in its extent and achieveject of lubricating oils is becoming of more por in comparison with water vapor, he ments, is well calculated to fill both native importance every day. We do not know ought to have seen how untrustworthy the how much is expended every year for oils on statement in Silliman's Journal is, which The annexed figures represent an improveour railroads alone, but it must amount to an enormous sum. And when we take into consideration the number of steamships, steamboats, woolen and cotton factories, saw mills, printing presses, and all the othe machines in our country, which consume oil, for lubrication, we should not be surprised if the sum total amounted to five millions of dollars annually. If any saving can be effected by a knowledge of what is the most economical lubricating material, a great good will be accomplished. The price, antifriction, and durable qualities of each oil will form the data of comparison, and the unit of the tests will be the best quality of sperm oil. We hope and trust that great benefits will result from this notice. Those who send samples of oils to Mr. Kendall will be pleased to pay the expense of transport, as his labors are to be given without fee or



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### [Reported Officially for the Scientific American.] LIST OF PATENT CLAIMS

Issued from the United States Patent Office. FOR THE WEEK ENDING MARCH 28, 1855.

ROTARY PUMP-Abel Barker, of Honesdale, Pa. : I claim causing the buckets. cc c, during a portion of their revolu-tion, to pass through an enclosed channel, k, and during the remainder of their revolution to pass through the cham-ber which communicates directly with the central induction opening, f, substantially in the manner and for the purpose set forth.

CLAMF AND MOUTHFIEGE FOR LUMBER JOINTING MA-GHINKS-C. P. Bauersfeld, of Uncinnati, Ohio: I claim, first, two or more clamps so arranged, and connected as de-scribed, as to be simultaneously and equally applied to or withdrawn from the different parts of a portion of furniture to be jointed by the means of a single handle. Second, the parallel motion fixed in any desired position by means of the bridle and screw, as described.

PREFARING WOOLEN ROVING-A. E. Bigelow, of Chi-copee, Mass.: Having thus described the nature of my in-vention, and the reasons for the mode of operation which I have invented, together with the mode of construction which I have tried with success and deem the best. I wish it to be distinctly understood that I do not dipit myself to such special mode of construction, as the "after mode of op-eration may be obtained by the mere substitution of equiva-lent means.

lent means. But I claim the mode of operation specified, of spinning woolen yarms from previously twisted roving between two sets of naw rollers, substantially as specified, in combina-tion with the subsequent twisting n the same direction by ring groove travelers, flyers, or other equivalent devices substantially as specified.

substantially as specified. SFINNING WOOL-A. E. Bigelow, of Chicopee, Mass : Al-though I have elseribed the use of flyers for twisting and whating on the rovings, I do not wish to limit myself to the use of flyers in the practical application of my said inven-tion, as any of the known equivalents for the flyer or any be substituted for this one element of the combination. But I claim in the preparation of woolen roving the combination of flyers, or the equivalent thereof, and their appendages with the ring doffer or doffers of a carding ma-chnne, by the interposition of a pair or pairs of rollers, sub-statinilly as specified. Macquires non Trueynor the Lise or Augens-Ran-

MACHINES FOR TURNING THE LIPS OF AUGERS-Ran-som Uook, of Shelburne Falls, Alass. : I do not claim any of the several and separate parts of the machine described ex-cept the wrench. But I claim the combination of the several factors

Corp the wrench. But I claim the combination of the screw shaft, or its equivalent, with the wrench, and crimping or clamping dies, as sub-stantially set forth and for the purpose mentioned. I also claim the shape of the wrench, substantially as de-scrived, for the purpose of turning the lips of boring imple-ments.

GRAIN AND GRASS HARVESTERS-Andrew Dietz, and J. Duuham, of Raritan, N. J. Ante-dated Jan. 2, 1855 : Dunham, of Raritan, N.J. Ante-stated Jan. 2, 1855. e claim, first, constructing the cams, U and D, upon driv-g whiel A, of a length exac.ly corresponding to the cut-ig range of a single stroke of the knile startug the ast-nce and return of the cutter bar, substantially as and for

vance and return of the casts and the purpose set forth. Second, the difference in the relative depths of the cams, C and D, in combination with the linked levers, B and V,

Called J. In Contentation with the infacts revers, in and v, arranged and operating substantially as set forth. Third, arranging the highest elevation of each can upon the wheel. A, at a point between the highest elevation and lowest depression of a cam upon the other side of the wheel, substantially as set forth.

PROCESSES FOR REFINING JEWELLERS' SCRAPS-Levi B. Darling, of Providence, K. I. : I claim the processes descri-bed of separating and recovering the gold and silver from goldsmiths' and jewellers' scraps, such as turnings, sweep lugs, cuttings, hings, which contain both noble and base metals, that is, by melting down the metallic compounds, then surring in gradually the niter, and working the mass without fluxing, then washing with water and treating with sulphuric acid to convert the oxydized products into sul-phates, in the manner described. phates, in the manner described.

[This is one of the most valuable inventions which has been patented under the chemical class for a long time.]

Computer that the chemical design of a long time j Computer of the chemical design of the computer of the chemical entritugal governor, or a resistance governor, when used separately, as I am aware that a governor of the latter char-acter was patented by W. Gardner, June 10th 1851. But I claim the combination of a speed governor with a resistance governor, in such a manner that each shall exert its own proper effect upon the motive power, producing thereby a compound resultant regulation, without either of the said governors interfering with the action of the other, as set forth.

[See notice of this invention on another page.]

CHAIRS-L. W. Ferrins of Owego, N. Y.: I do not claim a chair wherein the parallelism of the back and foot rest rails is maintained by the arms and seat. But I claim hinging the seat, at its back to the back of the chair only in combination with hinging the rails of the foot rest to the lower end of the pieces forming the back so that the seat shall partake of the inclination of the back and foot rest rails, and said foot rest rails move on a changing center, as set lorth.

MODE OF SUPPORTING TABLE LEAVES-H. A. Frost, of Worcester, Mass. : Leo not claim the idea of using a brace to support table leaves, as such. But I claim the application to table leaves of a self acting swing brace or support, which shall operate by its own weight, when the leaves are valued, substantially as set forth.

CULTIVATORS - H. D. Ganse, of Freebold, N. J. : I claim hrst, that shape of the up light parts or fenders described, in its application to the purposes described, by which the fore most point of each fender is elevated to or above the sur-face of the ground, and the lower or cutting edge inclines backward from that point, in the manner described, so as to secure the result described. Second, the combination of said fenders with the mold boards and wheels in the manner described, the invention of which mold boards and wheels i do not claim.

boards and wheels I do not cla

# Scientific American.

Looms-David S. Harris, of Coventry, Rhode Island I do not claim the shutle guard, as I am aware that shut the guards, substantially similar to that I have shown have been employed, attached fixedly to the lay, or if movable, requiring to be moved by hand, and I do not confine myself to the use of a shutle guard constructed precisely like that

to the use of a shuttle guard constructed precisely has the described. But I claim the connection of the shuttle guard in any way substantially as described, with the belt shipper, in such a manner that when the loom is in gear the guard may stand over the shuttle rice in such a way as to prevent the shuttle flying out of the loom. Jour when the loom is out of gear, the guard may bersized out of the way of the atten-dant to enable threads to be picked out or drawn through the reed, or such other manipulations to be performed as may be necessary.

[On another page may be found a notice of this valuable improvement in Looms.]

FIRE PROOF SAFES-R. G. Holmes & W. H. Butler, of New York City: We are aware that a compound of alum and clay has been used as a fire-proof filling for safes: also that brick, soft stone, layers of pumice and other porous substances have been used for an interior fire proof limity or shield for the like purpose; likewise that, in connection with various soft porous fillings between the inner and outer cases of the safe, tubes containing alkaline solutions have been interspresel; none of such therefore do we claim, nor yet, as a more antiphlogistic compound, the combination of analkali with alum. But we claim a new and useful improvement in alum fillings of safes or other fire-proof structures, essentially as specified, combining with the alum filling an alkali, in such proportions as that the alum in becoming heated or melted, has a part of its acid neutralized by the action of the alkali, when the said filling is interspersed with, and supported or restrained from setting down by cells, a, of porous material, or frame work of porous substance arranged substantially as described. FIRE PROOF SAFES-R. G. Holmes & W. H. Butler, of

restrained fro or frame wor as described.

[This invention is one of importance to safe manufacturers and the well known reputation of Messrs. Holmes & Butler as safe manufacturers will be greatly enhanced by adopting this new filling.]

this new filing.] ILLUMMATING VAULT COVERS—Thaddous Hyatt, of New York City: I donot wish to be understood as making claim broadly to the security of glass directly within a soft metal sash, nor to the securing of glass within a metal case to be inturn secured within a metal socket, as these have been known when applied as specified. I claim the method of securing glasses in the apertures of metal plates or other surfaces by surrounding the glass with a hoop or belt of lead, gutta percha, or other equivalent yielding substance, and forcing the glass so in rounded into the aperture or recess, substantially as and for the purpose specified.

Looks-Wm. S. Irish, of Middlebury, O. : I do notclaim the harness frame uprights, cams or shoes; but I claim the method of raising the harness to the immediate application of the cams to the shoes or projections of the harness, sub-stantially as set forth.

WATE DAR-J. S. Kirk & W. H. Elliot, of Plattsbur N. Y.: We claim the employment of a suspension rod the support of the grate bar arranged as described, or equivalent. The constructing of the wearing and supp ing parts, as described separately, so that said wearing p may readily be removed and replaced for the purposes forth. GRATE BAR-J. S. Kirk & W. H. Elliot, of Plattsburgh, J. Y.: We claim the employment of a suspension rod for

TOOL FOR BORING HUBS TO RECEIVE BOXES-Urias Kimble, of Penfield, N. Y.: I do not claim theshaft, thead justable kuita, or the adjustable gauge, as they have been

known before. I claim the oval-shaped box with the nut with spurs on the undersideresting on the oval shaped box in combina-tion with the shaft, the knife, and the gauge, for the purpose set forth.

METHOD OF CHALKING LINES-S. B. Knight, of North Providence, R. I. : I claim the described method of chalk-ing a line by drawing it through the cylinder or other ves-sel containing the fine chalk, and also through the rubber of leather or other compressible substance for the purpose and in manner substantially as set forth. And this I claim when used for chalk or other coloring material.

SHINGLE MACHINE-Charles Leavitt, of Quincy, Ill. : I SHINGLE MACHING—Charles Leavitt, of Quincy, III.: I claim, first the clastic table, k, capable of being elevated and depressed by the means described or their equivalents, in combination with the froe or splitting knife, h, substan-tially in the manner set forth and for the purposes specified. Second, the elastic shingle holder constructed and arrang-ed substantially as described and for the purposes specified. Third, the jointing knifes, d, pivoted to the plane stocks in combination with the bar, a', substantially as described, for the purpose of jointing the edges of the shingles with a drawing cut.

SELF-ADJUSTABLE OR ANCHORING PUMP-Thomas Ling, of Shelby, . I claim, first, connecting the bision or sta-SELF ADJUSTABLE OR ANGLORING PUMP-Thomas Ling, of Shelby, O. I claim, first, connecting the pixion or sta-tionary part to a weight or anchor by a flexible joint, or its equivalent, so as to allow the anchor to a shapt itself to the bottom of the well without cramping the other parts, sub-stantially as described. Second, connecting the anchor to the cylinder or moving parts by means of the projections and slotted arms, or their equivalents, so as to draw the anchor from the well by means of the pipe and cylinder or moving pats, substantial-ly as described.

means of the pipe and cylinder or moving parts, substantially as described. Third, I claim the devices, substantially such as are described, or their equivalents, for guiding and steadying the upper end of the pipe, and discharging the water downwards into a box, having an opening in the side in which the pipe traverses closed below the pipe by the plate, **F**, or its equivalent.

alent. CHARCOAL FURNACES—Jo'hn McNeill, of New York City: I do not claim a hollow or tubular iron beam, merely as such, as I am aware that hollow beams have been and are commonly used in various structures. But I claim supporting the retort tubes, B B, by a hollow or tubular beam or beams with open ends applied substan-tially as described, so that one end of each is in communica-tion with the cold or atmospheric air outside the furnace, and the other with the chimney or escape fine, whereby a current of cold air is caused to be induced through the beam by the draft of the chimney or flue, for the purpose of keep-ing it comparatively cool, preventing it burning and render-ing it a firm and durable support to the retort tubes. And I also claim constructing the furnace with one or more arched walls, H, extending across it, substanially as uescribed, to support the joints in the beams,  $\oplus$  G, when the said beams are make in two or more lengths, and also to support thesidewalls and roof. I See a further description of this furnace which is so im-

[See a further description of this furnace which is so important to sugar refine is, on another page.]

SEED PLANTERS—Hiram Moore, of Climax, Mich; I do not cluim a grooved seed distributing wheel, nor a seedscat-

SEED FLANTERS-mirram muone, on communy matters not cluim a grooved seed distributing wheel, nor a seed scat-tering board individually. I claim grooved seed distributing wheels, K K, provided at the bottom of the grooves with partitions extending about one third of their depth, in combination with the dash board, H, in the manner and for the purposes set forth.

BILL HOLDER-G. W. Palmer, of Boston, Mass. : I claim an oblong box of suitable size for holding files of bills or papers, having upon one of its sides a hinged movable arm and attached spring, by which the papers are held in place, as fully described.

frame and arrangement of teeth, the front angle bearing a light steel cutter tooth, and the rear angle a large shovel tooth, in the manner and for the purposes set forth.

HULLING COTTON SEEDS-Joseph Walker, of Dover, Eng-land. Patented in England, July 20, 1854: I claim sup-portin - and adjusting the concave bed by means of grooves cut within, or other equivalent devices affixed to the side frame, in such manner that the said concave shall be eccen-tric to the axis of the hulling cylinder, for the purpose speci-fied.

CULTIVATORS FOR SWEET POTATOES-Wm. P. Zane, of Woolwich, N. J.: I claim the vine hooks, fg g, arranged in such a manner in relation to the cultivating teeth, h h, that the said hooks will remove the vines out of the way of the said cultivating teeth, and allow them to operate upon the soil without injury to the vines, substantially as set forth.

PROCESSES FOR MAKING KEROSENE—Abraham Gesner, of Williamsburgh, N. Y. (assignor to "The Asphalte Min-ing and Kerosene 6ms Go."): I claim the process described for extracting the liquid hydrocarbons which I have denom-inated Kerosene, from asphaltun, and biuminous rocks and shales, petroleum and maltha, by subjecting any of these substances to dry distillation, rect-fying the distillateby treating it with acid and treshly cal-cined lime, and then submitting it to re-distillation, as set forth.

MANUFACTURE OF ZINC WHITE-Smith Gardner, of New York City (assignor to [through others] Edward Kellogg, of Brooklyn, N. Y. : felia the combination of the fire cham-ber, the vaporizing chamber or oven, and the oxydizing chamber, substantially as described.

### ADDITIONAL IMPROVEMENT.

LUBRICATOR-R. M. Wade, of Wadesville, Va. Patented June 6th, 1854: I claim, first, the division of the plug into two longitudinal chambers, C and D, and the relative posi-tions of the feed and discharge openings in said chambers, so that while one chamber is discharging a simultaneous feed will take place in the other. Second, disclaiming the tubes, f and P, as mere vent pas-sages I claim their insertion relative to the feed openings of cup and plug, as described, whereby they perform the double

Second disclaming the tudes, i and T, as mere vett pas-sages I claim their insertion relative to the feedopenings of cup and plug, as described, whereby they perform the double junction of vent and steam passages : the feed openings of the plugs passing under the tubes and discharging the steam contained in the plug clear of the oil in the cup, before com-municating with the feed channel of the cup.

[On page 356, Vol. 9, SCI. Am.; this invention may be und illustrated.]

A Substitute for Guano.

The Montreal Commercial Advertiser says that a French farmer, by the name of Malon. has discovered a method of converting the offal and refuse parts of fish into a valuable manure, equal in fertilizing power to the best Peruvian guano, and possessing no offensive qualities. He conceived a project of converting these fish into a more compact and convenient kind of fertilizer, and accordingly, after a few trial experiments, embarked in 1851 for Newfoundland and established a large factory at Herpon, in the Straits of Belle-Isle. He associated with himself a partner who established also a similar factory at a little fishing village near Brest, in France. At these factories the refuse fish and offal of all the fishermen in the vicinity were bought. They were first boiled under a pressure of fifty pounds to an inch, and then the pressed cakes were reduced to a pulp by a mechanical rasp, and dried in a hot stove. The material was next ground to powder in a mill, and packed away in bags and barrels for use. One hundred parts of the fresh fish yielded twenty-two of fish powder, and is eagerly purchased by the farmers. From the water in which the fish is boiled, about two and a-half per cent. of oil is skimmed. The French factory produces some fifteen hundred tuns a year of fish manure, and that of Newfoundland is expected to produce annually eight or ten thousand tuns.

## A Great German Skeleton,

The famous fossil skeleton of the zeuglodon, found in Alabama some fourteen years ago by a German named Koch, exhibited in New York, and afterwards sold to a Dr. McDowell at St. Louis, was lately taken for debt, and in process of removal fell to pieces, and many of the bones were broken, when the wonderful monster was found to be of genuine plaster of Paris formation, and of entirely German origin, being connected with the primeval epochs only by the raw material.—[Exchange.

[Barnum couldn't perform such a feat as

use it, and had to throw it among his old brass rubbage. He believes that long exposure to the air is the cause of it becoming brittle.

Steel and Iron,

The difference between common iron and steel is in the carbon in the latter, but if iron be heated to a white heat and plunged in cold water, it becomes very hard. Mechanics take advantage of this in making axles and collars for wheel work, for it is easily filed and turned in a soft state, and afterwards hardened; this is most commonly practiced in the machine shop. Molders who make wheels, are often embarrassed by this chemical property in iron. Foras the metal is poured into the mold of moist sand, the evaporation of the water carries off the heat and cools the iron so quick as to make it extremely hard. This is common in such portions of the metal as have to run the greatest distance from the aperture of reception. The only remedy for this, is to have the sand as dry as possible, and as many apertures as are convenient.

The harder the steel the coarser the grain, -fine steel has the closest grain. A neat curved line and gray texture denote good steel; threads, cracks, bright specks denote bad. The management of the forging may indeed modify these indications, and steel good for some purposes, may be bad for others. Very small articles heated in a candle, are found to be perfectly hardened by whirling them in the cold air; and thin plates of steel, such as the needle of a compass, are hardened by being ignited and laid upon a plate of cold lead and quickly covered with another.

"Case hardening" is that property of iron by which it becomes very hard on its surface. Articlesof iron may be case hardened by smearing their surface with a paste of the prussiate of potash, then heating them to a red heat, and dipping in cold water.

In making tools, the artist is directed by the colors of the steel while heating. The different colors direct, in tempering, to a standard. When steel is too hard, it will not do for tools intended to have a very fine edge, because it will soon become notched, and if too soft, it will too easily bend. Purple is the color for gravers, or tools used to work in the metals; when the color appears in heating, it is immediately plunged in cold water; a very hard temper will be made, if the steel is taken at a yellow color and dipped. Blue is the color for springs and instruments for cutting soft substances, such as leather, &c.

### Force of the Wind in a Tornado.

On the 1st of January, Bombay was visited by a cyclone or hurricane, which commenced about midnight, and lasted six or seven hours. It began at S. E., and before its force was expended had gone round the compass to W. N. W. At the hight of the gale the pressure of the wind was equal to thirtyfive pounds to the square foot-a force against which nothing living could stand up on open ground. The next morning the gardens appeared as if a heavy roller had passed over them, and the various directions in which the tall Palmyra palms had fallen, afforded a palpable indication of the revolving character of the storm.

# Florida Cochineal,

them on the plants is to put a small quantity

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The cochineal is said to be native to Florthis. ida; this insect hovers about several varie-Give employment to the poor man when- | ties of the cactus, but prefers that known as er you have an opportunity. By so doing, the prickly pear, where it weaves its web you will often save a fellow being from want and deposits its eggs. In Guatemala it is -from the pang of returning, without bread, cultivated to support the insect, being plantto his house. You will encourage him to be ed in rows on rich lands and kept free from honest and industrious-add to the comfort weeds. When twenty months old it is said of his family-receive his grateful thanks, to be fit to receive the insect. The seed inand acquire by his labor the full value of the sect is small, and is preserved in boxes, twenty-five pounds being sufficient for one pittance thus bestowed upon him. thousand plants. The manner of placing

SCREW WRENCHES-L. D. Gilman, of Troy, N. Y.: I make no claim to the tech on the sliding bar of the wrench. But I claim the arrangement of the adjustable toothed plate with its springs, the toothed shath ot the adjustable jaw, and the eccentric with its strap attached to the toothed plate, the several parts being operated in the manner as de-scribed and shown.

PACKING JOURNAL BOXES-Warner Groat, of Troy, N. 1.1 claim the combination and arrangement of the pack-ings, ring and apparatus for tightening the same within the box, substantially as described, so that the packing in the inner end of the box can be tightened at the end, and the box be kept oil tight without being pierced with holes, as senoited specified.

Specifies, OPERATING VALVES IN DIRECT-ACTING STEAM ENGINES, -W. H. Guild & W. F. Carrison, of Brooklyn, N. Y.: We do notconfine ourselves to the particular form of the valve do notconfine ourselves to the particular form of the valve within described operation. We claim giving to the valve the whole or part of the movement necessary to effect the change in the direction of the engine piston by means of the steam acting upon a pis-ton, E, which is arranged and applied to work perpendicu-larly to the valve within a cylinder, D, attached to a cap fitted to the back of the valve, e, or its equivalent, by which it is caused to operate substantially as set forth. Isee a description of this invention on another page.]

[See a description of this invention on another page.] LSee

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COFFINS-David Sholl, of Cincinnati, Ohio: I claim the production of a coffin composed of terra cotta or pottery ware.

CURRENT WHEEL-W. S. Smith, of Cedar Rapids, Iowa: I claim the construction of current wheels with heads or hubs movable on the shaft, as and for the purposes set forth

MANUFACTURE OF BOOTS AND SHOES-H. G. Tyer and John Helm, of New Brunswick, N. J. We disclaim the useor application of this our deviceor invention to anyoth-er matter or thing other than is described and set forth. We claim the uniting of the outer sole and upper manufac-tured wholly or in part, of vulcanized india rubber, with the insole of boots and shoes, by means of cement, the cement passing through perforations made for that purpose in th upper, in the manner substantially and for the purposes d upper, i scribed

SEED FLANTERS-Myron Ward, of Owego, N. Y. : I claim the adjustable slotted share for the purpose of removing ob-structions, and at the same time allowing the fine earth to pass through the slots, which share is made adjustable by means of a thumb screw and plate in rear. I also claim the short compressors glocks on the periphery of the wheel, which compressors crowd the earth laterally over the seed, and at the same time indicate the place of the hill, and by which means the grain can be planted in check rows.

CULTIVATORS-R. P. Vanhorn, of Jackson Town, O.: I claim the peculiar elongated rhombus-shaped wrought-iron

#### Deterioration of Brass.

R. O. Dian, of St. Mary's, Ohio, informs us on a piece of gauze and attach it to a thorn; that he worked a great deal of brass in Eng- from this they distribute themselves over the land, and when he came to America he plant, and when come to maturity, which is brought a quantity of brass wire-Nos. 13 in about two months, are scraped offgently; and 14-with him, which, he thought, had and exposed to the sun on a polished piece been in the shop about twenty years. Latter- of metal for some twenty days, and then ly, it has become so brittle that he could not carefully packed in mats.-[Florida News.