

ENGINEERING INVENTIONS.

A railroad rail spike forms the subject of two patents issued to Mr. Thomas A. Davies, of New York city. According to one of the patents, the heads are laterally inclined upon their lower sides, to give them a substantial bearing upon the flanges of the rails when the spikes are driven into the ties in an inclined direction. The other provides for the head of the spike having its lower part in the form of a frustum of a cone, with its axis at right angles with the axis of the spike body, to give a firm bearing on the rail flanges whether the spikes are driven vertically or not.

A stay plate for railroad rail spikes has also been patented by the same inventor. Combined with the rails, ties, and spikes are tapered plates, of a width greater than that of the spikes, driven into the ties at the outer sides of the spikes, and transversely with the grain of the wood, to hold the spikes firmly in place against the rail flanges, and prevent the rails having any lateral movement.

A center fastening for railroad rails, likewise patented by the same inventor, provides for recesses in the edges of opposite flanges of the rail, in which are driven inclined fastening spikes, at opposite inclinations on opposite sides of the rail, such improvement being especially applicable on single track railroads, to resist the tendency of the rails to creep in either direction.

MISCELLANEOUS INVENTIONS.

A tool handle has been patented by Mr. Frank Cronin, of Deming, New Mexico. This invention covers a double ratchet mechanism, made for easy adjustment, to allow rotation of the bit in either direction, and is intended for use with all sorts of hand tools requiring a rotary motion.

A machine for sewing looped fabrics has been patented by Mr. Joseph M. Merrow, of Merrow, Conn. This invention relates to machines for uniting parts of stockings or other knit work, and covers an attachment whereby the thread that unites several articles is cut automatically instead of by hand.

A hand saw has been patented by Mr. Alfred Forander, of Brooklyn, N. Y. Combined with a stock or handle are a straining bar and cam lever, for locking the straining bar on the stock or handle, to facilitate placing and securing saw blades of various sizes in the frame, the improvement being especially applicable for hack saws and butchers' saws.

An insect destroyer has been patented by Mr. Dudley H. Manning, of Sibley, Iowa. Combined with an inverted conical ring holding a frame with a lamp within it and a transparent shade around the lamp are reflectors, and a conical hood above the lamp, the apparatus being placed on the top of a pail or other vessel partly filled with water, which is thus illuminated and attracts insects.

An endless band or cord has been patented by Mr. Leedham Binns, of Philadelphia, Pa. It is tubular plaited, united at its ends by each of the ends being inserted bodily and longitudinally in reverse direction to each other within the portion of the body of the band next adjacent to the other end, being specially designed for driving the spindles of spinning machines and other machinery.

A loom shuttle has been patented by Mr. Charles N. Newcomb, of Omaha, Neb. It is designed especially for rag carpet looms, and has tension regulating springs projecting into its eye, with a rag receiving can having an open end adapted to be placed within the shuttle body, the can holding a large quantity of rags and delivering the weft with a light and uniform tension, without twisting.

A windwheel has been patented by Mr. Franklin G. Tallyerday, of Poplar Grove, Ill. Its wings are made of sail cloth or similar material, in a suitable frame to be expandible and contractible, and the construction is such that the wind, acting upon the concave part of the wing, opens it to its fullest capacity, and when blowing on the convex surface closes the fan or wing part way down.

A bicycle has been patented by Mr. Selden A. Jan Graw, of Nashua, N. H. This invention covers a novel construction of parts and details in a bicycle whose speed can be regulated as desired by changing the proportional sizes of toothed wheels which transmit the power, and which has a safety attachment to prevent headers or the tilting of the bicycle.

A metallic sole for boots or shoes has been patented by Mr. William T. Milholland, of McKeesport, Pa. It has closed hollow projections on its outer face, such projections being struck from the body of the metal of the plate, so as to inclose air spaces on the sole when applied, and the plates being fastened on by nails or screws, making boots or shoes well adapted for mill men or others having to walk over hot floors.

A permutation lock has been patented by Mr. Walter E. Malley, of New Haven, Conn. Combined with a casing, sliding bolt, and sliding tumbler are ratchet wheels adapted to engage with the tumbler, and push pins or other devices for turning the ratchet wheels, the latter being held in place by pawl springs which can be disengaged from the wheels, making a lock that is simple, safe, and not liable to get out of order.

A shoulder brace has been patented by Messrs. William Carroll and John Meekison, of Columbus, Ohio. Besides the usual features of a shoulder brace, the straps are connected with wires or cords made to extend down to each heel, where there is, in the hollow boot heel, a spring, rack, and pinion, which operate to make a pull on the brace to hold the shoulders back when the weight of the body is resting on the feet.

A wool washing machine has been patented by Mr. James E. Sinclair, of Waverly, Md. This invention covers improvements in a former patented machine of the same inventor, the machine having a series of connected receptacles in which the wool is successively treated, the receptacles being combined with one or more pumps for elevating the wool and water, and elevators for returning the water to the place from whence it was drawn.

Special.

AMONG THE BANK NOTES.

The American Bank Note Company is the largest as well as the oldest corporation in this country devoted to the work of designing and engraving bank notes, coupon bonds, and all that extensive class of fine art commercial literature. It dates back as far as to 1785. It printed the work for Government securities as long ago as 1809. One of the oldest engraving firms outside of this great concern was that of Rawdon, Wright, Hatch & Smillie, whose name is familiar to all who handled the bonds and notes of thirty or forty years ago. Mr. Smillie, of this firm, who achieved national reputation as an artist, is now spending the years of a ripe old age at Poughkeepsie, New York. His son, William M. Smillie, Esq., is one of the Vice-Presidents of the American Bank Note Company, having charge of the detail of the artistic work in that great institution.

A well known New York editor recently visited Mr. Smillie in his office in the new building of the American Bank Note Company. This building, by the way, is the most beautiful and ample in the world for the purpose of commercial art work. It is under the shadow of the spire of Trinity Church. Its offices are spacious and elegant, and its workrooms are equipped with a wonderful perfection in everything pertaining to the designing and production of the immense quantity of fine engraving and choice printing sent out from there.

"So your father is now seventy-eight years old, is he, Mr. Smillie?"

"Yes, and for a man of his age he has had a wonderful experience. Last winter he had an attack of pleurisy. We brought him from Poughkeepsie to this city in order to place him under the care of his old physician. He remained here two or three months, most of the time in very low condition. There was great adhesion of the pleura, and he could use only about half of one lung. He returned to his home, and grew so much weaker that we all thought he would die. The pleura was tapped, and three quarts of water taken from it. He suffered so that we determined to send him to my brother's at Montrose, Pa., thinking that change of air might do him some good. The change was made last July. While at Montrose he suffered much from intense pain in the chest and suffocation. We gave him the best medical care that could be obtained. But it was of little avail. He wanted to go home to die.

"In this condition he was brought to New York, wrapped in shawls and blankets, for his feet were swollen and he could not get his boots on. I found him thus at the St. Cloud Hotel early in September.

"When my father's case had reached this point, I said to him and my mother and sisters: 'Now, you have all had your way as to medical treatment; suppose you let me have mine. I am a believer in Compound Oxygen. I want to try it on father.' They agreed to it, although they said his case was hopeless. We got a nurse from Bellevue Hospital. She said she knew nothing of Compound Oxygen, but would give it a fair trial.

"I went to my old friend, Dr. Turner, in charge of the New York office of Compound Oxygen, 148 Fifth Avenue. I told him my father's feet were badly swollen; that his breathing apparatus was all out of order; that his stomach was in bad condition from twenty years of dyspepsia, and that he was very low. The doctor said: 'I hope we can help him; we will try.'

"So I took a 'Home Treatment.' Father was so weak he could hardly inhale it at all. He could take the Oxygen in short whiffs. The nurse gave it to him ten or twelve times the first day. That night he slept, and it was the first good sleep he had taken for weeks. It was on a Tuesday that he began the Oxygen Treatment. By Saturday he was so much better that he wanted to leave the hotel and go to his home in Poughkeepsie. We lifted him along as gently as we could, and in a few hours he was sitting on his portico overlooking the Park and the Hudson River, and enjoying one of the most beautiful sunsets ever seen. Said he: 'The Lord has made this sunset especially for me. Now let me go to bed. I want to sleep.' He slept nearly all night, and with almost entire freedom from pain.

"A week ago I spent a day with him. I arrived about lunch time, and they gave me lunch in his room. When he saw it set out on a small table, he said: 'That's most appetizing. Why don't they give me my lunch that way? I'm tired of eating sick folks' dishes. I want some cold lamb and food like other folks.' Then he said that in order to eat solid food he must have his teeth fixed. He sent for a dentist, who took out three lower teeth and made him a new set. Why, if those teeth had been taken out before he began taking the Compound Oxygen, it would simply have killed him. Now he stood it bravely, and what is more, he is getting along handsomely with his new set, and eating pretty much what other people eat. His improvement has been marvelous. Formerly he could sleep only by resting his head forward on a chair placed for the purpose. Now he can lay his head back on his easy chair and sleep comfortably. Before he took the Oxygen he had not been in a bed for six weeks. Now he goes to bed every night, and obtains refreshing slumber. He walks about his room, and is sometimes taken out for a short drive. He takes Oxygen several minutes at a time, morning and night."

"Mr. Smillie, has your father's improvement been steady and regular, or has he had interruptions?"

"There have been occasional days of depression, and two or three times we have almost feared that he was going to lose all he had gained. But each of these depressing periods had been less than the previous one. I shall not be surprised if such periods return occasionally. It is natural in a man of his age that they should. But see the improvement! His breathing was obstructed, his stomach pain was great, his sleep was misery, and his skin was hard and dry. Now he breathes naturally, his stomach is free from distress, his sleep is refreshing, and his skin is like that of an infant. Let me remark that the use of the Oxygen, which accompanies the Compound Oxygen, proved very advantageous for the relief of his stomach and bowels."

"Do you regard your father as an entirely well man?"

"As well as a man of seventy-eight can be who has passed through the experience he has. To renew the youth and heal all the infirmities of a man of his age would be an impossibility. But you see what Compound Oxygen has done for him. It has evidently prolonged his life. And it has performed wonders in easing him of pains which made life a burden."

"And now as to your own experience, Mr. Smillie? You must have had good reason for falling in love with Compound Oxygen to such an extent as to recommend it for your father."

"Four or five years ago I was badly overworked. I had been giving too close attention to business, and found myself breaking down. I procured a 'Home Treatment,' and diligently followed directions. It brought me up. Since then I have never been without it, and I never will be. My wife has been suffering from nervous prostration, and she is now taking Compound Oxygen with excellent results.

"I have a friend who, three summers ago, was suffering with a dreadful cough. 'That man can't live long,' said some of his friends who heard him cough. I persuaded him to go with me to the Compound Oxygen office. A few inhalations of Oxygen produced a marked effect on him. He had been almost sleepless at night. He soon began to enjoy restful sleep. All summer he kept on improving. In the fall his cough was gone. He is now as lively and hearty as any of us."

Is not this Compound Oxygen a wonderful thing? The doctors try to find out what it is made of. Mr. Smillie's physician asked for a vial from the "blue bottle" in order to analyze it. He reported that he couldn't tell what it was, but he was satisfied that it had done wonders for Mr. Smillie. Its whole history is the history of the accomplishments of wonders, which in many instances were more than its most sanguine believers had dared to hope for. A little book which will be mailed free by Drs. STARKEY & PALEN, 1529 Arch Street, Philadelphia, tells much that is of value and interest concerning Compound Oxygen. Make free to write for it.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Bradley's improved Cushioned Helve Hammer. New design. Sizes, 25 to 500 lb. Bradley & Co., Syracuse, N. Y. Light and Fine Machinery to order. Foot Lathe catalogue for stamp. E. O. Chase, Newark, N. J.

Curtis Damper Regulator for draught and steam pressure in boilers. Curtis Regulator Works, Boston, Mass.

Geo. E. Lloyd & Co., Electrotype and Stereotype Machinery, Folding Machines, etc. Send for catalogue. Chicago, Ill.

Notice to Manufacturers or Inventors.—A company with a large foundry, iron and woodworking machine shop in running order, located in one of the best towns in Ohio, not troubled with strikes, where coal, wood, and iron are cheap, would take any article made of iron or wood to make during the winter months, which is their duldest season of the year. Stoves or stove castings preferred. Address H. B. J., Lock Box 221, Columbus, O.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Sole manufacturers of the new Dip Lacquer Kristaline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty, St., New York.

Grimshaw.—Steam Engine Catechism. A series of thoroughly Practical Questions and Answers arranged so as to give to a Young Engineer just the information required to fit him for properly running an engine. By Robert Grimshaw. 18mo, cloth, \$1.00. For sale by Munn & Co., 361 Broadway, N. Y.

The Knowles Steam Pump Works, 44 Washington St., Boston, and 98 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

Coiled Wire Belting takes place of all round belting. Cheap; durable. C. W. Belting Co., 98 Cliff St., N. Y.

Air Compressors, Rock Drills. J. Clayton, 43 Dey St., N. Y.

Haswell's Engineer's Pocket-Book. By Charles H. Haswell, Civil, Marine, and Mechanical Engineer. Giving Tables, Rules, and Formulas pertaining to Mechanics, Mathematics, and Physics, Architecture, Masonry, Steam Vessels, Mills, Limes, Mortars, Cements, etc. 900 pages, leather, pocket-book form, \$4.00. For sale by Munn & Co., 361 Broadway, New York.

Shafting, Couplings, Hangers, Pulleys, Edison Shafting Mfg. Co., 36 Goerck St., N. Y. Send for catalogue and prices.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

Wanted.—Patented articles or machinery to manufacture and introduce. Lexington Mfg. Co., Lexington, Ky.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

Send for Monthly Machinery List to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN patent agency, 361 Broadway, New York.

Supplement Catalogue.—Persons in pursuit of information of any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Send for descriptive circular on lubrication. Charles H. Besly & Co., North American Agents for Reiser's Celebrated Solid Oil, 175 & 177 Lake St., Chicago, Ill.

Keystone Steam Driller for all kinds of artesian wells. Keystone Driller Co., Limited, Box 32, Fallston, Pa.

Wood Working Machinery. Full line. Williamsport Machine Co., "Limited," 110 W. 3d St., Williamsport, Pa. Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 46.

Cutting-off Saw and Gaining Machine, and Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

Cushman's Chucks can be found in stock in all large cities. Send for catalogue. Cushman Chuck Co., Hartford, Conn.

Crescent Steel Tube Scrapers are made on scientific principles. Crescent Mfg. Co., Cleveland, Ohio.

Curtis Pressure Regulator and Steam Trap. See p. 222. The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Holting Engines. D. Frisbie & Co., Philadelphia, Pa. Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 350.

Send for catalogue of Scientific Books for sale by Munn & Co., 361 Broadway, N. Y. Free on application.

Pays well on Small Investment.—Stereopticons, Magic Lanterns, and Views illustrating every subject for public exhibitions. Lanterns for colleges, Sunday schools, and home amusements. 136 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., N. Y.

The "Improved Green Engine," Automatic Cut-off. Providence Steam Engine Co., R. I., Sole Builders.

Catechism of the Locomotive, 625 pages, 250 engravings. Most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for catalogue of railroad books. The Railroad Gazette, 75 B'way, N. Y.

"To Mechanics."—When needing Twist Drills, ask for "Standard," or send for catalogue to Standard Tool Co., Cleveland, O. See page xi., Export Edition.

Steel name stamps, 15 cts. per letter; steel figures, \$1 per set. F. A. Sackmann, 1099 First Ave., Cleveland, O.

Seam and Looming Machines, patent Burr Wheels Brushing Machines. Tubbs & Humphreys, Cohoes, N. Y.

●Machinists' Pattern Figures, Pattern Plates, and Letters. Vanderburgh, Wells & Co., 110 Fulton St., N. Y.

Astronomical Telescopes, from 6" to largest size. Observatory Domes, all sizes. Warner & Swasey, Cleveland, O.

NEW BOOKS AND PUBLICATIONS.

ELEMENTS OF INORGANIC CHEMISTRY, DESCRIPTIVE AND QUALITATIVE. By James H. Shepard. Boston: D. C. Heath & Co., 1885.

There is a marked tendency at present to make all education subjective. From the youngest baby who toddles to a kindergarten to the college senior nearing graduation, the successive steps are taken as far as possible by the student himself, and both text book and teacher become subordinate to his own faculties. In many respects the system is advantageous. The studies appear more absorbing than when viewed impersonally. There is, however, a danger that in limiting the investigation to one's own experience, the broader view of the subject, the underlying theory, may be lost. Mr. Shepard has recognized these tendencies, and in the present volume has attempted to avoid the disadvantages of too strict an adherence to either theory or practice by combining laboratory work with text book instruction from the very beginning. Systematic, experimental, and analytical chemistry are thus united in one volume, and are intended to be taught side by side. The method is unusual, for a student is seldom admitted to the laboratory until he has acquired some knowledge of elementary chemistry. It is well presented, and with a careful instructor could be expected to give good results. The grouping of the elements is made according to the reactions, as in strict analytical works, and arsenic and antimony find place therefore among the metals. The work has had the advantage of a careful revision by Dr. Ira Remsen.

PITTSBURG AND WESTERN PENNSYLVANIA. Issued by the Chamber of Commerce of Pittsburg, 1885.

Of late years, when rival towns are pressing their advantages upon the attention of manufacturers, a custom has grown up, among the various Chambers of Commerce of the competing points, of issuing pamphlets descriptive of the merits of their respective towns. It is a very good custom; for though these local bodies perhaps see more of the rose color about the smoke of the home atmosphere than other people would, their corporate standing is a guarantee of the integrity of the statements made; they offer also a convenient medium for further correspondence. The present brochure is a good example of its kind. A description is given of the main industries of Pittsburg and the natural facilities which aid their development, particular attention being of course devoted to the question of natural gas. An excellent map, showing the position of the oil fields and main gas wells, accompanies the monograph.

Natural gas: its advantages, use, and economies, by George H. Thurston, is a similar monograph having Tarentum as the subject of its eulogies. It is put forward evidently by the borough, and makes a strong appeal to the prospecting capitalist. Those investigating the economic advantages of Western Pennsylvania will find both of these pamphlets of interest.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) C. C. B. asks: Do you know of any remedy to prevent horses from wind or stumpsucking and weaving? A. Both of the troubles mentioned by you are habits, and therefore not curable by any treatment other than care. The sucking habit may be prevented by tying a piece of sheepskin, woolly side out, over the posts, or by tying something around his throat to prevent swallowing. The other habit is incurable.

(2) S. R. asks for a receipt for making German paste for canary birds, small quantity. A. Blanched sweet almonds one pound, pea meal two pounds, butter three ounces, saffron a few grains, honey a sufficient quantity. Form the whole into a paste, and granulate it by pressing it through a colander. Some add the yolks of two eggs.

(3) J. C. H. writes: 1. When I add tincture of cantharides to Horsford's acid phosphate, the mixture becomes cloudy. What are the reactions? A. The alcoholic extractive matter, insoluble in water, is naturally precipitated by the addition of an acid aqueous solution. 2. Is the phosphorus precipitated? A. The phosphorus is therefore not thrown down. 3. Are the medicinal properties of the ingredients changed? A. Not unless the extractive matter, which is precipitated, is removed, and also it depends upon what the compound is given for, whether it is impaired.

(4) H. W. H., Jr., writes: Some time ago I saw a very good method of assay of gold, a short process producing the metal from the ore to the pure state. Kindly say where I may find it. A. The detection of gold in a given mineral is a simple process, but the assay involves a determination of the amount of gold in the ore, and can only be satisfactorily accomplished by the collection of the metal in a lead button and subsequent cupellation of the same, as described in all text-books on the subject.

(5) H. M. asks (1) for means of restoring to its previous condition a painting done on white velvet, which was soiled by smoke, etc. A. We do not think that it is possible to remove the smoke without injury to the painting. 2. The method of cleaning steel engravings? A. Articles on "How to Restore Soiled Steel Engravings" are given in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 44, 115, and 124.

(6) C. M. McK. asks how will vulcanite a little less hard than that used for combs, brushes, etc., compare, under pretty rough treatment, with leather in durability? A. The vulcanite will not stand "pretty rough treatment." 2. About what proportion of sulphur would be used to obtain such a quality of vulcanite? A. For details as to manufacture see SCIENTIFIC AMERICAN SUPPLEMENT, No. 252. 3. Can you give me some idea of the cost of vulcanite in large quantities? A. The value of vulcanite is dependent upon its quality, and the price in accordance is from 30 cents to 75 cents.

(7) E. H. R. asks if the "white bronze" monuments retain their original color for an indefinite length of time. A. Yes. 2. Is the expansion or contraction of the metal by reason of heat or cold such as to be material, or worthy of consideration? A. No. 3. Does the white bronze, which I understand is zinc, wear well? A. Yes, it is very enduring. 4. My reasons for inquiry is, we are about getting up a soldiers' monument, and we want a good one. A. White bronze is excellent for the purpose you mention.

(8) J. H. asks the names of the ingredients composing the liquids in the various patent fire extinguishers, or a formula for a good liquid for the same. A. 8 pounds carbonate of soda, 4 pounds alum, 3 pounds borax, 1 pound carbonate of potash, and 24 pounds silicate of soda solution are mixed together; 1 1/2 pounds of this mixture is added to each gallon of water when required for use. See also answer to query 7 in SCIENTIFIC AMERICAN for February 7, 1885.

(9) W. W. A. asks: Can I keep ice successfully with sawdust in a room 6 feet square and 8 feet high? The bottom is 6 feet below the ground, and is well drained. How thick should the sawdust be around it? A. Your plan is feasible. A layer of sawdust from 6 to 8 inches between double wood walls will be quite sufficient.

(10) H. L. K. asks (1) how sugar coated popcorn is prepared after the corn has been popped. A. The adhesive mixture with which the corns are held together consists of gelatine with a little molasses; the coloring matter is carmine.—We cannot undertake to give examples in simple arithmetic in these columns.

(11) F. E. asks: 1. Is there any book giving full information in regard to the manner of removing hair by electricity? A. There is no single book treating on this subject, and the practical success of this method can hardly be called proved. See the articles on Removal of Hair by Electricity contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 176 and 353. 2. Are there irido-platinum needles, manufactured for this purpose? A. No. 3. Is a one cell battery sufficient? A. No. 4. How is turtle shell softened, so that it may be given any desired shape? A. It is softened by the heat of boiling water, and if compressed in this state by screws in iron or brass moulds till it may be bent into any shape, the moulds being then plunged into cold water.

(12) J. W. V. asks: Is there any difference between the so-called "compound oxygen" used by some of the doctors, and the oxygen obtained by heating potassium chlorate and manganese? A. "Compound oxygen" is simply a fancy name given to an article made and sold by various physicians throughout the country. In the May issue of the Druggists Circular, the analyses of five articles bearing the name of compound oxygen are given. 2. Is the latter ever used for medicinal purposes? A. Under certain circumstances, it is probably used for inhalation. 3. How are paper mustard plasters made? A. They are probably made by dipping porous paper in a strong alcoholic extract of oil of mustard. After it has dried, it may be applied.

(13) C. R. C. writes: An eight day clock spring 3/4 inch in width would be equal to a weight of how many pounds as to power? A. Clock springs are not always of the same power for the same width. You can only ascertain by trial of a given spring.

(14) E. C. & J. E. Y.—For stove cement use pulverized clay 8 parts, fine iron filings 4 parts, peroxide of manganese 2 parts, sea salt 1 part, borax 1 part. Thoroughly pulverize, dry, and mix. When required for use, make up the required quantity for immediate use into a thick putty with water.

(15) C. E. A. asks the simplest way to melt small quantities of gold, silver, copper, etc., also if platinum can be melted in the same manner. A. The simplest method of melting gold, silver, copper, etc., is by treating them with a little carbonate of soda on a piece of charcoal, and then fusing with a blowpipe. Platinum requires a much higher heat, and is infusible by the ordinary processes.

(16) B. writes: I can buy a good second hand portable 12 horse power boiler and engine for the same price I can a 5 horse power of same style. I wish to put an engine in my barn for steam purposes generally, such as cutting forage, firewood, etc., but do not need over 5 horse power. Which of these two engines is preferable for me? Will the 12 horse power be as economical as the five horse power in doing the same work? In my experience, it appears that a 12 horse engine doing half work is as economical as a 5 horse power at its full power. Is it? A. We recommend the 12 horse power engine, which will do your work at half the boiler pressure; and, if your boiler is in proportion, will not only give you economical results, but will be a source of satisfaction if you should afterward need more power or wish to sell.

(17) M. C. C. asks: What chemical is used in annealing malleable iron castings, and in what proportion? A. Pulverized hematite or pulverized anvil scales. The goods to be packed in cast iron boxes so that each piece shall be surrounded with the above material. The whole to be placed in an oven and heated red hot, and remain so for from 2 to 4 days.

(18) G. M.—The bluing of gun barrels is done by heating evenly in a muffle until the desired blue color is raised—the barrel being first made clean and bright with emery cloth, leaving no marks of grease or dirt upon the barrel when the bluing takes place. We do not recommend this except in the hands of experts. It requires considerable experience to obtain an even, clear blue. The receipt for browning is from the United States Ordnance Manual, and is as follows: Spirits of wine 1 1/2 ounces, tincture of steel 1 1/2 ounces, corrosive sublimate 1 1/2 ounces, sweet spirits of niter 1 1/2 ounces, blue vitriol 1 ounce, nitric acid 1/4 ounce. Mix, and dissolve in 1 quart of warm water, and keep in a glass jar. Clean the barrel well with caustic soda water to remove grease or oil. Then clean the surface of all stains and marks, by emery paper or cloth, so as to produce an even bright surface for the acid to act upon. No finger marks. Stop the bore and vent with wooden plugs. Then apply the above mixture to every part with a sponge or rag, expose to the air for twenty-four hours. Then rub the loose rust off with a steel scratch brush. Again apply the mixture and scratch brush, and if not perfect, a third time. If satisfactory, wash in boiling water, dry quickly, and wipe with linseed oil or varnish with shellac.

(19) R. G. W. asks (1) how to gold, silver, and nickel plate small things. I have a powerful battery of zinc and carbon and sulphuric acid and bichromate of potash. A. For information on electroplating we refer you to SUPPLEMENT, No. 310. You will not require a battery giving a high tension current for electroplating. 2. Which can be burnt the hardest—a hard pressed brick or one that is not pressed very hard? A. So far as the hardening of the clay is concerned, one brick will be as hard as the other; but the pressed brick will be more dense, and will consequently stand more pressure.

(20) F. R. H. asks: Will you give me in your valuable paper a little advice as to the use of melted paraffine as a means of protecting metal (tools, implements, etc.) from rust, damp, and salt air? Here in Florida I have great trouble with such things as guns, carpenter's tools, machinery, and hardware in the house rusting, and have heard a good deal of talk about paraffine. A. You can obtain paraffine from any of the wholesale druggists in New York city, who will give you prices on application. It comes in irregular fragments or in cakes; you can apply it to the metal surfaces by warming the metal and rubbing the paraffine on, allowing it to melt, or you can dissolve the paraffine in benzole or naphtha, and apply it as a varnish.

(21) D. G. E. asks: Why will a long horse-hair stretched in an Æolian harp produce a sound, when a shorter one, blown upon with a current of air from the mouth, will not? Are there any peculiar conditions in which strings produce sounds by such means? A. There is no reason why the Æolian harp effect cannot be produced by the breath, if the conditions are favorable, probably one reason why you did not succeed in your experiment is that your string was so short as to produce vibrations too rapid for a musical note.

(22) J. B. S. writes: Please send me the directions for using the Reis telephone, or let me know in what number of your paper, if in any, I can find an explanation of the same. A. Reis' telephone may be used successfully by substituting carbon for the platinum points. It may be made to transmit speech by a careful adjustment of the platinum points, but it is not practical when used in that way. Some experimenters have placed between the contact points of the transmitter a liquid such as acidulated water, thereby improving the effect. For description of Reis' telephone, see SUPPLEMENT, No. 389.

(23) F. A. H. writes: To-day a man came in my office with a small glass tube with two round globes on each end, each as large as an egg. The tube connecting the two globes was some 8 or 10 inches in length. They were about half full of a red, blood-looking fluid. By holding one bulb in the hand, for some persons, the fluid would rush to the other bulb, although the other bulb was much higher than the one in hand; for others, the fluid would not move. It was claimed by the man that had it that it was operated by the blood; a person having good blood would cause it to flow almost perpendicular into the upper chamber, while a person with poor blood would not move it. As I had never seen anything of the kind before, I was much surprised. Will you kindly explain in Notes and Queries the science of this instrument, what the fluid is, and why it operates? A. The tube and bulbs contain ether colored by aniline. The air is exhausted from the bulbs, so that the ether boils at a very low temperature, the heat of the hand being sufficient to vaporize it rapidly. The quality of the blood of the person handling the instrument has nothing whatever to do with the action of the ether.

(24) R. L. asks: 1. Would not brass wire do for winding field magnets of electric machine described in SUPPLEMENT, No. 161? A. Brass wire will not answer so well as copper wire, because its electrical conductivity is considerably less than that of

copper. 2. Would not paper covered wire do? A. Paper covered wire would do, provided you could wind it without breaking the insulation. The paper covering should be very thin and strong. 3. What would machine be worth complete? A. Such machines may be purchased for from \$40.00 to \$50.00.

COMMUNICATIONS RECEIVED.

On Clinical Thermometers. By C. E. W. On the Fly's Foot. By C. H. L.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

November 17, 1885,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with names and patent numbers. Includes items like Air and gas compressor valve, Air exhauster and water elevator, Animal trap, Animal trap, W. R. Hampton, Auger, post hole, F. Grimm, Axle box, car, N. W. Cutter, Axle box, car, W. C. Miller, Bag filler, weigher, and register, grain, L. P. Summers, Ball lock, automatic, G. B. Ballou, Bed, W. Wall, Bed clothing clamp or fastener, C. G. Harger, Jr., Bed, folding, H. S. Hale, Bed, folding couch, R. E. Hammer, Bed pan, S. V. Beal, Bed, sofa, C. Streit, Bedstead, folding, L. C. Boyington, Beehive, E. Armstrong, Beehive, W. Groff, Beehive, W. P. Hamlin, Bell, call, W. L. Upson, Bevel, miter, and try square, combined, S. S. Colt, Bevel swaging machine, J. T. Speer, Bicycle holder, A. P. Seiler, Bitters, D. J. Kyte, Blackboard composition, L. Chadwick, Board, See Electric switch board, Washboard, Bobbin, T. Hall, Boiler, See Steam boiler, Boller tube cleaner, E. W. Vanduzen, Book and music clamp, J. E. Munsaker, Boot jack, E. Harris, Boot or shoe sole, G. B. Seigenthaler, Bottle irrigating attachment, A. B. Tutton, Bottle stopper, W. Ward, Bottle stopper fastening, L. Kalling, Jr., Bottles, cans, etc., closure for, E. Schmitz, Box, See Window seat box, Bracket, L. Bridge, Bracket arm, C. Mollweg, Broom, G. A. Thompson, Brushes, machine for making, A. Frazier, Buckle, C. C. Shelby, Buckle shield, harness, J. P. Scollay, Buckle, suspender, D. L. Durand, Burner, See Hydrocarbon burner, Bustle, A. L. Rich, Butter package, W. White, Button, R. H. Isbell, Button fastener, A. G. Irvine, Buttonhole cutter, G. E. Combs, Button or stud, T. W. Foster, Buttons to cloth or other material, connecting, J. Keith, Capsule for medicines, wines, etc., C. L. Jensen, Car coupling, J. Button, Car coupling, S. G. Marsh, Car coupling, A. Nutting, Car mover, S. Shackelford, Car, railway, A. W. Driggs, Car replacing jack, L. F. Longmore, Car spring, R. Vose, Car strap, E. Q. Bowman, Car wheel, D. H. Rice, Car wheel and axle box, S. A. Bemis, Car wheel lathe, Small & McNaughton, Carpet cleaning machine, S. T. Jull, Carpet sweeper, G. W. Kelley, Cartridge shell holder, Raabe & Fisher, Case, See Cigar case, Toilet case, Casket plate, G. W. Moulton, Cement, manufacture of, M. Mathey, Centering hubs and other blocks, device for, B. Wing, Chair, See Desk chair, Folding chair, Hammock chair, Oscillating chair, Cherry seedling machine, G. W. Knapp, Chicken brooder, G. B. Bayley, Chopper, See Cotton chopper, Chuck, pivoting, F. Boardman, Cider press, P. R. Cross, Cigar case, H. W. Pitz, Cigar bunching machine, J. A. McConnell, Cigar tip cutter, W. H. Lilly, Clamp, See Book and music clamp, Presser clamp, Clamp for roof scaffolds, etc., A. T. Barlow, Clay cutter and pulverizer, W. N. Graves, Cleaner, See Boiler tube cleaner, Lamp chimney cleaner, Clipping machine, hair, Whittier & Donlon, Clocks, contact maker for electric, L. H. Speller, Clothes and hat rack, combined, J. S. Lash, Clothes drier, L. A. Johnson, Clothes drier, Z. Stephenson, Clothes line, J. S. Wailes, Clutch, A. J. Moyer, Coffin, I. C. Shuler, Coke, furnace for the manufacture of, H. M. Pierce, Coke, manufacturing, H. M. Pierce, Collar and hame, combined, Barber & Reynolds, Collar, horse, M. F. Sauer, Collar or cuff, E. Kipper, Comb, See Curry comb, Confection, F. P. Ziegler, Core barrel, collapsible, P. Wilkes, Corn sheller, King & Gilman, Corset stay, M. W. Menus, Cotter pins, machine for making, J. Adt, Cotter pins, making, J. Adt

Table listing inventions with names and patent numbers. Includes items like Cotton coopper, J. I. Greer et al., Cotton silver evener, device for adjusting, E. P. Phillips, Coupling, See Thill coupling, Crate for fruit, etc., W. F. Redding, Cream, egg, and liquor mixer, R. M. Eastman, Creamer and refrigerator, combined, F. W. Mosely, Cuffholder, D. Greenhoot, Cultivator, Brown & Bragg, Cultivator, G. Carrothers, Cultivator, J. J. Franklin, Cultivator, J. Macphail, Cultivator, C. Whitehall, Cup, See Oil cup, Current wheel, W. J. McGavock, Curry comb, W. E. Lawrence, Curtain cabinet, B. Vallett, Curtain fixture, A. C. F. Grimm, Curtain fixture, Page & Weber (r), Cut-off, cistern, G. W. & W. Lawhon, Cutter, See Buttonhole cutter, Cigar tip cutter, Clay cutter, Vegetable cutter, Derrick, adjustable, A. P. Cadden, Desk, L. Larson, Desk chair, A. Cutler, Die presses, adjusting screw for, F. M. Leavitt, Disinfecting apparatus, portable, W. W. Rosenfield, Distance instrument, J. L. Buford, Ditching, tile forming, and wire laying machine, mole, S. Montgomery, Door strip, W. Clark, Drier, See Clothes drier, Drill, See Rock drill, Drum and ventilator, heating, J. Springer, Electric circuits, device for making and breaking, E. P. Brown, Electric lighting, incandescent, E. P. Brown, Electric lighting system, E. P. Brown, Electric machine, dynamo, O. F. Jonsson, Electric machines, armature core for dynamo, M. M. Slattery, Electric machines, armature for dynamo, C. D. Jenney, Electric switch board, T. N. Vail, Electrical meter, E. Weston, Elevator, B. A. Legg, Elevator, W. Stevens, Engine, See Rotary engine, Steam engine, Traction engine, Envelope opener and paper knife, combined, G. T. Brown, Excavator, tunnel, C. C. Quinn, Expansion joint, M. H. Gray, Eyeglass hook, G. D. Briggs, Eyeglass nose pad, J. S. Spencer, Fabric, T. Isherwood, Fan, J. M. Seymour, Farm gate, W. S. Smith, Faucet, water, A. Stover, Feed water heater, O'Brien & Weaver, Feed water heater, S. J. Weaver, Feed water purifier and heater, J. P. Warner, Fence, metallic, C. Hanika, Fence strips, machine for making barbed, J. W. Roop, Fence wire reel device, W. S. Newth, Fencing, connection for metallic, C. Hanika, Fifth wheel, B. F. Gorsuch, Filter and cooler, combined, J. C. Jewett, Fireplace and heating stove, S. Reeve, Fish hook, C. Lie, Fishing reel, J. Vom Hofe, Fishing rod, bamboo, E. M. Edwards, Flask, See Liquor flask, Flue welding machine, B. F. Lowther, Folding chair or settee, H. J. Harwood, Fork guard, J. W. Drew, Fortification, revolving tower, T. R. Timby, Fortifications, revolving tower system of, T. R. Timby, Fortifications, shield and tower system of, T. R. Timby, Frame, See Quilting frame, Umbrella and parasol frame, Furnace, See Locomotive furnace, Open hearth furnace, Furnace grate, F. Miner, Game, parlor baseball, Jacobus & McKinley, Gas, apparatus for making, W. P. Elliott, Gas conduits, tube joint for, W. L. Scaife, Gas, producing illuminating, R. H. Smith, Gate, See Farm gate, Water gate, Water wheel gate, Gate, E. Fischer, Gate, J. D. Fox, Gate roller and hinge, combined, E. C. Washburn, Gear cutting machine, M. O'Gorman, Glass furnace stone, H. Felker, Glazier's point, H. W. Eames, Glazier's point, E. J. Van Reyper, Glove fastening, A. C. Mather, Governor for vessels, pendulum engine, J. M. C. Hawkins, Governor, steam engine, A. I. Loop, Grain binder, A. Stark, Grate, C. L. Riker, Grate bar, J. T. Hambay, Guard, See Fork guard, Razor guard, Hair, composition for removing, S. R. Kennedy, Hair, tablet for use in removing, S. R. Kennedy, Hammock chair, G. B. Hook, Handle, See Shovel and spade handle, Tool handle, Hanger, See Pipe hanger, Harness pad dress, J. W. Johnson, Harness sweat pad fastener, R. Brownson, Harrow, J. Macphail, Harrow, iron, A. Callander, Harvester, J. Keller, Harvester, Whiteley & Bayley, Harvester, D. Young, Harvester and mowing machine, G. M. Patten, Harvester bundle carrier, W. Beltz, Harvester, grain binding, D. R. Preston, Hat holder and coat rack, G. D. Spielman, Hat rounding machine, Tweedy & Yule, Hay press, power, A. B. Farquhar, Hay rack, H. Connolly, Hay rake, D. F. Oliver, Heater, See Feed water heater, Heating apparatus for buildings, S. Bradley, Hides, machine for unhairing, working, and scouring, A. E. Whitney, Hoisting machine, D. G. Zeigler, Hog and cattle separating device, D. L. Monroe, Holder, See Bicycle holder, Cuff holder, Hat holder, Pencil holder, Holland cases, extension door for, C. Cregmille, Hood and other garments, W. Randel, Hook, See Eyeglass hook, Fish hook, Snap hook