

Business and Personal.

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Hotchkiss & Ball, Meriden, Conn., Foundrymen and workers of sheet metal. Fine Gray Iron Castings to order. Job work solicited.

For Sale—Second Hand Wood Working Machinery. D. J. Lattimore, 31st & Chestnut St., Phila., Pa.

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American Metal Co., 61 Warren St., N. Y. City. Genuine Concord Axes—Brown, Fisherville, N. H.

For Solid Emery Wheels and Machinery, send to the Union Stone Co., Boston, Mass., for circular.

Faught's Patent Round Braided Belting—The Best thing out—Manufactured only by C. W. Army, 148 North 3d St., Philadelphia, Pa. Send for Circular.

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Magic Lanterns and Stereopticons of all sizes and prices. Views illustrating every subject for Parlor Amusement and Public Exhibitions. Pays well on small investments, 72 Page Catalogue free. McAllister 49 Nassau St., New York.

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Water, Gas, and Steam Goods—New Catalogue packed with first order of goods, or mailed on receipt of eight stamps. Bailey, Farrell & Co., Pittsburgh, Pa.

The "Scientific American" Office, New York, is fitted with the Miniature Electric Telegraph. By touching little buttons on the desks of the managers, signals are sent to persons in the various departments of the establishment. Cheap and effective. Splendid for shops, offices, dwellings. Works for any distance. Price \$6, with good Battery. F. C. Beach & Co., 246 Canal St., New York, Makers. Send for free Illustrated Catalogue.

For best Bolt Cutter, at greatly reduced prices, address H. B. Brown & Co., New Haven, Conn.

The Baxter Engine—A 48 Page Pamphlet, containing detail drawings of all parts and full particulars, now ready, and will be mailed gratis. W. D. Russell, 18 Park Place, New York.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing Metals. E. Lyon, 470 Grand Street, New York.

Spinning Rings of a Superior Quality—Whitinsville Spinning Ring Co., Whitinsville, Mass.

Solid Emery Volcanite Wheels—The Original Solid Emery Wheel—other kinds imitations and inferior. Caution—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, New York.

For best Presses, Dies, and Fruit Can Tools, Bliss & Williams cor. of Plymouth and Jay, Brooklyn, N. Y.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph &c.

Notes & Queries

A. J. will find directions for stereotyping on p. 363, vol. 30.—J. T. can blue steel articles by the process given on p. 123, vol. 31.—J. K. will find an explanation of the theory of the crank on p. 112, vol. 31.—R. J. T. should consult a physician.—J. F. is informed that etching on glass is described on p. 409, vol. 31.

(1) W. B. asks: At what angle should mower knives be ground, so as to give the best and most desirable edge? A. It depends upon the material to be cut.

(2) W. K. says: Inasmuch as the question whether sparks of electricity can be discharged from the body of a workman in a powder mill, and cause an explosion, is agitating the minds of scientists, I send you an account of an incident which came under my observation a number of years ago. On a bitterly cold wintry day, a friend and myself started in a sleigh to make a visit. On retiring at night, my friend, after having removed an entirely woolen garment, threw it carelessly over his arm. Having laid it down, he approached the said garment with his other hand; and upon so doing, he was amazed to see an immense number of sparks all over the garment, as if it were on fire. This was accompanied with a noise similar to that produced by a voltaic battery. He withdrew his hand, and the sparks were gone, then reapplied it, and the same phenomenon was observed, in a less striking manner, however. Reapplying his hand for the third time, but a few sparks were seen, without any noise whatever. Where did the sparks proceed from? A. The sparks were caused by friction. They are often observed in removing woolen clothes in winter, especially when the air is very dry.

(3) R. E. B. asks: What would be the practical difference between cutting off steam at 3/4 stroke, and throttling the steam until just 1/8 of the full working pressure is realized? A. To cut off the steam at 3/4 stroke would be the more economical, there being in that case less loss from condensation.

(4) A. M. asks: How can I produce a fine high color on gold jewelry? A. Boil 8 ozs. saltpeter, 4 ozs. alum, and 4 ozs. common salt together in a porcelain or other fireproof vessel (not metallic), in barely sufficient water to dissolve them; add 9 ozs. strong muriatic acid to this solution, and filter. This quantity will be sufficient for coloring 4 ozs. of work at a time, and should be kept in a well stoppered glass bottle when not in use. Another recipe is: Boil 10 1/2 ozs. saltpeter and 5 1/2 ozs. common salt together, in a porcelain dish, in a quantity of soft water barely sufficient to dissolve them, and 1/2 oz. nitrate of silver (lunar caustic) and 9/16 ozs. muriatic acid; filter. This quantity will be sufficient for coloring 4 ozs. of work at a time, and should be kept in a well stoppered glass bottle when not in use. To color with either of the foregoing mixtures, anneal the work twice, and boil it, each time after annealing, in a pickle consisting of 8 parts water and 1 part sulphuric acid. Then pour a sufficient quantity of the coloring mixture into a porcelain dish, and heat it to about 150° Fah. Hold the work in this for about two minutes, then take it out and rinse it in clean water. If not sufficiently colored to suit, repeat the process until the desired color is obtained. Another and more common method among jewelers is to make a kind of paste, consisting of 2 parts saltpeter and 1 part each of alum, sulphate of zinc, common salt, and a little water. These ingredients are well mixed in a mortar, and the articles to be colored are covered with the paste, laid upon an iron plate, and heated over a clear fire nearly to a black heat. They are then suddenly plunged into cold water and well washed. This insures a beautiful high color.

(5) F. H. D. asks: Will a locomotive, standing still on an up grade, move or start as easily up the grade when the crank is on a line from the axle to the point of the wheel which rests upon the rail as it would if the crank was at either side of this line? A. A locomotive should start equally well with one crank in any position, for if one is on the absolute dead center, the other is in a position to exert its maximum force.

(6) H. J. E. asks: 1. How much sulphuric acid must put to a gallon of water to take the scale from castings that are to be used for stove patterns, and how long should they remain in the acid? A. About one of acid to fifteen to twenty of water. 2. What kind of a bath should the castings be put into after they are taken from the acid? A. Wash with clean water, and keep in a quantity of water containing a little potash or soda in solution until required. 3. How should wax be applied for waxing iron stove patterns? A. The wax is applied by simple friction with the metallic surfaces. This increases the temperature sufficiently to impart a fine even coating to the metal. 4. How can I make good varnish for wood patterns? A. Use shellac in alcohol. A little gum sandarac is sometimes added to this.

(7) W. B. M. asks: How can engraving tools be hardened? I am greatly annoyed by their breaking. A. Use Stubs' steel, heat it to a low red heat, and temper to a straw color.

1. What is the best way to keep a boiler when not in use? I have one under my charge that is not used for several months in fall and winter. I generally run the water all out. Is that the best way to keep it? A. Yes. 2. I blow off a few inches at a time, never blowing out entirely when hot. A good many around here blow their boilers

out while hot, and this of course has a tendency to cake the slush, etc., held in solution, on the plates; at least that is my opinion. Am I not right? A. Yes.

(8) W. F. R. says: I claim that a powerful lamp for heating purposes will give off more heat to the room if a piece of sheet iron be placed horizontally just above it than if nothing be placed above it. My friend says there will be no difference. Which is right? A. The amount of heat given off by the lamp will be equal in both cases, but the metal would distribute the heat more evenly throughout the room.

(9) A. H. asks: How can I cement emery to cast iron? A. Coat the iron with white lead paint, mixed thickly; and when dry and hard, apply emery and glue.

(10) T. D. asks: How can I obtain the index of an engine lathe? I have applied to some machinists, and I purchased screw cutting tables; and although I can strike some threads, still I am unable to ascertain the proper method, as my gears all run differently from those described in any published system. My leading screw is an 8 thread; my gears are 28, 33, 35, 42, 49, 56, two 63's, 70, 77, 84, 91, 98, 105, 112. The gear on the spindle (under the head stock on cone) is 46. Can you give me any instructions in regard to filling out an index? A. Multiply the number of threads to the inch you wish to cut by any small number, for instance, 4, and this will give you the gear for the lead screw. Then multiply the number of threads to the inch in your lead screw by the same number (4), which will give you the gear wheel for the spindle. If the wheels thus obtained are sizes you have not got, try 2, 3, 5, or any other number as a multiplier.

(11) P. says: A rubber belt slips very much. Some people tell me to put rosin or it, and some say pitch. Will you give me your advice? A. Use a mixture of equal parts of red lead, French yellow, and litharge; mix with boiled linseed oil and japan sufficient to make it dry quickly.

(12) K. B. says: We recently cast a pair of brass boxes for the crank wrist of an engine of 100 horse power. The boxes were finished at the machine shop of the factory for which they were made. After the engine had run about 20 minutes the boxes became so hot that it was necessary to stop and cool them; and they continued to heat until we were obliged to remove them. The men condemn the boxes on the ground of being made of poor metal. The boxes were made in the proportion of 1 part block tin to 9 parts good scrap copper. Do you consider this a good material? If so, what was the probable cause of their heating? A. Your mixture of brass was a good one, though 1 part less copper would have been better. The heating may have occurred from the brasses not leading true, from the wrist not being true, from its having too little wearing surface, from the brasses bearing too much on the sides of the box, or from any one of a variety of similar causes.

(13) R. asks: 1. Where should I apply for a place on the school ship Minnesota? A. On board. 2. Will the authorities take a boy who is not a native? A. Yes.

(14) S. S. S. asks: What is the best treatment to give a Georgia pine floor, to make it non-absorbent of water and easily kept clean? A. Apply raw linseed oil, as follows: Take a block of wood, about 10 by 15 inches and 2 inches thick; tack woolen cloths upon it, saturate the cloths with the oil, and rub the floor till you produce a gloss.

What is the best paint for a smooth, hard-finished wall? A. Take best white lead and tone it down to a gray with a little black and yellow, using very little of the latter, so as to give only a slight tint off of the white. The first coats will sink into the wall, appearing spotted in places; repeat the coats until there is a uniform gloss throughout; this may take 4 or 5 coats.

(15) J. W. S. asks: How are twisted gun barrels made? A. After the square bars are made, they are twisted around a mandrel and then welded. See No. 1 of "Practical Mechanism."

(16) J. H. asks: 1. Will soft gray iron castings do for cores for electro-magnets? A. Yes. 2. Will they receive and discharge magnetism quick enough for cheap telegraph instruments? A. Yes. 3. Is Léclanché's battery a patent? A. Yes. 4. Which gives the best results with a given length of wire, a long slim coil or a short thick one? A. A thick wire with few convolutions gives the best effect when the amount of current passing through it is comparatively great. A thin wire with many convolutions is best when the current is small but has considerable electro-motive force. 5. Is a cone of hourglass shape, with broad poles, any better or as good as a straight one? A. Somewhat better for equal weights.

(17) E. C. H. asks: 1. In making the core box for the pattern of a steam cylinder, should it be made exactly the same size as the coreprints, or is some allowance made for shrinkage? A. Green sand cores shrink, while dry cores expand a little. The amount is, however, in either case too small to render any allowance necessary. 2. Is cast steel melted and run into molds, as cast iron is, to produce the various articles of a steel difficult to forge? A. Yes.

(18) J. M. S. asks: 1. Will No. 16 coppered wire do to construct a telegraph line 1/2 a mile in length? A. Yes, but iron is better. 2. Which is the best, a ground or a return wire? A. A return wire. 3. How many more cells of battery will it take with the ground than the return wire? A. Three times. 4. Can a good ground be made by putting a bar of 1/2 inch round iron in a hole 3x1x1, and then filling with scraps of old iron? A. Yes. This will be a pretty good one if the ground is wet.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

W. B. B.—Your boiler deposit consists of lime alumina, oxide of iron, and oily matters.—B. B.—It is celluloid.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On a Feat in Saw-Making. By J. E. E.
On Large Safes. By S. H. R.
On Life-Saving Apparatus. By B. F.
On Copying Photographs. By J. C. C.
On Reaching the North Pole. By C. S.
On Fast Trains. By H. B. C.
On a Marine Governor. By P. A. H.
On Interstellar Space. By A. H. McK.
On Electric Motors. By H. M. P.
On the Locomotive. By F. G. W.
On the Psycho Mystery. By T. M. W.
On Mineral Wool. By A. D. E.
On Electric Force. By J. P.
On Terrestrial Magnetism. By N. S. W.

Also inquiries and answers from the following: R. C.—J. C. B.—J. W.—P. S. A.—H. H.—M. S. J. J. A.—T. M. W.—H. P. G.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who makes air and gas engines? Who sells cheap ice machines? Who builds windmills? Where can native potash be obtained? Who sells pumps and water pipes made of glass? Who makes the best velocipedes? Who sells engine indicators? Who sells shadow pictures?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

November 2, 1875.

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

Table listing inventions and their patent numbers, including items like Air, devaporizing, L. K. Fuller, Arm pit shield, E. C. Bragg, Bale tie, C. H. Chase, etc.