

RECENTLY PATENTED INVENTIONS.

Engineering.

FURNACE AND PROCESS FOR TREATING ZINC ORES.—William West, Denver, Col. Two patents have been granted this inventor for means designed to facilitate the saving of all the metal in minerals composed of zinc and lead sulphides carrying gold and silver, for which purpose the roasting furnace is provided with a drying floor, in combination with leaching tanks and a blower, whereby the gases may be drawn from the drying floor and forced beneath a false bottom of the leaching tanks, and the zinc will be separated and recovered from the other metals as a sulphite, this being effected in a single economical operation, and the other metals left in good condition for further treatment.

STRENGTHENING DIKES.—Albert Q. Withers, Victoria, Miss. This invention covers an apparatus to facilitate forming a vertical channel in a levee or dike, filling the channel with a suitable grout, such as cement mortar, to form in the dike a vertical plate or wall of solid cement, the invention covering a novel combination of parts designed to afford a most efficient construction.

BOILER FURNACE.—Samuel Porter, Denver, Col. The grate of this furnace is mounted to turn, and the fire box and ashpit are transversely divided, while a water drum passes transversely through the fire box, with other novel features, designed to form a simple and durable construction, to insure complete combustion, and consume all smoke and gas.

Railway Appliances.

CAR BRAKE.—John Kinney, Philipsburg, Montana. By this invention a rod is mounted to slide on the end of the car and connected by a chain or rope with the brake mechanism, a lever or levers pivotally connected with the rod being fulcrumed on the car, to enable the operator to quickly set or throw off the brakes from either the side or the top of the car, the device being specially designed for box and flat cars.

FARE COLLECTOR.—Moses D. Greengard and Fradelson Harris, St. Louis, Mo. This invention covers a casing with interior mechanism, to be carried by a conductor of a street car and presented to each passenger for the deposit of the fare, the construction being designed to prevent the extraction of money therefrom, or in any way tampering with it, without detection.

INTERLOCKING BOLT.—Thomas J. Bush, Lexington, Ky. The formation of this bolt is such that when its flattened surfaces come in contact with each other, all tendency of the bolts to turn is obviated, and adjustable sloping washers are provided for use therewith, to permit of a rail thus fastened to be adjusted to the proper gauge, while by slackening the nuts the rail may be removed and replaced.

BOLT MAKING DIE.—Thomas J. Bush, Lexington, Ky. This invention relates to a machine for making interlocking bolts patented by the same inventor, the bolt being faced off and recessed to form a locking shoulder, which is effected by compression without removing the metal, whereby its strength is not materially weakened.

Mechanical.

PIPE OR ROD CUTTER.—William Vanderman, Willimantic, Conn. This device has a body frame to which is attached a chain adapted to surround the article to be cut, rotary cutters being mounted in the links of the chain and an adjusting device connected with the frame, making a readily adjustable device adapted to cut pipes or rods of various sizes.

ARTESIAN WELL BORER.—Thomas H. Logan, U. S. Army (El Paso, Texas). Combined with a tube in which reciprocates a shank to operate an auger are dogs adapted to engage the well casing and hold the tube from rotary movement, with other novel features, forming a simple and durable auger, actuated by the weight of the connecting rods, to sink wells in rock, gravel, etc., without the use of water.

BRUSH TO CLEAN METAL CASTINGS.—Louis P. Mahler, New York City. This is a rotary brush with metal bristles arranged in bunches and having flexible connection with the brush core, whereby they will yield sufficiently to prevent their being easily broken, and will yet stand the strain of severe service.

PAPER MAKING MACHINE.—Heinrich Hoeborn, Hemer, Germany. In this machine the paper, in its passage from the couch rolls to the press rolls, is made to pass between two felts, and is guided in a broken line forming an obtuse angle to the press rolls, the same machine being designed to make paper of all kinds of materials, and of any desired thickness, from cardboard to tissue paper.

Agricultural.

CULTIVATOR.—Nathaniel F. Bloominger, Rochester, Ill. This cultivator is made with an improved shank, whereby, when the blade meets an obstruction, the blade will yield and be automatically carried rearward, being returned to its normal position when the obstruction is passed, thus guarding the share and the parts connected with it from liability to breakage.

POTATO DIGGER.—Augustus Leonard, Newell's Run, Ohio. This is an attachment designed to be quickly secured to the curved beams of an ordinary shovel plow, a digging shovel being bolted upon a short standard, the blade being of spade form and having its upper edge bifurcated, to disintegrate the soil and expose the potatoes, the device being very simple and inexpensive.

Miscellaneous.

CHAIR.—Henry U. Pohl, Saginaw, Mich. This invention covers an improvement in rock-

ing chairs, providing means whereby the back may be readily set at different inclinations, and the chair so adjusted that the occupant can assume a comfortable reclining position.

HEAD REST FOR CHAIRS.—Isaiah D. Crispell, West Stockbridge, Mass. A block secured to the back of the chair has a rack on which is pivoted the head rest, while a handle lever is adapted to engage the rack and hold the head rest in adjusted position, the construction being specially adapted for use in connection with dentists' or barbers' chairs.

FIREPLACE HEATER.—Nathaniel A. Boynton, New York City. Combined with the body of the heater, its base and frame, is a novel arrangement of flues or passages for the escape of the products of combustion, including flues down either side of the body in front, whereby the heat is more thoroughly utilized within the apartment in which the heater is situated.

DENTAL Mallet AND RE-ENFORCING ATTACHMENT.—Dr. J. L. Mewborn, Memphis, Tenn.—Two patents have been issued to this inventor for a device he styles the "Mullely mallet," with which the old hand pluggers, burnishers, and chisels are used, no points or bits being required, but adapted to deliver 2,000 blows per minute on the hand pluggers to condense the gold, or on the chisels, trimmers, and burnishers in the other work. The re-enforcing attachment takes the place of the bit in other mechanical pluggers, converting them into re-enforcing mallets, so that those who already have the electric or other pluggers may use this attachment with advantage, it being a cup-shaped tool to be inserted in the pluggers to receive the end of an ordinary hand tool.

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SCIENTIFIC AMERICAN

BUILDING EDITION.

FEBRUARY NUMBER.—(No. 64.)

TABLE OF CONTENTS.

1. Handsome plate in colors of an elegant residence on Chestnut Hill, Mt. Vernon, New York, erected at a cost of \$12,000 complete. Two perspective views, floor plans, etc.
2. Colored plate representing an attractive residence at Auburn Park, Chicago. Cost \$7,000. Floor plans, perspective elevation, etc.
3. Plans and perspective view of a carriage house erected at South Orange, N. J., at a cost of \$2,700 complete. H. H. Holly, Esq., architect, New York.
4. A residence at South Orange, N. J. Cost \$11,000 complete. Perspective elevation, floor plans, etc. Architect, H. H. Holly, New York.
5. Handsome residence of Gothic design at Germantown, Pa., erected for Mr. B. P. Wilson. Perspective elevation and two floor plans.
6. Cottage in Sophia Avenue, Chicago, estimated cost \$2,800. Floor plans and perspective elevation.
7. Perspective elevation and floor plans of a recently erected cottage at Stratford, Conn. Cost \$2,700 complete.
8. A colonial residence erected at South Orange, N. J., from plans by Rositter & Wright, architects, New York. Cost \$17,000 complete. Perspective elevation and two floor plans.
9. Cottage at Austin, Chicago. Estimated cost \$3,700. Floor plans, perspective view, etc.
10. Floor plans and perspective view of an elegant cottage at Austin, Chicago. Cost about \$5,000.
11. A corner of a boudoir, designed by J. Armstrong Stenhouse. Half page illustration from a colored drawing, which appeared in the Royal Academy exhibition last year.
12. A picturesque cottage of moderate cost at Austin, Chicago. Two floor plans and perspective elevation. Estimated cost \$900.
13. Miscellaneous contents: Jarrah wood.—Biographical sketch of Henry Schliemann, the archaeologist.—Bronze castings.—The SCIENTIFIC AMERICAN a help to builders.—American stone fields.—How can iron pulleys be papered?—England's favorite hard woods.—Floors.—Plaster.—Developments of construction.—Corrosion of zinc in contact with brick.—Etching upon glass.—Magnesia in cement.—Our last year's volume.—Improved woodworking machinery, illustrated.—A novel calendar, made of tin.—Broughton self-closing basin cock, illustrated.—The Edison recording pressure gauge.—A new gasoline engine, illustrated.—Universal file handle, illustrated.—The Dunning hot water heater.—Improved conduits for electric wires, illustrated.—A thoroughly built parlor door hanger, illustrated.—California fruit.—Labor-saving appliances for the carpenter and builder, illustrated.

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Notes & Queries

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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.

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Minerals sent for examination should be distinctly marked or labeled.

(2793) J. L. F. asks: 1. Would you kindly tell me how to make a gelatine pad, such as is used in offices for copying 100 or more letters from one original? A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 438, and as below. 2. How to keep copying ink from running when used on wood, and exposed to the rain. A. It cannot be done while the ink retains its copying qualities. 3. The formula to make a transparent cement, used for pasting advertising labels on show windows. The cement is put on the engraved side, and water will not wash label from the glass. A. Attach with a solution of gum tragacanth and when dry varnish, or at each directly with dammar varnish.

(2794) R. V. H. asks: 1. Is there any simpler form of hektograph than that described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 38? A. No; nothing could be much simpler. See also SCIENTIFIC AMERICAN, March 15, 1890, p. 166. 2. How is paste shoe blacking made? A. See answer to query No. 1704. 3. What is the composition of those so-called magical ink erasers? A. Possibly potassium binoxalate, or perhaps a mixture of tartaric and oxalic acids. 4. Is there any composition which if rubbed on softened stiff hats will restore the stiffness and brilliancy somewhat? A. Hats are stiffened by a solution of shellac in borax water. The solution can be made quite strong, but it never stiffens to the same extent that an alcoholic solution will.

(2795) E. E. asks: 1. Are sulphate of lime and oxide of iron harmless when taken internally, either separately or together, and what is the ordinary dose? A. They are harmless. Hydrated oxide of iron is administered as an antidote to arsenic poisoning. Sulphate of lime in large quantities might give rise to troublesome concretions. No dose can be prescribed. 2. Can you recommend a book upon the elements of chemistry, which can be had at a moderate price? A. We recommend Fownes' "Chemistry," \$3.25, in cloth. We can supply others at lower prices.

(2796) How can the ravages of book-worms be stopped? A. It is said that the best method of putting a stop to the depredations of book worms is to take equal parts of powdered camphor and finely chopped tobacco, and then to sprinkle this mixture over the shelves. This operation should be repeated every six or eight months.

(2797) A. E. P. asks: What is the best thing to take out printer's ink from woollens and tweeds? A. It is almost impossible to effect. Benzine

or chloroform may do it. Apply in a circle all around the spot, and gradually work in to the stain.

(2798) M. T. writes: I observed that gas would not burn on a cold day, in Omaha, Neb. Why was that, did the pipe freeze up, or was the pipe full of condensed moisture? A. The pipe was probably filled with ice condensed from the gas as water, and freezing in contact with the cold metal pipe.

(2799) G. M. P. says: Please inform me through the SCIENTIFIC AMERICAN whether or not you ever printed in the said paper any such notice as this: "That the government or any party offered twenty thousand dollars for a nut lock that would never become unscrewed," or words to that effect. A. We think no such statement was ever printed in SCIENTIFIC AMERICAN.

(2800) G. R. L. asks how to read an aneroid barometer. A. A very slight tap may be given before reading, to cause the index to reach its proper place. This is not always advocated, however. The figures may be for inches and decimals, or for millimeters.

(2801) F. J. G. asks: What chemical or compound is used by the so-called fire eaters to protect them from being burned? A. Dilute sulphuric acid, or a strong solution of alum.

(2802) J. E. F. asks what size wire the field magnet of Bishop's motor is wound with. A. No. 24.

(2803) A. A. H. asks how to amalgamate zincs. A. This is accomplished in several ways: 1. By dipping the zinc in dilute sulphuric acid and then dipping the end of it into a small quantity of mercury, afterward rubbing the surface with a brush. 2. Dissolve 1 pound of mercury in 5 pounds of nitro-muriatic acid (nitric acid 1 part, muriatic acid 3 parts), heat the solution gently to hasten the action. When a complete solution of the mercury is effected, add 5 pounds more of nitro-muriatic acid. The solution should be applied with a brush, as immersing the zinc in it is wasteful. 3. To the bichromate solution commonly used in batteries, add to every pint of solution 1 drachm of bisulphate of mercury or a similar amount of nitrate of mercury (mercury dissolved in nitric acid). By employing this method, the amalgamation of the zincs is maintained continuously after the first amalgamation, which must be accomplished by method 1 or 2. 4. In the Bunsen Grove, or Fuller battery the amalgamation may be accomplished by placing a small quantity of mercury in the cells containing the zincs. 5. Place a little mercury in a saucer with some dilute sulphuric acid. Dip the zinc into dilute acid. Then with a little strip of zinc or galvanized iron touch the mercury under the acid and rub it on the zinc. This will transfer a little to the surface, and a few minutes' rubbing will make the zincs as bright as silver. A very small globule of mercury is enough for a single plate.

(2804) J. F. B. asks: 1. Are the materials and processes in patent medicines patented, or only the name and trademark? A. The composition and the method of making may be patented. 2. How to find the safe working pressure of a boiler. A. Examine the boiler carefully for corroded places, go over it carefully with a hammer to ascertain if there are thin places, and finally subject the boiler to a test by hydrostatic pressure, which should be 50 per cent more than the working pressure. If no defects appear, the boiler may be safely worked to a pressure $\frac{2}{3}$ that reached in the test. 3. Do the carbon plates for batteries need as much care in making and as long baking as the rods used in arc lights? A. The plates may be more porous than electric light carbon. They require the same baking. 4. Are the dynamos used for electric welding wound for high E. M. F., or heavy current strength? A. The dynamos for welding are generally made to deliver an alternating current of high E. M. F., which is reduced to a very low E. M. F. by the transformer. 5. What is the resistance of No. 26 copper wire? A. The resistance of 23'54 feet of No. 26 wire Am. W. G. is 1 ohm. One pound of the same wire has a resistance of 55'33 ohms.

(2805) A. L. asks what the ingredients are of stamping powder that is used by dressmakers in stamping embroidery designs on cloth. A. Powdered talc is good for marking cloth. For blue marks on white goods use ultramarine blue.

(2806) O. C. H. asks (1) how benzine or gasoline can be made so as not to have a disagreeable odor. A. Treat with cold solution of bichromate of potash and concentrated sulphuric acid, agitating thoroughly and allowing to settle. Decant, wash with weak alkali, followed by pure water, and if necessary distill, rejecting first and last portions of distillate. 2. Can it be colored red or blue? If so, what shall I use? A. For red, use extract of alkanet root. For other colors use oleates of the aniline bases. See SCIENTIFIC AMERICAN, vol. 63, No. 16, page 248.

(2807) S. E. H. asks how to prepare (1) a varnish, lacquer, or metallic compound with which I will be able to give a thin coat to a plaster Paris impression without heat and which will not peel off, but make a hard, smooth surface with no air bubbles, so that when a cast is moulded from it, the latter will come out very smooth. The article, if possible, should stand boiling water for an hour without change. A. Your requirements are too severe. Possibly by shellacking and subsequently japanning, you might effect your purpose, but we doubt it. We would suggest a trial of hydraulic cement for the moulds, made as smooth as possible, but unvarnished. 2. Please inform me if potash lye poured into clogged drain pipes will injure lead, iron, and glazed drain pipes by corroding the same, and to what extent? A. It will do no injury, unless on standing a long time.

(2808) E. S. F. asks: 1. Will you please tell me a good recipe for making a paste of gum that will make paper adhere to greasy cans? Something I suppose has to be added to the paste that will corrode the tin first. A. If the can is really greasy, remove grease by hot water. Use gum tragacanth in thick mixture with water for a paste. Also consult SCIENTIFIC AMERICAN, vol. 63, No. 15, page 227. 2. What essen-