

RECENTLY PATENTED INVENTIONS.

Engineering.

FILLING BLAST FURNACES.—Thomas F. Witherbee, Port Henry, N. Y. This inventor has devised an improved charging apparatus designed to properly fill the stack, even when very finely divided ore is to be treated, such as magnetically concentrated iron ore. The apparatus comprises a movable bell having a central aperture, through which is adapted to pass a spreading bell, while a fixed bell is adapted to close the central aperture of the movable bell and receive the spreading bell. A great variety of charging combinations can thereby be formed to permit of placing the materials as desired in the stack.

COAL CHUTE REGULATOR.—John F. Schmadeke, Brooklyn, N. Y. This is an apparatus adapted to operate automatically in connection with the usual elevator to throw mechanism into gear by the filling of the chute, which shall wind up a cable on a drum and open the chute doors, the mechanism being arranged so that it will work in a converse way to close the doors as the chute becomes empty. The invention relates to coal chutes filled by elevators, and from which coal is withdrawn for use, where it is desirable to keep the chutes full to prevent the breaking of the coal by dropping to the chute bottom.

Railway Appliances.

CAR COUPLING.—John Cochran, Jr., Collins, Mo. According to this invention, swinging balls are arranged, one in rear of the other, rods or bars which connect the balls being extended in advance of them and supporting an inclined link guide. The balls form swinging parallel carriers, which operate in parallel lines and swing the guide back and forth without changing its angle to the horizontal, so that it will be presented properly to receive the approaching link. The construction is simple, and by means of the improvement the cars may be coupled from the side or top, without need of the trainmen going between the cars.

Mechanical.

SAW HANDLE.—Azeil B. Van Campen, Raymond, Cal. This is an adjustable handle for long saws, such as are used for cutting up logs and timbers, being adaptable to any saw of this class, and designed to facilitate the operation of sawing by permitting of greater freedom of movement of the hands. The invention consists of a revoluble handle for the end of the saw, with a handle for the back of the saw and a hooked bolt for clamping the two handles to the saw.

METALLIC PACKING.—Frederick A. Ives, Grant's Pass, Oregon. The proper packing of piston rods, valve stems, etc., is the more especial object of this invention, which provides a packing consisting of a coil having uncut ends forming steam-tight bearing surfaces. The packing is simply made and is readily applicable to large or small stuffing boxes. On one uncut end of the coil is a pin engaging a correspondingly shaped recess in the bottom of the casing, a similar pin on the other end engaging a recess on the inner face of the gland, fitted loosely on the piston rod or valve stem.

SEWING MACHINE NEEDLE BAR.—Henry A. Dodge, Boston, and William T. Richards, Newton, Mass. This invention provides the face plate with gibs so arranged as to effectually take up the wear of the needle bar and prevent it from wearing in the face of the plate. The gibs are so made that they will be interchangeable, right or left, and the surfaces adapted for engagement with the needle bar are hardened to resist wear.

STONE CARVING MACHINE.—Antonio Zambardo, New York City. In this machine a table has movement in a bed and a tool carriage is held to revolve upon the table, there being a plate adjustably located in the bed and adjusting devices, whereby the bed plate may be set eccentric to the carriage. The tool may be given any required angle to produce a desired undercut, and may be regulated to carve various embossed or intaglio figures upon the same or different planes. The setting of the tool is quickly and easily effected, and with the machine circles and ovals may be made as desired, as well as the carving of any design, even to a figure of a human being in relief.

Agricultural.

MOWING MACHINE ATTACHMENT.—William L. Hay and Robert L. Johnston, Franklin, Tenn. This is a gathering attachment comprising side supports detachably secured on the sickle portion of the mower frame, a receiving platform and a revolving rake, over the rear end of which is journaled a revolving discharging rake. The improvement is especially designed to facilitate the gathering and piling up of seed clover as it is cut by the mower. The attachment may be detachably connected with any of the mowing machines now in general use, and it is simple in construction and easily manipulated.

Miscellaneous.

HOUSE MAIL BOX.—Edwin F. Kinsey, Washington, D. C. This box is to be attached near the front door of a building, and is so arranged as to indicate to the carrier when mail is deposited in it, and to indicate by a signal to the occupants of the house when the carrier places any mail in the box. The box is also arranged to effect the purchase of stamps, stamped envelopes, and postal cards from the carrier, in definite quantities, and the making of change therefor, without risk of loss of money or mail.

SOLDIER'S FIELD EQUIPMENT.—George H. Palmer, U. S. Army. This invention comprises a half shelter canvas tent, to be united with a like half shelter tent, and carried by being placed around the soldier's bedding and placed in a roll over the shoulders and across the body, in combination with a valise similarly carried, to hold ammunition, clothing, and toilet articles. By the novel construction and by certain straps and attachments, both the valise and half tent roll are held in place on the shoulders, the body and arms being unconfined and free, and the weight being well distrib-

uted, while the whole is so made that the wearer may easily put it on or off.

PIN FOR ATTACHING FLOWERS TO DRESSES.—Edward W. Stifel, Wheeling, West Va. This pin is made of a single piece of wire bent and twisted about itself to form a body terminating in two closed loops, through which a ribbon may be passed, there being a projecting portion adjacent to each loop, and a spring pin and hook at the ends of the projecting portions. The pin will securely hold in place flowers in spray or other shape without injury to costumes or dresses.

Designs.

CARPET.—William F. Brown, Newark, N. J. The body of this design is decorated with flowers of the rose and daisy type, with foliage in festoon arrangement, and the border has differently arranged but corresponding festoons of flowers and foliage.

HANDLE FOR SPOONS, ETC.—Charles Osborne, New York City. A foliated figure at the top of this handle represents centrally a cluster of grapes. Near the center the handle is nearly circular in cross section, while near the bowl it is nearly rectangular, with intarsia leaf-like figures on the obverse and reverse, there being flowing tendrils on the back of the bowl.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

SCIENTIFIC AMERICAN BUILDING EDITION.

MAY, 1894.—(No. 103.)

TABLE OF CONTENTS.

1. Elegant plate in color showing a handsome residence recently erected for William H. Bartlett, Esq., at Evanston, Ill. Two perspective views and floor plans. Mr. J. L. Silabee, architect, Chicago, Ill. A very picturesque design.
2. Plate in color showing a cottage at Mt. Vernon, N. Y., recently completed for E. J. Walther, Esq. Two perspective views and floor plans. Mr. L. H. Lucas, architect, Mt. Vernon, N. Y. An excellent design.
3. Cottage at Morgan Park, Ill., recently erected for G. F. Patterson, Esq., at a cost of \$3,000 complete. Two perspective views and floor plans. Mr. H. H. Waterman, architect, Chicago, Ill.
4. A summer house at Southampton, Long Island, N. Y., recently completed for H. M. Day, Esq. Two perspective views and floor plans. A model design. Messrs. G. E. Harney & W. S. Purdy, architects, New York.
5. A residence at Portchester, N. Y., recently erected for Walter S. Haviland, Esq. Two perspective views and floor plans. A very pleasing design. Mr. Louis Mertz, architect, Portchester, N. Y.
6. Floor plans, interior view, and two perspectives of a residence recently completed at Hackensack, N. J., for George A. Vroom, Esq. An excellent design and unique plan. Cost complete \$6,950. Mr. Christopher Meyer, architect, New York City.
7. The Barnum Institute of Science and History, of Bridgeport, Conn., donated by the late Phineas T. Barnum. A one-half page perspective view. Cost for building and grounds \$100,000. A fine example of the Romanesque style of architecture.
8. A residence at Stamford, Conn., recently erected for Oliver G. Fessenden, Esq., at a cost of \$5,199. Two perspective views and floor plans. Mr. Wm. H. Day, architect, New York City. A very pleasing design.
9. A cottage of moderate cost recently completed for Hiram R. Smith, Esq., at Randall Park, Freeport, Long Island, N. Y. Cost complete \$3,900. Two perspective views and floor plans. Mr. Wm. Raynor, Freeport, Long Island, N. Y., architect. A very attractive design.
10. "Otter Cottage," recently completed for Henry H. Adams, Esq., at Belle Haven Park, Greenwich, Conn. Mr. H. W. Howard, architect, Greenwich, Conn. An attractive design in the colonial style of architecture. Two perspective views and floor plans.
11. A colonial cottage at "The Bluffs," Mt. Vernon, N. Y., recently completed for E. A. Hunt, Esq. Two perspective views, an interior view and floor plans. Mr. Louis H. Lucas, architect, Mt. Vernon, N. Y.
12. Half-page engraving showing hall and staircase of a London dwelling.
13. Miscellaneous Contents: Clients' right of replicating design.—Shop and mill construction.—Seasoning oak.—Beautiful designs in parquetry work, illustrated.—The effect of fire on concrete.—Water-proof cellars.—Embossing wood.—Steel butt with ball-bearing washers, illustrated.—"The Holland" radiators, illustrated.—Graphite paint.—Sand-paperying machines.—The Van Wagoner & Williams Hardware Company.—Window screens and screen doors.—Maple flooring.—The Pullman sash balance, illustrated.—Portland cement walks.—Subterranean London.—An alloy which adheres to glass.—A saw clamp and filing guide, illustrated.

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Distance Reading Thermometers.—See illus. advertisement, page 265. Ward & Doron, Rochester, N. Y.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Cheapest Water Power.—See top of 1st column, page 170. Also top of 3d column, page 239. Look, it will pay.

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Inventors wishing to bring their inventions to the public notice should confer with H. Pittock, Room 61, 1 Beacon St., Boston, Mass.

Guild & Garrison, Brooklyn, N. Y., manufacture steam pumps, vacuum pumps, vacuum apparatus, air pumps, acid blowers, filter press pumps, etc.

Patent for Sale.—Stall for comfort and cleanliness of milk cattle. Agents wanted at 50 per cent commission. M. Schembri, 336 Van Buren St., St. Paul, Minn.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y.

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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.

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Scientific American Supplements referred to may be had at the office. Price 10 cents each.

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Minerals sent for examination should be distinctly marked or labeled.

(6008) C. J. T. asks: I have a motor built after the Edison style, of the following dimensions: Drum armature core 6 inches long by 4½ diameters, wound with No. 16 B. & S. 32 sections, 6 convolutions in each section, two layers deep. Fields wound with 10 pounds No. 23 each. Want to rewind for a power circuit. The machine when run as a dynamo is 90 volts at 3,000 revolutions. I want to make a 110 volt machine of it and run at slower speed. Want to put in a fan circuit of about ten ¼ horse power motors. A. You can probably use your machine safely as it is. To lower speed, increase the number of turns on the armature, or weaken the field. To keep high amperage you must use as low resistance as possible.

(6009) D. S. S. asks: 1. If a bell be rung inside a vessel exhausted of air, does it create any sound within said vessel, none being heard outside of same? A. There is no sound to be heard within the vessel, except by contact with the bell or with some object touching it. 2. If a transmitter were placed in the vessel with the bell and connected with a telephone outside, could we thereby hear the ringing of the bell? Has this experiment ever been tried? A. You could not hear it. We never heard of the experiment being tried.

(6010) E. A. S. says: One rule of mechanics is that a belt will always run to the highest point. What is the reason? A. The length of the belt edge on the high side as it is called, when shafts are not parallel or on the crown of pulleys, is always longer than at the low part or low side. The stretch of the belt to accommodate itself to this condition springs the straight part of the belt near its point of contact with the pulley toward the high part or crown and causes it to run in that direction; the effect being the same as if pushed by a shipper fork.

(6011) C. M. W. writes: In supplying blast to a cupola at an altitude of 9,000 feet, where the atmosphere is so much lighter than at sea level, will a pressure of 10 ounces furnish as much oxygen to support the flame under above conditions as a similar pressure at a lower altitude, or must the pressure be greater to compensate for difference in the rarefied condition of the air, owing to the altitude? A. The atmospheric pressure at 9,000 feet elevation is only about 10 pounds per square inch; 10 ounces pressure at the sea level only represents

6½ ounces at the above elevation and would probably be too weak in the blast as well as in the quantity of air supplied to the cupola. You will need 15 ounces pressure.

(6012) F. A. M. asks: 1. How can I make a dry battery? A. It is best to buy them. A mixture of plaster of Paris and chloride of zinc with chloride of ammonium and water in a zinc vessel with carbon pole in center will answer. 2. How can I make fluid in Edison-Lalande battery? What should I dissolve caustic potash in? A. Dissolve in water. 3. Please name a firm that manufactures batteries and supplies. A. Address Bunnell & Co., of this city.

(6013) R. E. W. asks: 1. Would cotton-covered wire (No. 36) answer nearly as well as silk-covered for a small induction coil? A. Yes. 2. I wish to make some good permanent magnets. What kind of steel should I order, and about what will it cost per pound? A. Use good quality Stubs or tool steel. 3. Will the inclosed sample of wire give good results on a telephone line of two miles? A. Yes. 4. What would be the objection to using a well to ground the end of a telephone line? A. None, unless you object to having the plate immersed in the well. Some slight corrosion will take place.

(6014) J. A. McN. asks: 1. How many cells Leclanche would I need to work a telephone system over about two miles of a circuit (transmitter and receiver being alike)? A. Use 4 cells. 2. Which is the best for such a line or shorter? A. Leclanche cells are as good as any. 3. Is a metallic circuit better than a ground circuit and does it take less battery? A. It is superior, but hardly saves battery. 4. A body weighs 100 pounds at the poles and 101 pounds at the equator. How is this computed? A. Your figures are wrong. A body is heavier at the pole than at the equator. The relative weights are calculated by the formula for centrifugal force.

(6015) F. H. asks: Can you give me a table, or tell me how it is ascertained, what by different given current, length of wire, etc., will be the attraction, in ounces or pounds, toward the core of a magnet? In other words, how can I find out what weight a magnet of any build can sustain? A. You will have to calculate the lines of force driven out at the poles through the armature. In S. P. Thompson's work on the "Electro-Magnet," \$6, you will find excellent matter on this subject.

(6016) F. H. S. asks: Is it possible to reflect all of a ray of light from a transparent body? Will not refraction take place to some extent as long as the ray strikes the body? A. For the rear surface of every transparent body there is an angle of total reflection within which all light is reflected. This applies to rays of light which, having passed through the body, reach the other surface. There is no such angle for the front surface.

(6017) L. F. D. asks: Do telephone, telegraph and electric light companies run their cables in the same conduits (under ground)? If not, why? A. Generally not, in order to avoid induction and possibility of danger from leakage. 2. Please give a solution how to clean hard rubber? A. Wash with ammonia and water, polish with kerosene and rottenstone.

(6018) R. asks if a good tennis court could be made out of coal ashes. If so, the method of operation and whether the ashes would require sifting. A. Ashes alone would hardly answer. You might by sifting them and mixing with clay get a good surface.

(6019) J. D. asks (1) what size wire to use to wind motor No. 759 for 25 volts, and about what power will it develop? A. Wind with No. 21 or 22 wire. 2. How many storage batteries like described in SCIENTIFIC AMERICAN, and how many plates and what size, should be to run it about 12 or 15 hours, and how long will take to charge same? Will dynamo No. 600 charge them? A. Twelve to fifteen. The time of charging will depend on the current. The dynamo named will be larger than necessary.

(6020) A. B. R. asks if the simple electric motor in "Experimental Science" can be run to good advantage with the Edison-Lalande battery; if so, which type would be most advisable, and how many cells would be required to give about the same result as the plunge battery, suggested to run this motor? A. Yes. Use ten cells type Q.

(6021) E. L. A. writes: Where can I get a history of the calendar and all its changes? What day of the week was George Washington born? And in what year? (So recorded at that time.) Was 1700 a leap year under Julian calendar? To make my meaning plain on questions 2 and 3, I will state that I have examined different encyclopedias on the calendar and find that they do not agree in this. Washington's birthday is now generally celebrated as having occurred on February 11, 1732, and now called February 22, 1732, but the following quotation from Appleton's Encyclopedia puts a different phase on it: "The change from Julian to Gregorian reckoning was made by act of Parliament in Great Britain in September, 1753, the 3d being called the 14th. In England from the 14th century till the change in 1752 the legal year began at March 25. After the change was adopted in 1752, events which had occurred in January, February, and before March 25 of the old legal year would, according to the new arrangement, be recorded in the next subsequent year. Thus the revolution of 1688 occurred in February of that legal year, or as we should now say in February, 1689." If the above quotation from Appleton be the correct way of computing back dates, then, since under the Gregorian calendar we celebrate Washington's birth as having occurred on February 22, 1732, at the time he was born (Julian calendar) it must have been called February 11, 1731, Friday. Or if, according to Julian calendar, he was born on February 11, 1732, we should now, under the Gregorian calendar, celebrate his birth as having occurred on February 22, 1733, Sunday. Which is correct? A. There is no special history of the calendar. It is scattered in detached details in the encyclopedias and technical works. Probably the best account is detailed in the Dictionary of Science, Literature and Art, long since out of print, under the heads of calendar, year, cycles, and chronology. George Washington was born on Friday, the 11th day of February, 1732, historical time in England and the American