RECENTLY PATENTED INVENTIONS.

Engineering.

REVERSING GEAR FOR ENGINES.—Daniel H. Grant and Henry Miller, Raymore, Mo. A collar having a lug is keyed on the main driving shaft, and a sleeve adapted to be shifted axially and circumferentially is arranged concentric on the shaft, the sleeve having a spiral cam groove and a straight slot. The spiral groove is engaged to the lug on the collar, and an eccentric is formed in the bore of its disk with a lug engaging the straight slot in the sleeve, the latter being shifted at any time by the operator to move the eccentric and valves in any desired position.

POP SAFETY VALVE AND MUFFLER.—Erastus B. Kunkle, Fort Wayne, Ind. This is an improvement on a former patented invention of the same inventor, the device affording a powerful discharge of steam and the immediate relief of the boiler of overpressure. The valve body carries a cup forming a steam space between it and the valve body, and a cup-shaped valve extends into the valve body cup and forms a steam space between it and the valve body cup, the valve being provided with an exterior seat flange adapted to be seated on the valve body and its cup.

RAISING SUNKEN VESSELS.—Oscar A. Bulette, Charleston, Washington. A wreck indicator and raising device, patented by this inventor, provides a lifting chain or cable to be automatically attached to the sunken vessel from above without the employment of a diver, the chains to be then connected with any approved hoisting mechanism. A float supports the drum carrying the cable, the spool having a peculiar brake mechanism, and on the vessel is a bill hook from which a cable leads to the float, while the lifting chain or cable has a large terminal link or ring adapted to slide down on the float cable and automatically engage the bill hook.—[Mr. Bulette may be addressed at the SCIENTIFIC AMERICAN office, New York City.]

Railway Appliances.

FENDER FOR TRAM CARS.—William Dryden, Brooklyn, N. Y. This device has body section to be supported by the forward portion of the car, provided with a cushioned chamber in which are cushioned spring-controlled doors, while a cushioned fender extends forwardly and downwardly from the threshold of the chamber. It is designed that a person struck shall be forced to fall upon padded surfaces and prevented from rolling or dropping from the fender, thus receiving no injury. The device is of simple and strong construction, and may be conveniently applied to the dashboard of any car.

Electrical.

SASH BALANCE.—William C. Hodgkins, Washington, D. C. According to this invention two or more hollow coils of insulated wire are arranged in alignment, a magnetic core or plunger being arranged to move through them, while a set of corresponding electric circuits and switches are connected with the coils, there being means for connecting the core with the sash. By means of the apparatus, the opening and closing of doors and windows, and locking or unlocking them, may be effected on operating a suitably arranged push button.

Mechanical.

PERFORATING SHEET METAL.—David Henderson, Central City, Col. This inventor has devised a metal-punching machine in which the punch block is made in sections having in their opposing faces longitudinal grooves adapted to receive the punches, clamps extending inwardly into the grooves at each end to engage with the end punches. The machine is capable of rapidly perforating sheet metal screens with slits or openings surrounded by a burr on one side of the sheet. One set of punches may be removed and another inserted with great facility, and the machine is of simple contruction and inexpensive.

CEMENT MILL.—John A. Albertson, of Lansford, and James H. Fisher, of Siegfried's Bridge, Pa. This is a crushing mill in which, within an enveloping case, a rotary cylindrical pulverizer shell is secured upon and driven by a central rotatable shaft, outwardly projecting pockets on the side of the shell radiating from central circular open-ended feeding chambers, there being screens over the radial edges of the pockets and a loose roller rotatable by its gravity within the shell below the shaft. The mill is adapted to pulverize any hard rocky material, separating the powder from the coarser particles and expelling the completely pulverized portion as the operation progresses

SAW FILING MACHINE.—William B. Allen, Allentown, La. This machine is adapted to file the sides of saw teeth, performing the work rapidly and uniformly, and it can be instantly applied and readily adjusted to saws of various patterns, as circular, gang and band saws, etc. Its frame has parallel side bars, to be supported from the edge of a saw, while a file holder composed of two crossheads is fitted and adapted to slide on the bars, a rigid handle connecting the crossheads, there being a lengthwise slot in one of its extended ends through which passes a clamp screw securing the handle adjustably to the crosshead.

NUT LOCK.—Jesse A. Wells, Guyandotte, West Virginia. According to this improvement, the screw-threaded bolt has a longitudinal channel and the nut has recesses on its inner face, a key lying in the channel having a head adapted to enter one of the recesses, while a washer with an internal diameter equal to the combined thickness equal to that of the bolt and the head of the key, and a thickness equal to the length of the head, is adapted to move bodily at right angles to the bolt and hang suspended behind the head of the key.

Miscellaneous.

FOLDING BED.—Samuel Hawver, University, Cal. This inventor has devised a ventilated folding bed, to be warmed with the least possible outlay, and designed to be placed in the wall and built in with the house, becoming a permanent fixture. It is arranged to fold into and out of a recess, with which are communicating flues admitting fresh outside air or air from a furnace or other heater, and when raised out of the room it forms a neat paneled or mirrored section at one side.

GARMENT SUPPORTER AND UNDERWAIST.—Charles F. Richmond, Mattoon, Ill. This inventor has designed a skeleton underwaist to which is secured a stocking supporter and a waistband, to which skirts and other like apparel may be fastened, the whole being supported from the shoulders of the wearer, to carry all the weight of the garments in a healthful and hygienic manner.

RECEIPT PROTECTOR.—Alfred Steiner, New York City. This protector is designed to conveniently cover up portions of a leaf in a receipt or other book to prevent the reading of executed receipts by other parties. The invention consists principally of a series of movable cover or shield plates independent of each other and adapted to each cover or portion of a leaf.

JUG.—George W. Spring and George W. Printz, Crooksville, Ohio. As a new article of manufacture, these inventors have devised a jug which may be burned in a kiln without necessitating the addition of other pieces of crockery to maintain the columns of jugs in position for proper burning, enabling the kiln to be entirely filled with jugs. The jug has a spout which forms its mouth and is adapted to be closed by a stopper.

FOLDING CHICKEN COOP.—Luther Matthews, Paris, Tenn. In this coop the end sections are hinged to fold inward flat on the bottom, and the side sections fold flat on the end sections, there being a pair of screw bolts of unequal length pivotally secured centrally to the bottom, and a removable top having a central aperture and a lock nut adapted to be fitted on either of the bolts. The coop may be easily spread or folded and held locked in either position.

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.

AUGUST, 1894.—(No. 106.)

TABLE OF CONTENTS.

1. An elegant plate in colors showing a residence at Plainfield, N. J., recently erected for George H. Babcock, Esq. Perspective views and floor plans. A picturesque design. Mr. E. L. Hyde, architect, New York City.
2. A residence at Edgewater, Ill., recently erected for Mrs. Eva L. Prescott. Perspective elevations and plate in colors, together with floor plans. An excellent design. M. J. L. Silsbee, architect, Chicago, Ill.
3. A residence recently completed for J. P. Clarendon, Esq., at Hackensack, N. J. Two perspective elevations and floor plans. Mr. J. E. Turhune, architect, Hackensack, N. J. An attractive design.
4. A dwelling at Erie, Pa., erected for William J. Sell, Esq., at a cost of $4,500 complete. Two perspective elevations and floor plans. Mr. C. F. Dean, architect, Erie, Pa.
5. A beautiful residence recently erected at Belle Haven, Conn. Three perspective elevations, one interior view, together with floor and ground plans. Mr. C. P. H. Gilbert, architect, New York City. A model design.
6. The beautiful residence of E. Einstin, Sq., at Pompton, N. J. Perspective elevation and floor plans. Cost complete about $20,000. Architect, Mr. Manly N. Cutter, New York City.
7. A conveniently and economically arranged suburban cottage recently erected for George W. Payne, Esq., at Carthage, Ill. An attractive and picturesque design. Perspective elevation and floor plans. Cost $3,000 complete. Architects, Messrs. G. W. Payne & Son, Carthage, Ill.
8. Perspective elevation and floor plans of a well arranged dwelling, recently erected for A. N. O'Harra, Esq., at Carthage, Ill. A pleasing design. Cost complete, $5,500. Architects, Messrs. G. W. Payne & Son, Carthage, Ill.
9. A stable at Belle Haven, Conn. Perspective view and ground plan. A unique design. Mr. C. P. H. Gilbert, architect, New York City.
10. The Club House of the Knickerbocker Field Club, recently erected at Flatbush, L. I., N. Y. Engravings and floor plans. Messrs. Parsett Bros., architects, Brooklyn, N. Y. A neat design in the Colonial style.
11. An elegant residence of A. B. Bigelow, Esq., at Cranford, N. J. Perspective elevation and floor plans. Estimated cost, $6,000. Mr. Manly N. Cutter, architect, New York City.
12. Miscellaneous Contents: The Hayes metallic lathing, illustrated.—Nonsuch Palace.—The Joseph Dixon Crucible Co.—The slate business.—New and old styles of eaves troughs, illustrated.—The Weathered hot water heaters.—Design for mantel and fireplace, illustrated.—The "P. & B." sheathing and insulating papers.—An improved vise, illustrated.—What becomes of all the lumber.—Globe ventilator, illustrated.—An improved sadiron, illustrated.

The Scientific American Architects and Builders Edition is issued monthly. $2.50 a year. Single copies, 25 cents. Forty large quarto pages, equal to about two hundred ordinary book pages; forming, practically, a large and splendid MAGAZINE OF ARCHITECTURE, richly adorned with elegant plates in colors and with fine engravings, illustrating the most interesting examples of Modern Architectural Construction and allied subjects.

The Fullness, Richness, Cheapness, and Convenience of this work have won for it the LARGEST CIRCULATION of any Architectural Publication in the world. Sold by all newsdealers. MUNN & CO., PUBLISHERS, 361 Broadway, New York.

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 the following week's issue

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.
Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(6190) Rain Gauge.—G. F., J. M. P., S. E. S. & T. J. St. L. write criticising answer to G. F. The answer was erroneous. The angle of the rainfall does not affect the accuracy of the rain gauge record to an appreciable extent.

(6191) E. J. S. asks: 1. In making the tangent galvanometer and resistance coils described in "Experimental Science," will German silver resistance wire answer the same purpose as copper wire? If not, why? A. German silver will answer for the resistance coil, but is not suitable for a galvanometer. In a galvanometer the object is to secure the greatest number of turns with the smallest resistance where great sensitiveness is required. German silver having 13 times the resistance of copper, would necessitate an enormous total resistance. 2. Cannot any small battery motor be adapted to the Crowfoot gravity battery, by winding motor with finer wire to make its resistance proportional to the battery resistance? A. Yes. 3. I have an induction coil with a secondary winding of No. 36 wire. Could I not get the same secondary current if I had used No. 25 or any size up to 36 by making the same number of turns of wire? A. By using small wire the winding is brought near the primary and core. If larger wire is used, it takes up more room and the outer coils are farther removed from the inductor.

(6192) R. W. asks whether it requires a greater expenditure of energy or not to raise a weight of say 8 tons on a car up a hoist or elevator (the balance weight of which is made to counteract the additional weight of the car) than to draw it by a locomotive or other force up an inclined track to the same height. The friction to be minimum in both cases. A. The energy required for lifting a given load, whether on an incline or vertically, is the same. The energy lost in the mechanical appliance for lifting is not the same in all cases. A vertical lift is the most economical in energy, as it saves weight and friction in the car. Locomotive train haulage is the least economical in energy, by the amount of energy required to move the locomotive and train. Rope haulage is nearly as economical in energy as the vertical lift, but each has its particular advantages in the conditions of the horizontal distance that material must be transported. The different systems cannot be exchanged without regard to the horizontal element in the problem.

(6193) J. S. P. says: Please give me a receipt telling how to make elderberry wine. A. Gather the berries when quite ripe, on a dry day; pick them off the stems, and bruise them with your hands. Strain the juice; let the liquor rest in glazed earthenware pans for twelve hours to settle. Allow to every pint of juice 1½ pints of water, and to every gallon of the mixed water and juice 3 pounds of sugar. Put it over the fire in a large saucepan, and when it is ready to boil, clarify it with the whites of four eggs. Let it boil for an hour, and, when nearly cold, put in some yeast to work it; pour it into the cask, reserving some of the liquor to fill up the cask with, as it sinks with working. If you have about ten gallons or so, it should be fit to bottle off in two months' time after it has been closed down. Keep at least a year in bottle.

(6194) W. S. D. asks: 1. How much wire would be required to wind the spool of the telephone described a few weeks ago, to be used on a quarter mile line? A. 188 feet, or about 2 ounces. 2. Could ordinary ungalvanized wire with ground circuit be used for a quarter mile line? A. Yes. 3. What would be the number of Leclanche cells required to work call bell on line of gravity cells? A. 2 or 3 on each end. 4. Which is preferred? A. Leclanche. 5. How many cells would be needed on a metallic circuit of same length? A. Three would probably do.

(6195) B. J. writes: Please give me through the columns of the SCIENTIFIC AMERICAN a simple and accurate rule for figuring the horse power of steam boilers. A. The horse power of boilers as usually rated in trade is based on the amount of heating surface in flues or tubes and shell. The number of square feet of heating surface for a horse power varies largely with different kinds of boilers and with different makers; 10 to 12 square feet for water tube boilers, 12 to 16 square feet for tubular and locomotive forms, and from 8 to 12 square feet for flue boilers are about the range of nominal horse power. The actual output of horse power which may be realized depends upon the steam pressure and the economy of the engine; so that the actual work of a boiler may be two or three times its nominal horse power, as the steam pressure may range from 50 to 150 pounds and the engine consume from 30 to 15 pounds of steam per horse power per hour.

Communications Received.

"Life Guards." By J. J. B.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

August 14, 1894,

AND EACH BEARING THAT DATE.

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

Ammonia purifier, anhydrous, R. G. Sneath 524,567
Animal trap, J. W. Collins 524,415
Animal trap, S. D. Morton 524,425
Axle lubricator, car, J. E. Gill 524,318
Bag. See Hand bag.
Baling press, A. C. Miller 524,597
Bar. See Furnace grate bar.
Barrel machine, F. G. Hoopes 524,550
Barrel washer, A. & B. Danner 524,461
Basin clamp, J. W. Biddle 524,477
Battery. See Storage battery.
Bearing, roller, F. Purdon *et al.* 524,397
Beating engine for rags, etc., P. Dillon 524,497
Belt, electric, F. A. Brewster 524,664
Belt fastener, J. F. Williams 524,432
Bevel and square, combined, T. Fahey 524,417
Beveling shears for cardboard, A. Krah 524,638
Bicycle, H. La Casse 524,389
Bicycle, F. Risinger 524,652
Bicycle brake, E. J. Rea 524,398
Bicycle seat guard, Martin & De Bem 524,640
Bicycle sleigh attachment, J. B. Putrow 524,349
Binder, temporary, W. H. Benson 524,456
Blackboard, W. T. Slaughter 524,617
Board. See Violin finger board. Wagon shoveling board.
Boats, etc., removable center and bilge keelson for metallic life, L. H. Raymond 524,350
Boiler or steam generator, C. D. Mosher 524,391
Bolster spring, W. H. Weber 524,365
Boot or shoe, E. A. Thurston 524,620
Boot, quarter, T. Morgan 524,555
Boring tool, C. E. Blue 524,375
Bottle, W. Von Bokern 524,694
Bottle closing device, W. W. Dixon 524,632
Box. See Fruit box. Letter box. Locking box. Lunch box.
Brake. See Bicycle brake. Velocipede brake.
Brazing or smelting apparatus, M. S. Thompson 524,450
Brick kiln, C. F. Kaul 524,442
Brick machine, C. H. Horton 524,438
Bridge, suspension, D. B. McHenry 524,486
Brush, J. L. Shute 524,654
Brush, fountain or hydraulic, W. H. Miller 524,448
Bucket cover, sap, Sperry & Hannum 524,356
Buckle, G. M. Aylsworth 524,298
Buckle, D. F. Stayman 524,618
Building construction, E. R. Storm 524,472
Bumping post, A. Ewald 524,416
Burner. See Injector burner. Lamp burner.
Burning city refuse, E. L. Ransome 524,687
Bus-bar switch for central stations, A. B. Herrick 524,383
Button or stud, cuff, C. C. Champenois 524,523
Calipers and dividers, R. A. Saddler 524,611
Cane, walking, M. Forst 524,678
Car brake operating mechanism, T. F. Kenney 524,329
Car coupling, S. G. Wilber 524,452
Car, dumping, R. C. Davison 524,580
Car elevator, railway, G. T. McLauthlin *et al.* 524,344
Car fender, J. T. Duff 524,316
Car fender, J. F. McDonough 524,503
Car jack, W. Jewell 524,440
Car, railway, C. A. Smith 524,355
Cars, switch for electric railway, T. A. Remsen 524,532
Carding engines, means for fastening card clothing to flats of, W. Senior *et al.* 524,563
Carding machine, ring doffer cylinder, J. K. Proctor 524,318
Carpet rag looper, J. Gerard 524,435
Carrier. See Fruit carrier. Lamp carrier. Package and cash carrier. Parcel and cash carrier.
Case. See Needle case. Packing case. Sample case.
Casting, means for, Drake & Green 524,543
Check perforator, S. Windecker 524,454
Chromium, making green oxide of, F. L. Slocum 524,470
Cigar bunch machine, A. Schwehr 524,565
Circuit breaker, automatic, A. C. Carles 524,630
Clamp. See Basin clamp.
Clasp. See Garment clasp.
Cleaner. See Dish cleaner.
Closet. See Water closet.
Clothes pounder, N. D. Lewis 524,422
Clutch, friction, W. D. Ewart 524,585
Clutch, reciprocating, L. Porter 524,530
Coal screen, revolving, G. W. Cross 524,577
Conduit cleaning device, C. O. Ehlert 524,434
Confectionery machine, T. Robertson 524,401
Cooking utensil, J. B. Skeyen 524,616
Cotton beater for use in machines for opening, J. C. Potter 524,695
Cotton, feeding mechanism for machinery for opening and preparing, J. C. Potter 524,650
Coupling. See Car coupling. Hose coupling. Thill coupling.
Crane or derrick, J. N. Sturm 524,619
Crank, extension, T. F. Bourne 524,522
Cultivator, J. Porteous 524,561