

**RECENTLY PATENTED INVENTIONS.**  
**Engineering.**

**LOCOMOTIVE BOILER.**—Elmer C. Jordan, Sacramento, Cal. The boiler may be of the usual construction, having at its front end the fire hole through which fuel is introduced to the fire box, and the invention consists principally of a box-like frame on the under side of the boiler, having at its under side an air opening from which air passages lead to a top opening and to the fire hole in the boiler end, whereby heated air will be supplied to the fire box for insuring more perfect combustion and saving of fuel.

**METHOD OF CARBURIZING IRON.**—Jean Meyer, Dudelingen, Germany. According to this invention molten pig iron is subjected to carburization directly in the casting ladle by introducing a carburizing substance to produce steel of any desired degree of hardness. Briquets of pulverized coal or coke and lime are so prepared that their substance may be dissolved immediately and regularly and distributed throughout the mass of molten metal, the moment of their introduction being so chosen that the reaction of the carburization is completely terminated before pouring the metal from the ladle into the ingot moulds.

**Railway Appliances.**

**CAR FENDER.**—Robert Thomson, Brooklyn, N. Y. This is designed to be a simple and practical device, well adapted for ready and secure removable attachment upon either end of the car, affording when in place an adjustable and yielding apron that will pick up any one who may be in front of a car in motion, without injury, and affording safe support to the person until the car is stopped. The top of the main fender frame is covered with elastic woven wire fabric secured upon a border frame at the front of which is a semitubular elastic cushion piece, the latter absorbing a portion of the force of concussion and preventing fracture of the lower limbs, while similar tubular elastic guard pieces prevent the party struck from rolling off at the sides.

**Miscellaneous.**

**GLASS CARRYING TRUCK.**—Robert M. Roberts, Anderson, Ind. The bed of this truck has at each end a vertical standard with cushioned arms to carry glass cylinders, a wheel being arranged beneath one end of the bed, and leaf springs secured to the bed journaled on the axle of the wheel, while there are supporting legs at the other end of the bed. The invention is an improvement in vehicles for carrying glass cylinders from where they are blown to the place where further work is to be done on them, and provides for the safe support of the cylinders without their being excessively jarred. The vehicle has sufficient capacity to carry quite a large number of cylinders.

**GLASS STRUCTURE.**—Edgar W. Cunningham, Jersey City, N. J. To provide a coupling between overlapping panels or panes of glass is the design of this invention, one which is simple and conveniently applied, and which will keep out water or moisture. It consists of two spring leaves, one below the other, having a water-tight connection at one point, with a gutter at the connection portion of the leaves and an apertured flange at the free end of one of the leaves. The device is designed to facilitate the construction of roofs of conservatories, or their sides, or any portions where panes or panels of glass are to overlap. Expansion and contraction are provided for, as well as the ordinary unevenness and irregularities of the glass.

**LUNG POWER TESTER AND DEVELOPER.**—John R. Hanlon, Pennington, N. J. The tube to be blown into, according to this invention, is connected with the upper end of a threaded pipe held in vertical supports, and on this pipe screws a nut on the upper end of an inverted T-shaped pipe, the branch arms of the lower ends of which have at their ends apertured heads. Air passing from the tube which is blown into passes through the inverted T-pipe and out of the opposite heads, giving a turning motion to the pipe, and carrying down the nut, which serves as an indicator on a graduated scale at the side.

**MEASURING TANK.**—Owen James, Scranton, Pa. This tank has an inclined bottom in the lower portion of which is a discharge opening, with valve and valve rod, an air vent leading from the opening to the top of the tank, and a measuring vessel is arranged directly beneath the tank chamber and forms a permanent attachment thereto. The construction is simple, the tank may be readily cleaned, and permits the convenient drawing and accurate measuring of the contents, it being adapted to contain oil, milk, or other liquids for dispensing at retail.

**VEHICLE AXLE.**—William L. Massengale, Deatleville, Ala. The axle spindle, according to this invention, is made in two sections, one having a dovetail rib and the other a dovetail groove to receive it, the lower section having also a tongue adapted to enter a recess in the body of the axle and clips locking the tongue to the axle body. It is designed that with this construction worn spindles may be restored to proper shape without the necessity of cutting the axle or re-forging or reworking the spindle, the work not calling for the employment of skilled labor.

**PURSE FRAME.**—Scheyer Nathan, Brooklyn, N. Y. This frame is of spring material, so made that one member may be sprung endwise past the other, opposing latches inside interlocking and opening by laterally forcing one from the other, while coiled springs on the pivots bear on the frame members and the frame opens when the latches are disengaged. The locking device is thus entirely concealed within the frame, and the opening may be readily effected with one hand.

**WHEELBARROW.**—Auguste Taufflieb and Victor Chausard, Issoudun, France. This is an upturning barrow, whose body is pivoted to the wheel axle and is raised by the action of a dog, which at the desired moment becomes connected with the periphery of the wheel and upturns the body of the barrow in a forward direction. The upturning mechanism can be applied to any kind of a barrow having one or more

wheels, as well as to trucks, and so as to upturn the body either toward the front or the side of the road.

**FOLDING BOX.**—George H. Savacool, Newton, N. J. This is a strong and inexpensive box designed to hold ice cream and similar semi-liquid substances, but which may be folded flat so as to be conveniently shipped, may be easily and quickly set up, and has a cover adapted to fold tightly into the box. It may also be used as a packing box to hold a variety of substances.

**BOOK HOLDER FOR READING STANDS.**—Francis J. Anderson and William M. Erick, Gainesville, Texas. This holder is especially designed to receive large books of reference, such as dictionaries, etc., the mechanism of the holder providing a cradle for the reception of the book, the cradle to be carried upward and outward to bring the book in proper position for consultation, and also acting to lower the book without jar or injury. The cradle has pivoted sides, which may be locked in position to keep the book closed, or fully opened and supported in open position.

**LANDING NET.**—Allan Holmes, Dunedin, New Zealand. This is an angler's net, with collapsible frame pivotally connected with the pole in such manner that it can be quickly swung back onto the handle, making it more convenient to carry. The net is of very simple construction, and may be swung into position or folded back without detaching any of the parts or employing shifting devices, the frame swinging to its extended position by tilting or holding the pole with its front end downward, when it is automatically locked in such position until released by hand.

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.**

SEPTEMBER, 1894.—(No. 107.)

**TABLE OF CONTENTS.**

1. An elegant plate in colors, showing a Colonial residence at Portchester, N. Y., recently completed for Geo. Mertz, Esq. Two additional perspective views and floor plans. An attractive design. Mr. Louis Mertz, architect, Portchester, N. Y.
2. Plate in colors showing a residence recently completed for R. H. Robertson, Esq., at Southampton, L. I. Two perspective elevations and floor plans. A picturesque design and an admirable model for a seashore cottage. Mr. R. H. Robertson, architect, New York City.
3. Residence of Frederick Woollven, Esq., at Rosemont, Pa. Two perspective elevations and floor plans. A neat design in the Colonial style. Cost complete \$4,800. Mr. J. D. Thomas, architect, Philadelphia, Pa.
4. A cottage at Roger's Park, Ill., recently erected for Edward King, Esq. Two perspective elevations and floor plans. A unique design. Mr. Geo. W. Maher, architect, Chicago, Ill.
5. Cottage at Hollis, L. I., recently completed for the German-American Real Estate Co. Two perspective elevations and floor plans. Cost complete \$3,200. Mr. Edward Grosse, builder, same place.
6. Perspective elevation with ground plan of Saint Gabriel's Chapel, recently erected at Hollis, L. I. A unique and most excellent plan for a small chapel. Cost complete \$6,500. Mr. Manly N. Cutter, architect, New York City.
7. Two perspective elevations and an interior view, also floor plans, of a residence recently erected at Orange, N. J., for Homer F. Emens, Esq. Mr. Frank W. Beall, architect, New York City. A pleasing design in the Colonial style.
8. Perspective elevation and floor plans of a cottage recently erected at Flatbush, L. I., for F. J. Lowery, Esq. Cost complete \$4,600. Mr. J. C. Sankins, architect and builder, Flatbush, L. I.
9. A residence at Yonkers, N. Y., recently completed for Mrs. Northrop. A very unique design for a hillside dwelling. Perspective elevation and floor plans. Messrs. J. B. Snook & Sons, architects, New York City.
10. Club House of the Sea Side Club, Bridgeport, Conn. A good example of Romanesque style. Perspective elevation and floor plans, also an interior view. Messrs. Longstaff & Hurd, architects, Bridgeport, Conn.
11. A residence at Hinsdale, Ill., recently erected for C. E. Raymond, Esq., at a cost of \$7,000 complete. Perspective elevation and floor plans. Mr. J. H. Shannon, architect, Hinsdale, Ill.
12. The Castle of Bonnetate. Half page engraving.
13. Miscellaneous Contents: The Irrigation of laws, illustrated with two engravings.—Viaduct for street railways, Cincinnati, Ohio, illustrated.—The fire-proof building construction of the New Jersey Wire Cloth Co., illustrated.—Silvester's remedy against dampness.—Palmer's "Common Sense" frame pulley.—"The Old Hickory Chair," illustrated.—An improved hot water heater, illustrated.—The Caldwell Tower, illustrated.—The American Boiler Co.—The "Little Giant" floor clamp, illustrated.—The Akron air blast furnace.—Laundry glaze.—The "Piqua" metallic lath, illustrated.

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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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**Minerals** sent for examination should be distinctly marked or labeled.

(6204) J. D. W. writes: 1. I have nearly completed a  $\frac{1}{2}$  horse power electric motor which is about the form of an Edison dynamo. It is to run on a 110 volt circuit. The field magnet is wound with  $\frac{1}{4}$  pounds No. 24 magnet wire and the drum armature with  $\frac{1}{2}$  a pound of No. 18 magnet wire. What size rheostat shall I use? A. Your field will only stand one ampere, which it will pass at 32 volts potential. Use two lamps in parallel with each other, and in series with the motor as a rheostat. 2. I have made an induction coil with the following dimensions: Length of core, 5 inches; diameter of core,  $\frac{1}{2}$  inch No. 16 soft iron wire; primary coil 2 layers No. 18 magnet wire; secondary coil 3 ounces No. 30 magnet wire; condenser 20 sheets tinfoil 8x5 inches. When it is attached to two 5x6 bichromate cells I could obtain only an eight inch spark from the terminals of secondary coil, but a very powerful shock. Should not the coil have given a longer spark than that? A. You need more wire on your secondary and more tinfoil in your condenser. 3. What is the best way to make a ground for a lightning rod? A. Dig a hole four or five feet deep and put a copper plate in it attached by riveting to the rod. Fill with coke rammed in. If in dry ground, it will give a poor connection.

(6205) W. M. McV. writes: We have a machine which, while running at about 5,000 rotations per minute, seems to run in almost perfect balance, but when the same machine is being started or stopped and runs at about half that speed it seems very much out of balance. How do you account for it? Can a machine rotate so fast that it will run smoothly even if out of balance? What is the mechanical way of expressing the unevenness in balance of a machine that is sometimes noticed when the machine is running at about half speed? A. There appears to be a synchronal harmony in running machinery like the relation of musical notes, that when the vibratory time conditions of an unbalanced wheel upon any shaft are greater than the number of revolutions, the wheel will show by excessive vibration that it is unbalanced, while if the revolutions are greater in number than the natural vibration of the shaft and wheel for equal times, the vibration will be overcome or suppressed, and the wheel will revolve on its own center of gravity. There is no better expression than the word "unbalanced" as applied to the vibration of revolving machines.

(6206) L. R. asks: 1. How can I form a combination from both the primary and secondary currents of an induction coil? I made an induction (medical) coil as described in No. 569 of the SUPPLEMENT and connected a tinfoil condenser with primary coil. The primary as well as the secondary coil give a strong current with a Grenet battery, but I would like to know if I can get a still stronger current by combining both, without more battery. A. You will not get as good results by the combination as with the single secondary coil connection. 2. How is a condenser connected with secondary coil? A. You can connect the terminals of the secondary to those of a condenser if you desire.

(6207) A. W. G. asks: 1. If a powerful revolving fan were placed on the deck of sailing vessel or yacht and a current of air blown against the sails, it being a dead calm, would said vessel move backward, forward, or remain stationary, fan to be open (not enclosed in metal pipe or air shaft), coupled directly to motor, or driven from belt coming from motor below. If not too much trouble, give reasons. A. The vessel would go backward, owing to the reaction of the air. 2. Can a small fan motor, wound with course wire, intended to be

run with two or three cells of battery, be used (without re-winding) safely on an Edison lamp circuit? If so, can it be so arranged that current will not be wasted? A. Only by introducing resistance with a waste of over 90 per cent.

(6208) C. W. P. asks: 1. Will you give me directions for making a storage battery that will run a 1-32 horse power motor from 6 to 8 hours? A. You should state the potential of your motor. For each square foot of positive plate in a cell allow 1-64 horse power. 2. What size wire should you use on a small galvanometer and how much should you use? A. See our SUPPLEMENT, Nos. 23, 794, and SCIENTIFIC AMERICAN, No. 23, vol. 55. 3. Will you name in their order the best conductors of electricity, the best first? A. 1. Annealed silver. 2. Annealed copper. 3. Hard copper and hard silver. 4. Annealed gold. 5. Hard gold. 6. Annealed aluminum. 7. Compressed zinc. 8. Annealed platinum. 9. Annealed iron. 4. Is there any way of reversing a motor without having two sets of brushes? If so, how do you make it and how do you connect it with the motor? A. See the SCIENTIFIC AMERICAN February 20, 1894, query 5776 for illustration and description of connections asked for. 5. What is the velocity of sound, lightning, and light? A. Sound 1,089 feet per second; light 186,300 miles per second; lightning the same as light as far as the first transmission of disturbance is concerned, but a certain time may be required for the transmission of the full stroke. 6. Is there any book that tells about making motors, batteries, and bells? A. We can supply Allsop's "Electric Bell Construction," price \$1.25; Reynier's "Voltaic Accumulator," price \$3; Parkhurst's "Electric Motor Construction, for Amateurs," price \$1 mailed.

(6209) C. T. V. asks: 1. What causes the starting current in a dynamo? A. The residual magnetism in the cores of the field magnet. 2. What kind of electricity do human beings possess? A. They may be statically excited. 3. What causes lightning to strike bodies? A. A high difference of potential between the air and earth. 4. What kind of electricity is that generated by the dynamo? A. Dynamic. 5. Does the country in which a child is born determine its nationality? A. Yes, in most cases.

(6210) L. T. says: In paper making the following rule is used to figure the amount of paper made per hour: Multiply the number of sheets in width by  $\frac{1}{4}$  and the number of feet run per minute by that result; divide that by the length of the sheet in inches, which gives the number of reams run per hour. Why does this give the desired result? A. The rule appears to be correct. The sheets in a ream divided by the minutes in an hour equals  $\frac{60}{60} = 1$ ; and the number of inches in a foot divided by 8 =  $\frac{1}{8}$ , the multiplier for the speed in feet per minute or the number of sheets in width, with the same result in either case.

(6211) S. S. says: A boat's crew can row 8 miles in 1 hour in still water. What is the rate of the current per hour, if they can row 8 miles up and 8 miles down in 2 hours and 40 minutes? A. Rowing 8 miles per hour against a 5 mile stream equals 3 miles per hour gain, or 8 miles in 2 hours 40 minutes. Rowing at the same rate against an 11 mile current will make the down stream distance of 8 miles in 2 hours and 40 minutes.

(6212) B. F. C.—Dr. F. H. Chittenden, Acting Entomologist, Department of Agriculture, states that the specimen sent is the common bag worm (Thyridopteryx ephemeraformis). He adds that these worms are protected by a silken pod which is externally covered with bits of plant on which they feed, so that they are not subject so much to the attacks of predaceous insects and birds. There is no better remedy than hand picking where the numbers are not too great to make this feasible. A full, illustrated account of the insect will be found in Bulletin No. 10 of this division.

**TO INVENTORS.**

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**INDEX OF INVENTIONS**

**For which Letters Patent of the United States were Granted**

**August 28, 1894,**

**AND EACH BEARING THAT DATE.**

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

Adju table chair, C. H. Knight et al.....	525,051
Advertising cabinet, A. Bourlier.....	525,185
Alarm. See Low pressure alarm. Train robber alarm.	
Alarm lock, electric, J. Slater.....	525,291
Anderson, J. R. Grogan.....	525,304
Animal trap, G. A. Dumbuck.....	525,141
Automatic brake, W. P. Wigley.....	525,173
Axle, vehicle, C. Burns.....	525,257
Baling press, R. H. Gray.....	525,203
Bar. See Mowing machine cutter bar.	
Barometer, aneroid, B. Logan.....	525,273
Battery. See Dry battery. Storage battery.	
Bearing, lubricating, S. Straker.....	525,294
Bed brace, W. H. Moffitt.....	525,226
Bell, electric, R. Varley, Jr.....	525,169
Bell, electromagnetic call, J. J. Geary.....	525,145
Belt fasteners, die for bending teeth of sheet metal, W. O. Talcott.....	525,124
Belt fasteners, machine for making sheet metal. W. O. Talcott.....	525,123
Bicycle handle, adjustable, R. C. Whayne.....	525,171
Bicycle saddle, L. M. Devore.....	525,190
Bicycle signal, F. E. Matthes.....	525,153
Block. See Toy building block.	
Blocks, manufacture of hollow, Granjon & Belon.....	525,202
Boat. See Torpedo boat.	
Boiler. See Steam or hot water boiler. Tubular boiler.	
Boiler, T. A. Myers.....	525,228
Boiler tubes, apparatus for removing incrustation from, E. P. Anthony.....	525,177
Boilt. See Expansive boilt.	