

counted for. [A. This is a very pretty experiment, which we do not remember to have seen put in this form before. The principle is not new. The edges of all objects seen through a prism or uniaxial lens are fringed with colored bands by the decomposition of the light into its various wave lengths. The production of green light by passing white light through yellow and blue light is not difficult of explanation by "modern views" and accords with them, as may be easily proved by a spectroscope. The yellow seen in this case is opaque to and cuts off blue, indigo and violet; similarly the blue is opaque to and cuts off red, orange and yellow. The only color which can pass through both the yellow and the blue is green. It is therefore seen whenever yellow and blue are so placed that we look through or at them together. It is easy of proof that the yellow and blue lights when mixed form, not green, but white, that is, they are complementary colors. In a darkened room project upon the wall the yellow and then over it the blue, by some arrangement of mirrors or two lanterns, and where both lights fall on the same space, the wall is white.—Eds.]

(7407) S. M. P. writes: There is a large difference in opinion as to whether or not an object traveling a complete circle goes around everything within that circle whether moving or not. A says a pulley fastened to a revolving shaft goes around the shaft. B claims that it does not, but that the pulley goes with the shaft. Which is right? A. A pulley or any other revolving body turns on its axis, which is an imaginary central line. The axis does not revolve. The shaft does revolve with the pulley; therefore, the pulley does not go around the shaft. B is correct.

(7408) W. L. E. asks: 1. If a 1/2 horse power motor is catalogued voltage 8, will an 8 volt current from four 2-volt accumulators run it for its full 1/2 horse power? A. An electrical horse power is 746 watts. One watt is 1 volt x 1 ampere. Any number of volts multiplied by any number of amperes are so many watts. If then you have 1/2 horse power motor and the voltage is 8, the amperes to drive it will be found by dividing 1/2 of 746, or 373, by 8, which gives 47 about. You will need 47 amperes in your accumulators. 2. Can the rheostat described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 885, be used to regulate the speed of any motor, or is it only used to start the motor? A. A rheostat both starts and regulates the speed of a motor. Its office is to protect the armature coils from too much current while they are at rest or turning very slowly. 3. What is the voltage of the motors used in the World's Fair launches? If they had only 66 cells and they connected them in three sets of 22 each, they would only get 44 volts, wouldn't they? Or have the accumulators a strength of more than 2 volts. Please explain. A. See SCIENTIFIC AMERICAN for November 25, 1893, price 10 cents. There are no storage cells with more than 2 volts. 4. If a current of higher voltage than the motor is wound for is connected to the motor, will it burn the motor out? A. It will overheat or burn the coils. 5. In making accumulators, is the only advantage in size a greater ampere hour capacity? A. The size of the cell should be proportioned to the work. A cell too large wastes current.

(7409) E. A. B. asks for a receipt for making a kind of resin which is of a more sticky nature than the common resin used for violins, a kind of resin which is sticky enough so that, if applied to a violin bow and drawn across a steel string (touching very lightly), it will take effect. A. 1. For violin resin boil down Venice turpentine with a little water until a drop cooled on a piece of glass is of proper consistency. During the boiling cold water must be added from time to time. When sufficiently thick pour into cold water, knead well, and when cold break into pieces. Expose to sun until dry and transparent. 2. Select the best clear brown resin, melt it in a clean basin to nearly a boil, which will clear it of turpentine or other volatile oils. Pour in paper moulds.

(7410) J. T. H. asks which dynamo, the series or the shunt, is used to the best advantage? A. The series dynamo is not self-regulating. An increase in the resistance of the external circuit causes a decrease in the E. M. F. of the machine. This necessitates a separate regulator. The shunt dynamo acts just the reverse of this. A combination of those two, or a compound-wound dynamo, is self-regulating.

(7411) C. C. R. asks: What is the per cent of economy of a common turbine waterwheel over a Barker or reaction wheel, all things being equal? Also how much more economical is a good marine engine than a good steam turbine, under the same circumstances? A. A common turbine wheel may have any economy from 60 to 70 per cent. The best turbines have an economy of from 85 to 87 per cent. A Barker's mill seldom reaches an economy of 45 per cent. Reaction wheels of the Pelton and other types of impact jet wheels under high pressure range in economy from 80 to 87 per cent. The best types of triple or quadruple marine engines have reached an economy of 12 1/2 to 13 pounds of steam per horse power hour; the steam turbine, from 25 to 30 pounds of steam per horse power hour.

(7412) C. A. H. says: I have understood that by introducing oxygen gas into an arc light (of the same intensity as used for street lighting purposes) that a heat could be obtained of 18,000 degrees Fahrenheit, or sufficient to fuse marble. Is it true? If not, will the introduction of oxygen gas into the arc light increase its intensity, and to what extent? A. The temperature of the arc light is quite high enough to reduce marble to calcium oxide without introducing oxygen. We doubt if an arc, except in the electric furnace, will fuse (melt) the calcium oxide. The introduction of a stream of oxygen blows the arc and cools it. If the arc were immersed in oxygen, it would doubtless be hotter and would consume the carbon more rapidly than in open air. The temperature of the electric arc is taken to be about 6,000 degrees Fahrenheit.

(7413) C. C. S. asks: 1. How to attach wires for charging American storage batteries? A. To charge a storage battery send the charging current in the opposite direction to that in which the discharging current flows. 2. How do you arrange the bank of lamps for resistance on 110 volt circuit? A. Connect the lamps in series for the amount of resistance needed to produce the drop in voltage required and then add similar series till the amount of current required will flow through the lamps.

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INDEX OF INVENTIONS For which Letters Patent of the United States were Granted APRIL 12, 1898, AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

Table listing inventions and their patent numbers. Includes items like: Abrading mechanism, W. A. McCool; Adding machine, C. C. Clifford; Air brake, J. J. Neff; Air compressor, hydraulic, W. F. Stark; Antirain, C. W. Seaside; Asparagus holder, C. H. Oertle; Atomizer, W. S. Frost; Automatic lubricator, A. A. De Witt; Axle safety, T. N. Crook; Bath tub seat, W. Burrows; Battery, See Galvanic battery; Secondary battery. Storage battery; Bearing, center, P. H. Murphy; Bearing, vehicle wheel axle, R. C. Patterson; Bed, E. E. Munger; Bed, T. H. Campbell; Bicycle, G. P. Ohlgart; Bicycle crank shaft, G. M. Beard; Bicycle driving gear, W. S. Kellogg; Bicycle frame, A. B. Simonds; Bicycle handle bar and handle, G. H. Newell; Bicycle lock, automatic, G. L. Grass; Bicycle propelling mechanism, I. W. Conseyea; Bicycle retainer and lock, J. Battersby; Bicycle rest, F. F. Hawkes; Bicycle stand, J. R. Moore; Bicycle support, H. Geldt; Bobbin, C. P. Plaster; Bicycle support, H. T. Sackett; Bicycles, etc., seat or saddle support for, S. C. Whitlow; Blackboard cleaner, L. A. Peck; Block system, electric, F. Burger; Bobbin, G. Pendleton, Jr.; Bobbin, sheet metal, J. A. Sutcliffe; Bolt, See Socket bolt; Bolt case, H. B. Sargent; Bolt holder, A. L. Platt; Broom handle, L. Rydell; Broom brush, H. W. Hacy; Brush, C. A. Meuert; Brush, polishing, G. F. Cooper; Butter cake and means for making same, Burger & Williams; Cabinet, lace or ribbon, C. H. Martin; Caisson air lock, S. Mattson; Can filling apparatus, oil, Campbell & Urie; Canning food, E. Norton; Carriage hitch, J. W. Nunns; Car, I. J. Hoyt; Car coupling, I. Low; Car coupling, W. C. Perkins; Car door, grain, Newstrom & Miller; Car fender, F. A. Harris et al.; Car lighting systems, dynamo forelectric, Preston & Gill; Car pilot, railway, E. P. McKaig; Carpenter's tool, B. Fuller; Carpet fastener, stair, G. F. Murdock; Carriages, suspending batteries on, Brougham & Bersey; Cart, dump, A. Maxwell; Cartridge loading and crimping machine, F. Raymond; Case, See Bolt case; Caskets, etc., work support for, R. B. Heuchan; Cattle guard, W. C. Halley; Cement distributing brush, combined, A. L. Weis; Chair, See Reclining chair; Chart, dress, I. Williams; Children, device for amusing, E. L. Foster; Churn, V. G. Stone; Clamp, See Plumber's clamp; Saw clamp; Clamping device, R. H. White; Cleaner, See Blackboard cleaner; Track cleaner; Clothes hanger, window, R. B. Fordham; Coat hook, locking, J. C. Backus; Cook, gas, A. W. Tuckerman; Coffin, J. Donohue; Collapsible box, H. H. Kinsey; Collar folding and shaping machine, A. Farina; Combination lock, L. C. Thompson; Compresses, bagging attachment for roller, D. C. Ball; Conveyor, T. A. Edison; Conveying apparatus, F. B. Knight; Cooking apparatus, G. D. Fox; Copying press, J. M. Moore; Cotton opener, J. O'Connell; Cotton picking machine, Hamerschlag & Price; Coupling, See Car coupling; Thill coupling; Crate, collapsible shipping, W. O. Parker; Crate corner, M. C. Ryan; Crushing mill, portable, H. L. Jessen; Cultivator, garden, A. Ficus; Cup lubricator, J. R. Holmes; Curtain and window shade holder, combination, T. McCormick; Cutter, See Feed cutter; Milling cutter; Cyclist's riding record, H. S. Brodie; Dentist's arm support, L. P. J. V. Kjoer; Desk, writing, H. Heine; Discharge chamber, A. Hoesch; Disks, mechanism for controlling action of oscillating, J. Thomson; Display frame, J. C. Palmer; Drill, See Well drill; Drying and tanning machine for door knob spinning, C. B. Slusher; Dumping platform, S. F. Evans; Educational appliance, S. Kimble; Egg beater, F. S. Bellanger; Egg tester, I. S. Vedder; Electric cord adjusting device, F. N. Lawton; Electric motors, automatic device for removing resistance in starting, G. H. Whittingham; Electric transformer, L. Gutmann; Electrodepositing, process of and apparatus for, E. L. Dessolle.

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