A substantiating fact is known that a wooden whaleboat has been carried down so deep in the ocean by a harpooned whale that when the whale rose to the surface and was captured, the boat had to be hauled up by the line, and was found to be so thoroughly water-logged and compressed by its few minutes' dive that the wood had become heavier than water. Fishes having live elastic tissue are compressed to the same extent, but recover in rising by their own exertion. It has also been stated that whales that have received a death shot and dived have not come to the surface, although watched for during several days.

(3684) L. N. writes for an effective exterminator for fleas, etc., on domestic animals, and for bed bugs and all other pests of the kind. A. A little of the essence of pennyroyal sprinkled about is said to be effectual in driving away fleas; Persian insect powder is also used for the same purpose, and we doubt if anything is more efficient than fresh Persian powder of good quality for the destruction of bed bugs and other pests of a similar character. Buhach or pyrethrum (see SUPPLEMENT, Nos. 247 and 299) is highly recommended.

(3685) F. M. S. asks: How many times will I have to carbonize my plater and rods, as described in "Experimental Science," for carbons to use in batteries? A. They will answer very well without recarbonization; but two or three repetitions of the process will improve them.

(3686) W. G. R.—We favor the Staten Island stone, which is a fine grained trap rock. It takes a fine finish.

(3687) W. H. L. asks: 1. Will a dental lamp of one-half candle power, requiring from 3 to 4 volts and 1·20 amperes, work successfully from a medical battery composed of two bichromate cells and an induction coil? And whether it should be attached to the primary or secondary wires? A. Two bichromate cells should easily run a one-half candle lamp. The lamp should be run directly from the batteries, the induction coil being disconnected. 2. What is the E. M. F. and amperage of the Roberts storage battery? A. The E. M. F. of all storage batteries with which we are acquainted is about two volts. As we do not know the constants of the battery referred to, we cannot state the amperage. 3. What is the principle of the governor of the speed in motor of Edison's phonograph? A. The governor of the Edison motor used in the phonograph is a centrifugal governor, which operates by shunting the current through resistance. 4. Can a rheostat of 16 candle power lamps be used successfully with current supplied by an Edison 120 volt incandescent circuit, to do electro-plating? If so, how must the lamps be arranged for silver, gold, copper and nickel plating? A. You may put a lamp in series with your bath. This will give you in the neighborhood of one-half ampere of current. The voltage of the bath terminals will depend on its resistance. For more current put more lamps in parallel, and carry one lead joint to one terminal of the bath, and a single lead from the other terminal to the other main wire. 5. What is the best kind of watch demagnetizer to use with my rheostat? What is the principle of it? And how could I make it? I have a commutator or alternator which is turned by a crank. A. A good way to demagnetize a watch is to attach it to a twisted string and twirl it in front of an electro-magnet, at the same time withdrawing it from the magnet as it rapidly revolves. See query 3275.

(3688) H. R. B. asks: What is the composition used in making rollers for printing presses? I have some pieces of copper tubing of the proper size and wish to make some rollers. How shall I proceed? How long should they be left in the moulds? How shall I get them out? A. Printers' rollers are made by soaking good white glue until it swells to a jelly, drain off all excess of water and mix with an equal portion of glycerine, heat with care so as not to scorch and evaporate the water until the proper consistency is obtained for the required work; which must be done by taking out a small portion, say a tablespoonful, and pour into the bottom of a small tin pan and set the pan in cold water to cool it to the proper temperature. This may require several trials. When the mass becomes of the right temper, pour into the mould, which should be very smooth inside and greased; with the spindle set exactly in the center. Let the mould stand for a day to get thoroughly cold and set, when the roll can be slowly pulled or pushed out by the gudgeon.

(3689) Mrs. Dr. B. asks how to remove iron rust from linen. A. If the ground be white, oxalic acid, employed in the form of a concentrated aqueous solution, will effectually remove fresh iron stains.

(3690) H. L. N. writes: The singeing of hair is at present greatly agitated by the professional tonsorial artist, claiming that through this process the hair will become more vigorous and prevent its falling out. This naturally would be a great benefit for persons with exceedingly thin hair, and especially for those who possess the misfortune of getting bald. Please inform me of your opinion on this subject. A. The remedy appears to be worse than the disease.

(3691) F. M. asks what the influence of a powerful current of electricity would be on the felting of furs? A. As fur is a non-conductor, we think a powerful current would have no effect on it. Possibly static electricity might be of some service. An experiment would determine this.

(3692) J. L. L. asks: Is there any cement that will fasten stereotype plates to wood bases? I have some plates difficult to nail, as the cut takes all the space. A. We cannot recommend any cement for the purpose. There are cements that would answer for a short time; but the wood is apt to swell and shrink under use, and this, together with the heavy pressure of the press, would be likely to loosen the plate and do injury to the type forms.

(3693) B. T. writes: I found mica float on the surface of the ground scattered for some distance in detached chunks, 10 by 14 inches in width and from 4 to 10 inch in thickness. The float is not transparent, but cloudy, etc. Does the mica lie in veins or deposits like other minerals? Please state what formation is mica found in. How would a person go about to discover where the float came from? A. No general rule can be given for prospecting for mica. The mineral mica is found in very irregular veins of what is often a coarse granite rock. It occurs in the primitive rocks, such as gneiss and granite. Only general Rules for prospecting can be given. In the Mineral Resources of the United States for 1887, published by the Department of the Interior, Washington, D. C., you will find an interesting and practical article on the subject of mica. We recommend also Anderson's "Prospector's Manual." $1.50 by mail.

(3694) C. H. M. says: 1. When matter of different specific gravity, but free to move independently in the same mass, is rapidly rotated, what will be relative position taken up by the heavier and lighter parts? Example: Suppose a hollow sphere, partially filled with oil and water in about equal parts, to be rapidly rotated on an axis, will the oil hug the equator and the water be in a ring inside of the oil, or the reverse? Or, what is somewhat equivalent, suppose the earth's rotary motion to be accelerated until all the water on the globe should be thrown out in a ring a thousand miles from the equator, would the earth's atmosphere be outside or inside of the water ring? A. Centrifugal force acts inversely as gravity. The heaviest element goes to the outer side in a centrifugal apparatus. The condition and disposition of the material of the earth would not come under this condition, because gravity must be the greater force, or the material would not hold together, but would fly off into space. Hence the heaviest or densest material would still gravitate to the center. 2. What is the explanation of a substance rubbed against itself producing more friction than if rubbed with equal force against a dissimilar substance? For illustration, two pieces of iron, or of wood, of the same kind, rubbed against each other with a force equal to x, will encounter more friction than if a section of the iron is rubbed with the x force against a piece of the wood. Is there a standard of equivalency established in respect to friction of different substances, bearing against each other in motion? A. In regard to friction of soft or hard substances, so much depends upon lubricants and the smooth and even surfaces that are moving over each other that no general explanation or theory will suit each case. Otherwise, the fact is apparent that soft substances moving upon each other with pressure do not adjust their surfaces of contact to a perfect plane, and are frictionally retarded according to its minute inequalities; whereas, with surfaces of unequal hardness, the tendency of the hardest surface is to assume a perfectly true surface by wear which is found to have the least friction. 3. What is the pitch of ordinary heavy rumbling thunder? How long would a closed organ pipe have to be to produce sound of the pitch of heavy thunder? A. The pitch of ordinary rolling thunder varies considerably, ranging through the median notes of the base clef, and would require a pipe from 8 to 12 feet long. 4. As forces act most readily in the direction of least resistance, does a sound (on account of the atmosphere diminishing in density as we go upward) act more effectively upward than horizontally? A. Sound vibrates more intensely upward than along the surface of the earth. This has been noticed by aeronauts, who hear ordinary sounds from the earth at great heights.

(3695) H. E. F. says: 1. A Corliss engine has just been erected which has a shaft fifteen inches in diameter and eighteen feet in length between bearings. The shaft and wheel weigh ninety-six tons, the former deflects 1/8 of an inch in the middle from excessive weight. With the wheel in motion will this condition change and the shaft resume a straight line? A. The shaft will not assume a straight line, nor approach near to it, unless the speed is so great that a half revolution is equal in time to the natural vibration of the shaft. As the speed of such engines is far below the requirement for synchronal action with the shaft vibration, you will not be able to discover an appreciable amount of relief from the spring of the shaft by its velocity. The shaft is too small. Would like to have more details of the engine. 2. I am running a compound condensing engine which requires four hundred gallons of water per minute. Could that water be passed through a motor or small wheel as it flows into the vacuum and produce a small amount of power? The source of supply is on a level with condenser. Vacuum 27-28 inches. A. A small motor could be run in the condenser water pipe, but it would be of doubtful utility. 3. We could utilize all of the exhaust steam from the engine above referred to in heating water for dyeing purposes. Under these conditions would it pay to run compound non-condensing? Or would it be better economy to use a surface condenser? Water from jet condenser not available for this purpose on account of oil. A. There would be just as much objection to the use of the exhaust for heating the dye tubs as there is to the use of the injection water. You would still have all of the oil in the tubs. 4. At eighty pounds pressure what should be the number of pounds of steam (in weight) consumed in heating sixty cubic feet of water from 50° to 212° Fah.? Also from 150° to 212°? A. It will require 525 pounds of steam to heat the water as stated from 50° to 212° and 207 pounds of steam to heat the amount from 150° to 212°.

(3696) S. R. T. says: Suppose a lead pipe 2 inches in diameter, laid from a spring, descends 19 feet into a ravine, then up 32 feet to the top of a ridge, thence down 70 feet to the base of a building three stories high. Can this pipe be made to siphon the water and raise it to the top of the building, 32 feet high? If so, what is the best way to fill the siphon. By a pump at the spring or an air pump at the house? What is the limit of useful employment of siphons this way? What is a good practical work on this class of subjects, and do you furnish it, and the price? I should have mentioned that the pipe will be a half mile long. A. The pipe can be made to siphon the water to the house, and should flow about 18 gallons per minute at top of house, if free from air. Place the air pump at the house for convenience. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 793, on sipbons. The principle of siphonage is perfectly practicable wherever desirable within the limit of atmospheric pressure as applicable to pump suction, say 25 feet lift, and any height required in an invert siphon. In this way the siphon has been largely used in the United States for water supply. There are no books on this subject.

(3697) G. D. says: In running an inch pipe about 500 feet from a well upon a hill to supply a house and barn with water, to reach house under about 30 feet water pressure, and to be used for culinary and all house purposes, which kind of pipe is best—lead, ordinary wrought iron gas pipe, or the latter galvanized or tarred? Is the tar coating of the pipe durable? It would seem to avoid the rust of iron pipe, and the possible deleterious effects of the zinc salts from galvanized iron. Would the brass of ordinary globe valves cause salts to be formed, either from the brass or from other metals in contact with it, that would be injurious to health? A. Lead and galvanized iron pipe are the best for conveying water for household purposes. Both are perfectly safe if the water is kept running, or the contents of the pipe entirely drawn off after standing in the pipe overnight. The tarred pipe flavors the water for some time and the tar is not durable upon the inside of the pipe. Brass valves do not affect the water to any perceptible extent. The most approved management for a house and barn supply is to keep a small stream constantly running into a watering trough at the barn, with an overflow to an underground drain.

(3698) M. O. R. says: I am building nearly two miles of fence. Oak pickets ½×2 inches 4 feet long, woven in five pairs of wire, Washburn & Moen galvanizing process, in which the zinc is fairly soaked through the iron. Having some doubts as to durability of the oak pickets, I wish to apply some preservative which will not injure the wire, but preserve the wood. Would the Bordeaux mixture (sulphate of copper in a whitewash of lime) do? Is the copper salt injurious, or the lime, or both? Will you suggest something superior? A. There is no objection to the Bordeaux wash. Another way is to use 2 pounds sulphate of zinc and 1 pound salt to 30 pounds dry lime, and color if desired with yellow ocher, or any cheap mineral paint. To give the above a strong body a half pound of glue may be added, dissolved separately. You may also add a little glue to the Bordeaux mixture to advantage. If appearance is no object, coal tar is the best preservative. The whitewashes are not injurious to wood or wire.

(3699) M. C. S. asks: Will it be safe for one who has not had any experience to undertake to make a boiler to run a 2 horse power high pressure engine? What will be the easiest and safest type of a boiler to make? Have you issued any paper, explaining how to construct a small furnace that will be sufficient to melt iron? A. Many amateurs make small boilers and very good ones, but they require some shop privileges. If there is a good pipe fitter in your city, you may with his help make a safe and good boiler for any pressure up 100 pounds or more. You will find illustrations to scale and description of pipe boilers of one to threehorse power in SCIENTIFIC AMERICAN SUPPLEMENT, No. 702; you will find a portable furnace for melting 100 to 140 pounds of metal in SCIENTIFIC AMERICAN SUPPLEMENT, No. 180; and for a regular cupola consult West's "Foundry Practice," $2.50 mailed.

(3700) E. S. asks: What acid or solution can I use to rot or destroy stumps in ground after trees are cut down, mostly oak? How long will it take to rot them? A. There is no quick way of rotting stumps. The cheapest way to get rid of them, if you have no suitable means of pulling, is to bore a 1¼ inch auger hole down the center of the stump about 18 inches deep, and put in 1¼ ounces of saltpeter, fill the hole with water and plug it tight. In the spring take out the plug, pour into the hole a half pint of crude petroleum oil, and set it on fire. The stump will burn and and smoulder to the ends of the roots, leaving nothing but ashes.

(3701) H. W. W. says: How can the phylloxera be destroyed? A. Numberless remedies have been suggested and tried—sulphur, carbon bisulphide, coal tar, lime, soap, caustic soda and many others. The following are among the best receipts: See the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 167, 205, 464, 471, 478. 1. Try sulpho-carbonate of potassium and sand. 2. London purple, a by-product in the manufacture of rosaniline, mixed with water. 3. Forty-five pounds sodium phosphate, 15 pounds ammonium phosphate, 60 pounds ammonium chloride, 45 pounds potassium sulphate, 75 pounds of soda, 2,800 pounds iron sulphate, 90 pounds flowers of sulphur. Mix with the soil. 4. Mix 45 parts nitrobenzol, 75 parts sulphuric acid, 1,400 parts water. To kill the eggs, make a paste of 4 ounces benzol, 8 pounds lime, and 360 pounds of earth.

(3702) R. J. F.—Window polishing paste is made of 99 parts prepared chalk and five parts each of white bole and Armenian bole, rubbed together into a smooth paste with 50 parts water and 25 parts alcohol. The paste is to be rubbed on the window, allowed to dry, and then rubbed off with cloths.

(3703) H. T. R. asks how to lag pulleys with paper. A. Scratch the face of the pulley with a rough file thoroughly, so that there are no bright or smooth places. Then swab the surface with a solution of nitric acid, 1 part; water, 4 parts; for fifteen minutes; then wash with boiling hot water. Having prepared a pot of the best tough glue that you can get, stir into the glue a half ounce of a strong solution tannic acid, oak bark, or gall nuts, as convenient to obtain, to a quart of thick glue, stir quickly while hot and apply to the paper or pulley as convenient, and draw the paper as tightly as possible to the pulley, overlapping as many folds as may be required. By a little management and moistening of the paper, it will bind very hard on the pulley when dry, and will not come off or get loose until it is worn out. Use strong hardware wrapping paper.

(3704) L. K. asks: What is the best way to prepare the canvas covering on a canoe to be used along the Florida coast? A. For a canvas canoe, rubber cement or varnish is the safest and easiest to apply. Use the kind obtained through the rubber trade and thin it with naphtha. After a painted coat of the thin rubber has dried, the thick paste rubber may be applied all over the outside with a spatula, and if carefully done will make a smooth waterproof boat. Paraffin wax melted in with a hot iron is excellent.

(3705) G. D. asks how to make a thick rubber cement. A. Rubber cement is made by dissolving masticated rubber in benzole or solvent naphtha. We refer you to "Rubber Hand Stamps and the Manipulation of Rubber." $1.00 by mail.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

November 24, 1891,

AND EACH BEARING THAT DATE.

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

Agricultural machine, J. E. Reed 463,966
Armature core for dynamo-electric machines, E. Thomson 463,671
Assay furnace, Ricketts & Bush 463,712
Axle, W. H. Curtis 463,621
Axle, H. C. Shultz 463,797
Axle lubricator, vehicle, J. L. House 463,682
Axle, wagon, S. E. Oviatt 463,668
Baling press, C. E. Whitman 463,929
Baling press, A. Wickey 463,873
Banjo, H. C. Middlebrooke 463,952, 463,953
Barber's indicator, C. Van Dusen 463,872
Basket, C. E. Gates 463,964
Baskets, apparatus for making, B. F. Bobbitt 463,714
Batteries, separator for the plates of secondary, C. F. Waldron 463,879
Bearing, ball, H. Howard 463,833, 463,834
Bearing box adjuster, automatic, H. L. Hopkins 463,627
Bearing, colter and wheel, H. R. Howe 463,899
Bed bottom, woven wire, W. B. Noyes 463,730
Bed, hanging, W. M. Buell 463,657
Bed, wardrobe or folding, F. B. Williams 463,855
Bedstead, invalid, W. Coughlin 463,944
Beehive, P. H. Ackley 463,674
Belt fastener, Hanee & Redick 463,664
Belt guide and tightener, P. W. Minor 463,686
Bicycle, J. H. Mathews 463,710
Bicycle, H. B. Murdock 463,703
Board. See Shooting board.
Boiler. See Steam boiler.
Boiler furnace, S. Eggenberger 463,829
Bolster standard, J. T. Livingston 463,803
Boot or shoe, machine for trimming the edge of the upper at the toe of a, G. W. Day 463,948
Boots or shoes, crimping machine for, W. E. Frost 463,970
Boots or shoes, manufacture of, G. W. Day 463,947
Bottle cleaner, F. E. Howland 463,835
Box making machine, J. F. Gilliland 463,961
Boxes or similar articles, machine for making plaited, M. Vierengel 463,849
Brake. See Car brake.
Brakes, automatic adjuster for, E. D. Eames 463,718
Bridge gate, H. F. Barndt 463,677
Bridle, O. Von Briesen 463,962
Buckle, harness, W. R. Bruner 463,774
Building material, J. O. Rollins 463,649
Bullet, patched, L. Marble 463,840
Burner. See Gas burner. Hydrocarbon burner. Petroleum burner.
Calcium light apparatus, G. R. Prowse 463,870
Calendar, perpetual, D. A. Fisher 463,678
Camera. See Enlarging camera.
Car brake, W. W. Allen 463,635
Car brake adjuster, Manchester & Miller 463,907
Car brake, railway, M. G. Hubbard, Jr 463,683
Car coupling, J. W. McGill 463,697
Car coupling, E. S. Meals 463,678
Car coupling, A. C. Merritt 463,896
Car coupling, G. E. Nichols 463,737
Car coupling, W. P. Simpson 463,925
Car coupling, J. Van Dell 463,782
Car door, grain, D. D. Miles 463,957
Car, dumping, M. O'Connor 463,956
Car, dumping, C. D. Page 463,889
Car, nursery and lawn, J. A. Elliott 463,891
Car wheel chill, F. E. Canda 463,940
Card, sample, J. W. Schloss 463,995
Card table, F. Vornbrock 463,654
Carpet stretcher and tacker, Keogh & Lockman 463,746
Carrier. See Hay carier.
Carving machine, wood, J. Hunzinger 463,836
Case. See Opera glass case. Show case.
Cash carrying apparatus, H. L. Lovejoy 463,694
Cash indicator and recorder, J. F. Pfeffer 463,706
Catamenial sack and supporter, A. Willoughby 463,819
Centrifugal separator, C. G. P. De Laval 463,794
Chair. See Swinging chair.
Chalk holder, C. W. Lurtey 463,972
Chlorine, making, De Wilde & Reychler 463,767
Chromates and bichromates, manufacture of, Massignon & Watel 463,841
Churn, J. H. Brownfield 463,800
Churn, J. P. Wilson 463,656
Churn power, R. Reese 463,872
Cigar lighter, electric, G. N. Engert 463,754
Cigar tip former, I. Lichtinger 463,633
Clasp. See Rope end clasp.
Cleaner. See Bottle cleaner. Horse cleaner.
Clock, electric programme, J. L. McCaskey 463,843
Cloth stretching machine, C. A. Cavanagh 463,658
Clutch, W. Goldsworthy 463,895
Clutch, A. Lesperance 463,812
Clutch, Worrall & Lesperance 463,820
Clutch, friction, W. Goldsworthy 463,894
Coffee pot, B. L. Hutchins 463,950
Coffin handle, W. H. Lawson 463,865
Coffin lid fastener, J. Richey 463,690
Collar for flannel shirts, A. H. Anderson 463,884
Commutator for electrical machines, W. W. Vail 463,694
Compasses, pencil, R. H. Ingersoll 463,901
Conductors, machine for covering, C. Klotzbach, 463,809, 463,810
Conduit for buildings, surface, R. W. Gibson 463,830
Corn cutting machine, H. Willits 463,930
Corn popping machine, J. C. Tutt 463,878
Cotton handling device, Williams & Bennett 463,708
Coupling. See Car coupling. Thill coupling.
Cradle, J. K. Potter 463,707
Cultivator, S. L. Allen 463,610
Cultivator attachment, C. A. Armstong 463,933
Cultivator attachment, E. Children 463,941
Cultivator tooth, S. L. Allen 463,612
Curling irons, frame for supporting, G. L. Thompson 463,999
Curtain and shade stretcher, A. Shampay 463,692
Cut-out, multiple fuse, G. K. Wheeler 463,764
Cyclists, home trainer for, L. F. Guignard 463,862
Dental engine, J. T. Calvert 463,855
Diamonds and excessively hard substances, apparatus for drilling, D. D. Palmer 463,973
Digger. See Potato digger.
Door check, A. W. Paine 463,813
Door check, G. W. Wright 463,821
Door hanger, sliding, C. D. Fey 463,700
Dovetailing machine, C. E. Parks 463,814
Draught equalizer, H. E. Pridmore 463,776
Draught equalizer, R. Wickham 463,772
Draining and aerating land and apparatus therefor, system of, W. Reading 463,871
Drier, E. Reynolds 463,920
Drilling machine, E. E. Claussen 463,659
Drilling machine, A. D. Quint 463,790
Dust arrester, H. W. Petersen 463,689
Dye, blue, A. Herrmann 463,898
Dynamos, carbon brush clamp for, S. Morse 463,748
Egg beater, Whitney & Kirby 463,818
Electric arc interrupter, E. Thomson 463,762
Electric battery, therapeutic, J. A. Crisp 463,945
Electric cut-out, E. W. Rice, Jr 463,770
Electric lighting system, Hodgson & Stearns, Jr 463,793
Electric meter, A. Reckenzaun 463,711
Electric motor and dynamo, A. L. Parcelle 463,704
Electric motor and generator, I. E. Storey 463,693
Electric motor mechanism, S. E. Mower 463,839
Electric motors, brush holder for, J. E. Lyons 463,835