

stratum of water. It does not sink in masses, as claimed by some.

(12) R. J. L.—Coal or gas tar makes a good roof paint. Mix with any cheap earth color, as pulverized slate, chrome yellow, etc. Thin with benzine.

(13) L. E. C. asks: The E. M. F. and the ampere or strength of current from an induction coil 1/4 inch core, 4 layers of No. 15 primary. The secondary wire to be 20 layers of No. 30 wire, and would the current heat a small section of wire for cantering? A. The current strength and E. M. F. would depend on the battery. The current would be of very slight quantity and high E. M. F., and would heat probably not one thousandth as much wire as would the original current. For cantering use a heavy battery current applied directly without an induction coil.

(14) J. S. McC.—There is little or no difference in the crushing strength of short cylinders, say 2 or 3 diameters, whether solid or hollow. It is when of considerable length, as in supporting columns, that the hollow cylinder of equal weight supports the greatest weight by the bracing it receives from its cylindrical form. If a long solid cylinder is braced so as absolutely to prevent flexure in any part, it will be equal to a hollow cylinder of the same weight and length for resisting a crushing weight or pressure.

(15) L. I. O.—13 lb. of anthracite is equal to 1 gallon crude petroleum.

(16) H. W. N. asks how to make a good blacking for shoes; also how to make a good washing compound. A. There are several receipts for both purposes, many of which we have already published. For valuable information on these and many similar subjects see "Trade Secrets," which we mail for 60 cents.

(17) W. T. H.—For a black stain on iron mix 8 parts protochloride of antimony, 4 parts sulphuric acid, 2 parts empyreumatic pyroigneous acid, or gallic acid. Apply several coats of the mixture to the polished iron or until black enough, or paint with black japan varnish and bake hard. Then remove the polished surface with pulverized charcoal on a wet cloth.

(18) C. D. M. asks a recipe for removing the oil burned on the finished parts of an engine. A. Use caustic soda or potash. What this fails of removing, take off with a scraper.

(19) W. M. writes: I tin malleable iron, which comes from the bath nice and bright, but although I keep it covered, after a few days it gets red, copper colored in spots, and this color gradually spreads all over the work. Can you tell me the cause? A. The red color is probably derived from oxidation of the iron by the acid left in the pores of the iron. The acid rusts the iron and oozes out through the pores of the tin by the pressure due to increase of bulk by the action of the acid upon the iron; possibly also moisture may be absorbed by the acid through the tin, which is porous. Rinse the work, immediately after tinning, in boiling water, holding 2 oz. sal soda to the gallon in solution.

(20) J. J. H. asks the proper way to cure animal skins before the hair is dyed. A. Scrape the flesh side clean, and while they are moist (but not wet) rub in liberally a mixture of alum and salt, about one-half of each. Roll up, hair side out, for two to four days, then shake out and give another application, but with less salt. In two to four days more, according to size of skin, shake and beat out clean, and soften the skin by working it well over.

(21) W. H. E. asks: At what speed can a grindstone run, six feet diameter and ten inches thick, with perfect safety? A. 150 revolutions per minute.

(22) H. H. W. asks a good method for coating small castings of iron and brass with lead, also what is the technical name for this process? A. The process is called kalamein. Cast iron articles are galvanized in the regular way and then passed through a lead bath. Wrought iron and other metals may be either galvanized or tinned and then leaded.

(23) H. E. H. asks for a method by which he can find the point in an irregular triangle, from which as a center to inscribe a circle whose circumference will be tangent to each side of the triangle. A. Bisect any two angles of the triangle, prolong the bisecting lines until they intersect, and use their intersection as the center.

(24) R. W.—The tensile strength of wrought iron slightly increases with temperature from 60° (1) to 212° (1-2), and to 435° (1-4) of its initial tensile strength. This is no excuse for testing boilers with steam at a risk in case of rupture. We only repeat that there is no difference in a given pressure by whatever means it is procured.

(25) J. P. H. asks which would be the most efficient way to remove blood and grease stains from birds to be set up or stuffed. Also if it would be better to remove it before or after stuffing? A. Wash with pure water and keep agitating the feathers with the fingers until they are dry. This will remove blood. Similar treatment with benzine will remove grease. Do this before stuffing. It will undoubtedly injure the specimen to some extent.

NEW BOOKS AND PUBLICATIONS.

WILD FOWL SHOOTING. By William B. Leffingwell. Chicago: Rand, McNally & Co.

This is a book made up principally of the personal experiences of the author, and they have been sufficiently extensive to make it a genuine pleasure to follow him, in its pages, through many delightful excursions often attended with much hard work and exposure, but generally resulting in the "bagging" of a good quantity of game. The resorts, habits, and flights of wild fowl are described, with the most successful method of hunting them, and much practical information is plainly set forth touching the right kind of boats to use and how to build and take care of them,

about decoys and blinds, retrievers and their characteristics, and on the selection and use of a gun. The book cannot fail to be extremely valuable to every amateur, while its pages are full of entertainment to such as have been most successful in this class of sport.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

October 16, 1888,

AND EACH BEARING THAT DATE.

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

Table listing inventions with names and page numbers, including: Adding machine, J. C. Seymour; Alcohol, purifying, T. G. Bowick; Animal trap, W. H. Castle; Automatic switch, R. E. Nolley; Axle, divided car, R. K. Skinner; Axle, vehicle, W. H. Wright; Axles, toughening, J. Coffin; Band fastening, J. M. Scott; Bar, See Grate bar. Locomotive draw bar; Batteries, separator for electric, H. W. Butler; Beam straps, implement for forming, McDougall & Potter; Bed bottom attachment, O. S. Foster; Bed, spring, O. S. & W. S. Foster; Beehive, B. F. Kendall; Bell, door, W. B. Atkinson; Belt clasp, L. Sanders; Belt fastening, J. M. Whittemore; Belt, galvanic, E. D. Granger; Bench, See Wash bench; Beverage shaking and mixing machine, B. F. K. Jennings; Bicycle lock, Gongware & Hanley; Blind slat tenoning machine, W. H. Doane; Boat building, former for, M. Y. Ransom; Boiler. See Steam boiler; Boiler cleaning compound, J. A. Wright et al.; Bolt, spring, W. Cole; Bolt. See Flour bolt; Bookbinding apparatus, G. H. Orden; Book, letter copying, S. Chadwick; Boot and shoe heels, machine for moulding and compressing, Cummings & Coombs; Box. See Letter box; Box, C. H. Hardin; Box handle, J. A. Traut; Bracket attachment, shade, G. S. Pearson; Brake. See Car brake. Wagon brake; Breast drill, J. Sangster; Brick kiln, perpetual, F. B. Graves; Brush and towel operating mechanism, bath, J. Mayer; Brush holder, H. H. Sawtelle; Brush making, E. I. Miller; Buckle, W. F. Osborne; Buggy boot, P. M. Barnes; Burner. See Gas burner. Straw burner; Button, S. Cottle; Button, separable, E. Pringle; Button, separable, M. D. Shipman; Cable coupling and grip device, J. H. Bowden; Camera. See Photographic camera; Can. See Milk can. Oil can; Cane mill, Robertson & Hudson; Cane, walking, G. H. Coursen; Car brake, H. C. Fletemeyer; Car brake, J. Walsh; Car coupling, W. Gibboney, Jr.; Car coupling, D. Schofield; Car coupling, E. Waldron; Car heater, J. G. Phillips; Car platform, metallic, B. W. F. La Mothe; Car, steam street, W. E. Wilcox; Car ventilator, H. Lindsey; Cars, changeable signal light for railway, W. S. Adams; Cars, construction of railway, F. G. Caldwell; Cars, smoke conductor and ventilator for, A. S. Miles; Card fillet setting machines, head of, R. Sellers; Cards, etc., device for automatically exhibiting business, G. D. Keach; Carpet sweeper, W. J. Drew; Carriage curtain light, F. A. Neider; Carriage top prop, Shibley & Payne; Carrier slats, attachment for endless, C. C. Smalley; Cart, road, C. C. Hayes; Cart, road, Ketchum & Palmer; Cart, road, F. J. Melvin; Case. See Medicine case; Cash carriers, retarding tube for, F. N. Jones; Charcoal, apparatus for restoring the spent properties of, C. L. Porter; Check loop, overdraw, L. D. Jones; Chlorine, apparatus for making, J. A. Just; Chlorine, making, J. A. Just; Churn, J. M. Hunt; Clasp. See Belt clasp. Shoe lace clasp; Cleaner. See Flue cleaner; Clock, A. Phelps; Clod crusher and roller, combined, O. C. Look; Cloth cutting machine, A. Warth; Clothes drier, E. J. Ritterhouse; Clothes drier, J. S. Valentine; Coal, chain conveyor for handling, A. J. B. Berger; Coal drill, W. C. Johnson; Collar stuffing machine, W. Fogleson; Concentrator, Starr & Kinley; Confection pan, steam, W. L. Jancey; Connecting rod, R. Humble;

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