

before applying the varnish. For a red stain use camwood, logwood, or aniline. You can find the tone of a piece of wood by comparing its note when it is struck with the notes of any musical instrument tuned to standard pitch.

(18) C. C. M.—Red Varnish for Violins.—Dissolve over a moderate fire— Sandarac... 12 parts. Shellac... 6 " Mastic... 6 " Elemi... 3 "

In 150 parts 95 per cent alcohol which has been colored red with cochineal, or if a darker red is required, add dragon's blood gum. When the above is dissolved add 6 parts Venice turpentine. As this varnish is highly inflammable, use caution as to fire. Find the tone of a piece of wood by direct comparison with similar notes on the piano or any standard instrument. A violin in tune at the proper pitch by a tuning fork is very convenient.

(18) Varnish for Violins—Tone of Wood for Same.—Dissolve by heat 2 ounces amber in oil of turpentine 5 ounces, and drying linseed oil, 5 ounces. Color with dragon's blood or extract alkanet root. The tone given by a piece of wood depends upon its size, thickness, etc. Therefore, a test must be comparative. Cut square plates of equal size and thickness of a known wood and of the wood to be tried. Place the center of the plate upon the end of a cork or spool placed upon a table near the edge. Press the center of the plate of wood with the thumb and bow it near one of the corners. This will give the lowest note such a plate can produce, or the normal tone. The higher the tone, the better the wood.—T. S.

(19) Self-Propeller.—This approaches the perpetual motion problem, which has not been solved as yet. We know of nothing unless animated nature is a mechanical device.

(19) Mechanical Device.—Not in a mechanical sense. If built of good material, it would probably be perpetual motion, which is an impossibility. A machine could easily be made so fragile as to go to pieces when set in motion.—Y.

(20) Relief Maps.—Make the original in intaglio in plaster of Paris. Then beat papier mache into its cavities with a brush, as making paper cliches for electrotyping. See query No. 5 in SCIENTIFIC AMERICAN, December 15, 1888.—W.

(20) Relief maps are made in clay or wax and a plater cast taken from which a relief cast may be taken in plaster or papier mache. To make the papier mache cast requires that the mould of plaster should be backed by a stone slab, to allow of pressure by beating the papier mache into the mould with a stiff brush, and applying pressure with a cushion of sponge. Oil the moulds with linseed oil to prevent sticking.

(21) Utilization of Leather Scraps: Paper Ware.—These are trade secrets; have tried to find them out, and have failed.

(21) Sundry Recipes.—I have compiled a "RECIPE BOOK," which largely treats of artificial leathers, papier mache, and water proofing. The chapter on imitations and substitutes covers a large range. See pp. 174 to 184. Paper gas pipe, bottles, etc., p. 454, 455. Papier mache for buckets, spittoons, etc., pp. 62 and 63. All of which appertain to this query.—G. D. H.

(22) Grafting Pear Trees.—Spring if done outdoors; on small stocks, it may be done indoors in winter, the stocks being kept in a cellar. There are good articles on the subject in Appleton's Cyclopaedia. Also see SCIENTIFIC AMERICAN SUPPLEMENT, No. 122.

(22) Grafting.—For an article on the art of grafting see SCIENTIFIC AMERICAN SUPPLEMENT, No. 122. For a good grafting wax see Note and Query No. 16 (present list). The best time depends upon the season; after the sap starts and before budding time.

(23) Boiling Lined Eggs: Making Cider Vinegar.—(a) Try boiling slowly, beginning with cold water and bringing it to a boil. The eggs will then be cooked. If this does not answer, make a pin hole in the large end. (b) Add to your barrel, a quantity of the mother or lees of vinegar. Leave bung hole open; you may stick the neck of a bottle into it.—S. S.

(23) Lined Eggs.—We know of no way to prevent lined eggs from cracking when boiled. It is the confined gas expanded by heat that cracks them. Add a little yeast, 1/4 a pint to a barrel, to start your vinegar.

(24) Varnish for Maps.—Use Canada balsam or dammar varnish. The principal trouble will be in removing the old wax. The paper must be perfectly dry.—A. A. W.

(24) Mounted maps are sized with thin white glue and varnished with mastic.

(25) To Bleach Ivory: Cleaning Marble.—Bleach ivory by exposure to the sun under glass, or soak in a solution of binoxide of hydrogen. To clean marble, mix a quantity of the strongest soap lye with quicklime to the consistency of cream and lay on the stone for a day, clean it off afterward and rub with putty powder or whiting.

(25) To bleach ivory, place the ivory in a saturated solution of alum for an hour. Polish with a woolen cloth and wrap in linen to dry. Also with peroxide of hydrogen, to 1 pint add 1 ounce aqua ammonia. Warm, soak the ivory for 24 hours, wipe and polish with chalk.

(26) Refining Cotton Seed Oil.—Ten tons of crude oil are treated with 30 cwt. caustic soda lye of 10° to 12° Twaddell at 60° Fah. After agitation, if oil is not yet colorless more lye is added, and eventually all is left to stand 12 or 15 hours. The clear oil is then run off, washed, and bleached with chloride of lime or exposure to sun. It may be used directly to fry in, as lard.

(26) Refining of Cotton Seed Oil.—To 100 gallons crude oil add gradually 3 gallons caustic potash lye (45° Baume), with constant stirring for several hours; or, the same quantity of oil, add 6 gallons soda

lye of 25° to 30° Baume, heat to 200° to 240° Fah., with constant stirring. Allow it to settle and cool. Decant the clear oil and filter the residue with canvas bags and pressure. When properly and cleanly done, the refined oil has the color, transparency, and taste of olive oil, and is largely used for culinary purposes, and used as an adulterant of olive oil.

(27) Bell Telephone, Battery, etc.—1. No. 2. Use No. 36 copper wire, silk covered. Wind to 80 ohms resistance. This will require about 35 feet of wire. 3. A properly made single contact transmitter will give every satisfaction. The multiple-contact instruments are sometimes considered more sensitive. 4. For details on telephone apparatus, consult "Bell's Electric Speaking Telephone," by Prescott. 5. Lead is unsuitable, as it will not hold the carbons firmly. Dip the dry carbon tops in melted paraffine, copper-plate them, and cast the plate in type metal. This will give a first class job. You may cast the cover directly around the carbons if you wish. It will not crack them. 6. The cast iron-zinc couple excited by caustic soda is probably best for your purposes.

(28) Erasing Ink.—Oxalic acid mixed with citric acid may be used. There are two distinct species of red ink, aniline and carmine, on the market, and some will be found hard to remove.

(28) For Ink Eraser.—Equal parts of cream of tartar and citric acid in solution with water. Or, a more powerful one, a saturated solution of oxalic acid in water. The red inks are made of various bases for the color, as Brazil wood, cochineal, and aniline red. The aniline red may be removed by alcohol acidulated with nitric acid. No receipt for the other reds.—G. D. H.

(29) Driving 1/2 H. P. C. and C. Motor.—Your water power (1/2 hp, 25 feet head) is ample. Donaldson's "Water Wheels" gives details of such matters. For battery, you would need large bichromate cells, say one gallon each. Eight or ten such cells should suffice.—C. H. P.

(30) Tempering Steel.—SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 71, 36, 37, 95, 103, 105, and many others treat of this subject of tempering steel.—Sup.

(30) Tempering Tools.—To temper cutlery, daggers, bowie knives, butcher knives, etc. Edged cutlery should be hardened before the blades are finished or sharpened to prevent cracking. Should be heated to the lowest temperature at which the particular kind of steel that it is made of will harden. If of German or spring steel, a full cherry red; if of tool steel, a lesser brightness in the heat. A slow fire that is long enough to heat the whole length of the blade equally is necessary. When at the proper heat, plunge the blade exactly vertical in water at shop temperature. Add a little salt, a handful to a pail. Then smear the surface thickly with whale oil or linseed oil and heat carefully over the open fire, so as not to overheat the point, until the oil flashes flame all along the blade. Then plunge vertically in oil or warm water. See also a valuable paper by Joshua Rose on The Hardening and Tempering of Steel, in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 95, 103, 105.

(31) Rubber Oxygen Bag.—It is best to buy one. Make of rubber cloth (cotton dril coated with rubber), double seaming at joints, and paying same with India rubber cement. A copper or brass reflector can be silvered by regular electroplating process. First amalgamate the surface to be plated. Directions for plating can be found in many books and back numbers of SCIENTIFIC AMERICAN SUPPLEMENTS.

(31) H. P.—Bags for Gas.—Rubber bags suitable for oxygen gas are beyond the ways and means of an amateur. We recommend you to obtain one through the rubber trade. The silvering of a metal reflector should be an electro deposit, which you will find described and illustrated in SCIENTIFIC AMERICAN SUPPLEMENT, No. 310. The polishing of the silver surface you may do by rubbing the surface with a buckskin pad stuffed with cotton and wet with a paste of rouge and water.

S. H. sends a beetle specimen, and says: The inclosed beetle was found in a pine seat of a painted chair. It was embedded in a cavity about 1 1/4 inches deep. The writer having been in the furniture business a number of years, and this being the first instance under his notice of an insect attacking painted furniture, would be under obligations should you enlighten him concerning the name, habits, and other information relating to the subject.—A. Prof. C. V. Riley, of the U. S. Department of Agriculture, Division of Entomology, says the specimen is a common longicorn beetle known as Monohammus scutellatus, which is a common borer of pine trees. It is found all through the Northern United States, infesting, of course, only standing trees. It remains for a long time in its preparatory stages, and is also under unnatural conditions capable of considerable retardation of development. Either in the larva or pupa state it was living in the tree when it was cut, and its particular burrow was undisturbed by the sawing and the subsequent manufacture of the chair, from the seat of which it afterward emerged. Instances of this kind are not uncommon, and all are to be explained in this way. It does not, of course, as S. H. imagines, "attack painted furniture."

Books or other publications referred to above can, in most cases, be promptly obtained through the SCIENTIFIC AMERICAN office, Munn & Co., 361 Broadway, New York.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

December 11, 1888,

AND EACH BEARING THAT DATE.

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

Acid proof receptacle and lining therefor, E. R. Rand... 394,296
Adding machine, W. Snider... 394,219
Air, apparatus for carburizing, C. M. Fulkerson... 394,480
Alarm. See Electric alarm.
Amalgamating apparatus, W. A. Koneman... 394,493
Animals, preparing food for, J. R. Barret... 394,431
Awning, H. B. & F. X. Coyle... 394,341
Axle box lid, W. H. Lawrence... 394,378
Axle lubricator, car, F. C. Hockensmith... 394,362
Bag. See Saddle bag.
Baling press, A. Freytag... 394,261
Banjo, E. J. Cubley... 394,159
Banjo, J. J. Doyle... 394,348
Banjo, W. R. Wood... 394,530
Barrel stand, W. Beckert... 394,439
Barrel tester, F. P. Bixler... 394,444
Basin, bath tub etc., set wash, W. Scott... 394,404
Basins, sinks, etc., trap for, W. Scott... 394,405
Battery. See Secondary battery.
Battery plates, making secondary, L. Duncan, 394,472, 394,473
Bearing, roller, R. W. Hent... 394,269
Belt fastener, J. Snow... 394,412
Belting, G. F. Page... 394,503
Berth, temporary ship's, G. Hurson... 394,186
Bin. See Grocer's bin.
Binder, temporary, G. V. Clifford... 394,249
Binder, temporary, W. M. Kinnard... 394,189
Binder, temporary, W. D. Lane, Jr... 394,496
Binder, temporary, W. D. Ready... 394,384
Bit. See Bridle bit.
Block. See Cartridge loading block. Snatch block.
Blower, grate, W. S. Harris... 394,359
Boiler. See Steam boiler.
Boilers, etc., covering or jacket for steam, J. M. Riley... 394,398
Bolt turning machines, blank feeder and gripping die for, C. H. Graham... 394,170
Book rest for the use of invalids, T. H. D. May... 394,196
Book, sample, J. E. Spears... 394,516
Boots or shoes, follower or form for, G. H. Clark... 394,154
Bottle fastener, automatic, T. B. Howe... 394,490
Bottle stopper, Hitchcock & Chapman... 394,182
Bottle stopper, Philburn & Moors... 394,294
Box. See Honey box.
Box fastener, J. Wotruba... 394,320
Box opener and tobacco claw, D. W. Thacker... 394,547
Brake. See Car brake. Vehicle brake. Wagon brake.
Brick machine, Ross & Keller... 394,510
Brick machine, hydraulic, H. Von Metzlauff... 394,628
Bridle bit, T. Brabson... 394,453, 394,454
Bridle blinder, A. Pearl... 394,389
Broach, G. Thompson... 394,226
Broom, F. S. Stark... 394,410
Buckboard, H. L. Sweet... 394,519
Bucksaw frame, C. Eisenhardt... 394,477
Burning material for architectural purposes, composition of, C. Straub... 394,518
Burner. See Hydrocarbon burner. Oil burner.
Button setting machine, E. H. Taylor... 394,546
Button setting machine, J. H. Vinton... 394,231
Buttons, machine for rubbing and polishing, E. P. Howe... 394,185
Camera. See Photographic camera.
Can. See Oil can.
Can, J. F. Maxson... 394,381
Caps, making, Dormer & Marks... 394,469
Car brake, B. Boyer... 394,462
Car coupling, L. M. Fox... 394,165
Car coupling, G. A. Guice... 394,357
Car coupling, E. P. Johnston... 394,368
Car heater, L. G. Gilbert... 394,354
Car heating system, auxiliary, W. Buchanan... 394,456
Car mover, A. J. Dominy... 394,254
Car uncoupling device, W. O. Rutledge... 394,301
Car, vestibule, N. P. Cowell... 394,339, 394,340
Car, vestibule, T. E. Thompson... 394,313
Car wheel, S. W. Tanner... 394,312
Cars, automatic fan for, J. Sands... 394,402
Cars, grip for cable railway, B. L. Harris... 394,539
Cars, system for heating and ventilating, E. F. Roberts... 394,508
Carpet fastener, stair, D. Walker... 394,315
Carriage, O. Gilsnann... 394,263
Carriage, F. W. Zimmer... 394,239
Carrier. See Cash carrier.
Cartridge case, J. C. Kelton... 394,376
Cartridge case and means for carrying the same, J. C. Kelton... 394,375
Cartridge feed pack, J. C. Kelton... 394,374
Cartridge loading block, W. H. Pack... 394,288
Cartridge pack, J. C. Kelton... 394,373
Case. See Cartridge case. Show case.
Cash carrier, S. W. Barr... 394,326
Caster frame, J. J. Sullivan... 394,310
Centrifugal machine, D. M. Weston... 394,234
Chain links, machine for uniting, D. D. McKernan... 394,199
Chair. See Rail chair.
Chimney cap, A. E. Clute... 394,337
Chuck, E. A. Howe... 394,364
Clutch, friction, W. H. Johnson... 394,367
Coffee, coating, W. Hindhaugh, Jr... 394,181
Coin counter, match safe, and cane handle, combined, J. M. Basinger... 394,327
Collar fastening, dog, J. M. Riley... 394,506
Concentrator, M. McAneny... 394,197
Condensing liquids, apparatus for, J. H. Bassler, 394,432 to 394,434
Contact maker, electric, J. S. Farmer... 394,164
Copy holder, R. W. Bloemke... 394,440
Corn husker, S. C. Harper... 394,177
Corn husker, D. T. Phillips... 394,504
Cotton picker, J. W. Wallis... 394,316
Coupling. See Car coupling. Thill coupling.
Crayons, automatic holder for lead, G. Sandell... 394,401
Cuff blank hem folding and cutting machines, stamping device for, F. B. Ide... 394,274
Cuff holder, R. J. Newman... 394,206
Cultivator, E. Case... 394,334
Cultivator, C. Mendenhall... 394,283
Cup. See Oil cup.
Cut-off for steam engines, draught, A. M. Zimmerman... 394,430
Cut-off gear for steam engines, B. V. Nordberg... 394,501
Cut-off or regulator for gang boilers, automatic, W. C. Fairbairn... 394,257
Cutter. See Paper cutter.

Cutter head, J. T. Grzybowski... 394,175
Dental plugger, pneumatic, L. E. Custer... 394,464
Digger. See Potato digger.
Dispatch tube, electric, W. Dulles, Jr... 394,161
Display rack, J. S. Davis... 394,252
Door hanger, G. W. Warner... 394,317
Dovetails in wood, forming, D. B. Wesson... 394,423
Dovetail slots in wood, forming, D. B. Wesson... 394,422
Drawer, record, G. W. Newberry... 394,500
Drill. See Rock drill.
Drill, T. Goserd... 394,169
Drilling, channeling, and gadding machine, combined, W. L. Saunders... 394,212
Dust collector, H. Simon... 394,408
Dust collector and separator, Allington & Curtis... 394,240
Dye vat, J. P. Delahunty, Sr. (r)... 10,973
Eysing, V. G. Bloede... 394,447
Electric alarm and water gauge, J. H. Johns... 394,491
Electric distribution by secondary batteries, Z. Latshaw... 394,541
Electric machine, signaling dynamo, E. Gray... 394,172
Electric motors or generators, safety device and signal for, C. J. Van Depoele... 394,525
Electric motors, safety device for, C. J. Van Depoele... 394,417
Electro-magnetic switch, W. W. Griscom... 394,465
Electro-mechanical movement, B. Cadwallader... 394,332
Engine. See Gas and calorific engine. Rotary steam engine. Triple expansion engine.
Engine crosshead, steam, L. D. Davis... 394,345
Engines, steering apparatus for traction, C. A. Copeland... 394,460
Extracts, making, J. H. Lorimer... 394,191
Fan, chair, G. B. Ulrichs... 394,229
Fan, exhaust, D. A. Sailor... 394,400
Faucet for wagon tanks, measuring, G. H. Perkins... 394,391
Feed regulator, J. A. McNulty... 394,278
Feed water circulator, J. P. Kelly... 394,372
Feed water heater, Vogt & Burns... 394,526
Fence, J. A. Barber... 394,241
Fence, portable, S. Hobson... 394,361
Fence post, C. E. Hamilton... 394,266
Fertilizer distributor, E. P. Johnston... 394,369
File or book holder, J. H. Ferguson... 394,258
Fire escape, T. J. Baker... 394,149
Fire escape, J. Hotchkiss... 394,272
Fire escape, T. B. Nutting... 394,502
Flux, manufacturing, J. Webster... 394,233
Frame. See Bucksaw frame. Caster frame.
Fuel compound, L. Haas... 394,486
Furnace. See Hot air furnace.
Furnace, J. W. Cassidy... 394,152
Furnace grate, T. H. Sears... 394,545
Furnaces, apparatus for charging and drawing, S. T. Wellman... 394,419, 394,420
Furnaces, combination mechanism for charging and drawing, S. T. Wellman... 394,421
Fuse, electrical, J. Macbeth... 394,192
Gas or calorific engine, A. Kollason... 394,239
Gases, apparatus for testing mine, T. Shaw, 394,214, 394,215
Generator. See Steam generator.
Gold from quartz or gangue, separating, G. Sweanon... 394,225
Grading and ditching machine, J. B. Gavin, 394,534, 394,535
Grain, apparatus for heating, R. C. & G. E. Hawley... 394,267
Grain, apparatus for mashing, C. Kaestner... 394,370
Grinding mill, G. A. Young... 394,288
Grocer's bin, L. Johnston... 394,276
Hammer, pneumatic, G. Glossop... 394,483, 394,484
Handle. See Shovel handle.
Hanger. See Door hanger. Lamp hanger.
Harness mountings, die for, D. McCance... 394,282
Harp, J. C. Dietz... 394,467
Harrow, J. H. Sharp... 394,514
Harvester, C. F. Search... 394,513
Harvesters, cutting apparatus for, D. H. Bennett... 394,441
Harvesters, knoter for, W. F. Goad... 394,536
Hat, felt, F. W. Cheetham... 394,336
Hay rake, horse, E. McGovney... 394,198
Head rest, C. W. Hooven... 394,271
Heater. See Car heater. Feed water heater.
Heating purposes, apparatus for vaporizing and burning non-explosive oils for, I. Hayes... 394,179
Heel attaching machine, F. F. Raymond, 2d... 394,298
Hoisting apparatus, F. M. Davis... 394,344
Hoisting bucket, G. W. Rawson... 394,297
Holder. See Copy holder. Cuff holder. File or book holder. Sash holder. Twine holder.
Honey box, H. D. Davis... 394,160
Hoop machine, barrel, E. Olund... 394,546
Horse detacher, J. W. Cronan... 394,157
Horseshoe, M. Payne... 394,388
Hose, elastic, E. Tivey... 394,27
Hot air furnace, H. R. Gillingham... 394,355
Hydrant, C. G. Ette... 394,478
Hydrant, P. White... 394,529
Hydraulic press, L. Miller... 394,383
Hydraulic press, H. Von Metzlauff... 394,527
Hydrocarbon burner, L. Stevens... 394,517
Hydrogen sulphide, obtaining, Parnell & Simpson... 394,387
Indicator. See Station indicator.
Insect destroyer, W. Neef... 394,205
Insole, spring, D. A. Johnson... 394,186
Insulators, wire holder for, E. L. Lloyd... 394,330
Iron. See Singletree iron. Whiffletree iron.
Jack. See Lifting jack. Wagon jack.
Jewelers' use, machine for cutting solder for, S. F. Merritt... 394,201
Jewelry, Traitel & Rawiszer... 394,523
Jute and other fibrous plants, machine for stripping, W. Menzies... 394,284
Key, T. Donahue... 394,406
Knife. See Surgical knife.
Knob, stop, M. Clark... 394,246
Ladder, step, B. F. Johnson... 394,492
Lamp hanger, D. Chisholm... 394,153
Lamp support, extension, T. D. Stone... 394,224
Lamps, cut-out for electric, C. Heisler... 394,180
Lamps, extension standard for, J. Kintz (r)... 10,974
Lamps, wick rafter for central draught, Z. Davis... 394,465
Latch, E. S. Winchester... 394,427
Latch, reversible, J. H. Woolaston... 394,428
Lathe tool for finishing and polishing, W. M. Seeger... 394,406
Lathing, metallic, B. Scarles... 394,403
Lifting jack, A. A. Strom... 394,308
Light. See Pavement and floor light.
Limekiln, R. H. Burns... 394,151
Lock. See Nut lock. Permutation lock. Seal lock.
Locomotives, clutch mechanism for the driving shafts of, A. Mathies... 394,194
Loom shuttle spindle, J. M. Cheney... 394,456
Looms, let-off motion for, J. J. Honan... 394,184
Lubricator. See Axle lubricator.
Lubricator, J. Mense... 394,497
Mainspring winder, A. F. Robbins... 394,507
Match safe and cigar clipper, combined, E. L. Lake... 394,4