



(23) M. R. asks: Which of two engines will give most power: one of two cylinders, 3 inches diameter, 4 1/2 inch stroke; or one of one cylinder, 3 inches diameter, 9 inch stroke? How much power will I get from either of above, 40 lb. steam, 75 revolutions per minute? A. The power, under similar conditions, would be the same with 40 lb. average piston pressure and 75 revolutions—1/4 to 1/2 horse power.

(24) D. M. S. asks: What is proper size for steam pipe leading from boiler with 90 lb. steam, to engine, cylinder 16x36, placed 10 feet away? Should it be as large as 4 inches diameter, and will it do to be not more than 2 1/2 inches diameter? A. It should not be less than 4 inches. 2. What size should pulley be on Judson governor: valve is 4 1/2 inches diameter, pulley on mainshaft is 12 inches diameter; it belongs to above engine? A. Cannot say, as you do not give the speed at which either engine or governor is to run, nor the dimensions of the governor. You should write the maker of the governor, or determine the proper speed by experiment.

(25) H. S. M. writes: 1. Suppose a gun barrel doubled in length without breech pin; put a charge of powder in the middle, and a ball on each side of it, to be driven in opposite directions; fire the charge; would the effect of each ball be equal to one fired from an ordinary gun with same charge of powder? A. You must suppose the conditions perfectly equalized, that the powder has equal effect on both balls. The sum of the effect on the two balls would equal that on one ball when the whole force of the powder was acting by one only. 2. If not, how is the principle of action and reaction being equal sustained? A. The principle of action and reaction is not affected by the result.

(26) C. B. W. asks how the oxychloride of zinc cement is mixed by dentists and used, what proportion of the ingredients is used, and how to obviate the disagreeable taste that zinc chloride produces? In what manner should the cement be introduced into cavities? A. That in most general use for ordinary plugging is composed of oxide of zinc, 5; silic, 2; borax, 1; moistened with a solution of 1 oz. zinc chloride in 6 drachms of water. Where it is to be used as a capping or temporary filling over freshly exposed pulps the fluid should be zinc chloride, 1 oz.; water, 1 to 2 oz.; making a solution of only sufficient strength to cause the mixture to set. The cavity having been cleaned, creosote should be applied to the exposed pulp, and the oxychloride introduced in a semifluid state, and protected by a rubber dam from the fluids of the mouth until properly hardened (half an hour usually suffices). It is advisable to allow several days to intervene for the more thorough solidification of the cap prior to the removal of the excess of material and final insertion of the metal stopping.

(27) C. B. asks: How can I prepare gum dextrine? A. Crushed malt, 1 lb.; warm water, 2 gallons; mix, heat to 145° Fah; add 5 lb. starch, raise the heat to 160°, and mash for about 25 minutes or until the liquid becomes thin and clear. Then run off immediately, and boil for 3 or 4 minutes to prevent the formation of sugar; filter, and evaporate the liquid to dryness.

(28) E. R. H. asks: 1. What can I use with sand and silicate of soda to make the latter water proof when making artificial stone of great strength: is there any acid that will do it? A. Dilute sulphuric and muriatic acid, also carbonic acid, have been used.

(29) I. H. P. writes: I have now on hand a lot of sumac leaves gathered in July and August, to experiment on. I wish to make the extract fluid and solid from the sumac leaves. My chemist has made samples; he uses acid which eats up the leaves and leaves behind a heavy thick pasty substance. Would this do? I intended to manufacture it in my chemical works. If you can enlighten me on this I shall be under many obligations to you. Can you give me the name of a work treating on it? A. Dry, powder, leach with hot water, filter, and evaporate the liquid (preferably in a vacuum pan) to the proper consistency at a moderate temperature. From your statements we cannot judge of the extract prepared for you.

(30) P. W. asks how to get the rust off my hand, made by cast iron? Am at present using pumice stone and castile soap, but it takes too much. A. Try a little dilute muriatic acid; then plenty of water.

(31) J. S. asks how to mould sealing wax. A. The moulds usually employed are of heavy iron (so as to conduct away the heat rapidly). They are made in two pieces, each representing half the matrix. The strained wax is poured in from the top (end of stick). The mass of iron quickly chills the moulded stick, and when the mould is opened the stick does not adhere to the smooth metal. The sticks then go through an ironing process which imparts the smooth gloss. If the wax is not properly compounded and strained the casts are likely to be imperfect under the best management.

(32) E. A. H. asks: To what extent can blocks of wood of about 2 inches in thickness be rendered fireproof? What is the easiest wood to treat and what the best process? A. Blocks of wood may be rendered superficially non-inflammable by saturating the fiber as far as possible with a strong aqueous solution of sodium tungstate (commercial). The most satisfactory way is to place the wood in a strong iron vessel, exhaust the air as far as possible with a suitable pump, then let in the hot solution and subject it to pressure, which forces the liquid into the fiber. Light porous woods are more readily saturated than the heavier and denser kinds. Wood thus impregnated will not take fire in contact with temporary flame. All organic bodies when heated high enough suffer destructive distillation, and as the gases evolved are quite inflammable, such bodies cannot be made strictly fireproof.

(33) J. J. W. asks (1) how much water and weight of quicklime to make cream of lime. A. One of lime to thirty or forty of water. 2. Also how much of same it would require to throw down the lime in ordinary limestone water. I wish to use about 30,000 gallons per day thus purified. A. It depends altogether upon the amount of lime and carbonic acid in

water. Must be determined by chemical analysis, as no two waters are alike in this respect.

(34) S. S. K. asks a recipe for an amber varnish, suitable for varnishing a new violin. A. Fuse 6 lb. very pale clear amber in the gum pot, and add to it 2 gallons of hot clarified oil. Boil until it strings very strong, remove from the fire and stir in 4 gallons oil of turpentine. Allow plenty of time before polishing. 2. Is there any work published on the new process of milling? A. We believe not; but you will find several articles on the subject in back numbers of the SUPPLEMENT.

(35) S. R. asks how the pulp is obtained from sawdust, straw, or rags, of which water pails are manufactured, and if there is any material or chemical put into the pulp to bind or hold it together. Also the pounds pressure per square inch required to bring this pulp to the consistency of pine wood. A. The materials are boiled for some time in aqueous solution of caustic soda, rinsed, and reduced to a pulp of suitable fiber in the ordinary beating engine. The pulp is mixed with a sufficient quantity of resin size, glue size, or both, and with suitable coloring materials, and pressed into the mould. The pulp is often heavily loaded with earths, kaolin, etc. Both the screw and hydraulic presses are employed.

(36) D. M. T. writes: I have some trouble with nickel plated cast iron rusting through being exposed to a moist atmosphere. The work is carefully washed both before and after being plated, and has a heavy coat of the protecting metal, but still it rusts. I am told that in the east an undercoat of bronze or some similar material is used before plating, which prevents the rusting. Can you give me the process? A. Give the metal a thin coat of copper by electricity before nickel plating.

(37) M. S. O. writes: Having read a description of a home-made horse power in SUPPLEMENT, No. 190, I would like to ask some questions in regard to the machine. 1. Do you think it would be a serviceable machine to run several hours per day? A. Yes, if well made. 2. What should be the length of sweep to which the horse is attached to make the smallest possible circle? A. Should not be less than about 12 feet. 3. How large should the main pulley be to drive a shaft 120 revolutions per minute, pulley on shaft being 10 inches in diameter? A. About 8 1/2 feet.

(38) N. G. B. writes: I frequently have occasion to change the marks and brands on oak barrels that have been stained to give them the appearance of age. How can I retain the parts scratched to make the color uniform? I have tried a copperas solution, but it gives oak a bluish cast. A. Use a more dilute solution of the copperas, and add a little sal-ammoniac; or use dilute nitric acid.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

G. M. W.—a. Powdered feldspar not kaolin. b and c, Partly decomposed mica schist. d, Clay slate. There is no such substance as that you mention. Second does not indicate oil. Quartz does not necessarily indicate the presence of metals.

[OFFICIAL.] INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending October 26, 1880, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing various inventions and their patent numbers, including items like Animal trap, Axle railway car, Baling cotton, Baling press, Baling grain, Basins, Bell, letter box, Bicycle, Bolts and rivets, Book binder's press, Book binding, Bottle stopper, Bridle, Buik, machine for handling articles in, Bung and faucet, Bung bushing, Can opener, Cane top and match safe, Car, cattle, Car door fastening, Car stock, Car wheel, Carbon bisulphide and sulphuric acid, Carpet sweeper, Carriage, baby, Carriage spring, Carriage top support, Casting box, stereotyp, Casting printer's leads, Center piece, Chamber pail, Churn, Cider compound, Clamping or tearing checks or paper, device for, etc.

Table listing various inventions and their patent numbers, including items like Clasp, G. G. Klett, Clipper, animal, Clothes pounder, Coal hod, Colter, G. G. Nott, Copies, making hectograph, Corn sheller, Corn sheller, J. S. waterman, Cotton gin condenser, Cracker machine, Crutch top, Cultivator, Curtain cord tightener, Dental forceps, Dental engine hand piece, Dental hand piece, Dining table for vessels, Dish, wooden, Door hanger, Doors, device for forcibly opening, Drum heads, Dye wood chipper, Dye wood cutter, Earthenware vessel, Eaves box, Eggs, desiccating, Electric machine, Elevator, C. H. Otis, Eyeglasses, Eyeglasses, G. C. Hilpert, Eyeglasses, A. Landsberg, Farm gate, Farm gate, Faucet, A. Goetzinger, Fence, barbed wire, Filter, coffee, Firearm, breech-loading, Fire escape, Flue expander, Fruit drier, Fruit gatherer, Fruit jar, Furnace, Galvanic battery, Gas burner, Gas engine, Gas meter, Gate, G. Breon, Gate, D. Sheets, Gem setting, Glass pitchers, Gold and silver from ores, Governor, steam engine, Grate, H. Mather, Grate, E. A. Wood, Hame strap attachment, Harness crupper, Harrow, R. N. Bennett, Harrow, C. La Dow, Harrow and cultivator, Harrow and cultivator teeth, Harvester, Harvester gaveler, Hats and other uses, Hay elevator, Hay elevator and carrier, Heating device, Heddles, machine for making wire, Hog nose cutter, Hog rings, machine for making, Horse hitcher, Hub, vehicle wheel, Hub, vehicle wheel, Iron upsetting machine, Ironing machine, Joint support, Knob attachment, Latch, Spencer & Eggleston, Lathe for turning ovals, Lathe, screw cutting, Lead and crayon holder, Link machine, Locomotives, exhaust attachment for safety valves, Locomotive spring, Log rolling and turning machine, Lubricator, Manure fork, Match box, Microphone, Milk cooler, Motion, gear mechanism and connecting rod for converting rotary into reciprocating, Muscle and skin beater, Musical instrument, Net, fly, Net for horses, Ore separator, Paper and cloth, etc., Paper bag machine, Paper drier, Pawl and ratchet device, Pen, stylographic fountain, Pianoforte, Piano sounding board, Plane iron stock, Planter, cork, Planter, cotton, Planters, check row attachment for corn, Planting seed potatoes, Plow, N. C. Orrick, Plow, D. Wolf, Plow and pulverizing apparatus, Plow gauge, Plow, one wheel, Pocketbook handle, Printer's rule, Printing machine sheet delivery apparatus, Pulp mills, Pump attachment, Pump, compression and vacuum, Pump for boilers, Pumping machine feeding device, Railway signal apparatus, Railway signaling apparatus, Railway switch, Rakes, manufacture of, Range, cooking, Refrigerator, etc.

Table listing various inventions and their patent numbers, including items like Refrigerator building, Roofs, machine for closing seams in sheet metal, Rubber goods, Ruler, parallel, Saddle, J. Straus, Saw, drag, Sawing machine, Sawing machine, scroll, Screw threads, Secretary table, Settee, lawn, Sewers or pipes, Sewing machine, Sewing machine embroidering attachment, Sewing machine shuttle, Sewing machine shuttle, Miller & Diehl, Sewing sweat linings into hats, Sifter, scoop, Sink, G. & C. Hayes, Slaughtering apparatus, Snuff, catarrh, Soldering cans, Soldering square cans, Soup compound, Spinning frames, Stamp canceling device, Steam boiler and furnace, Steam engine, Steam generator, Stirrup, Stove, coal, Sulky, W. S. Frazier, Suspenders, Tack extractor, Tap and faucet, Telephone, Testing machine, Theft detector, Thill coupling, Thrasher and separator, Thrasher, clover, Tobacco case, Toy, bell, Toy building block, Toy pistol, Toy whip and cane handle, Triangle, draughtsman's, Truck, hand, Trunk, traveling, Truss, hernial, Tuyere, Valve, N. Curtis, Vegetable cutter, Vehicle spring seat, Velocipede, D. A. Gunn, Velocipede, G. Lowden, Velocipede, W. Palmer, Veneering, Wagon box, Wagon jack, Wagon platform gearing, Washing machine, Water conductor and joint, Water supply for cities and towns, Water wheel, Well, reservoir, Wells, apparatus for lining, Whiffletree hook, Whistle and compass combined, Wick trimmer, Wire stretching device, Wires, machine for forming loops for, etc.

DESIGNS. Carpet, J. Barrett, Carpet, W. J. Gadsby, Oil cloth, C. T. & V. E. Meyer, Pencil case, L. W. Fairchild, Picture chart, S. Hursen, Polishing head, C. L. Bellamy, Sewing machine case, E. F. French, Statue, R. Kasinski, Type, font of printing, J. Herriet, Type, font of printing, A. Will, Wall paper, E. Leissner, etc.

TRADE MARKS. Flour, B. R. Pegram, Jr., Ointment, Crispin Brothers, Soap, T. A. Butler, etc.

English Patents Issued to Americans. From October 22 to October 29, 1880, inclusive. Amber working, Brakes, railroad, Coke, manufacture of, Condensers, surface, Dynamo-electric machine, Electric current, measuring, Electric lighting apparatus, Firearms, Grain, separating iron particles from, Gas combustion apparatus, Gas, apparatus for lighting, Gold ore separator, Ice, manufacture of, Horseshoes, manufacture of, Life saving raft, Mowing machine, Meat, packing and preserving, Suspenders and braces, Spindles of spinning machines, Spirit levels, Tables, etc., for ships, Wire annealing, Wire cleaning, etc.