

with water and transferred to tall casks to settle, after which the clear liquid is drawn off, the residue washed with water, the clear washings added to the liquid, and the whole evaporated down in copper or leaden pans. The clear liquid is then drawn off from the calcareous deposit, the sediment drained on a filter, and the liquid evaporated to the consistence of honey and mixed with charcoal powder (9 lb. for 100 lb. bone ash). The mixture is then dried in iron pots and heated to incipient redness, cooled, and put into earthen retorts well luted and dried. Heat is applied around the sides of the retort in an air furnace. The beak of the retorts are connected with copper tubes which dip a quarter inch beneath the surface of lukewarm water, at the bottom of the vessel containing which the phosphorus which distills over collects. It is purified by squeezing it through chamois leather under water. While melted (under water) it is drawn up into glass tubes and transferred to cold water, where it solidifies and drops out of the tubes. These sticks must be kept under water. 2. What per cent of phosphorus do they contain? A. About 20 per cent.

(22) E. M. asks: Can you give me a good receipt for making manifold paper? A. Saturate fine unglazed paper with the following preparation. When dry it is ready for use: Allow, 2 oz.; graphite (black-lead) in finest powder, 1/2 oz.; linseed oil, 1/4 pint; lamp-black, q. s. to make it of the consistence of cream; melt and rub well together in a mortar.

(23) H. S. W. asks for the best method of cutting a double, triple, and quadruple thread. A. There is no difficulty in doing it on a screw-cutting lathe; you determine the pitch of the thread, and you can then divide the thread into two, three, or four parts by changing the position of the cutting tool.

(24) N. B. P. asks: What will remove grape stains from a carpet? A. Wash out with warm soapsuds and a little ammonia water.

(25) S. R. B. writes: A wart has been growing on the right side of my nose for several years, and is now about the size of a large shot. Can you inform me how to remove it without leaving a scar, and whether there would be any bad result afterward? Several friends have suggested means for its removal, but I prefer to hear from you. A. By the system of Dr. Barnes—the use of an ordinary burning glass—the excrescence could be removed, leaving as little of a scar probably as by any method.

(26) H. D. P. writes: I have a piece of machinery which is almost constantly covered with a light rust: what can I apply to keep it off? A. Camphor, 1/2 oz.; dissolve in melted lard, 1 lb.; take off the scum, and mix in as much fine blacklead (graphite) as will give it an iron color. Clean the machinery and smear with this mixture; after twenty-four hours rub clean with a soft linen cloth. It will keep clean for months under ordinary circumstances.

(27) A. C. S. writes: I have a compound engine, small cylinder, 3 inches diameter by 6 inches stroke; large cylinder, 7 inches diameter. I wish to build a boat suitable for the engine. Please give me dimensions, also diameter and pitch of screw. A. About 16 feet long, and 3 feet 8 inches to 4 feet beam; screw about 18 inches diameter and 2 feet 9 inches pitch. 2. What should be the stroke of treadle for foot lathe, driving wheel, or large cone, 26 inches diameter? A. From 6 to 8 inches. The stroke should be adjustable to the ease of the person using it. What would be right for one would be too long or too short for another.

(28) J. S. asks: 1. Which is the best gasoline gas machine in use? A. For this information see our advertising columns and Hints to Correspondents. 2. What is the best absorbent for gasoline? A. Infusorial silica is about the best thing. Sisal hemp is often used.

(29) H. S. H. asks: 1. What pressure will a copper boiler, 1/2 inch thick, 2 feet long, 18 inches diameter; with 40 one-inch copper flues, depth of fire box from grate to crown 8 inches, space between fire box and outside shell 1/2 inch, copper flanged head and flue sheet the same, copper rivets 1/4 inch diameter and double riveted both ways, or every seam and head to be double riveted. A. 35 lb., if all parts are equal in strength to the shell. 2. I would like to know what horse power it would be, burning coke or hard coal? It is to be a vertical boiler. A. About 2 horse power. 3. What would be the power of two cylinders, 3 inches bore and 3 inches stroke, connected at right angles, running 300 revolutions per minute? A. With 80 lb. steam, 2 horse power. 4. What would be most durable, brass or iron cylinders? A. Cast iron.

(30) R. B. F. writes: We are in search of a handy and rapid means of retaining a copy of short notes, telegrams, etc., without the aid of the copying press. The stylographic process seems to be about the thing, but the manner of using the carbon sheet in the several ways we have been able to secure are unhandy and not adapted to our wants. I want to try and improve the methods employed, and would like to know how to prepare the carbon sheets. The sample enclosed is good, durable, and furnishes a clear line free from smut, more like ink than the usual smutty sheets used. Can you explain the process in your paper of making the sheets? A. Try the following: Tannic acid, 10 parts (weight); pure sulphate of iron, 15; glycerine, 35; indigo sulphate paste (nearly neutral), 1; warm the glycerine, add the tannic acid, and rub together in a mortar to dissolve; powder the iron salt, divide into two portions, and calcine one by stirring it about on an iron plate over a fire until it becomes brown. Mix with the other portion, and gradually triturate into the glycerine; add in a similar manner the indigo, and rub all well together. Saturate thin unsized paper with this (adding more glycerine if too thick), hot, pass between a pair of smooth iron rolls under strong pressure, and hang up in the air for half an hour before packing for use. See answer to E. M. this page.

(31) M. A. H. writes: I wish to put in a new boiler to run a 12x24 engine, to be run at 60 revolutions per minute. Am divided in opinion between these boilers, namely: a. A two flue (flues 15 inches diameter), 42 inches diameter, 24 feet long. b. A Norton flue

(flues 6 inches in diameter), 48 inches diameter, 16 feet long. c. A twenty-four flue (tubes 4 inches diameter), 46 inches diameter, 14 feet long (tubular). I am aware that these are not the same horse power, but either will answer, and I want your opinion on the following points: 1. Is there any difference in the durability under the same treatment in the boilers? A. The two-flue boiler will wear longest and is easiest cleaned. 2. Which will use the least fuel to produce the steam necessary for engine? A. Boiler with 4 inch tubes. 3. Which is the most likely to leak first, the tubular at end of tubes, or the flued to crack at end of flues? A. The tubular at the tube heads. 4. Which do you consider the best for economy of fuel, safety from explosion, and general use for the engine named? A. Either is safe from explosion under proper care, but the two-flued boiler is easiest managed.

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

C. C. D.—The sulphur colored substance is pine pollen—carried by the wind.—F. M. D.—Silica similar to your sample is used in the preparation of cements, glass, enamels, silicate of soda, and artificial stones. It is also used for polishing and scouring purposes, and also filtering. See Hints to Correspondents.

COMMUNICATIONS RECEIVED.

On the Cheops Pyramid. By G. V. On the Propulsion of Ships. By J. G.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week Ending

March 29, 1881,

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 Air compressor, Altitude instrument, Amalgamating gold and silver ores, Apple cutter and corer, Automatic gate, Axles, Bag lock, Barrel cover, Basket splints, Bed, Bed spring, Bedstead, Billiard table leveler, Billboards, Bobbin, Boilers, Boot and shoe, Boot and shoe crimping machine, Boot and shoe insoles, Boot and shoe nailing machine, Boot strap, Boot straps, Boot treening machine, Boots and shoes, Boots and shoes, manufacture of, Bottles, Bracelet, Bricks, Bridle bit, Buckle, Button die, Button, Cables, Camera, Canal boats, Candle holder, Candy, Car coupling, Car, passenger, Car, railway, Car, stock, Car, stock, Car wheels, Cargoes, Castings, Cement, Chuck lathe, Churn, Cigar holder, Cigar shaping machine, Clapboard gauge, Clothes hook, Coal, Coat, Connecting rod, Corn sheller, Cot chair, Cotton gin feeder, Cotton, preparing absorbent, Cultivator, Cut-off mechanism, Dead centers, Desk, Door hanger, Earthenware vessel, Electric cable, Electric condenser, Electric currents, Electric light carbons, Electric machines, Electrical switch board, Elevator, Elliptic spring, Extension table slide, Faucet and tap, Fence, Fence wire, File cutting machine, Filter, Firearm, Fire escape, Fruit stoner, Furnace, Gate, Gate catch, Governor, Grain cutting machine, Gridiron, Grinding mill, Harrow, Harvesterrakes, Harvester tripping device, Hedge trimming machine, Hide fleshing machine, Hinge, Hitching clamp, Hoisting machine, Hoist, Honey box sections, Hoof expander, Horse clothing, Horse power for gins, Hot blast regulator, Hot or cold bed frame, House, Hydrant valve, Ice machine, Ice pick, Incrustation preventive, Insulating or non-conducting bituminous compound, Knife cleaner, Lamp and advertiser, Lamp burner, Lamp, electric, Lamp extinguisher, Lamp for coal oil stoves, Lamps, adjustable attachment for carriage, Lantern sign for locomotive engines, Last, Leather, Lock case, Loom stop motion, Lubricating device, Lubricating slide valves, Magnesia, Mail bag, Mattress, Meat block, Mechanical movement, Medical compound, Medical compound, Millstone and machine for making the same, Mining machine, Mining machine, Moth trap, Multiplication block, Musical instrument, Necktie shield, Nut and die holder, Nut lock, Nut lock, Oiler, Ore feeder, Ore washer, Organ, Outlines, Oven, Oyster float, Packing for axle boxes, Paper bag machine, Paper bag machine, Paper, box, slide, Paper, cloth, etc., Paper pulp mould, Paper pulp shovel blade, Pendulum balls, Phosphoric anhydride, Pillow sham frame, Pipes, Planters, Plated ware, Plow, Plow, sully, Pocket for wearing apparel, Pool table, Potato digger, Pressure regulating valve, Printing press cushioning device, Propeller, Pulley, Pump engine, Pump, J. Bulger, Jr., Pump, double-acting, Pyroxyline, Pyroxyline, treating, Railway crossing, Railway rails, Reflector, Refrigerator, Refrigerator and refrigerator house, Refrigerator building, Rein handle, Rein holder, Remedy for coughs and colds, Rveting machine, Rock and coal drilling machine, Rolling mill, Rope coils, Rope fastener, Rotary engine, Rotary engine, Rubber goods, Rule joint, Sash fastener, Saw mill attachment, Sawing machines, Scarf, neck, Scow, dumping, Scrapper, miner's, Sewer cutting die holder, Seeder, Sewer gas from waste pipes, Sewer ventilator, Sewing machine, Sewing machines in sewing linings into hats, Shawl strap handle, Shovel handle, Shutter bower, Sliding gate, Smoke and gas consumer, Smoke consuming furnace, Smoke consuming furnace, Sound, etc., Spout, turpentine, Sprinkler, Station indicator, Steam boiler, Steam boiler heater, Steam boiler, sectional, Steam engine, Steam engine, portable, Steering apparatus, Storage tank for petroleum, Store service apparatus, Stove board, Stove, cooking, Stovepipe, Stud and button, Sugar evaporating pan, Switch signal, Syringe apparatus, Telegraph and telephone line, Telegraph line, underground, Telegraph lines, manufacture of, Telephone signaling apparatus, Telephone transmitter, Temple roller, Thrashing and clover hulling machine, Thrashing grain, etc., Tile and brick kiln, Time detector, Tire setter, Tire upsetter, Tobacco curing apparatus, Tobacco fork, Tongue support, wagon, Toy cap exploder, Toy circus, Trace carrier, Trace holder, adjustable, Traction engine, Transom fixture, Truck frame, car, Trunk lock hasp, Truss, Turret, armor clad, Valve, injector, Valve operating mechanism, Vapor condenser and spirit cooler, Vehicle brake apparatus, Vehicle spring, Vehicle spring brace, Ventilator, Wagon, ice, Wagon platform, iron, Wash board, Wash board, Washing machine, Watch regulator, Water cooler for refrigerators, Water elevator, automatic, Water pipe, sheet metal, Waterproof fabric, Watering stock in cars, Wheelbarrow, Wig form holder, Wire grasping tool, Wool washer.

Table listing various inventions and their patent numbers, including items like Rolling mill, Rope coils, Rope fastener, Rotary engine, Rotary engine, Rubber goods, Rule joint, Sash fastener, Saw mill attachment, Sawing machines, Scarf, neck, Scow, dumping, Scrapper, miner's, Sewer cutting die holder, Seeder, Sewer gas from waste pipes, Sewer ventilator, Sewing machine, Sewing machines in sewing linings into hats, Shawl strap handle, Shovel handle, Shutter bower, Sliding gate, Smoke and gas consumer, Smoke consuming furnace, Smoke consuming furnace, Sound, etc., Spout, turpentine, Sprinkler, Station indicator, Steam boiler, Steam boiler heater, Steam boiler, sectional, Steam engine, Steam engine, portable, Steering apparatus, Storage tank for petroleum, Store service apparatus, Stove board, Stove, cooking, Stovepipe, Stud and button, Sugar evaporating pan, Switch signal, Syringe apparatus, Telegraph and telephone line, Telegraph line, underground, Telegraph lines, manufacture of, Telephone signaling apparatus, Telephone transmitter, Temple roller, Thrashing and clover hulling machine, Thrashing grain, etc., Tile and brick kiln, Time detector, Tire setter, Tire upsetter, Tobacco curing apparatus, Tobacco fork, Tongue support, wagon, Toy cap exploder, Toy circus, Trace carrier, Trace holder, adjustable, Traction engine, Transom fixture, Truck frame, car, Trunk lock hasp, Truss, Turret, armor clad, Valve, injector, Valve operating mechanism, Vapor condenser and spirit cooler, Vehicle brake apparatus, Vehicle spring, Vehicle spring brace, Ventilator, Wagon, ice, Wagon platform, iron, Wash board, Wash board, Washing machine, Watch regulator, Water cooler for refrigerators, Water elevator, automatic, Water pipe, sheet metal, Waterproof fabric, Watering stock in cars, Wheelbarrow, Wig form holder, Wire grasping tool, Wool washer.

Table listing various inventions and their patent numbers, including items like Rolling mill, Rope coils, Rope fastener, Rotary engine, Rotary engine, Rubber goods, Rule joint, Sash fastener, Saw mill attachment, Sawing machines, Scarf, neck, Scow, dumping, Scrapper, miner's, Sewer cutting die holder, Seeder, Sewer gas from waste pipes, Sewer ventilator, Sewing machine, Sewing machines in sewing linings into hats, Shawl strap handle, Shovel handle, Shutter bower, Sliding gate, Smoke and gas consumer, Smoke consuming furnace, Smoke consuming furnace, Sound, etc., Spout, turpentine, Sprinkler, Station indicator, Steam boiler, Steam boiler heater, Steam boiler, sectional, Steam engine, Steam engine, portable, Steering apparatus, Storage tank for petroleum, Store service apparatus, Stove board, Stove, cooking, Stovepipe, Stud and button, Sugar evaporating pan, Switch signal, Syringe apparatus, Telegraph and telephone line, Telegraph line, underground, Telegraph lines, manufacture of, Telephone signaling apparatus, Telephone transmitter, Temple roller, Thrashing and clover hulling machine, Thrashing grain, etc., Tile and brick kiln, Time detector, Tire setter, Tire upsetter, Tobacco curing apparatus, Tobacco fork, Tongue support, wagon, Toy cap exploder, Toy circus, Trace carrier, Trace holder, adjustable, Traction engine, Transom fixture, Truck frame, car, Trunk lock hasp, Truss, Turret, armor clad, Valve, injector, Valve operating mechanism, Vapor condenser and spirit cooler, Vehicle brake apparatus, Vehicle spring, Vehicle spring brace, Ventilator, Wagon, ice, Wagon platform, iron, Wash board, Wash board, Washing machine, Watch regulator, Water cooler for refrigerators, Water elevator, automatic, Water pipe, sheet metal, Waterproof fabric, Watering stock in cars, Wheelbarrow, Wig form holder, Wire grasping tool, Wool washer.

DESIGNS.

Table listing various designs and their patent numbers, including items like Belt bag, Carpet, Carpet, A. L. Halliday, Carpet, Halliday & Neil, Carpet, H. Horan, Carpet, H. Hunt, Carpet, W. L. Jacobs, Lamp, F. G. Palmer, Scarf, neck, Stove, cooking, G. W. Gill.

English Patents Issued to Americans.

Table listing various English patents issued to Americans, including items like Bottle stopper, Carriage dashboard fastening, Cop tube, Furs, ornamenting, Gas, preserving substances by, Governor for steam engine, Lock, Eagle Lock Company, Paper stock, Railway brake, Spinning machinery, Steam regulator, Steam heating apparatus, Wire, manufacture of.