

vation, about 80 feet. The pipe is half way 4 inches and the other half 3 inches. The pump has also a Bulky condenser; the water is taken for it from the lower part of air chamber and is discharged into the suction pipe. giving a vacuum of 15 inches to 20 inches. The vacuum at the Corliss engine is 24 inches to 28 inches. Can you give me percentage of gain under these conditions? I have taken your papers for about 40 years and I have never asked a favor before. A. You do not give sufficient data for exact figures. Your vacuum adds to the engine about 40 horse power and you expend in steam on the pump probably less than 4 horse power in steam. So your gain will be the difference, or 36 horse power. Now, if you engine is 200 horse power without the condenser, you will gain 36/200 = 18 per cent by the use of the vacuum.

(6997) E. E. S. writes: Most men, who have occasion to use screwdrivers, think that, of two screw drivers exactly alike, except in length, the longer one will start screws which could not be started with the shorter one. Is this difference real or imaginary? And if real, please explain why. A. The only advantage that the long screw driver has is in the facility for a strong grip from the hands.

(6998) J. P. J. asks: 1. What two liquids when poured together will ignite with a rose colored flame, and also the reaction which takes place? A. Turpentine and strong nitric acid may be used to produce deflagration. The experiment is highly dangerous. 2. Can you give me the chemical reaction taking place by calc. carb. in H2O, and the formula for acetylene gas? A. CaC2 + H2O = C2H2 + CaO or CaC2 + 2 H2O = C2H2 + Ca(OH)2. 3. Also can you give me a good preservative for insects, which, when put on, will kill and preserve them? I am now using turpentine and creosote, but do not like the mixture. A. Potassium cyanide is very generally used for killing insects, but is poisonous, and is liable to stain the insects. Chloroform is good, but is apt to cause a stiffening of the wing membranes. Labourene recommends for the preservation of insects in a fresh state plunging them in a preservative fluid consisting of alcohol with an excess of arsenious acid in fragments; 1 1/2 pint alcohol will take about 14 troy grains of arsenic. The living insect, put into this preparation, absorbs about 3-1000 of its own weight. When soaked in this liquor and dried, it will be safe from the ravages of moths. Anthrenus or Dermestes. This liquid will not change the colors of blue, green, or red beetles if dried after soaking from twelve to twenty-four hours. Hemiptera and Orthoptera can be treated in the same way. The nests, cocoons, and chrysalids of insects may be preserved from injury from other insects by being soaked in the arseniated alcohol, or dipped into benzine or a solution of carbolic acid or creosote. For spiders, puncture them and steep for several days in a strong alcoholic solution of pure phenol, and then in dilute alcoholic glycerine. Or use a saturated solution of salicylic acid in glycerine; dry carefully.

(6999) E. M. B. says: Can you send me a recipe for hektograph gelatine that will absorb the ink and not require washing? A. Hektograph Sheets. - Soak 4 parts of best white glue in a mixture of 5 parts of water and 3 parts of solution of ammonia, until the glue is soft. Warm the mixture until the glue is dissolved and add 3 parts of granulated sugar and 8 parts of glycerine, stirring well and letting come to the boiling point. While hot, paint it upon white blotting paper with a broad copying brush, until the paper is thoroughly soaked and a thin coating remains on the surface. Allow it to dry for two or three days, and it is then ready for use. An aniline ink should be used for writing, and before transferring to the blotting paper, wet the latter with a damp sponge and allow it to stand one or two minutes. Then proceed to make copies in the ordinary way. If the sheets are laid aside for two days, the old writing sinks in and does not require to be washed off. - Chem. and Drug

(7000) M. C. asks for a receipt for removing writing in ink from paper. A. The Journal de Pharmacie d'Anvers recommends sodium pyrophosphate for the removal of ink stains. This salt does not injure vegetable fiber, and yields colorless compounds with the ferric oxide of the ink. It is best to first apply tallow to the ink spot, then wash in a solution of pyrophosphate until both tallow and ink have disappeared. Thick blotting paper is soaked in a concentrated solution of oxalic acid and dried. Laid immediately on a blot, it takes it out without leaving a trace behind. Tin chloride, 2 parts; water, 4 parts. To be applied with a soft brush, after which the paper must be passed through cold water.

(7001) A. L. F. asks: How to bleach bones to deodorize and take grease out? A. The curators of the anatomical museum of the Jardin des Plantes have found that spirits of turpentine is very efficacious in removing the disagreeable odor and fatty emanations of bones or ivory, while it leaves them beautifully bleached. The articles should be exposed in the fluid for three or four days in the sun, or a little longer if in the shade. They should rest upon strips of zinc, so as to be a fraction of an inch above the bottom of the glass vessel employed. The turpentine acts as an oxidizing agent, and the product of the combustion is an acid liquor which sinks to the bottom, and strongly attacks the ivory if allowed to touch it. 2. How to blue screws such as those used in guns and safe doors. A. The articles to be blue should have their surfaces cleaned and polished. They may be then heated in fine clean wood ashes to a temperature of from 500° to 600°, accord mg to the depth of the color required. It is not necessary to watch the temperature, but simply to examine the articles from time to time to see that when cooled in the air they assume the proper color. They should then be immediately removed, and the operation is then completed.

(7002) H. W. S., Jr., says: Will you give me recipe for waterproofing silk fishing lines to prevent them from sinking? A. 1. Two parts boiled oil, 1 part good size, put in a bottle, shake well, and it is ready for use. Apply with a piece of flannel, expose to the air and dry. After using the line two or three times it should have another coat, the application being repeated when necessary. 2. Apply a mixture of 2 parts boiled linseed oil and 1 part good size; expose to the air and dry.

(7003) H. L. S. asks for a method for removing tattooed marks from the body. A. A writer in the Chemical News has stated that if the tattooing is performed with some carbonaceous matter, the marks can be made to disappear by being first well rubbed with a salve of pure acetic acid and lard, then with a solution of potash, and finally with hydrochloric acid. A dermatologist should be consulted if possible.

(7004) D. A. asks: How can the fingers be best cleansed if stained in photographic development, especially when they have been wet with old or dirty hypo? A. Paint the blackened parts with tincture of iodine, let it remain until the skin becomes red, then apply ammonia, when the stain will disappear. This treatment should not be used if there are any recent cuts on the bands.

(7005) A. G. says: Can you give me the name of a manual on plaster moulding or any information on the finishing up of plaster with paraffine as they are finished in the plaster shops? A. The polish on plaster figures is said to be produced by immersion in melted paraffine or wax, and rubbing smooth.

(7006) F. T. says: Please give me a formula for darkening copper without injuring it. I have some electros of half tones which I want to blacken and then fill hollows with magnesia to use all as a picture. What substance is put on metal (brass) to imitate the color of wrought iron work? A. You can produce a dead black surface on both copper and brass by using 1/2 ounce platinum tetrachloride dissolved in 1 ounce of water. The metal must be chemically clean.

(7007) G. G. Y. writes: I am putting up a line of eight stations. I want to use the Bell receiver for transmitter, there being two at each station, making sixteen in all. Now the question is, will a person hear the message just as plain at one place as at another? The message will have to go through each one. We have up a line where there are two at each end and it works all O. K. How many can we put on the line before we overload it, or cause the sound to be indistinct? A. The message will be heard as well at one place as at another; if the telephones are in series, the operation will be impaired as more telephones are introduced. The exact number that can be used cannot be stated. You can readily experiment with the proposed connections before erecting your line. Try a through metallic circuit with the telephones in parallel with each other, arranged like incandescent lamps.

(7008) E. A. O. asks if there would be any advantage in using mica plates instead of glass plates in the Wimshurst influence machine. A. Possibly, if you could get perfect sheets of adequate size. The experiment would be interesting and worth trying.

(7009) J. J. K. asks how to make the foundation for a walk and what proportion of cement and sand to put on it so as to make it good in all weathers. A. The foundation for a walk (not a street sidewalk) may be made with a layer of very coarse gravel or finely broken stone 3 to 4 inches thick, with a coat of cement 1 part, sand 2 parts, 1 inch thick. The gravel or broken stone bed should be wet and well rammed to make the walk permanent. For street sidewalks a thicker bed of gravel or broken stone should be made.

(7010) G. E. B. writes: I have had made to order a few 10 candle power 10 volt incandescent lamps to be run by batteries. 1. Will you kindly inform me as to the amount of amperes needed? A. Allow three and one-half amperes to each lamp. 2. Would six cells, 2 volts each and 5 amperes and 100 ampere hours each, be sufficient and for how long? A. The six cells, if able to maintain the voltage and amperage stated, would answer; presumably for ten hours, possibly for less.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted October 13, 1896, AND EACH BEARING THAT DATE.

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

Acid and making same, dimethoxytrichloroacetic acid... 569,419
Acid and making same, paraethoxyphenylsuccinamic acid... 569,425
Air brake, Walker & Cook... 569,288
Air compressor, inlet valve for, H. V. Conrad... 569,223
Alarm. See Bicycle alarm. Speed indicating alarm.
Antipyren mandelate and making same, O. Hinsberg... 569,415
Automatic gate, D. E. Wilson... 569,269
Axle lubricator, car, A. W. Wright... 569,480
Bath cabinet, thermal, Jones & McGreevy... 569,183
Bed, folding, J. Hotopillar... 569,202
Bedstead, folding, J. E. Deihm... 569,548
Bicycle, H. J. Thompson... 569,394
Bicycle alarm, E. Arnold... 569,158
Bicycle, folding, M. B. Ryan... 569,334
Bicycle handle, C. O. Spurr... 569,436
Bicycle handle bar, adjustable, B. Porter... 569,349
Bicycle lock, C. B. Woodbury... 569,584
Bicycle saddle, Drury & Sims... 569,326
Bicycle stand, F. Giacinto... 569,433
Bicycle support, J. S. Lynch... 569,239
Billiard table cushion, W. J. Rodd... 569,519
Blind holder, J. W. Woodward... 569,479
Block signal, L. C. Smith... 569,246
Block signal system, J. E. Donbavand... 569,551
Boat, See Steamboat.
Boiler, B. Cannon... 569,170
Boiler. See Steam boiler. Water tube boiler.
Boiler, V. Karavodin... 569,287
Boiler, N. L. Warren... 569,477
Boiler, T. C. Beat... 569,164
Boiler or other furnace, E. W. Jones... 569,207
Boiler, apparatus for feeding anti-incrustation compounds to, W. A. West... 569,440

Bookkeeper's posting guide, E. H. Wintermute, Jr... 569,478
Boots, rubber, C. F. Shaw... 569,569
Boring and cutting tool, W. T. Smith... 569,433
Boring and turning mill, G. W. Moreton... 569,544
Bottle, C. P. Lundquist... 569,217
Bottle stopper and bottle, Dorn & Reinstate... 569,181
Bottling apparatus, M. E. Donally... 569,180
Box. See Miter box. Toilet box.
Boxers, apparatus for applying metal strips to, O. & M. Schubert... 569,577
Box corners, metal strip for, O. & M. Schubert... 569,568
Box cover brace or support, C. R. George... 569,193
Bracket. See Curtain pole bracket. Transmitter bracket.
Brake. See Air brake. Car brake. Vehicle brake.
Brake, J. F. Burgin... 569,488
Brake, W. H. Sauvage... 569,476
Branding sheep or other animals, appliance for, H. W. F. Fox... 569,515
Brush, rotary tooth, Courtright & Purdy... 569,409
Buckle, harness, J. R. Mole... 569,584
Bullion, softening base, G. A. Marsh... 569,293
Bunks, etc., machine for making, E. E. Elder... 569,554
Bungs, etc., machine for making, Elder & Taylor... 569,555
Bung making machine, Elder & Kelly... 569,550
Butcher and smelter, combined, Beat & Meador... 569,537
Burner. See Hydrocarbon burner. Lamp burner. Oil burner. Vapor burner.
Button, J. E. Kenna... 569,581
Button, cut, G. P. A. Guntter... 569,495
Button setting machine, A. W. Ham... 569,219
Calculator and smelter, combined, Beat & Meador... 569,537
Calculator, W. A. Copeland and J. M. Elliot... 569,544
Camera, photographic, J. M. Elliot... 569,328
Car brake, R. G. Woodward... 569,311
Car coupling, A. D. Alden... 569,481
Car coupling, R. D. Edwards... 569,481
Car fender, J. E. Henry... 569,537
Car fender, G. A. Henry... 569,457
Car safety guard, A. J. Brown... 569,168
Cars, strainer for air brakes of, T. B. Hunt... 569,303
Carburetor, C. W. Ingraham... 569,480
Cardboard scoring machine, C. W. Hobbs... 569,200
Cardboard and smelter, combined, Beat & Meador... 569,537
Carpet holder, M. H. Sullivan... 569,525
Case. See Barber's case. Show case.
Chair. See Rocking chair.
Chair fan attachment, rocking, G. Herfurth... 569,497
Chair table attachment, J. E. Mould... 569,508
Check draft order, self-identifying, E. L. Clark... 569,264
Chuck, expandable, J. O. Smith... 569,245
Cigarettes, manufacture of, N. J. Evans... 569,184
Clamp. See Basin clamp.
Clasp. See Lace clasp. Last clasp.
Claw, W. F. Fox... 569,586
Clutch, automatic safety spring, J. Annan... 569,396
Coat and hat holder, J. F. Main... 569,422
Cock for water service systems, stop, J. Slaymaker... 569,304
Coin changing device, A. J. Levin... 569,214
Coin, J. M. F. Jones... 569,304
Collar pad, R. C. Van Der Veer... 569,363
Colors on fiber, producing, B. Stork... 569,392
Commode, E. W. Jenkins... 569,206
Coop, chicken, W. W. Mendenhall... 569,226
Cordset fastener, E. M. Lehning... 569,225
Cord, W. F. R. H. Hook... 569,225
Coupling. See Car coupling. Locomotive tender coupling. Shaft or tongue coupling. Thill coupling.
Crank handle, J. D. McFarland, Jr... 569,346
Crate, exp., H. W. Spurr... 569,590
Crate, exp., H. W. Spurr... 569,590
Curling iron, N. Berryman... 569,536
Curtain fixture, E. L. Slight... 569,592
Curtain pole bracket, G. P. Neal... 569,563
Cutter. See Box cutter.
Cyanids, process of and apparatus for producing, H. W. F. Fox... 569,325
Cyclometer, C. H. Clawson... 569,322
Damper regulator, G. F. Nilsson... 569,513
Dental cathartic apparatus, M. W. Hollingsworth... 569,380
Dental engine tool rest, C. H. Lam... 569,210
Dental plates, C. H. Lam... 569,535
Disinfecting ships or other structures, apparatus for, H. R. Cassel... 569,173
Display cabinet, combination, T. E. Wood... 569,367
Doll walker, H. E. Hinckley... 569,333
Dough mixer, Edwards & Potter... 569,449
Dowel, E. F. Point... 569,253
Dowel pins, machine for making, H. H. Rockwell... 569,234
Draught regulator, F. H. Treat... 569,254
Draw plate, J. Hudson... 569,335
Drawers, night, C. Arnold... 569,483
Dr. Peters' machine for cutting twist, H. C. Peters... 569,566
Drive mechanism for machines in series, successive, G. E. Henry... 569,414
Dye and making same, alizarin, R. Brasch... 569,404
Dye and making same, blue, H. Laubmann... 569,419
Dye and making same, green, A. J. R. Brasch... 569,419
Dyeing phenetid red, Ulrich & Gallois... 569,385
Dyeing skeins, apparatus for, Gleason & Bower... 569,453
Easel, G. L. R. Dahlberg... 569,410
Electric bond, M. J. Wightman... 569,226
Electric circuits, cutout for, L. W. Downes... 569,373
Electric generation, method of and means for, S. H. Short... 569,591
Electric generator, magnet, C. H. North... 569,385
Electric heater, G. B. Fraley... 569,278
Electric motors, system of control for, E. A. Sperry... 569,205
Electric motor, C. G. Pelt... 569,299
Electric snap switch, G. B. Thomas... 569,309
Electric switch, G. Emmett... 569,576
Electric switch, W. H. Powell... 569,300
Electrical distribution system, G. T. Woods... 569,443
Electrical transformers, automatic cutout for, A. F. Booth... 569,538
Electromagnetic, J. Wayland... 569,262
Electrotherapeutic band, B. H. Velines... 569,529
Elevator. See Water elevator.
Elevator, G. F. Brott... 569,539
Elevator attachment, E. C. Jenkins... 569,336
Engine. See Gas engine. Rotary engine. Steam engine.
Engine starter, gas. Weinman & Euchenbofer... 569,365
Engine stop, automatic, A. K. Bonta... 569,445
Engraving, N. S. Amstutz... 569,596
Ester of alkylamidophenols and making same, C. J. H. Jacobs... 569,416
Evaporating apparatus, liquid, L. F. Hauptman... 569,456
Exhibiting samples of garments, M. A. Adler... 569,581
Extension and retraction device, J. J. Gier... 569,494
Extractor. See Spike extractor. Stump extractor.
Eye and tongue support for artificial heads and masks, I. Roescher... 569,475
Eyeglass cases, etc., clasp for, A. G. Williams... 569,267
Fastening device, S. G. Temple... 569,308
Facet, registering, C. Van Graafeland... 569,439
Feed water heater and purifier, J. Struben... 569,322
Fence, A. H. Cox... 569,274
Fence, C. F. Barnett... 569,276
Fence machine, wire, W. F. Dobbs... 569,487
Fence, wire, W. Conrad... 569,275
Fender. See Car fender. Wheel fender.
Field glass, E. Rousseau... 569,528
File, P. W. Jacobs... 569,285
Filter, E. M. Knight... 569,382
Filter, oil, F. Bain... 569,159
Firearm, breech loading, A. Sill... 569,244
Flour bolting or scalping machine, I. C. & M. C. Landes... 569,211
Folding machine, C. Schartz... 569,235
Folding table, J. J. Palmer... 569,514
Furnace. See Boiler or other furnace. Gas furnace. Glass annealing furnace. Open hearth furnace. Ore roasting furnace.
Furnace draught attachment, A. Jabant... 569,201
Furnace grate, F. W. Jarvis... 569,205
Furnace grate, W. R. Roney... 569,353
Furnaces, apparatus for improving combustion in, T. M. Eynon... 569,329
Gable ornament, T. L. Dillon... 569,550
Game. See Carpenter's gage. Railway track gage. Gage, water gage.
Gage, water gage, C. J. Stauffer... 569,391
Garter and belt, F. H. McClung, Jr... 569,511
Gas engine, F. C. Olin... 569,366
Gas engine, H. A. Winter... 569,530
Gas furnace, regenerative, L. J. Lemaire... 569,421
Gas furnace, generator, acetylene, E. Bucher... 569,273
Gas heater for carriages, etc., H. E. De Witte... 569,286
Gas, oil and water separator, A. P. McBride... 569,345
Gate. See Automatic gate.
Generator. See Electric generator. Gas generator.
Glass annealing furnace, J. George... 569,279
Gold, extracting, B. C. Himmann... 569,234
Golf club, D. I. & R. L. Urquhart... 569,438
Grain recleaner and separator, J. B. Schumann... 569,389
Grapple, J. E. MacDonald... 569,230
Grate bar, J. T. Fuller... 569,273
Grate, D. E. Barnard... 569,371
Gun carriage counterpoise disappearing, W. H. Morgan... 569,222
Gun carriage, disappearing, W. H. Morgan... 569,225
Gun carriage, disappearing counterpoise, W. H. Morgan... 569,223
Halter, J. W. H. H... 569,223
Handle. See Bicycle handle. Crank handle.