The Knowles Steam Pump Works, 44 Washington St., Boston, and 93 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailedfree of charge on application.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J Concrete Apparatus, etc. Ernest Ransome, S. F., Cal.

Nickel Plating.-Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Sole manufacturers of the new Dip Lacquer Kristaline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn. Send for catalogue of Scientific Books for sale by

Munn & Co., 361 Broadway, N. Y. Free on application. Timber Gaining Machine. All kinds Wood Work-

ing Machinery. C. B. Rogers & Co., Norwich, Conn. Iron, Steel, and Copper Drop Forgings of every de-

scription. Billings & Spencer Co., Hartford, Conn. Rubber Belting, all sizes, 771/2 per cent regular list.

Allkinds of Rubber Goods at low prices. John W. Buckley, 156 South Street, New York, We are sole manufacturers of the Fibrous Asbestos

Removable Pipe and Boiler Coverings. We make pure ashestos goods of all kinds. The Chalmers-Spence Co. 419 East8th Street, New York. Supplement Catalogue.-Persons in pursuit of infor-

mation of any special engineering, mechanical, or solen-tific subject, can have catalogue of contents of the Sci-ENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Curtis Pressure Regulator and Steam Trap. See p. 142. Cushman's Chucks can be found in stock in all large cities. Send for catalogue. Cushman Chuck Co., Hartford, Conn.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

60,000 Emerson's 1886 EF Book of superior saws, with Supplement, sent free to all Sawyers and Lumbermen Address Emerson, Smith & Co., Limited, Beaver Falls, Pa., U. S. A.

Wrinkles and Recipes. Compiled from the Scienti-FIC AMERICAN. A collection of practical suggestions, processes, and directions, for the Mechanic, Engineer, Farmer, and Housekeeper. With a Color Tempering Scale, and numerous wood engravings. Revised by Prof. Thurston and Vander Weyde, and Engineers Buel and . 12 mo, cloth, \$2.00. For sale by Munn & Co., 361 Broadway, New York.

Hoisting Engines. D. Frisbie & Co., New York city. Equatorial Mountings, Reflecting Telescopes, etc.

for free 88 page book. Jas. C. Hotchkiss, 93 John St., N. Y.

Lanterns, and Views illustrating every subject for public exhibitions. Lanterns for colleges, Sunday schools, and home amusements. 136 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., N. Y.

Stewart's Anti-Incrustation Solution. See next issue. Iron and Steel Wire, Wire Rope, Wire Rope Tramways. Trenton Iron Company, Trenton, N. J.

Astronomical Telescopes, from 6" to largest size. Observatory Domes, all sizes. Warner & Swasey, Cleve

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.



HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question. It quiries not answersed in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of which we can send you for \$2.00. Minerals sent for examination should be distinctly marked or labeled.

(1) M. R. T. asks (1) a recipe for black paint for iron amokesateks. A. Use coal tar if it can be had; next, lampblack and boiled linseed oil, or We recommend a study of Davis book on boiler in- will purify the oil. scale. We can furnish it for \$2.00. 3. What causes the roaring or humming noise produced by acoustic telephones, and why is it at intervalsinstead of being constant? A. The hum ing noise of the telephone is mostly caused by wind, or an induction from some

(2) F. C. asks (1) for a receipt for making an indelible marking ink using aniline black as coloringmatter. A. An indelible aniline ink may be made thus: One hundred gr. of hydrochlorate of aniline and sixty gr. of chlorate of sodium are dissolved in or any other soft metal or alloy will stand depends upon three and a half ounces of water, and a half grain of the relative proportions of the thickness of the walls vanadate of ammonia added to the liquid, when it and the interior area of a cylinder. Noneof the soft will soon become dark colored, and deposit an abun- metals is fit for a steam cylinder for an engine, if that dant precipitate of aniline black. This may be dried. made into a paste with powdered gum arabic water, and glycerine, and used with a stencil. 2. A good receipt to copper. make inks for stylographic pen. A. Use simple solu tions of nigrosine or aniline black in water.

three hundred and fifty parts.

(4) C. S. M. asks how to prepare a polish (or dressing) for furniture, whereby old furniture may be made to assume a bright and new appearance. A. Melt three or four pieces of sandarac, of the size of a walrut, add one pint of boiled oil, and boil together for one hour. While cooling add one drachm of Venice turpentine, and if too thick a little oil of turpentine also. Apply this, and after some hours rub off. Make frequent applications.

(5) A. H. C. asks how to make a hard transparent soap. A. It is made by dissolving hard white soap, previously reduced to meal and thoroughly dried, in alcohol. A steam bath, fitted with a still-head, makes a good containing vessel. The alcohol and soap are taken in about equal proportions; and as the solution proceeds, any spirit which may distill over must be allowed to condense in a worm and be collected in a receiver. The heat should not exceed 212°. After solution, allow time for settling. Then draw off the clear fluid from the sediment into wooden frames or globular moulds, after which color and perfume the same as other soaps.

(6) A. E. H. asks: What is the best aterial for polishing brass, especially hot brass? A. Mix together 1 ounce oxalic acid, 6 ounces rottenstone and a half ounce gum arabic; all these are to be finely powdered. Then add one ounce sweet oil and sufficient water to form the mixture into a paste. Apply a small portion to the article to be cleaned, and rub dry with a flannel or wash leather. See "Spons' Work shop Receipts," second series, which we can send you for two dollars.

(7) E. M. R. wants a No. 1 cement for ementing hot air furnace and stoves. A. The follow ing cement, used for steam pipes, will probably be found satisfactory: Litharge 2 parts, powdered slaked lime 1 part, sand 1 part. Mix the mass with a sufficient quantity of hot linseed oil varnish to form a stiff paste This cement must be used while fresh and warm

(8) J. & B. ask for a receipt to make a ood stove polish which can be moulded into bars. A. It is made from graphite or black lead purified in the usual manner, and then mixing the powder with some oil of turpentine, to which some ordinary turpentine has been added to make it adhesive, after which the whole is subjected to strong pressure in appropriate moulds.

(9) J. K. asks how to get out the white stain which alcohol makes on varnish, without painting it over. I am informed there is a preparation which you need only to rub over it to take the stain Reasonable prices. Gardam & Sons, 96 John St., N. Y. out and polish it at the same time. A. As the alcohol "How to Keen Boilers Clean." Send your address, dissolves the varnish, the spot cannot be removed, except by renewing the varnish. The article to which Pays well on Small Investment.—Stereopticons, Magic | you refer is probably some simple alcoholic solution of

> (10) W. C. P. asks for a mineral that, when moistened, will Ignite, and that can be worked into very small lozenge-like pieces. A. The article referred to may be the metal potassium or phosphide of calcium; as they are all dangerous, we would not recommend their use.

> (11) J. G. M. asks if there are any chemicals that will destroy lampblack. A. Boiling solution of chromic acid in sulphuric acid or boiling nitric acid. These are to be handled with care

> (12) D. B. K. asks how to oxidize brass and German silver ferrules. Would like to give them a dark appearance without being shining or polished. A. You may oxidize brass or German silver by a vapor bath of sulphur made by burning a small piece of sulphur in a box in which the ferrules are hung. Another method is to dip the ferrules in a solution of water and a few drops of hydrosulphate of ammonia heated to about 180° Fah. The strength must be found by

(13) A. B. asks (1) how to make a composition to resilver brass. A. Prepare a solution of 1 part cyanide of potassium in 6 parts water; add to it a concentrated aqueous solution of nitrate of silver (free from acid) until the precipitate is redissolved. Mix this solution with fine chalk, and apply after previous cleaning of the objects. 2. And also how to silverize iron. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. cess is somewhat difficult. See the receipts given for this purpose in the "Techno-Chemical Receipt Book,"

(14) E. A. M. asks the best lubricating oil to use on very light machinery, such as dental engines and lathes. Sperm, lard oil and kerosene all gum up in time. A. There is no oil that will not gum in time. Use good sperm oil that has been treated with lead shavings and exposed to the sun in a bottle for a plumbago paint. 2. For preventing boiler scale. A. few days. Decant the clear oil. The lead and sunlight

(15) G. F. asks a way to color castings of Babbitt metal or type metal so as to give them the appearance of gray iron that has been coppered. A The castings can be colored by a deposition of a thin film of copper by dipping in a solution of sulphate of copper and water.

(16) B. C. H.—Low temperature ther mometers are made with colored alcohol, which is liquid at about as low as 160° Fah.

(17) T. V. L. F.—The pressure that lead is what you mean. Use iron or hard brass. Use the ordinary yellow brass for hard soldering or brazing

(18) C. S. R.—Coke at 8 cents per bushel has nearly the same value in carbon as anthracite at (3) C. M. asks: What are the chemicals \$4.50 per 2,000, lb., but is not as good for firing under used, or the process necessary, in order to repair arti-; small boilers. It is light and spongy, occupying nearly cles made from tortoise shell? A. Use the following twice the space of anthracite, and requires more attencement: Mastic thirty parts, shellac ninety parts, turtion to keep up the intensity of fire required in boilers Camera. See Photographic camera.

pentine six parts, spirit of wine ninety per cent strong, | constructedfor anthracite fires. With fire chambers of larger dimensions, coke is nearly equal to anthracite for

> (19) J. S. W. asks (1) why a cutter yacht carries a shifting bowsprit. A. For convenience of housing in rough weather. 2. Why is the cutter or sloop rig faster than the schooner rig? A. With the same area of sail, the single sail is supposed to hold the wind better than when divided.

> (20) P. A. F. writes: In plating small articles with tin, I find that the metal becomes foul and makes the work rough. How shall I remedy this? Would it be advisable to mix antimony with the tin? A. You can improve the tin bath by thoroughly stirring with a stick of green wood, which boils the tin by liberatting steam and gas, then cool until it will just pour, when you can pour off the tin slowly, leaving the alloys in the pot. You may use a little sal ammoniac (pulverized) on the tin surface to clear it, and occasionally skim off the dross. You will not be able to use up all the tin of the bath in tinning. It does not pay. Better sell it or make it into coarse solder. Use no antimony.

> (21) T. S. asks the process by which quicksilver is applied to glass to make a mirror? What coating can be applied to the quicksilver to protect it from dampness or moisture? A. The quicksilvering of glass is done by covering a sheet of pure tin foil laid upon a cushioned table with mercury; then, sliding the clean glass on the mercury to prevent air bubbles, and pressing the glass down upon the foil, slightly tip up the table to allow the surplus of mercury to run off. Leave the glass under pressure for several hours, to allow the amalgam to set. You cannot put anything on the back to protect it. See Scientific American Supplement, No. 105, for the wet process, which allows of lacquering the back.

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 unequaled facilities for procuring patents everywhere. 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 ex-tensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broad-

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted,

October 12, 1886.

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.] Air with natural gas, apparatus for mixing atmos-

| pheric, W. Snee | 350,849 |
|---------------------------------------------------------------------------|----------------------------------------------------------------|
| Armatures, machine for winding, L. B. Jones | 350,828 |
| Ash pan, S. J. Byers | |
| Aspirator, etc., surgical, A. E. A. Ruault | 350,895 |
| Atomizer, C. H. Fisher | 350,822 |
| Auger, S. Burd | |
| Auger handle, W. H. F. Raifsnyder | |
| Awning frame, Toulouse & Delorieux Axle box, car, J. Timms | |
| Axle lubricator, carriage, J. Sladdin | |
| Bag or satchel frame, W. Romer | 350,641 |
| Baking or firing compounds of plastic material, | |
| etc., process of and apparatus for, Stewart & | |
| Hastings Balusters, machine for dovetailing, B. F. T. Bell | 350,567 |
| Banjo, F. R. Mustill | |
| Bar. See Window shade bar. | 000,000 |
| Barrels, machine for cutting head linings for, L. | |
| Reed | 350,697 |
| ReedBathing apparatus, J. W. James | 850,490 |
| Bathing machine, J. W. James | 350,489 |
| Battery cell, galvanic, L. Drescher | 350,621 |
| Bench. See Work bench. | 1 |
| Bicycle, C. E. Duryea | |
| Bicycles, saddle spring for, L. S. Copper | 350,868 |
| Blast ovens, cleaning apparatus for hot, V. O. | 250 560 |
| Strobel | |
| Block. See Tackle block. | 000,000 |
| Blotter case for copying presses, J. W. Callard | 350.802 |
| Board. See Bosom board. | , |
| Boiler. See Steam boiler. | |
| Boiler, E. V. Hutchens | |
| Boilers, circulating water in, W. Craig | |
| Book cover protector, Stiff & Watrous | 850,508 |
| Boot for shoes, uniting the sole and heel of, E. J. | 250 540 |
| Le Gay Bosom board, L. Funk | 950,740 |
| Bosem board, G. E. Palmer | |
| Bottle holder. S. Frost | |
| Bottle stopper, C. W. Buffum | |
| Bottle stopper, E. H. & C. Morgan | |
| Bottle washer, C. Singer, Jr., et al | |
| Box. See Axle box. Call box. Cock box. Paper | |
| box. | |
| Brake. See Car brake. | |
| Bricks, etc., composition of matter to be used for |] |
| preventing discoloration of burned, W. W. Neuer | פבח בבת |
| Bridge, turntable, etc., draw, T. Cooper | 350 528 |
| Bridle blinder, W. W. Beach | 350.716 |
| Broom holder, A. M. Bodley | |
| Brush. shaving. G. D. Pushee | |
| Buckle, trace, H. T. Simons | 350,778 |
| Buggy tops, folding section for, G. W. Crozier | 350 580 |
| Burner. See Gas burner. Laboratory burner. | 000.000 |
| Button, M. D. Shipman | |
| Button or other analogous article, J. C. W. Jefferys | |
| TOTAL | 350,776 |
| | 350,776 350,491 |
| Cabinet for prints, books, etc., I. W. Heysinger | 350,776 350,491 350,588 |
| Cabinet for prints, books, etc., I. W. Heysinger Cable grip, T. O. Cooper | 350,776 350,491 350,588 350,813 |
| Cabinet for prints, books, etc., I. W. Heysinger | 350,776 350,491 350,588 350,813 350,585 |
| Cabinet for prints, books, etc., I. W. Heysinger Cable grip, T. O. Cooper | 350,776 350,491 350,588 350,813 350,585 350.652 |

Calipers, micrometer, A. L. Washburn...... 350,513

Caltpers, micrometer, W. H. Wilkinson...... 350,516

| | 283 |
|------------------------------------------------------------------------------------------------|-----------------|
| | |
| Candle attachment, G. Whyte | 350.710 |
| Canteen, McKenney & McKeever | |
| | |
| Car brake and starter, Morell & Tilton | |
| Bar coupling, J. W. Carley | |
| Car coupling, T. E. Corkhill, Jr | |
| Car coupling, S. H. Harrington | 350,486 |
| Car coupling, S. G. Howe | 350,745 |
| Car coupling, W. R. Jenkins, Jr | 350,746 |
| Car coupling, L. Macy | 350.756 |
| Car coupling, W. A. Mitchell | |
| Car coupling, A. J. Shipman | |
| Car coupling, A. J. Shipman | FO OF SEC 100 |
| Car coupling, W. H. Thurmond | 00,040, 000,780 |
| Car coupling, Wood & Drake | 350,518 |
| Car coupling links, machine for making, J. J. | J. An- |
| derson | 350,859 |
| Car starter and brake, T. & T. Cox, Jr | 350.661 |
| Cars, brake handle for street, F. B. Browne!! Cars, smoke and cinder deflector for, C. T. L | 350.525 |
| Care smoke and sinder deflector for C T I | athy 350 888 |
| Combustion for Arrend as a humana E. D. Ct. | 250 000 |
| Carburetor for Argand gas burners, F. B. St | |
| Carriage curtain fastening, H. L. Sanders | |
| Cart, road, I. V. Hicks | 350,437 |
| Cartridge shells, finishing, H. E. Fowler | 350,729 |
| Case. See Blotter case. | |
| Cask, brewer's chip. H. Bletzer | 350.522 |
| Caster, furniture, D. C. Otis | |
| | |
| Chandelier, extension gas, B. Churchill | 350,806 |
| Chimney cowl, T. J. Bradbeer | 350,800 |
| Chopper. See Clod chopper. | |
| Churn, M. S. Bowser | 350,524 |
| Chute for branding cattle and horses, N. C | . Gill- |
| more | |
| Chute, stock, B. F. & M. M. Watson | |
| Cistorna device for element I D. Kibler | 250 526 |
| Cisterns, device for cleaning, J. B. Kibler | 330,300 |
| Clamp. See Tube clamp. | |
| Clamp, M. E. Converse | 350,579 |
| Clod chopper and pulverizer, D. Lubin | 350,831 |
| Clod crusher, D. Lubin | 350,832 |
| Clutch, friction, H. Barnes | 350.798 |
| Coal breaker, E. B. Coxe | 350 814 |
| Cost and bet rock T. Wortmand | 950,700 |
| Coat and hat rack, F. Westwood | |
| Cock box, water street stop, A. W. Morgan | |
| Coffee pot, A. H. Denis | |
| Combing and mixing bristles, etc., machine | e for, |
| G. E. Willet | 350.649 |
| Constant potential regulator, C. Hering | |
| Cooking and renovating apparatus, steam | 1 F |
| Parrish | |
| | |
| Corkscrew, W. Schollhorn | |
| Corn husking machine, P. D. Cummings | |
| Corn sheller, Root & Myers | 350,642 |
| Coupling. See Car coupling. Shaft cou | pling. |
| Thill coupling. Yoke coupling. | - |
| Cowl. See Chimney cowl. | |
| Crusher. See Clod crusher. Rock crusher. | |
| | 250 200 |
| Cuff holder, C. Frank | 550,62% |
| Cultivator, N. Roggy | 350,506 |
| Cup. See Oil cup. | |
| Cutter. See Finger nail cutter. Tobacco cu | tter. |
| Cutting double piled fabrics, machine for, | O. E. |
| Drown | |
| Damper and fire alarm, universal electric, | Tr A |
| | |
| Morley | |
| Derrick, stacking, A. Gallagher | |
| Dials, making spindles for timepiece, M. | V. B. € |
| Ethridge | 350 671 |

Digger. See Potato digger.

 Door check, J. W. Ring.
 350,560

 Door hanger, J. J. Baldwin
 350,860

 Door hanger, E. T. Prindle
 350,638

 Door spring, R. Hicks
 350,585

 Draught equalizer, A. Curtice
 350,580
 Draw bridge gate, Quatermass & Ellsworth 350,696 Driving device, frictional, J. Bachman 350,471
Drum head strainer, E. J. Cubley 350,870 Egg beater, W. Vickers...... 350,708 Electric cable. underground, B. Williams. Electric circuits, safety cut-out for, E. R. Whit-Embossing rollers, making counterpart, M. Con-. 350,481 Envelope counting machinery, A. A. Rheutan.. Envelopes, machine for counting and packing, A.

Fence machines, tension device for wire, S. C. &

 Fence, wire, B. Scarles.
 350,698

 File, newspaper, W. Schulz.
 350,507

 Filling apparatus, T.H. Hathaway
 350,675

 Firearm, Johnson & Fyrberg...... 350,681 Flier, speeder, J. A. V. Smith 350,782 Flour chest, J. Ozenberger 350,600 Freight handling mechanism, D. Stretch.......... 350,704

Feed water heater for steam boilers, W. M. Ferry 350,820

Faucet, R. Marsh.....

Furnace. See Hot air furnace. Smoke consuming furnace. Furnaces, apparatus for charging blast, J. M. Get-Gas burner, Dawes & Haarlander...... 350,815

Generator. See Steam generator.
 Governor, W. D. Marks.
 350,595

 Governor, engine, W. Arnot.
 350,797