and a piece of copper sulphate as big as a walnut, boil together a few minutes and spread hot over the marble, leave for 24 hours, then wash off and polish with tlannel or a piece of felt.

(3082) J. S. asks for a recipe for taking indelible ink out of linen. A. A solution of bichloride of mercury (corrosive sublimate) is about the best material for the purpose

(3083) C. L. F. asks (1) how to make a a good cheap brass solution. A. Cyanide of potassium 1 pound, cyanide of copper 2 ounces, cyanide of zinc 1 ounce, rain water 1 gallon. Add finally sal ammoniac 2 ounces. Use at 160° F. The color is affected by relative sizes of anode and cathode. Use brass anode. 2. How is fire gilding done , A. Make an amalgam of gold 1 part, mercury 3 parts. Rub it over the perfectly clean surface of the object until coated, expose to a very low red heat, cool, clean with a brush and cream of tartar. A little muriatic acid may be needed in connection with the first application of the amalgam.

(3084) A. H. asks whether melting aluminum in a common cast iron ladle has a bad effect on the aluminum, and what it is. A. Plumbago crucibles are recommended. See the SCIENTIFIC AMERICAN vol. 62, No. 26, for details on manipulation of alumi

(3085) H. F. D. asks: 1. The upturned edges of rubber soles in tennis shoes peel off from the upper cloth. Please give the proper cement or process see "Rubber Hand Stamps and the Manipulation of Rubber," \$1 by mail. A good job cannot be made after manufacture. The soles should be vulcanized in place. 2. Who was the first discoverer of America-Columbus or Leif Erikson? A. The discoveries of Leif Erikson antedated Columbus' voyages by nearly four centuries.

(3086) W. H. writes: I want to make a wooden box and divide it into compartments, by means of sheet lead partitions. Required something to line the box, adhering to it and to the edges of the partitions, so as to make each compartment independently acid proof (for a 20 per cent solution of sulphuric acid). It must be an insulator. Should be melted and used hot or as a paste which will harden. Please give me a recipe which does not require special apparatus. A. There are several recipes. One reads thus: Burgundy pitch 150 parts, gutta percha in shreds 25 parts, ground pumice stone 75 parts. Apply hot and melt in with a hot iron. Another reads: Resin 4 parts, gutta percha 1 part, and a little boiled oil. Before applying either composition the cells should be absolutely dry.

(3087) J. J. McL. asks for (1) a receipt for making extract of lemon. A. Expose 4 ounces lemon rind to the air until partially dry, rub up in a porcelain or glass mortar, agitate with 2 quarts deodorized alcohol until the color is extracted, add 6 ounces freshly made oil of lemons. Let it stand for two days and filter if necessary. The oil is made by distilling water from the rinds: the oil distills over with the steam. 2. One on extract of vanilla. A. Cut 1 ounce vanilla into small pieces, rub up with 2 ounces sugar in a mortar, percolate with 1 pint alcohol, add 1 pint simple sirup. Artificial vanillin is now largely used instead of vanilla

(3088) F. T. asks how to make phosphate, such as is used for drinking purposes, in soda water which comes from the fountain on the counter. A. Use 2 drachms phosphoric acid to 1 gallon of simple sirup.

(3089) M. S. S. asks how to make a furniture polish that will make a fine gloss and dry in the shortest possible time. A. Dissolve 4 ounces beeswax in 1 pint turpentine, color with alkanet root if desired. There are many other formulæ; the above is given for its simplicity.

(3090) W. L. C.-Calcined gypsum or plaster of Paris is used in the Cassner dry battery.

(3091) J. A. B. asks what preparation to use for removing finger spots and other soiled marks from a banjo head without necessitating its removal from the banjo while applying. A. Try bread crumbs, India rubber, or a very smooth piece of pumice stone for bad spots.

(3092) A, G. asks: 1. What is infusorial earth? A. Siliceous skeletons of diatoms. These re presented a low form of animal life, and infusorial earth is made up of remains of their microscopic skeletons. 2. What are its uses? A. Principally as a polishing agent, as an absorbent for explosives, and in brick and tile and stoneware making. 3. What is its commercial value? A. About \$5 per ton. 4. Can sulphate of aluminum be easily and cheaply reduced to merchantable metal? A. No; but it should be of value for the manufacture of alum. 5. Is the Cowles method applicable in reduction of same? A. No.

(3093) W. H. says: Here is my receipt for ingrowing toe nails: Soak the foot in for ten or fifteen minutes, then take a medium sized file (a new one, so it is very sharp) and file off the top of nail down as thin as you please; once a week is often enough. I have tried every other known remedy, but this, used for a year, beats them all.

(3094) P. J. L. asks (1) how to deodorize kerosene. A. It cannot be completely deodorized. Treatment with concentrated sulphuric acid and bichromate of potash, mixed, may do something, but complete deodorization is not likely to be attained. 2 How to make camphorated oil? A. Dissolve 20 parts camphor in 80 parts cottou seed oil. In China an oil is drained off from the crude camphor, which is termed camphoroil. 3. How to make vaseline. A. By decolorization of petroleum residue with sulphuric acid and bichromate of potash and digestion with bone char

(3095) H. B. asks: Is there any differ ence in the two saccharometers (used in this country for beer worts), Kaiser and Balling, as to degrees? A. They are identical except as regards range. The Kaiser goes up to 40 per cent, the Balling stops at about 10 per cent lower. The reading temperature is 14° Reaumur (63% outlet or nozzle of the exhaust should be about for Fah.), and the readings correspond to percentages of cane sugar.

(3096) W. P. B.—The mottling of small steel work, gun work, etc., is described in Notes and Queries, No. 6, Scientific American, September 24,

(3097) C. O. S. asks for a good and cheap way for refining lard, so as to get it quite white and able to stand hot climates. A. Cleanliness is the great point in treating lard. The fat is freed from all adhering fleshy or discolored matter by cutting. It is then cut up into small pieces and washed until the water runs off clear. It is next melted by direct fire or steam coil until it becomes perfectly clear. It is run through close linen filters into the barrels, in which it is stirred until white and opaque, but only thickly fluid. The great point is when to cease stirring. It is then cooled and tightly covered. Air makes it rancid. In Brannt's "Animal and Vegetable Fats and Oils," \$7.50, and in the same author's "Manufacture of Soap and Candles." \$7.50, there is some information on this and allied sub-

(3098) R. D.—For the indicated horse power of a proposed engine: Multiply the proposed horse power by 33,000; divide this product by the mean engine pressure multiplied by the speed of the pistor (assigned) in feet per minute; this gives the area of the cylinder in square inches. The mean engine pressure must be assumed from the value of the cut-off, and may be obtained from the steam tables in engineering books The piston speed may be assumed at any figure between 300 and 400 feet per minute. The length of stroke is arfor repairing it. A. For treatment of rubber in general bitrary, from 11/2 to twice the diameter of cylinder. The knot is 1.157 miles. Fastest trains about 60 miles per hour. Driving wheels 6 feet 6 inches diameter. Special locomotives may have driving wheels larger. A rate of 80 to 90 miles an hour is probably the maximum velocity a locomotive could run.

> (3099) B. C. writes: I have a guitar that has got some grease or oil spots of a dark color on the face of the instrument. Can you tell me what and how to remove them without injuring the sound or tone of the guitar? A. Fuller's earth mixed to a cream with benzine and placed in a thick layer over the spots, and allowed to dry, may draw out some of the grease. there will be danger of injuring your instrument by the benzine acting on the varnish.

> (3100) S. D. asks: 1. How can we purify natural gas so as to use it for lighting? It burns with a blue blaze with great heat, but does not give much light, A. Carbureting with gasoline will effect your purpose; no purifying is needed. Possibly passing through slaked lime would help it. 2. Will natural gas run a gas engine as well as coal gas? A. Not generally, and in your case certainly not. 3. Our gas well has a steady flow, but the gas will not burn at all times. What is the cause? A. Your gas evidently varies in composition. When it will not burn, it is because it contains probably too much nitrogen

> (3101) H. V. asks: 1, Can the smoke from zinc ore roasting furnaces profitably be worked up for sulphuric acid? A. There is no reason why it should not, except that the percentage of sulphur is low, and if the roasting is effected with fuel there will be too much organic matter in the fumes to make it profitable. 2. What effect will the smoke of 50 such furnaces in a city of 10,000 inhabitants in the course of time have on health? You know that it kills all vegetation fo quite a distance. A. We should not anticipate much, if any, injury to health.

> (3102) E. asks: What chemicals or acids united to phosphorus will produce a constant glow in an air-tight bottle? A. The nearest approach to what you ask is Balmain's luminous paint, described in our SUPPLEMENT in several places. A solution of phos phorus in olive oil will glow after exposure to the air.

(3103) W. McC.—Gun barrels and other parts are properly blued by finishing of an even or polish grain, and heating until the proper color is obtained For amateur work a brown stain may be made on the clean and polished barrel by brushing with a mixture of protochloride of antimony 1 part, nitric acid 1 part, hydrochloric acid 2 parts. Add the hydrochloric acid very slowly to prevent ebullition. Apply to the surface of the metal with a woolen rag and rub the surface with green young oak wood until the desired brown color i obtained. Wash with warm water, dry, and wipe with boiled linseed oil.

(3104) S. E. B. asks: Can you give me a receipt for treating oak and giving it a 16th century finish? Also a receipt for treating iron, such as grates fenders, etc., giving the same an old iron finish? A Oak may be given the appearance of age by spongin with sulphuric acid and water equal parts, or what i preferable staining with umber in thin shellac vainish Iron work may be treated with a wash of sulphate o soda and heating over a fire, or by brushing a solution of flour sulphur in 10 parts of turpentine, dissolved by heat ing, over the irons, then holding them over an alcohol ne heat until the black poli

(3105) F. D. S. says: I wish to use th power of a fall of 30 feet of water delivered through a iron pipe 2 feet in diameter and 70 feet long. a. Who size turbine should I use? b. How much useful power would I obtain? c. What would be the rate of flo from the end? A. If you have a full supply at the hea of your pipe, it will deliver over 8,000 cubic feet of wate at the mouth per minute. If you are sure that you hav this quantity of water supply, you may realize 225 hors power with a 48 inch turbine of good make, or equal t the Leffel wheels.

(3106) W. H. S.—To polish rubber, the hard rubber should be turned as smooth as possible Then finish with the finest sand paper or flour emer paper. Then polish with a paste of oxide of tin (putt powder) and water on a cloth.

(3107) W. McL. asks if it is practicabl to exhaust steam from engine and heaters int smoke stack. A. If there is a necessity for a stronge draught than the natural draught of the stack, a well ar ranged iet exhaust is practical and advantageous. Th diameters of the stack below the top and in th center for best effect. If not needed for draught, and

the stack is large enough and draught strong enough to overcome the choking by the volume of steam, it is practicable, if convenient, for iron chimneys. Brick chimneys should be kept free from steam under all cir-

(3108) A. K. F.—The frying sound in the telephone is caused by induction from other lines. earth currents and static discharges. To increase the volume of sound in a magneto telephone, use a carbon transmitter.

(3109) J. C. P. asks for latest method of determining by simple process, suitable for high school laboratory, the presence of arsenic in wall papers, etc. A. By simple burning the garlic-like odor of arsenic can be detected if arsenic is present in large quantities. If chemically pure zinc and sulphuric acid are obtainable, Marsh's test is best. It is given in all analytical chemistries, such as Shepard's "Inorganic Chemistry,"

(3110) H. H. asks: Where is the Hennepin Canal? A. In Illinois. It extends from the Illinois River at the town of Hennepin to the Mississippi River near Rock Island. It forms part of the waterway intended to connect Lake Michigan with the Father

(3111) E. G. W. asks: What do you consider the highest surface speed (with reference to friction) infect per minute at which iron forged shafting may safely run in babbitt boxes without danger of melting the babbitt, provided the best known lubricating oil is used? A. We have no information as to the extreme limit of friction or speed necessary to melt babbitt metal, both the lubricant and babbitt metal being of uncertain value. The severest trial of frictional value is on a fast railroad train, where a journal speed of 800 feet a minute has been attained on short runs. In ordinary machinery 400 to 500 feet per minute can be obtained with safety from overheating. As a general rule the percentage of friction due to load decreases with an increase of velocity. See chapters on friction in Trautwine's "Engineer's Pocket Book," \$5 mailed.

(3112) W. S. S. asks: Kindly give the weighs for cord of granite, lime, and sandstone. A. No definite weight can be given. Each kind of stone varies in different localities. If you mean broken stone, an approximate answer only can be given, granite 2.700 pounds, limestone 2,600 pounds, sandstone 2,400 pounds per cord. These figures will vary from 100 to 200 pounds, according to locality and condition.

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June 9, 1891.

AND EACH BEARING THAT DATE.

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Hinge and asjustable clamp, combined, F. G. Disper	
Horses, annotation few desired for A. Lynen	
43,727 Hose on the spindles of couplings, device for fastening, J. Young Hub attaching device, L. Faris. Hub attaching device for farishing device for	
Incrustation preventive, Draper & Holmgren. 453,824 Incrustation preventive, Kassebaum & Darr. 453,624 66 Indicator. See Engine indicator. 453,626 Inhaler, C. L. Coulter. 453,626 Inhaler, E. L. Holohn 453,677	
Innaier, F. L. Upjonn. 453,677 Inkstand, J. Adair. 453,687 Insect catcher, A. Ansley. 453,787 5 Insect trap, J. M. King. 453,842	•
0 Jack See Boot Jack 0 Journal bearing J. Appel 453,826 4 Journal box, self-uiling H. W. Hill 453,836 1 Key Seal Cuttling machines, attachu.	,
Nin. See Lime Kin. I Knobs attaching F. M. Stevens 453.800 453.870	
0 Ladder or fire escape, folding, W. Heister	
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	450.005	
Son. Lamps, manufacture of incandescent electric, R. A. Ressenden.	453,865 453,742	T
Lanterns, tubular, F. Dietz. Lanterns, dissolving view attachment for magic,	453,760	
Lathe dog, C. W. Le Count	453,761	ר
Brown. Level, plumb, J. Poet Lighting of tables and the like by electricity, O.	453,616 453,794	ι
H. Stovell	453,871 453,774 453,962	777
Loading and unloading apparatus, J. Abbott Lock. See Head gate lock. Nutlock. Log loader W. E. Hill	453,851	1
son. Lamps, manufacture of incandescent ejectric, R. A. Fessenden. Lantern, tubular, F. Dietz Lanterns, dissolving view attachment for magic, Z. B. Coes Lathe dog, C. W. Le Count. Lathes or planing machines, driver for, A. E. Brown. Level, plumb, J. Poet. Lighting of tables and the like by electricity, O. H. Stovell. Lime kiln or furnace, H. Hauenschild. Linotype machine, J. O. Clephane Loading and unloading apparatus, J. Abbott Lock. See Head gate lock. Nutlock. Loom, J. Couche Loom, J. Couche Looms shuttle tension device, W. Livingston Looms, lay motion for, G. F. Hutchins Lubricating composition, self, J. D. Brown Lubricator. See Axle lubricator.	453,625 454,013	1
Lubricating composition, self, J. D. Brown Lubricator. See Axle lubricator.	453,961	TO THE TANK I
Measuring and drawing instrument, C. W. James. Measuring instrument, electrical, F. C. Wagner	453,906 453,681	1
Meat slicer, R. Brown Mechanical movement, I. F. Good	453,936 453,991 453,903	
Metal beams, machine for bending or straighten- ing, H. Aiken	453,605	VVVV
Lubricator. See Axle lubricator. Lupuline, apparatus for extracting, J. F. Theurer Measuring and drawing instrument, C. W. James. Measuring instrument, electrical, F. C. Wagner Measuring vessel, D. A. McGee Metalicer, R. Brown Mechanical movement, I. F. Good Metal beams, machine for bending or straightening, H. Alken. Mill. See Crushing and grinding mill. Grinding mill. Roller mill. Mould. See Glass mould. Motor. See Fan motor. Nipple for nursing bottles, T. C. Chalk		
Motor. See Fan motor. Nipple for nursing bottles, T. C. Chalk. Nose bag, G. D. Leonard. Nose ring for animals, E. K. Rea. Nut lock, F. Reynard. Oil can and lamp filler, C. W. Proctor. Oil cup, T. McEntee. Oiler, L. F. Guyott. Ordnance, making, R. J. Gatling. Ore concentrating and separating apparatus, C. M. Fitch.	453,621 453,719 453,940	7
Nut lock, F. Reynard. Oil can and lamp filler, C. W. Proctor Oil cup. T. McEntee	453,660 453,913 453,911	,
Oller, L. F. Guyott. Ordnance, making, R. J. Gatling	454,001 453,833	1
M. Fitch. Ore roasting furnace, J. L. Giroux.	453,928 453,769	1
Mr. Fitch. Ore roasting furnace, J. L. Giroux. Pail, dinner, J. H. Benney. Pail, dinner, W. Powell. Paint, grease, etc., composition for the removal of, Y. D. Sisler. Paper box machines, wetter for, E. H. Taylor Paper cutting machines, slitter for, D. L. McCorkindale.	453,653	-
Paper box machines, wetter for, E. H. Taylor Paper cutting machines, slitter for, D. L. McCork-	453,987	
indale in	453,655 453,759 453,608 453,880 453,741 453,938 453,938	E
Pessary, rec al, R. W. Coffee. Phonograph, T. A. Edison. Planoforte action, S. R. Perry.	453,880 453,741 453,938	C
Pill anumerator and bottling machine F I. Un-	400,000	COCI
john	453,745	
table. M. Morton. Planter, cotton, J. H. Branan.	453,653 453,610 453,973	J N N
Plow, J. F. Akin Plow, Subsoil, J. Mallon	455,688 453,883	H
Pocketbook frame, T. R. Weidemann. Potato digger and harvester, C. Lanker.	453,822 453,9 65	HEOLOGIC
Printing lamp shades and analogous articles, type for, T. Harper	453,772	TO POTO
Printing machine, C. B. Cottrell	453,771 453,758 453,773	7
Printing machine, A. W. Vaughn Printing machines, plate holder for, J. T. Haw- king.	453,988 453,862	1
Propelling boats, device for, B. B. Pease Puller. See Stalk puller. Pulley, split. D. T. McNiel	453,704)
Pump, C. F. Allen Pump, D. Berridge Pump governor, steam, T. Shaw	453,781 453,925 453,671	I
Rack. See Display rack. Rail fastening, B. Smith. Railway cattle guard. J. T. Hall.	453,922 453,808	İ
Railway, electric, J. Jones. Railway spike, J. F. Le Baron. Railway switch, T. L. Carleton.	453,710 453,648 453,690	H
Railway switch, R. Woods	453,825 453,721	6
Pipe elamp, Nettleton & Lee. Pilaner and key seating machine, combined portable M. Morton I hanter cotton, J. H. Branan Planter cotton, J. H. Branan Planter cotton, D. L. Ham. Plow, J. F. Alim. Plow, J. S. Alim. Potato digger and harvester, C. Lanker. Pressure machine, circular, J. W. Coultas. Printing lamp shades and analogous articles. Printing machine, circular, J. W. Coultas. Printing machine, C. B. Cottrell. Printing machine, C. B. Cottrell. Printing machine, C. B. Cottrell. Printing machine, A. W. Vaughn Printing machine, A. W. Vaughn Printing machines, plate holder for, J. T. Hawkins, M. S. Popelling boats, device for, B. B. Pease. Propelling boats, device for, B. B. Pease. Puller. See Stalk puller. Puller, See Stalk puller. Puller, See Stalk puller. Pump, D. Berridge, Pump governor, steam, T. Shaw Rack, See Display rack. Rail fastening, B. Smith Railway cattle guard, J. T. Hall. Railway, electric, J. Jones. Railway spike, J. F. Le Baron, Railway switch, T. L. Carleton. Railway switch, T. L. Carleton. Railway switch, R. Woods. Railway switch, R. Woods. Railway, See Hay rake. Regulator. See Feed box regulator. Rogsulator. See Feed box regulator.	453,651	Corprorore
Refrigerator, Miller & Carille. Register. See Cash register. Fare register. Register. See Cash register. Fare register. Register. See Nose ring. Rod or pine wrench, M. Cummins. Roller mill, J. A. Buchholz. Roller mill, J. A. Buchholz. Roller mill, J. A. Buchholz. Roller mill, J. A. Ingraham. Roofing, G. S. Lee. Rotary engine, S. G. Brosius. Rotary engine, S. G. Brosius. Rotary steam engine, C. Miessner et al. Rule and try square, com bined folding, R. Oerlein Sash balance, J. P. Brown. Sash balance, J. P. Brown. Sash balance, C. Co. Burns. Savings receptacle, C. O. Burns. Saw brazing clamp, W. C. Okey. Saw filmg machine, F. Edge. Saw frame, back, J. E. Coleman Saw jin, B. W. Marston. Saw tables, bevel guide for, H. B. Smith. Scale, coin-operated weighing, G. G. Merry. Scarf pin and the like, S. Goldner. Scissors or shears, J. Langenberg. Screen. See Dust screen. Screen for magic lanterns and photographers' use, Parsons & Frazer. Score card, R. E. Bean.	453,736 453,755	7
Roller mill, A. Ingraham Roofing, G. S. Lee	453,812 453,979 453,615	8
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Sash balance, J. P. Brown. Sash fastener, C. E. Angell.	454,009 453,895 453,881	
Savings receptacle, C. O. Burns. Saw brazing clamp, W. C. Okey	453,879 453,983 454,011	Į.
Saw frame, back, J. E. Coleman	453,994 453,933 453,893	1
Scale, coin-operated weighing, G. G. Merry Scarf pin and the like, S. Goldner Scissor or shears, J. Langenberg.	453,787 453,715 453,908	•
Screen. See Dust screen. Screen for magic lanterns and photographers' use. Parsons & Fracer.	454,006	i
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Schlucht ner Spigot, T. Sa vill	453,919 453,668	,
Schlucht ner Spigot, T. Sa vill	453,919 453,668	I I
Schlücht ner. Spigot, T. Savil. Spigot, T. Savil. Spinning machines, saddle for top rolls of, W. T. Carroll Spoon, G. Gray. Spraying device, W. J. Ruff. Spring. See Vehicle spring. Spring shaping machine, C. F. Shoemaker.	453,919 453,668 453,854 453,972 453,918 453,779	I I I
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.	Track fastener, F. S. Ketchum	ı
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- 10	for Folger & Dearborn 453.997	и
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ĝ	Water heater for stoves, ranges, or furnaces, J.	П
ň	M. Carson	١,
ŏ	M. Carson	П
3	Weaving, warp operating mechanism for cross,	н
3	W. Talbot	П
i	Wheel. See Car wheel.	ŀ
3	Wheels, spindle and box for, J. Blessinger 453,960	Ľ
٦ ا	Wood turning machine, A. Derouin	М
8	Wrench. See Rod or pipe wrench.	П
9	Wrench C F Pickens 453 890	п
7	Wrench, C. E. Pickens	L
3	Koehler	H
٠	1000101	П
9		П
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