flour paste? A. Oil of cloves. 3. Please give a recipe for a good mucilage, one that will keep? A. Gum arabic solution perfumed with oil of cloves. 4. When qualities? A. Use pure dextrine. Filtering through bone black will tend to improve it.

(2809) M. M. asks: 1. What is the E. M. F. of a plunging bichromate battery with 2 carbon and 1 zinc plates 4×6 inches each? A. Very nearly 2 volts. 2. How many amperes of current will it give? A. On a short circuit of 0 resistance the battery would yield a current of from 4 to 8 amperes. 3. What is the voltage of the simple electric motor described in SUPPLE-MENT, No. 641? A. It requires a current having from 8 to 12 volts E. M. F. 4. What is its current capacity and what part of a horse power will it develop with the battery mentioned? A. It requires a current of 6 to 8 amperes and will develop about 1/8 horse power under favorable conditions.

(2810) W. G. asks: Can you tell me 1. How I can clarify bleached shellac varnish for use on drawings? A. Long settling might answer. Also if there is anything better for the purpose than the above varnish? A. Try Canada balsam or dammar varnish thinned with turpentine, or if you wish an alcoholic solution, use gum sandarac varnish.

(2811) C. A. W. asks: 1. What would you dissolve phosphorus in, so you could apply it with a brush on a wall to have it illume up at night? A. Olive oil. Balmain's luminous paint is better. See SUPPLEMENT, Nos. 229, 249, 497. 2. What is the fastest printing press in the United States, and how many impressions will it take, and how many completed papers will it print a minute? A. The Hoe perfecting press; it will print and fold 500 eight page papers a minute, the size of the page being about 17 by 22 3. What pay does the average machinist get, and is that a good trade for a young man to learn? A. It would be hard to strike an average that would be worth anything; the wages vary from \$2 to \$5 a day. It is a good trade, but requires intelligence and hard work to get to the top. 4. How do you temper drills, so they will bore the hardest steel known? A. Heat to dull redness and plunge into a strong solution of zinc chloride. This hardening is only superficial and will have to be repeated after the drill is ground.

(2812) H. L. J. asks: Will you please inform me how to prepare canvas for oil painting? A. Nail the canvas on the stretcher, then give it a coat of thin glue size. Allow this to dry, then apply paint of the desired tint with a palette knife. The paint should have about the consistency of that sold in artist's tubes

(2813) H. J. D. asks how to make white stain for the bottoms of shoes. A. Leather is bleached with a solution of oxalic acid. It is aut to injure the

(2814) G. R. asks what the chemical ingredients are that are in the smoke emitted from soft | may be used instead of molasses. coal. A. Principally carbon and vapor of water, with possibly minute quantities of hydrocarbons.

(2815) McF. & Co. ask: Why cannot water be made by gravity to run through a square coil of pipe, such as is sometimes used in the heaters when laid in a horizontal position? By pouring water in at the top it will not run out at the lower end. We think we know the air prevents it, but why does it? We certainly know the water is neavier than the air, and think that three inches or four inches of head should force both the air and water down and up through the returns of pipe and down out through bottom outlet, but it won't. We have tried it. A. A coil, either square or circular, with a number of turns, when laid on its side, forms a series of siphons, in which, if there is but one turn, water two turns, the head where the water is poured in must be twice as high as the diameter of the coil, with three turns, three times the height and so on. The coil becomes a series of siphons, each siphon after the first, re-enforcing the preceding siphon by its own hydrostatic pressure. Thus the first coil or siphon overflows and the water drops to the bottom of the second, and seals the air in the down leg and forcing the water 13 to the quotient, the final result is equal to 30? A. and so on through a series, each upward leg of water upward as far as possible. Thus 30-13=17=the quoadding its quota of hydrostatic pressure to be overcome by adding to the height of the water inlet.

(2816) T. P. A. writes: Suppose the + wire of an incandescent circuit is grounded, the wire being perfectly insulated, does any current go to ground? If not, what is the object of ground detectors? A. If one wire is grounded and the other is perfectly insulated, there would be no circuit, and as a consequence the current would not flow. Perfect insulation. however, is impossible. With the best there will be a small leakage, but this is negligible. The object of a ground detector is to determine when both branches of the circuit are grounded to such an extent as to interfere with the working of the circuit. 2. I have been told I could get a shock by grounding. say + wire, the - being perfectly insulated. I say no. What do you say? A. Generally enough of the current will find its way to the ground by leakage to give a serious shock. In the case of some arc light circuits, a ground connection through the body has proved fatal.

(2817) G. R. asks: Between what ages can a boy serve as a "page" in the national House of Representatives? What is the salary paid, and do they get pay monthly, whether House is in session or not, and about how many pages are required in that House ? A. The House of Representatives has thirty-two pages who get \$75 per month during the session, nothing when House is not session. A boy is eligible at 12 years of age and can remain as long as he has a good politica backing up to 24 years of age.

(2818) F. F. V. asks: If 25 open gas jets why? And if not, why? A. There will be but little pictures of the celebrated collection are reproduced, and

tial oils cau best be used to give an agreeable odor to difference in the total amount of heat. The gas jets would overheat the top of the room, while the gas stove would equalize the heat by heating the air near the floor. and would alsoproduce a general circulation and equali-I make a rum out of dextrine, it is of a brown color, zation of the heated air throughout the room. The How can I make it white without disturbing its keeping; thermometer, if hung high, would indicate in favor of

> (2819) J. R. asks: How are plans for exterminating Australian rabbits entered for the prize with the New South Wales government? A. Address Hon, F. Abigail, Sec. for Mines, Sydney, New South Wales.

> (2820) J. A. W. asks: 1. Can you furnish me with a book containing the recipes for making gold, silver and nickel solutions? A. We supply Watt's Electro-Deposition of Metals," \$3.50 by mail. Also see SUPPLEMENT, No. 310, for a very good article on the subject. 2. Can you furnish me with a recipe for coating brass that will wear well and withstand the action of hot potash and cyanide of potassium? A. This is almost an impossibility. You might cover with an India rubber tube, or even deposit India rubber on it by deposition. This would have then to be vulcanized, preferably by treatment with chloride of sulphur dissolved in naphtha, followed by heating toward the boiling point of water.

(2821) H. H. writes: Can you give me a receipt for an ink (waterproof) that will do just as well for drawings as the so-called India ink? A. We recommend you to rub up India ink in a solution of shellac in borax water. If it were not for its corroding qualities, an ammoniacal solution of shellac would give an absolutely waterproof vehicle for India ink.

(2822) C. L. H. asks: I am a stamp collector wishing to know how to make adhesive paper to hinge stamps in an album. A. Nothing is really better than solution of gum arabic just perfumed with oil of cloves. Postage stamp mucilage has often been published, as follows:

 Dextrine
 2

 Acetic acid
 1

 Water
 5

 Alcohol
 1

(2823) J. V. D. writes: I have a quantityof cider that has taken up a taste from a cistern coated with tar. Is there any way by which the taste can be removed or neutralized ? A. Try placing a bag of bone black in a sample of the cider. Success is doubtful.

(2824) A. B. asks how to cement polished glass to cast iron (planed smooth). I have tried Major's cement; it sticks good, but in taking it off with hot water, small pieces of glass break off and spoil it. I wish to know if there are other cements that will hold as tight as Major's, but can be removed without injury to the glass, and how to do it. It must be a liquid cement. A. Soak fine white glue or gelatine in water over night. Pour off the surplus water and add molasses equal to about 25 per cent of the bulk of glue, Heat gently and stir until the mixture is formed. You can vary the proportion of molasses to suit. Glycerine

(2825) A. W. B. asks: 1. What causes the singing noise that is heard on telegraph poles? A. The noise is due to the vibration of the telegraph wires produced by the movement of the air. 2. Has alcohol ever been frozen? If so, at what temperature? A. Alcohol has been rendered viscid by low temperature, but never solidified. 3. Can the simple electric motor be arranged to produce the electric light, and how? A. Yes. By using a cast iron field magnet and winding the magnet and armature with No. 20 wire. 4. What is the best work on physics? A. It would be difficult to say which is best. For the advanced scholar, Daniell, Ganot, or Deschanel can be recommended, while "Experimental Science "is suited to all interested in physics. 5. Are the paper conductors in the simple Holtz mawill flow through when the ends terminate on a level chine placed on the same side of the apertured disk, with the top and bottom of the coil. When there are and next to the revolving disk, when they are in position? A. They are both on the side of the disk remote from the revolving plate.

(2826) M. A. H. writes: What number complies with the following proposition: That if 5-7 of its 2 $_4$ / be multiplied by 9-12 of 5-10 of its 3 $_4$ / and then add 4543542399999-5227344295 to the product, and then extract the 5 γ of the result, then divide by 20 and add up the next leg, the air remaining in the down leg, The easiest way is to commence at the bottom and work tient last named. Multiply this by 20, giving 340, which by the statement is the 5th root of the sum of the long number given (4543542399999.5227344295) and of a certain other number. Then 3406=4543542400000. From this the given number must be subtracted, giving 0.4772655705. By the conditions $5-7x^{\frac{1}{2}} \times 9-12 \times 5-10 \times x^{\frac{1}{2}} = 0.4772655705$. The first member of the equation reduces to 225-8402 and the whole equation reduces to $x^{\frac{5}{8}}=1.78177813$. Solving, preferably by logarithms, we find x=2.

BOOKS AND PUBLICATIONS.

ELECTRICITY IN DAILY LIFE. Illustrated. New York: Charles Scribner's Sons. 1890. Pp. xv, 288. Price **\$**3.

The articles on electricity which have appeared in Scribner's Monthly Magazine during the past year are here collected into book form, producing a volume similar in its way to American Railways, produced by the same firm in the same way. The reputation of the authors of this work and the choice of topics are the best guarantee of its excellence. The illustrations are of the quality familiar to the readers of the magazine. and are also very numerous and pertinent to the subjects treated. It forms about as good a popular presentation of the subject as has vet been put before the public.

The Illustrated American.—This beautiful weekly publication, which is now issued in an improved form, so as to bind into conveniently sized volare burning to the best advantage in a room 18 by 18 umes for the library, continues to be of as fine quality feet, and the same amount of gas is burnt in an im- as ever. The issue for the week ending January 31 has, proved gas stove, in a room the same size, will the tem- as opening article, the Geo. I. Seney collection of paintperature register the same in both rooms, and if so, ings, with an excellent portait of Mr. Seney. Many of the

marginal cuts give the portraits of the famous artists whose works are displayed. The reproductions are admirable, giving all the softness and general effect of the Drying machine, J. H. Lorimer.... original works. The great collection of Mr. Seney, which has a wide reputation for its excellence, is soon to be disposed of at auction in this city, and the Illustrated American gives the record of its masterpieces Another article in this number describes and illustrates Sioux Women at Home" as seen at the Pine Kidge Agency. The everyday life of the agency Indian is well shown, with graphic pictures of the semi-civilized product reproduced from photos taken on the spot. Another article is devoted to the U.S.S. Philadelphia, and, with numerous illustrations, gives an excellent idea of the great flagship of the North Atlantic squadron. Music, literature, history, and last, not least," Women," receive their meed of attention in this issue.

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. A 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 extensive facilities for conducting the business. Address MUNN & CO., office Scientific American, 361 Broad way, New York.

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8	Flishing reel, A. B. Hendryx. Fluind graduating device, W. F. Richards. Folding chair, J. W. Bowen Folding chair, J. G. Nicolay. Frame. See Wire frame.	445,254 445,156 445,190
•	Fuel feeder and separator, W. F. Cosgrove Famigating trees and other plants, W. B. Wall et al Furnace. See Boiler furnace. Smelting furnace, Furnace W. A. Hetcher	445,390 445,342
5	Hange. See Pressure gauge.	445,249 445,425
	Gas, apparatus for the manufacture of water, T.	445,425 445,260 445,208 445,450
	S. C. Lowe Gate. See End gate. Sliding gate. Gate, W. Cooper. Globe, time, E. R. E. Cowell. Gold and silver bearing ores, machine for amalga-	445,343 44 5,39 3
		445,300 445,178 445,348
- 0 3	Governor, D. S. Henrie. Governor, Dressure, J. P. Stabler. Grate, boiler or stove, J. H. Waterman. Grinding machine, oval, R. Friedel. Grinding mill, A. Malach. Guard. See Car guard. Guns, hand hold for, F. Nye et al.	445,416 445,169 445,227
3 5 4	Hammock chair, R. Billeaux	445,492
1	Harness, J. E. Foster. Harrow, French & Bettendorf. Hsrrow and sod cutter, combined. J. B. Okey. Harrow, spring tooth, F. Van Patten. Harrow, spring tooth, F. Van Patten. Hay shield and manger, adjustable, Coffin & Shoemake.	445,444 445,507 445,324
0 0 9	Heating and ventilating huildings D. Andrews	445 49B
5 1 9 3	li eating apparatus, steam C. Edgerton Heel trimming machine, C. E. Phillips Heel trimming tool, O. L. Noble Hinge, gate, J. J. Wright Holder. See Bag holder. Commutator brush holder. Cuttle fish hoider. Horse mane hold-	445,283 445,229 445,887
5 4 3	Holder. See Bag holder. Commutator brush holder. Cuttle fish holder. Horse mane hold- er. Newspaper holder. Pencil holder. Horse heel expander, G. T. Chapman Horse mane holder, W. Ambruster	445,463
4	Horsesnoe, T. L. Tipton	440,481
Ţ	Hose coupling, air brake, A. W. Jackson (r). Hose, flexible metallic, J. C. Bayles. Ice elevator, Isbell & Gillett. Indicator, J. L. Dawson. Inkstand, E. S. Raff	445.525 445,271 445,201
70	Iron. See Sad iron. Irrigating, agricultural implement for, S. S. Black	220,014
5 2 0 2	Joint for mechanical elements, G. S. Heath	445,401
34	Knife and pencil sharpener, J. H. West Knife. See Pocket knife.	
1	Britting machine loop noiding mechanism, H. Brinton Knitting machine stop mechanism, F. Crawford Knitting machine trimmer, W. E. Cahill Knob alarm attachment, door, T. Braden Labeling machine, can, H. Albert.	445,494 445,465 445,423
3	Ladder and elevator, combined aerial, D. L. Os-	440,400
8	born Ladder, fruitpicker's ladder, W. Arnold Lamp, electric arc, J. A. Hayes Imp shade, Curtis & Himrod	445,20
50 5 8	Lantern, tubular, G. J. Gerber	445,171 445,187
5	Lathing, wire, P. Miles Leads, crayons, or pencils, form of, H. P. Norton. Leaf turner, T. D. Holcomb. Ledger leaf or sheet, C. M. Wilson Lensgrinding machine, W. Bausch. Letter box, Catudal & Drolet.	
103	Litter. See Wagon bed litter. Liquors, apparatus for treating fermented, W. H. Foye	
14	Lock layer P Forwell	445,501 445,328 445,395
7 13 18	Loom, Cranston & Wesson Loom let-off mechanism, W. E. Sharples. Loom temple, S. Hamblin Looms. spool holding bracket for, O. W. Schaum.	445,395 445,383 445,336 445,514
9668	Measuring vessel, L. D. Warnock Medicine, remedy for coughs, etc., M. E. Hess Metallic cylinders, device for scouring, H. Phillips	445,483
1	Metals, composition for treating the surfaces of, J. Meese	445,320
14 19	Moulding machine, W. Zoeller Mouldings, etc., fabric for covering, J. D. Ripson. Motor. See Electric motor. Electro-magnetic motor.	
9 19	Mowing machine, J. J. Courtney. Mowing machine, E. Smith Nail feeder, wire, Hartsuff & Murphy. Needle, ribbon, C. F. Hatthaway . Newspaper holder, D. Wagner Non-conducting compound, F. Sprinkmann . Nut lock, G. C. Elliott.	445,391 445,347 445,344 445,816
92 97	Newspaper holder, D. Wagner	445,434 445,358 445,166 445,469
12)6	Nut lock, G. C. Elliott. Nut lock, F. B. Harvey Oil cup. C. H. Baker. Ordnance, loading, L. Gathmann Ore washer, McLanahan & Kirk. Pan. See Dust pan.	445,490 445,899 445,430
16 17 14 15	Paper cutter and bookmark, combined, T. H.	445,196 445,436
7	Paper, machine for folding, pasting, trimming, and covering sheets of, C. Chambers, Jr., et al. Pattern. See Commutator pattern Pavement or floor light, J. C. French	445,498 445,311
21 19 86	Pencil holder, J. S. Shaw	
14 12 23	Photography, artificial light for T. H. McCollin. Picture card, W. Hagelberg. Picture hancer, W. C. Tidball Pipe forming machine, D. A. Ritchie. Pipe leak detector, A. H. Brown. Piping for pneumatic brakes, etc., flexible, P. C.	445 205
, 56 51	Dienter good I I Simon	445,200
12 3 36	Betting of, E. Watson	445,211 445,264 445,471
15 16 12	Plow jointer, J. T. Bender. Plow wheel, J. T. Bender. Pocketbook, A. Y. Andrews.	445,281 445,282 445,216
17 85	Pocket knife, C. P. Thayer. Portable table, P. J. Bresnan. Post anchor, Stites & Halser.	445,373 445,509 445,159 445,457
15 36 19	Potato digger, P. D. Smith Press. See Printing press. Pressure gauge, M. McNeil Pressure preservoire head for I W. Heave	445,206 445,355
?? 站 锅	Plaster, composition of matter for retarding the setting of, E. Watson. Plastering, stucco for, E. Olson. Plow, K. A. Hollister. Plow attachment. T. G. Tasker. Plow opinter, J. T. Bender. Plow wheel, J. T. Bender. Pocketbook, A. Y. Andrews. Pocketbook, C. Joseph. Pocket knife, C. P. Thayer. Portable table, P. J. Bresnan. Post anchor, Stites & Halsey. Potato digger, P. D. Smith. Press. See Printing press. Pressure gause, M. McNeil. Pressure reservoirs, head for, J. W. Hyatt. Printing machine, ticket, G. B. Massey. Printing press, plate, F. H. Allen Pruning implement, J. Stebel. Puller. See Stump puller. Pulp digester, G. F. Russell.	445.25 445,16 445,48
) (1)	Pulp digester, G. F. Russell	445,28