nary limit. A. You should speak of a "110 volt circuit;" there is no such thing as a "110 volt current." The resistance must exceed the quotient obtained by dividing the resistance of a single lamp by the number of lamps on the leads in question. Otherwise the safety fuses will melt or the house wire become too hot. A 20 ohm resistance will pass 5·5 amperes, and hence should be placed upon at least a ten-lamp lead, or the safety fuses may melt. A German silver wire No. 7 will be of sufficient size for this current, and 3,000 feet will give the desired resistance. The "Arithmetic of Electricity" is now ready for delivery by us, $1 by mail.

(3077) A. R. L. asks whether chloride of silver can be changed to nitrate or metallic silver, and how to do it? A. Yes. Place it in dilute sulphuric acid with some metallic zinc. This will reduce it to metallic silver if enough zinc is added. This may then be washed and dissolved in nitric acid, evaporated to dryness and fused at very low heat to give pure nitrate of silver. The fusion may be dispensed with.

NEW BOOKS AND PUBLICATIONS.

THE ARITHMETIC OF ELECTRICITY. By T. O'Conor Sloane, Ph.D. Pp. 138. 12mo. Norman W. Henley & Co., New York. Price $1.

This little book is a manual of electrical calculations by arithmetical methods, and contains, first of all, an introductory chapter explaining some of the principles of electricity, giving the relations of absolute and practical units, and examples of the principal ones taken from actual objects. The second chapter treats of Ohm's law in a concise manner, giving six different versions of this fundamental theorem. There are chapters on resistance and conductance, with many rules and problems; on potential difference, containing much good information on leads and wiring for arc and incandescent systems; on the measurement of conductors by circular mills and on many other topics; a chapter on the arrangement of battery cells, and general calculations for battery current, treats this subject in full detail. The electro-magnet, dynamos, and motors come in for their share of attention. All the calculations in the book are done arithmetically, algebra being left out entirely. The problems are stated in a series of rules accompanied by examples fully worked out. Each rule is generally followed with a formula embodying its statement. The simple system of calculating dynamos and motors deserves especial notice. The tables of equivalents, wire gauges, and other factors contained by the book are newly calculated and will be found very convenient. This little volume shows a great deal of careful work, and will prove of great value to both the professional and amateur electrician.

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Vehicle seat, spring, Bunn & Faircloth ... 453,543
Vehicle steering gear, E. Howland ... 453,389
Vehicle wheel, J. Severin ... 453,215
Vehicle wrench, C. C. Carman ... 453,576
Vehicles, glass front for, J. E. Schorah ... 453,452
Vehicles, steam steering gear for, E. Howland ... 453,388
Vending apparatus, automatic, W. B. Seward ... 453,392
Vessel for submarine or surface navigation, V. B. De Souza ... 453,560
Veterinary instrument, J. Ruby ... 453,508
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Wagon bed elevator, W. S. Harris ... 453,340
Wagon, dumping, G. S. Kyle ... 453,491
Wagon, tank, D. Maxon ... 453,358
Wash boiler, D. & D. Coffey ... 453,463
Washing machine, J. Danner ... 453,236
Waste and overflow pipe for bath tubs, etc., standing, M. T. F. O'Donnell ... 453,308
Watch case spring, A. Milne ... 453,202
Water wheel, jet or impact, W. H. Ridgway ... 453,449
Weighing machine, automatic grain, W. T. Barker ... 453,460
Welding links, die for, J. C. Taliaferro ... 453,228
Well bailers, valve for oil, A. W. Knittel ... 453,488
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Ax blade, J. M. Didero ... 20,814
Ballot box, J. Pettibone ... 20,797
Bottle, W. Rodiger ... 20,792
Button, J. Pettibone ... 20,790
Carpet, E. Fisher ... 20,802, 20,803
Carpet, H. W. Parton ... 20,791
Carpet, E. G. Sauer ... 20,805 to 20,808
Cigar band, L. C. Wagner ... 20,789
Dish, covered, J. Dean ... 20,815
Heel mould, G. R. Coburn ... 20,786
Salt cellar, etc., C. F. Monroe ... 20,788
Salt cup, G. E. Lawton ... 20,795
Spoon, E. W. Shannon ... 20,809
Spoon, J. L. Shepherd ... 20,798
Spoon, etc., C. R. Burch ... 20,793
Spoon, etc., G. W. Dimmick ... 20,801
Spoon, etc., E. G. E. Jaccard ... 20,804
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Spoon, etc., E. R. MacGillivray ... 20,796
Spoon, etc., C. Petersen ... 20,810
Spoon, etc., Spear & Sylvester ... 20,799
Stove, cooking, G. E. Wilbur ... 20,800
Toy money bank, D. Cooke ... 20,794
Window catch, H. W. Watson ... 20,810

TRADE MARKS.

Ale, ginger, H. L. Millis ... 19,634
Boots and shoes, leather dressing for, S. A. White ... 19,640
Boots and shoes, polishing material for, S. A. White ... 19,639
Canned fruits, vegetables, meat, and fish, Portland Packing Co. ... 19,625 to 19,626
Cosmetics, powders, and rouge, M. L. Allen ... 19,641
Cotton and woolen fabrics, China and Japan Trading Company ... 19,643
Cough sirup and liver pills, Ryan Chemical Company ... 19,648
Cutlery, silver and silver plated table, Rand & Crane ... 19,659
Eggs, compound for preserving, Rivard & Godfroy ... 19,626
Elastic woven fabrics known as goring, narrow, Green, Jr., & Moore ... 19,650
Felting made from cattle hair, Chalmers-Spence Company ... 19,629
Flour, wheat, S. Samper & Co. ... 19,627
Hardware, excluding locks and latches, builders' miscellaneous, Reading Hardware Company ... 19,658
Knives, scissors, razors, and strops, F. A. Clauberg ... 19,655
Lamp chimneys, L. Heuman & Sons ... 19,644
Leather dressing, S. A. White ... 19,638
Leather dressing, preparation for, M. T. Maguire ... 19,660
Metal in bars and harness trimmings, Pope's Island Manufacturing Corporation ... 19,636
Metallic receptacles for table and hand use, including bonbonnieres, Pairpoint Manufacturing Company ... 19,662
Musical instruments and trimmings, reed, string, and brass, C. Meisel ... 19,635
Newspapers, W. B. Dana & Co. ... 19,649
Paints, ready mixed enamel, J. J. Heins ... 19,633
Paper, cards, and envelopes, J. Dickinson Company ... 19,613
Perfumery, cosmetics, and like toilet preparations, Smith, Kline & French Company ... 19,651
Photographic dry plates, J. Carbutt ... 19,610
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Razors, strops, and shears, F. A. Clauberg ... 19,654
Remedies, certain named, H. P. Ernst ... 19,656
Remedies, certain named, Protection Papier Co. ... 19,647
Remedy for dyspepsia and anæmia, C. F. Hausmann ... 19,657
Salt for curing meats, preserving, J. Horner ... 19,632
Shirts and waists, for women and children, Corliss Bros & Co. ... 19,612
Soap for the feet, Terra Firma Soap Co. ... 19,663
Soap, perfumery, cosmetics, and similar articles, toilet, F. S. Cleaver & Sons ... 19,642
Stain and grease eradicator, R. N. Cunningham ... 19,611
Stove polish, J. B. Dyer ... 19,630
Stoves and burners, vapor, Standard Lighting Company ... 19,638
System renovator, cough sirup, catarrh balm, and worm powders, J. A. Burgoon ... 19,646
Thrashing machines, dust conveyer for, W. S. Miller ... 19,619
Tin plates, Grovesend Tin Plate Company, 19,614 to 19,616
Tin plates, Leach, Flower & Company ... 19,617, 19,618
Tin plates, Phillips, Nunes & Co. ... 19,661
Tonics, cough and asthma cure, and liniment, G. Hahn ... 19,631
Whisky, H. Walker & Sons ... 19,652, 19,653
Wines and liquors, S. Wolf & Sons ... 19,645
Wrenches, Tremont Manufacturing Company ... 19,637

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