simply collected in cups, from incisions made in the bark. To coagulate the milky juice and convert it into rubber fit for exportation, the juice of a vine called achuca is mixed with it, and so powerful is its action that five or six minutes is sufficient to produce coagulation. The Brazilian method slightly differs. The juice is first collected in clay bowls; it is then smeared over various shaped moulds, made also in clay and taking the form of bottles, balls, spindles, etc. Successive coats are laid on, each one having previously been allowed to thoroughly dry, either in the sun or the smoke of a fire, which blackens it. When a sufficient thickness is obtained the clay is washed out, leaving the India rubber ready for exportation. The trees yield twenty or thirty gallons of juice, and when we consider that each gallon will produce two pounds of market India rubber, the harvest is not so bad. Other trees producing caoutchouc are Siphonia brasiliensis, S. lutea, and S. brevifolia.

(6589) S. W. C. says: Can you give me some data for calculations relative to air? A. 1. To find the quantity of nitrogen by volume corresponding to 1 volume of oxygen, multiply by 3·770992. 2. To find the quantity of oxygen by volume corresponding to 1 volume of nitrogen, multiply by 0·265182. 3. To find the quantity of nitrogen by weight corresponding to 1 part by weight of oxygen, multiply by 3·313022. 4. To find the quantity of oxygen by weight corresponding to 1 part by weight of nitrogen, multiply by 0·301839. 5. To find the quantity of nitrogen by volume corresponding to 1 part by weight of oxygen, multiply by 2·6365411. 6. To find the quantity of oxygen by volume corresponding to 1 part by weight of nitrogen, multiply by 0·2730071. 7. To find the quantity of nitrogen by weight corresponding to 1 part by volume of oxygen, multiply by 3·6629154. 8. To find the quantity of oxygen by weight correspondtng to 1 part by volume of nitrogen, multiply by 0·3792848.

(6590) C. T. V. asks: 1. Why is electrical apparatus protected from lightning by lightning arresters? A. To convey away the lightning so as to prevent injury to the apparatus and the operators. 2. How to find the horse power of steam engines. A. Multiply the area of the piston in inches by the pressure of steam per square inch, then multiply this product by the speed of the piston in feet per minute and divide by 33,000. This leaves friction out of the account. 3. How to determine the proper size of fuses for electric light wires. A. As fuse wires made by different makers melt at different temperatures, an actual test of each kind of metal or alloy is required for the different diameters and lengths. Some use pure tin, others tin and lead. 4. Is it necessary for the neutral wire of a three-wire circuit to be equal to the capacity of the two outside wires combined? Why? A. No current goes by the neutral wire, unless there is a difference in the number of lamps on opposite sides thereof. In this case the neutral wire takes the difference in the current, and this only. For this reason this wire may be much smaller than the outside conductors.

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Umbrella cover, detachable, J. F. Witt 543,365
Upholstery, process of and apparatus for making tufted, J. F. Orr 543,218
Valve, G. F. Speer 543,274
Valve apparatus, air brake, H. E. Hunt 543,022
Valve, cut-off, J. W. Melvin 543,258
Valve for gas or air compressors, S. W. Johnson 543,446
Valve, globe, W. Curlett 543,128
Valve, straightway, J. M. Coale 543,173
Vegetable cutter and grater, J. Wagner 543,201
Vehicle folding top, Douglass & Slyder 542,999
Vehicle runner attachment, L. Lavigne 543,387
Vehicle spring, A. L. H. Messmer 543,038
Vehicle wheel, G. Laube 543,310, 543,311
Vessel, N. C. Jessup 543,210
Voting booth, folding, J. W. Ernest 543,422
Voting machine, electrically controlled, C. A. Stitzer 543,065
Wagon, dumping, N. Bate 543,167
Wagon storm door, D. Fuller 543,007
Watch, alarm, J. W. Nuramaker 543,048
Watch cannon pinion, J. S. & A. J. Baker 543,325
Watchcase, W. M. Rush, Jr. 543,317
Watch, stem winding and setting, J. G. Biessing 542,984
Water bag, W. H. Daly 543,177
Water closet seat, J. C. Febiger, Jr. 543,180
Water closet tank, K. Herrmann 543,091
Water heater, G. A. Houston 543,246
Water regulator, automatic, E. W. Long 543,034
Wave motor, J. A. Moore 543,137
Wheel. See Bicycle wheel. Paddlewheel. Traction wheel. Trolley wheel. Vehicle wheel.
Winding thread upon star-shaped holders, machine for, J. Keats 543,185
Windmill, R. Schmidt 543,194
Window, L. N. Fowler 543,380
Window fastener, H. H. Caswell 543,374
Window screen, adjustable, F. C. Miller 543,261
Wire stretcher, W. C. Cardwell 543,290
Wire working tool, J. O. Mitchell 543,100
Wires together, means for fastening parallel, R. I. Brown 543,125
Woodworking machines, antivibrating attachment for, A. Prentiss 543,219
Wrench. See Pipe wrench.
Yarn clearer, adjustable, T. A. Boyd 543,288
Zinc, process of and apparatus for extraction of, L. V. J. Lynen 543,256

DESIGNS.

Bottle, A. Dryfoos 24,500
Box, H. Fatton 24,502
Grate, C. T. Coe 24,504
Lamp, Keeler & Hamm .... 24,496 to 24,499
Pendant, G. Hilpert 24,494
Sign board, H. H. Dreyer 24,505
Spoon handle, L. D. Cole 24,495
Square, try, L. S. Starrett 24,503
Toy money bank, C. A. Bailey 24,501

TRADE MARKS.

Baking powder, Southern Manufacturing Company 26,864
Beer, lager, Estate of F. Oppermann, Jr. 26,852
Beer, lager, Firm of G. Pschorr 26,853
Bicycles and accessories thereto, Zimmerman Manufacturing Company 26,873
Bitters, magen, S. B. Rothenberg 26,855
Blood purifier and remedy for rheumatism, W. G. O'Donnell 26,859
Boots and shoes, Rice & Hutchins 26,842
Buttons, link cuff, J. A. Flomerfelt 26,846
Cement, imported, C. Zunz 26,870
Cleaning and polishing purposes, infusorial earth for, Colony & Osgood 26,868
Combs and other tortoise shell ornaments, Sinnock & Sherrill 26,845
Flour, wheat, Campbell Brothers 26,865
Gas burners and their accessories and parts, Welsbach Light Company 26,875
Hats, boys' and men's fur, Beltaire, Lurch & Company 26,841
Horse washing or cleaning preparation, L. B. Lord 26,869
Liniment, J. Barnes 26,861
Medical compound, certain named, A. H. Wells 26,857
Medical compounds, certain named, C. R. Ray 26,856
Medicinal beverages, Apohaqui Alkaline Spring Water Company 26,854
Musical instruments, Barrows Music Company 26,850
Plaster, calcined, Keystone Plaster Company 26,871
Remedy for anemia, chlorosis, megrim, and neuralgia, Knoll & Company 26,860
Remedy for coughs, colds, and pulmonary complaints, Bartlett & Villinger 26,858
Salve, J. Hubbard 26,862
Salve, W. F. A. Neynaber 26,863
Scarf pins, E. E. Hickok 26,847
Shoes, school, Hamilton, Brown Shoe Company 26,843, 26,844
Silks, embroidery, J. Pearsall & Company 26,839
Skates, Starr Manufacturing Company 26,872
Snuff, T. H. Garrett & Company 26,851
Soaps for use upon fabrics, leather, and other material, D. A. Kendall 26,866
Squares and rules, mechanics', Eagle Square Manufacturing Company 26,874
Umbrellas, cane sheaths for, E. H. Hirsh 26,849
Washing powders, W. McGlaughlin 26,867
Watch cases and movements, Dueber Watch Case Manufacturing Company 26,848
Yarns of wool, worsted, or hair, J. Paton, Son & Company 26,840

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