best writers and scientific experimentalists. In it we have the opinions and writings of English, American, German, and Austrian photographers side by side, which is of itself a new but very agreeable departure Many of the articles are of practical value to both the amateur and professional photographer. It contains seven photogravure illustrations made by five different processes, some of which are fully explained.

There is also much valuable information on emulsions, special developers, and photo-engraving processes, besides illustrations of new and novel apparatus.

We commend the book as a reliable guide to any disposed to take up photography.

THE PHOTOGRAPHER'S BOOK OF PRACTICAL FORMULÆ. Compiled by W. D. Holmes, Ph.B., and E. P. Griswold. Published in New York. 1888. Pp. 237. Price 50 cents.

In this book are published nearly all of the reliable formulas of the present time, relating more especially to the most approved developers, the wet plate process, intensifiers, carbon process, toning baths, albumen and bromide printing processes, and many other useful things desirable for a photographer to have for convenient reference. The authors state that it is not specially original, but is merely a compilation of well known formulas. It is well printed and contains much useful information. It should be found in the laboratory of every practical photographer. Any of the above books may be purchased through this office.

Notes & Queries

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 This is for our information, and not for publication.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.

Inquiries not answered 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.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

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

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(1) F. K. P. asks: If a large quantity of basswood shavings, kiln dried, mixed with green basswood sawdust, partially green, are stored in a large room at a depth of 8 feet, would the process of heating cause them to take fire? A. We should apprehend much danger from liability to spontaneous combustion.

(2) Theta.—Engines for utilizing the spent heat of exhaustion in vaporizing the highly volatile liquids, bisulphide of carbon, ether, and ammonia, have been built and large sums have been spent in endeavors to make them a success, but so far every form of combination has been a practical failure. The volatile liquids of the above class are exceedingly dangerous from tendencies to create fire or to suffocate persons exposed to their pungent odors. The use of gasoline in a vapor engine is now being introduced for running small laundries. This also requires great care, as leaky joints may cause serious trouble by igniting from the boiler fire.

(3) A. B. C. asks if a thoroughbred horse does not have one more rib than an ordinary horse. A. Certain horses have 19 ribs, while others have only 18, but we do not think that there is any rule by which you can claim that the horse having the greater number of ribs is any better than the other.

(4) J. A. H. asks: Is there any means of preventing rain water stored in wooden cisterns from becoming foul? A. Use charcoal of about the size of beans, with the dust sifted out, with which cover the surface of the water in the cisterns. This is the only antiseptic that we can suggest that does not interfere with the use of the water for all purposes. The cistern may be much improved, at the next cleaning, by washing the wooden surfaces, sides, bottom, and top, perfectly clean, and brushing a thin coat of pure Portland cement all over the surfaces. Mix quickly with water to a creamy consistency, and spread with a whitewash brush. Let it set for a few hours and go over it again. In one day the cement will be set and the cistern ready for use.

(5) D. C. S. asks: 1. Is there any wash that I can use to wash lime stains out of oak? A. No. 2. Is there any kind of wash that I can apply to oak or cherry to prevent lime and plaster from staining them? Coat them with paraffin, and the lime will not go through.

(6) Gloss asks how to manufacture a good liquid polish or gloss for shoes. A. We presume you desire a gloss for shoes. Take of gum shellac ½ lb., alcohol 3 quarts, dissolve, and add camphor 1½ oz. and lamp black 2 oz. For details as to combination and other information, with numerous receipts, see John Phin's "Trade Secrets and Private Recipes," which we can send you postpaid for 60 cents.

(7) W. S. P. asks: 1. How many pounds weight will a cubic foot of air, in an air-tight vessel, sustain on the surface of water? A. About 62½ lb., less the weight of the inclosing vessel. 2. How many pounds weight will a cubic foot of vacuum sustain, with same conditions? A. The same weight plus abont 535 grains. 3. Is the power of a cubic foot of compressed air to sustain weight on the water greater or less than the natural air? And if so, in what proportion? A. Less in proportion to the pressure. 4. Is there any gas, or other thing known, which possesses greater buoyancy or weight-sustaining power on water than air, natural or compressed, or a vacuum? If so, what is it? A. A vacuum possesses the greatest buoyancy, surpassing that of air by the trifling amount indicated in answer No. 2; hydrogen comes next.

(8) F. A. C. writes: Will you please explain the following phenomenon: In our station barometer I have noticed that from time to time an increasing number of very minute specks of quicksilver form above the mercurial column, and attach themselves to the inside of the tube, looking like fly specks. A. Possibly the tube contains air bubbles, which, as they work their way up through the mercury and burst, carry up the minute particles you allude to. If so, your vacuum is becoming impaired.

(9) G. A. H. writes: I wish to have made several cells of Lalande and Chaperon's oxide of copper batteries as described in Hospitalier's "Domestic Electricity for Amateurs" (C. J. Wharton), but desire further information upon the following points not given in the description: 1. Will commercial caustic potash do, or must it be the C. P. kind, such as is used by pharmacists in the preparation of liquor potassa? A. Use commercial caustic potash. 2. What is meant by oxide of copper, the black (cupric) or the red (cuprous) oxide? A. Black or cupric oxide of copper. 3. What, do you understand by the expression "the transformation of the potash into the oxide of zinc," etc.? A. The potash dissolves the oxide of zinc. 4. Will this battery (Fig. 11 for instance) answer perfectly for minor cautery, and furnish a current of sufficient capacity to make it at all times reliable? A. Yes. 5. Will these elements suffer by long periods of time in open circuit, say one or two months of continuous disuse? A. No.

(10) C. S. W. asks: What will prevent a full nickel bicycle from tarnishing or rusting at the seaside? Is there any substance which will not gather the dust, and that can be easily removed? A. This is a constant trouble wtih nickeled parts of bicycles. We can only suggest vaseline. Address some dealer in bicycle supplies, who may be able to offer a more efficient anti-rust material.

(11) F. B. C. says he is troubled in obtaining sufficient density in his negatives. He employs a Seed plate and a ready prepared single solution developer. Exposing instantaneously or up to five seconds, he obtains no better results. A. Probably the developer contains hydro-quinone, and works slower than pyro. You do not let the plate remain in the developer long enough. Half an hour is not too long, if the plate has been instantaneously exposed, and five minutes is not too short for a fairly exposed plate. You will save time and trouble by consulting a photographer in your locality. These images are due to too short development, over-exposure, or to too little pyro. or hydro-quinone in the developer.

(12) F. H. asks: How much mercury in an half inch brass tube (half inch diameter) will be required by an application of heat, to raise a piston weighing 4 ounces, and what is the maximum of heat the mercury will stand? A. You cannot use mercury in a brass tube, as it will destroy the brass. Any amount will raise such a piston by the application of any degree of heat. You may heat it to about 600° Fah., before it will volatilize. Its expansion by heat is very slight, and under conditions named, is too slight to be of much practical use.

(13) A. G. B. asks: Is there any substance which will prevent and stop fermentation in apple cider or other fruit juices? A. Sulphur burned in the barrel has the desired tendency. A stick may be coated with melted sulphur, lighted and held in the half filled barrel, which is shaken to cause absorption of the gas.

(16) T. H. C. desires instructions for some sort of a sizing, such as is used on campaign flags to stiffen them up and put on a gloss. A. After the coloring has been printed, the flags are stiffened with starch size, and then passed through rollers.

(15) E. C. asks: Can lime be used to advantage with barn manures? If so, how? A. No; because it tends to set free the ammonia, which then escapes into the air.

(16) R. O. asks: Will you kindly tell me how I can remove the solder from platinum, so that it may be made comparatively pure. It is at present soldered to small German silver springs. Also, how I can utilize platinum filings? A. If gold-soldered, the solder cannot be removed without elaborate refining or melting at a high enough temperature to volatilize the gold. If brass-soldered, nitric acid will dissolve much of it. Sell the filings to dealers in platinum. It will not pay you to try to work them up.

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Scale, grain, flour, and feed, J. B. Dutton 387,154
Scale, logarithmic sliding, W. Hart 387,070
Screw cutting die and stock, B. Oehmen 386,842
Screws, die for forming and threading the points of, C. D. Rogers 387,184
Seat or couch spring, W. F. Rippon 386,849
Secondary battery, J. S. Sellon 386,898
Sewer ventilator, Benson & Stilwell 387,134
Sewing machine, I. W. Litchfield 386,837
Sewing machine presser feet, device for lifting, Dimond & Campbell 386,868
Sewing machine presser foot, C. F. Littlejohn 387,083
Sewing machine table, M. G. Blake 387,040
Sewing machine trimming attachment, C. H. Wilcox 387,029
Shingle cutting machine, W. Goldie 386,878
Ship's logs, rotating trolling device for, O. Kustel 387,168
Shoe and stocking, combined, D. Basch 387,035
Shoe jack, W. C. Davis 386,867
Shoe or slipper, L. A. Merrithew 386,840
Sifter, ash, O. J. Bagley 387,034
Sign or advertising card, T. P. Heinemann 386,883
Signaling apparatus, train, C. F. West 387,026
Slubbing and roving frames, differential motion for, S. Tweedale 386,906
Snatch block, H. V. Hartz 387,071
Sole edge moulding machine, A. Eppler, Jr 387,059
Spike, H. Greer 387,066
Spinning machine, G. W. Shoemaker 386,900
Spinning machines, yarn guiding device for, J. F. Follett 386,975
Spinning spindle, R. Gill *et al* 386,810
Spring. See Carriage spring. Seat or couch spring.
Stalls, drain for, M. Logan 386,997
Stamp, self-inking hand, L. G. Andrews 387,032
Stanchion, T. H. McCreary 386,890
Station indicator, W. L. Crow 387,151
Steam and heating air, generating, W. G. MacLaughlin 387,087
Steam, apparatus for chemically heating water to produce, W. G. MacLaughlin 387,088
Steam boiler, C. L. Seabury 387,186
Steam boiler, water tube, C. Ward 386,858
Steam engine, concentric piston, G. W. Hubbard 386,922
Steam engine, rotary, W. B. Mayes 387,093
Steam generator, T. F. Morrin 387,100
Stereotype plate finishing machine, C. S. Partridge 387,007
Stopper. See Leak stopper.
Store service apparatus, J. H. Goodfellow 386,977
Stove, J. H. Brown 386,914
Stove, chemical, W. M. Conway 386,967
Stove for railway cars, J. T. Houchens 386,825
Stove or furnace grate, C. D. Howard 387,163
Stump extractor, H. C. Bell 386,957
Supporter. See Pants supporter.
Surgical table, B. H. Daggett 386,916
Suspenders, P. C. Dodge 387,054
Suspenders, V. Dubreuil 386,973
Suspenders, W. H. Wetmore 387,129
Switch for overhanging tracks, E. S. Ellis 386,871, 386,872
Table. See Sewing machine table. Surgical table.
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Tedder, L. S. Heald 386,921
Telautograph, E. Gray 386,815
Telegraphy, E. Gray 386,814
Telephone, mechanical, A. W. Hall 386,980
Telephone transmitter, W. R. Cole 386,965
Temperature regulator, C. W. Johnson 386,828
Thill coupling, E. A. Farr 387,060
Tobacco moistening device, J. McPherson 387,095
Tobacco pipe bowl, W. S. Blake 387,041, 387,135
Toilet rack, M. C. Sterling 386,939
Top, spinning, E. W. Dickerman 387,153
Transom lifter, Ball & McBride 386,794
Trough. See Water trough.
Trunk, W. D. Stillman 386,902
Trunk strap coupling, H. B. Lumm 387,086
Tube cleaner, A. Rast 386,848
Type writing machine, E. H. Argent 387,132
Valve locking device, J. S. Hall 387,161
Valve, revolving, T. O. Perry 387,008
Valve, straight-way, R. Hughes 387,164
Vehicle brake, automatic, Van Antwerp & Norton 387,022
Vehicle reach coupling, E. S. Cushman 387,152
Vehicle, spring, E. Cliff 387,052
Vehicle, two-wheeled, J. A. Odell 386,893
Velocipede, A. Jorgensen 387,166
Velocipede, G. Kibbe 386,980
Velocipedes, adjustable crank for, F. L. Rodel 386,896
Velocipedes, driving gear for, C. Benz 386,798
Ventilator. See Hat ventilator.
Wagon jack and truck, combined, W. Beckert 386,913
Warps, machine for linking, W. Hurst 387,165
Washing machine, H. Haggard 387,089
Watch case pendant, F. W. Schimmel 387,011
Water closet cistern, J. Demarest 386,917
Water closet cisterns, overflow valve for, J. Demarest 386,918
Water coolers, ice cage for, E. P. Bennett 387,037
Water heater, C. A. Winsor 387,196
Water meter, rotary, P. Ball 386,785
Water trough with submergedheater, J. F. Ferguson 386,873
Water wheel, E. M. Carhart 386,802
Watering poultry, device for, S. A. Bacon 386,855
Weather strip, J. Johnston 387,078
Wells, apparatus for the formation of deep, C. E. Kells 386,987
Wells, apparatus for walling, J. Moser 386,928
Wheel. See Conical wheel. Water wheel.
Wick adjuster, lamp, C. A. Evarts 387,156
Windlasses, driving gear for ships', Grater & Whitney 386,812
Windmill, A. G. Nagel 387,102
Window shade, G. L. Castner 386,961
Windows, stand for cleaning F. Meyer 386,927
Wood, preserving, J. C. Mallonee 386,999
Work bench, J. Kelly 386,831

DESIGNS.

Badge or banner, Brophy & Harvey 18,486
Bells, gong for table, A. Mayer 18,493
Blanket, horse, G. R. Ayres 18,485
Bottle, B. I. Mott 18,495
Handkerchief, M. R. Moore 18,494
Handkerchief, R. H. Rose 18,497
Handkerchief or banner, J. M. Bryce 18,487
Pencil case, J. Jones 18,491
Pencil, lead, S. Kraus 18,492
Spoon or fork handle, A. F. Jackson 18,490
Timepiece characters, R. B. Carr 18,488
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