

(11072) C. W. asks: Will you please explain why the sun shines on the north side of a house two times a day, early in the morning and late in the evening? A. From March 22 to September 22 the sun rises north of the eastern point of the horizon and sets to the north of the western point of the horizon. For a time then during the morning and evening it is north of an east and west line through any house which stands north and south. It will during that time shine on the north side of such a house.

(11073) J. D. asks: A bullet fired from a rifle perpendicularly, at what rate of speed would this bullet return to the point at which it was fired—at a greater, less, or same rate of speed? B says it would return to the rifle at the same rate of speed as it had when it started or was fired. A. The air resists the flight of a bullet very sensibly. If it is fired vertically upward, then it will not rise so high as theory requires, and starting to fall from a lower altitude than it should have attained by theory, it will again fail to gain the velocity with which it began its flight. If there were no resistance of the air to encounter, the bullet would rise to the height given by its initial velocity, and in falling, would regain its initial velocity. B is not right.

(11074) S. F. M. says: I wish to know what is considered the average per cent of loss in producing electric light from the coal pile. That is, what per cent is lost in generating steam, then in the engine, then in the dynamo, and then in the light bulb. A. We would say that the statement is frequently made that an incandescent lamp has an efficiency of one per cent; that is, one per cent of the heat value of the coal is given back in light. The arc lamp is more efficient. The steam engine is usually given as about 15 per cent. The dynamo is about 90 per cent. The loss in wiring, etc., depends upon conditions of the local service. Sloane gives the efficiency of the arc as thirteen times that of gas. You will find much in his "Handy Book of Electricity" of value to you. We will send it for \$3.50.

(11075) P. H. says: 1. The distances between graduations on mercury thermometers are uniform. Does mercury expand uniformly for each degree increase in heat? If not, is the thermometer (mercury) scale accurate? A. The rate of expansion of mercury with the rate of temperature increases as the temperature becomes higher, from which it follows that if a thermometer showing the dilation of mercury simply were made to agree with an air thermometer at 32 deg. and 212 deg. Fah., the mercurial would show lower temperature than the air thermometer between those points and higher temperature beyond them. For instance, according to Regnault, when the air thermometer marks 662 deg. Fah., the mercurial marks 683.89 deg. Fah., an error of 21.89 in the latter. Actual mercurial thermometers indicate intervals of temperature proportional to the difference between the expansion of the mercury and that of the glass; the latter corrects to some extent the errors arising from inequalities in the expansion of the mercury, so that for practical purposes the mercurial thermometer sensibly coincides with the air thermometer for all temperatures from a few degrees above the freezing point of mercury (-39 deg. Fah.) to about 500 deg. Fah., the errors in the ordinary atmospheric range of temperature being immeasurably small. 2. Is there any limit to the stellar universe? We say that the light from one star takes 20,000 years to reach us. Are there any stars farther away than this? If so, is there any calculable limit? A. Concerning matters which are immeasurable, there is nothing which may be asserted with more assurance than that there are no calculable limits to the stellar universe. There is every reason to suppose that there are stars the light of which has not yet reached the earth though they may have been incandescent for countless ages; quite as probably if they or our telescopes are of sufficient magnitude for their light to be detected at all, the latter will continue to reach us for ages after the stars are extinct.

State Railways to be the cheapest and simplest solution of the problem. Much of the success of that application is due to the care and enthusiasm of Mr. Garbe and the thoroughness of the German engineer is admirably exemplified in the manner in which he presents his experience and deductions in this book.

THE TEXT BOOK OF GENERAL BACTERIOLOGY. By Edwin O. Jordan, Ph.D. Philadelphia: W. B. Saunders Company, 1908. 8vo.; pp. 557. Price, \$3 net.

This book is the outgrowth of lectures given to students in the University of Chicago during the past few years. The subject is one that the writer believes should find a place in every general scientific course. The book is chiefly of professional interest to the medical student, but the subject also bears technical relation to household administration, to agriculture, to sanitation and sanitary engineering, and the various industries and technological pursuits. For the general scientific student and reader bacteriology presents certain aspects that tend to widen the outlook upon a variety of human interests. The reader who wishes to acquire greater familiarity with the subject will find some bibliographical references given as a sort of first aid to the investigator. It is an excellent piece of book making, illustrated with well-executed engravings. It is well printed on good paper.

PRINCIPLES AND PRACTICE OF AGRICULTURAL ANALYSIS. Vol. II. Fertilizers and Insecticides. By Harvey W. Wiley, A.M., Ph.D. Easton, Pa.: The Chemical Publishing Company, 1908. 8vo.; pp. 680. Price, \$4.50.

No one is better qualified to speak with authority than the Chief of the Division of Chemistry of the Department of Agriculture. In this volume an attempt has been made to treat the subject of fertilizers and fertilizing materials in the manner followed in the first volume with soils. The general principle of fertilizer manufacture and application have been presented in so far as they seem to throw light on the rational method of examination and analysis. The standard methods of analysis in use in this and other countries have been presented with sufficient fullness for the guidance of the skilled worker and the information of the student. This is the second edition of the book, and all the matter in the volume has been rewritten and brought down to date. New ventures of moment are those relating to the production of nitric acid for manurial purposes from cyanamid and by direct electric oxidation of nitrogen of air. A chapter on the analysis of insecticides has also been added. While not intended in any way as a library guide, Dr. Wiley hopes that this volume may be even more highly appreciated than in its first form by the student, the investigator, and the teacher.

"HÜTTE": DES INGENIEURS TASCHENBUCH. Proceedings of the Akademischen Verein Hütte. 3 vols. Berlin: Wilhelm Ernst & Son, 1908.

These pocket books are not limited, as one might imagine from their source, to the technology of iron works or even the use of their products but cover in the first two volumes every possible need of the mechanical engineer, marine engineer, and shipbuilder. The tendency of other recent pocket books has been toward condensation and making them more literally books for the pocket, but the Germans go in the other direction and there are parts of these admirably thorough works which might be taken as text books of the subjects discussed.

INDEX OF INVENTIONS

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AND EACH BEARING THAT DATE [See note at end of list about copies of these patents.]

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THE APPLICATION OF HIGHLY SUPERHEATED STEAM TO LOCOMOTIVES. By Robert Garbe. New York: Norman Henley Publishing Company. 8vo.; pp. 70; fully illustrated with folding plates and tables. Price, \$2.50.

This book is a reproduction, carefully edited by Mr. Leslie Robertson, of a series of articles which appeared in The Engineer, the interesting and in some instances revolutionary views of the author being carefully preserved in this the first English version of the reason for as well as the results of the adoption of superheated steam on the Prussian State Railways, of which he is locomotive superintendent. The continually increasing demand upon modern rolling stock and the limitations imposed by bridge and permanent way restrictions make the problem of the locomotive superintendent of increasing the hauling power of his engines without materially increasing their weight a difficult one. The enormous increase of coal bills also directs the attention of the management to the necessity of economy in fuel; and the use of superheated steam at temperatures of 600 deg. Fah. and upward, ten years ago considered impossible at least on locomotives, seems from the experience of the Prussian

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Inquiry No. 8871.—Wanted to buy chimneyless kerosene burners.

Inquiry No. 8874.—For manufacturers or importers of metal known as "Kaiserzium."

Inquiry No. 8877.—For manufacturers of convex glass for pictures.

Inquiry No. 8878.—For factory making paper out of peat.

Inquiry No. 8879.—For the manufacturers of steam air pumps such as are used on the Conrad steam cars.

Inquiry No. 8880.—For manufacturers of portable shower baths.

Inquiry No. 8884.—Wanted to buy second-hand "Gammeter Multigraph."

Inquiry No. 8885.—For manufacturers of the "Mysterious Ball" like that of Mr. Leper's—a man in a ball.

Inquiry No. 8886.—For makers of bean harvesting machines.

Inquiry No. 8889.—Wanted to buy a machine which breaks and divides apricot stones.

Inquiry No. 8890.—For manufacturers of a milking machine.

Inquiry No. 8891.—For manufacturers of a patent vise with an attachment for boring small holes.

Inquiry No. 8893.—Wanted to buy a second-hand adding machine.

Inquiry No. 8894.—For manufacturers of an automatic camera for making photographs on pin trays, etc.

Inquiry No. 8896.—For the manufacturers of earthenware vessels.

Inquiry No. 8897.—For the manufacturers of the "Lid on" can opener.

Inquiry No. 8898.—For manufacturers of kites.

Inquiry No. 8899.—For manufacturers of steel balls used for cutting sapphires or jewelry and also corn crisp used in clamping and polishing sapphires.

Inquiry No. 8900.—For the address of Electric Service Supplies Co.

Inquiry No. 8901.—For the address of the Electro-Manufacturing Co.

Inquiry No. 8902.—For the manufacturers of an axle grease known as "Ironside."

Inquiry No. 8903.—For firms dealing in motor cars to suit Indian climate.

Inquiry No. 8904.—Wanted to buy new or second hand machinery for making "bow type" mouse and rat trap springs and wire parts, single machine or full outfit.

Inquiry No. 8906.—For the address where Benz Gasoline Engine is built.

Inquiry No. 8907.—For address of New England Coil Winding Co.

Inquiry No. 8908.—For a dealer in tapes and cords for Venetian blinds.

Inquiry No. 8909.—For a machine to paint shade or blind rollers.

Inquiry No. 8910.—Wanted to buy a device for mending tin-ware without soldering.

Inquiry No. 8911.—Wanted to buy steamfitter's tools and screw-cutting lathes.

Inquiry No. 8912.—Wanted to buy an apparatus for counting currency of different denominations.

Inquiry No. 8913.—Wanted to buy machinery for shelling castor beans.

Inquiry No. 8914.—Wanted to buy a kettle without a bail but has a handle on the lid and claps on the side to hold the lid. The kettle to be about 5 1/2 inches high and 7 inches in diameter.

Inquiry No. 8915.—For parties who sell plans and specifications for building ice boats.

Inquiry No. 8916.—Wanted to buy a shoe-shiner that can be attached to a wall with a last to fit any man's shoe.

Inquiry No. 8917.—For a manufacturer who will make palmetto brushes to order.

Inquiry No. 8918.—For manufacturers of "Wyd't's Electro-Catalytic Baking Plug."

Mine timber, Z. Z. Ansbach 907,554

Mining shearing machine pick, K. C. Hoffman 907,360

Mirror, R. T. Sollis 907,420

Mixing machine, F. A. Sickelstel. 907,297

Mobile hydrometallurgical apparatus, Blaisdell & Brown 907,309

Mold, Harding & Brubeck 907,494

Mold-making apparatus, L. J. Wing 907,212

Mower, lawn, E. Fisher 907,133

Mower, lawn, D. G. Frost 907,198

Mower, lawn, D. G. Frost & Earl 907,371

Mower sharpening device, lawn, D. B. Keumow 907,245

Musical instrument players, valve for pneumatic, L. D. Perry 907,642

Musical instrument, stringed, S. W. Buercklin 907,679

Nasal inhaler, A. Riggs 907,178

Necktie frame, A. Perrilliat 907,398

Nitrite solutions, purifying, K. Geelmyden 907,332

Numbering machine, B. B. Conrad 907,128

Nut lock, G. Zoll 907,305

Nut lock, F. W. De Tray 907,473

Operating table, C. E. Wood 907,347

Optical clamp pieces, P. B. Hart 907,222

Overshoe, E. C. Abrams 907,703

Overshoe retainer, A. E. Peterson 907,597

Packing, F. Hennebohle 907,597

Pan and holder, evaporating, H. A. Stemmer 907,195

Pants or skirt hanger, adjustable, M. E. Davis 907,321

Paper clip, A. W. Friskey 907,588

Paper feeding machine attachment, J. Kleidmann 907,610

Paper file, C. Slemin, Jr. 907,647

Parachute, rocket, N. W. Assen 907,133

Pasteurizing apparatus, J. T. H. Paul 907,639

Pen, knocking, H. C. Abrams 907,215

Perforating machine, sheet, H. K. Sandell 907,530

Photographic printing frame, J. Goddard 907,592

Piano, etc., automatic, J. A. Weser 907,206

Piano player automatic attachment, F. P. Smith 907,707

Picture hook hanger, C. W. Holtz 907,599

Pile trimmer and crimper, J. W. Butler 907,456

Pile cutting machine stop motion, C. G. Gildard 907,334

Pile fabric, W. Peersall 907,397

Pipe bender, J. R. Williams 907,210

Pipe cap, sewer and other, G. O. Miller 907,159

Pipe joint packing, Farington & Van Denburg 907,136

Pistol, repeating, A. A. Cowing 907,315

Pistol, toy, C. R. Cochran 907,461

Plate hanger, adjustable, H. R. Seavey 907,706

Plate or stone coating machine, W. C. Huebner 907,385

Pliers, H. R. Hendrickson 907,147

Plow, W. P. Wigley 907,302

Plow, L. M. & J. D. Andrews 907,306

Plow cutter stay, J. C. L. Adams 907,671

Plow flanger, snow, H. E. Parsons 907,701

Plow soil pulverizing attachment, Kaufmann & Kramer 907,505

Plow traction, E. E. Friddy 907,173

Pole step, C. G. Ette 907,483

Post cards or other pictures, descriptive holder for, J. S. Peyton 907,174

Powder blower, F. B. La May 907,376

Power hacksaw, R. C. Berry 907,445

Power transmitting mechanism, D. M. Kyle Press. See Printing press. 907,610

Press self feeder, baling, J. S. Tuttle 907,654

Printing and delivering apparatus, coupon, J. W. Jones 907,369

Printing press, R. C. Seymour 907,415

Printing press, J. M. Thomas 907,535

Projector, J. Minor 907,511

Propeller, wheel, reversible, C. Sintz 907,298

Pump, L. B. De Hymel 907,132

Pump, P. A. Myers 907,164

Pump, air, J. J. Gilday 907,591

Pump, hydraulic air, A. S. Gray 907,341

Pump-operating mechanism, F. G. Bascolo 907,452

Pump, self measuring, J. J. Tokheim 907,653

Pumps, turbines, and the like, equalizing device for, Griessmann & Gottschling 907,343

Punching machine, J. R. Harbeck 907,690

Puzzle, W. Walker 907,203

Rack attachment, hay, J. W. Rives 907,179

Rail clip, F. Braine 907,563

Rail handling machine, B. F. Brown 907,455

Rail joint and nut lock, combination, C. W. Bridgum 907,564

Railway lantern, A. McDonald 907,267

Railway rail joint, M. J. MacKinnon 907,697

Railway tie, C. W. Bridgum 907,565

Railway tie, steel, A. W. Jenkins 907,502

Range and stove water heater, B. B. Culver Ratchet coupling, automatic, R. H. Danziger 907,574

Razor, G. L. Truitt 907,424

Record and file, card, W. O. Johnson 907,244

Recording device, A. B. Herrick 907,235

Refrigerator lining, A. J. Nutter 907,277

Regulator, cleaning feed water, T. Keenan 907,606

Reversing mechanism, H. P. Yost 907,549

Rock breaker, subaqueous, C. L. Rowland 907,407

Roll, crushing, T. L. & T. J. Sturtevant 907,300

Rotatable table, A. M. Stover 907,649

Rule, slide, W. L. E. Keuffel 907,373

Ruling mechanism, D. W. Custer 907,684

Sad iron support, E. T. Jarrett 907,501

Safety lock, J. Herr 907,234

Sash center, Kjellin & Anderson 907,151

Sash fastener, window, J. S. Rapson 907,625

Sash holder, Lenkey & Szalay 907,381

Sash lock, O. Gunther 907,493

Saw, J. Nell 907,163

Scale, automatic grain, F. L. Smith 907,190

Score board, J. P. Keenan 907,506

Scoring machine, J. P. Bird 907,674

Screw set, L. J. Molloy 907,160

Seat for window cleaning, folding, C. W. Boost 907,677

Seed cleaner and grain separator, Hatfield & Wullenwaber 907,348

Semaphore, J. Erickson 907,482

Sewing machine, W. M. Ammerman 907,436

Sewing machine, E. G. Fellows 907,485

Sewing machine attachment for making zig-zag stitches, A. Morin 907,627

Sewing machine trimming cutter, J. M. Merrow 907,618

Shade and curtain fixture, adjustable window, A. Logsdon 907,696

Shade, window, E. F. Cleary 907,460

Shaft clamp, M. T. Thomas 907,539

Shaft coupling, W. A. Perry 907,523

Shaft support, S. P. Stovall 907,537

Shears tension device, J. J. Conway 907,464

Sheet metal packs, opening, L. C. Steele 907,193

Shock absorber, T. Veitch 907,427

Shoe metal fly protector, L. Feinstein 907,554

Shoe trees, A. H. Baker 907,115

Shoes, renewable sole for worn planter, A. L. Raughman 907,440

Show case, fly and dust proof, W. R. Kirk 907,609

Shutter lock, F. T. Skelton 907,646

Signal system with continuous rail connections, D. J. McCarthy 907,165

Sink, basin, etc., A. D. Martin 907,261

Skid, adjustable, McCaddin & Sutherland 907,519

Slate, making artificial, R. Kesler 907,608

Sled, O. L. Beardsley 907,217

Sled, S. Robb 907,288

Slug operated machines, slot protector for, H. K. Sandell 907,531

Smoke consumer, Gibson & Smith 907,490

Snow and ice scraper, W. Cross 907,317

Snow guard, H. H. Hstrand 907,355

Soldering machine, can, S. A. Baker 907,116

Sound records, etc. apparatus for controlling, E. E. Rice 907,177

Speed recording and indicating device, A. W. Polte 907,400

Spring wheel, S. S. Childs 907,459

Springs, apparatus for rolling spiral or helical, C. O. Gustavsen 907,594

Stalk chopper, Canuteson & Ringness 907,221

Steam trap, Bourne & Rees 907,675

Stirrup, safety, J. Speaks 907,535

Stock feeding apparatus, S. F. Moore 907,264

Stock feeding apparatus, Porter & Binnington 907,283

Stove attachment, heating, J. L. Sanders 907,292

Steel faced machine, making, F. Krabbe 907,247

Stretching machine, C. H. Knapp 907,351

Sugar over biscuits, cakes, etc. apparatus for distributing, G. Herbert, Jr. 907,118

Superheater boiler, J. E. Bell 907,685

Surface finishes, removing, Dosselman & Neymann 907,331

Surgical package, F. P. Gates et al. 907,403

Sweeping compound, W. Redfern 907,403

Switch, See Electric switch.

Switch lock, automatic, T. A. Walker 907,202

Switch operating mechanism, J. A. McCroskey 907,390

Switch throwing crank, adjustable, F. C. Anderson 907,114

Switches, arrangement of contacts for, O. Engel 907,481

Talking machine, D. J. Hood 907,362

Tank indicator, liquid, B. Webster 907,657

Tap and drill holder, Blake &

