

promising multitude, ninety per cent. have been either cured or greatly benefited.

We have proved that a number of diseases which by common consent have been assigned to the category of "incurables," no longer belong there. We have cured a number of cases of Bright's disease. Two of these cases were brothers whose father, one brother, and one sister had died of the same disease.

A distinguished member of the New York Bar, who appeared to be a wreck both physically and mentally, and who had settled up his worldly affairs, resumed his active business after three months' treatment; and this business he has successfully followed for a year.

But why multiply examples? We have published many hundred statements in the patients' own language of the effects of Compound Oxygen in almost every kind of disease.

Now what of the future? Having accomplished what we have, and against such odds, our progress henceforward should be broader, more successful, and more beneficent. As was to have been expected, proprietors of sanitariums and health resorts, whose business has been diverted from them by the popularity of the Compound Oxygen, try to show that our agent is inert.

But despite all factious opposition Compound Oxygen must become increasingly popular, so long as it possesses the ability to effect such remarkable cures as now attest its merit.

For full information regarding the treatment and its use, address Drs. STARKEY & PALEN, 1109 and 1111 Girard St., Philadelphia.

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

All Books on Electricity, Cheap. School Electricity, N. Y.

"The Sweetland Chuck." See ad. p. 108. Address wanted of manufacturer of gasoline stoves. A. Roesler, Market Street, Charleston, S. C.

Wanted.—Superintendent for agricultural implement factory near New York. Must understand machine shop, wood shop, foundry, blacksmithing, etc., according to modern customs, and be a man of proved ability.

Street Telescope, M. T. 835 Linden St., Camden, N. J. If you want the best Helve Hammer in the world, send to Bradley & Company, Syracuse, N. Y.

Iron and steel drop forgings of every description. R. A. Belden & Co., Danbury, Ct.

Thread Cutter.—Something new and useful, adapted to all kinds of sewing machines. Patent for sale. Address, Gavino Gutierrez & Co., 192 Front St., New York.

Hoisting Engines for Mines, Quarries, Bridge Builders, Railroad Construction, etc. Send for catalogue. Copeland & Bacon, New York.

Quinn's device for stopping leaks in boiler tubes. Address S. M. Co., South Newmarket, N. H.

"How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 86 John St., New York.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

Pumps—Hand & Power, Boiler Pumps. The Goulds Mfg. Co., Seneca Falls, N. Y., & 15 Park Place, New York.

Fox's Corrugated Boiler Furnace, illus. p. 354. Hartmann, LeDoux & Maecor, sole agents, 134 Pearl St., N. Y.

For Freight and Passenger Elevators send to L. S. Graves & Son, Rochester, N. Y.

Best Squaring Shears, Tinners', and Cannery Tools at Niagara Stamping and Tool Company, Buffalo, N. Y.

Lathes 14 in. swing, with and without back gears and screw. J. Birkenhead, Mansfield, Mass.

The Best.—The Dueber Watch Case.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN Patent Agency, 261 Broadway, New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Lists 29, 30 & 31, describing 4,000 new and 2d-hand Machines, ready for distribution. State just what machines wanted. Forsaith & Co., Manchester, N. H., & N. Y. city. For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. "Abbe" Bolt Forging Machines and "Palmer" Power Hammers a specialty. Forsaith & Co., Manchester, N. H. Railway and Machine Shop Equipment. Send for Monthly Machinery List [to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

Wanted.—Patented articles or machinery to make and introduce. Gaynor & Fitzgerald, New Haven, Conn.

Water purified for all purposes, from household supplies to those of largest cities, by the improved filters manufactured by the Newark Filtering Co., 177 Commerce St., Newark, N. J.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. THE SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

Fossil Meal Composition, the leading non-conducting covering for boilers, pipes, etc. See adv., p. 108.

Straight Line Engine Co. Syracuse, N. Y. Best in design, materials, workmanship, governing, no packing.

Improved Skinner Portable Engines. Erie, Pa. Drop Forgings. Billings & Spencer Co. See adv., p. 398.

Curtis Pressure Regulator and Steam Trap. See p. 78. Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 78.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 77.

American Fruit Drier. Free Pamphlet. See ad., p. 94. Brass & Copper in sheets, wire & blanks. See ad. p. 94.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 20,000 Crank Shafts and 15,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon 24 Columbia St., New York.

Friction Clutch Pulleys. D. Frisbie & Co., Phila. Pa. Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 93.

Magic Lanterns and Stereopticons of all kinds and prices. Views illustrating every subject for public exhibitions. Sunday schools, colleges, and home entertainment. 116 page illustrated catalogue free. McAllister Manufacturing Optician, 49 Nassau St., New York.

Hand and Power Bolt Cutters, Screw Plates, Taps in great variety. The Pratt & Whitney Co., Hartford, Ct.

Lightning Screw Plates, Labor-saving. Tools, p. 92.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) C. M. asks: In what proportion of bulk atmospheric air is reduced by compression into 2, 3, 4, etc., atmospheres? I mean, for instance, what room will 1 cubic foot of air occupy after having been compressed to 2, 3, 4, etc., atmospheres, showing a pressure of 45, 60, 75, 90, etc., lb. respectively? A. The pressure resulting from the compression of atmospheric air in volumes after cooling to the normal temperature is—

Table with 5 columns: 2 vol., 3 vol., 4 vol., 6 vol., 8 vol., 10 vol., etc.

At the instant of compression the pressure arising from the liberation of the latent heat carries the pressure somewhat higher.

(2) H. M. B.—We should infer from the description that the substance was some sort of slag having a melting point lower than the heat to which the bricks were exposed. It is probably a silicate of lime or iron. To positively determine its nature an analysis would be necessary, the expense of which would be from \$10 to \$20, and a larger quantity of the coating would be required.

(3) J. L. T. writes that hammering and heating are two essentials to insure a good mill pick. Never strike a pick or any steel tool on edge where the red heat has left it; let all the hammering be on the flat surface, and the last blows right along the point of the tool to bring the steel close where the greatest resistance to the blow is required. Clean, cold, soft water with salt enough in it to float a common potato. Give

the pick a cherry red heat, and dip without drawing temper; if the steel is good, you will have a pick that will give good service, and you can draw them down just as thin as you want them and give them from 1 1/2 in. to 1 3/4 in. clear temper.

(4) F. W. M. writes: 1. Suppose I have a gear wheel with a loose journal-bearing surface 2 in. in width, revolving on a shaft 1 1/2 inches in diameter, and another loose gear wheel just like the first, only that the width of its journal-bearing surface is half an inch, and it revolves on a shaft 6 inches in diameter. Will the bearing surface in both cases be the same, viz., 9'4248 + sq. in.? A. The bearing surface will be the same, 9'4248 + sq. in. 2. Now suppose the wheel on the 6 in. shaft is to be revolved only one-fourth as fast as the wheel on the 1 1/2 in. shaft, would the friction and wear be same in each? A. The friction and wear on the small shaft will be about four times as great as on the larger. The contact surfaces in both instances are the same, but in the former case the same particles are brought in contact with one another four times while the other shaft is revolving once; and since the weight upon both shafts is assumed to be the same, the wear must be four times as rapid in the one instance as in the other. 3. Would it require any more power to operate one than the other? I have been thinking that under the above circumstances the wheel with the large shaft would suffer no more wear or friction, and take no more power, than the wheel with the smaller shaft. But if they were both to make a revolution in the same time, the former would wear four times as fast and take four times the power. A. It is impossible to answer the question of power positively, as the conditions are not fully enough given. We should say, however, that the power required to fulfill above conditions will be about the same for both shafts, although theoretically a little more power will be required to overcome greater wear of smaller shaft.

(5) O. F., Jersey City, asks what sized air chamber is required to sustain about 2,000 lb. dead weight in water? A. A chamber containing 32 cubic ft. of air is sufficient if made of wood.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

S. P.—The sample consists of pyrite (iron sulphide). In order to determine whether it carried gold in paying quantities, an assay, costing \$5.00, will be necessary.—C. B. S.—The specimen is decomposed limestone, of no value.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

January 29, 1884,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

- Alarm. See Lamp alarm. Bag holder, M. Hayman. 292,643 Baling press, Seeley & Buckman. 292,693 Bar. See Hitching bar. Jail bar. Barrel finishing machine, R. O. Dobbin. 292,737 Barrel making machine, S. Wright. 292,728 Bed lounge, A. Hansen. 292,556 Beer fnings spreader, J. Schafhaus. 292,590 Bicycle, W. H. Davis. 292,545 Billiard table attachment, J. Dockstader. 292,547 Bit and drill brace, J. D. Richardson. 292,587 Boiler furnace, T. E. Jones. 292,751 Bolt heading machine, J. Bruderer. 292,534 Boot and shoe counters, machine for bending, R. Glover. 292,646 Boot and shoe sole, rubber, H. A. Wattson. 292,711 Boot or shoe stiffeners, molding, N. J. Simonds. 292,514 Boot or shoe upper, machine for pebbling or embossing, J. H. Parker. 292,572 Boots and shoes, manufacture of, L. F. Norman. 292,503 Bottling and siruping aerated beverages, apparatus for, McEwen & Spencer. 292,565 Box. See File box. Letter box. Mail box. Paper box. Brace. See Bit and drill brace. Bracket, shelf, or picturesupport, J. E. Wickham. 292,523 Broom holder, H. C. Berg. 292,621 Bucket, G. A. Spross. 292,708 Buckle, C. S. Wells. 292,777 Burner. See Gas burner. Vapor burner. Butter cutter, N. H. Sweet. 292,706 Button, H. Smith. 292,700 Button, E. Wuerfel. 292,729 Button fasteners, implement for setting, J. H. Goodfellow. 292,482 Buttons to fabrics, etc., instrument for attaching, P. H. Sweet, Jr. 292,518 Calculator, tax, interest, and percentage, W. S. Kiser. 292,658 Can holder and funnel, combined, W. M. Doty. 292,629 Can opener, F. Sharp (r). 10,443 Car brake, automatic, J. C. Dane. 292,736 Car coupling, J. Coup et al. 292,538 Car coupling, F. A. Hoyt. 292,557 Car coupling, C. G. McCormick. 292,564 Car coupling, M. M. Shur. 292,695 Car coupling, W. Stamp. 292,704 Car coupling, P. Wineman. 292,724 Car coupling, adjuster, J. P. Ples. 292,506 Car roofing, W. H. Paige. 292,675 Car, sleeping, J. Shorey. 292,595 Car spring, R. Vose. 292,773 to 292,775 Cars of cable roads, pilot or guard for, W. U. Bohm. 292,624 Cars, etc., propulsion of street, Graham & Young. 292,488 Carbon black, apparatus for the manufacture of, G. G. Shoemaker. 292,696 Carpet stretcher, E. P. Shaffer. 292,698 Carriage, R. C. Huse. 292,558 Carriage curtains, clamp fastening for, A. S. Parker. 292,571 Carriage doors, device for closing, H. W. Yonley. 292,536 Centrifugal machine, H. B. Stevens. 292,705 Chain, ornamental, W. Ballou. 292,615 Charcoal oven, J. A. Edwards. 292,635 Check rowers, wire stretcher for, W. W. Porter. 292,679 Chimney protector, I. A. Smith. 292,701 Chimney top, N. Petersen. 292,505 Chuck for holding fittings, S. P. M. Tasker. 292,599 Churn, R. R. Shive. 292,695 Cigar dealer's knife, Dieterich & Walford. 292,473

- Clay crushing roller, J. W. Penfield. 292,576, 292,577 Clevis for chain cables, etc., swivel, F. Joseph. 292,493 Coal screen, J. Jones. 292,500 Coffee and other grain, machine for cleaning, J. Reaney. 292,681 Coffee, etc., machine for cleaning and grading, G. S. Hungerford. 292,750 Coin counter for money drawers, C. G. Raber. 292,584 Copper, tinning sheet, A. A. Cowles. 292,540 Creamer, centrifugal, Lefeldt & Lentsch. 292,661, 292,662 Creaming milk, centrifugal machine for, Lefeldt & Lentsch (r). 10,441 Cultivation and harvesting, system and apparatus for farm, R. Romaine. 292,511 Cultivator, H. W. Ferguson. 292,639 Cultivator, R. C. Norton. 292,674 Cut off, automatic spring valve, J. L. Mitchell. 292,758 Cutter. See Hammer cutter. Die. See Hammer die. Digger. See Well digger. Dredging machine, H. C. Carter. 292,732 Drill. See Ratchet drill. Dust pan, J. I. Flanagan. 292,477 Electric accumulator, G. Philippart. 292,762 Electric cable, compound, H. Van Hovevenbergh. 292,772 Electric circuit, E. Weston. 292,718 Electric circuit conductor, E. Weston. 292,717 Electric circuits, device for connecting safety strips in, E. Weston. 292,716 Electric circuits, fusible safety strip for, E. Weston. 292,718 Electric conductor, A. A. Cowles. 292,539 Electric machine, dynamo, W. F. Buckley. 292,625 Electric machine, dynamo, J. S. Sellon. 292,691 Electric machine regulator, dynamo, E. Weston. 292,715 Electric signaling apparatus, L. J. Crossley et al. 292,542 Electrical circuit breaker for annunciators and gas lighting apparatus, T. H. Rhodes. 292,586 Electrical generator or motor, E. Weston. 292,719 Electrical indicator, E. Weston. 292,714 Electrical transmission of power, system for the, E. Weston. 292,721 Elevator, G. A. Saxer. 292,684 Elevator safety gate, F. K. Bartlett. 292,462 Elevator stop mechanism, F. Secones. 292,686 Engine. See Locomotive steam engine. Pumping engine. Evaporator, steam heated, R. W. Turner. 292,748 Excavating machine, H. C. Carter. 292,468 Excavator and land leveler, B. M. Hague. 292,555 Eyeglasses, I. Fox. 292,479 Fatty acids, solidifying liquid or semi-liquid, W. F. M. McCarty. 292,669 Faucet, P. Huff. 292,489 Felly planing machine, S. T. Kennan. 292,752 Fence, flood, I. McDougall. 292,757 Fences, strand wire for barbed, H. B. Scutt. 292,688 Fertilizer, D. R. Castleman. 292,470 Fertilizer distributor, A. Mckenney. 292,672 File box, F. M. Senter. 292,692 File, extension, J. Gross. 292,484 Filter, J. Durel. 292,631 Fire escape, H. E. Doren. 292,548 Fire escape, R. Stevenson. 292,767 Fire escape, F. J. Underwood. 292,769 Fire escape ladder, A. J. Bartlett. 292,531 Folding table, E. C. D. Kirkpatrick. 292,657 Furnace. See Boiler furnace. Furnace for treating ores continuously, A. M. G. Sébillot. 292,690 Furnace grate, M. C. Jones. 292,492 Furnace joint, E. C. Condit. 292,537 Furnaces, device for indicating the temperature in annealing, M. A. Lhuissier. 292,497 Furnaces, manufacture of non-calcareous linings for metallurgical, J. Keese. 292,508 Gage. See Liquid or water gage. Sawyer's gage. Gage, J. H. Fenety. 292,551 Game apparatus, G. A. Lillendahl. 292,563 Game, checker and base ball combination, H. S. Towner. 292,709 Gas and water regulator, A. E. Cohn. 292,536 Gas, apparatus for producing, G. W. Billings. 292,622 Gas burner, J. G. Sanderson. 292,766 Gas scrubber, C. W. Isbell. 292,491 Glass, apparatus for the application of compressed air to the manufacture of, A. A. & L. A. Appert. 292,730 Glass articles snap holding, H. C. Schrader. 292,885 Glassware, manufacture of ornamental, W. F. Russell. 292,765 Glassware, manufacture of spangled, W. Leighton, Jr. 292,663 Gold by means of alkaline sulphides, extracting, C. P. Williams. 292,605 Governor, centrifugal, J. Selwig. 292,512 Grain, etc., separator for, F. L. Kidder. 292,656 Grinding mill, J. Q. Adams. 292,612 Grinding mill, W. E. Gorton. 292,746 Grinding mill, F. Wilson. 292,524 Hammer die, J. Withington. 292,608 Handle. See Tool handle. Harness, S. Funk. 292,742 Harness loop, J. M. Basinger. 292,618 Hat bodies, apparatus for stretching, J. Eaton. 292,634 Hat bodies, machine for felting and sizing, J. J. Perine. 292,578 Hat linings, manufacture of, A. Solmans. 292,596 Hat protector, C. A. Helbig. 292,487 Hat sizing or felting machine, J. J. Perine. 292,579 Hay rake, horse, J. N. & T. Wallis. 292,726 Hay rake, horse, S. F. Weaver. 292,530 Heat and fire resisting valve, W. A. Goodyear. 292,745 Heel burnishing tool, A. E. Strickler. 292,597 Heel trimmer, C. S. Dwyer. 292,683 Hide scouring and fleshing apparatus, A. Whiting. 292,723 Hinge, W. Patterson. 292,574 Hitching bar, horse, F. Taylor. 292,519 Hitching loop and strap, safety, R. W. Jones. 292,561 Holder. See Bag holder. Broom holder. Horses, device for stopping runaway, A. Ruegenberg. 292,589 Ice creeper, J. Reist. 292,509 Insulated conductor of electricity, W. A. Shaw. 292,694 Interlocking switch apparatus, O. Gassett. 292,744 Iron. See Sad iron. Jack. See Lifting jack. Railway jack. Screw jack. Shoe maker's jack. Jack, S. J. Wisdom. 292,725 Jail bar, L. D. York. 292,387 Jar wrench and can opener, combined, A. Van Slyke. 292,710 Jeweling tool, J. R. Parsons. 292,676 Joint. See Furnace joint. Jug top, Lang & Lauster. 292,660 Knapsacks, means for carrying, A. Mendel. 292,566 Knife. See Cigar dealer's knife. Knitting machine, W. D. Huse. 292,490 Lamp alarm, electric, J. Olmsted. 292,761 Lamp, incandescent, E. Weston. 292,720 Lasting machine, A. W. Pearson. 292,575 Latch, door and gate, C. Wormuth. 292,727