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.

OFFICE OF H. K. & F. B. THURBER & CO., West Broadway, Reade, and Hudson Sts., New York, March 15, 1882.

H. W. Johns M'f'g Co., New York:

DEAR SIRS: After an experience of over five months with your pure Asbestos Packing in use as a piston packing, I am free to say I am agreeably surprised at the result, for after being in constant use that length of time it shows little or no signs of wear, holds steam and water perfectly, does not "blow out," and I find requires less oil than any other packing I have ever used. I shall continue to use it in all the engines under my charge.

Yours truly, CHAS. D. DOUBLEDAY, Chief Engineer.

Drop Forgings of Iron or Steel. See adv., page 188.

Patent Key Seat Cutter. See last or next issue.

Latest and best books on Steam Engineering. Send stamp for catalogue. F. Keppy, Bridgeport, Conn.

Steel Stamps and Pattern Letters. The best made. J. F. W. Dorman, 21 German St., Baltimore. Catalogue free.

Portable Hoists; double the power and one fourth the cost of any others. L. Hoffman & Co., 229 River St., Cleveland, O.

Patents Sold, Leased. Correspondence solicited. Inclose stamp. Kocbendoerfer & Urie, 200 Broadway, N.Y.

Heavy Trimmed Walrus Leather, by the Hide or in Wheels, for Polishing Metal. Greene, Tweed & Co., N.Y.

Wanted 100 tons of Casting, in pieces weighing from 3 lb. to 300 lb. each. Any one prepared to do this will find a good and constant customer. H., Box 773, New York.

The New System of Bee Keeping.—Every one who has a farm or garden can keep bees on my plan with good profit. *Illustrated circular of full particulars free.* Address Mrs. Lizzie E. Cotton, West Gorham, Me.

Cheapest and best Hoists. 229 River St., Cleveland, O.

Blake's Belt Studs. The strongest and best fastening for rubber and leather belts. Greene, Tweed & Co., N.Y.

Now Ready. Catalogue of Electrical Books; also general catalogue. E. & F. N. Spon, 446 Broome St., N. Y.

Send name and address to Cragin & Co., Philadelphia, Pa., for Cook Book free.

Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsaith & Co., Manchester, N.H.

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

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Send for Pamphlet of Compilation of Tests of Turbine Water Wheels. Barber, Keiser & Co., Allentown, Pa.

Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N.J.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock, 80 to 88 Market St., Chicago, Ill.

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

"How to Keep Boilers Clean," and other valuable information for steam users and engineers. Book of sixty-four pages, published by Jas. F. Hotchkiss, 84 John St., New York, mailed free to any address.

Saw Mill Machinery. Stearns Mfg. Co. See p. 156.

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.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

List 27.—Description of 3,000 new and second-hand Machines, now ready for distribution. Send stamp for same. S. C. Forsaith & Co., Manchester, N.H., and N.Y. city.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y.

Improved Skinner Portable Engines. Erie, Pa.

Supplee Steam Engine. See adv. p. 157.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 173.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 173.

4 to 40 H. P. Steam Engines. See adv. p. 174.

The Berryman Feed Water Heater and Purifier and Feed Pump. I. B. Davis' Patent. See illus. adv., p. 174.

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

Ball's Variable Cut-off Engine. See adv., page 188.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'f'rs, 23d St., above Race, Phila., Pa.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.

Paragon School Desk Extension Slides. See adv. p. 199.

Brass & Copper in sheets, wire & blanks. See ad. p. 189.

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

Machine Diamonds. J. Dickinson, 64 Nassau St., N.Y.

Draughtsman's Sensitive Paper. T. H. McCollin, Phila., Pa.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 189.

Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever.

Granville Hydraulic Elevator Co., 1193 B'way, N. Y.

For Mill Mach'y & Mill Furnishing, see illus adv. p. 188.

Upright Self-feeding Hand Drilling Machine. Excellent construction. Pratt & Whitney Co., Hartford, Conn.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

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 this 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) E. E. asks: Of what is gasoline made, such as is used in street lamps and gasoline stoves? A. Gasoline is one of the first products obtained when petroleum is submitted to distillation and the vapors passed through tubes chilled by surrounding water. These products are as follows:

	Limits of gravity. Baume.	Average gravity. B.	Specific gravity.	Boiling point.
1 Gases uncondensed				
2 Cymogene	115° to 105°	110°	600	32°
3 Rhigoline	105° to 95°	100°	625	65°
4 Gasoline	95° to 80°	87°	664	120°
5 Naphtha (refined)	80° to 65°	73°	700	175°
6 Benzine	65° to 60°	63°	750	250°
7 Kerosene, or burning oil	60° to 38°	46°	807	340°
8 Lubricating oil (common)	38° to 25°	30°	885	425°
9 Paraffine				

(2) B. F. S. writes: Please state the formula for making glue (which is not sweet) that will dissolve without the aid of heat, as in the so-called mouth glue. A. Try the following: soak good white glue in a little cold water over night, then dissolve it by aid of heat (over a water bath) in a sufficient quantity of strong acetic acid. It does not gelatinize on cooling.

(3) C. G. S. asks: 1. What can I do or apply to polished steel, either tempered or draw the temper, and have it to maintain its brightness or high polish? A. The only way to preserve the brightness of finished steel is to protect the surface of the metal from the action of moist air. The best way to do this is to coat it with a film of some transparent lacquer and harden the latter by heat. 2. What can be applied to gold alloys and silver as a preventive of discoloring? A. The only resource is lacquer. 3. Do you know of any villages that offer large inducements to receive manufacturing enterprises? A. No. 4. Can steel springs be soldered, both ends to meet as broken, and be used for the same purpose as before? A. This cannot be done satisfactorily.

(4) W. H. M. writes: 1. I am thinking of obtaining power to run my printing press from a steam power 40 rods away. Can I use a cable made of annealed steel wire (same as used on self-binders) twisted into a rope, say five or six strand, to advantage? Will it not rust out in a short time if not coated? A. You can convey the power by a wire rope, but do not use annealed iron; use either fine iron or steel wire unannealed 2. Is there not something that it can be coated with, say, asphaltum paint, or something of the kind? A Coating occasionally with linseed oil and ocher, or coal tar, or asphaltum paints, will protect it. 3. What size of wheel should it run over to give and receive the power? A. The larger your pullies, the longer the rope will wear. They should be at least three feet in diameter.

(5) C. C. C. writes: I would be very glad to have an opinion from your valuable paper (which is an authority in our family) on the healthfulness of that most common article of diet in every household, raised bread. 1. Is it a myth, or is there some truth in the often expressed saying, that "freshly raised bread is unwholesome?" If it is, I am sure your paper can give us a scientific explanation of it. A. Raised bread is not unwholesome if properly baked. If underdone the yeast is not all killed; the live cells set up fermentation in the stomach and give rise to dyspeptic troubles. 2. Why are hot soda biscuit said to be unwholesome? Are they more or less so than hot raised biscuit? Has the "heat" anything to do with it in either case, or is it only the freshness? A. Hot soda biscuit may be unwholesome when an excess of soda is used, or when the biscuit is underdone. In the latter case the doughy mass is swallowed in lumps which the gastric juice cannot easily penetrate, and digestion is seriously retarded. If baked until firm (so that it cannot be compacted like dough) hot bread is not unwholesome. The heat is not injurious; neither is the "freshness." 3. Why do we not hear the same cry against that modern breadstuff hot "Graham gems," made from simple flour and water, beaten well and dropped into highly heated iron moulds, which, when made properly, are a worthy rival in lightness and deliciousness of even the lightest of fine flour raised or soda buscuit? A. Because of an unreasonable prejudice in favor of Graham flour, which may be, and often is, exceedingly unwholesome.

(6) J. N. H. asks: 1. Can a locomotive push any more cars up a grade of 100 feet to a mile than it can pull up? A. We think not, though it may occur that, with some peculiar arrangement of engine, which would throw more weight on the drivers, when on an incline and pushing. 2. Will it require any more power to force an inch square stream of water in the bottom of a tank 100 feet deep and overflow at the top, than it will to force the same up a pipe to the same height? A. Theoretically, no. 3. Can a 10 inch bore by 12 inch stroke engine do as much work, and as economically, as a 10x20? If not, what is the reason? A. No, as the losses by waste spaces, radiation, etc., are greater in proportion in the small engine.

(7) O. M. W. asks: 1. Will a vertical boiler 6 inches diameter and 12 inches high, 1 flue through the center, be large enough to run an engine 1 inch bore and 2 inch stroke? A. No; make it 18 inches to 24 inches high. 2. How much steam per square inch must I carry in the boiler to make the engine work one thirty-second horse power, and how thick must the boiler plates be—either of brass or copper? A. About 45 pounds per square inch. You cannot make it much less than one-eighth inch thick, and make good work. This will be sufficient for strength. 3. Will it make any difference if the steam ports are round or square? State size, round or square. A. One-fourth of an inch or five-sixteenths of an inch diameter. 4 Will this engine run a small lathe (lathe 3 inches swing)? A Yes. 5. Will a one-fourth inch safety valve be large enough for a vertical boiler, one flue through the center, outside diameter 6 x 12 inches? A. Make your safety valve not less than half inch diameter.

(8) W. E. G. writes: 1 I am trying to master all the rules pertaining to engineering as laid down by Haswell. In hydraulics I find a rule to compute the volume of water discharged from a pipe, viz., $39{\cdot}27 \frac{\sqrt{h}\, d^5}{l} = V$ in cubic feet per second. I would like to know where the factor 39·27 comes from and what it is? A. The multiplier 39·27 is the product of 50, the constant of velocity in feet per second x 0·7854, the area of a circle of unity, diameter 0.7854x50=39·2700. 2. What is the general meaning of wire drawn, as sometimes applied to steam? A. Wire drawn is an expression used to signify drawing steam, air, or other fluid, through an opening reduced in area from the general area of the pipe, as in partially closing the throttle valve of an engine.

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

J. F. J.—It is very common mineral—iron pyrites—composed of iron and sulphur.—E. I. S.—The clay contains too much ferruginous silicious matter to be of much value.—E. P. M.—(U. S. C.) It is kaolin of very fair quality. If properly "washed" it could be used to advantage in the manufacture of white ware and enamels, etc.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

March 7, 1882,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired and remit to Munn & Co., 261 Broadway, corner of Warren Street, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Aeriform fluids, apparatus for mixing, J. F. Barker 254,589
Alarm. See Burglar alarm. Fire alarm.
Amalgamator, A. McKellar 254,675
Anvils, cutter and punch attachment for, G. T. Childs 254,532
Axle cleaner and wrench, combined, C. H. Hamilton 254,643
Axle, vehicle, C. Cook 254,466
Axle, vehicle, Deisher & Adam 254,625
Baking plate, pie, C. T. Hurd 254,770
Ball. See Toy ball.
Barrel bushing, T. J. Loftus 254,667
Basket, J. Hibbard 254,479
Battery. See Galvanic battery.
Bed bottom, spring, Hood & Fox 254,652
Bed bottom, spring, T. B. Laycock 254,663
Bed, folding, C. M. Morrison 254,678
Bed, folding cabinet, J. Fournier, Jr. 254,632
Bed, iron, A. Hebert 254,548
Bedstead, J. Monzel 254,777
Bedstead, Pitt & Dunks 254,690
Bedstead, wardrobe, A. Ortlieb 254,501
Belt, strawconveyer, A. J. Park, Jr. 254,686
Billiard cue cutter, P. Ryan 254,703
Billiard table, R. Herman 254,549
Bit. See Bridle bit.
Bleaching and washing linen, etc., composition for, Levy & Alexandre 254,487
Block. See Building block. Saw mill head block.
Blower, air, O. C. Davis 254,538
Boiler. See Locomotive boiler.
Boiler cleaner, A. Rogers 254,698
Bolt beading machine, H. J. Johnson 254,484
Boneblack kilns, etc., automatic discharging apparatus for, A. A. Goubert 254,474
Boot and shoe lasting machine, Copeland & Brock 254,617
Boot or shoe, S. C. Dizer 254,626
Boots and shoes, lasting and uniting the upper and soles of, E. Bertrand 254,594
Bottle stopper, C. Beecher 254,528
Bottle stopper, dose cup, J. H. Zeilin 254,760
Bottles, jars, etc., stopper for, G. A. Smyth 254,718
Box. See Packing box.
Bran flouring machine, W. Warren 254,784
Brewing, Percy & Wells 254,565
Brick machine, W. & A. B. Woodward 255,525
Bridge, draw, Edwards & Kelly 254,627
Bridle bit, E. Little 254,663
Broiler, H. H. Sheldon 254,709
Broom hanger, J. Rath 254,692
Brush machine, wire, J. E. & C. E. Howard 254,655
Bug catching machine, potato, F. D. Casey 254,459
Building block, foundation, M. R. Marks 254,489
Burglar alarm, electric, H. C. Roome 254,699
Burner. See Vapor burner. Vapor retort burner.
Calcimine, Hecht & Davis 254,647
Can. See Cream can.
Can opener, A. W. Lyman 254,488
Cane juice, sirup, etc., with sulphuric acid, etc., bleaching, A. G. Fell 254,471
Cane mill and process of extracting saccharine substances, G. W. Soule 254,575
Car coupling, G. Cade 254,609
Car coupling, D. Fetters 254,472
Car coupling, L. T. Gose 254,766
Car coupling, T. C. Ryan 254,702
Car coupling, C. P. Willson 254,754
Car door, grain, A. E. Pepper 254,689
Car door, grain, J. H. Wickes 254,752
Carding engines, condensing cylinder for, J. Greaves (r) 10,054
Carriage top, Butterworth & Bolles 254,608
Carriage top joint, G. Asher 254,447
Carrier. See Egg carrier. Hay carrier.
Cartridge capping and uncapping implement, A. Worden 254,757
Case. See Watch case.
Casting car wheels, mould for, L. W. Washburn 254,521
Chain, neck or bracelet, D. S. Spaulding 254,512
Chain, pitch, A. H. Wallis 254,739
Chisel, mortising, G. R. Valentine 254,733
Chroming fabrics, T. Simpson 254,713
Churn, G. N. Cleveland 254,614
Clamp. See Rope clamp. Tubing clamp.
Cleaner. See Axle cleaner. Boiler cleaner. Grain cleaner. Steam boiler cleaner.
Clip. See Yoke clip.
Clothes rack, D. A. Epperson 254,470
Coat hanger, W. B. Bisbee 254,451
Coffee roaster, C. Abele 254,582
Coffee roaster, E. A. Hartsell 254,547
Collar pad, J. N. Nesson 254,499
Collyrium, A. Templeton 254,724
Combing machine, A. Smith 254,714
Connecting rod, H. See 254,707
Cooking vessel, A. W. Obermann 254,500
Corn husking implement, J. Nixon 254,682
Corset, J. Hilborn 254,650
Corset, C. H. Williams 254,786
Cotton gin attachment, Thames & Riley 254,725
Cotton press, G. E. Judson 254,774
Cotton scraper, J. L. Farnsworth 254,629
Coupling. See Car coupling. Drill rod coupling.
Cravat fastening, G. E. Poland 254,503
Cream can, H. B. Scoville 254,706
Cultivator, J. W. Bunch 254,606
Cultivator, W. A. Knowlton 254,556, 254,557
Cultivator, G. Martin 254,776
Cut-off valve gear for steam engines, J. James 254,483
Cutter. See Billiard cue cutter.
Cutter head for wood-working machines, J. C. Tunnicliff 254,732
Disb, covered, E. A. Parker 254,687
Doffer rings for card setting machines, joining, J. J. Hoey 254,651
Door hanger, C. W. Bullard 254,605
Door strip, C. E. Rice 254,694
Draught regulator, H. Bisson 254,595
Drawers and other garments, Stiefel & Juhn 254,782
Drawers, men's, I. Schneer 254,506
Dredge dipper, R. R. Osgood 254,563
Drier. See Fruit drier.
Drill. See Grain drill.
Drill rod coupling, E. E. Hardy 254,477
Dyeing colors on textile fabrics, T. & R. Holliday 254,550
Egg and sugar beater, C. Deis 254,540
Egg carrier, N. F. Tipton 254,517
Electric light regulator, J. H. Guest 254,546
Electric meter, C. V. Boys 254,597
Elevator. See Freigbt elevator. Hod elevator.
Engine. See Rotary steam engine.
Evaporator. See Register evaporator. Steam heat evaporator. Sugar evaporator.
Extractor. See Stump extractor.
Fanning mill, Eddy & Levan 254,469
Faucet, G. A. Naumann 254,680
Faucet attachment, W. W. Sweeney 254,577
Fence, barbed wire, Watkins & Scutt (r) 10,053
Fence, portable, W. H. Randall 254,504
Fence post, C. Kinney 254,662
Fence wire stretcher, G. Arrowsmith 254,587
Fencing, machine for making barbed wire, Thompson & Farrell 254,516
Ferrule, wire, H. O. Lotbrop 254,559
Fiber, apparatus for determining the nitrition of cellular, White & Whitcomb 254,751
Fiber disintegrated from cotton stalks, F. Wheaton 254,746
Fiber from the cotton plant and manufacture of articles therefrom, separation of, F. Wheaton 254,749
Filter, J. Grant 254,475
Filter, J. P. McPherson 254,491
Filter stand, H. B. Tiffany 254,726
Fire alarm, automatic, I. Kitsee 254,553
Firearm, breech-loading, J. Nemetz 254,681
Firearm, breech-loading, J. Tonks 254,727, 254,728
Firearms, magazine for, H. Borchardt 254,453
Fire extinguisher, E. Jones (r) 10,051
Fire extinguisher for railway cars, automatic, F. A. White 254,785
Fire extinguishing compound, M. Mathes 254,560
Flour, manufacture of whole wheat, W. Warren 254,742
Flue, boiler, H. L. Trout 254,731
Forage by storage in silos, preserving, C. H. Roberts 254,695
Frame. See Picture frame.
Freight elevator and conveyer, T. Keith 254,661
Frog, uniting and separating, H. McDonald 254,673
Fruit drier, Woodruff, Wheeler & Pearson 254,524
Furnace. See Glass furnace. Glass melting furnace. Ore Roasting, desulphurizing, and chloridizing, furnace.
Galvanic battery, A. Michaud 254,676
Gas for heating and illuminating purposes, process of and apparatus for manufacturing, Attrill & Farmer (r) 10,056
Glass furnace, J. W. & J. R. Houchin 254,653
Glass melting furnace, continuous, J. W. & J. R. Houchin 254,654
Glass, melting, refining, and working out, C. W. Siemens 254,572
Glass moulds, frame and treadle for, N. Granger 254,637
Governor, Judson & Cogswell 254,775
Grain binders, elevator frame of, I. P. Cadman 254,456
Grain cleaner, Shackelford & McClure 254,571
Grain drill, G. G. Blunt 254,452
Grain mill, L. Hottmann 254,551
Grain separator, Smith & Chase 254,574
Grate and grate bar, A. R. Parkison 254,688
Grating, illuminating, T. Hyatt 254,656
Guard. See Safety pin guard.
Hair machinery for untwisting and carding curled horse, T. Adcock 254,583
Halter hook, F. B. Brown 254,602
Hammock or bed, C. Moore 254,677
Hanger. See Broom hanger. Coat hanger. Door hanger.
Harness, draught adjusting device for, J. Hugill 254,552
Harness loop, D. McMillan (r) 10,060
Harvester pitman connection, O. M. & M. C. McMillan 254,490