## NEW BOOKS AND PUBLICATIONS.

GREAT INDUSTRIES OF GREAT BRITAIN. Vol. 1. Illustrated. London and New York: Cassell, Petter & Galpin. $3.

A handsome volume, devoted mainly to the popular description of the industries based on cotton, hemp, flax, jute, wool, and worsted, iron and steel, and shipbuilding, with well written descriptions of the leading English establishments devoted to each. In addition the well known biographer Robert Smith tells the life story of several eminent English manufacturers; Mr. Fox Bourne discusses the conditions and prospects of foreign rivalry with English mining and manufacturing industries; Dr. Gordon Hogg, late Senior President of the Royal Medical Society of Edinburgh, has three papers in relation to health and disease in industrial occupations; and Mr. James Henderson, assistant inspector of factories, discusses the factory system and other phases of industrial legislation. Though prepared especially for English readers this work will be found instructive as well as entertaining to all interested in great industries everywhere.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1879.

This excellent little annual is now before us, brimful of valuable information for the photographer and all who are interested in the progress of this most useful art. All the new photo processes and improved formulæ brought to light during the past year are here given together with hundreds of recipes, hints, diagrams of new instruments, scientific information concerning light-colors, illumination, and many other appropriate subjects. Edited by J. T. Taylor. New York. E. & H. T. Anthony, Broadway, New York.

## Notes & Queries

(1) R. J. F. writes: 1. I have some carbons and porous cups of an old Leclanche battery. What shall I do to prepare them for use in a bichromate battery? A. Soak them a day or so in warm water. 2. In the SCIENTIFIC AMERICAN SUPPLEMENT of February 8, No. 162, on page 2577, there is described an electric light under this head, "No. 29, A Simple Electric Light." Please give me the size of the carbon used. A. One sixteenth inch diameter, three quarters inch long 3. How shall I reduce the size of a piece of carbon if it is too large? A. File it or grind it. 4. It was also stated under that head that the person used 3 or 4 cells of a bichromate battery. How many cells of a Watson battery would be needed to do the work? A. 12 probably.

(2) J. H. P. writes: I am building a steam yacht after plans taken from your paper, and I wish to ask of what quality of iron should the boiler be made to stand the Government inspection. A. The rule of the United States Inspectors is as follows: "Every iron or steel plate intended for the construction of boilers to be used on steam vessels, shall be stamped by the manufacturers in the following manner, namely: At the diagonal corners, at a distance of about four inches from the edges, and also at or near the center of the plate, with the name of the manufacturer, the place where manufactured, and the number of pounds tensile strain it will bear to the sectional square inch."

(3) R. G. asks: 1. Can you give me the best method of setting buggy axles? A. You should consult some good treatise on the subject, as any instructions that we could give you in our limited space would be of little service. 2. Give a good mixture for welding plowshares. A. Mix the powdered borax with 8 or 10 per cent of finely powdered quartz sand or flints, or what is better, dry powdered water glass—silicate of soda—and a little powdered charcoal, lampblack, or argol.

(4) C. W. L. writes: 1. I have a small engine, and wish to use a cast iron or rather an iron casting 8½ inches diameter by 9 inches height, three sixteenths of an inch thick. How much pressure would you risk to the square inch? A. If, as we suppose, you refer to a boiler, we would not be inclined to take any risk with one of that kind. 2. Describe a small pump to feed above with. A. You do not send sufficient data. 3. If I use a small round dish of iron lined with asbestos, and saturate it with kerosene, is there any danger of explosion while burning? A. With ordinary care, no. 4. Do all the small yachts and propellers used by private individuals for pleasure, etc. (the same as one would use his horse and buggy, not kept for hire or used as a money making concern), have to be inspected by the United States Inspectors, carry a full complement of life preservers, buckets, etc., and have their men licensed? A. Yes.

(5) S. writes: 1. The area of a pipe is 0·010 foot, what is the diameter of same in inches? A. 1·354 inch. 2. Give formula for reducing the area of circles in feet to the diameter in inches. A. Divide the area by 0·7854, and multiply the square root of the quotient by 12.

(6) J. R. L. writes: We want to put up a steam engine on the table land, 40 feet from the brow of the hill. The spring from which we must get water to supply the boiler is about 40 feet below, at an angle of 45 degrees. What is the best method and machinery to raise the water that height and distance? A. If you have enough water, you can use a hydraulic ram. But if this is impracticable, use a steam pump, or place a force pump at the foot of the hill and drive it with a wire rope.

(7) W. H. F. asks: What is the horse power of an engine with 9 inches cylinder, 14 inches stroke, 100 lbs. mean pressure, making 350 revolutions per minute? Working by a rule given in the AMERICAN of January 4, I find it to be 157 horse power. Am I right? A. Your answer is correct.

(8) C. R. G. asks: What is the best material for covering a 2½ inch steam pipe and a 1½ inch return pipe, each about 100 feet long, passing through a cold cellar to a radiator in the room above? Would there be any saving of steam in having them covered? A. You will effect a saving by covering both pipes. There are numerous coverings in the market that answer well. We refer you to our advertising columns.

(9) I. W. S. asks who was the inventor of the Monitor. A. The question is in dispute, but the credit is usually given to a Mr. Timby.

(10) "Engine" asks: Can I acquire a knowledge of mechanical engineering by home study, and what books and time are required to accomplish it? A. We think it is very doubtful whether you can become proficient without some practical experience in the shops and elsewhere.

(11) E. L. W. asks: What is the best thing to put on a steam boiler to make it look well and prevent rusting? A. A black varnish made from petroleum.

(12) "Reader" asks whether the car wheels made of *papier mache* have a metallic tire? A. Yes.

(13) J. W. asks: What is the average weight of English locomotives, also the heaviest used there? A. They are made as heavy as 70 tons or more. Average weight, between 40 and 50 tons.

(14) J. H. asks: What is the pressure of lake water to the square inch at a depth of 25, 50, 100 feet, etc. A. The pressure is about 0·433 lb. per square inch for each foot of depth. 2. How many cubic feet of air must an iron box or chest, weighing 3 tons or 60,000 lbs., and closed on all sides, contain, in order to keep one sixth of its bulk floating above water and five sixths submerged below water? A. The data are insufficient. The box will float as specified, when it has such dimensions that five sixths of its volume will displace an amount of water equal to the total weight of the box. 3. Where may I obtain an account of the various kinds of diving armor and appliances used in submarine work? A. You will find accounts of some of the appliances in any good encyclopedia, but you can probably obtain full particulars by addressing manufacturers.

(15) G. C. E. writes: I use a 2½ inch stream of water for condensing purposes, but as I take it from a brook, in the summer months I do not get the condensing power necessary on account of the temperature. How can I reduce the temperature to about 35° or 40° in the summer? Would running it through pipes in an ice house reduce it to the required temperature? If so about what length of pipe? Iron or wood pipes? A. Use iron pipes. You do not send sufficient data to enable us to give the amount of pipe, but it would probably be sufficient if it encircled the ice house once or twice. Unless you have abundance of ice, however, we do not think this plan is advisable.

(16) M. B. asks: 1. What thickness of granite should be used in a bank vault to make it fireproof? The building is a two story brick, situated on a corner. A. From 18 to 24 inches. 2. Is there any other stone that furnishes more fireproof protection than granite? If so, what is it? A. We think not.

(17) A. C. G. asks how India rubber hand stamps are manufactured. A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 83.

(18) S. B. G. asks: 1. How is it determined whether snakes can hear? A. By observation. 2. If they can hear, do they heed? A. Yes. 3. It is said that the birds of the northern climate go south in the fall; if they do, are there not more birds in the south in the winter than in the summer? A. Yes. 4. Which is proper, eighteen hundred and seventy-nine, or eighteen hundred seventy-nine? A. Both.

(19) H. J. B. asks: What kind of black paint is on the ordinary tin thermometers, and how is it put on? A. Asphaltum, one half pound; melt, then add hot balsam of copaiba, 1 pound; thin with turpentine oil, apply with a soft brush, and bake for some time in a japanner's oven. Repeat the operation several times if necessary, and finally rub with a soft cloth and a trace of oil.

(20) B. F. M. asks for a formula for preparing a good mucilage for pasting papers. Can you recommend anything better than gum arabic mucilage for pasting manifests and way bills into scrap books made of manila paper? A. Rice or starch paste is better. The following is well recommended: 4 parts (by weight) of fine glue are allowed to soften in 15 parts of cold water, and then moderately heated until the solution becomes quite clear; 65 parts of boiling water are now added, with constant stirring. In another vessel 30 parts of starch paste are stirred up with 20 parts of cold water, so that a thin, milky fluid is obtained without lumps. Into this the boiling glue solution is gradually stirred, and the whole kept at a boiling temperature for a short time. After cooling, a few drops of carbolic acid are added to the paste. This paste is exceedingly adhesive, and may be used for leather as well as for paper and cardboard. It should be preserved in corked bottles to prevent evaporation, and in this way will keep good for years.

(21) E. R. T. writes: I use an Argand burner, and though the wick fits apparently tight, when I suddenly turn it up or down, while burning, a blue blaze appears in the bowl of the lamp, though no explosion has ever occurred. This happens when the lamp is half full. I never allow it to get any lower. By moving the lamp backward and forward quickly, the oil extinguishes the blaze, though I consider this a dangerous experiment. Sometimes the blaze will shoot out the top of the chimney, and at the same time go down the wick into the bowl of the lamp, on turning it down quickly. A. From your statements it would appear that the oil used is not safe. Place the bulb of a good thermometer in a small cup nearly filled with a sample of the oil, and suspended in a large vessel containing water. Gradually heat the water, apply a lighted taper to the oil, and note on the thermometer at what degree the oil flashes (*i. e.*, the temperature of the oil at the moment it begins to give off inflammable vapors). Good oil under these conditions should not flash below 120° Fah.

(22) N. O. M. asks: 1. Which of the various "Stubs" or "Stubbs" firms is the standard one, as there seem to be at least two or three concerns of that name? I would like to know the "original." A.—P. S. Stubs, we believe. 2. Also, what will remove paint or varnish stains from ground glass doors? A. Warm concentrated alcoholic solution of caustic potash will quickly soften paint or varnish so that it may be readily removed by washing with warm water. Remove as much of the paint as possible with the knife blade before applying the alkali. The latter must not, of course, be allowed to come in contact with the woodwork or hands.

(23) A. M. D. asks: 1. For an easy and cheap way of tracing patterns for scroll or net work, without using a pencil. A. Place carbon paper between the pattern and the wood, and trace the design with a stylus. 2. Also to prevent the fret saws from breaking easily when working in the machine. A. Use a good machine, good saws, and exercise care.

(24) F. W. I. asks: Does a rapidly moving train cause a greater strain on a bridge than one moving slow. If so, why? A. Yes, because the motion of a train produces a series of blows on the rails.

(25) A. N. M. writes: I am preparing to construct a dynamo-electric machine according to the drawings in No. 161, SCIENTIFIC AMERICAN SUPPLEMENT. Will you answer the following questions, namely: 1. Should the brass caps at the ends of the armature play just within the electro-magnets, or just without? A. Just without. 2. What amount of each of the Nos. 14, 16, and 18 wire will be needed? A. 2 or 3 feet of No. 14, about 5 lbs. of No. 16, and ½ lb. of No. 18. 3. Should the vulcanite for the commutator be hard, or soft and yielding? A. It should be hard. 4. Can the electro-magnets be wound with separate wires and the wires united with a joint, or should they be wound with the same wire without a break? A. You can wind the two parts of the magnet separately, and unite them after they are fixed to the base. 5. Again, what is the force of the word "excess" as used in chemistry and medicine? I consider that it means a little more than enough of an acid to neutralize an alkali, or the reverse. Am I correct? A. Yes. 6. What is the meaning of gtt. of ss. and A in medicine or chemistry? A. Gtt. or gtt., gutta or guttæ, drop or drops; ss., semis, half; Ā or ā, Ana (Greek ἀνά), of each the same quantity. The expressions are not used in chemistry, but in medicine.

(26) W. N. C. asks what there is (other than sal soda) that can be held in solution with water,

which will prevent small threaded articles of bright iron or steel wire from rusting or turning in color, by immersing therein, when the finished surface of said articles are broken. A. Try water glass or borax.

(27) N. Q. P. asks: How many ways are there for propelling water vessels? What is meant by screw steamer? A. Screw propellers, immersed paddle wheels, partly or wholly under water, water jets, paddles, oars, and their equivalents, have been used. A screw steamer is one that is fitted with a screw propeller.

(28) G. N. F. asks: 1. Can I make a permanent earth battery to supply a current of electricity for an electric light equal to that of two kerosene lamps? A. An earth battery is not suited to the electric light. 2. Will you give me the name of some good works on physics? A. Ganot's Physics is a good elementary work. 3. Are there any books published, containing lectures on various subjects, such as would do to read at a lyceum? A. You may obtain such books as you require from any of the dealers who advertise in our columns.

(29) A. B. P. writes: I am making a shocking machine: 1. Can I use iron wire in making induction coil? A. Not to advantage. 2. What size wire must I use for making the little magnet for breaking the current? A. The same as you use for your primary, probably No. 18 would answer. 3. Is it necessary for the U to be hollow? A. No. 4. Must the current be broken between the battery and the induction coil? A. Yes. 5. Will 3 or 4 quart jars, of zinc and copper and sulphuric acid, be strong enough? A. Yes. 6. Can I use charcoal and zinc for making a battery? Would it be better than copper and zinc? A. Copper and zinc are the best.

(30) M. V.—For ink receipts see SCIENTIFIC AMERICAN SUPPLEMENT, No. 157.

(31) J. H. S.—You will find an explanation of the wagon wheel problem, on p. 394, of vol. 39, SCIENTIFIC AMERICAN.

(32) J. J. asks for a formula for silver solder. A. Fine—Silver, 66·6; copper. 23·4; zinc, 10. Common—Silver, 66·6; copper, 30; zinc, 3·4. See soldering in SCIENTIFIC AMERICAN SUPPLEMENT, No. 20.

(33) E. F. K. writes: I intend to erect works which need a chimney 55 or 60 feet high, the draught of which must be quite strong. A brick chimney costs much more than an iron one. Will the draught of the brick chimney be the strongest? A. Yes, but there will not be a great difference. 2. How long will the iron chimney last, the heat but no fire reaching it? A. A number of years, if properly painted and cared for.

(34) D. J. C. writes: 1. In a little volume entitled "Familiar Science" I notice the following question and answers: "Q. Why does the sun, in shining upon a fire, make it dull, and often put it out? A. Because the air (being rarefied by the sunshine) flows more slowly to the fire; and 2d, even that which reaches the fire affords less nourishment; and 3d, sunshine also produces some chemical effect upon the air and fuel detrimental to combustion." What is your opinion of the above? A. We do not think sunlight ever put out a fire. Its superior brightness will undoubtedly make the fire look dull. The difference in the heat of a fire with and without sunlight must be infinitesimal, if anything.

(35) J. R. asks: 1. Do iron shipbuilders use cast iron rivets to rivet the outside plates on vessels? A. No, the best wrought iron is used. 2. What is the correct focal distance for the lens of a camera, the distance from the lens to the back being fourteen inches? A. 14 inches.

(36) G. L. G. writes: 1. I have my house and another (¼ mile distant) connected with the Bell telephone, which works without a battery. Is there any kind of arrangement that will increase the sound? A. If the telephones are well made and properly adjusted, we know of no way to increase the sound. 2. I have made a microphone according to directions, Fig. 5, SCIENTIFIC AMERICAN, No. 20, vol. 39, but cannot make it work. A. If carefully made according to description it should work.

(37) J. R. D. asks: What power would be required to run a vertical sawmill, say in sawing an oak log 2½ feet through, feeding ¼ inch? What speed, in strokes per minute, would be most profitable? What power is required to saw the same log with a circular saw? What would be the effect if an 18 inch circular saw were run at a rate of 10,000 revolutions per minute, not considering the liability of bursting? Would it cut? A. Running either saw so as to cut the same amount of lumber in a given time, there would probably be little difference in the power required, but as the saws are usually run, you could do good work with the vertical saw, 150 to 200 strokes a minute, with from 10 to 15 horse power, when you might require from 20 to 30 horse power for the circular saw. The circular saw would cut well at the speed stated.

(38) A. E. J. asks: What is meant by squaring the circle? A. Finding the side of a square whose area is exactly equal to that of the circle: in other words, doing what is impossible.

(39) G. C. M. writes: Please inform me of the greatest depth that a diver was ever known to go down at sea in a bell or diver's suit, also the depth that they generally like to go. A. The ordinary depth is from 30 to 40 feet, but the greatest diving feat which we have seen recorded is that of a diver named Hooper, who, in removing the cargo of the ship Cape Horn, wrecked off the coast of South America, made 7 descents to a depth of 201 feet, and at one time remained down for 42 minutes.

(40) J. N. M. writes: Suppose a loaded wagon should be weighed on scales in perfect balance, then the empty wagon weighed on same scales, would the net weight of the load be the same if the scales had been out of balance? A. No, as we understand your meaning.

(41) D. J. asks: 1. What is the average expansion per degree C. of soft brass rod or wire from 32° to 50°, from 50° to 70°, and from 70° to 100°? A. Brass expands lengthwise 0·000018782, for each degree between 0° and 100° centigrade. 2. A current from a galvanic battery traverees a wire to other apparatus 100 feet distant and return. If the wires to and from the remote apparatus be properly covered and insulated, and then united together in a single cable, will the effect of the battery on an electro-magnet be materially less than when the two wires are separated from each other? A. No.

(42) R. S. asks: 1. Will mercury put in melted zinc volatilize? A. The mercury will volatilize. 2. Would the fumes be liable to salivate a person? A. Yes. 3. How is galvanizing (so called) done? A. The metal to be galvanized is first cleaned by pickling in dilute sulphuric acid, and scouring with sand if necessary, passed through a strong slightly acid bath of zinc chloride, and from this directly into and through the bath of melted zinc, covered with sal ammoniac.

(43) J. A. F. writes: I have a thrashing engine of the following dimensions; Cylinder 7 inches in diameter, stroke 10 inches, speed 200 revolutions per minute, cutting off at four fifths stroke, using steam at 60 to 80 lbs., size of steam pipe 1¼ inch, size of exhaust pipe 1½ inch, size of blast nozzle 1 inch, slide valve, Pickering governor. Dimensions of fire box, 36 inches long, 19 inches wide, to 31 inches high, boiler 24 inches waist, with 26 2-inch flues 66 inches long, with locomotive smoke stack 7¼ inches in diameter, fitted with disk and screen spark arrester. I am running a thrasher with the above engine, with 36 inch cylinder, and 51 inches separator, and some of the time am short of power. I have consulted boiler makers in regard to lengthening the fire box about 8 or 10 inches. Would the flues and smoke stack be sufficient? Could I improve it by using a smoke stack 8 or 10 feet long (present stack 3½ feet long)? How much gain in power would there be by covering the boiler with some good material? Is the engine using steam economically, and are the proportions proper to get the best results? A. The engine seems to be fairly proportioned. You might make a saving of between 5 and 10 per cent by covering the boiler. If the draught is good, there would be no material gain realized by raising the smoke stack. Instead of increasing the length of fire box, it would be better, if practicable, to change the point of cut off to half stroke, and increase the speed of the engine. You do not send sufficient data to enable us to form an opinion in regard to the economy of performance.

(44) C. C. D. asks (1) for the best method of softening iron to be used in making electro-magnets. A. A good quality of soft bar iron does not require annealing for ordinary electro-magnets. Iron may be annealed by heating it cherry red and plunging it into powdered quicklime and allowing it to remain until cool, or it may be thrown on a fire and allowed to cool as the fire dies out. 2. What is the best No. of covered wire to use in making an electro-magnet? A. It depends on the battery power to be used, and upon the purpose to which the magnet is applied. If you use it merely for experimental purposes, No. 18 will probably answer.

(45) A. E. S. asks: What is understood by soft iron core for magnets? Is it wrought or cast iron? A. It is the portion around which the helix is wound. It is usually of wrought iron, but soft gray iron castings are often used.

(46) A. H. S. asks: Does the gas of coal or coke injure steel when heated in the flame so as to prevent a fine spring temper. If so, which is better? A. For fine work a charcoal fire is better than an anthracite or coke fire.

(47) M. F. H. asks: Why do axes break more frequently in cold weather than in warm? Is there frost in the steel, or is the wood harder to cut? A. Steel is rendered more brittle by cold, and the wood, if green, is undoubtedly harder to cut when frozen.

(48) E. A. H. asks: What is a good receipt for dyeing woods black to imitate ebony? A. See SCIENTIFIC AMERICAN, vol. 39, p. 411 (2).

(49) Engineer asks if brass or bronze shafts will run as well in cast iron bearings as cast iron shafts will run in brass or bronze bearings; that is, will the wear and friction be the same, and will they be equally good at work—in neither case to be overloaded? A. Yes.

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

J. H. B.—It is stibnite—a sulphide of antimony, which affords nearly all the antimony of commerce. Antimony is quoted in New York at 12 cents. This ore contains nearly 70 per cent of the metal.—C. K.—No. 1. A silicious limestone. It will probably make a fair hydraulic lime. The small fragment is quartz. No. 2. Chiefly lime carbonate. No. 3. Calciferous sandstone containing much iron.—W. S. B.—Clay slate, mica schist, and iron pyrites—iron sulphide—not valuable.

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

## COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure the receipt of original papers and contributions on the following subjects:

On Aerial Navigation. By F. B.
Signaling. By T. H. H.
On the Collisions at Sea. By P. O. P.
On the Significance of the Popular Interest in the Electric Light. By T. F. D.
On the New Patent Law. By L. F.
On the New Patent Law. By L. D. N.

### HINTS TO CORRESPONDENTS.

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.

Many of our correspondents make inquiries which cannot properly be answered in these columns. Such inquiries, if signed by initials only, are liable to be cast into the waste basket.

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.

[OFFICIAL.

## INDEX OF INVENTIONS

FOR WHICH

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

**January 28, 1879,**

**AND EACH BEARING THAT DATE.**

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

Air cushion for invalid beds, T. R. Johnson . . . 211,741
Alloy for coin, W. W. Hubbell . . . 211,630
Animal trap, J. H. Lewis . . . 211,751
Animal trap, J. A. Novinger . . . 211,771
Axle, vehicle, L. A. Mayall . . . 211,764
Bale tie, J. A. Dickinson . . . 211,713
Bark reducer, W. E. Nickerson . . . 211,666
Bark reducer, W. Shaw . . . 211,798
Barrel cover attachment, Reynolds & Brown . . . 211,787
Barrels, manufacture of wooden, T. Hanvey . . . 211,628
Bed bottom, spring, C. N. Homan . . . 211,659
Bee hive, G. B. Pitts . . . 211,779
Beer cooler, V. Cook . . . 211,704
Boiler tube fastener, W. H. Walsh . . . 211,809
Bolt nutter, S. L. Worsley . . . 211,826
Bomb lance, E. Pierce . . . 211,778
Book binding, E. S. Boynton . . . 211,616
Boot leg finisher, M. V. B. Ethridge . . . 211,623
Bottles, effecting escape of air from, A. E. Rich . . . 211,789
Brick, fire, G. W. Smith . . . 211,800
Brick machine, J. M. Mitchell . . . 211,765
Button, J. F. Christian . . . 211,702
Car door, Petrie & Hall . . . 211,776
Car wheel, G. W. Swett . . . 211,803
Carbureter, P. Keller . . . 211,744
Cartridge, L. A. Merriam . . . 211,665
Caster, table, Plympton & Latham . . . 211,780
Castings, supplementary pieces to, E. L. Burdick . . . 211,698
Check, overdraw, J. A. Lakin (r) . . . 8,553
Chopper and cultivator, J. W. McMillan . . . 211,760
Churn, J. McAnespey . . . 211,756
Cigar box, E. Tollner . . . 211,644
Circle describer, T. P. Worthington . . . 211,825
Clock, calendar, T. Weisser . . . 211,816
Clock light, alarm, A. T. Koopman . . . 211,748
Closets, lighting and ventilating, B. Wilson . . . 211,645
Cloth shearer, I. Brooks (r) . . . 8,554
Coffee roaster, F. Goldsmith . . . 211,655
Colors from toluidine, etc., Roussin & Poirrier . . . 211,671
Condenser, quicksilver composition, H. H. Eames . . . 211,721
Corn sheller, Scharnweber & Barkham (r) . . . 8,561
Cot, folding, C. H. Dunks . . . 211,720
Cotton cleaner, Gay & Kellis . . . 211,654
Cotton press, J. J. Hines . . . 211,734
Cotton, wool, etc., drier, J. H. Wickes . . . 211,821
Cradle, H. H. Wiggers (r) . . . 8,563
Cultivator, S. Bailey . . . 211,646
Cultivator, P. S. Russell . . . 211,792
Cultivator, wheel, N. T. Remy . . . 211,786
Curtain roller and bracket, A. B. Shaw . . . 211,673
Cut-off, W. Sims . . . 211,799
Cylindrical and coil boiler, G. F. Brott . . . 211,649
Damper regulator, stove pipe, A. A. Walker . . . 211,810
Dental plugger, W. H. Dibble . . . 211,652
Dishpan, J. F. Hutchinson . . . 211,739
Doubling and twisting machine, T. Kershaw . . . 211,745
Door check, A. E. Hotchkiss . . . 211,660
Draught spring, J. Dabus . . . 211,710
Drum, stove, and furnace, heating, M. T. Baldwin . . . 211,687
Envelope, C. Foster . . . 211,725
Envelope machine, H. D. & D. W. Swift . . . 211,804
Excavator, earth, H. A. Carson . . . 211,640
Eyeglass frame, W. Barber . . . 211,688
Fan, fly, R. C. Evans . . . 211,653
Feed water heater, C. F. Barrett . . . 211,615
Feed water heater, etc., steam boiler, J. Pool . . . 211,781
Feeder for stables, automatic, C. A. Parker . . . 211,773
Fence, P. Herzog . . . 211,657
Fence, portable, A. T. Morris . . . 211,768
Fiber and hair cleaning, T. McAuley . . . 211,757
Fibrous material treater, G. M. 2d., & A. L. Rice . . . 211,788
Filtering apparatus, A. H. Peterson . . . 211,640
Firearm, breech-loading, F. W. Freund . . . 211,728
Firearm lock, A. E. Whitmore . . . 211,818
Firearm, revolving, B. F. Joslyn . . . 211,743
Firearms, magazine for, J. Shuster . . . 211,674
Firearms, sight for, W. Lyman . . . 211,753
Firearms, sight for, W. Matthews . . . 211,763
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Folding or camp chair, A. A. Young . . . 211,827
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Grain register, L. C. Ives . . . 211,740
Gun and harpoon, bomb, E. Pierce . . . 211,777
Gun, machine, B. B. Hotchkiss . . . 211,737
Guns, charger for, T. G. Bennett . . . 211,691
Guns, rifle barrel for breech-loading, J. Stevens . . . 211,642
Harrow tooth, E. R. Whitney . . . 211,819
Harvester dropper, H. A. Halvorson . . . 211,730
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Hog trap, P. Drais . . . 211,717
Hoof moistener holder, S. Perry . . . 211,639
Hoop dresser, etc., Dougherty & Naylor, Jr . . . 211,716
Hoop machine, barrel, J. B. Dougherty . . . 211,715
Horse rake, revolving, Abbey & Brammar . . . 211,680
Hydraulic elevator, K. Fletcher . . . 211,625
Ice creeper, E. D. Austin . . . 211,694
Jacketed can, N. E. Woods . . . 211,823
Knitting machine burr, Root & Jackson . . . 211,791
Lamp, Hildebrand & Cain . . . 211,658
Lamp, R. Sarre . . . 211,793
Lamp burner, R. Hoadley . . . 211,736
Lamp burner, S. S. Mann . . . 211,761
Lasting machine, C. W. Glidden (r) . . . 8,557
Life boat, Tremberger & Stein . . . 211,807
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Loom for weaving terry fabrics, W. Weaver . . . 211,814, 211,815
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Loom shuttle box shifter, G. Crompton . . . 211,708
Lubricating compound, G. W. Maguire . . . 211,755
Mandrel, buffing, G. B. Dunham (r) . . . 8,555
Manger, J. J. Budlong . . . 211,617
Marble moulder, W. Lautz . . . 211,631
Mask, A. Weidmann . . . 211,675
Matching machine guide, P. Cardiff . . . 211,699
Mattress for ships, water, J. Corduan . . . 211,705
Meap chopper, R. Dahl . . . 211,711
Middlings separator, W. P. Anthony . . . 211,683
Middlings separator, Reimers & Bierbauer . . . 211,785
Moulding, follow board for metal, A. Faulkner . . . 211,624
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Musical instrument, M. J. Matthews . . . 211,634, 211,635
Musical instrument pedal, J. Jaberg . . . 211,663
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Nail plate feeder, W. H. Field (r) . . . 8,556
Oiler for steam engines, E. M. Humstone . . . 211,661
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Oils, purifying paraffine, T. Marrin . . . 211,762
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Overshoe or sandal, D. B. Ranney . . . 211,784
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Pegging machine, J. E. Crisp . . . 211,651
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Pill drying closet, A. F. W. Neynaber . . . 211,770
Pin package, E. Fontaine . . . 211,723
Pipes, moulding, F. Shickle (r) . . . 8,562
Planing machine, hand, H. D. Walls . . . 211,811
Planter and cultivator, W. E. Lowrie . . . 211,752
Planter, corn, P. H. Cresse . . . 211,622
Planter, seed, J. D. Green . . . 211,729
Plow, A. L. Manning . . . 211,632
Plow, W. H. Wilder . . . 211,822
Plow, rotary mould board, N. Palmer . . . 211,638
Plow, sulky, L. Brown . . . 211,696
Plow, sulky, D. O. Fosgate . . . 211,724
Plow, sulky, M. J. Freeman . . . 211,626
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Plowshare, J. H. Barr . . . 211,689
Pounder, White & Walton . . . 211,820
Pump, etc., for oil wells, sand, A. Cunningham . . . 211,709
Railway sleeper, H. L. Bucknall . . . 211,697
Railway switch, P. V. M. Raymond . . . 211,670
Reflector, A. Bouchard . . . 211,648
Refrigerating apparatus, T. B. Carr . . . 211,700
Revolving screen, J. C. Bowman . . . 211,694
Rocking chair, platform, F. Mohr . . . 211,766
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Sectional boiler, R. Cosslett, Jr . . . 211,706
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Sheep protector, C. Gilbert . . . 211,726
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Stamp, perforating, W. W. Gelatt . . . 211,627
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Steam brake, W. Patterson . . . 211,775
Stencils, preparing autographic, J. Allen . . . 211,682
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Stirrup, L. Pulliam . . . 211,668
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Stove platform, W. Westlake . . . 211,676
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Washing machine, C. M. Bartholomew . . . 211,690
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Washing machine, H. C. Perry . . . 211,667
Washing machine, S. M. Smith . . . 211,801
Water elevator bucket, C. S. Warner . . . 211,812
Water elevator, compressed air, J. Patten . . . 211,774
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