NEW BOOKS AND PUBLICATIONS.

QUARTERLY JOURNAL OF INEBRIETY. Published under the auspices of the American Association for the Cure of Inebriates. Hartford, Conn.

The March number of this valuable periodical contains much interesting matter, including papers on "The Influence of Alcohol on Mental Maladies," by M. Magnan; "Inebriate Asylums," by Dr. N. S. Davis; "Curability of Inebriety," by Dr. Albert Day; and a variety of original and selected articles. The prevailing tone of the *Journal* is liberal, and is in pleasing contrast to the unfortunately too common failing of many temperance advocates, who are apt to be led, through excess of zeal, into being intemperate in language if in nothing else. For instance, we find Dr. Day saying: "No doubt that wine—the natural product of the vine—was intended as food for its exhilarating, cheering qualities, and not as an intoxicant;" and elsewhere in the present number similar expressions occur, evidencing an enlightened view of a subject rarely discussed with entire fairness.

REPORTS OF JUDGES OF GROUPS 4, 9, 12, 15 and 17, Centennial Exhibition. J. B. Lippincott & Co., Philadelphia.

These reports, edited by Mr. Francis A. Walker, Chief of the Bureau of Awards, consist largely of lists of prizes awarded and the reasons therefor, but are prefaced with general comments on the several groups of exhibits which furnish much valuable information. Group 4 includes animal and vegetable products and the machinery for their preparation, and its importance warrants the minuteness with which the reports have been drawn out; group 9 consists of wool and silk fabrics, materials and machinery; group 12, leather and its manufactures; group 15, builders' hardware, edge tools, cutlery, etc.; and group 17, carriages, vehicles, etc., and their accessories.

SECOND ANNUAL REPORT OF THE NEW YORK STATE SURVEY. 1878.

We are indebted to Mr. James T. Gardner, Director of the Survey, for a copy of this report, which gives particulars of the work accomplished during the year 1877. The triangulation now extends across eleven important counties in the heart of the State, and has afforded the means of determining with great accuracy nearly 170 geographical points lying within an area of 3,000 square miles, and forming parts of these counties. The expenses during the year were $13,977 41, leaving an available balance of $2,408 36.

MATTER AND MOTION. By J. Clerk Maxwell, F.R.S. D. Van Nostrand, publisher, New York. Price 50 cents.

This little volume is No. 36 of the Science Series, and is not inferior in point of interest to its predecessors. Mr. Maxwell has succeeded in compressing a very thorough *résumé* of his subject into a compact and serviceable shape—a task which, considering the temptations toward diffuseness, is by no means a light one.

The March number of *Industrial Art* contains the usual variety of readable articles, and is profusely illustrated. The leading topics are Art Education, Ancient Textile Art, Technical Education on the Continent, Fresco Painting and Modern Mosaics, and Notes on the Paris Exhibition of 1878. This excellent publication fills an important niche in serial literature, is ably conducted, and presents a handsome typographical appearance.

Notes & Queries

F. E. B.—See answer No. 43, p. 188, SCIENTIFIC AMERICAN, current volume.—J. Y. L.—See SCIENTIFIC AMERICAN, June 30, 1877, p. 408.—E. B. C.—The inductive effect in the arrangement you describe would be only momentary, and under the conditions would hardly be appreciable.—A. L. B.—See p. 155, SCIENTIFIC AMERICAN of March 9, 1878, No. 19.—J. F.—Use the cement recommended F. G. R., this page. Melted rubber sticks well enough, but does not readily harden.—W. H. B.—It should read —65° C.—L.V.B.P.—See answer No. 34, SCIENTIFIC AMERICAN, November 10, 1877, p. 299.—A. L. B.—Consult "Chemical Recreations," by J. J. Griffin, F.C.S., London.—G.J.—Ether is not injurious to iron and steel.—W. M. S.—See SCIENTIFIC AMERICAN, January 23, 1875, p. 49; also, March 27, 1875, p. 193; January 4, p. 20.—F. A.—The solution is camphor and sal ammoniac in alcohol, and fails to give satisfactory results.—J. H. H.—We do not know of such a process.—C. N. V.—We think the plan you describe will answer.—S. C. T.—There are a number of materials for the purpose in the market. If you do not find addresses in our advertising columns, you might obtain them by inserting a notice under head of "Business and Personal."—E. B.—We think you will have no difficulty in using coal stoves as you suggest, if your chimney is of sufficient height and clean, with a separate flue for each stovepipe.—W. C.—Among the most important studies for a machinist may be mentioned arithmetic, algebra, geometry, trigonometry, elementary mechanics, drawing, and the laws of heat, steam, and combustion.—T. G.—It is generally more economical to run an engine fast, and as there would be no practical difficulty in your case, it might be better to use the short stroke cylinder. As to pressure required, see SCIENTIFIC AMERICAN for July 17, 1875.—T. & A. W.—The data sent are not sufficient for us to judge of the practicability of the scheme. It will be well to refer the matter to an engineer.—J. C. H.—We think you can use a cylinder 3 x 6 if it is convenient to increase the stroke.—W. H. A.—There are several varieties of the instrument you refer to in the market. It is commonly known as an ear trumpet.—A. J. and M. E. P.—See answer No. 17, SCIENTIFIC AMERICAN of March 4, 1876.—R. R. J.—We can imagine circumstances under which the flanges would probably break, but we do not think they would be certain to do so in ordinary use.—J. G.—In the query referred to, we understood that reference was made to stationary boilers of the two styles known as locomotive and return tubular, and our answer was based on the results of experiments.—S. E. W.—Your data are insufficient, but, as we understand you, there is probably no great difference between the two.—J. W. L.—A 2 x 5 inch cylinder will, we think, be sufficient for the work you describe.—H. L. C.—We do not understand, from your question, exactly how the device is to be used. Send a sketch and full description.—A. B. E.—You might use a small hot air engine, which would not occupy much space and could be placed in any convenient location.—J. V. A.—If you mean a permanent magnet, 12 inches would be a good length for the diameter mentioned.—C. C.—Fryer's work on "Constructions in Iron" will probably assist you.—W. T. B.—See "Science Record" for 1874, p. 98; also, Watt's "Dictionary of Chemistry," with supplements.—A. M. D.—See SCIENTIFIC AMERICAN, vol. 34, p. 386.—J. A. J.—We do not know of such an explosive as "liquid dynamite." Probably nitro-glycerin, which sometimes exudes from dynamite when carelessly made, is what is meant.—W. H. C.—If you run the engine at a high speed, it would probably increase the power to make the alterations you propose. The covering mentioned usually prevents some loss of heat, and under some circumstances helps to preserve the iron.—L. B. H.—See answer No. 62, p. 156, SCIENTIFIC AMERICAN, September 8, 1877; and answer No. 10, p. 314, May 15, 1875.—E. C.—Brass can be cast in any iron mould that is properly vented to allow the air and gases to escape. The other materials you suggest would not be so durable. Diagram not received.—G. S.—About two horse power will be sufficient.—D. D. B.—There are such saw-filing machines in the market. Consult advertising columns or insert a notice under "Business and Personal." Emery wheels are made as thin as $\frac{1}{16}$ inch. The saws are cut by punching machines.—C. F.—As we understand the arrangement, we think it will answer.—L. S., J. B., and J. W. Z.—Insert notice in "Business and Personal" column.

(1) M. S. asks: What is it in ginger beer that makes the corks start out when the wires are taken off, and causes the beer to foam? A. The liquid is surcharged with carbonic acid (gas).

(2) J. B. C. asks: How can the capacity of a coal bin of given dimensions be found? A. If it is rectangular, take the product of the three dimensions in feet, and allow about 40 to 45 cubic feet for each ton of coal. If the bin is not rectangular, no general rule can be given without knowing the form, but you will find rules for special cases in works on mensuration.

(3) J. G. R. asks: What pressure will a boiler 18 inches high and 9 inches in diameter, made of 20 ounce copper, safely stand? A. From 15 to 20 lbs. per square inch. In reference to your second question, address the manufacturers.

(4) W. D. P. writes: O. C. L. can kill the vermin on his cattle with a decoction made from tobacco stems or other cheap tobacco. An application of coal oil put on very thin, or weakened, will answer; a strong application is not good for the animal.

W. D. P. will find a recipe for bluing gun barrels in SCIENTIFIC AMERICAN, July 21, 1877, p. 44 (46).

(5) F. G. asks: 1. Is too much blast in a melting furnace injurious to the iron? What effect does it have upon the iron? A. The principal effect of too much blast is to waste fuel. 2. How much pressure of blast per square inch should we have for a 28 inch cupola melting 8,000 lbs. per day with best anthracite coal? A. Exactly what pressure is best, under given conditions, should be settled, as it readily can be, by a few experiments. 3. Does poor coal affect the strength of iron? A. Coal containing ingredients that are injurious to iron is apt to affect its strength.

(6) G. M. A. writes: Tyndall in his "Fragments of Science," p. 19, uses the following words referring to a brick thrown into the air: "If not here caught by the bricklayer, it would return to the hodman with an accelerated motion, and reach his hand with the precise velocity it possessed on quitting it." My preconceived ideas were in accord with Tyndall, and I was surprised when I read your reply to C. H., p. 108, current volume. Would it be asking too much to set forth your reasons for saying that a bullet fired upward from a gun will not return to the earth with the same velocity with which it ascended? A. The resistance of the air affects the velocity. In a vacuum, the initial and final velocities would be the same. You will find an interesting investigation relating to this question in Bartlett's "Analytical Mechanics."

(7) F. G. R. asks: How can I cement firmly small pieces of soft India rubber to brass? A. Try a fused mixture of about equal parts of gutta percha and genuine asphaltum.

(8) H. B. M. asks: What was the best time made by the steamboats Chauncey Vibbard and Mary Powell? A. The Vibbard is reported to have made the run from New York to Albany, in 1876, in 6½ hours. The Mary Powell made the 76 miles between New York and Poughkeepsie in 3h. 3m., and it is claimed that on August 7, 1874, she ran from her dock to Piermont, 28 miles, in one hour. It is difficult to obtain trustworthy records.

(9) J. W. Y. wishes to know the mode of applying a waxed oil finish to black walnut furniture. A. Rub on a mixture of linseed oil and yellow wax, which may be colored by alkanet root.

(10) F. L. S. writes: I have a speculum of three parts copper to one part tin. How can I polish it? A. If it is scratched, you may first use very fine emery cloth, and then finish with rottenstone and oil.

(11) X. Y. Z. asks: What is the cause of sparks flying about more at one time than at another when they are casting in a blast furnace? A. It may be due either to differences in the iron or moulds, or mode of handling.

What should be done to cure eruptions on the face? A. It is advisable to purify the system.

(12) C. W. B. writes: I am building a high pressure condensing engine, cylinder 7 inches diameter, 9 in. stroke, 180 revolutions per minute. Average pressure 80 lbs. It is for a steam yacht. 1. How many square feet of cooling surface do I require (surface condenser), water to be taken from outside? A. Allow ¼ square foot of cooling surface for each pound of steam condensed per hour. 2. What should be the capacity of the cold water pump, making 180 strokes per minute? A. Make it large enough to supply from 35 to 40 times the weight of steam condensed. 3. What should be the area of steam ports for a cylinder 7 x 9? A. At least $\frac{1}{20}$ of piston area.

(13) J. M. H. asks: 1. What is the meaning of the word "line" as applied to the measurement of watches? A. A line is $\frac{1}{12}$ of an inch. 2. What is meant by the word "plate?" They are said to be full plate, three quarter plate, etc., as applied to the movements. A. In the full plate watch the balance wheel is above the plate; in the three quarter plate, below. 3. Has a watch ever been invented to run by atmospheric pressure or compressed air? Would such an escapement be practicable? A. We never heard of such an escapement, but are not prepared to say that it is impracticable. Compressed air has been tried for clocks.

(14) F. T. C. asks: Why is a tidal wave formed on the side of the earth opposite to that directly under the moon? A. Brande makes the following statement: "The attractive force of a body on a distant particle of matter varying inversely as the square of the distance, the particles of the earth on the side next the moon will be attracted with a greater, and those on the opposite side with a smaller, force than those which are situated intermediately. The gravitation towards the earth's center of the particles nearest the moon will therefore be diminished, and, consequently, if at liberty to move among themselves, they will rise above the general level. In like manner, the moon's attraction on the most distant particles being less than on the central ones, their relative gravitation towards the center will also be diminished, and the waters will consequently be heaped up on the side of the earth which is turned away from the moon."

(15) A. C. F. asks: What is the safe working pressure of a boiler shell 44 inches in diameter, ¼ inch good boilerplate? A boiler maker says it is safe at 150 lbs. to the square inch. A. We think 60 lbs. would be a much safer figure.

(16) H. & S. write: We have a 12 x 20 cylinder that now takes steam to within 2 inches of the last part of stroke. Can we by lengthening the valve so as to cut off at one half or two thirds the stroke get one half or two thirds the same power, which is all we need? A. We think your best plan will be to change the point of cut-off as suggested. If you can also increase the speed of the engine, you may effect some saving.

(17) C. S. I. asks: 1. What effect does it have on a slide valve to diminish or increase the size of the openings under it, the valve to remain the same size in both cases? A. If that is the only change the general effect would be to cause a very unfavorable distribution of steam. The question is so general that no very definite answer can be given, but you can make a model out of cardboard or stiff paper, and determine the action in any given case very readily. 2. Suppose there were no openings under the valve, what would be the pressure on it? A. The projected area of the valve, multiplied by the steam pressure, if it is supposed that the valve is tight.

(18) C. H. L. asks: 1. What is the best solvent for asbestos? A. There is no solvent for asbestos as such. 2. Can asbestos be reduced to a powder, so as to be mixed with other ingredients? A. Yes; heat it strongly and quench in cold water; then grind to powder.

(19) B. H. W. writes: I have a telegraph line 1 1-3 miles long in excellent working order. The wire is No. 12 galvanized, and is worked with 9 cells gravity battery. 1. Can I convert it into a telephone line? A. Yes, by removing the relay or sounder that is in connection with each end of your main line, and substituting a telephone. 2. Must I use the battery to operate the telephone, or can I operate it without the use of a battery? A. The use of the battery is not necessary. 3. Can the ground be used the same as in the telegraph line? A. Yes. 4. Where will I find instructions for the construction of a magnet suitable for the telephonic instrument? A. See answer No. 16, p. 299, of SCIENTIFIC AMERICAN of November 10, 1877.

(20) J. P. writes: When I dip my pen in ink the silvered holder shows a spot of copper where it touches the ink. What is the cause? A. Galvanic action may be the cause. If so, copper is present in the ink.

(21) G. D. H. asks: Can the electrical arch be produced with a Grove's battery of 4 cups, and also can it be made by the current developed by a magneto-electric machine? A. Four cups of Grove's battery are hardly sufficient for this purpose. From 20 to 50 cups of Grove's or Bunsen's battery, or a magneto-electric machine, are generally used; see p. 1814 of the SUPPLEMENT of March 9, 1878.

Would two or three cubic inches of air, or as much as would remain in a gas bag holding three gallons, after the sides were brought together so as to expel as much air as possible, render the hydrogen with which the bag is to be filled dangerous to be ignited at the end of a tube a foot long? A. There is a possibility of the gas exploding under the circumstances you mention; if you first introduce into the collapsed bag a small quantity of gas, and then expel this, there will be less chance of an explosion; but a safer way is to interpose a wash bottle between the bag and the tube from which the gas is burnt.

(22) M. H. asks: 1. Can steel be mixed with melted cast iron when in the ladle? A. Yes. 2. If so, what per cent of steel can be used? A. There is scarcely any limit. 3. Does it improve the iron? A. So far as we know, in certain proportions and for special purposes, it does, but scarcely enough to make the mixture very desirable.

(23) H. S. R. asks: How should the cut-off valve on a slide valve engine be set to get the greatest amount of power, to cut off the steam at equal distances from each end of the cylinder, or at opposite points in the revolution of the crank? A. It is generally advisable to equalize the cut-off in reference to the stroke.

(24) L. G. writes: I have a boiler which is too small for its work, and intend putting in another in connection with it. The proposed new boiler is to be shorter and with less tubes than the present one. The connections are to be a steam pipe running from the top of the new boiler to the dome of the old one, and a water pipe at the back of the boilers. I propose to fire both boilers together, or with the same fireplace. Will this arrangement answer? A. Yes; if you fit check valves to the feed pipe, so that the water cannot be forced from one boiler into the other.

(25) J. W. asks: 1. How is lead pipe prepared for making a wiped joint? A. Clean it thoroughly. 2. What is the solder composed of? A. Equal parts of lead and tin. 3. Are there any practical books on plumbing? A. Send for catalogue to one of the publishers who advertise in our columns.

(26) E. C. D. L. asks: How are concave razors made? A. By transverse grinding.

(27) H. L. asks: 1. How much heating surface is required for a yacht engine, 4 x 4 inches, to give plenty of steam without crowding the boiler? A. Make a boiler with about 100 square feet of heating surface. 2. Is a 3½ inch cylinder large enough for a boat 25 feet long and 5 feet beam? A. A cylinder 3½ x 5 inches will answer. 3. What is the best wheel for speed? A. A three-bladed screw, of as large diameter as can be immersed, will give good results.

(28) C. L. D. writes: 1. I have an upright tubular boiler 7 feet high, 26 inches diameter, 20 inches grate, 32 2-inch tubes 5 feet long. At what distance from the top of the boiler should I keep the water, with 60 lbs. pressure? A. From 12 to 15 inches. 2. Will it furnish any more steam with a given amount of coal than a boiler 2 feet shorter and tubes 3 feet long? A. Generally speaking, yes. 3. How much coal is generally used in 10 hours in such a boiler to produce 4 horse power? A. From 200 to 500 lbs. 4. What will be the best way to jacket a boiler—brick it to return the smoke down (after it has ascended the tubes) outside the boiler and in the chimney, or let the smoke go from the tubes to the chimney and brick it in? A. The first plan will generally be slightly more economical than the other. 5. My engine is 4 x 10 inches cylinder. If it is run 150 revolutions will it produce the same power that a cylinder 4 x 5 inches, run 300 revolutions, would? A. Other things being equal, it would. 6. Why are cylinders made lately 5 x 5, and 6 x 6, and 8 x 8, etc., and run so fast, instead of 5 x 10, etc.? A. To increase the efficiency for a given weight. 7. What distance should a 4 inch piston travel in a minute to produce a 4 horse power? A. It depends on the pressure.

(29) A. A. asks: Will Portland cement and sand make an artificial stone that will answer for a water table and window sills for a brick house? If so, what proportions are best? A. Coignet's béton (5 measures sand, 1 measure quicklime, ¼ to ½ measure hydraulic cement) will answer for the purpose about as well as stone.

(30) E. E. V. asks: What sized screw will it take to propel a flat bottomed boat 20 feet long, 6 feet beam, and 5 inches draught, at the rate of 3 miles an hour, with the screw two thirds immersed and running at the rate of 150 revolutions per minute? A. You have fixed the diameter by the draught and immersion. Make the pitch such as to give 1⅛ the required speed. A stern wheel will, however, probably answer better for such light draught.

(31) H. C. M. asks: What is the best way of removing lime scale in a locomotive boiler without injuring the latter, when the scale cannot be got at by mechanical means? A. Allow the water to become cool in the boiler before blowing out.

(32) W. O. asks how river steamers are propelled over bars. A. In some cases levers are used to lift the boat sover, and in others they are pulled over by throwing out an anchor connected to a steam windlass.

(33) C. A. L. asks: What speed may be expected of a flat bottomed stern wheel boat 8 x 35 feet, drawing 1 foot of water, and having two slide valve (double valves) engines 4 x 12, with 150 lbs. steam? A. Probable speed, 5 to 6 miles an hour. 2. How many square feet of heating surface will be necessary to furnish steam enough with forced draught? A. Boiler may have from 150 to 200 square feet of heating surface. 3. If I set the boiler so that the fire can go all around it, will not that part of the shell above the water line become too hot and injured before steam is got up? A. By getting up steam slowly you will have no trouble. 4. Will I have to pay a license for running such a boat on the Missouri river? A. Yes.

(34) J. W. R. asks: 1. What is the horse power of a locomotive firebox boiler with 52 flues, each 7 feet long by 2½ inches? A. There is no standard for rating the horse power of a boiler. 2. What is the horse power of a 10 x 22 inch engine? A. Multiply the area of the piston in square inches by the mean pressure in lbs. per square inch, and by the piston speed in feet per minute, and divide the product by 33,000. 3. How much coal per day of 10 hours would the boiler use? A. With a good draught such a boiler should burn from 12 to 15 lbs. of coal per square foot of grate per hour.

I wish to pump water 100 feet inclined up 45°. Can I do it with a common suction pump that carries 1 inch pipe by placing the pump half way and getting that far by suction and forcing the other part? A. You cannot draw water, in ordinary practice, through a vertical height much exceeding 27 feet.

(35) T. N. C. asks: Is there any well tested and established system of gas making by which half a million feet of heating or 200,000 feet of lighting gas can be made from a ton of pulverized coal by aid of steam? A. No. By Lowe's process about 43,000 cubic feet of combustible gas is obtained per ton of anthracite coal expended. This includes the fuel used under the steam generators.

(36) W. T. N. asks: What is the mode of preparation of sodium sulphydrate, and how is it known commercially? A. The pure salt is prepared in the laboratory by passing hydric sulphide gas through an aqueous solution of pure sodium hydrate to saturation. Commercial sodium sulphide consists almost invariably of the higher sulphides, mixed with sulphite, hyposulphite, and sulphate of sodium.

(37) W. R. R. asks: How can I make indelible ink for marking clothing? A. India ink ground up with a little good writing fluid makes one of the best indelible inks known.

What will prevent plaster of Paris moulds used in vulcanizing from cracking in the dry heat? A. Dry the mould thoroughly in an oven and impose in an iron form.

(38) C. F. asks how rancid butter may be made palatable, or at least improved. A. Rancid butter if boiled in water with a tenth part of new animal charcoal will be divested of its rancidity, and may be used for cooking purposes, although its fresh flavor will not be restored. A better way is to melt the butter in a stoneware or enameled iron vessel over a water bath, with an equal quantity of fresh animal charcoal, in coarse powder free from dust, and strain through a clean piece of uncolored flannel. The butter may then be worked over with new milk, and colored, if desired, with a little annotto. Butter thus recovered will not remain sweet very long in warm weather, but this tendency towards rancidity is in a measure overcome by well salting it and adding a few grains of sodium salicylate to the pound while working it.

(39) L. H. F. asks: 1. What is the thickest solid armorplating put on vessels? A. About 18 inches. 2. How thick have such plates been rolled? A. 22 inches.

COMMUNICATIONS RECEIVED.

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

Corroded Cannon Primers. By W. P. M.
Fixation of Atmospheric Nitrogen. By J. J. B.
Steam Cannon. By H. S. B.
Locomotive Strokes. By F. G. W. and E. S. N.
The Rail Problem. By W. G. B.
Utilizing Solar Heat. By W. A.
Causes of Explosions. By C.
Liverpool Engineering Society. By W. W. S.
Saw Straightening. By S. R.
Moon Rising in the West. By C. I.
Air in Water Pipes. By W. B. H.
Stovepipe Joints. By W. R. A.
Dividing Circles into Odd Numbers of Parts. By T. S. M.
Velocipede Brakes. By I. H. D.
Extermination of Wild Beasts. By A. H. L.
Fast Locomotive Building. By D. Z. A.
Atmospheric Telegraphy. By H. C. S.
Smokeless Factory Chimneys. By J. C. E.
Mirror Galvanometer. By A. F. D.

OFFICIAL.

INDEX OF INVENTIONS

FOR WHICH

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

March 5, 1878,

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.

Adding machine, M. W Winkle..... 200,911
Air compressing, etc., machine, I. Dreyfus ... 200,901
Album, easel, J. C. Koch, Jr. ... 200,922
Alkalies, etc., manufacture of, C Lowig 201,028
Animal trap. J. A Palmer. ... 200,930
Auger, hollow, G N. Stearns. ... 201,064
Axle box, car, W. H. & F. C. Burden ... 200,893
Axle box lid, car, J. Conner ... 200,854
Axle box, vehicle, J. Edson ... 200,903
Bag holder, W. H. Dungan ... 200,857
Bale tie, R. H. Goldsmith 201,003
Bale tie, I. A. Kilmer ... 201,019
Band cutter, wire, R. Hale ... 201,006
Banjo, H. C. Dobson ... 200,900
Bath, vapor, I. Jansen ... 200,916
Bed bottom and fire escape, W. U. Hoover ... 201,015
Bed lounge, H. Richter ... 200,845
Bedstead, invalid, A. Iske ... 200,865
Bee hive, J. W. Park ... 200,931
Bell, call, W. H. Nichols ... 201,041
Boat, reversible dumping, J. L. Ketcham ... 200,920
Bobbin winder, N. S. C. Perkins ... 201,044
Boiler, tubular, G. H. Pond ... 200,873
Boot and shoe machine, T. H. Thomas ... 201,069
Boot and shoe machine, W. Corney ... 200,979
Boot and shoe, metallic nail strip, W. F. Prusha. 200,839
Boots, etc., sole protector, H. E. Van Benschoten 201,070
Bottle stopper, J. W. Curtis ... 200,984
Bottle stopper, A. F. Dietz ... 200,991
Bottle stopper, W. H. Hicks ... 201,011
Bracket, show, C. M. Webster ... 201,073
Brake for light vehicles, C. H. Weiss ... 200,956
Brake, wagon, R. D. Adams ... 200,887
Bread, etc., implement for cutting, L. Quigg ... 201,046
Buckle, G. W. McGill ... 200,867
Burglar alarm, H. Hart ... 201,008
Button, W. T. Farre ... 200,824
Buttons, fastening plate for shoe, G. Conover ... 200,978
Cake cutter, J. Whitehead ... 200,958
Can for transporting liquids, J. Graves (r) ... 8,113
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Carpet cleaner, C. Cummings ... 200,822
Carriage, child's, G. W. Pearce ... 201,043
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Carriage, safety top, J. Curren ... 200,856
Carriage, shade, H. S. Smith ... 200,945
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Cartridge box, J. W. Frazier (r) ... 8,112
Cartridge loading device, E. Schenck ... 200,846
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Churn, C. Farmer ... 200,997
Churn, revolving box, E. P. Conser ... 200,897
Churn, power, A. W. Decker ... 200,988
Cigar pipe, J. G. McCarter. ... 201,031
Cigar wrappers, forming, O. A. Bishop ... 200,889
Cigarette, C. G. Emery ... 200,859
Clock, cosmographic, Henard & Lasnier ... 200,830
Clothes pounder, K. A. Eddy ... 200,902
Coffee polishing machine, H. O. Bloom ... 200,817
Collar and cuff, Sanborn, Kanouse & Sanborn ... 200,939
Cooler, liquid, C. A. Maus ... 200,925
Corset, L. S. Bortree ... 200,967
Corset, I. D. Warner (r) ... 8,114
Corset stays, etc., wooden, J. G. LaFon e ... 201,022
Crane, J. M. DeCelis ... 200,898
Crayon, J. W. Swarts ... 201,067
Cultivator, P. J. Ward ... 200,955
Cultivator, S. Gesley ... 201,001
Curtain roller, J. C. Lake ... 201,023
Cutter head, C. M. Coulter ... 200,980
Deflector and evaporator, hot air, S B. Sexton ... 201,054
Dentist's slab and bottle holder, E. F. Hanks ... 200,889
Die for plastic substances, M. Carty ... 200,986
Dough raiser, J. Whitehead ... 200,957
Dredging scow hopper, R. Cartwright ... 200,821
Drill, coal, Rigney & Hemingray ... 200,936
Drill, seed, O. N. Skaaraas ... 200,943
Drills, force feed for grain, A. J. Martin ... 201,029
Drills, force feed for grain, J. F. Winchell ... 201,079
Drilling machine, T. B. Jordan ... 201,017
Drum, heating, W. A. Swaren ... 200,948
Egg carrier, W. W. Smith ... 201,062
Elevator, C. H. Morgan ... 201,037
Elevator, J. G. Willard ... 201,078
Engine for sawing machines, J. J. Carter. ... 200,895
Engine, gas, J. Brady ... 200,970
Engine, steam pumping, G. F. Blake ... 200,890
Engines for paper pulp, C. L. Hamilton ... 200,888
Envelope, W. L. Benham ... 200,853
Fabric, S. W. Baker ... 200,965
Faucet, Lillis & Rebasz ... 200,866
Fence post, A. B. Sprout ... 200,946
Fertilizer dropper, J. Moltrip ... 200,837
File, bill, J. E. Gorman ... 201,004
File, postal card, A. Wiel ... 201,077
Fire arms, nipple guard, N. Fretz ... 200,909
Fire escape, J. C. Moore ... 200,870
Fire escape, J. G. Richardson ... 200,854
Fire escape, S. Root ... 201,050
Fire escape, N. Schroeder ... 200,878
Fire extinguisher, T. F Gilliland ... 200,826
Fire kindler, Boote & Hechler ... 200,972
Fire kindler, J. H. Prentice ... 200,045
Fruit boxes, etc., handle for, R E. Morey ... 201,036
Furnace, boiler, W. Ayres ... 200,815
Furnace, glass, J. M Broofield ... 200,973
Gas retort, J. Burns ... 200,820
Gas retort, charging scoop, T. H. Birch ... 200,888
Gate, J. Flinner ... 200,825
Gate, Kelter & Leicken ... 201,018
Gate, P. Philippi ... 200,840
Grain and middlings drier, E. H. Gratiot ... 200,908
Grain binder, D. McPherson ... 200,868
Grain separator, J Worick ... 201,080
Grate, De Cell & Jennings ... 200,989
Grinding machine, C. Riches ... 200,935
Hame strap loop, A. Ableiter ... 200,886
Hammock support, G. Wheeler ... 201,074
Handcuff, Tower & Kahlke ... 200,950
Harvesting machine, Samuelson & Manwaring ... 201,052
Hat folding device, A. C. Fuller ... 200,906
Hat mirror, F J. Hoyt ... 201,016
Hat pressing machine, A. C. Fuller ... 200,905
Heater, car, W. Smith ... 201,061
Heating apparatus, R. Freer ... 200,998
Hoe, cotton, J. M. Moore ... 200,926
Hoisting apparatus, C. E. Albro ... 200,961
Hop picking box, W. Brooks ... 200,892
Hop picking machine, H. G. Locke ... 201,026
Horse collar, P. J. Schmitz ... 200,847
Horses, implement for cleaning, A. A. Russell ... 201,051
Hydrometer cup and thief, C. Cox ... 200,981
Insect powder blower, M Mark ... 200,924
Knitting machine, T Langham ... 201,024
Knob attachment, W. Stewart ... 200,880
Lamp chimney attachment, L. D. B Shaw ... 200,879
Lamp, oil cook stove, H. L. House ... 200,913
Lamp, student, F. W. Platt ... 200,933
Lamp globe, T. Walton ... 201,072
Lathe head, W. Krutzsch ... 201,021
Leather strap holder, D A Johnson ... 200,918
Lightning rod connection, Smith & Hewitt ... 201,059
Link and cross head, W Jackson ... 200,915
Lock, bag, R. Flocke ... 200,904
Lock, seal, A. F. Whiting ... 201,076
Locomotive ash pan, J. B Harrison ... 200,910
Loom temple, N. I. Allen ... 200,814
Lozenge machines, T Robertson ... 201,049
Lubricator, axle F. W. Carpenter ... 200,985
Lumber drier, A. McNeile ... 201,033
Lumber, machine for ripping, etc., J. Du Bois ... 200,992
Magnet, electro, E. L Paine ... 200,929
Meal bin, C. Raible ... 201,047
Mechanical movement, J. W Mullins ... 201,039
Medical compound, H & M. Hawkins ... 201,010
Mill bed stone support, F. G. Wallace ... 201,071
Millstone driver, W. E. Sergeant ... 201,053
Millstone exhaust, F. Teepell ... 200,949
Mop heads, etc, attaching, L. Grube ... 201,005
Motor, spring, E B Rice ... 200,843
Mower, lawn, E A. Hildreth ... 201,012
Musical instrument, chart for, F. E. Mason ... 201,030
Nail rod machine, G. Gilbert ... 201,002
Nozzle and spout, L. F. Betts ... 200,816
Nut, A. Wieting ... 200,959
Nut lock, G. W. Goodwyn ... 200,862
Obstetrical support, J. Loree ... 201,027
Organ, reed, G. Woods ... 200,850
Padlock, H. A. Deraismes ... 200,990
Pail, R. H. Stilwell ... 201,066
Paper folding machine, Nordblom & Hansen ... 200,838
Passenger register, S. Hastings ... 201,009
Photographic negatives, G W. Stigleman ... 201,065
Piano case and frame, G. Woods ... 200,852
Picture frame, F. H. Moore ... 201,035
Plane, bench, H. P. Taylor ... 201,068
Planter, cotton, W. H. Bowman ... 200,968
Plow, H. Gale ... 200,861
Plow colter, J. Pierpont ... 200,842
Plow regulator, D. M. Johnson ... 200,919
Plow, shovel, T. W. Boyle ... 200,819
Plow, sulky, J. C. Leidy ... 201,025
Plow, sulky, J. Pierpont ... 200,841
Pneumatic, etc., apparatus, J. W. Hyatt ... 200,914
Pocketbook, G. W. Amesbury ... 200,962
Policeman's club, J. Christman ... 200,987
Printer's quoin, G. D. Whittlesey ... 201,075
Printing machine, rotary, G. Newsum ... 200,927
Printing press, W. H. Goldin ... 200,887
Propeller, S. Tragheim ... 200,951
Pump, lift and force, N. Malmquist ... 200,923
Pump, steam vacuum, D. M. Terry ... 200,881
Radiator, steam, J. H. Cunningham ... 200,983
Railway, elevated, A. Brandon ... 200,969
Refrigerator box, G. D. Cunliffe ... 200,982
Safe, burglar proof, G. L. Damon ... 200,823
Sash balance, Shinkle & Stambaugh ... 201,055
Saw mill head block, J. S. Schofield ... 200,940
Saw teeth, securing insertible, N. Johnson ... 200,833
Sawing machine, Dixson & Records ... 200,899
Scraper, earth, B. Slusser ... 201,057
Scraper, revolving earth, B. Slusser ... 201,058
Semolino, etc., to flour, reducing, R. Frost ... 201,000
Sewer trap, J. L. Knight ... 201,020
Sewing machine motor, I. E. Myrick ... 201,040
Sheep wash, Scott & Skene ... 200,941
Shingle cutting machine, A. I. Hogan ... 200,912
Shoe, H. Band ... 200,818
Shot, canister, A. M. Sawyer ... 200,876
Shutter fastening, J. C. Knoeppel ... 200,921
Signal apparatus, G. L. Anders ... 200,963
Slasher, M. L. Hitchcock ... 201,014
Soldering apparatus, F. S. Robinson ... 200,875
Spring, car, C. French ... 200,860
Spring, vehicle, C. N. Schofield ... 200,877
Stamp, pneumatic fountain, Roberts & Gary ... 201,048
Steam generator, W. S Salisbury ... 200,938
Stone, artificial, F. Koskul ... 200,834, 200,835
Stone preservative compound, A. McLean ... 201,032
Stove, coal oil, Hailes & Gray ... 200,864
Stove, cooking, W. A. Strong, Jr. (r) ... 8,111
Stove oven, E. Bussey ... 200,975
Stove pipe shelf, R. G. Yonge ... 201,081
Stove shelf, E. Bussey ... 200,974
Strainer for milk pails, M. Campbell ... 200,976
Surveyor's transit, W. L. F. Martens ... 200,836
Syringe cap, E. Hagerty ... 200,909
Table, extension, J. B Thurston ... 200,849
Table, folding, W. H. Palmer ... 201,042
Table, kitchen, J. Bliss ... 200,891
Table leaf support, G. T. Wallace ... 200,954
Tea kettle, Menaar & Sangster ... 201,034
Telegraph, acoustic, T A. Edison ... 200,994
Telegraph perforator, etc., T. A. Edison ... 200,995
Telephone, J. E. Smith ... 201,060
Thill coupling, H. J. Iles ... 200,832
Tobacco pipe, T. A. Van Norden ... 200,882
Tool handle, J E. Parrish ... 200,932
Toy money box, Abell & Brecht ... 200,885
Toy musical instrument, L Anderson ... 200,964
Transom lifter, W B Mitchell ... 200,865
Twisting yarn into hanks, B S. & A. Jennings ... 200,917
Valve coupling for vacuum pipes, W. H Smith ... 200,944
Valve for steam engines, Cope & Maxwell ... 200,855
Varnishing machines, G. Burns ... 200,894
Vehicle running gear, J A. Hinson ... 201,013
Vehicle running gear, I. H. Mulford ... 200,872
Vehicle seat, spring back, E. Wilson ... 200,960
Veneer cutting machine, C. T. Fairchild ... 200,996
Vise, A P Thompson ... 200,848
Wagon running gear, F. Gordon ... 200,863
Wagon running gear, W. Ulrich ... 200,952
Wash board, C H. Baldwin ... 200,852
Wash board, H. L. St. Clair ... 201,063
Washing machine, B. F. Comstock ... 200,896
Washing machine, Sievert & Young ... 200,942
Watches, reversible pinion for, W. P. Huntoon ... 200,831
Watchmaker's oil cup, E. R. Weber ... 200,883
Watchman's detecter, T. D. Osborne ... 200,928
Water regulator, Mueller & Gross ... 200,871
Water wheel, turbine, A. Bee ... 200,966
Water wheel, turbine, G. A. Harbaugh ... 201,007
Wheel and axle, car, J. M. Whiting ... 200,884
Windmill, F. Robert ... 200,874
Window, G. H. Gerken ... 200,907
Wire cutting machine, W. E Stearns ... 200,947
Wrench, Berden & Warren ... 200,971
Yoke attachment, neck, Clemmons & Hills ... 200,977