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.

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.

(1) E. L. asks: Which is the strongest acid, HNO_3, H_2SO_4, or HCl? Please state their respective strengths. A. If you mean which acid most rapidly corrodes or dissolves metals, a mixture of nitric (HNO_3) and hydrochloric (HCl) acids (aqua-regia—HCl 3, HNO_3 1) would head the list, followed by nitric, hydrochloric, and sulphuric acids. Hydrochloric (cold) acid does not attack silver, yet it decomposes a solution of that metal in nitric acid, forming silver chloride. Sulphuric acid does not attack lead, yet it is capable of decomposing the nitrate or chloride of that metal to form a sulphate.

(2) C. H. L. asks how to make white writing ink. A. Triturate together 1 part of honey and 2 parts dry ammonia alum, dry thoroughly, and calcine in a shallow dish over the fire to whiteness. Cool, wash, and rub up with enough gum water for use. Pearl white (nitrate of bismuth) may be used in a similar manner.

(3) J. S. T. asks how to make a good drier for printer's ink. We frequently get ink, especially job ink, that is off set; can hardly handle the work. If drier is not what it needs, please state what it does need. A. A small quantity of perfectly dry acetate of lead or borate of manganese in impalpable powder will hasten the drying of the ink. It is essential that it should be thoroughly incorporated with the ink, by trituration in a mortar.

(4) W. J. B. asks for a receipt for making a gum to attach muslin to leather. I think the sample sent is made of gum arabic, but I am not positive. A. The gum on your samples is gum dextrine or British gum, a commercial article. It is simply dissolved in hot water to mucilaginous consistence, applied with a brush and allowed to dry.

(5) J. P. M. asks: Which do you consider best for the arch of press, a heavy cast iron one or a lighter one of cast steel, malleable iron or a wrought iron forging? A. Use steel or wrought iron. They will spring under the pressure and not break.

(6) G. A. W. asks: 1. How can I get the manganese oxide out of some coke, which I had in a Leclanche battery? A. Coarsely powder and wash in a gentle stream of water. With care the lighter coke may be washed away from the heavier oxide. 2. Can you refer me to a paper which describes the ice machine? A. See "Ice Making and Ice Machines," SUPPLEMENTS 85 and 91.

(7) J. C. B. asks: What composition is used in the manufacture of articles made of sawdust, for holding the particles together? A. Blood, or blood freshly mixed with a little finely powdered lime. Weak glue size has also been used with sawdust in a similar manner. The articles are moulded under heavy pressure.

(8) D. Bros. ask: Can you inform us where to get some red indelible ink to use with stamps on linen? A. Liquefy 1 pint of balsam of capivi by aid of heat, and gradually stir in 2 ounces of thoroughly dry white curd soap, cut in thin shavings, and stir until properly diffused. Then introduce a sufficient quantity of vermilion, and stir occasionally until cold. This ink is suitable for stamps.

(9) J. H. W. asks: 1. Please give some formula by which I can prevent the fungus growths on cedar trees. A. Wash the trunks occasionally with lime water. 2. How can I cheaply extract nitrogen from the air and hydrogen from water? A. Pass dry air slowly through granular charcoal heated to redness in an iron tube, then through several copper tubes containing red hot oxide of copper, then over dry slaked lime. The hot carbon forms carbonic acid and carbonic oxide with the oxygen of the air; the carbonic oxide is converted into carbonic acid by the oxide of copper, and the carbonic acid is absorbed by the lime leaving nearly pure nitrogen. Pass steam through a large quantity of red hot iron turnings; a portion of the steam is decomposed by the hot iron. The hydrogen resulting may be collected in a reservoir with the unchanged steam, the latter condensing on cooling. 3. If hydrogen is compressed to one-half its natural volume will it be one-fourth as light as air or one-seventh? A. About one-seventh as heavy.

(10) R. T. asks: Which are the best acids for tin, lead, and antimony, or an acid for a composition of these three metals together? A. A warm mixture of 1 part nitric and 3 parts hydrochloric acid will dissolve these metals with the greatest facility.

(11) A. R. writes: Having broken my 17x21 glass bath from top to bottom (the zigzag or center lines show the breakage), I would like to know if you have any suitable means of cementing it together. I have thought of gutta percha, but as this should be put on hot, I am afraid that parts would get cool. I have also thought of this stratena cement. Would it resist nitric acid? A. Dissolve shellac in alcohol enough to form a liquid of the consistence of molasses. Clean the parts dry, smear them with this, press the parts firmly together, and allow to remain under pressure twenty-four hours; then coat the inside over the joint with a strong solution of gutta percha in benzole, and let it harden before wetting. The shellac solution should be perfectly smooth and free from lumps.

(12) E. L. H. asks: How can a physician's thermometer be tested to know if it is correct? A. Only by comparison with the indications of a standard thermometer under similar circumstances.

(13) R. H. C. asks: What is the proper temperature for an incubator? A. 104° Fah.

(14) R. H. B. writes that A. S. R. will find on page 57, vol. xli., SCIENTIFIC AMERICAN, an elaborate article on the "Manufacture of Indian Arrowheads," by F. H. Cushing.

(15) A. S. writes: We have standing throughout our factories water barrels in case of fire. The water in these, after long standing, becomes offensive, and I should judge unhealthy. Will you please tell me what preparation put in fresh water will keep the water sweet for any length of time? A. The solution of a quarter pound ordinary green copperas (sulphate of iron) in each barrel of water is recommended.

(16) E. H. asks: Is it necessary to have the brass tubing or condenser of a steam yacht tinned? If so, how is it done? A. It is better to have them tinned. You can purchase them already tinned much better and cheaper than you can do it yourself.

(17) H. E. asks: Will polished steel plated by being immersed in a solution of sulphuric ether and gold chloride last long? A. The film of gold deposited in this way will not wear as well as an electro deposit. See page 116 current volume.

(18) E. D. V. writes: You recently advised to use No 30 copper wire for acoustic telephone. My experience suggests otherwise, and I submit it. No. 22 is generally sold for this use. On a very short line No. 30 would answer, but on lines of usual length it will break too easily between supports, and too many supports interfere with the transmission of sound. On a line of 3,600 feet I use No. 22, and six supports between the terminal ends; that is, supports are 500 feet apart. The wire has stood for four years, worked well, and no breakage. No. 30 would not do at all. I have tried many varieties of telephone—wood, metal, leather, and cloth for diaphragm; steel, iron, and copper wire. No. 22 copper wire, and wood diaphragms, one-sixteenth inch thick and 3 inches diameter, make the best combination. Chamois skin for longest lines makes best diaphragm, but it soon needs replacing. Steel wire produces too much roaring.

(19) R. B. writes: About two years ago I put down in my well a double cylinder pump. The hose at the end of the suction pipe is 18 feet from the pump (water level only 6 feet). The water has to be forced 75 feet high in a tank which is 12 feet above the well and ground level. The suction pipe is 3 inches, delivery pipe 2½ inches, each cylinder of pump 4 inches diameter, stroke 8½ inches. The pump worked well for six months, but since then has worked by fits and starts; that is, it will work for half an hour, and suddenly stop forcing water; it always draws water as high as the pump, but will not force it up. I have had some of the best pump fitters at work at it and they can do nothing. There is no leak whatever anywhere; all joints are tight. The pump is worked by a three horse power horse wheel. Can you or any of your correspondents say why the pump will not work, and what I should do to get it to work? A. There is probably some defect in the delivery valves which permits the water to fall back into the pump on the return stroke.

(20) C. B. C. asks for a receipt for making ink fireproof, and also one for making paper fireproof. A. We know of no means by which ordinary paper may be made practically fireproof. Paper made of pure asbestos fiber resists a high temperature without material alteration. An ammoniacal solution of nitrate of silver, colored with a little India ink, will preserve a legible copy when written with on such paper and subjected to strong heat. Ordinary writing inks cannot be made fireproof.

(21) G. C. F. asks: 1. Is pulverized raw lime better than burned slaked lime as a fertilizer? A. The old slaked lime is best. 2. How much pressure can be produced at the bottom of 1,000 feet of tubing in an artesian well by a rotary pump with a cylinder one foot in diameter run at 200 revolutions per minute pumping air? A. The limit to the pressure would depend entirely upon the perfection of the pump and of the joints and connections of the pipe.

(22) H. B. S. Co. writes: We have two steam pumps running at our store for the purpose of exhibition. They pump Schuylkill water from a tank in the cellar and return it to the same tank continuously. The water, although in constant circulation during the day, becomes very offensive. We have been unable to correct the trouble with lime, etc. Please suggest something that will keep it sweet and harmless, without injuring the working parts of the machinery. A. A small quantity of copperas (ferrous sulphate) will not injure the pumps and will deodorize the water.

(23) A. P. H. asks (1) for a receipt for a good harness blacking oil. A. Melt together 2 oz. asphaltum and 3 oz. beeswax; remove from the fire and add ½ oz. fine lamp black and ⅛ dr. of Prussian blue in fine powder; then reduce to a thin paste with neats-foot oil.

(24) P. P. writes: I have several hundred pounds of metal, principally lead, with some tin and antimony, which comes from a smelter but is not refined, and therefore does not run freely. Can you tell me of a cheap process to accomplish this, or will you name some work from which I may obtain the desired information? A. Melt and heat the metal nearly to redness in No. 2 well annealed sand pots, and for every 10 lb. metal stir in (gradually) about 6 oz. dry nitrate of soda. Cool somewhat and skim off the dross before pouring. Save the latter for reduction, as it contains much lead oxide, beside stannic and antimonic oxides.

(25) E. E. P. asks how to dissolve isinglass. A. If you mean fish gelatin, dissolve in hot water, after soaking over night in a little cold water. Mica, sometimes improperly called isinglass, cannot be dissolved without decomposing it.

(26) A. G. B. asks how to make ammoniated opodeldoc. White soap, cut in small shavings, 2 lb.; camphor, 5 oz.; oil of rosemary, 1 oz; oil of origanum, 2 oz.; wine spirit, 1 gallon. Heat over a water bath until solution is effected, cool somewhat, strain, and add 11 oz. ammonia water. Bottle and stopper immediately.

(27) R. G. asks for a receipt for making a paint for roofs, etc., composed of coal tar or pitch, and ground slate or oxide of iron. A. Melt in a capacious iron vessel for at least four hours, 28 lb. each common pitch and asphaltum; then gradually stir in 20 lb. of finely powdered and dry iron oxide or red ocher, and continue the heat another hour or until a drop of the mixture on cooling rolls up very hard. Then remove from the fire, let cool somewhat, and stir in gradually (to avoid accident) a sufficient quantity of good benzine.

(28) J. C. B. asks: Has the question of the formation of ice been conclusively settled, that is, whether it forms on the upper or lower surface? A. Ordinarily ice forms at the surface of water. On cooling, water contracts in volume—becomes denser—until it reaches a temperature of about 39·2° Fah.; if cooled below this point it gradually expands—becomes lighter—until at about 32° Fah., it congeals. Water chilled at the surface contracts and sinks, the warmer and lighter water rising to the surface. This continues until the whole body of water is chilled to 39·2° Fah. From this point to 32° the colder water remains at the surface and there congeals. In shallow and turbulent water ice sometimes forms at the bottom, and, becoming attached to stones, rocks, etc., does not rise. See answer to D. M., page 202 (21), current volume.

(29) D. S. writes: In the construction of wrought iron cylinders, as the flues or shell of a boiler, what is the correct rule for the shrinkage, or, in other words, how much is allowed for the bending of the iron over and above the circumference of a given circle? For instance, for a shell 60 inches diameter, ¾ inch thickness of iron, how many inches of iron will it take to form the above? A. If the iron is laid out correctly for 60 inches diameter inside, it, is supposed that in the bending the outer part of the plate will draw or stretch to its proper length.

(30) R. L. S. asks: 1. Can you give me a solution that will take the taste out of pine wood vessels? A. Washing with hot dilute hydrochloric acid (acid 1, water 3) will in a measure effect this. They should be thoroughly washed with hot water after this treatment. 2. Have you a receipt for making a paste that will make labels stick on a polished surface for any length of time? A. See answer to R. S., page 203 (26), current volume; also cements, SUPPLEMENT, No. 158. 3. Is there any method, besides sealing air tight and

drying, for preserving fruits so they will keep in any climate? A. There is no other practical method, we believe.

(31) W. M. L. asks (1) if there is any way by which a large tower bell that is cracked can be mended so as to be serviceable and also sound well. If so, how? A. A mode that will improve (but not restore) the tone of a cracked bell is, to drill a small hole at the extremity of the crack and make a saw cut the whole length of the crack. 2. What is the best compound for setting iron posts in stone? A. Salammoniac (powdered), 2 oz.; flowers of sulphur, 1 oz.; iron borings (free from oil), 5 lb.; water, q. s. to moisten.

(32) C. T. W. asks: 1. What is the horse power of a steam engine, cylinder 2 inches bore by 4 inches stroke, with 60 lb. of steam in the boiler, and running at the rate of 200 revolutions per minute? A. About two-thirds of one horse power. 2. What size boiler is needed for the same? A. A boiler with 25 square feet heating surface. 3. If such an engine be made to run the largest possible electric machine, how many lamps would the machine supply? A. One, and possibly two. With small machines and small power, electric lighting is not economical. 4. What is the candle power of an ordinary Edison lamp, such as is used for lighting dwellings? A. About 16. 5 How many candle power would be required to properly light a room 26 feet long by 17 feet wide by 13 feet high? A. 100 would do it well.

(33) W. B. A. writes: A firm in this city use three boilers in one battery, set in brick work the usual way. They now intend to do away with the water line, tile, and back plates, put cast iron arches over the top, and fill with brick, leaving the boilers naked and exposed to the action of the fire. The boilers are 25 feet by 42 inches, 4 flues; have been in use about eight years, and fired hard. Do you think this a safe plan, and is there any benefit to be gained by so doing? A. It will be liable to injure the boilers and may lead to accident. 2. If the fire flue of a Cornish return flue boiler be 24 inches diameter and 16 feet long, working pressure 100 lb., what kind of iron should be put in the flue? A. Half-inch or nine-sixteenth inch thick, and should have strengthening rings.

(34) H. T. asks how to make dynamite. A. Dynamite is prepared by mixing infusorial silica (a fine silicious sand resembling tripoli) with about 75 per cent of nitroglycerine, which it readily absorbs. It is exploded by percussion priming. See answer to F. & S., page 202 (3), current volume.

(35) R. I. M. asks: 1. Will coke injure a boiler? A. No. 2. How can I prevent coke from clinkering? A. Pure coke will not clinker, there must be some impurity in your coke. It might be beneficial to burn it at a lower temperature.

(36) R. H. M. asks if the linear expansion of thick iron is greater than that of small wires. A. No. 2. What would be the probable linear expansion of one-eighth inch wire 100 feet in length? A. Iron wire for an increase of temperature of 180° expands $\frac{1}{815}$ of its length. 3 Does expansion in length cause corresponding contraction in thickness? A. No. 4. Does contraction and expansion cause displacement of molecules? A. No permanent displacement, unless the iron is under strain. 5. Is there a point in temperature where heat and cold cease to expand and contract iron? A. No such point has been discovered.

(37) J. H. H. asks: 1. How much bituminous coal is required under a tubular boiler to evaporate one gallon water? A. With a good boiler you should evaporate from three-quarters to one gallon of water per pound of coal. 2. What power would be required to put the water at 60 horse power into boiler at 90 lb. pressure to the inch. Does it require more power to put in water at 200° to 212° than at 75° Fah.? A. It does not require more power at 200° than at 75°. To determine the power required we must know the quantity of water to be delivered in a given time.

(38) J. F. S. asks: Does the piston in engine driving machinery stop while the machinery is in motion? A. Yes, it stops twice every revolution of the crank.

(39) A. H. H. asks: 1. Can anything be done to apple trees, the bark having been eaten off above the ground by rabbits? A. Wrap with common gunny or jute bagging and whitewash. 2. Can you give me a composition for welding cast steel at a low heat, which will be cheap and more efficient than borax, and what is the philosophy of its action? A. Try the following: Fuse together in a crucible, at a quick heat, borax, 2 parts; potassium chloride, 3 parts; boracic acid, 1 part; cool and powder. It melts at a low red heat and readily dissolves iron oxide, thus cleaning the metal.

(40) H. L. writes: On our line shaft is a pulley 42 inches in diameter, fastened by set screws, which supplies power to our exhaust fan. These set screws are constantly slipping, and I propose to reduce strain on them by substituting a smaller pulley on line shaft, and interposing a counter shaft geared so as to give same speed to exhaust as before change. Please inform us through your paper if this arrangement will reduce strain on set screws holding driving pulley to line shaft or not? A. It will not reduce the strain on the set screws, if the fan runs at the same velocity. It is the resistance of the fan that determines the strain on the set screws, and not the mode of belting or gearing. Better slot your wheel, put a key seat in your shaft, and drive in a well fitted key.

(41) A. D. writes: I wish to know how I can prepare pulp for casting papier mache heads, similar to masks or false faces, in a plaster cast; or would it be better to make the cast out of some other composition. A. Paper is pulped in a mortar (or pulping engine) and mixed with ordinary glue size thinned somewhat with hot water. Remove the pulp and let it partially drain upon a linen covered frame. Put a quantity of this into the mould under strong pressure, and let it remain until it becomes hard enough to handle. A counter mould is used in casting such thin sheets. Plaster moulds are too fragile. Casts in type metal or fusible metal are much better. See SUPPLEMENT, No. 17.

(42) J. W. asks (1) if there is any cloth or knit work that will conduct electricity. A. Cotton and linen are conductors of static electricity. Cloth having filaments of metal will conduct dynamic electricity. 2. Is there any cloth that will not conduct it, the cloth or goods being dry? A. Silk is a non-conductor of electricity, but of course a static discharge would pass through a silk fabric. 3. Give some simple method of telling whether a battery gives a current of electricity or not. A. Touch the ends of the wires to the tongue when they are connected with the battery, and then do the same thing when they are detached from the battery. If you discover no difference the current must be very feeble or absent altogether.

(43) S. B. D. asks: 1. How can I regain the silver from an emulsion as described under the head of "Emulsion for Amateurs," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 226? A. Mix with about three times its weight of warm water, slightly acidified with hydrochloric acid, and let it stand. Collect the chloride of silver upon a filter, wash it with warm water, and mix it with a few fragments of clean zinc and enough dilute sulphuric acid to cover it. When the chloride is reduced pour off the acid liquid, pick out what remains of the zinc, wash the spongy metal with hot water, and dry it. It may be obtained in the form of a button, if desired, by mixing it with a little borax and heating the mixture strongly in a small black lead crucible. 2. How can I make the iron develop for the same? A. Proto-sulphate of iron, 2 drachms; dissolve in 8 oz. water and add 2 drs. glacial acetic acid and 2 drs. alcohol. 3. How is albumen paper made? A. Albumen can be obtained from any dealer in photographic goods. It is ordinarily prepared by beating up egg albumen to a froth with a little floured salt (about 15 grs. salt to each egg), and after this has stood twelve hours to subside, floating the paper upon its surface in such a manner that every part becomes uniformly coated, after which it is fastened to frames to dry in the air. 4. Can I use French gelatine? If not, where can I obtain Nelson's? A. Yes. See our advertising columns and Hints to Correspondents. 5. I am making an induction coil of the following dimensions: Core 3 inches long by ½ inch diameter of No. 18 annealed iron wire; primary, two layers of No. 18 copper cotton covered wire; secondary, 14 layers of No. 36 silk covered copper wire, with a condenser of 300 square inch surface. What size spark can I get using two Leclanche batteries? A. You may be able to get a spark from one-eighth to three-sixteenth inch long. The coil is rather small for sparks.

NEW BOOKS AND PUBLICATIONS.

THE MAGAZINE OF ART. Cassell, Petter, Galpin & Co., 739 Broadway, New York.

The April number of this *Art Journal* is, like the previous issues, full of engravings of choice and artistic works, consisting of elaborately carved oak furniture, ancient mosaics, and other art objects of rare beauty. The most interesting of the various subjects illustrated is an engraving of the French artist, Bonnat's, famous painting of "Ribera at Rome," which was recently sold by Knoedler & Co. for about $12,000 to a gentleman in this city well known in art circles, as a collector of rare and costly pictures. This number also contains a portrait of Bonnat the artist.

SWINTON'S SUPPLEMENTARY READERS. IN SIX BOOKS. I. EASY STEPS FOR LITTLE FEET; II. GOLDEN BOOK OF CHOICE READING; III. BOOK OF TALES; IV. READINGS IN NATURE'S BOOK; V. SEVEN AMERICAN CLASSICS; VI. SEVEN BRITISH CLASSICS. Edited by William Swinton and George R. Cathcart. New York and Chicago: Ivison, Blakeman, Taylor & Co.

These readers are intended to supplementary series of school readers, the volumes falling in severity of requirement between the several numbers of the more technical and formal school books in use. In this way they offer half a dozen oases in the ordinary desert of elementary instruction in reading, and are open only to the possible objection that children may not take kindly to the less charming books of the regular series after enjoying these. Certainly in beauty of mechanical make up and illustration, as well as in the excellence and appropriateness of the selections for reading, they far surpass anything in the line of school readers that have come to our table.

THE MICROSCOPE.

Charles H. Stowell, M.D., and Louisa Reed Stowell, M.S., both of them writers and observers of distinguished ability, have commenced the publication, at Ann Arbor, Mich., of a new bi-monthly magazine, entitled "The Microscope and its Relations to Medicine and Pharmacy." It is a handsome periodical, and cheap enough in price, namely, one dollar a year. We welcome this new work. The first number is highly creditable to the editors.

THE DIET CURE. By T. L. Nichols, M.D. New York: M. L. Holbrook & Co.

An essay on the relations of food and drink to health and disease. The author believes that men eat and drink too much, both in quantity and variety, and that the average death rate is double what it would be were temperance and intelligence more the rule in eating and drinking. He also has a vast assortment of notions and crotchets about food and drink which are much less worthy of general acceptance. The professional dietarian is too prone to set up his individual likes and dislikes as rules for all men, overlooking the obvious fact that, injurious as indiscriminate and excessive eating and drinking may be, the extreme of water drinking vegetarian dietetics is quite as bad; if anything the latter is less conducive to, or at any rate less associated with, forceful and enjoyable living than the former. The men and women who determine and control the world's affairs, whoare strongest in thought and deed, are not generally or exclusively fed upon brown bread and roots.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

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

April 5, 1881,

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 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. 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.

Advertising device, automatic, W. Akin 239,593
Adzes, forming, S. A. Hewitt 239,778
Anthracite waste, etc., for combustion, preparing, A. Berney 239,642
Anvil, vise, and drill, comb'd, Ware & Fleming 239,686
Axle box, W. Jones 239,800
Axle box, car, S. A. Bemis 239,702
Bales, cover for cotton and other, R. S. Jennings 239,795
Bag holder, W. H. Hockensmith 239,783
Baking powder, C. A. Catlin 239,602
Ballot box, S. T. Bacon 239,637
Band cutter, wire, B. F. McCarty 239,817
Bed bottom, spring, J. W. Morton 239,658
Bed bottom, spring, E. Oberndorfer 239,829
Bed, litter, and chair, combined folding cot, C. P. Nash 239,664
Bedstead, Grégoire & Hebert 239,768
Beer preserving apparatus, C. W. Weissenborn 239,687
Billiard cue tips, fastening, G. Zittel 239,913
Blind wiring machine, C. Hinz 239,782
Boilers, attachment for removing sediment from stand, M. T. Rogers 239,672
Boot and shoe sole buffing machine, J. H. Stevens 239,682
Boot and shoe sole shaping machine, N. J. Roop 239,849
Bottle wrapper and material therefor, Yocum & Kacer 239,912
Bracelet, H. Unger 239,890
Brick machine, L. B. Kennedy 239,611
Brush holder, H. H. Hurlburt 239,660
Buildings, construction of, J. M. Peck 239,669
Burnishing machine head block, P. D. Allen 239,635
Bushing, anti-friction, H. Loud (r) 9,635
Button and stud, W. W. Covell 239,733
Button polishing machine, H. W. Terry 239,886
Button, separable, F. A. Smith, Jr 239,627
Buttons, etc., mould or die for forming, J. W. Hyatt 239,793
Cableway, endless, H. Casebolt 239,726
Cake machine, H. Duesh 239,743
Calisthenic implement, R. S. Jennings 239,796
Cap, D. Fox 239,758
Cap, winter, D. Fox 239,757
Cap, winter, I. B. Kleinert 239,804
Car coupling, W. L. Nuckols 239,665
Car coupling, M. Steffy 239,628
Car heater, P. F. Randolph 239,671
Car spring, J. W. Evans 239,605
Car starter, F. Dawson 239,736
Car, stock, W. S. Bright 239,713
Car, stock, Kitsee, Illoway & Keck 239,802, 239,803
Car wheel, E. L. Taylor (r) 9,644
Card, game, W. Stranders 239,879
Carpet lining, J. Hunt 239,789
Carpet, pad, and mat, G. L. Witsil 239,908
Carriage seat backs, spring cushion support for, C. C. Bailey 239,694
Carrousel, T. A. Carl 239,601
Cartridge holder for revolvers, G. W. Schofield 239,676
Cartridge loading machine, W. H. Whitehead 239,688
Celluloid, hard rubber, bonsilate, etc., process of and apparatus for moulding, J. W. Hyatt 239,791
Chain, drive, W. D. Ewart 239,749, 239,750
Chuck, drill, W. L. Bergen 239,597
Churn, J. W. Neal 239,825
Cider and wine press, S. M. Brown 239,717
Cigarette package, J. Straiton 239,878
Cigars, machine for coloring and flavoring, J. T. & W. T. Hill 239,780
Circuit closer, S. H. Wood 239,680
Clevis, S. P. Baughman 239,700
Coal and ore breaker, P. H. Sharp 239,626
Coat, N. Malmar 239,814
Cock, steam, W. Bronk 239,645
Cock, steam heated water, J. Burnett 239,718
Coffee pot, Ayer & Taylor 239,693
Copying press, P. Lehmann 239,808
Corn husking roller, T. C. Elliott 239,747
Corn sheller, J. N. Wolfe 239,689
Corset, T. P. Taylor 239,884
Corset and dress stay, T. B. De Forest 9,643
Cotton and corn scraper, R. Wixson 239,632
Cotton chopper, E. Hutson 239,790
Cotton gin, I. F. Brown 239,715
Cotton gin brush, I. F. Brown 239,716
Cotton gins, breast for, C. C. Tate 239,883
Crane, hydraulic, J. Hemphill 239,775
Creamer, centrifugal, Houston & Thomson 239,659
Crib or bedstead, wardrobe, J. W. Knapp 239,805
Crucibles, repairing steel and other, J. Pedder 239,619
Cultivator, R. A. Johnson 239,798
Cultivator and other teeth, friction block for attaching, Workman & Hitchcock (r) 9,638
Currycomb, J. Forsyth 239,756
Cutter head, J. H. Eddy 239,744
Cylinder heads, machine for welding, R. A. Carter 239,725
Damper, stovepipe, J. H. Goodfellow 239,765
Damper, stovepipe, H. H. B. Vincent 239,895
Desiccating substances, process of and apparatus for, L. J. Cadwell 239,722
Distilling petroleum products, process of and apparatus for, A. Neilson 239,618
Ditching machine, U. Blickensderfer 239,707
Door mat and foot scraper, combined, F. Greenland 239,767
Drain and hydraulic water supply, combined underground, C. J. Hoflund 239,784
Drawing frames, etc., roving delivery mechanism for, J. Pollitt 239,839
Drying apparatus, H. R. Searle 239,678
Dust collector, W. H. Foote 239,755
Eaves trough hanger, J. Stricker 239,880
Electric light, W. G. Levison 239,811
Electric machine, dynamo, W. L. Voelker 239,685
Embroidery, lace, etc., packing lengths of, J. W. Mason (r) 9,641
Excavating machine, F. W. Schulz 239,857
Fan, M. Rubin (r) 9,636
Farm gate, C. A. Broome 239,714
Fence, J. Fisher 239,752
Fence, L. B. Mesnard 239,663
Fence lock, W. P. Green 239,656
Fencing, metallic barb, A. J. Upham 239,891, 239,892
Fibers, separating animal from vegetable, G. M., 2d, & A. L. Rice 239,622
Filter, water, S. H. Bellows 239,595
Firearm, breech-loading, A. Martin 239,662
Firearm lock, B. A. Fiske 239,652
Firearm, magazine, W. H. Elliot 239,748
Firearm, revolving, F. H Allen 239,634
Firearm, revolving, R. L. Brewer 239,914
Firearms, cylinder stop for revolving, H. McGee 239,821
Fire extinguisher, automatic, C. Barnes 239,639
Fire extinguisher, automatic, F. Grinnell 239,769
Fish plate, G. H. Waring 239,898
Fish plate and bolt, combined, J. M. Ayer 239,594
Flagstaff holder, B. Smith 239,680
Flax drawing machine, F. Mahler 239,614
Floor, portable, J. Ring 239,846
Flue cleaner, boiler, D. H. Sweeney 239,882
Fog horn, H. C. Langrehr 239,613
Foot rest, L. Wittich 239,631
Furnace, F. Hundt 239,788
Gas, apparatus for the manufacture of, R. H. Smith 239,870
Gas generator, R. H. Smith 239,871
Gas lighting apparatus, automatic electric, W. Vogel 239,896
Gas lights, apparatus for automatically igniting, extinguishing, and regulating, J. Schülke 239,856
Gasoline burner, W. E. Vernon 239,894
Glass melting furnace, J. J. Gill 239,763
Glassware, mould for the manufacture of pressed, W. Haley 239,772
Glove fastener, D. J. Bard 239,697
Glutinous or plastic materials, manufacture of articles from, H. G. Guild 239,770
Grain binder, I. Lancaster (r) 9,634, 9,640
Grinder, feed, L. J. Caldwell 239,600
Grinding mill, A. H. Bell 239,701
Grinding mill, feed, A. S. Baker 239,638
Gun, blow, C. Alex 239,633
Hammer, tack, R. Hepflinger 239,777
Harrow, J. P. Bradford 239,712
Harrow and seeding machine, wheel, E. Batchelor 239,699
Harvester, C. Clapp 239,648
Hay rake, horse, W. Z. Dafoe 239,604
Heel and mould therefor, rubber, J. J. C. Smith 239,681
Heel protector, T. L. Keif 239,801
Hides, machine for unhairing, A. W. Reid 239,841
Hinge joint, etc., J. M. Dodge 239,739
Hod elevator, G. W. Brown 239,646
Hod elevator, J. Smith 239,866
Hog scraping machine, R. C. Tompkins 239,888
Hoop cutting machine, C. E. Chittenden 239,730
Horse litter, T. M. McDougall 239,819
Horseshoe pad, C. A. Wells 239,899
Hose coupling, J. B. Newman 239,827
Hot air furnace, G. E. Hopkin 239,787
Hot water generator, J. D. Carmody 239,724
Hub boring machine, A. O. Withey 239,907
Hydrocarbon burner, C. Holland 239,786
Hydrocarbon furnace, V. W. Blanchard 239,706
Hydrocarbon furnace, C. Holland 239,785
Hydrocarbon furnace burner, J. J. Walter 239,630
Ice cream freezers, holder or clip for, T. Sands 239,674
Ice machine, C. C. Palmer 239,666
Inkstand, calendar, J. G. Smith 239,867
Insulating electrical conductors, W. T. Henley 239,776
Iron and steel, manufacture of, A. Braconnier 239,711
Iron, apparatus for dephosphorizing, E. & E. Pirath 239,621
Ironing board, E. L. Schlotterback 239,853
Ironing board, shirt, E. Birmingham 239,704
Ivory, manufacture of a factitious material to imitate, J. W. Hyatt 239,794
Joint or hinge for locket or watch cases, J. K. Underhill 239,684
Key, E. Parker 239,668
Ladder, extension, E. Cauble 239,727
Lamp, J. F. Kramer 239,612
Lamp, W. B. Robins 239,847
Lamp burner, A. P. Odell 239,830
Lamp, electric, T. A. Edison 239,745
Lathe for turning handles for table cutlery, J. Johnson 239,797
Level road, engineer's, M. L. Lynch (r) 9,639
Lock case, indicator, F. W. Mix 239,616
Lumber, etc., drier, E. V. Wingard 239,906
Meat cutting machine, T. Williams, Jr 239,902
Milk creaming apparatus, D. M. Weston 239,900
Millstone ventilating apparatus, etc., self-acting screen cleaner for, G. Behrns 239,640
Moth and waterproofing compound, D. M. Lamb (r) 9,633
Mortising machine, Strong, Seymour & Turnbull 239,881
Muzzle and poke, combined horse, J. R. Elliott 239,746
Nails and tacks, machine for affixing caps to, H. R. Packard 239,833
Necktie, A. F. Chase 239,647
Necktie fastener, H. Selvage 239,858
Nut for power screws of presses, R. H. Butler 239,721
Opera, school, and office chair, E. Shupe 239,862
Ore treating apparatus, C. C. Coats 239,650
Paddlewheel, T. C. Robinson 239,623
Paper cartridge machine, G. P. Salisbury 239,851
Paper machine screen plate, Pinder & Hardy 239,837
Paper pulp from wood, machine for making, R. B. Lane 239,807
Paper watch dial, A. Bitner 239,643
Parasol, E. Wright 239,911
Photographic plateholder, T. W. Schmidt 239,675
Piano action, Guillaume & Beunon 239,670
Planing machine, rotary, E. F. Gordon 239,654
Plant setter and fertilizer distributer, combined, M. I. Goldsmith 239,764
Planter and cultivator, combined seed, J. H. Jones 239,799
Planter, check row corn, W. D. Furguson 239,751
Planter check rower, corn, L. D. Benner 239,596
Planter, combined corn and pumpkin seed, J. P. Van Vleck 239,893
Planter, cotton, M. M. McFall 239,820
Planter, cotton seed, J. A. Crow 239,651
Plastic material, applying designs to articles made of, J. W. Hyatt 239,792
Plow beam attachment, J. T. Cunningham 239,735
Plow, reversible, J. Hartmann 239,773
Poison plate, fly, W. E. Hingston 239,781
Potato digger, H. Arnold 239,692
Printing machine, C. Machris 239,813
Pump, oil and liquid, Nichols, Manwaring & Livesey 239,828
Railway brake, W. P. Thompson 239,887
Railway rail fastening, Clements & Light 239,731
Railway time signal, A. P. Burroughs 239,719
Reflector, heat, J. Southward 239,873
Refuse and other material, machine for separating street, H. Newlin 239,826
Register foot rest, G. W. Woodward 239,909
Rocking chair, platform, J. Flinn 239,754
Rope fastening, J. D. Paldi 239,834
Rowboat seat, C. T. Soniat 239872
Saddle, C. H. Veeder 239,629
Saddle tree, P. Bottger 239,709
Sails, reefing, T. B. Wilson 239,905