The liquid opodeldoc is prepared by taking 2 ounces Castile soap shavings, and dissolving them in one quart alcohol, with gentle heat, then add 1 ounce camphor, ½ ounce oil rosemary, and 2 ounces spirits hartshorn (aqua ammonia) For cure of rheumatism, we advise consultation with physician. It is impossible to recommend any prescription without first seeing the patient.

(3) G. A. S. asks what he can use to remove varnish and paint from wood. A. We would recommend you to use a solution of caustic soda. It is applied with a brush made of bristles, and after a while is rinsed off with water. This operation is repeated several times, according to the thickness of the paint. Some caution is necessary to prevent the wood checking. By this means the wood is restored to its natural color.

(4) H. C. asks for any apparatus or dialyzer by which alkali and silica in solution (solution of silicate of soda) can be separated in large quantities, retaining the alkali in solution in one vessel and the silica in solution in another. A. We do not remember any mechanical apparatus by which the silica can be separated from the waterglass. Chemically, however, that is, by the addition of alkaline carbonates or chlorides, the silica will be thrown down.

(5) M. M. W.—On page 2499 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 157, several recipes for indestructible inks are given, either of which will probably meet your demands. The majority of inks contain glycerine, the tendency of which is to prevent their perfect drying, and hence the blurring to which you allude.

(6) G. K. G. asks: What will remove red ink from a ledger without defacing the writing? A. SCIENTIFIC AMERICAN SUPPLEMENT, No. 157, recommends cold aqueous or acetic acid solution of calcium hypochlorite, bleaching powder, or eau de javelle; in fact, any bleaching agent ought to accomplish the object.

(7) B. S. H. asks for preparation by which steam laundries make their goods so stiff and give such a glaze to them, especially collars and cuffs? A. This is given in full in answer 2, in SCIENTIFIC AMERICAN of May 26, 1883. 2. Please give formula for good cologne. A. Take of pure 95 per cent cologne spirits 6 gallons, oil of neroli 4 ounces, oil of rosemary 2 ounces, oil of orange 5 ounces, oil of citron 5 ounces, oil of bergamot 2 ounces; agitate; then allow to stand for a few days perfectly quiet before bottling. 3. What is the use of gold chloride in photography; otherwise, what good does toning do a picture, and what is it for? A. Gold chloride is used to tone the picture, that is, to soften the harsh effects produced by the direct action of the sun.

(8) C. A. B. writes: I am desirous of becoming a mechanical engineer, and having mastered mathematics through calculus, would like to know what books would be required? A. We give the names of some of the works studied in our schools of technology, but we think you would find it very difficult to master them without supplementary instruction: Elementary Mechanics, by De Volson Wood. The Materials of Engineering, 2 vols., R. H. Thurston. Mechanics of Engineering, J. Weisbach. Machinery and Millwork, Steam Engine and other Prime Movers, by J. W. McQ. Rankine. Roofs and Bridges, De V. Wood. Civil Engineering, Wheeler. Metallurgy, "*Science Series*," Bloxam. Elements of Machine Design, Unwin. Steam Engine, Proportion of. W. D. Marks. Elementary Quantitative Analysis, Elliot & Storer. Elementary Quantitative Analysis, Thorpe. Steam Engine, Arthur Rigg. Catechism of the Locomotive, Forney. Haswell, Engineer's Pocketbook. Molesworth, Engineer's Pocketbook. Trantwine, C. E. Pocketbook. Ganot's Physics, Atkinson.

(9) J. B. F. asks: 1. Ought steam pipes to leak at all if properly put up and the valves kept constantly packed and in good order? A. No. 2. Could the turning of steam on to a line of pipes when the return valve is closed start a leak or burst the pipes? A. It should not.

(10) M. & Co. ask what are the best proportions of tin, antimony, and copper for genuine Babbitt metal. Are the different proportions of these metals used according to the different speeds required? A. Genuine Babbitt metal, according to the formula of the inventor, is 9 of tin and 1 of copper. Antimony has been added since, so that the proportions by hundreds will stand 80 tin, 5 copper, 15 antimony. For high speeds the metals should be cooler, giving a larger proportion of tin; for weight the metal should be harder, giving a larger proportion of antimony.

(11) E. C. asks how to clarify or filter cod liver oil? A. Filter the oil through charcoal in a linen or felt filter.

(12) H. W. writes: The other day I accidentally got some quicksilver on a large gold ring, and am unable to remove it. A. We fear that the mercury has become amalgamated with the gold, in which case it will be necessary to treat the ring with chemical reagents. It is possible that you may remove some of the mercury by heating the ring as hot as possible without melting, thereby causing the mercury to volatilize.

(13) J. W. S. writes: 1. A mischievous boy has danbed my blackboard with candle grease. It does not wash off with soap or soda. What solvent would you recommend? A. If the candle is made of paraffine, hot oil of turpentine will dissolve it. Ether will also be found to be a good solvent. 2. How may I make an automatic blow pipe to use in blowing glass? I cannot blow the flame and glass too. A. Connect the end of the blow pipe with bellows by means of rubber tubing.

(14) A. G. W. asks if there is any preparation for making the hair white without injuring the hair or scalp? A. Peroxide of hydrogen will take the coloring material entirely out of hair. See description of this important bleaching agent in SCIENTIFIC AMERICAN SUPPLEMENT, No. 339. No injury attends its employment.

(15) E. B. S. asks the horse power of an engine as follows, viz.: Diameter of cylinder, 9 in.; length of stroke, 12 in.; revolutions per minute, 150; pressure of steam (in boiler), 60 pounds; cut off at 9 in.; mean effective pressure, 58 pounds? A. About twenty-five horse power. 2. The means by which the power is obtained? A. See rule in SUPPLEMENT, No. 253.

(16) J. R. D. asks: What lacquer is used by makers of chandeliers that makes them look so bright and like red brass? A. Take two gallons spirits of wine, one pound dragon's blood, three pounds Spanish annatto, four and a half pounds gum sandarac, two pints turpentine. Digest for a week, shake frequently, decant, and filter.

(17) P. & Co. ask: What are the compositions used in making the slip for the inside of pipkins? A. The following is a white glaze suitable for earthen ware. An intimate mixture of massicot, 4 parts; tin ashes, 2 parts; crystal glass fragments, 3 parts; and ½ part sea salt. This mixture is melted, and the liquid flux used.

(18) W. L. C. asks for a formula for correcting the taste of rancid butter? A. The rancidity is due to butyric acid, a substance freely soluble in water or fresh milk, so that the butter can be thoroughly washed, first with good new milk and then with cold spring water; or the butter can be melted in water, which will dissolve out the butyric acid, and then work it over.

(19) J. F. writes: I have some wrought iron bars which I wish to nickel plate, but from some cause unknown to me I have been unable to plate them so as to keep bright in the open air. How shall I remedy this? A. The difficulty is due to the oxidation of the iron, the adhesion of the nickel not being as satisfactory as if the iron were first copper plated and then coated with nickel; or even better still would be to first coat the iron with copper, then tin, and finally with nickel.

(20) L. S. asks (1) the best and cheapest way to construct a furnace for melting brass and cast iron for casting small articles. A. You may melt 5 pounds of brass or cast iron in a forge by building a small well of fire bricks around the tuyere, about 16 inches high, 12 inches diameter, and melt in a crucible with a charcoal fire; put a large piece of charcoal over the crucible to keep the heat in. 2. Do you think it at all probable that bills now pending, as regards patents, will become laws? A. Time alone can divulge what action our erratic Congress may take as regards the patent laws. 3. Do you think the new form of steel mentioned in SCIENTIFIC AMERICAN of 8th ult., page 151, column three, will soon be introduced in United States? A. We have had inquiries concerning the steel castings you mentioned from our own manufacturers, and we presume that experiments in that line are already being made in this country. If the new steel is found upon trial to be useful for its price, it will no doubt be largely used.

(21) W. W. asks: 1. Why is it that the rule for finding the traction of locomotives only takes note of one cylinder? A. We have seen no rule that takes note of but one cylinder; if you can refer to such a rule, perhaps we shall be able to explain it. 2. What is the cause of water flowing in gushes from an underground flume? Would several different angles of inclination cause it? A. Could not say without examination. Very likely, because of commingling with the current. 3. If the velocity of waterfalling free from a height of 16 ft. is about 32 ft. per second, what would be the velocity at the small end of a properly constructed cone under the same head of water? A. The velocity will be less under the conditions you name, but we cannot tell exactly how much, since you do not state explicitly all the aspects of the problem.

(22) R. C. asks best receipt for cleaning spots or stains from his English tile. A. This depends upon the nature of the stain forming the spot. Naturally they must be removed by some solvent which will dissolve them without affecting the tile. Water, alcohol, ammonia, caustic alkalies, and even acids will hardly have any effect upon the porcelain surface of tiles.

(23) B. S. H.—Of course trotting at a high rate of speed is an artificial gait for a horse, but we believe that trotting is the natural intermediate gait between walking and cantering. There is nothing in the anatomy of the horse that renders trotting unnatural or awkward. The yearling at the side of its dam takes as naturally to trotting as it does to cantering.

(24) S. A. H. writes: I should like to ask if salt in some form is not necessary to the maintenance of the human system. A. Salt (chloride of sodium) is believed to be necessary to the health of the human system. But probably no such extensive and habitual use of it as civilized people indulge in is essential. It is well known that the Maori, aborigines of New Zealand, a strong and hardy race, do not use salt.

(25) J. P. McD. asks: 1. What animal has the finest hearing, and its cause? A. Nothing is certainly known as to the absolute superiority of any species of animals in this respect. That many mammals possess a very keen sense of hearing, and detect sounds, inaudible to human ears, is unquestioned. The common cat in an alert state has a very sharp and accurate ear, also the barn owl. The bats have extremely sensitive auditory nerves, detecting the almost noiseless rush of insects through the air. Perhaps the best equipped animals with this sense are the group of foxes known as Feneks, or desert foxes, of Africa, of which *Canis zerda*, the desert fox, is a typical example. It has large ears and nervous concentration when aroused. In regard to the cause, it may be generally said that the acuteness of a sense is conditioned largely upon its usefulness in the animal's economy. Hunting animals have necessarily a better sense of hearing than those whose prey is more easily obtained. Again *per contra*, timid, defenseless animals, as the hares, have trained ears because they subserve to them the purpose of protectors. Also the size of the external ear is a fair index of the provisions supplied in this sense for the animal. All animals, says Brehm, which have large, erect, and easily moved ears hear better than those whose auditory apparatus is small, dependent, and sluggish. 2. Is not perfection in nervous force and physical development more nearly attained in the tropics than elsewhere? A. This may be answered with some reservations, yes, though some definitions of nervous force might modify this considerably.

(26) A. G. asks: 1. How is gold lettering put on the backs of books, and what composition is used to make the gold leaf stick? A. Gold letters are printed or pressed on book bindings by means of an albuminous size—white of eggs—the gold leaf placed on the size and the block of type heated and pressed on the gold leaf. 2. How is gold printing done on cards and paper? A. Gold printing on paper is printing with a size sold as "gold size" and dusting with bronze powder.

(27) F. O. asks how to give brass the beautiful iridescent colors. A. By referring to the SCIENTIFIC AMERICAN of December 1, answer 14, the process of obtaining the iridescent colors will be found. The antique or very old brass color is probably the result of some lacquer whose composition is not generally known. The bright gold finish on brass is, if not the result of polishing, apt to be produced by some lacquer, such as the following: Seed lac, 3 ounces, turmeric 1 ounce, dragon's blood ¼ ounce, alcohol 1 pint. Digest for a week, frequently shaking, decant, and filter.

(28) L. P. V. asks if a refracting telescope can be rendered as perfectly free from chromatic and spherical aberration on the dialytic plan as by the common method where the crown and flint lenses are in contact, or nearly so? And, if so, why are not the larger astronomical telescopes so constructed, thus saving thousands of dollars in the cost of the flint lens, besides actually shortening the length of tube for a given focal distance? A. The dialytic telescope cannot be made as perfect as those corrected at the object glass. This is the reason they are but little known. The field is not as large, and the definition is only good in the center.

(29) M. E. E. asks for a recipe for making water colors, such as are used for coloring photographs. A. The articles referred to are presumably nothing but aniline colors. So that you can purchase the desired color or shade of aniline you desire, dissolve it in water or alcohol according as to which is the proper solvent, and you will have the color precisely identical to the variety possessing the fanciful name. 2. Can you tell me of any way in which tar can be rendered more palatable to the taste, when taken as a medicine? Macerate tar in eight times its weight of alcohol until completely dissolved, then add a suitable flavoring compound, such as oil of wintergreen.

(30) G. J. G. writes: If two ten horse power engines were running 100 revolutions per minute, one with 48 inch pulley on crank shaft driving on to a 24 inch pulley on counter shaft, the other with 24 inch pulley on crank shaft driving on to a 24 inch pulley on counter shaft, both using 4 inch belt and same distance from center to center of each shaft, which counter shaft will require the most amount of power to stop in the same length of time? A. One-half the power only applied in the second case to the counter shaft will be required in the first case.

(31) H. B. A. asks: Will oil spread over tubes in boiler after cleaning prevent its scaling? A. No, but for a short time it may prevent the scale adhering.

(32) A. McL., Jr., asks how litmus is thoroughly dissolved. A. The preparation of litmus is as follows: The ground lichens are first treated with urine containing a little potash, and allowed to ferment for several weeks, whereby they produce a purple red; the colored liquor, treated with quick lime and some more urine, is again set to ferment during two or three weeks; then it is mixed with chalk or gypsum into a paste which is formed into small cubical pieces by being pressed into brass moulds and dried in the shape. Litmus is easy to pulverize, is partially soluble in water and dilute alcohol, leaving a residue consisting of calcium carbonate, silica, gypsum, and iron oxide combined with the dye. This residue is not soluble unless by treatment with acids, which would interfere with the action of the litmus. For making litmus paper an infusion of one ounce of litmus to half a pint of hot water is recommended by Faraday.

(33) J. B. R. asks: 1. Is the pressure the same on the bottom of a boiler as on the top? If there is any difference, please tell me which has the greatest, and what is the difference? A. The greatest pressure is at the bottom, as you have there the weight of the water in addition to the pressure of steam. 2. How high will a good jet throw water with 100 pounds steam? A. We cannot say, as it depends on other things than merely the pressure, viz., length, kind and size of pipe, diameter and shape of nozzle. 3. How high will a siphon lift water or oil with one hundred feet fall? With two hundred feet fall? A. A siphon cannot lift water more than 26 or 28 feet, and even then there must not be any air leaks; we think not more than 18 or 20 feet can be depended upon in ordinary work. 4. When a locomotive is going down grade with her engines reversed for the purpose of holding back, where does she exhaust her steam? A. Whether going ahead or back, it must exhaust through the pipe to chimney

(34) H. N. P. asks how the cement composed of equal parts of pitch, gutta percha, and shellac is made. A. Fuse together the gutta percha and the pitch, then add the shellac, or else dissolve the mixture in carbon disulphide.

(35) J. B. W. asks: How shall I mix wax and gutta percha? A. By dissolving them in coal tar, naphtha, carbon disulphide, or like solvents.

(36) J. M. asks how to make powdered manganese into blocks for Leclanche batteries. A. Manganese dioxide is mixed in nearly equal parts with carbon, but with the addition of a small quantity—5 per cent—of resin for the purpose of giving consistency to the mass. These three substances, properly pulverized and intimately mixed, are conglomerated under a considerable pressure, and at a temperature of 212° Fah., into a solid cylinder. A small cylinder of sodium bisulphate is also inserted in the center of the carbon and manganese electrode while it is being moulded.

(37) J. K. M.—The composition used for picture frame ornaments is elastic, for fitting to uneven surfaces while fresh, and dries hard. If for outside work they should be thoroughly oiled with linseed oil upon the backs when applied, using nails and no glue. This composition is made like putty and of the same material, only worked up hard and moulded with a press.

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

Mrs. B. W. A.—The specimen is an iron ore—hematite (sesquioxide of iron).

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

April 15, 1884,

AND EACH BEARING THAT DATE.

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

Addressing machine, Parker & Drummond 296,778
Advertising bird cage, H. Bishop 296,912
Advertising card, B. D. Baldwin 296,713
Advertising musical instrument, H. Hardy 296,956
Againg whisky, process of and apparatus for, P. E. Jay 296,886
Air cooling machine, W. V. Wallace 297,089
Alarm. See Steam alarm.
Alarm apparatus, electrical, Porter & Wilder 296,875
Alloys, manufacturing metal, G. Selve 296,884
Anvil attachment, M. A. Ladd 296,850
Aquarium, A. Ledig 296,858
Auger handle, D. M. Parry 296,878
Ax polls, etc., machine for making, J. W. Bowers 296,817
Axle, self-oiling, E. E. Baker 296,717
Baby jumper, C. T. Gardner 296,946
Bag. See Mail bag. Paper bag.
Bails for buckets, device for forming, A. J. Blair. 296,811
Barrel shaping machine, J. M. Robinson 297,010
Bathing apparatus, G. Koons 297,081
Bed bottom, spring, B. A. Ham 296,958
Bell, electric call, G. P. Conant 296,729
Bell pull, electric door, S. N. Blake 296,812
Bell ringing apparatus, pneumatic, R. P. Garsed.. 296,828
Bicycle handle. G. S. Kelsey 296,978
Bill-of-fare indicator, E. S. Sutton 297,094
Bit. See Bridle bit.
Block. See Building block. Hitching block. Sawmill head block.
Boiler. See Steam boiler.
Bookcase, P. E. McIntosh 296,767
Boots and shoes, toe tip indicating apparatus for, H. D. Smith 296,885
Boring square holes, tool for, M. Rothschild 297,013
Bottle stopper, E. W. F. Natter 296,995
Box. See Jug packing box. Post office box.
Brick drier, J. Blum 296,814
Brick kiln front or furnace, J. Blum 296,818
Brick machine, W. Andrus 297,051
Bridle bit, Blyholder & Hughes 296,815
Broom balance tip, W. A. Scollay 296,879
Brushes, fountain attachment for marking, P. C. Forrester 296,945
Buckle, suspender, C. S. Wells 296,803
Building block, T. L. Jowett 296,971
Butter package, J. C. Brown 296,821
Button, E. A. Thiery 296,891
Button attaching instrument, J. F. Thayer 296,890
Button fastener, W. H. Dodge 296,735
Button fastener, J. F. Thayer 296,798
Cable road slots, machine to protect, M. Ohlson.. 296,870
Cables, system of propelling cars by means of, J. L. Boone 296,916
Calendar, J. Cussons 296,984
Candy machine, J. P. Wick 296,901
Capsule drying rack, J. Krehbiel 296,846
Capsule machine, J. Kriehbiel, 296,844. 296,845, 296,847, 296,848
Capsule stripping machine. W. A. Tucker 296,895
Car brake, F. J. Underwood 296,896
Car, cattle, Klaeser & Sell 296,842
Car coupling, F. Baldt 297,052
Car coupling, C. O. Barnes 297,053
Car coupling, C. L. Hathaway 296,957
Car coupling, G. A. Kirkpatrick 296,756
Car coupling, C. E. Mark 296,859
Car cover, railway, R. H. Wyman 296,809
Car, railway, R. H. Wyman 296,810
Car seat, safety brace, W. R. Lampton 296,975
Car wheel, M. Hamlin 296,954
Car wheel, J. N. Kaufholz 296,840
Car wheel lubricator, Silliman & Maxwell 297,021
Cars, grain door for freight, A. W. Alexander .. 296,907
Carriage body. G. A. Ellis 296,943
Carriage top fastener, J. J. Travis 297,044
Carrier. See Cash carrier. Hay carrier.
Case. See Book case.
Cash and parcel receptacle for cash carrier systems, Grant, Jr., & Lawrence 296,881
Cash carrier, Grant, Jr., & Lawrence 296,882
Cash carrier system, Badger & Lakin 296,909
Celluloid and other compounds of pyroxyline, manufacturing, J. W. Hyatt 296,967
Celluloid for enameling textile fabrics, etc., application of, Wood & Stevens 297,098
Celluloid, etc., of pyroxyline, manufacture of, J. W. Hyatt *et al* 296,970
Cellulose from wood, etc., manufacturing, C. F. Dahl 296,935
Chain, roller, H. A. Church 296,925
Check row wire, C. S. Locke 296,981
Cherry seeder, W. F. Hibner 296,961
Chest of drawers, A. L. Adams 296,905
Chuck, lathe, G. W. Davis 297,070
Churn, J. M. & W. H. Curtice 296,932
Churn cover fastener, M. M. Maycock 296,995
Clasp. See Garter clasp.
Clasp, H. C. Frank 296,827
Clay for potters' use, blunger for mixing, P. Wilkes 297,047
Clock winding device, automatic, N. Silberberg... 297,020
Clod crusher, W. H. Hartzell 296,750
Clutch, J. Thomson 296,892
Cock, dissolving, T. J. Mapes 296,984
Cock, waste, Taylor & Sharp 296,797
Coffee mill motor, A. J. Clark 297,065
Coffee pot, F. J. Bicknell 297,059
Coffin, N. Rappleyea 296,782
Collapsing cup, A. H. Wirz 296,902
Convertible chair and bedstead, E. Rundell 297,014

Copy holder, E. Nunan ... 296,868
Cores, manufacture of green sand, J. Scull ... 296,880
Corn package, pop, V. D. Urso ... 296,897
Cornice. W. H. Dodge ... 296,734
Corset busk and clasp, combined elastic, C. A. Stevens ... 296,888
Cotton ginning and cleaning apparatus, M. Covel. 296,824
Coupling. See Car coupling. Rope and cable coupling. Thill coupling.
Crane, traveling, Huber & Barnhart ... 296,965
Crate, knockdown, J. A. H. Ellis ... 296,737
Crusher. See Clod crusher. Stone crusher.
Crushing mill, G. W. Morrow ... 297,083
Cultivator, T. J. Craft ... 297,069
Cultivator, D. N. Luse ... 296,983
Cultivator, M. W. McCann ... 296,860
Cultivator, M. A. Travis ... 297,035
Cultivator, N. Trowbridge ... 296,800
Cultivator, wheel, A. Lindgren ... 296,760
Cup. See Collapsing cup.
Demijohn or bottle safe, I. B. Wollard ... 296,903
Dental rubber-dam holder, R. H. Moffitt ... 296,992
Ditching machine, A. J. Osborne ... 296,872
Door check, L., G. & E. Rail ... 297,005
Door check, pneumatic. W. C. Clark ... 296,727
Doorkeeper, electric, A. C. Woebrle ... 297,096
Draft equalizer, W. Crozier ... 296,930
Draw bar and buffer, Turner & Mann ... 296,801
Drawer lock, J. Wise ... 296,807
Drier. See Brick drier.
Drill. See Ratchet drill.
Dust arrester, O. Kutsche ... 296,758
Earth remover, S. A. Miller ... 296,990
Electric machine, dynamo, A. E. G. Lubke ... 296,857
Electric machine, dynamo, E. Thomson ... 296,799
Electrical currents, apparatus for distributing, G. W. Durbrow ... 297,072
Elevator. See Hay and grain elevator.
Elevator safety attachment. R. Seiffert ... 296,883
Engine. See Road engine. Rotary steam engine. Traction engine.
Ensilage, etc., machine for packing, L. McMurray ... 296,863
Escapement, variable, J. D. Cottrell ... 296,927
Extractor. See Stump extractor.
Eye rods and hook-and-eye hinges, machine for making, C. Lanz ... 296,852
Eyeglasses, I. Fox ... 296,826
Eyeglasses, C. F. Spencer ... 296,886
Faucet attachment to barrels, J. Paulus ... 297,000
Fence, barbed. J. E. Kelly ... 296,753
Fence post, Sweeney & Irwin ... 296,796
Fence, wire, A. G. Hulbert ... 296,835
Fifth wheel, vehicle, J. W. Leete ... 296,855
File, bill, J. H. Louder ... 296,762
Filter, A. B. Denton ... 296,939
Filter press, H. Warden ... 297,042
Filter, water, E. Karst ... 296,972
Fire alarm apparatus, electric, M. D. Porter ... 296,874
Firearm barrel, W. Hebler ... 296,958
Fire engines, automatic relief valve for steam, J. E. Prunty ... 297,087
Fire escape, R. C. Rutherford ... 297,089
Fire escape ladder, W. Brannan ... 296,920
Fire escape sling, Miller & Hume ... 296,769
Fire extinguisher, hand grenade, J. J. Harden ... 297,075
Fish, apparatus for catching star, J. F. & F. L. Homan ... 297,079
Foot rest, F. H. Plummer ... 296,778
Fruit jar, Lyon & Lossard ... 297,082
Furnace. See Hot air furnace.
Game, B. S. Wheeler ... 296,900
Garter clasp, P. Kalish ... 298,080
Gate, R. F. Baughn ... 297,055
Glass mould, E. Herckner ... 297,077, 297,078
Glass mould and the product thereof, W. H. Brunt ... 297,062
Grain crasher and disintegrator, J. A. Jones ... 296,838
Grinding mill, G. K. Smith ... 297,024
Grinding mill, J. F. Winchell ... 297,049
Handle. See Auger handle. Bicycle handle.
Harness, J. M. Porter ... 297,003
Harness pad, J. C. Harpham ... 296,748
Harness pad, C. W. Rogers ... 297,011
Harrow, Munz & Molno ... 297,084
Harrow and scraper, cultivating, W. R. Craig ... 296,732
Harvesting machine, grain, J. Knoop ... 296,843
Hat sweat, G. S. Bracher ... 296,918
Hat sweat reed, G. S. Bracher ... 296,919
Hay and grain elevator, J. G. Livingston ... 296,856
Hay carrier, C. A. Gutenkunst ... 296,745
Hay carriers, adjustable stop for, W. Gutenkunst. 296,746
Hay carriers, elevator power for, J. S. Grabill. ... 296,950
Hay stacker, J. R. Wright ... 297,099
Head rest, F. H. Plummer ... 296,779
Hitching block, F. Gifford ... 296,739
Hitching device, detachable, C. Marquardt ... 296,764
Hoisting machine, J. & T. McNeil ... 296,864
Holder. See Copy holder. Lead and crayon holder. Sash holder.
Horseshoe, H. Olson ... 296,996
Hot air furnace, P. B. Clark ... 296,926
Indicator. See Bill-of-fare indicator.
Injector, steam boiler, W. W. Cowley ... 296,731
Insulator, J. A. Seely ... 296,881
Iron, manufacture of sheet, W. D. Wood ... 297,097
Jack. See Wagon jack.
Jar. See Fruit jar.
Jar fastening, preserve, E. Rosenzi ... 296,876
Journal bearing, E. Copley *et al.* ... 296,823
Journal bearings, drip cup for, J. G. Braun ... 296,820
Journal box, E. H. Rust ... 297,016
Jug packing box, L. H. Bradley ... 296,819
Key ring, W. C. Lucas ... 296,763
Ladder, C. A. Root ... 297,088
Lamp burner, S. Russell ... 297,015
Lamp, electric arc, J. J. Skinner ... 297,022
Lamp extinguisher, Ogden & Anderson ... 296,771
Lead and crayon holder, C. W. Boman ... 297,060
Lead, manufacture of white. J. C. Martin ... 296,765
Leather strings, die for cutting, C. E. Ramus ... 296,781
Leggin, H. J., Jr., & S. M. Seibel ... 296,882
Lens, trial, J. King ... 296,841
Leveling instrument, L. C. Strong ... 297,093
Lever wrench, self-adjusting fulcrum, B. F. Bennett ... 296,721
Light. See Signal light.
Lock. See Drawer lock.
Locket, F. B. Gould ... 296,741
Locomotive ash pan, E. S. Hart ... 296,749
Locomotive ash pan, Hoyt & Twiggs ... 296,964
Locomotive pilots, safety device for, O. Rothrock ... 297,012
Loom let-off mechanism, J. Shew ... 297,018
Lubricating can, illuminating, E. R. Walker ... 296,802
Lubricator. See Car wheel lubricator.
Mail bag, J. S. Bailey ... 296,910
Mail bag, T. H. Smith ... 297,025
Mail bag fastener, W. D. Doremus ... 297,071
Mail bag label holder, F. L. Herold ... 296,959
Match cards, machine for sawing, Flewwelling & Harris (r) ... 10,468
Matrices, machine for making, R. L. Kimberly ... 296,974
Mechanical movement, J. P. Lavigne ... 296,977
Meter. See Water meter.
Middlings purifier, A. Hunter ... 296,752
Mill. See Crushing mill. Grinding mill.
Mining apparatus, T. W. Campbell ... 297,064
Mixing solids and liquids and for other purposes, apparatus for, E. A. Pond ... 297,002
Mould. See Glass mould. Thermometer and barometer mould.
Moulding plastic material, C. M. Du Puy ... 296,825
Mop and brush holder, W. F. Cornelius ... 297,067
Mop wringer, J. F. Walter ... 297,040
Motor. See Coffee mill motor. Rotary motor. Spring motor.
Mower, lawn, H. Lacasse ... 296,759
Nail platefeeder, J. F. Hammond ... 296,747
Nut lock, J. Gilgour ... 296,948
Overshoe, G. A. Lewis ... 296,978
Pad. See Harness pad.
Paddlewheel, submerged feathering, T. A. Cook ... 296,728
Pain, E. H. Hague ... 297,074
Paint mixer, R. H. Smith ... 296,792
Paper bag, J. P. Onderdonk ... 296,981
Paper, fireproof, D. A. Brown ... 296,722
Paper fixture, toilet, S. Wheeler ... 297,044
Paper fixture, wrapping or toilet, S. Wheeler ... 297,045
Paper holder, toilet and wrapping, S. Wheeler ... 297,043
Paper machines, machine for preparing pulp for, W. Umpherston ... 297,037
Paper, manufacture of, Z. M. Crane ... 296,928
Paper pulp from wood, process of and apparatus for manufacturing, G. H. Pond ... 296,780
Pen, fountain, J. P. Hoyt ... 296,963
Pencil, G. C. Ward ... 297,041
Pencil sharpener and holder, T. Holdsworth ... 296,751
Pencil sharpener, eraser, etc., combined, J. A. Cook ... 296,730
Photographs, coloring, A. Bisson ... 296,913
Piano music desk, M. J. Chase ... 296,726
Pick, G. W. Elliott ... 296,736
Plane, J. B. Ripsom ... 296,785
Plane, bench, N. E. Curtis ... 296,933
Planing machine, metal, G. A. Gray, Jr ... 296,951
Planter, check row corn, T. J. Lindsay ... 296,980
Planter, corn, A. D. Adams ... 296,906
Planter, cotton, W. T. Gardner ... 296,947
Planter, hand corn and seed, F. E. Culver ... 296,733
Plow, planting, J. Lane ... 296,851
Plow, shovel, Hudgens & Allison ... 296,966
Plow standard, J. P. McIntyre ... 296,861
Plow, wheel, J. W. Bartlett ... 296,720
Pocketbooks, etc., frame for, H. Didout, Fils ... 296,940
Pool ball rack and spotter, automatic incline, W. A. Tea ... 297,031
Post office box, E. Osgood ... 296,772
Press. See Filter press. Printing press.
Printing press, J. H. Utter ... 296,898
Printing, stamping, or embossing, producing roller surfaces for, J. J. Sachs ... 297,017
Puller. See Stump puller.
Pump, R. Hardie ... 297,076
Pump, wooden, D. Plews ... 297,001
Punching machine, N. C. Stiles ... 297,090
Punching the eyes of axes and similar tools, machine for, J. W. Bowers ... 296,818
Pyroxyline material, manufacture of, J. W. Hyatt *et al.* ... 296,969
Pyroxyline pulp, process of and apparatus for effecting the desiccation of, J. W. Hyatt *et al.* ... 296,968
Pyroxyline, treating and moulding, J. W., Jr., & I. S. Hyatt (r) ... 10,469
Railway, endless cable traction. F. G. Corning ... 297,068
Railway gates, operating, J. Little ... 296,761
Railway safety signal, E. H. Tobey ... 296,893
Railway switch rods, connection of, J. B. Witty ... 296,808
Railway tie, W. T. Carter ... 296,725
Ratchet drill, self-feeding, R. N. Cherry ... 296,924
Reclining or hammock chair, F. H. Plummer ... 296,777
Refrigerator, J. Castell ... 296,923
Ribbon holder, A. Stevens ... 296,887
Ring. See Key ring.
Road engine, G. F. Page ... 299,998
Rock drill and well boring machine, W. C. Wells ... 296,804
Rocker and reclining chair, combined platform, P. B. Cupp ... 299,931
Rope or cable coupling, G. M. Green ... 297,073
Rotary motor, H. A. Tobey ... 296,894
Rotary steam engine, F. Stitzel ... 297,091
Rule, caliper, S. H. Bellows ... 297,056
Safes and vaults, electric locking mechanism for, H. F. Newbury ... 296,866
Safes and vaults, supporting the bolt work of, H. F. Newbury ... 296,867
Sash cord guide, W. C. Gilmer ... 296,830
Sash fastener, A. D. Ordway ... 296,997
Sash holder, S. A. Brown ... 296,723
Satchel, folding, R. Moffly ... 296,993
Sawmill head block, D. Parkhurst ... 296,999
Screw, A. Mitchell ... 296,991
Screw, S. Potts ... 297,004
Screw, wood, J. B. Low ... 296,982
Seal, C. H. Bundy ... 296,921
Seam finishing machine, Ober & Stevens ... 296,869
Seaming elevator buckets, machine for double, C. J. Williams ... 297,048
Secondary batteries, device for connecting the elements of, W. Lachlan ... 296,849
Sewing and embroidering, process of and cutting apparatus for, L. Bertrand ... 297,057
Sewing machine, carpet, G. Grisel ... 296,744
Sewing machine ruffling attachment, H. C. Goodrich ... 296,740
Sewing machine shuttle, E. H. Smith ... 296,790
Sewing machine thread moistening attachment, J. Nixon ... 296,770
Shade fixture, H. E. Stover ... 297,030
Shaft, flexible, J. G. Nichols ... 297,085
Shirt, J. H. Scriven ... 297,018
Shoe sole fastening, L. J. Atwood ... 296,908
Shovels, forming, E. A. Barnes ... 296,719
Shutter worker, L. Tilton ... 297,032
Sifter, ash, E. Bateson ... 297,054
Sifting machine, flour, F. W. Andrée ... 296,716
Signal. See Railway safety signal.
Signal light, nautical, M. White ... 297,046
Skate, roller, M. F. Hanlon ... 296,833
Skylight, C. A. Vaile ... 297,038
Smoke consuming device, J. W. & J. D. Smith ... 296,791
Soap, etc., machine for plotting, F. S. Rutschman. 296,878
Spark arrester, H. M. Stainfield ... 297,028
Spindle bearing, J. Kilburn ... 296,754, 296,755
Spinning machine spindle bolster, A. S. Hopkins. 297,962
Spouting elbow, D. B. Rock ... 296,786
Spring. See Vehicle spring.
Spring motor, J. W. Fawkes ... 296,738
Spring motor, P. A. Tarbox ... 296,889
Stamp, steam power, W. S. Sharpneck ... 296,789
Steam alarm and damper regulator, Jones & Reid 296,839
Steam boiler, J. Roberts ... 297,009
Steam boiler and furnace lining, C. McMillan ... 296,763
Steam engine, balanced, B. Field ... 296,944
Stereotyping apparatus, F. J. Smith ... 297,023
Stone crusher, T. A. Blake ... 296,914
Stone crusher, H. Sundquist ... 296,795
Stone dressing machine, F. Trier ... 297,036
Stopper. See Bottle stopper.
Stove jacket, W. H. Benson ... 296,911
Stump extractor, A. S. Croxton ... 296,929
Stump extractor, W. Smith ... 297,026
Stump puller, C. A. Blume ... 296,915
Sugar and apparatus therefor, washing raw, J. H. Tucker ... 297,095
Sugar evaporator, G. H. Grimm ... 296,743
Sugar, method of and apparatus for bleaching, O. B. & J. M. Stillman ... 297,029
Suspended adjustable chair and seat, H. S. Peck ... 296,775
Tag and tag fastener, G. W. McGill ... 296,768
Tan vats, apparatus for agitating the liquor in, T. A. Mayes ... 296,986
Telegraphic cable, W. R. Patterson ... 296,774
Telephone, W. Gillett ... 296,829
Terret, harness, H. F. & L. A. Townsend ... 297,033
Thermometer and barometer mould, etc., W. Somerville ... 296,793
Thill coupling, Rossman & Strever ... 296,787
Thill coupling, F. M. Stevens ... 296,794
Thill coupling, H. M. Wheeler ... 296,805
Thrashers or separators, recleaning attachment for, H. Campbell ... 296,923
Tire tightener, S. McCay ... 296,987
Torch, signal, J. Hall ... 296,952
Tool holder, A. Mercer ... 296,989
Toy, C. Diener ... 296,941
Toy and advertising medium, Burridge & Marshman ... 296,724
Toy building, W. S. Reed ... 296,783, 296,784
Traction engine. H. B. McMurray ... 296,862
Treadle mechanism, H. Leeming ... 296,854
Triturating machine, Boericke & Goll ... 296,816
Truck, car, McClure & Murdock ... 296,988
Truck, railway, L. S. Zachariasen ... 296,904
Truck, safety car, S. Brown ... 297,061
Truck, shifting, P. H. McWilliams ... 296,865
Trunk, W. J. Large ... 296,976
Tug, automatic shaft, J. T. Watson ... 296,899
Type writing machine. H. Orpen ... 297,086
Valve and muffler, safety, J. M. Coale ... 297,066
Valve grinder, H. W. Burleigh ... 297,063
Valve, marine safety, G. W. Richardson ... 297,007
Vegetable slicer, S. Kraushaar ... 296,757
Vehicle, hand power, T. A. Davies ... 296,936, 296,937
Vehicle spring, J. Howell ... 296,834
Vehicle spring, G. W. Morris ... 296,994
Vehicle, two-wheeled, W. T. Goodman ... 296,949
Velocipede, F. W. Jones ... 296,887
Velocipede, A. Pesenecker ... 296,776
Ventilator. See Window ventilator.
Vessel for containing liquids, W. T. Sallé ... 296,788
Vessel, non-heat conducting, H. M. Hanmore ... 296,955
Vessels, apparatus for filling, M. L. Best ... 297,058
Wagon, dumping, Boyce & Frische ... 296,917
Wagon, dumping, L. C. Dees ... 296,938
Wagon jack, J. F. Lindsey ... 296,979
Water closet, P. Connolly ... 296,822
Water meter, rotary, F. Stitzel ... 297,092
Weighing and supplying apparatus, H. E. Smyser 297,027
Wheel. See Car wheel. Fifth wheel.
Whip, A. C. Rand ... 297,006
Windlass, Zeigler & Graves ... 297,050
Window ventilator, show, G. W. Richwine ... 297,008
Wire, apparatus for galvanizing and coating, B. A. Grant ... 296,742
Wire coiling machine, L. Wildermuth ... 296,806
Wrench. See Lever wrench.
Wrench, J. Du Shane ... 296,942
Wrench, B. Ross ... 296,877
Wringer. See Mop wringer.
Yoke, neck, N. Hiatt ... 296,960
Zinc sulphide anhydrous, making, T. Macfarlane. 296,858

DESIGNS.

Album leaf, photographic, S. Meers ... 14,961
Cards, ace of spades for playing, A. Binkert ... 14,957
Sewing machines, ornamentation of, W. Haehnel. 14,958
Table ware, ornamentation of, C. A. May ... 14,960
Table ware, ornamentation of, Mountford & May ... 14,962
Type, font of, J. K. Rogers ... 14,964
Type, font of printing, C. E. Heyer ... 14,959
Type, font of printing, J. K. Rogers ... 14,963

TRADE MARKS.

Baking powder, W. Prescott ... 11,108
Beer and other malt and alcoholic liquors. Grande Societé Francaise de Distilleries, Malteries, et Brasseries ... 11,104
Bicalcium acid lactate, Avery Lactate Company ... 11,099
Buttons and studs, sleeve and collar, Howard & Son ... 11,092
Candy, French and other fine, Darby & Co ... 11,091
Cigars, F. Glahn ... 11,103
Cigars and cigarettes, H. Segnitz & Co ... 11,110
Coffee, roasted, Ricker & Lee ... 11,095
Condition powders, S. Jennings ... 11,093
Cordials and liquors, Les Héritiers de Marie Brizard et Roger, M. B. Glotin, Achard & Glotin, 11,105 to 11,107
Fertilizers, phosphate, Shroff & Co ... 11,111
Grape juice, unfermented, A. Werner ... 11,113
Matches, safety, Trummer & Co ... 11,097
Medicine for the cure of female diseases, C. F. Simmons & Co ... 11,096
Pens, metallic, G. D. Barnard & Co ... 11,087
Sewing machines, White, White Sewing Machine Company ... 11,098
Shade rollers, spring balance, C. H. Cushman ... 11,090
Shirts, drawers, and overalls, Rich & Levi ... 11,109
Soap, J. Armstrong & Co ... 11,086
Soap, olive oil, Liebman & Butler ... 11,094
Spool cotton, Clark Thread Company ... 11,100, 11,101
Tobacco, smoking, Wellman & Dwire Tobacco Company ... 11,112
Tobacco, smoking and chewing, G. W. Gail & Ax ... 11,102
Velvets, velveteens, velvetas, and similar pile fabrics, C. E. Bruce ... 11,088
Waterproof clothing, J. F. Carter ... 11,089

A printed copy of the specification and drawing of any patent in the foregoing list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired, and remit to Munn & Co., 261 Broadway, New York. 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.

Canadian Patents may now be obtained by these inventors for any of the inventions named in the foregoing list, at a cost of $40 each. For full instructions address **Munn & Co., 261 Broadway, New York. Other foreign patents may also be obtained.**