(27) C. Y. M. asks whether a long coupled wagon pulls easier or harder than a short coupled, or whether it is the same; and if one pulls easier than the other, why? A. The long coupled wagon will draw the easier, because the horses will have a greater leverage over a twisting strain, caused by an obstruction on one side of the road.

(28) W. G. R. asks how to prepare thin paper that, by writing on it with a pointed stick while lying on white cloth, the writing will be transferred to the cloth. Would like to have it stand washing. A. We do not know of an indelible transfer paper.

(29) H. G. M. asks the formula of a composition used in soldering to make solder stick. A. Dissolve zinc in muriatic acid until effervescence ceases; dilute it with a quantity of water equal to that of the acid.

(30) J. S. writes: I make an axle grease which I put up in cans. The trade calls for goods put up in wooden boxes. I placed some of my grease in such a receptacle, but cannot prevent the oils penetrating the wood. How can I treat the boxes in order to avoid that? A. Coat the inside of your boxes liberally with glue size.

(31) A. C. H. asks: What are the ingredients of gold solutions that deposit a red color on metal to be plated? I use the Smee battery; has that any effect on the coloring or gilding in this case, or what battery is best to use? A. A Smee's battery is as good as any for the purpose. For information on electro-metallurgy, consult SUPPLEMENT, No. 310.

(32) C. L. W. writes: Our house is alive with fleas from a pet cat. We have tried Persian insect powder without much effect; can you tell me of anything better for the purpose? A. The oil of pennyroyal will drive your fleas away. Beds made of pennyroyal for dogs to lie on will also drive away fleas.

(33) G. W. S. asks a receipt of some liquid or oil to place in gravity batteries that will keep them from evaporating and using up so quick? A. Any non-drying oil will do; try common lard oil.

(34) G. S. T. writes: I have an eighty barrel water tank on barn; the bottom of tank is 24 feet above the ground. A windmill supplies the tank automatically. My carpenter's shop floor is 26 feet below low water mark in tank and about 6 rods in a lateral direction; with a two inch pipe connecting tank to a suitable turbine at the shop, what amount of power ought to be developed, and in what time 80 barrels be run out, when turbine is at full work? A. The discharge of the 80 barrels of water will develop ¼ horse power for an hour, or ⅛ horse power for 2 hours. You will not realize more than 60 to 70 per cent of this power through a motor.

(35) Engineer writes: I have some celluloid billiard balls that have become faded. I wish to recolor them. What shall I use? A. Use the following colors in the proportion of about 10 grains to the gallon of water: Black, use nigrosine; for violet, methyl violet; blue, soluble blue; red, aniline red or magenta; green, malachite green. Dissolve these aniline colors in hot water. The balls are immersed in the hot water, and then allowed to cool in the coloring solutions until sufficiently dyed. Perhaps three to four hours.

(36) J. P. B. writes: Please give me a recipe for making the following inks, aniline preferred: green, blue, burnt sienna, yellow and purple. A. Green: Dissolve 1 part of iodine green in 100 to 110 parts of hot water. This ink writes a brilliant bluish green; if it is desired to give it a yellowish green tint, a little picric acid is to be added. Blue: Dissolve 1 part of the soluble bleu de nuit (bleu de Paris) in 200 to 250 parts of hot water. Yellow: Dissolve 1 part of picric acid in 120 to 140 parts of water. Purple: Dissolve methyl violet in sufficient water. For brown ink select a suitable aniline color that is soluble in water, and add a small quantity of alcohol and a little glycerine (1 to 4 per cent). The addition of these two ingredients is desirable in any case.

(37) E. S. writes: We have lately had our cistern cleaned. The water seemed perfectly clear and pure, without taste or odor; but as it had gotten quite low, and as the cistern had not been cleaned for several years, we thought it best to have it emptied and thoroughly cleaned. Since then, the water has had a very bad taste and smell, which we can notice even after it has been through the filter. Can you tell me why this is so? A. In cleaning your cistern you may have exposed the clean cement to the action of the water, which may have given it the taste of lime or alumina. As you do not tell us how it tastes or smells, we cannot well solve the mystery. The soot that was found in the cistern was no doubt derived from the smoke of soft coal, which deposits carbonaceous matter with a little pyroligneous acid upon the roofs where bituminous coal is used. This is washed into the cistern and becomes a deodorizer and disinfectant, finally settling as the black soot mentioned. If the water tastes and smells of lime or alumina, it is all right. If of decayed animal matter, it is all wrong.

(38) A. & F. B. ask if there is such coke manufactured in any part of the States as is used for fuel in English locomotives, and where. A. The coke made at Connellsville, Pa., is considered the best made in the United States, and nearly equal to the best English coke. You will find the names of makers in any commercial agency reference book.

(39) J. W. K.—There is no special examination required for entering the classes at Cooper Union. You must be 15 years of age. Appear in person, with a letter of recommendation if possible from employer. By calling at the office in second story of the institute you may obtain a circular containing all needed information.

(40) S. L. W. writes: Will a Breguet upright galvanometer, such as is sold for $10, do for experimental work in electric measurement, and also asks how to construct a cheap rheostat to use with the same. As I am studying electricity out of school hours, I do not wish an expensive instrument for the present. I principally wish to measure the resistance of batteries, electro-magnets, and short stretches of outside wires, principally on a private telegraph line. A. The galvanometer referred to will answer a good purpose; but one provided with a horizontal needle would be more serviceable, as it would be more sensitive. You cannot readily construct a cheap rheostat without having a standard rheostat with which to compare it. An imperfect instrument of this kind is of no value whatever.

(41) J. S. H. asks: Can you inform me what causes the ivory on piano keys to turn yellow? Some I have recently seen change in a few months from a pure white. Others, many years in use, still retain their original whiteness. Please explain the cause, and suggest a remedy or preventive. A. The yellow color of the piano keys may be due to grease absorbed from the fingers of the player, or it may be that the piano sits in a dark place or is generally closed. Under these circumstances ivory is apt to turn yellow. There are also many kinds of ivory, and the inferior qualities do not retain their whiteness without precautions. Good ivory keys having a liberal exposure to the light ought to retain their whiteness for many years. Ivory is bleached by exposure to sunlight for periods varying from four weeks to six months, or by immersion in turpentine. kept near the surface, and exposure to the sun for three or four days.

(42) L. P. A.—We have frequently published articles on microscopy and upon all the modern investigations in this branch of science. It is possible that we may in the future publish elementary articles on the subject.

(43) S. E. K. F. writes: I have constructed a small pressure blower as described on page 75 of vol. xxxix., SCIENTIFIC AMERICAN, and get a fair blast through a ¾ inch tube, but I cannot contract it so as to serve as a blowpipe, as I desire. Please give directions as to construction of pipe from the fan to the bench, say four feet. A. We do not think you will find it possible to so change your blower with any form of pipe as to make a blow pipe with much, if any, additional force.

(44) W. C. M. asks how to refine whale oil soap, so that it will produce a white lather. A. You will be obliged to first refine the whale oil. Whale oil soap is usually made from the sediment produced in refining the whale oil. 2. What is "English crown soap?" A. English crown soap is an imported soft soap used by harness makers and the like for rubbing and polishing leather. 3. Also soap stock. A. Soap stock is the residuum from cotton seed oil and from olive oil.

(45) J. H. G. writes: 1. How much of 100 per cent of bitartrate of potash or cream of tartar can be dissolved in one gallon of boiling water? A. Cream of tartar is soluble in 18 to 14 parts of boiling water. 2. Cream of tartar manufacturers utilize all their waste products, by converting them into tartaric acid. Can I use any other test besides litmus paper, for absolutely determining if sufficient lime carbonate has been used, to perfectly precipitate the first equivalent, and secondly, what is a good test for determining if all the tartaric acid has been freed from the potash in using the sulphate of lime? A. To determine the acidity by other means than with litmus is possible. You can add a little cochineal solution to a portion of the mixture, and then pour in potassium hydroxide (caustic potash) until the coloring disappears. This reaction will show you approximately how much lime carbonate to add. 3. Would hydrate of lime added to very weak solutions of bitartrate of potash take the place of lime carbonate for freeing the first equivalent? A. The use of hydrate of lime would not be as effective as the carbonate. The tartaric acid decomposes the lime carbonate, and we do not think such a reaction would follow if the hydrate was used. 4. Can the sulphur be freed from the potassium sulphate? If so, how? A. Barium chloride will precipitate the sulphur from potassium sulphate, forming barium sulphate and potassium chloride. 5. What work in chemistry, published, can I get, that will thoroughly post me in this particular industry? A. There is no literature available on baking powders other than articles found here and there in the SCIENTIFIC AMERICAN and other similar journals. Blyth's book on Foods may contain some information suited to your wants.

(46) F. G. H. asks if there is any foundation in fact for the prevailing belief that tomatoes cause cancer. And if so, why? Or, rather, how do they operate—by poisoning the blood, or otherwise? A. The belief, which has become quite common, that tomatoes cause cancer is utterly without foundation. There is not the slightest ground for fear in using freely what is really one of our most valuable vegetables. At the same time, they ought to be used like everything else, with proper moderation. Even a good thing may be abused, and a person may become so extremely fond of tomatoes as to consume an excessive quantity, and thereby derange the functions of the stomach. The acid nature of the fruit would, in such a case, perhaps, cause canker sores in the mouth. But it must be understood that there is no resemblance between cancer and canker, except the similarity of spelling. Cancer is a malignant, frightfully dangerous disease; canker is merely a result of disturbance of the stomach, and is commonly of small importance except from the pain and annoyance it causes. But even for this the tomatoes are not fairly responsible, for though, as stated, it may sometimes follow their very free use, yet with most persons no such result would occur. 2. Have you ever set forth the wonderful power of red clover in curing cancer, a fact indisputable, if taken before death is inevitable? A. The belief in the efficacy of red clover is not very common; it is local, and has no better claim than that concerning tomatoes. Very frequently harmless tumors are considered to be cancers; in such cases the various popular remedies—red clover (*Trifolium pratense*, cancer root (*Conopholis Americana*), etc., are used, and when the tumor disappears, as of course it presently does, a "cancer cure" is falsely reported, and a reputation for a perfectly inert remedy is established.

(47) W. G. S. writes: I wish to make a telescope as described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 252, and would thank you to explain the following: 1. Diameter of object glass as given is 2½ inches and external diameter of tube 3 inches; drawing shows both of same diameter; which is right? A. The internal diameter of the telescope tube should be larger than the clear aperture of the object glass. 2. How thick should paper tube be? A. The thickness of the tube is of no consequence. 3. Please give diameter of field and eye lenses. A. The diameters of the field and eye lenses are unimportant if they are of the correct focal length. 4. Paper reads eye aperture should be 1¼ inches; should it not be ¼ inch? A. The aperture should be ¼ inch. 5. What combination of lenses would you recommend for higher and lower power eye pieces than that described? A. It is only necessary to preserve the same relation between the focal lengths of the field and eye lenses for higher and lower powers. 6. What gauge of wire is used for gas lighting spark coils? A. Almost any size of wire will answer for this purpose; No. 24 is often used. 7. What should be size of coil? A. The coil may be 6 inches long, 2 inches in diameter for three or four burners. 8. How many Leclanche cells will be required to light a single burner? A. From two to four cells.

(48) W. F. D. asks (1) proportions and ingredients for blue prints. A. Dissolve 40 grains ammonia citrate of iron in 1 ounce distilled water. Also dissolve 1 drachm potassium ferrocyanide in 1 ounce distilled water. The foregoing solutions are prepared separately and kept from the light. 2. Chemical reaction in making making blue prints? A. The ferric compound (ammonia citrate of iron) is by the action of the light reduced to the ferrous condition, which with potassium ferrocyanide produces an intense blue coloration similar to Prussian blue. 3. Chemical action of bicarbonate of soda in bringing out white lines on blue prints? A. The soda bicarbonate turns the picture to a lavendar color, and prevents its fading. A dilute solution of acid (citric or hydrochloric) will produce the effect described by you, as it dissolves out the superfluous blue and so brings out the white lines.

(49) W. H. P. asks how alumina soap is made, and also where I can find a description of the hot air engine. A. There is a soap now manufactured in this country, in which caustic soda is replaced by the aluminate of soda. The latter can be prepared either from bauxite or from cryolite. Bauxite is calcined with soda ash, whereby an aluminate of soda is formed, and the iron is separated by lixiviation, the resulting liquors being evaporated until a dry commercial aluminate of soda is obtained. Powdered cryolite is mixed with six equivalents of lime and boiled with water, when an insoluble fluoride of calcium is formed, and the alumina becomes dissolved in the excess of caustic soda. If an excess of lime is used, the alumina will be precipitated, leaving the caustic soda alone in the solution. For making soap from aluminate of soda about equal parts of lard and tallow are preferred, and these should not be heated to a greater extent than is just necessary to liquefy them. The materials are not boiled in the usual way, but the combination is effected at the lowest temperature at which they can be intimately mixed. Hot air engines are described in the SCIENTIFIC AMERICAN SUPPLEMENTS Nos. 162, 247, 284, and 368.

(50) C. W. H. asks: Which is the best method of drying fish scrap after leaving a hydraulic press, whether by some machine or by a kiln? A. When steam is used for boiling and pressing, there will be economy in employing the waste steam, as well also as direct steam in coils of iron pipe in a drying room. Another plan is to make flues in brickwork under the floor of the drying room, making the floor itself of large tile laid over the flues, and carry the hot gases from the boiler furnace through these flues to the chimney, or, if not convenient, use a separate fire for the drying room flues. The slabs of scrap may be laid upon shelves. The coils of iron pipe may be made by any pipe fitting establishment.

(51) W. J. D. asks: Who was the builder of the first locomotive, and where first used? A. Cugnot, a Frenchman, made a small locomotive in 1769, which is still preserved in the Museum of Artsand Metiers, Paris. Watt took out patents from 1769 to 1784, on steam carriages or wagons, but not known to have made any. Symington made a model of a steam carriage in Edinburgh, in 1770. William Murdock built and actuated a locomotive in 1784, in Cornwall England. Oliver Evans, of Philadelphia, obtained patents in Maryland, U. S., in 1787, for the exclusive right to operate steam wagons on roads and railways. In 1803, a Mr. Fredericks built a locomotive for a mine in Hanover, Germany. Trevithick's first locomotive was running in 1802, and is considered the first effective effort on rails. Blenkinsop's locomotive, 1811. Hedley's locomotive, 1813, the "Puffing Billy." Dodds and Stephenson commenced their improvements in 1815.

(52) W. J. D. asks: 1. What is the best and most powerful battery for electro magnet? A. The plunging bichromate battery is the best for this purpose. 2. About how large should an electro magnet be, and how much wire in the coils, and what size, to lift a weight of 1,000 pounds, or as much as it will lift conveniently, at a distance of from 1 to 3 inches? A. An axial magnet would be better for your purpose than the ordinary form of electro magnet. The size of the helix and of the wire of which it is made will depend upon the kind of battery used and the manner in which it is connected up. It would be more or less a matter of experiment to determine the size of coil required to lift 1,000 pounds from 1 to 3 inches. 3. How is an electric reservoir made, and about how long would the electricity last in a reservoir 8 feet long, 4 feet high and 4 feet wide—8x4x4 feet—to lift the aforementioned weight at every second interval by disconnection of the wires? A. For information on storage batteries, consult SUPPLEMENT, Nos. 304, 332, 370, 215, and 354.

(53) J. H. K. asks (1) whether there is any metal or composition ("Delta" metal for instance) that will not rust or corrode when frequently used in water, and hard enough to bear as much friction (or more) as is required of ends of a sewing machine bobbin. Would bone, or zinc, or celluloid, or two of either do? A. Try phosphor-bronze. 2. Let me know also what is the best and cheapest battery to use to work on a line 40 to 100 yards long; and if a battery that is strong enough to work one telegraph instrument on a line like the above, how many more cells would be needed to work six or a dozen instruments on the same length of line? I would want the power of the magnets to be as strong if I had on a dozen as if only one or two, but do not know whether their power depends on the length of the line or on the number or strength of the cells of the batteries. What book or books would best teach me all these things? A. The power of the current on the line depends on the number of cells of battery employed; the gravity battery is probably best for your purpose. For full information on telegraph lines. instruments, and batteries, consult Prescott's Electricity and Electric Telegraph.

(54) S. A. H. writes: In your paper August 10, in No. 4 of Notes and Queries, you state that a carbureter for gas machine to supply 8 five foot burners should have 12 feet evaporating surface. I use Sisal hemp in my carbureting tank, the air passing over the fibers of the hemp, which have become saturated with gasoline; I therefore cannot tell what amount of surface I have. I use an iron tank 2 feet diameter and 2 feet high, fill it with hemp, and keep about 3 inches depth of gasoline on bottom; the air is introduced through a pipe, the end of which is under the surface of the gasoline; this is to supply five 6 foot burners; have carbureter in a cellar the temperature in which is sometimes as low as 32; use 88 gasoline. When weather is cold the gas is poor, making blue light. Is this the best way of making a carbureter? If not, will you please give directions for construction of a good one? A. Your carbureter is probably too small for cold weather. The iron tank in so compact a form absorbs heat from the surrounding air very slowly. Making it long and narrow is advantageous, or use two round ones. Any means that you can use for warming the air used in making the gas by taking it from the cellar will materially help the process. Some use hot water in a pan under the carbureter in winter. There are a great many patents on carbureters; you could not do better than to make them a study. Copies will cost 25 cents each. 2 Is chrome steel much better for lathe tools, etc., than the ordinary cast steel? Does it require different treatment, in forging and tempering, from cast steel? A. Chrome steel is good, but we do not know that it is any better than the best tool steel. The treatment in forging and tempering is the same as for tool steel.

(55) H. W. M. writes: 1. I would like to learn to read faces easily. Would you please inform me in Notes and Queries of a good work on physiognomy? A. To read faces easily is in a great degree a matter of personal faculty not easily learned. There is an excellent book called the "New Physiognomy," also one on "Comparative Physiognomy." 2. How are rings (finger) made? A. Finger rings are cast in moulds if heavy, or rolled out in bars, cut off the proper length, the ends hammered or rolled down to the proper size and bent into a ring around a mandrel; the ends are then cut and fitted for the desired size of ring and soldered together, then the rings are filed up and polished.

(56) C. P. K. writes that during the operation of a steam fire engine near his house, an iron leader shook very hard, so much so he was afraid it would break, seeming to shake in unison with piston rod of the engine. A. Probably the motion of the piston of the fire engine became synchronous with the vibrating properties of the leader, which induces vibration. This is a well known phenomenon in connection with bridges, which are often thrown into a severe vibration by a synchronous step or even the trot of a dog. 2. In your issue of July 12, you speak of the Payne process for preserving timber. Can you tell me what that process is? A. Payne's process for preserving timber consists in impregnating the wood, while in a vacuum, with a strong solution of sulphate of iron, and afterward forcing into the timber a solution of sulphate of lime, or any of the alkaline carbonates, such as carbonate of soda, by which means the oxide of iron becomes insoluble.

(57) J. W. S. asks: How can I harden the calks on horseshoes of malleable cast iron or of steel? A. The steel is low, or decarbonized, and like the iron is amenable best to casehardening. Heat the shoes so that the calks are red hot, either over a fire or in red hot lead, dip the calks in a pan of powdered prussiate of potash, and throw them into water.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

September 23, 1884,

AND EACH BEARING THAT DATE.

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

Acetates directly from metallic ores, manufacture of, J. A. Mathieu 305,524
Aerial transit by wire rope, etc., apparatus for, F. Byrnes 305,422
Alarm. See Fire alarm.
Animal trap, A. L. Bryan 305,664
Antiseptic compound, S. Cabot, Jr. 305,423
Artist's box, G. Stirrup 305,544
Auger, T. Newey, Jr. 305,625
Automatic lubricator, M. A. Dees 305,678
Awning, F. B. Mallory 305,614
Axle, car, Howe & Green 305,594
Bag holder, P. Cole 305,572
Bagasse pulverizer and furnace feeder, Hibberd & Hibbard 305,450
Bale tie, Brown & Deidrich 305,569
Baling box, O. Bulkeley 305,508
Band wheel, pulley, etc., S. Aland 305,651
Bar. See Claw bar.
Bark breaking and grinding mill, J. T. Phillips 305,711
Barrel heads, machine for trimming, A. Guerdan 305,447
Battery. See Stamp battery.
Bearing for pulley shafts of chain gearing, W. C. Mackinney 305,699
Belt fastener, G. W. Southwick 305,540, 305,541
Billiard and pool table, W. G. Morse 305,643

Billiard ball composition, A. H. & J. Gunklach. .. 305,448
Blast furnace, A. F. Wendt..... 305,553
Boilers, cut-off for kitchen. J. E. Boyle..... 305,504
Boilers, hand hole seat for, Pratt & Higgins 305,633
Boot and shoe counters, machine for shaping, L. Cote..... 305,427
Bottle stopper, T. B. Moore..... 305,704
Bottling machines, combined vent and safety-valve for, J. Mathews 305,525
Box. See Artist's box. Baling box. Pulley box. Sheet metal box.
Brake. See Vehicle drag brake.
Breeching loop, H. C. Maxwell 305,458
Brick, burning, C. F. T. Kandeler 305,599
Brick machine, R. N. Ross (r)..... 10,524
Brick machine, C. A. Wyman..... 305,728
Bridle bit attachment, N. J. Blatherwick..... 305,659
Brush, pen, G. Maderia..... 305,612
Brushes, drip cup and binder for paint, J. T. Sutton 305,545
Buckle, strap, H. Anisz..... 305,562
Buckle, suspender, H. Anisz..... 305,561
Buggy body, M. Y. Buck 305,507
Burner. See Gas burner.
Button, E. S. Mayer 305,620
Button fastener, O. W. Ketchum..... 305,456
Buttons, machine for manufacturing, J. F. Bapterosses 305,564
Cabinet scraper, J. A. Keiser..... 305,603
Calendar and business directory, monthly, J. C. Forth..... 305,586
Can. See Hermetically sealed can. Milk can.
Cans, machinery for the manufacture of, W. S. Doig..... 305,514
Car coupling, B. Bird 305,418
Car coupling, E. T. Leonard..... 305,707
Car coupling, S. B. McPheeters..... 305,527
Car coupling, H. Reid..... 305,634
Car loading and unloading device, P. H. Kane. .. 305,600
Car wheel, E. Cliff..... 305,671
Car wheel, W. E. Mason..... 305,616
Car wheel and axle, G. B. Trout..... 305,488
Car wheels, machine for rolling, O. Nioggemeier.. 305,706
Carrier. See Cash and parcel carrier.
Case. See Surgical case.
Cash and parcel carrier, G. W. Baldrige..... 305,414
Caster, revolving, J. S. Dignam..... 305,437
Check row wires, reel for, C. F. James..... 305597
Check rower, A. F. Dice..... 305,679
Chuck, F. Egge..... 305,580
Churn, J. F. & W. C. Cameron 305,570
Churn, rotary, E. H. Funk 305,444
Cigar support, L. L. Twiss..... 305,550
Clamping device, E. M. C. Anderson..... 305,497
Clasp for supporting garments, B. McGovern. . . 305,621
Claw bar, detachable, D. Christie 305,670
Clip. See Paper clip.
Clock, secondary electric tower, Pond & Munger. 305,632
Coating pipes, bars, etc., apparatus for, G. H. Everson..... 305,442
Cock for gas and water fixtures, J. Spruce..... 305,638
Coffee roaster, H. Wade *et al*..... 305,725
Collar, E. P. Shaffer..... 305,481
Conveying apparatus, G. C. Blickensderfer..... 305,566
Cooler. See Liquid cooler.
Cordage, machine for manufacturing, O. S. Bullock..... 305,509
Cotton condenser, J. Knott 305,695
Cotton gin feeder, A. L. Stietenroth 305,721
Coupling. See Car coupling. Thill coupling.
Cultivator, rotary, J. Mulion..... 305,613
Cultivator tooth attaching device, N. S. Johnson. 305,454
Cup. See Lubricating cup.
Curtain fixture, D. E. Kempster..... 305,455
Curtain fixture, window, C. E. Kemp..... 305,698
Cut-off valve, J. P. Simmons..... 305,718
Cut-off valve, B. Topmiller.....305,547, 305,548
Cutter. See Ice cutter.
Cylinder engine, revolving, J. J. Blair..... 305,565
Derrick, C. F. Ruff..... 305,536
Derrick, portable arch, A. Reitz..... 305,476
Digger. See Potato digger.
Door opener and fastener, A. M. Freeman 305,443
Drying machine, F. M. Ironmonger..... 305,596
Educational instrument, W. Forrest..... 305,585
Electric conductor joint, R. W. Kear..... 305,601
Electrical conductor, T. S. Reed..... 305,475
Electrical signaling apparatus, J. K. D. Mackenzie..... 305,611
Elevator. See Hatchway elevator. Hay elevator. Portable elevator.
Elevator, W. Stevens..... 305,542, 305,543
Elevator guards, mechanism for operating, A. T. Ramsdell..... 305,472
Elevator safety device, L. W. Hewett *et al*..... 305,689
Engine. See Cylinder engine. Gas engine. Rotary engine. Steam engine.
Engraving and chasing machine, H. P. Kent..... 305,605
Envelope, return registering, J. M. Crull..... 305,672
Evaporating alkaline solutions, apparatus for, J. P. R. Polk..... 305,631
Evaporator, J. T. Sangston 305,479
Excavator and skep, self-acting, T. Whitaker..... 305,493
Feed water heater, G. H. Zschech..... 305,557
Fence, J. Du Bois..... 305,682
Fence post, J. W. Cheney..... 305,571
Field roller, R. Braden..... 305,661
Filter, J. A. Crocker..... 305,574
Fire alarm and call bell system, electric, P. Gugerty..... 305,688
Fire escape, J. Finnegan..... 305,582
Fire extinguisher, Shobe & Flannigain..... 305,482
Fire extinguisher, automatic, J. R. Brown..... 305,663
Flames, producing pointed, T. P. Doane..... 305,439
Fringe, silk, C. A. Linnemann..... 305,696
Furnace. See Blast furnace. Glass flattening Furnace. Heating furnace. Smoke and gas consuming furnace.
Furnace, L. Metesser..... 305,461
Furnace, T. C. Zetzsche..... 305,650
Furnace water grate, R. P. Shackelford 305,480
Gauge. See Saw table gauge. Surface gauge.
Galvanometer, W. G. David..... 305,431
Garment supporter, B. McGovern 305,622
Gas burner, E. B. Requa..... 305,535
Gas, electric device for lighting, H. N. Williams.. 305,726
Gas engine, G. M. & I. N. Hopkins..... 305,452
Gas engine, P. Murray, Jr..... 305,464 to 305,467
Gas making apparatus, J. Carroll 305,510
Gas washing apparatus, J. Somerville..... 305,719
Gearing, H. Schulze-Berge 305,715
Gearing, B. D. Whitney..... 305,648
Gearing device, H. Schulze Berge..... 305,714
Glass flattening furnace, G. R. Williams..... 305,555
Glass, manufacture of plate, H. Schulze-Berge... 305,716
Glass surfaces and signs, decoration of silvered, L. Stern..... 305,732
Glassware, J. Dalzell..... 305,674
Glassware, A. Sperber..... 305,720
Grader, road, S. Pennock..... 305,533
Grain binder, J. A. Paige..... 305,470
Grain separator, A. B. Monck 305,528
Grate bar, A. Haarlander..... 305,589
Grinding mill, J. C. Dell..... 305,435
Grinding pan, G. H. Malter..... 305,700
Gun stock, folding skeleton, F. Schwatka 305,537
Hame, J. McParland 305,526
Hame fastener, G. W. Greene..... 305,588
Hame, harness, H. C. Maxwell 305,459
Hanger. See Sash hanger.
Harrow, A. Hirshheimer..... 305,592
Harrow, riding, P. Mougey..... 305,529
Hat sizing machine, J. G. Meeker..... 305,623
Hatchway elevator, J. W. Birely 305,419
Hay elevator, H. & L. M. McCown..... 305,619
Hay elevator and carrier, M. W. Chamberlain..... 305,666
Hay tedder, R. W. Dixon..... 305,578
Heat conductor and radiator, M. Ryan..... 305,713
Heater. See Feed water heater.
Heating furnace, T. R. Renwick..... 305,477
Heel nailing machine, M. A. Tyler..... 305,723
Heel trimming machine, O. Breuer 305,662
Hermetically sealed can, C. Drake..... 305,680
Hinge, awning blind, H. S. Tucker..... 305,549
Hog trap, H. C. Lower..... 305,609
Holder. See Bag holder. Pocket utensil holder. Spoon and fork holder.
Hominy mill, N. J. Tilghman..... 305,546
Honey extractor, centrifugal, G. W. Stanley..... 305,483
Hoop fastener, barrel, W. L. Jones 305,692
Hoop fastener or keeper, H. De Bus..... 305,677
Horse rake, W. S. Wilson..... 305,649
Hose support, fire, R. S. Van Zandt..... 305,490
House, portable, L. Forrest 305,584
Ice cutter or pick, C. F. Hall..... 305,449
Iron. See Soldering iron.
Jack. See Lifting jack. Pegging jack.
Jar, A. V. Whiteman..... 305,554
Jar fastening, J. Y. Sigafus 305,637
Joint. See Electric conductor joint.
Key, L. Hillebrand..... 305,451
Kneader and roller, dough, J. W. Reed..... 305,474
Knob attachment, P. Wagner..... 305,645
Knob attachment, door, J. K. Clark 305,426
Knob, door, W. I. Alvord 305,559, 305,652
Knobs, manufacture of door, W. I. Alvord. 305,558, 305,560
Ladder, step, N. Fisher..... 305,516
Lamp, electric arc, R. H. Mather..... 305,617
Lathe for turning polygonal forms, Pryibil & Mackintosh..... 305,712
Lathes, cutter support for hollow mandrel, E. H. Hudson..... 305,519
Leather working machine, J. A. Panton..... 305,532
Leer, portable, J. Dalzell 305,675
Leg frame, spring, A. Cote..... 305,573
Lifter. See Spittoon lifter.
Lifting jack, H. H. Brown..... 305,421
Lime during transportation, protecting unslaked, J. W. Ormsby..... 305,708
Liquid cooler and water filter, combined, D. H. Logan..... 305,523
Lock, A. B. Ewing..... 305,684
Loom for weaving chenille or Axminster carpets, and rugs, W. Adam..... 305,496
Loom shuttle, H. P. Garland..... 305,416
Lubricating cup, T. B. Merrill..... 305,460
Lubricating cup, J. L. Winslow 305,494
Lubricator. See Automatic lubricator.
Lubricator, A. Lotz..... 305,608
Measure, tailor's, J. R. Bechtel..... 305,501
Measuring distances, instrument for, J. P. Nolan. 305,626
Mechanical movement, J. H. Palmer..... 305,530
Metal shearing machine, Parry & Longstreth..... 305,709
Milk can, A. E. Brockett..... 305,505
Mill. See Bark breaking and grinding mill. Grinding mill. Hominy mill. Sawmill.
Mining machine, F. T. Chew..... 305,669
Mirror, hand, E. T. Starr..... 305,640
Mole trap, J. Gilbert..... 305,445
Motion, device for converting, E. Boettcher..... 305,503
Motion, device for converting, J. B. Eads..... 305,440
Motor. See Water motor.
Motor, A. D. Meunier..... 305,462
Nut, divider screw, G. S. Hilts (r)..... 10,523
Organs, key frame brace for reed, E. S. Votey.... 305,724
Ornamentation of metal and other surfaces, T. Courtright..... 305,512
Padlock, permutation, R. D. Green..... 305,686
Pan. See Grinding pan.
Paper clip, cutter, and rule, combined, W. H. Castles..... 305,665
Paper making machines, method of and device for washing the felt in, J. J. Manning..... 305,615
Paper, process of and machine for sizing or coloring, H. F. Case 305,424
Paper wheel or pulley, E. B. Martindale..... 305,702
Paving material from clay, making, W. Davy..... 305,432
Pawl and ratchet, W. A. Loud..... 305,697
Pegging jack, S. O. Brown 305,506
Pen, fountain, J. & T. Ross..... 305,678
Penman's assistant, W. H. Botsford..... 305,568
Plane, bench, J. A. Keiser..... 305,602
Planing machine, R. D. Whitney..... 305,647
Planter, W. W. Curtis 305,673
Planter, corn, M. Records..... 305,473
Planter, seed, E. A. Daniel..... 305,430
Planters, marker for corn, Taylor & Gray..... 305,641
Plow, sulky, J. R. Ervin 305,441
Pocket utensil holder, M. H. Kerner 305,521
Portable elevator, F. C. Starke..... 305,639
Post. See Fence post.
Potato digger, L. Norton..... 305,627
Power, device for regulating, J. Schinneller..... 305,635
Press. See Printing press.
Press, A. De Nobili 305,577
Printing machine, J. G. Northrup 305,469
Printing machine, plate, J. R. White..... 305,616
Printing press, T. Reichard..... 305,534
Puller. See Stump puller.
Pulley box, J. M. Aubery..... 305,655
Pulley, shifting, A. Berrenberg 305,417
Pulverizer, soil, W. R. Hinds 305591
Pump bucket, chain, C. S. Chase..... 305,667
Pump, chain, C. S. Chase..... 305,668
Railway, electric, E. M. Bentley..... 305,729
Railway, electric, W. H. Knight 305,694, 305,738
Railway, electrical, B. Bidwell..... 305,730
Railway head, A. T. Atherton 305,654
Rein support, L. D. De Mars..... 305,436
Roaster. See Coffee roaster.
Rock drilling machinery for oil wells, etc., Davies & Woods..... 305,676
Roller. See Field roller.
Rotary engine, B. T. Babbitt..... 305,656
Saddle and bridle for breaking horses, H. O. V. Kelley..... 305,604
Sash hanger, automatic, W. S. Greening 305,687
Sash rails, machine for shaping, G. W. Steele..... 305,485
Sawfiling and gauging device, D. E. Borger..... 305,660
Saw horse, R. Wylie..... 305,556
Sawmill, circular, J. H. Jones..... 305,598
Sawmill head block, R. W. Shelbourne..... 305,538
Saw table gauge, E. Baer..... 305,563
Scraper and ditcher road, N. Vars..... 305,491
Seats, reclining folding back for, L. B. Covert.... 305,428
Separator. See Grain separator.
Sewing machine, W. B. Palmer..... 305,531
Sewing machine, buttonhole, C. M. Banks..... 305,657
Sewing machine, buttonhole, D. Mills..... 305,624
Sewing machine lamp bracket, A. Harton..... 305,517
Sewing machine quilting attachment, J. W. Clayton..... 305,511
Sewing machines, automatic tension for, Dimond & Dial..... 305,433
Shaping and planing machine, G. Juengst 305,520
Sheet metal box, J. R. Patton 305,710
Shutter fastener, C. Drake..... 305,681
Size for use in textile manufactures, preparing a vegetable, Ducancel & Fortin..... 305,579
Skate, roller, T. H. Dean 305,434
Skate, roller, F. E. Vandercook 305,644
Skating rink, M. Vieweger..... 305,551
Sleigh, Kruger & Trim 305,522
Smoke and gas consuming furnace, M. Krudewig 305,457
Snow plow, railway, G. E. Sherry..... 305,717
Soldering iron, N. B. Mayhew..... 305,618
Sole or heel protector, R. S. Pickett..... 305,630
Spectacles, J. Franklin..... 305,685
Spittoon lifter, J. J. Anthony..... 305,658
Spoon and fork holder, glass, D. Barker..... 305,498
Spoon, jeweled, T. J. Pairpoint..... 305,629
Springs, machine for forming, G. Norwood..... 305,707
Stamp battery, G. H. Malter..... 305,701
Stamp, dating, W. E. De Lap..... 305,513
Stave sawing machine, C. M. Mueller..... 305,705
Steam boiler flue tube, J. A. Hopkinson..... 305,593
Steam engine, E. Catlin..... 305,425
Step or ladder, R. Hammill..... 305,590
Stopper. See Bottle stopper.
Stove and furnace, heating, M. T. Hynes..... 305,691
Studs, etc., fastening for, A. Bauer..... 305,658
Stump puller, J. A. Horseman..... 305,518
Surface gauge, C. P. Fay..... 305,515
Surgical case, M. F. W. Ohlemann..... 305,628
Suspender end, E. Deming..... 305,576
Suspenders, J. Lawrence..... 305,606
Suspension device, spring, A. S. Fontaine..... 305,583
Table. See Billiard and pool table.
Telephone, mechanical, J. V. Hyder..... 305,453
Telephone switch, H. E. Waite..... 305,552
Telethermometer, W. H. H. Barton..... 305,499
Thill coupling, B. Fahrney..... 305,581
Thill coupling, G. E. Smith..... 305,539
Thill coupling, H. Temple..... 305,642
Torpedo, submarine, J. W. Graydon (r)....10,525 to 10,527
Toy money safe, E. T. Gibson..... 305,587
Trap. See Animal trap. Hog trap. Mole trap.
Truck, harvester, A. B. Barker..... 305,415
Trucks, side bearing for car, J. F. Wallace..... 305,492
Tug, harness, L. A. Blood..... 305,567
Valve, E. R. Tomlinson..... 305,722
Valve, safety, W. C. Barr..... 305,416
Varnish, J. A. Shephard..... 305,636
Vehicle drag brake, C. Trim..... 305,487
Vehicles out of car tracks, device for turning, T. H. Macdonald..... 305,610
Vehicles, storm protector for, F. P. Stone..... 305,486
Velocipede, T. Humber..... 305,690
Velocipede, R. B. Lunsford..... 305,698
Veneer backing, L. H. Cremers..... 305,429
Wagon running gear, H. S. Nelson..... 305,468
Wagon, spring, G. F. Thompson..... 305,643
Wall paper trimming machine, J. M. Staples..... 305,484
Warping machine, F. Berckmans 305,502
Water and gas pipes, automatic electric shut-off for, T. P. Hughes..... 305,595
Water, apparatus for indicating the velocity or measuring the flow of, G. F. Deacon..... 305,433
Water motor, J. H. Culver 305,575
Weather strip, D. S. Early..... 305,688
Weather strip, E. W. Philbrook..... 305,471
Wheel. See Band wheel. Car wheel. Paper wheel.
Wheel, S. T. Williams..... 305,727
Wheel or pulley, E. B. Martindale 305,703
Window, W. C. Tucker..... 305,489
Window bead fastener, W. H. H. Barton..... 305,500
Wire stretcher, F. H. Bissell..... 306,420
Wrench and pipe tongs, combined, D. Witt..... 305,495

DESIGNS.

Clothes drier, G. W. Rhines..... 15,427
Hammer or hatchet, claw, N. B. Allyn 15,422
Ornamental stand, Cooper & Cohen..... 15,423
Range, cooking, W. E. Parfitt..... 15,426
Screw, coffin, W. E. Stevens..... 15,428
Tobacco package, C. W. Guerrant..... 15,424
Type, font of, H. Ihlenburg..... 15,425

TRADE MARKS.

Canned fruits, vegetables, fish, and meats, Davis, Baxter & Co..... 11,500
Cigars, R. Rendueles 11,516
Cigars, cigarettes, and smoking tobacco, Jacoby & Bookman..... 11,511
Disinfectants, C. F. Hilker & Co 11,509
Fire extinguishers, hand grenade, Harden Hand Grenade Fire Extinguisher Company..... 11,505
Flour, Eby & Reist..... 11,502 to 11,504
Flour, wheat, J. A. Cole..... 11,497
Gin, Cook & Bernheimer..... 11,498, 11,499
Glaze for furniture, Sylvester & Smith..... 11,517
Guns, sporting, Hermann, Boker & Co..... 11,508
Medicines put up for immediate use, J. C. Kennedy..... 11,512
Paints, W. B. Price 11,514
Pens, steel, G. F. King..... 11,513
Perfumery and toilet preparations, certain, J. & E. Atkinson 11,495
Petroleum, refined, J. W. Hunnewell & Co..... 11,510
Ribbons, Basel Ribbon Manufacturers' Association 11,496
Skates, roller, J. V. Rowlett..... 11,515
Spectacle and eyeglass frames, C. B. Headly, 11,506, 11,507
Smutters, separators, and brush machines, M. Deal & Co..... 11,501

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., 361 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 the inventors for any of the inventions named in the forgoing list, at a cost of $40 each. For full instruction address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.