

either from free acids or insects. Commercial sealing wax was used for stopping the leaks; is there anything better than this to cover the plates and prevent further corrosion? Also have you sufficient data to say how long the pipes (gas pipes) should last and not suffer from incrustations; length of same, 1,100 feet? A. If there are but few holes in the tank lining, the surface may be cleaned and the holes soldered up, or little patches of thin copper soldered over the holes. Then clean the tank thoroughly, and paint the inside with red oxide of iron and boiled linseed oil (Prince's metallic paint). Iron pipes if small close up by corrosion in from 3 to 6 years, according to the quality of the water. 2. We have a turret turbine that is corroded badly, and thereby prevents a free opening of gate; is there any fluid that could be put on to cut the rust and cause a free working of the gates better than kerosene oil? A. For clearing the rust from a turbine we know of nothing better than a scraper and painting as above. 3. Can No. 14 wire be used on an acoustic telephone by cabling each end securely to glass insulators and attaching smaller wire from the end of same to each diaphragm. or in other words does the sound travel through the metal or the wire move endwise in the vibrations of the transmitter? What is the best arrangement for a cheap and effective telephone, short line? A. Small wire, No. 22 to No. 24, should be used for an acoustic telephone, and connected directly to the transmitter, with sufficient resist to relieve the transmitter of undue strain. Small angles may be turned by passing around rubber suspenders. Vibrations are longitudinal. 4. Has heating by electricity been tried effectually, by whom and where, and what substances were tried as radiants for the electrical energy? A. Electricity is used only as a regulator of the heat, but does not furnish it.

(8) N. S. S. writes: I wish to paint an old building with crude petroleum. Please tell how I can treat the oil so as to make it dry readily without injuring its quality for the purpose needed. A. The only mixture that has any influence upon the petroleum as a paint lubricant may be found in resin and litharge; about 5 per cent resin powdered will be taken up by the petroleum, an equal quantity of litharge. Then add any common earth colors to thicken for a paint. The volatile part of the petroleum will evaporate, part of the oil will penetrate the wood, leaving the resin to cement the color.

(9) G. M. I.—The best arrangement for deafening floors is to have two distinct tiers of beams, one carrying the floor and the other the ceiling beneath. The ceiling beams are set lower than the floor beams, and between them. We then have the ceiling entirely separate from the floor, and there is nothing solid to carry the sound. Where this is not practicable, lay a double flooring with a layer of either concrete or felt between. The concrete will give a better result than the felt, but requires stronger beams. When the sound is to be deadened in the room containing the floor, the felt will probably give the best result.

(10) A. C. E. asks: How much internal pressure will a brass boiler 4 inches by 8 inches, one-sixteenth sheet, safely stand? A. Supposing the boiler to be 4 inches diameter, cylindrical, and 8 inches long, with raised heads, in the best form one-sixteenth inch best brass, it may be trusted to 15 pounds pressure. We do not approve of brass when copper can be had. In brazing the brass heads and seams you cannot use as strong brazing material as you can on copper, and more liable to injure the brass by burning.

(11) W. O. B.—Sodium and mercury combine readily under ordinary conditions by being brought in contact one with another. The union is attended with much hissing and spluttering. Johnson, Matthey & Co., the celebrated metallurgists of London, have a patented composition containing varying amounts of different metallic ingredients, including sodium. They prepare a concentrated amalgam, 10 pounds of which are to be used with 1,000 to 1,500 pounds mercury; the proportion of sodium employed does not exceed in all probability more than one per cent. How to make luminous paint is described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 249, page 3971.

(12) O. F.—An occultation is the eclipsing of one planet by another or of a satellite by its primary. The occultation of the moon by the earth took place on October 4, visible in eastern part of the United States and Europe. It is a perfectly natural phenomenon, of often recurrence and of no import to any but cranks.

(13) J. W. D. asks how to purify crude sulphuric acid. A. By distilling in either glass or platinum retorts until perfectly pure.

(14) J. A. B.—We do not know of any chemical to mix with kerosene oil for cleaning brass. Oxalic acid and water is a powerful cleaning agent, and can be mixed with pumice stone and rotten stone for cleaning, and polish with the oil.

(15) C. J. L.—With a steam pump capable of pumping 62 gallons per minute through 1,000 feet of 2 inch pipe to a height of 100 feet you will require a 10 horse power boiler. An 8 horse power will do the work at 60 pounds pressure. The absolute power absorbed by the transit of the water is only about 2 horse power. The rest is waste, radiation, and friction of pump.

(16) H. C. C.—The usual size of saws for cutting split cord wood is from 18 to 20 inches. Your 2 horse treadmill will not drive a large saw for useful work.

(17) F. P. writes: I am using a solution of soap and water for toilet purposes; it thickens like jelly and will not flow from the bottle, while if I make it thin enough to flow it will be too thin for use. Is there anything I can add without injury to the soap that will make it flow about like molasses? A. Use glycerine or glycerine and alcohol. The exact proportions would have to be determined by experiment.

(18) J. H. W. asks: Which of two screws will stand the greatest strain—one of ten threads and the other of twelve threads to the inch; threads to be square, the thread on one end to be right hand and on the other end left hand, sliding in a nut embracing about one-third the diameter of the screw, the right

and left hand ends pulling, of course, in opposite directions? A. The question is not one of the relative strength of threaded bolts; its conditions are those of a "worm" and "worm gear." The coarser thread is the stronger.

(19) W. S. R.—The best as well as the cheapest way of using pennyroyal to get rid of fleas is to use the herb itself; the oil, of course, cannot be used where the inconvenience attending it would be greater than the evil to be overcome.

(20) T. D. & Co. ask: What is done with the dross of zinc left at the bottom of galvanizing pots? A. Galvanizing works here sell all their dross to refiners. SCIENTIFIC AMERICAN SUPPLEMENT, No. 176, gives two or three modes of treating the dross.

(21) J. A. T. asks: Is there any oil that annatto will assimilate with thoroughly, and yet not increase the thickness of the oil to any marked degree? If so, what is the process? A. Annatto is soluble both in the essential oils, as oil of turpentine, and in fixed oils. You have your choice therefore of using almost any oil you please. Cotton seed oil will probably suit.

(22) A. F. S.—There is no method of applying a permanent coating of silver without a battery. Knives are sometimes coated with tin, which gives them a white appearance something like silver. This is done by thoroughly cleaning the surface, and then dipping the knife endwise into melted tin covered with oil or wax to prevent oxidation.

(23) W. H. R. asks for a chemical or combination of chemicals which upon exposure to the light will turn instantly black. Preparations of nitrate of silver are too slow in their action to answer my purposes. A. There is no chemical, as far as we know, that will so turn black on being exposed to the light. The silver salts are considered the most sensitive in their behavior toward light.

(24) N. H. asks how long a balloon one foot in diameter is required to lift ten pounds? Also how long a balloon of eighteen inches to lift ten pounds? Also the best method to cover a balloon so as to make it gas tight. A. For 1 foot diameter, 180 feet long; for 18 inches diameter, 80 feet long. Rubber varnish is probably as good as any for balloons. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 312, 249, 413, about balloons and their construction.

(25) H. J. O. asks to be informed of the ingredients used in making good sporting powder, and the proportions of each used; and also what is used for glazing it, and how it is glazed. A. The exact proportions vary with the different manufacturers. According to Crookes, the following figures express approximately the composition of the best kinds of sporting powder:

Salt peter .....	74.84 per cent.
Sulphur .....	11.84 "
Charcoal .....	13.32 "

The glazing is accomplished by causing the grains to rub against each other in revolving wooden barrels.

(26) W. writes: A favorite glaze among the potters in Iowa is composed as follows:

Oxide lead .....	55
Feldspar (calcined) .....	15
Flint .....	15
White clay .....	10
Paris white .....	5
	100

Practical potters differ in their opinions as to the object and effect of each of these ingredients, and also as to how their respective proportions are determined; will the SCIENTIFIC AMERICAN please explain? This glaze fuses at about 2,000° Fahr. A. Practical potters, as you say, differ as to the object and effect of these ingredients. Their use has grown up from experience, without any definite cause or reason why they should be used, more than that they accomplish the purpose. The oxide of lead probably increases the fluidity of the other substances which are used, likely as tending to produce the glaze proper. The exact proportions can easily be determined by quantitative analysis.

(27) H. A. H.—For your purpose in coating chromes we would recommend you to use wax dissolved in ether or benzine, or else take ordinary white shellac varnish and dilute it with alcohol.

(28) J. W. T. writes: How can I heat chafing dishes from boiler that now heats the house by coils of pipe, or will I have to get a separate boiler? A. You may make a flat coil, and set the dishes upon it. The steam may be made to circulate from the house-heating supply pipes for winter service. At other times a hot water circulation from the kitchen boiler may be utilized.

(29) C. V. D.—Zinc is the most sensitive of the metals. It expands and contracts two one-hundredths of an inch in 10 feet for a change of 10° in temperature. Glass expands and contracts the least. Rods of glass and zinc arranged together make a good thermostat. Also some use sheet brass and sheet iron soldered together and coiled in a helix.

(30) W. J. K. asks: Is there any way in which I can keep oysters longer than one week in a cellar, and if I can feed them in any way? A. There is no way of feeding oysters. They are best kept in a cool, damp, dark cellar, and under such circumstances they will sometimes live as long as two months, oysters generally getting fatter and better when so kept a few days. 2. A receipt for making ice cream on a small scale. A. The following is given by Marion Harland: 1 quart rich milk, 8 eggs—white and yolks beaten separately, and very light—4 cups sugar, 3 pints rich sweet cream, 5 teaspoonfuls, or other seasoning, or 1 vanilla bean, broken in two, boiled in the custard and left in until it is cold.

(31) J. S. writes for a simple method of finding the amount of water per horse power per hour consumed by an engine, by the indicator diagram, and says Haswell gives a method and example on page 572, where he says: "Volume of steam at above pressure (15.3) compared with water (15.3+14.7)=883." Where does he get the 883? A. By turning to page 574, you

will find the volume of steam for 1 cubic foot of water for pressures up to 200 pounds. A blunder in the steam tables makes it necessary to add the atmospheric pressure—14.7 pounds—to the indicated pressure in your boiler in order to obtain the tabulated volume due to the pressure. Hence 70 pounds + 14.7 pounds = 84.7. Opposite this number you will find, by interpolating the fraction, (nearly) 344 cubic feet, which is equivalent to 1 cubic foot of water at 70 pounds pressure. There is a typographical error in the sign quoted from Haswell; X should be +, which is the index for the tabular number 883. Thus for your engine we find area of cylinder 201 square inches, length of stroke 18 inches, cut off by card 0.5 inch, whole length of card 3.64 inches; then  $18 \times 0.5 = 9.07$

$$\frac{364}{9.07} = 40.13 \text{ inches=length of stroke at moment of cut off}$$

$$\frac{2473 \text{ inches} \times 201 \text{ square inches} \times 2 (2 \text{ half strokes})}{4473.000} = 2588 \text{ cubic feet}$$

497 cubic inches  $\times 150 \times 60 = 4473.000$ —2588 cubic feet of steam per hour; pressure on boiler 70 lb.

atmospheric pressure 14.7 "  $\frac{84.7}{84.7}$

Page 574, tabular number for 84 pounds is 346, and for 85 is 342. The nearest whole number is 344, as explained above. 2588

$\frac{2588}{344} = 7.52 \text{ cubic feet} \times 62.5, \text{ weight of a cubic foot of water} = 470 \text{ pounds of water per hour.}$

$\frac{470}{2588} = \text{pounds of water per pound of coal.}$

(32) F. D. R. asks: 1. Is there any soluble substance which can be made insoluble through currents of electricity? A. There is nothing, as we understand your question, that can be made insoluble by the electrical current. Decomposition, producing precipitation, as shown in the case of copper sulphate, results from the action of the current, but it is not the copper sulphate that is made insoluble, rather that it is decomposed. 2. Is there any chemical agent which will make a soluble substance insoluble? A. If potassium bichromate is added to glue and exposed to the light, the glue is rendered insoluble.

(33) J. R. M. writes: A friend claims that if you could put fresh ripe fruit in a vacuum, it would keep for an indefinite time. I say it will not keep a month. To put it another way: If you put fruit in a vessel and exhaust the air, how long will it keep in its natural state? A. Theoretically, the fruit would keep indefinitely, but it is an absolute impossibility to obtain any such vacuum, for the pores of the fruit are full of air. In canned fruits the cooking is supposed to destroy organic germs; then the cans are boiled to exclude air, a final pin hole being left for this purpose to be sealed up last; but even this cannot be said to absolutely get out all the air, and so there is a limit to the keeping qualities of all canned goods.

(34) A. G. asks: 1. How can I harden ordinary car spring rubber nearly as hard as soft wood, yet have it as tough after hardened as before? A. Rubber that has been vulcanized cannot be readily hardened unless it contains a greater proportion of sulphur than it should for spring rubber. In such case further vulcanization would harden it. 2. What can I mix with plaster Paris in casting small articles, to make it hard, to prevent being easily broken, to turn easily in a lathe; would like it as nearly white as possible; or do you know of any other composition or substance that can be turned in lathes? A. A small quantity of flour of marshmallow added to your plaster will render it easy to turn, and harden it somewhat. Plaster mixed in a solution of alum becomes hard on setting.

(35) P. R. writes: In a lecture recently, the remark was made that water or any fluid would flow more steadily, or produce a steadier stream, through an elastic pipe than through a non-elastic one, or in other words, through a rubber pipe than an iron one, other conditions being the same. If so, what is the reason? A. We have no data in regard to comparative flow of water in solid and elastic pipes, but if the statement is true, it must be because the elasticity of the pipe lessens the friction.

(36) J. R. T. asks how walnut furniture is polished; I mean what is termed oiled walnut, such as sewing machines and fine bedssteads. I am not a furniture maker, but would often polish walnut articles, such as wall brackets, etc. A. There is an excellent wood filler now largely used. In the absence of this, first mix with good whiting such colors as will produce as near as possible the color of the wood to be filled. This mixture to be dry. Then give the wood a good coat of oil, and sprinkle the mixture over the work until it is pretty well covered; then with a soft rag or other substance rub this in well. Wipe off all superfluous material. Let dry thoroughly, and varnish. To give the highest degree of luster to varnish after it is laid on, it undergoes the process of polishing. This is performed by first rubbing it with very finely powdered pumice stone and water; afterward rub patiently with an oiled rag and tripoli until the required polish is produced. The surface is then cleaned off with soft linen cloths, cleaned of all greasiness with powdered starch, and then rubbed bright with the palm of the hand.

(37) J. P. L. writes: Would you let me know what the average price of mushrooms is per pound, during the year in New York, and when the season for them begins and when it ends? A. The price of cultivated mushrooms at Fulton Market averages 75 cents per pound, the wild 35 cents per pound. The season of the cultivated begins about January and ends in May; that of the wild extends from August to the middle of September.

(38) C. A. writes: Can you tell me how to make a good gold ink? Can it be made out of this gold paint or bronze powder? Also a good, bright silver ink. I want an ink that can be used with an ordinary steel or gold pen. A. Gold and silver inks are made as follows: 24 leaves gold, half an ounce bronze gold, 30 drops spirits of wine, 30 grains honey, 4 crachms gum arabic, 4 ounces rain water; rub the gold with the honey and gum, and having mixed it with the water, add the

spirit; or else 1 part gold, 3 parts aqua regia; mix and evaporate until all the chlorine is driven off; cool, and mix well with ether and thicken with naphtha or essential oils. Use genuine gold leaf. For silver use either silver foil or leaf, dissolved in nitric acid, and thicken with naphtha or essential oils as described previously. You also will find in SCIENTIFIC AMERICAN SUPPLEMENT, No. 157, several recipes for gold and silver inks.

(39) J. H. N. wants to know of any one that ever was successful in making luminous yellow paint, after formula given in SCIENTIFIC AMERICAN, about a year ago. He has tried it every conceivable way, and it won't work. A. The manufacture of luminous paint will always be impracticable in this country until the exact nature of the calcium sulphide from which it is made is better understood. All that is in use at present is imported.

(40) J. R. C. asks for a formula of a black writing ink that will resist all tests. A. Dissolve 25 grains of powder gum copal in 200 grains of lavender oil by the aid of a gentle heat, then add 2½ grains of lampblack and half a grain of powdered indigo.

(41) W. B. writes: Can I not secure a constant influx of fresh air for my stable by ending a pipe in the stable and carrying the other end up a hill above building far enough to give the air a proper head? Suppose I make this pipe of 4 inches diameter, would the air rise up through one inch perforations made at various places along its course in the building? If so, it appears to me that thorough ventilation can be attained, and that with air deprived of its chill in winter and its heat in summer. What is desired in stables as well as dwelling houses is avoidance of cold draughts of air. If air will escape through perforations made in the conduit, the stable man can easily attain perfect ventilation. A. The air will draw in at the perforations, provided there is any inducement by difference in gravity between outside and inside air in the uptake. This can only be obtained by heat in calm weather. Exposure to the heat of the sun of the vertical pipe will induce a current in the pipe on a still, unclouded day. A draught cap will do well for all times when you need ventilation the least; but when there is a dead, muggy air, all devices except artificial heat fail. A 4 inch pipe for a stable is entirely inadequate to its requirements; 8 or 10 inches diameter with artificial heat in the vertical pipe is the only means of obtaining proper ventilation when it is most needed.

(42) T. G. M. S.—At present writing we do not believe that there is any demand for ozokerite in this country; there have been several companies started for the purpose of working the Utah deposits, but until satisfactory means of refining the crude mineral are found they are not likely to do much. Its uses are the same as those of wax, and principally for the manufacture of paraffine candles. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 36, page 593, and also on page 640 of SCIENTIFIC AMERICAN SUPPLEMENT, No. 401.

(43) W. D. asks about the method of equipping buildings with perforated pipes, with the small holes sealed with metal that will melt at a low temperature, on the automatic shower principle. I want to know how to fit them, what size pipe is used, how far apart the holes should be and what size, and is there any patent on the principle? A. The automatic fire extinguishing apparatus, consisting of a system of pipes distributed throughout the mill, with fusible metal plugs and valve fastenings, is the subject of a great many patents, covering the details of apparatus and as much of the principle as a patent can cover. The kind that have small holes or open perforations to be flooded by opening valves in a protected place or on the outside of the building are, we believe, not now the subject of patent. It will be difficult to instruct you in the detail of these methods without an engineering study with plans of the building and the points that require particular protection; we think that you will best serve your interest by addressing the manufacturers of automatic apparatus.

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

E. L. S.—The shiny flakes are graphite, a substance valuable in the arts for the manufacture of lead pencils, crucibles, stove polish, and lubricators. Its value is not very great, as it is a common mineral, and the larger factories own their own deposits.—L. S.—The specimen is pyrite, or iron sulphide, of no value.

## INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

November 11, 1884,

AND EACH BEARING THAT DATE.

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

Amalgam for filling teeth, W. C. Davis .....	307,921
Amalgamating machine, centrifugal, G. W. Pearsons .....	307,982
Annunciator, electro-magnetic, A. C. Palmer .....	307,966
Artist's color holder and palette, I. W. Hey-singer .....	307,768
Automatic motor, McCraney & Johnson .....	307,785
Bag. See Mail bag.	
Baling press, G. W. Smith .....	307,812
Banknotes and paper therefor of asbestos, manufacture of, G. T. Jones .....	307,956
Barrel, knockdown, J. H. Miller .....	307,971
Bath, combined electro, vapor, and warm air, J. B. Campbell .....	307,745
Battery, W. S. Hogg .....	307,945
Bee trap, drone, H. Alley .....	307,737
Bell, double hammer, F. O. Landgrane .....	307,860
Belt tightener and brake attachment, combined, M. W. Brey .....	307,839
Belt, woven machine, W. L. Teter .....	308,044
Bessemer converter, H. Schulze-Berge .....	307,874
Binder or fastener, metallic, J. F. Tapley .....	337,817
Boards, machine for matching, B. S. Atwood .....	307,789
Boiler. See Range boiler.	
Bookkeeper's chair or stool, G. B. Edwards .....	307,850
Books, etc., cover for, S. Van Campen .....	307,888

Boots or shoes, seam protector for moccasin, E. A. Buck	307,744	Fruit and vegetable drier, J. C. Gunn	307,854	Safe, J. R. Grove	307,937	Logs and planks, J. Spencer & Co.	11,660
Bottle for holding and applying blacking, etc., J. Stevens	307,878	Fruit, etc., drier for, J. B. Belcher	307,741	Safes, perforated plate for kitchen, G. W. Knapp	307,959	Mineral waters, ginger ale and analogous beverages, Medical Lake Mineral Water Company	11,658
Bottle stopper, M. Rubin	307,990	Fuel composition, R. M. Breiling	307,838	Sail, ship's, C. F. Jones	307,932	Mowers, lawn, Blair Manufacturing Company	11,645
Boole stopper clamp, L. B. Wollard	307,825	Furnace, See Gas furnace. Hot air furnace.		Sash fastener, A. G. Safford	307,805	Mustard leaves for sinapisms, P. Rigolot & Co.	11,665
Box. See Paper box. Signal box.		Furnace for annealing glass and treating, annealing, and tempering metals, J. A. Tatro	308,009	Saw handle clamp, A. McNiece	308,037	Needles for hand and machine sewing, J. James & Sons	11,658
Brake. See Car brake. Wagon brake.		Furnace for the calcination of ores, J. Douglas, Jr.	307,924	Scaffold clamp, H. Steinebrei	308,005	Oils, burning, illuminating and lubricating, H. W. Peabody & Co.	11,636
Bread, making, T. Monierichard	307,978	Furnaces, siphon tap for, J. S. Curtis	307,845	Scraper, dirt, H. O. Hooper	307,856	Paints, ready mixed, G. D. Wetherill & Co.	11,670
Bridge, J. F. Anderson	307,896	Gauge. See Weatherboard gauge.		Semaphore signal, W. Thornburgh	308,013	Paper, wood pulp used in manufacturing, O. Baerlein	11,648
Bridge chords and stay rods, self-adjusting coupling for, W. Ireland	307,770	Garment stand, W. H. Knapp	307,960	Sewing machine shuttle, A. Tracy	308,016	Pins, brooches, and hat and dress ornaments, Jersey, hair, and scarf, A. Luthy & Co.	11,656
Broom holder, H. Harger	307,761	Gas and electric light fixture, combined, L. Stieringer	307,879	Shells for breech-loading firearms, paper, Union Metallic Cartridge Company	11,640	Refrigerators and cooling receptacles, J. Linsley	11,655
Brush, dampening, J. Stevens	307,877	Gas burner, I. W. Heysinger	307,765	Silo press, C. W. Jefferson	307,951	Remedy for dyspepsia and kindred stomach diseases, J. G. Schumacher	11,638
Button attaching implement, J. A. Smith	307,999	Gas, electrophorus for igniting, C. W. Weiss	307,823	Silo, automatic, J. P. Hyde	307,951	Remedy for kidney diseases, A. Bowens	11,628
Buttonhole in India rubber goods, J. Beck	308,029	Gas furnace for forming glass, etc., J. Anderson	307,829	Skate, roller, G. D. Burton	307,840	Saddle bags and buggy cases, A. A. Melther	11,659
Camera, Lewis & Barker	307,965	Gate. See End gate. Sliding gate.		Skate, roller, C. H. White	308,025	Salad dressing, Horton, Cato & Co.	11,633
Can. See Milk can.		Gate, A. King	307,773	Skate, roller, E. J. Worcester	307,826	Salt, sea, Tidman & Son	11,639
Can heading machine, J. Brakeley	307,908	Gelatine, fat, etc., extraction of, C. D. Ekman	307,754	Sleight, J. Kinney	307,958	Sauce, R. v. Briesen	11,664
Can holder, J. W. Edwards	307,929	Governor or speed regulator, R. D. Napier	307,975	Sliding gate, J. L. Smith	307,997	Shells for breech-loading firearms, paper, Union Metallic Cartridge Company	11,640
Can opener, C. Schwerdtfeger	307,991	Governor, steam engine, J. L. Bogert	307,835	Smoke consuming furnace, G. W. Mears	307,970	Soap, hard, N. K. Fairbank & Co.	11,649
Car and air brake coupling, combined, J. F. Batchelor	307,902	Grater, H. Bioch	307,742	Sod cutter, seeder, and harrow, combined, W. F. Hubbard	307,949	Soap, laundry and toilet, Lautz Bros. & Co.	11,635
Car brake, E. W. Dwight	307,849	Harrow, sulky, Pack & French	307,977	Soda, manufacture of bichromate of, W. Simon	307,994	Stove polish, Wood Bros	11,671
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Car coupling, P. Campbell	307,910	Hay carrier, C. E. Hunt et al	307,950	Spinning frame, ring, W. E. Sharples	307,875	Tobacco, plug, Hicks & Brunhild Bros	11,632
Car coupling, H. W. Johnstone	307,955	Hay fork and carrier, J. Farrell	307,932	Spinning frame, ring, M. E. Sullivan	307,980	Tobacco, plug and twist, G. C. & D. Ayres	11,627
Car coupling, W. T. Jordan	307,957	Hay fork, horse, F. H. Bolte	307,906	Spool blanks, machine for cutting off, Allen & Morrison	307,736	Tobacco, smoking and chewing, C. W. Allen	11,626
Car coupling, O. S. King	307,774	Heater. See Steam heater.		Spout sieve, D. B. Weichtman	307,822	Watch cases, composition, J. C. Dueber	11,647
Car coupling, R. W. Thomas	308,011	Hoe, horse, M. Hardenbrook	307,999	Spring. See Vehicle spring.		Wine, champagne, T. Roederer & Co.	11,666
Car coupling, Titus & Bossinger	308,014	Hoisting and lowering gear, J. W. Porritt	307,999	Sprinkler. See Street sprinkler.		Yarns and chenilles, knitting and embroidery, W. H. Horstmann & Sons	11,661
Car coupling, D. Wertz	307,824	Hoisting machine, R. C. Smith	307,813	Square, combination try and bevel, H. W. Merrill	307,787		
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Car replacer, D. A. West	307,896	Hydraulic elevator, C. W. Baldwin	307,740	Stone, machine for rabbeting, grooving, or moulding, A. McDonald	307,865		
Car step, folding, I. W. Fleck	307,985	Hydraulic elevator, J. Smith	307,998	Stopper for rubber tubes, C. Richtmann	307,811		
Carpet cleaning machine, A. A. Boyer	307,837	Ice chipping or cutting machine, N. S. Chandler	307,913	Stove burner, oil, R. E. Dietz	307,847		
Carrier, top bow, A. C. H. Ritter	307,803	Ice making, D. Smith	307,996	Stovepipe thimble, J. L. Wilber	307,887		
Carrier. See Cash carrier. Hay carrier. Twine carrier.		Injector, S. Macfarlane	307,967	Stove, range, J. Roy	307,804		
		Inkstand, I. W. Heysinger	307,764	Street sprinkler, C. D. R. Perkins	307,983		
		Insulator, Cleveland & Kent	307,916	Swing, E. J. Smith	307,811		
		Knife. See Pocketknife.		Table, C. Kossbiel	307,962		
		Lamp burner, petroleum, O. Passow	307,793	Tanning hides, apparatus for, R. Spitta, Sr	308,008		
		Lamp, electric arc, E. J. Houston	307,769	Target, H. M. Quackenbush	307,799		
		Lamp, electric arc, A. Serrallier	307,808	Telegraph key, C. Borchers	301,836		
		Lamps, cut-out for electric arc, E. Thompson	307,819	Telegraph, printing, G. A. Cassagnes	307,841		
		Lasting machine, G. Hawkes	307,763	Telephone circuit, H. Van Hoevenbergh	308,020		
		Lath, mortise, W. G. Richards	308,041	Telephone, mechanical, M. Randolph	307,800		
		Lath, metallic, J. W. Wissinger	307,893	Telephonic circuits, anti-induction device for, H. Van Hoevenbergh	308,019		
		Lathe attachment, B. A. Barnes	307,901	Thermometer magnifying device, H. C. Kirk et al	307,775		
		Leather, cutting and forming shanks, etc., from, S. A. Lentz	307,779	Thill coupling, F. A. Wittich	308,026		
		Leather, machine for cutting shanks, etc., from, S. A. Lentz	307,780	Tools by electricity, apparatus for operating, C. J. Van Depuele	307,884		
		Liniment, G. Deikman	307,748	Ton, W. Vogel	308,045		
		Lock. See Fence lock. Staple lock.		Traction engine, N. J. J., & E. Johnson	307,771		
		Log turner, W. F. Fidler	307,934	Trap. See Bee trap.			
		Loom for weaving double pile fabrics, C. Coup-land	307,747	Trowel, H. A. Peace	307,981		
		Lubricating cup, G. T. Shackelford	307,992	Truck, hook and ladder, E. F. Steck	307,816		
		Lubricator. See Crank pin lubricator.		Tube. See Mining tube.			
		Machinery, reversing mechanism for, C. B. Cottrell	307,844	Tubing, manufacture of, T. B. Sharp	307,998		
		Magnet, electro, W. A. Leggo	307,777	Turbine wheel, L. B. Swartwout	307,881		
		Mail bag, C. F. Walters	308,021	Twine carrier, H. W. & C. W. H. Prindle	307,798		
		Measure, automatic grain, F. M. Sommer	308,001	Umbrella frame rivets, machine for making and inserting, D. M. Redmond	307,987		
		Measures, tallying attachment for, J. A. McIntosh	307,786	Unwinding attachment for spools and bobbins, C. E. Wilkinson	307,890		
		Meat tenderer, E. Richmond	307,802	Valve gear, engine, F. C. Simonds	307,995		
		Mechanical motor, I. N. Groves	307,863	Valve gear, steam engine, T. Barber	307,898		
		Mechanical movement, C. H. La Due	307,859	Valve, piston, R. De Palacios	307,750		
		Metals from copper matte, separating the, J. J. & R. Crooke	308,031	Valve, piston, W. W. St. John	308,007		
		Milk can, J. H. Hoover	307,947	Vehicle spring, S. G. Smith	308,000		
		Mill. See Rolling mill.		Vehicle, two-wheeled, A. Hofmann	307,943		
		Mining tube, pneumatic, Leonard & Corcoran	307,861	Velopede, R. C. Fletcher	307,757		
		Mortises, tool for making lock, Drowne & Hubbard	307,848	Wagon bodies, device for removing, W. H. Lowe	307,884		
		Motion device for converting, T. S. Peck	307,868	Wagon brake, W. Benthin	307,903		
		Motor. See Automatic motor.		Wagon top, C. R. Parks	307,978		
		Mowing machine, H. L. Hopkins	307,948	Watch case, J. Macher	307,968		
		Nailing machine, G. F. Cass	307,912	Watch, stop, E. J. A. Dupuis	307,925		
		Oatmeal machine, A. Swingle	307,882	Water wheel governor, C. E. Gibbs	307,758		
		Oil cup, automatic, J. H. Wilkinson	307,891	Wax, composition for sealing, G. W. Coddington	307,746		
		Oscillating chair, C. Wetterhan	308,022	Weatherboard gauge, Dyer & Maxey	307,927		
		Packing, piston, Barendt & Carter	307,831	Wheel. See Fifth wheel. Turbine wheel.			
		Parlor fountain, D. Lienhop	307,966	Whiffletreeclip, R. S. Clark	307,914		
		Paper box, C. M. Arthur	307,897	Whip, E. M. Turner	308,017		
		Paper pulp, treating vegetable fiber for the manufacture of, D. Minthorn	307,972	Wool drier, F. G. & A. C. Sargent	307,873		
		Pessary, E. F. Hofmann	307,944				
		Piano music rack, A. Feldin	307,933				
		Pipe wrench, A. Barbour	307,830				
		Pipes, adjustable rod and box for water, gas, and steam, H. E. Earle	307,763				
		Planing machine presser roll, W. M. Dwight	307,926				
		Planter check row wire, corn, A. C. Evans	307,755				
		Planter, corn, A. Runstetler	308,042				
		Plow, W. J. Davidson	307,919				
		Plow, S. B. Ezell	307,756				
		Plow, J. N. Stevenson	308,006				
		Plow jointer, T. C. Belding	307,832				
		Plow, spade wheel, H. Skillings	307,809				
		Plow, sulky, J. P. Black	307,834				
		Pocket attachment, safety, J. P. Preston	307,797				
		Pocket knife, I. W. Heysinger	307,767				
		Portable ventilator, T. C. Perry	307,794				
		Pot. See Coffee pot.					
		Press. See Baling press. Cotton press. Printing press. Silo press.					
		Pressure regulator, automatic, J. Collis	308,080				
		Printing press, P. S. Dodge	307,922				
		Pump, J. J. Birch	307,905				
		Pump, G. E. Chandler	307,842				
		Pump, W. M. Johnston	307,964				
		Pump barrel, C. E. Loth	307,862				
		Pump piston, force, S. P. Spooner	307,815				
		Rack. See Piano music rack.					
		Radiator and stove shelf, combined, W. Lichtenbergh	307,782				
		Railway signal system, Hadden & Van Hoevenbergh	307,760				
		Railway switches, safety appliance for, B. Briody	307,909				
		Railways, safety driveway for cable, I. W. Heysinger	307,766				
		Railways, electrical conductor for, A. M. Nepper	307,791				
		Range boiler, H. P. Folsom	307,852				
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		Reel. See Harvester reel.					
		Refrigerating cars, process of and apparatus for, H. Tallichet	308,008				
		Refrigerator, E. B. Jewett	307,857				
		Regulator. See Pressure regulator.					
		Ring. See Finger ring.					
		Road, gravity pleasure, P. Hinkle	307,942				
		Roaster. See Coffee roaster.					
		Rock drilling machine, Harkness & Shaw	307,762				
		Rock for grindstones, etc., machine for channeling, M. J. O'Connor	307,792				
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