Notes & Queries

R. W. S. asks: How are toy balloons made?

P. W. asks: What two metals cause frictional electricity with very little rubbing?

W. J. asks: Where can the photometrical apparatus of Erdmann be seen, or where is it described at full length?

C. S. says: In building the dome for a new telescope, I desire to make it exceedingly light, so that it may revolve more easily. Over a light ash frame, I glue thin pine boards, and, on the boards, canvas. The dome will be very rigid. I want some reasonably cheap material to cement on the canvas, so that, in case rain gets through any crack in the paint, the canvas will not come off. The dome is to be of 22 feet diameter and 10 feet high.

Answers to Correspondents

P. W. should read Noad's "Student's Manual of Electricity." See our advertising columns for books on mechanism.—A. D. W. will find a recipe for paste on p. 170, vol. 24.—B. J. will find directions for repairing rubber garments or boots on p. 155, vol. 26.—C. S. will find a recipe for glue impervious to moisture on p. 202, vol 28.—O. A. D. can mold india rubber by the method described on p. 283, vol. 29. Wood can be fastened to rubber with glue.—R. L. W. and J. E. R. should refer to p. 299, vol. 28, for a blackboard composition.—C. A. K. will find instructions for bleaching sponge on p. 379, vol. 28.—J. R. W. should read the article on p. 258, vol. 29, for instruction as to a substance that will ignite in contact with the water.—S. will find a recipe for jet black drawing ink on p. 10, vol. 25.—W. B. will find directions for making plastic (not imitation) rubber on p. 283, vol. 29.—J. C. should try the recipe for cement for meerschaum on p. 202, vol. 27, on his broken ivory. Read Lyall's "Manual of Geology."—C. H. S. should consult our advertising columns for books on mechanism.

C. A. T. asks: Which do you consider the most efficient wheel to be used for a flat bottomed boat with a sharp bow and a scow stern? Her sides are perpendicular; size of boat is 5 x 25 feet. Should I use side wheels, paddle wheel at stern, or the Fowler wheel? The draft of boat does not exceed 10 inches. Which do you consider will drive the boat the fastest? We can not use a screw to any advantage with such light draft. With sufficient power, what speed could we get from the best wheel? Answer: You might get a speed of from 5 to 6 miles an hour, by using a stern wheel; and if it was made with feathering floats, it might be quite small.

F. H. J. says: I am about to construct an engine with 4 inches stroke x 2 inches bore. Would steam pipe of ⅛ inch internal diameter and exhaust pipe ⅝ inch internal diameter be large enough? 2. Would a boiler 20 inches long x 12 inches diameter x ⅛ inch thick, of iron, furnish enough steam to run such an engine 150 revolutions a minute? How many pounds steam would a boiler of the above description stand, and how many pounds would it take to run the engine 150 revolutions a minute? Answers: 1. The following table, taken from W. S. Auchincloss' valuable work on "Link and Valve Motions," will doubtless be of interest to many of our readers:

Speed of piston, in feet per minute.	Area of steam pipe.	Area of exhaust pipe.
200	0·025 area of piston.	0·040 area of piston.
250	0·032 " "	0·047 " "
300	0·39 " "	0·055 " "
350	0·046 " "	0·062 " "
400	0·053 " "	0·070 " "
450	0·060 " "	0·077 " "
500	0·067 " "	0·085 " "
550	0·074 " "	0·092 " "
600	0·080 " "	0·100 " "

The engine of our correspondent is to have a piston speed of $150 \times 4 \times 2 \div 12 = 100$ feet per minute, so that the areas given in first line of the table will be more than sufficient. These would give a steam pipe a little over five sixteenths of an inch in diameter, and an exhaust pipe nearly seven sixteenths. 2. This question cannot be answered definitely, as our correspondent does not state how much power he wishes to produce. If the engine is well constructed, it should give 150 revolutions per minute, running light, with a very low pressure of steam. Probably it would be well to proportion the boiler with about 20 square feet of heating surface per horse power.

W. Y. C. asks: 1. Are the yearly differences in the variation of the magnetic needle always the same for New York city? 2. Are the differences from year to year always the same for any place? 3. If not, is there any place which has an equal yearly difference, and what is it? 4. If the answers to 1 and 2 are affirmative, then are the yearly differences of any two or all places alike? 5. What is the relation between the differences of places, if any? 6. Is there any rule for finding the variation of the needle for any year, at any place? If not, what are the variations for January 1, 1873 to 1877? 7. If the yearly difference varies, what is the rate of variation? 8. What are the extremes of the variation east and west, what is the length of time between them, and when will the next extreme be reached? 9. Does the line of no variation extend around the earth? If so, does it all lie in a plane? Is this plane the plane of a great circle, and does the line joining the extreme northern and southern points of this great circle make a fixed angle with the axis of the earth, and, if so, what is that angle? If the angle is variable, what is the rate of variation, and what is the angle at present? 10. Where does the line of no variation run on the surface of the earth at present, and what is its rate of progression at the equator? 11. What are the fusing and decomposing points of solidified nitrate of silver and nitrate of copper, or do they fuse before they decompose? Answers: 1. No. 2. No. 3. Extended observations would seem to indicate that there is no such place. 4. The yearly differences of many places, situated on lines of equal variation, are nearly the same. 5. If you mean by this the general law, probably there is none, as the magnetic variation is affected by climatic influences, and other variable elements. 6 and 7. Empirical formulæ have been established for various stations, based on a number of observations, but it is not certain that they are correct. In New York the annual variation seems to increase or diminish at the rate of one minute in ten years. 8. This is by no means accurately determined. 9 and 10. There appear to be two agones, or lines of no variation, one in America and the other in Asia. Neither line lies in a plane. 11. Nitrate of silver is fused at 426° Fah., without decomposition. Nitrate of copper decomposes before the melting point is reached.

J. P. asks: 1. Can one or two spinning jennies or mules be profitably operated by gin gearing, so that any farmer who has the means may spin his own cotton before it leaves the gin house? In other words, can one or two such machines be worked economically? 2. How many spindles are run by one frame, and what is the cost per spindle, or what is the cost of all the apparatus necessary to convert the lint into thread? Answers: 1. Probably not as economically as they are used in a large manufactory. 2. You had better address a dealer.

P. F. D. asks: If a model bridge 10 feet long bears 100 times its own weight, will one 100 feet long (having all its dimensions correspondingly increased) bear 100 times its weight, supposing both to be equally well constructed? You say that models are generally stronger than structures; is this because they are better built, or why? Answer: It does not follow because a model bridge of 10 feet will support 100 lbs., that a bridge of ten times the length and ten times the size in its parts will support ten times that load. Models of bridges are generally stronger in proportion than large structures because the materials are subjected to less proportional strain. The load that a bridge can sustain becomes less and less as the span is increased.

A. L. R. asks: 1. Are not inside cylinder passenger locomotives more expensive than outside cylinder engines, or why is it that so many more outside cylinder engines are now built in this country than inside cylinders? 2. What is the chief objection to inside cylinder engines? Answer: Outside cylinder engines are better adapted to sinuosities and irregularities of the track, which is probably the reason why they are so largely used in this country.

A. F. H. says: I have lately constructed an electric or telegraphic clock, and find difficulty in reversing the current. I employ platinum cups filled with mercury and platinum points for immersion. The platinum points will oxidize and, in course of time, stop connection. Is there anything to prevent this? Hard friction I cannot well employ. Answer: We know of nothing that will prevent the oxidation of the platinum points by the continual succession of electrical sparks. You might use a break in the form of a slider, as in Bain's electric clock. This slider is worked by the pendulum rod, and ought to offer little friction.

R. K. asks: Why does a locomotive engine cut her guides in running backwards, and not in running ahead, even in wet weather, so that it cannot be from dust arising from the ground? It is not from lack of oil. We have two engines that will do it nearly every time. Answer: We see no reason why this should occur in general. We infer from your remarks that such action only takes place in two of your engines; from which it would seem as if the trouble might arise from imperfect fitting.

J. W. asks: 1. When, where, and by whom was lead ore first discovered? 2. Has volcanic action anything to do with the formation of true fissure veins? Answers: Lead is one of the metals most anciently known, being mentioned in the books of Moses in the Bible. 2. Geologists do not agree in regard to fissures which now constitute veins. Some attribute them to unequal support in different parts of the same mountain, in consequence of which the unsupported part sinks; others ascribe them to drying and cracking of the strata; while others, and perhaps most at the present day, declare their origin to be due to earthquakes and subterraneous fire or volcanic action.

G. H. W. asks: Are the very small wax tapers dipped, or run in molds? Answer: They are cast in molds.

G. W. H. asks: What acid will cover new cast iron with a thick coat of rust, in from 10 to 12 hours, so as to destroy its porosity? How strong should it be used? 2. Is it possible to force water from a boiler up and into radiating pipes, if the pipes do not contain a vacuum? Answers: 1. Probably a solution of sal ammoniac will be the best thing to use. 2. We should suppose not, under ordinary circumstances.

C. asks: Is there any thing that will give sausage skins a sweet smell, as they are sometimes quite offensive? Could anything be made to give them the flavor of white wax? Answer: We would recommend packing your skins, fresh or immediately after pickling, in common molasses or a mixture of molasses and vinegar. Coating them with a thin film of wax might answer as regards the flavor, but would probably be too expensive.

M. J. F. asks: How can I color wax? I want to produce green, red and yellow, and also the intermediate shades, such as are used in the manufacture of wax flowers. The colors used must stand heat sufficient to melt the wax, in which I dip the molds to secure proper shape for leaves, etc. Answer: Stir into the melted wax the following pigments, in quantity until properly colored, thoroughly incorporating the ingredients. For green, Schweinfurt green, the aceto-arsenite of copper. For red, vermilion. For yellow, chrome yellow. Use more or less coloring matter according to the shade required.

C. R. asks: How can I prepare the best and cheapest fireproof paint for wood? Answer: Soluble glass, sometimes called water glass, makes a good fireproof varnish. You might use ocher or other pigment to give body. To make soluble glass: fuse together 1 part silica (fine white sand) and 2 parts carbonate of soda. Use boiling water as a solvent.

A. B. says: I claim that the Monitor was the first turret ship ever built. A party claims that the first one was built in England. Answer: We think you are right, although it is claimed that several models for this class of vessels had previously been made.

N. W. asks: 1. Is there any way in which water can be intermixed with coal oil, and stay mixed? 2. Can you tell me how to make lemon extract? Answers: 1. It is possible to make an emulsion or mechanical mixture of coal oil and water. Take any convenient quantity of coal oil, and add from 10 to 20 per cent of water, according to the specific gravity of the oil; the greater the specific gravity, the more water. Churn the two together thoroughly, by stirrers or heaters, adding during the operation from 2 to 5 per cent, of the water used, of caustic lime. 2. Steep dried lemon peel in hot water; then filter the liquid and evaporate to dryness.

W. J. S. asks: 1. How can I tin a soldering bolt? 2. How can I make Seidlitz powders? Answers: 1. Clean the bolt, heat it, apply nitric acid, and rub it on the solder. 2. Seidlitz powders are generally put up in different colored papers, white and blue. The blue paper contains 2 drams of the double tartrate of potassa and soda, and 2 scruples of bicarbonate of soda; and the white paper, 35 grains of tartaric acid.

H. S. asks: 1. How are brass castings bronzed? 2. How is brass purified in the crucible? 3. Can the metal be overheated in the melting? 4. What metal will wear the best in fresh water on a screw wheel steamer outside bearing, 1 to 6 copper and tin, or 1 to 8 copper and tin? Answers: 1. Dissolve 2 drams of sal ammoniac and ½ dram of binoxalate of potash, in 14 ounces of clear vinegar; apply the mixture to the brass, first heating the latter slightly. 2. The impurities generally rise to the surface. 3. Yes, the zinc may be volatilized. 4. Probably Babbitt metal will do as well as anything.

T. C. E. asks: 1. How is shellac dissolved in borax to make the cement for amber? What will dissolve the gum of the peach tree? Alcohol will not. Water will only soften it. 2. How is Indian ink made? 3. Can you give me the algebraic formula for finding the area of a pipe to convey the steam necessary for any horse power? 4. Please give me a formula for finding the power exerted by a given bulk of water, having a given depth, on a suction water wheel of a given diameter. 5. To raise any given amount of water to a given hight, what proportion of applied power does a centrifugal pump require, as compared with any other pump? 6. How can I temper brass springs? Answers: 1. Shellac and borax are both solids. Probably either will dissolve the gum you speak of. 2. Indian ink is mostly, if not entirely, manufactured in China. It has been analyzed, and appears to be composed of lampblack and animal glue. 3. See article on efflux of steam, page 113, current volume. 4. We do not understand what you mean. 5. It depends on the hight to which the water is to be raised. Within certain limits, the centrifugal pump is more economical than a direct acting steam pump. 6. By hammering them.

S. W. asks: 1. How many square feet of canvas will give a horse power on sailing vessels? In using windmills on land, does it require a much larger number of square feet of surface to average a horse power than on the water? When the windmill is placed in a favorable position, how many feet of surface are required to give a horse power? 2. At what angle should the sails of a windmill be set to give the best results? 3. Why do not the mechanics oftener use wind power? 4. Where does the common house fly have its nest or breeding place? 5. In Georgia there is a small fly which gets into a person's eyes and ears, and is, in this wet season, a great annoyance. It is very small, has a yellowish body, and does not bite, but it will go right into the eyes or ears; a very little wind will drive it away. Where does it multiply? Answers: 1. The force of the wind in pounds per square foot, as given below, approximately for different velocities:

Velocity in miles per hour.	Force in pounds per square foot.
1	0·005
4	0·079
5	0·125
10	0·492
15	1·107
20	1·968
25	3·075
30	4·429
35	6 027
40	7·875
50	12 300
60	17 715
80	31·490
100	49 200

2. This depends on the relative velocities of the wheel and wind. 3. They could, if the wind would accommodate itself to their wants. 4. In cracks or crevices. There are so many varieties of files that we could not attempt to describe them. 5. We cannot tell.

J. A. M. asks: How do electricians calculate the resistance on a telegraph wire, and how do they determine where a rupture has taken place? Who is the best author on the subject? Answer: To ascertain where a break has occurred in a telegraph wire, the charge of electricity which the wire from either station will contain is first measured; and if the charge per mile is known, the amount actually observed will give the distance of the break. A galvanometer is used for this purpose. Consult Noad's "Electricity."

W. R. H. says: I wish to build a small steam boat, about 30 feet long and 6 feet wide. 1. What should be the size of her engine and boiler? 2. What should be the diameter and pitch of screw wheel? 3. What would be about the cost of her machinery, complete? 4. How many persons could she carry conveniently? 5. When loaded with as many as she can hold what would be her speed on still water? 6. Are there any regular builders of such small steamers; and if so who are they? Answers: 1. Cylinder 6 x 9. boiler with 125 square feet heating surface. 2. Diameter 2 feet pitch 3 feet. 3. From twelve to fifteen hundred dollars. 4 From fifteen to twenty. 5. Seven or eight miles an hour. 6. Yes. Insert a notice in our Business and Personal columns.

N. asks: Can you give me a delicate test for the pressure of citric and tartaric acids? 2. Also the composition of the onion, and tests for the same? Answers: 1. Citric acid is frequently adulterated with tartaric acid. To detect this, dissolve the acid in a little cold water and add to the solution a little acetate of potash. If tartaric acid be present, a white, crystaline precipitate of cream of tartar will be produced on agitation. Citric acid is soluble in water and alcohol, and the precipitate from its aqueous solution, by acetate of lead (citrate of lead), is dissolved by nitric acid. Tartaric acid is slightly soluble in alcohol, and a solution of potash causes a white granular precipitate of cream of tartar, soluble by agitation in excess of the precipitant. 2. Onions contain gum, sugar, and an oil containing sulphur.

M. B. asks: What are the ingredients of vulcanized rubber, and their proportion? Answer: Vulcanization of rubber is effected by combining it with sulphur or the mineral sulphurets. The process is differently conducted in different manufactories. Caoutchouc combines with from 12 to 15 per cent of sulphur, and vulcanization can be affected by dissolving the rubber in naphtha, charged with a sufficient quantity of sulphur to become a compound solvent of the rubber 10 to 12 per cent of its weight of sulphur is then added to the naphtha paste and thoroughly incorporated. The article is then molded into any form required. The temperatures for vulcanization by the common method range from 320° to 330° Fah.

J. C. G. asks: Can you tell me of a good elementary book upon electricity, and a good practical and scientific work on telegraphy? Answer: Apply to any good bookseller for Noad's book on electricity, and for Pope or Culley on electric telegraphy.

G. F. asks: Is there an instrument for finding buried gold and silver? Answer: No.

F. S. asks: How can I galvanize, or tin, or otherwise make brilliant and rust proof, a flat polished surface of cast iron? Answer: Dip the plate first into muriate of zinc, and afterwards into a tin bath.

P. S. A. asks: How do lapidaries drill quartz and hard stones? What kind of tools do they use? Is any kind of grit or quartz required? Answer: They ordinarily employ steel drills, with either diamond dust or the dust of the stone that is to be drilled.

P. C. C. says: 1. By what rule (if any) can I determine the power per square foot of a river current? 2. How large a paddle wheel do I need to place in a current running three miles per hour, to obtain 10 horse power? 3. Is there a better than the paddle wheel for use in a current? Answers: 1. The theoretical power per square foot of a river current is found by multiplying the discharge in pounds per square foot per minute by the velocity in feet per minute, and dividing by 33,000. 2. Make the wheel so that it will have at least two floats in the water at a time, exposing about 13 square feet of surface to the current. 3. We think not.

H. B. B. asks: 1. In driving electro-magnetic engines, is intensity of current, or quantity, required? 2. What is the most powerful electro-magnetic engine known, and on what principle is it constructed? 3. Has any electro-magnetic engine been constructed for driving small machinery economically? 4. What is the most constant cheap battery manufactured? 5. What is the chief difficulty in the general use of electro-magnetic engines? Answers: 1. Both intensity and quantity are required. 2 and 3. Professor Page, in 1850, constructed an electro-magnetic engine, of between 4 and 5 horse power, which was exhibited at the Smithsonian Institute. It worked upon the principle of the attraction of a helix upon a piece of soft iron suspended vertically in it. Other machines have been made upon the principle of the attraction and repulsion of electro-magnets upon armatures of soft iron, made to revolve in front of them. Such machines are made to drive sewing machines. 4. Daniell's is a good constant battery. 5. The difficulties are the limited distance within which the magnetic attraction is practically exerted and the cost of maintaining the battery current.

S. A. W. asks: 1. When were the first United States postal cards issued for general circulation? 2. A few months back you told of a sure cure for rats made by mixing plaster of Paris and some other substance together. I want to find what the other substance is. 3. If a rat should be killed by that method, and get in between the walls, what would remove the smell? Answers: 1. In the early part of May, 1873. 2. Wheat flour. A very good rat poison is made by putting some phosphorus into flour paste, adding some lard and spreading on bread. 3. Probably nothing, except removal of the rat.

A. K. says: Beavers are building a dam in a stream which we have to ford, and the dam has backed the water up until the ford is three feet deeper than it was before the dam was built. Now A contends that when the stream rises two feet, the stream at the ford will still be three feet deeper than it would if the dam was not there; I don't think it will. Which is right? The banks are, of course, supposed to be perpendicular. 2. What will cure the effects of poison ivy? It is very plentiful here, and some persons are affected so that their eyes swell till they are shut, and remain so for several days. 3. Is there any difference between poison ivy and poison oak? The kind that grows here is not a vine, but grows in dwarfish bushes six or eight inches high. 4. Is there any ink which will write jet black or bright blue, and, after a few days or weeks, disappear entirely? How can I make it? Answers: 1. As we understand the question, you are right. 2. The subnitrate of bismuth is said to effect a cure. 3. We think not. 4. We do not know of any.

J. B. says: 1. Suppose I have a vertical cylinder, something more than two feet high, open at the top and fitted with an airtight piston of one square inch area. Let the piston be supposed to be without weight and capable of moving in the cylinder without friction, and let the cylinder be impervious to and destitute of capacity for heat. Further, suppose the piston placed one foot from the bottom of the cylinder, and the air at both sides of the piston to be of the same temperature and pressure; now if the air underneath the piston has its temperature raised 273° C., the volume will be doubled and the piston will be raised one foot. Again, let the original conditions be resumed, and let the piston be prevented from rising; on heating the enclosed air 273° C., its elastic force will be doubled. Let any further supply of heat be now withheld, and let the piston be made free to rise with merely the weight of the atmosphere to keep it down; it is evident the elastic force of the enclosed air will cause the piston to rise, so long as there is an excess of pressure underneath it; heat will be consumed in this operation, and the temperature of the air will fall, no heat being supplied from without. To what hight will the piston rise, and what will be the temperature of the enclosed air? 2. Suppose I compress a quantity of air to a pressure of ten atmospheres, what would be its temperature? And after compression, if the air be cooled down to 183° C. and be then allowed to expand and perform work, what will be its temperature after expansion? Answers: 1. It would be necessary for us to know the original temperature of the air. You will find the whole question thoroughly treated in the late Professor Rankine's treatise on the "Steam Engine and other Prime Movers." 2. You do not say how much you propose to expand the air.

S. M. S. asks: What will kill roaches immediately? I have been feeding them with strychnia for a week, and their sanitary condition is greatly improving. Answer: If the poison alone is not sufficient for their extermination, you should try something more efficacious. Phosphorus paste is recommended.

S. J. J. says: There is a leak, under heavy pressure, at the lower end of the water column of a mining pump. Suppose the leaking to be x gallons per minute; is the loss of power as great as though the same quantity escaped from the upper end of the column and fell back into the main? Answer: Yes, if the pressure under which the water escapes is the same as that of the water that is elevated.

C. M. N. says: The dates on worn coins can be read by heating to a dull red and dropping into cold water. The letters and figures will appear black, and the plain parts white. If they do not show brightly, try at a different redness. A piece of coin, hammered perfectly flat and smooth, will show plainly. I think the reason that a worn coin will show is that the coin is pressed, and of course the raised parts are softer; and the heating and sudden cooling has a different effect on the parts. Another reason is that coins do not wear perfectly flat; the raised parts are still slightly elevated, although they do not show.

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

J. H. M., of L. I., describes certain growths, asking what they are. Answer: Numbers 1, 2, 3, represent a very common fungus called *mucor mucedo*. It belongs to the same family of parasitic plants as *penicillium glaucum*, *puccina graminis*, *cephalo-sporium* and others. The fact that the rain water was filtered and placed in a tightly corked bottle does not prevent their growth; because the germs from which they originate are present in the air enclosed in the bottle and in the water itself. If the water were first boiled and then sealed up free from air, no fungus would grow. From the description given of No. 5, the object appears to be a crab which frequents fresh water pools, by name *macrura*, belonging to the general order *decapoda*. No. 4 is a bud of the sweet pepperbush or white alder, the *clethra alnifolia* of Linnæus. It is a shrub, from three to ten feet high, growing in wet copses, from Maine to Virginia, near the coast. In July and August, it is covered with handsome fragrant blossoms.

A. S.—Potter's clay, but not perfectly free from uncombined silica.

COMMUNICATIONS RECEIVED.

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

On Butter. By J. A. V.

On Railway Religion. By J. P.

On Tracks in Sandstone. By A. M. B.

Also enquiries from the following:

E. B. T.—R.—J. P. L.—A. G. R.—S.—T. B. H.—F. C.—D. P.—C. F. C.—G. L. S.—W. M. R.—A. S.—W. C. D.—M. M.—W. H. H.—B. K.—J. S. M.

Correspondents who write to ask the address of certain manufacturers, or where specified articles are to be had, also those having goods for sale, or who want to find partners, should send with their communications an amount sufficient to cover the cost of publication under the head of "Business and Personal" which is specially devoted to such enquiries.

Correspondents in different parts of the country ask: Where can I obtain a lead-burning apparatus? Which is the best college whereat to study architecture? Who makes heavy spiral springs? Where can I get headstocks for lathes? Makers of the above articles will probably promote their interests by advertising, in reply, in the SCIENTIFIC AMERICAN.

[OFFICIAL.]

Index of Inventions

FOR WHICH

Letters Patent of the United States

WERE GRANTED FOR THE WEEK ENDING

October 21, 1873,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

Auger bits, making, J. Swan (r)	5,624
Bag, grain, W. B. Carlock	143,876
Bag holder, N. A. Geisinger	143,897
Bale tie, D. McComb (r)	5,616
Bale tie, cotton, B. Kimball	143,911
Bale tie, cotton, J. McMurtry (r)	5,617
Band, endless, L. Binns	143,743
Barrels, with glue, lining, E. W. Leggett	143,770
Bed, spring, Smith & Gill	143,854
Bee hive, J. H. Stockwell	143,937
Billiard chalk holder, H. W. Collender	143,885
Boat for trains of cars, ferry, F. Cass	143,808
Boiler, wash, Truesdell & Curtis	143,796
Boots, molding toes for, D. H. Packard	143,926
Boots, burnishing the heels of, C. W. Glidden	143,899
Boots, jack for nailing, etc., J. G. Ross	143,786
Bosom pad, H. M. Miller	143,921
Bottle, sample, S. H. Gilman	143,753
Brick machine, J. D. Bush	143,806
Bridge, suspension, E. W. & E. W. Serrell, Jr	143,788
Bronzing pad, L. G. Chaput	143,880
Building block, F. W. Colby	143,809
Burner, vapor, J. C. Love	143,915
Button fastening, I. F. Eaton	143,892
Buttons, mode of fastening, I. F. Eaton	143,891
Buttons, mold for fancy, F. Maass	143,916
Can, oil, W. G. Cowell	143,810
Car axle box, W. B. Howe	143,763
Car coupling, J. Enos	143,894
Car coupling, F. A. Fleming	143,752
Car coupling, J. Gum	143,756
Car coupling, R. Lloyd	143,828
Car coupling, T. W. & T. D. Ryan	143,932
Car coupling, P. Swineford	143,791
Car starter, B. F. Oakes	143,837
Car starter, A. Whittemore	143,948
Car brake and starter, C. L. Irving	143,909
Car dumping platform, J. W. Harrison	143,758
Carbonates, alkaline, H. D. Grousilliers	143,755
Cardmount, J. H. Caterson	143,878
Carpet fastener, B. D. Kested	143,784
Carriage, child's, A. F. R. Arndt	143,803
Carriage, child's, T. Galt	143,818
Churn, J. Masten	143,919
Churn, reciprocating, A. D. Huntley	143,906
Churn, reciprocating, E. T. Wheeler	143,800
Clock, alarm, D. M. Charters	143,881
Clock, electric, F. J. Ritchie	143,847
Clothes pounder, S. F. Hawley	143,901
Coal breaker, H. Bradford	143,745
Cock, gage, A. A. Murray	143,923
Coffee substitute, E. Dugdale	143,889
Coffee substitute, E. Dugdale	143,890
Coffin fastening, W. S. Crane	143,748
Collodion compound, J. A. McClelland	143,772
Cooler, milk, J. Pearl	143,840
Corn husker, J. Ure	143,797
Cotton for collodion, soluble, H. T. Anthony	143,865
Cows' tails, fetter for, C. F. Tolles	143,943
Cylinders, etc., boring, J. MacDonald	143,917
Dental instrument, I. A. Salmon (r)	5,623
Desk, school, C. J. Higgins	143,760
Ejector, water, H. Coll	143,884
Electric signal, F. L. Pope (r)	5,622
Elevator, O. Tufts	143,944
Embroidery patterns, transferring, C. Bordas	143,872
Engine, reciprocating, S. J. Jones	143,827
Engine relief valve, fire, A. Mayer	143,920
Engine, rotary, J. C. Spencer	143,636
Engine, steam fire, W. C. Davol, Jr	143,750
Engine, steam pumping, W. C. Hicks	143,824
Engine valve, steam, A. Carr	143,807
Evaporating pan, G. W. Storer	143,939
Explosive compound, A. Nobel, (r)	5,619
Eye, apparatus for treating the, M. F. Potter	143,928
Faucet, measuring, J. Schalk, Jr	143,850
Filter, G. S. Neff	143,924
Filter for oils, acids, etc., J. Jowitt	143,768
Fire arm, revolving, W. S. Smoot	143,855
Fire extinguisher, W. C. Bruson	143,746
Fire extinguisher, automatic, I. P. Tice	143,7
Flour bolt, W. Gosshorn	143,82
Flour bolt, J. G. Kaufman	143,910
Food from cider, articles of, S. W. Mahan	143,918
Fork, horse hay, A. J. Nellis	143,775
Fruit drier, J. Williams	143,949
Furnace, D. Harger, (r)	5,614
Furnace, hot air, C. J. Shepard	143,851
Game apparatus, West & Lee	143,799
Gaselier extension, L. Hull	143,765
Gate, automatic, Olbert & Young	143,839
Generators, steam, D. Renshaw	143,842, 143,843, 143,844
Generator, steam, D. Renshaw	143,845
Glass, etc, forming necks on, J. Wing	143,863
Glassware, stemmed, J. Oesterling	143,778
Grate, S. Smyth	143,856
Harness mounting, T. Fawcett	143,817
Harrow, C. Svenzen	143,941
Hat frames, forming, Ertola & Caselli	143,814
Heating drum, I. P. Tice	143,795
Heel blanks, etc., compressing, R. C. Lambart	143,914
Hinge, gate, W. Hull	143,764
Hobby horse, J. Reinhart	143,930
Horseshoe machine, C. H. Perkins	143,781
Horseshoe machine, C. H. Perkins	143,782
Houses, construction of, W. Ward	143,946
Hubs to shafts, securing, E. Sanford	143,849
Ice cream freezer, M. F. Graves	143,822
Iron, apparatus for puddling, J. Davies	143,811
Iron for wheels, etc., cast, C. Burgess	143,874
Kiln, lumber drying, S. R. Kirby	143,912
Knife polisher, etc., T. Bootsman	143,871
Lamp fountains, mold for glass, J. Wing	143,864
Lathe, screw cutting, W. Gleason	143,898
Leather crimping and folding, Platts & Walden	143,783
Leather, etc., scouring, F. A. Lockwood	143,829
Level, grading, J. Thornley	143,942
Lightning rod, J. J. White	143,862
Lock, seal, D. K. Miller	143,927
Loom shuttle, Pfefferkorn & Aust	143,927
Lumber marker, W. Merritt	143,773
Malt steep, W. W. Stoll	143,938
Manure from offal, etc., Adamson & Simonin (r)	5,612
Mill, grinding, J. G. Baker	143,967
Mill, grinding, P. Evans	143,816
Mower, lawn, W. Sellers	143,787
Navigation, etc., keeping open, J. Mullaly	143,833
Nitro-glycerin, exploding, A. Nobel, (r)	5,620
Nitro-glycerin, exploding, A. Nobel, (r)	5,621
Offal, etc., drying, Adamson & Simonin, (r)	5,611
Offal, etc., treating, Adamson & Simonin, (r)	5,610
Overalls, E. Weil	143,947
Paint compound, J. Quarterman	143,841
Pantaloons, E. T. Taylor	143,792
Paper bag machine, J. S. Ostrander	143,925
Paper feeding machine, J. T. & F. Ashley	143,740
Paper machine dandy, J. Whitehead	143,801
Paper stock, A. T. Sturdevant	143,940
Pen and pencil case, C. H. Streightoff	143,859
Petroleum, treating, S. Van Syckel	143,945
Photograph negative varnish, J. W. Morgeneier (r)	5,618
Piano, grand, G. Steck	143,789
Picture frame, Warren & Adderly	143,861
Pipe, earthenware, J. Bingham	143,870
Pipe, asphalt, A. Muller	143,922
Planter, corn, W. House	143,905
Planter, corn, C. Hutchins	143,826
Planter and distributer, R. Montfort	143,832
Plumb and level, S. Sanderson	143,933
Press, R. Esmond, (r)	5,613
Printing press, card and ticket, G. E. Peck	143,780
Printing press register, A. Hilgenreiner	143,904
Propeller, endless chain, T. Teed	143,793
Propeller, steering, F. G. Fowler	143,896
Pulley, lubricating, J. K. McLanahan	143,830
Pump, J. Edson	143,751
Pump, A. L. Hatfield	143,759
Pump, S. Lane, Jr	143,769
Purifier feed device, R. Craik	143,887
Rail joint fastening, G. A. Sturges	143,790
Railroad signal, automatic, H. S. Evans	143,815
Railroad signal circuit closer, G. H. Snow	143,935
Railroad signal circuit, S. C. Hendrickson	143,903
Railroad smoke conduit, etc., T. De Codezo	143,812
Railroad, electric signal, F. L. Pope (r)	5,622
Range, cooking, W. Hopkins, Jr	143,762
Rein, check, G. J. Townley	143,860
Sawing machine, scroll, M. Foley	143,895
Sewing machine, G. W. Hunter	143,766
Sewing machine table, J. Bennor	143,742
Sewing machine creaser, S. P. Babcock	143,741
Shaft coupling, R. S. Cathcart	143,879
Shelf, revolving, J. Danner	143,888
Shingles, machine for shaving, T. H. Carter	143,877
Shoe gores, gumming edges of, Walden *et al.*	143,798
Shutter fastening, J. P. Bush	143,805
Shutter fastening, B. D. Washburn (r)	5,625
Sink valve, J. Chilcott	143,883
Slate, office, C. Boyle	143,804
Snow, melting, J. Mullaly	143,854
Soda water cock, J. D. O'Donnell	143,777
Sole edge trimming, A. P. Hazard	143,823
Spark arrester, Richards & Meehl	143,931
Spindle bolster, G. Richardson	143,785
Staves, etc., crozing, H. Wilde (r)	5,626
Steam trap, J. W. Hodges	143,761
Stick, composing, L. Buschmann	143,875
Stools, etc., standard for, S. H. Newcomb	143,836
Stove pipe thimble, T. D. Slauson	143,852
Stoves, name plate for, P. Klotz	143,913
Street sweeping machine, L. J. O'Connor	143,838
Sugar, etc., refining, S. H. Gilman	143,754
Superheater, D. Renshaw	143,846
Teaching geography, J. Schedler	143,934
Tenoning machine, W. M. Sack	143,848
Thill coupling, J. M. Pusey	143,929
Timber, etc., raising floating, A. Bulman	143,873
Tobacco knife, I. S. Goldman	143,900
Toy block for object teaching, N. Muller	143,835
Trap, sewer inlet, G. R. Moore	143,774
Trap, stench, J. P. Hyse	143,907
Treadle, L. Heins	143,902
Truck for carrying bricks, R. A. Smith	143,853
Turning tool, J. W. Ellis	143,893
Valve, alarm safety, F. Steele	143,858
Valve, safety, J. Hoffman	143,825
Valve mechanism, slide, E. E. Gilbert	143,819
Vehicle wheel, D. Dimmick	143,813
Vehicle wheel, J. H. Glover	143,820
Vehicle wheel, J. O'Connor	143,776
Ventilator for buildings, G. R. Barker	143,868
Wagon brake, W. P. Buckner	143,747
Wagon jack, A. G. Cooley	143,886
Wagon spring, D. A. Boyle	143,744
Wagon spring, E. P. McCarthy (r)	5,615
Washing machine, J. Bennett	143,869
Washing machine, G. G. Curtiss	143,749
Washing machine, N. J. Parsons	143,779
Watchmaker's staking tool, J. Stark	143,857
Water, apparatus for raising, L. Chase	143,882
Wax mold, sealing, I. L. Baker	143,866
Wax package, sealing, W. J. Lumb	143,771
Weights, apparatus for lowering, T. Wrightson	143,802
Wheelbarrow, J. M. & J. L. Jones	143,767
Wrench for bung bushings, G. W. Harris	143,757
Wrench pipe, D. D. Ingram	143,908

APPLICATIONS FOR EXTENSIONS.

Applications have been duly filed, and are now pending for the extension of the following Letters Patent. Hearings upon the respective applications are appointed for the days hereinafter mentioned:

26,902.—PLANING MACHINE.—S. S. Gray, January 7.
26,906.—STITCHES.—A. F. Johnson. January 7.
26,914.—CLOTHES WRINGER.—R. O. Meldrum *et al.* Jan. 7.
26,919.—REPEATING FIREARM.—W. H. Morris *et al.* Jan. 7.
26,942.—CAR SEAT.—T. T. Woodruff. January 7.
26,948.—SEWING MACHINE.—A. F. Johnson. January 7.
27,008.—FINISHING BOOT HEELS.—H. Saloshinsky. Jan. 14.

EXTENSIONS GRANTED.

25,874.—BRONZING MACHINE.—G. H. Babcock.

DESIGNS PATENTED.

6,962.—GRAPE ARBOR.—C. H. Crump, Boston, Mass.
6,963.—CLOCK PENDULUM.—H. J. Davies, Brooklyn, N.Y.
6,964.—BREAST PIN, ETC.—G. W. Loomis *et al.*, N. Y. city
6,965.—COOKING STOVE.—E. Mingay, Boston, Mass.

TRADE MARKS REGISTERED.

1,503.—SAUCES.—A. P. Agresta *et al.*, New York city.
1,504.—RAZORS.—H. Boker & Co., New York city.
1,505.—RUBBER GOODS.—M. A. Cately, New York city.
1,506.—CHAMPAGNE.—Chilling worth & Son, London, Eng.
1,507.—UMBRELLAS.—A. M. Davies *et al.*, New York city.
1,508.—CANNED FOOD.—Gordon & Dilworth, N. Y. city.
1,509.—OATMEAL.—J. McCann, Beamond Mills, Ireland.
1,510.—SNAP HOOKS.—New York Wire Snap Co., N. Y. city

SCHEDULE OF PATENT FEES:

On each Caveat	$10
On each Trade-Mark	$25
On filing each application for a Patent (17 years)	$15
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On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
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On an application for Design (7 years)	$15
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