

J. C. M. asks: How are grass and bouquets crystallized, so that they preserve the same form and color? Answer: What you mean is probably that the grasses or flowers are covered with some crystalline salt. This might be done by dipping them into a sprinkling upon them a strong warm solution of sugar or alum, letting each portion crystallize before the next is applied.

I. C. asks: Will a suction pump work satisfactorily in supplying water taken from a well about 200 feet distant horizontally, with a perpendicular rise of say 22 or 23 feet? If so, what should the size of the pipe be, to cause the least outlay of labor in using the pump? Would it be preferable to lay the pipe according to the contour of the ground, or go to the additional expense of laying it nearly as regular in ascent as practicable, by deep cutting? Answer: A pipe one inch in diameter will answer, and it will be just as well to lay it according to the contour of the ground. The pump must be kept well packed, and will work satisfactorily, except that it will probably be a laborious operation for any one to furnish the requisite power. A small hot air engine, working a pump placed at the well and forcing the water to the house, is quite often employed in cases of this kind.

J. S. P. says: In your issue of July 19, C. M. P. says: "I have devised a machine which will grind a perfect lens of any size or shape." I should like to know how his machine is made, if he has no objection to publishing a description of it. I should like also an explanation of Professor Boyle's experiment which you referred to in the same paragraph. I don't understand how a polisher moving in cycloid curves can correct a spherical surface. Can you give a fuller description of Boyle's machine, or tell me where I can find such a description? Answer: A spherical refracting or reflecting surface must be converted into a paraboloid of revolution, before it will converge parallel rays to the same focus. This correction is accomplished by hand in the following manner: A disk of wood coated with pitch or rosin is worked with rouge in strokes across every diameter of the lens. The glass rests on an optician's post around which the operator walks, continuing the motion until the radius of curvature of the central part of the lens has been sufficiently shortened, so that the section curve becomes a parabola. Mr. Clark, who uses this method, makes the final correction by placing the lens over a paper disk marked with numbered concentric circles at intervals of a quarter of an inch; then, with his forefinger dipped in rouge, he rubs the glass gently in zones, guided by the numbered circles on the paper beneath. From time to time the glass is tried upon a star; wherever the zones are long focus, the touches are light; where they are short, the finger is pressed on hard. The machine for local correction, which Clark says works too rapidly for his use, moves the local polisher to and fro, and at the same time turns the lens gradually, so that the polisher traces hypocycloid curves of greater or less extent upon the glass. The finger, as it instantly detects a particle of grit, is not so likely to scratch the surface as the machine. The touch of the skilled optician, as with his forefinger dipped in rouge, he wipes away the superfluous glass, finds a curious parallel in that of the phobos, or burrowing mussel, which tunnels into granite with its soft foot, aided only by the abraded particles of the rock itself.

J. M. says, in answer to J. G., who asked how to solder broken files: They can be soldered with a common spirit lamp and blowpipe with common tinner's solder, after first cleaning the broken parts with muriate of zinc.

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

P. S. H.—It is blue clay, a silicate of aluminum. If it burn white, it might be of value to the potters, in the manufacture of earthenware.

COMMUNICATIONS RECEIVED.

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

- On the Hot Air Engine. By F. O. C.
On the Pulsometer. By E. D. W.
On the Patent Right Question. By W. F., and by C. H. A.
On a Device for Saving Fuel. By R. F.
On Interchangeable Parts. By B. F. S.
On the Million Dollar Telescope. By X. P. M.
On a Word to Apprentices. By F. H.
On the Manifestation of Energy. By W. D.

Also enquires from the following: P. R.—H. J. H.—B. L. B.—J. M. S.—C. de A.—A. B. C. 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 a magic lantern, for home use, be obtained? Where can machinery for making cheese boxes be had? Where are small rubber articles made? 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

August 19, 1873,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

Table listing inventions granted, including Air, carbureting, E. F. Van Houten, Air, etc., cooling, L. Schulze, Alarm, till, G. L. Geiger, Anchor for securing cores, Z. Ellis (r), Animal matter, drying, C. C. Coe, Annunciator, C. H. Greenleaf, Annunciator, electrical, A. Storer, Auger, earth, W. H. Salyer, Bale tie, cotton, F. Cook.

Main table of inventions with columns for inventor name and page number. Includes items like Baling hay, wire tie for, G. L. Laughland, Ballot box, J. Gamber, Beer on draft, preserving, J. W. Moore, Bell pull, A. L. Swan, Bellows, W. Picher, Boats, folding frame for, W. M. Ducker, Bolt for safe doors, etc., W. Hall, Boot heel screw, W. Ackerman, Boot, plowman's, Walker & Brown, Boot sole edges, burnishing, J. Beasley et al., Boot sole edges, burnishing, J. Beasley et al., Boot sole edges, finishing, C. M. Chase, Boot sole edges, trimming, R. C. Lambert, Boot lift punching, G. W. Ellis (r), Borer for sampling cotton, E. A. Clark, Boring machine, earth, J. Burns, Bottle stopper, L. Rhoades, Braking hoist, self, W. Hart, Brick machine, W. Cole, Bridge, ferry, C. J. Atkins, Bung, self-venting, C. F. Spencer, Button fastening, C. H. Reid, Can for oil, etc., J. R. Cole, Can, preserve, J. K. Chace, Cane juice with sulphur, treating, W. G. Billu, Car coupling, D. C. Camerer, Car coupling, F. J. Seybold, Car coupling, J. Temple, Car, dumping, J. Hughes, Car, dumping, J. Hughes (r), Car lamp, J. E. Cross, Car railroad, J. C. Wands, Car truck, railroad, G. Dixon, Car trucks, kingbolt for, Murray & Lamason (r), Carriage top, J. H. Snyder, Chair, self-reclining, G. Niderkorn, Chair splints, making, J. B. Poe, Chuck, T. B. Almond, Churn dasher, reciprocating, T. Earle, Clamp, L. Feely, Clothes line holder, W. Cooke, Clothes wringer, centrifugal, H. Rosamyer, Jr., Condenser, H. A. Towne, Cotton lint room, fireproof, R. R. Warren, Crib, W. B. Carpenter, Crimping clamp, P. A. Schoellhorn, Cultivator, A. C. Smith (r), Cultivator, corn, N. G. Blauser, Cutter head, A. H. Shipman, Digger, potato, S. W. Tyler, Door closing apparatus, H. F. Shaw, Drawers, men's, E. L. Crosse, Dressmaker's marking gage, M. Blauvelt, Eaves trough fastening, W. W. Hammond, Engine, portable steam, Schiedler & McNamar, Engine, rotary steam, O. Adams, Engines, regenerating steam in, F. M. H. Motard, Equalizer, three horse, T. Hoadley, Fertilizer, A. F. Andrews, Fiber from felt, removing, J. T. Waring, Fire place, W. Lossie, Firkin, C. Alford, Fluting machine, E. M. Deey, Fork, horse hay, S. B. Bowen, Furnace, boiler, S. A. Ford, Furnace for smelting ores, E. Balbach, Jr., Furnace grate, W. B. Le Van, Furnace grate, J. Withington, Furnace grate bar, A. Rawson, Furnace, soldering, W. S. Potwin, Gage, micrometer, A. Bonnaz, Gage board, G. Wentz, Gas apparatus, railway car, J. B. Olney, Gas machine, air, P. Wernl, Gas machine pulley, E. F. Van Houten, Gate, automatic, J. S. Folt, Gate, automatic, J. E. Strong, Generator, steam, H. P. Wright, Glass furnace, W. Leighton, Jr., Grain binder, A. Philippi, Grain steaming apparatus, Eberts & Pitts, Hammers, die for forming, J. Yerkes, Harness coach pad, A. Gillam, Harrow, W. D. Summers, Harvester, O. Billings (r), Harvester, J. H. Elward, Harvester, J. H. Elward, Harvester, J. H. Elward, Harvester, J. H. Elward, Harvester, S. Luce, Harvester, W. Wallace, Harvester wheel and axle, B. G. Turner, Hats and caps, dyeing felt, J. T. Waring, Hay tedder, T. J. & G. M. Clark, Heater, water, L. S. Mead, Hinge, E. Boileau, Hook, cant, F. Mansfield, Hook, cant, R. Whittier, Hook, fish, B. F. Allen, Horses from cribbing, preventing, A. Stillwell, Horseshoe nails, forging, F. H. Richards, Hose, etc., testing engine, P. Noyes, Hose, hydraulic, E. A. Street, Ice cream, jellies, etc., mold for, E. M. May, Jack, hoisting, J. H. Churchill, Kettle spout, tea, J. Ash (r), Lamp, J. Kirby, Jr., Lamp, advertising, F. R. Warner, Lamp extinguisher, F. C. Wireman, Lamp, hanging, G. Bohner (r), Land marker, G. W. Betts, Latch, reversible knob, C. Moody, Lathe, turning, J. P. Luther, Lathes, centering device for, H. Gray, Lathing, metallic, T. O'Callahan, Leather work, seam for, C. Keniston, Level, pendulum, A. C. L. Delsarte, Lithographic stone, Moore & Bagger, Lock, combination, A. D. Hoffman, Log turner, C. Van Vleck, Loom, J. Zurcher, Lumber, machine for edging, W. G. Caldwell, Mallet, A. Holbrook, Match sticks, making, F. Zais (r), Medical compound, P. H. Steenbergen, Metal bars, bending, S. Holmes, Milk, preserving, L. F. Kirchoffer, Mill, rolling, Stephens & Cooper, Millstones, dressing, W. Farrow, Millstones, dressing, L. Randolph, Molding machine, H. B. Smith (r), Mortar mixer, C. Pierce, Motor for driving machinery, A. N. Proctor, Mowing machine, W. S. Stone, Nut and bolt fastening, Antill & Sloan, Nut and bolt fastening, P. F. King, Ovens, reel for, A. Crumble, Paint compound, F. A. Stall, Panels, machine for raising, F. D. Green, Panier, J. S. Colby, Pantaloons stretcher, L. Kaltenbacher, Paper bags, making, G. Dunham, Paper tubes, making, T. J. & J. T. Jones, Pipe coupling, L. T. Scofield, Pitman, O. F. Thomas, Plane, match, C. G. Miller, Planter, seed, B. Kuhns (r), Plow, J. Marr, Plow, F. H. Starke, Plow coupling, T. L. Thrasher, Plow, wheel, L. W. Richardson, Power apparatus, foot, E. & H. Harding, Press, steam cloth, Dennis & Weston, Presses, mold or box for brick, J. McKenna, Propeller, screw, D. Freed, Pump, T. C. H. Kraus, Pump piston, W. C. Culbertson, Pump rod attachment, H. H. Locke (r), Purifier, middlings, Hunter & Whitmore, Purifier, middlings, Hunter & Whitmore, Railroad rail, W. W. Alter, Railroad rail joint, J. L. Hudson, Railroad rail joint, W. L. Linsley, Railroad water tank, J. Morton (r), Railroad water tank, J. Morton (r), Rake, horse hay, Lufkin & Allen, Rake, horse hay, B. Morse, Roads, construction of, E. Chadwick, Roofing, sheet metal, Hegeler et al., Roofing, tile, D. Swain, Sash holder, T. Weaver, Saw, Luppert & St. Pierre, Saw heading, J. E. Merritt, Saw teeth, setting, G. W. Bugbee, Sawing machine, A. Xander, Sawing machine, W. H. Shugart, Sawing machine, edging, E. Tarrant (r), Screw driver, J. H. Davis, Sewing machine, H. A. Blanchard, Sewing machine, E. A. Goodes, Sewing machine, Bayer & Lincoln, Sewing machine bobbin holder, Barnes & Mesick, Sewing machine hemmer, F. Caswell, Sewing machine motor, B. C. Chambers, Sewing machine shuttle, J. B. Secor, Sewing machine table, J. Benner, Sewing machine table, E. A. Jeffery, Shaft bearing, Bird & Sullenberger, Shingle bands, notching, C. E. McGregory, Shrinking metal bands, W. Carr, Sieve, grain, L. D. Carpenter, Smoothing iron, A. S. Mann, Spark arrester, W. D. Farrand, Spoke machine, A. McNeill, Steering apparatus, C. A. Seavey, Steering apparatus, H. F. Shaw, Stock shed, portable, D. H. Yeizer, Stone, machine for cutting, P. H. Hopkins, Stoves and furnaces, grate for, J. J. Richardson, Suspender, B. J. Greeley, Table, extension, C. Rieger, Table leaf support, E. W. Perrin, Telegraph sounder, H. Van Hoevenbergh, Thill couplings, clamp for, M. Taylor, Thrashing machine conveyor, C. D. Decker, Tobacco, hook for hanging, H. N. Strong, Tool receptacle, L. L. Lamb, Trap, fly, J. R. Johnson, Trap, steam, Perkins et al., Umbrella, J. McAuliffe, Valve, automatic regulating, G. L. Kitson, Valve and cut off, rotary, W. S. Bartie, Valve, E. D. Weller, Vehicle pole, H. Schmidt, Vehicle side bar, F. I. Flowers, Veneer keg, G. W. Swan, Voting apparatus, legislative, J. A. Criswell, Wagon, dumping, D. D. Smith, Wagon, market, J. Tamkins, Sr., Washing machine, E. W. Bowen, Washing machine, D. B. Dorsey, Watch case centers, making, J. C. Duerber, Whip socket fastener, W. W. Richardson, Whip socket fastener, W. W. Richardson, Wire pointing machine, F. H. Aiken, Wire to hammer dies, feeding, W. H. Dayton, Wood pulp making, S. B. Zimmer, Wool, pulling, J. Watteau

VALUE OF PATENTS

And How to Obtain Them. Practical Hints to Inventors.

PROBABLY no investment of a small sum of money brings a greater return than the expense incurred in obtaining a patent even when the invention is but a small one. Large inventions are found to pay correspondingly well. The names of Blanchard, Morse, Bigelow, Colt, Ericsson, Howe, McCormick, Hoe and others, who have amassed immense fortunes from their inventions, are well known. And there are thousands of others who have realized large sums from their patents.

More than FIFTY THOUSAND inventors have availed themselves of the services of MUNN & Co. during the TWENTY-SIX years they have acted as solicitors and Publishers of the SCIENTIFIC AMERICAN. They stand at the head in this class of business; and their large corps of assistants, mostly selected from the ranks of the Patent Office: men capable of rendering the best service to the inventor, from the experience practically obtained while examiners in the Patent Office: enables MUNN & Co. to do everything appertaining to patents BETTER and CHEAPER than any other reliable agency.

HOW TO OBTAIN Patents.

This is the closing inquiry in every letter, describing some invention which comes to this office. A positive answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them; they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

How Can I Best Secure My Invention?

This is an inquiry which one inventor naturally asks another, who has had some experience in obtaining patents. His answer generally is as follows, and correct: Construct a neat model, not over a foot in any dimension—smaller if possible—and send by express, prepaid, addressed to MUNN & Co., 37 Park Row, together with a description of its operation and merits. On receipt thereof, they will examine the invention carefully, and advise you as to its patentability, free of charge. Or, if you have not time, or the means at hand, to construct a model, make as good a pen and ink sketch of the improvement as possible and send by mail. An answer as to the prospect of a patent will be received, usually, by return of mail. It is sometimes best to have a search made at the Patent Office; such a measure often saves the cost of an application for a patent.

Preliminary Examination.

In order to have such search, make out a written description of the invention, in your own words, and a pencil, or pen and ink, sketch. Send these, with the fee of \$5, by mail, addressed to MUNN & Co., 37 Park Row, and in due time you will receive an acknowledgment thereof, followed by a written report in regard to the patentability of your improvement. This special search is made with great care, among the models and patents at Washington, to ascertain whether the improvement presented is patentable.

Rejected Cases.

Rejected cases, or defective papers, remodeled for parties who have made applications for themselves, or through other agents. Terms moderate. Address MUNN & Co., stating particulars.

To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention if susceptible of one, although sometimes it may be dispensed with; or, if the invention be a chemical production, he must furnish samples of the ingredients of which his composition consists. These should be securely packed, the inventor's name marked on them, and sent by express, prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by a draft, or postal order, on New York, payable to the order of MUNN & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents.

Foreign Patents.

The population of Great Britain is 31,000,000; of France, 37,000,000; Belgium, 5,000,000; Austria, 36,000,000; Prussia, 40,000,000, and Russia, 70,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, when business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. A large share of all the patents secured in foreign countries by Americans are obtained through our Agency. Address MUNN & Co., 37 Park Row, New York. Circulars with full information on foreign patents, furnished free.

Caveats.

Persons desiring to file a caveat can have the papers prepared in the shortest time, by sending a sketch and description of the invention. The Government fee for a caveat is \$10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & Co., 37 Park Row New York

Reissues.

A reissue is granted to the original patentee, his heirs, or the assignees of the entire interest, when, by reason of an insufficient or defective specification, the original patent is invalid, provided the error has arisen from inadvertence, accident, or mistake, without any fraudulent or deceptive intention.

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:

- 26,202.—PAPER PULP.—J. B. Palmer et al. November 5.
26,329.—BOOT TIPS.—N. Silverthorn. November 12.
26,564.—CARRIAGE TOP PROP.—G. Cook et al. Dec. 10.

EXTENSIONS GRANTED.

- 25,153.—NAIL MACHINE.—Daniel Dodge.
25,191.—PAPER BAG MACHINE.—W. Goodale.
25,199.—FEEDING PAPER TO PRESSES.—R. M. Hoe.

DESIGNS PATENTED.

- 6,803.—BAND SAW FRAME.—L. M. Collins, Lebanon, N. H.
6,804.—GLASS GOBLET.—J. H. Hobbs, Wheeling, W. Va.
6,805.—GLASS DISH.—J. H. Hobbs, Wheeling, W. Va.
6,806.—SEAL PRESSES.—C. A. Mathieson et al., N. Y. city.
6,807.—SAFETY STIRRUP.—R. Renfif, Bloomington, Ill.
6,808.—GASALIER.—J. F. Travis, New York city.
6,809.—GAS BRACKET.—J. F. Travis, New York city.
6,810.—OIL CLOTH.—J. Barrett, New York city.
6,811.—CARPET.—J. Dornan, Philadelphia, Pa.
6,812 to 6,818.—OIL CLOTHS.—J. Hutchison, Newark, N. J.
6,819 to 6,823.—CARPETS.—C. A. Righter, Philadelphia, Pa.
6,824.—CARPET.—J. T. Webster, Philadelphia, Pa.

TRADE MARKS REGISTERED.

- 1,410.—COTTON GIN.—Gullett Gin Mfg Co., Amity City, La.
1,411.—FERTILIZERS.—M. J. Solomons, Savannah, Ga.
1,412.—PACKED OYSTERS, ETC.—Wentz et al., Baltimore, Md.
1,413.—SELECTED NAILS.—J. Coyne, Pittsburgh, Pa.
1,414 to 1,415.—FANOEY AND DRY GOODS.—E. Flaxland & Co., Paris, France.
1,416.—WINES, ETC.—S. McCullagh, London, England.

SCHEDULE OF PATENT FEES:

Table listing patent fees: On each Caveat \$10, On each Trade-Mark \$25, On filing each application for a Patent (17 years) \$15, On issuing each original Patent \$20, On appeal to Examiners-in-Chief \$10, On appeal to Commissioner of Patents \$20, On application for Reissue \$30, On application for Extension of Patent \$50, On granting the Extension \$50, On filing a Disclaimers \$10, On an application for Design (3 1/2 years) \$10, On an application for Design (7 years) \$15, On an application for Design (14 years) \$30.