

(24) I. H. R. asks: Can you tell me how to make an electro-magnet that will work very slowly? A. We cannot.

(25) W. R. B. says: Is there any method in use of blowing a church organ by the use of a heavy weight acting through a system of clock-work? A. Yes. A weight of 7,000 lbs. with a fall of 30 feet, and proper gears, will drive the bellows of an ordinary church organ for half an hour.

(26) C. E. J. says: I have made an induction coil, 12 inches long and 6 inches in diameter, in the following manner: I took a piece of hard rubber tubing, 1 1/4 inches in diameter and 13 inches long; I put in 7 inch heads, 1/2 inch thick, of dry varnished walnut. I wound 4 layers of No. 16 cotton-covered copper wire for the primary coil, I then wrapped around the primary coil two thicknesses of manilla paper, thoroughly saturated in white paraffin, to insulate it from the secondary coil; my secondary coil was composed of between 7 or 8 miles of fine insulated green silk-covered copper wire, part being No. 30 and part No. 35 relay wire; and between each layer of wire, I wrap a sheet of paraffined paper. My core consisted of a number of small iron wires soldered together and slipped inside of the rubber tubing; my condenser consisted of 24 sheets of 12 inches square tin foil, each sheet separated by a sheet of paraffined paper, the alternate sheets of foil being connected together. I have connected the condenser with the coil in three different ways, with about equal results; the longest spark that I ever got out of it was 3/4 of an inch. Please tell me the defects of this machine. A. For full particulars regarding the construction of induction coils, see page 115, vol. 33. The principal faults in your machine consist in the soldering of the wires forming the core, and in the construction of your condensers. The bundle of wires forming the core should neither be soldered together, nor surrounded with a metallic substance. One side of the condenser should be connected to each side of the break piece in the primary circuit, the object being to furnish a reservoir for the extra currents to flow into when the primary circuit is interrupted, and thus prevent the spark. You should use a Bunsen battery instead of a Smee. 2. If made properly, how long a spark ought it to give? A. The length of your spark will depend upon the size of your battery.

(27) G. E. G. says: Is it practicable to allow for the expansion of shafting of 2 3/4 inches diameter and 220 feet long, running at 42 revolutions, when the temperature is from 65 to 70 degrees, there being on the line two sets of bevel gears containing 30 and 36 teeth of 3 1/4 inches pitch, running shafting at right angles? A. Yes. 2. What should be the angle of gears containing 30 and 36 teeth, of 3 1/4 inches pitch? A. About 40 degrees.

(28) C. H. says: A friend claims that four persons, holding their breath, may lift, with one finger each, a fifth person from the floor, he also holding his breath. I have tried it without success, but my friend says that he has seen it done at various times. What do you know about this experiment? A. We have told all we know about this matter (and it is very little) several times before. We have never seen the feat performed, but we have heard about it so often that we are inclined to think it may be true. As we have remarked before, however, it is certain that the person who is lifted does not lose any weight by holding his breath, neither do the lifters gain any strength by the process.

(29) W. J. B. asks: In heating a room, would it require more fuel to do it by ordinary steam, or to take ordinary steam and superheat it? In other words, would it be more expensive to continue to generate ordinary steam for a given number of hours, and use this for heating a room, or to convert ordinary steam into superheated steam, estimating the cost of the superheated steam from the time you began to superheat it, and not counting the cost of generating it in the first place? A. The second plan would be the most economical.

COMMUNICATIONS RECEIVED.

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

- On Paris Green, and on the Keely Motor. By G. W. P.
On Repairing Bells. By C. S.
On Bee Culture. By E. C.
On Draft of Vehicles. By M. W. W.
On Large and Small Axles. By F. W. D.

Also inquiries and answers from the following:
A. J. K.—N. B.—E. T. H.—B. W.—W. R. P.—N. K.—R. H. B.—F. J. W.—J. C. T.—H. T.—J. K.—T. W.—J. D.—B. L.—W. P.—N. K.—O. P. R.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells telescope lenses? Who makes machinery for grinding lenses? Whose is the best vertical boiler? Who makes a good flocking machine? Who sells the best plow for use on heavy lands?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week ending August 3, 1875, AND EACH BEARING THAT DATE. (Those marked (r) are reissued patents.)

Table listing inventions with names and dates. Includes: Air brake, W. D. Jones; Amalgamator, E. J. Fraser; Annunciators, E. A. Hill; Auger, S. W. Higgins; Axle skein, J. D. Smith; Book-binding machine, J. Armstrong; Book-sewing machine, J. Armstrong; Bottle necks, finishing, W. Langwell; Box fastening, E. W. Bridge; Brush, dust, H. B. Conant; Bug on plants, destroying, R. M. Clark; Car axle box bearing, T. D. Rulon; Car brake, S. Doubleday; Car brake, hydraulic, T. McBride; Car coupling, J. Q. A. & J. D. Young; Car, dumping, B. Slusser; Car, refrigerator, J. H. Canfield; Car starter, T. McDonough; Cars, folding seat for horse, C. B. Sheldon; Cars, heating and ventilating railroad, W. Sage; Cars, safety runner for railroad, L. O. Root; Carburetor, automatic rotary, T. A. Stombs; Carding machines, cylinder for, C. N. Plantron; Carpets, sweeping, J. Kauper; Carpet sweeper, A. H. Spencer; Carpet sweeper, A. W. Stewart; Carriage, child's, F. W. Whitney; Carriage wheel, D. Cushman; Castanet, J. A. Crandall; Catch for boxes, spring, L. Messer; Chain, J. W. Bonta; Chain links, bending, B. Hershey; Chains, making, G. Trinks; Chair and swing, S. Feust; Chair backs, shaping, H. Buchter; Chill, W. J. Welling; Churn dasher, H. A. Stearns; Churn dasher, I. J. Whitlatch; Churn, rotary, Barden & Crudden; Clock dial, S. E. Root; Cloth testing machine, W. Heddon; Clothes pounder, D. W. Rawson; Clothes pounder, O. F. Stedman; Coal from slate, etc., separating, H. Bradford; Cock, gage, Malloway & Shaw; Colors on fabrics, etc., fixing, C. T. Mieg; Confectionery, etc., E. Hawker; Cord, rubber-coated, H. Scharbaum; Cotton cleaner, seed, M. C. Cheek; Cultivator, E. Nauman; Cultivator, J. C. Jenkins; Cultivator wheel, G. W. Schenck; Cup for effervescing drinks, W. C. Dodge; Curry comb, R. P. Van Horne; Cuttingangs, destroying, Fenner & Power; Dental mallet, automatic, I. A. Salmon; Derrick, M. Gray; Dish stand, wire, W. F. Collier; Distillation of hydrocarbon oils, T. McGowan; Doffer combs, operating, J. K. Proctor; Door check, H. B. Church; Drawing frame stop, D. W. Hayden; Drills, buffer for rock, J. C. Githens; Egg beater, J. F. Rote; Egg box, O. Sutphen; Electroplating, nickel, Hermann & Taylor; Engine, electro-magnetic, A. Tittman; Eyeglass, C. C. Parker; Fabric, imitation quilted, W. E. Corwin; Faucet, E. M. Fasoldt; Faucet, I. Lobree; Feed-cutting machine, L. Evans; Fence, H. & B. F. Bean; Fire arm, revolving, B. H. Williams; Fire plug, C. E. Gray; Fire plug and automatic pump, W. W. Harding; Fish preserving, Sellman, Reessing, & Wolf; Fish culture, apparatus for, J. Roth; Fishing rods, reel for, H. Winslow; Fork, grain, F. Gerfen; Forge for blacksmiths, A. Benac; Fruit dryer, J. Johnson; Fruit gatherer, M. Smith; Furnace, air-heating, J. M. Wilson; Furnace for blanks, J. W. Bonta; Furnace for heating tubes, W. L. McNair; Furnace grate, Little & Heuber; Game board, H. Darneal; Game board, I. N. Forrester; Garbage vault, Shepard & Bedell; Gas generator, J. C. Mitchell; Gas lighting apparatus, electric, F. V. Sandford; Gas illuminating, Eichbaum & Hunter; Gas, making, A. C. Rand; Generator, steam, G. T. McLauthlin; Glove, J. Fouillon; Grain decorticator, W. Seck; Grain-talley, W. D. Wiley;

Table listing inventions with names and dates. Includes: Harrow and sower, R. H. Hudgens; Harrows, adjustable handle for, S. D. Riegel; Heater, fire place, P. Rollhaus, Jr.; Hoisting machine, N. P. Otis; Hop grubs, etc., destroying, O. M. Knox; Horse power, J. R. Gray; Horseshoe, J. Russell; Horseshoe blank bar, J. Wike; Horseshoe blank bars, pile for, J. Russell; Hydrant, J. E. Mooney; Hydrant, water, J. W. Douglas; Index, M. N. Lovell; Inkstand, S. Darling; Knitting machine, I. & A. Tompkins; Lat for rubberworking, I. F. Williams; Latch for cupboards, etc., C. E. Herrick; Latch, reversible, A. F. Whiting; Letterblock apparatus, B. Irrgang; Lock, time, J. Burge; Measure, tailor's, J. S. Charch; Meat pounder, Black & Truax; Meattenderer, G. R. Comstock; Meattenderer, A. G. W. Foster; Medical composition, T. Biedenfeld; Mill, cider, J. Bowen; Mill spindles, bush for, N. B. Lewis; Millstone dress, G. T. Smith; Molding concrete pipe, T. E. Daniels; Mop head, C. B. Clark; Motion, converting, D. C. Burson; Motor, J. H. Bean; Needle blanks, trimming, P. M. Beers; Needle eyes, polishing, P. M. Beers; Organ, reed, H. K. White; Organ stop action, McMahel and Tracy; Organ stop action, reed, L. B. Norton; Pavement, A. B. Bean; Peg wood, pointing ribbon, B. F. Sturtevant; Photographic camera, J. and J. Stock; Pianos, etc., tuning pin for, J. M. Branig; Pipe, device for bending metal, M. L. Orum; Pipe, self-acting blow, J. M. Hancock; Plane, bench, D. F. Williams; Planing machine, L. S. Woodbury; Planter, etc., cotton, Bristol and Searcy; Plating, anodes for nickel, E. Weston; Plow, H. Krog, Sr.; Plow, corn, A. Binder; Plow, steam, T. C. Stark; Post hole borer, O. Love; Printing presses, feed guide for, J. Reed; Power, motive, P. B. Greene; Pulley cover, J. W. Sutton; Pump piston for artesian wells, T. Malcomson; Railway electric signals, F. L. Pope; Railway frog, J. Brahm; Rail joint, H. Allen; Rail joint fastening, Hipkins and Rigby; Rail joint fastening, A. Spencer; Railway switch, D. F. Cavanaugh; Railway ticket, complex coupon, T. Cook; Railway time signal, Dinkey et al.; Range, cooking, W. P. Abendroth; Refrigerator car, J. H. Canfield; Resawing machine, J. First; Roll, skelp-forming, J. C. Getz; Roofs, securing flexible roofing to, J. Perry; Rowlock, F. E. Davis; Rubber-coated fabric, W. Cable; Ruler, parallel, J. M. Taylor; Sad iron, reversible, T. T. Smothers; Sand paper roll, O. Gilmore; Sash balance, E. H. Hannum; Saw gummer, M. O. Smith; Sawmill head block, Perry and Mote; Screw tap, J. E. Sweet; Screw, wood, S. W. Young; Screws, shaping heads of metal, C. M. Spencer; Separator, grain, A. B. Farquhar; Sewer juncture indicator, J. H. Stanley; Sewing machine, T. A. Weber; Sewing machine bobbin, G. W. H. Curtis; Sewing machine feeding device, I. M. Rose; Sewing machine looper, Byrom and Clewley; Shelving for stores, H. T. Bestor; Shirt, F. A. Richardson; Shirt, bosom, F. L. Pickett; Shoe tips or protectors, C. T. Grilley; Shovelblade die, P. B. Cunningham; Shutter, window, W. O. Connor; Sleigh bell, R. and H. Marbach; Soda water fountain, F. W. Wiesebrock; Sole-fastening webs, severing, B. F. Sturtevant; Spinning frames, building, J. M. Stone; Stalk cutter, Gaylord and Ayers; Still, oil, J. C. Dickey; Stone, compound for artificial, T. E. Daniels; Stool, R. W. Myers; Straw cutter, L. Schellinger; Stump puller, W. O. Johnson; Sugar, pressing, J. W. Jarboe; Sugar-sawing machine, G. P. Ockershausen; Sulphur, separating free, S. H. Johnson; Table, folding, P. S. Crawford; Table slide, extension, Holland and Parker; Telegraphic circuit, W. E. Sawyer; Toy hoop or trundle, W. W. Wilcox; Trace carrier, W. H. Townsend; Track circuit connector, W. Robinson; Trap, fly, H. L. Ferris; Tube-drawing mandrel, T. Whitehouse; Tube-smoothing die, P. Brown; Tubing mandrel, M. L. Orum; Turn buckles, making, M. Merrill; Type, A. M. Howard; Umbrella, J. G. Widmann; Umbrella tips, etc., casting, A. Ligibel; Under clothing for women, S. T. Converse; Valve, globe, F. Lunkenheimer; Vehicle hub, J. H. Lindsay; Vehicle spring, C. Nelson; Vehicle wheel, F. H. Green; Veneer cutting machine, C. T. Fairchild; Vessels, attaching handles to, F. W. Hartwell; Wagon rack, J. Bolt; Wagons, king bolt for, W. Truax; Wagon-weighting apparatus, J. J. D. Kingsbury; Washing machine, J. H. Carroll; Washing machine, S. L. Denney; Washing machine, J. M. Oakley; Water closets, pan for, E. A. Leland; Water wheel, current, W. W. Cleaveland; Water wheel, turbine, G. H. Jones; Well, petroleum, E. M. Stevenson; Well, petroleum, L. Stewart; Woodwork, carving, M. T. Boulton; Wrench, pipe, H. C. Stouffer;

8,555, 8,556.—INKSTANDS.—C. Kitchell, New York city. 8,557.—CLOCK CASES.—W. F. Muller, New York city. 8,558.—STOVE KNOB.—J. F. Quimby, Troy, N. Y. 8,559.—TYPE.—J. K. Rogers, Brookline, Mass.

SCHEDULE OF PATENT FEES.

Table of 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 filing a Disclaimer \$10, On an application for Design (3 1/2 years) \$10, On application for Design (7 years) \$15, On application for Design (14 years) \$30.

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA August 7, 1875.

- 5,039.—J. G. Eberhard, Akron, Ohio, U. S. Hame. August 7, 1875.
5,040.—M. McCall et al., Buffalo, N. Y., U. S. Cutting attachment to lead pencils, August 7, 1875.
5,041.—A. B. Drake, Painesville, Ohio, U. S. Fence post base, August 7, 1875.
5,042.—W. H. Lotz, Chicago, Ill., U. S. Hot air furnace August 7, 1875.
5,043.—J. Kedey, New York city, U. S. Securing knob roses to doors, August 7, 1875.
5,044.—J. L. O'Connor et al., Monroe Village, Wis., U. S. Pruning shears, August 7, 1875.
5,045.—A. Berry, Waterloo, P. Q. Churn, August 7, 1875.
5,046.—J. Buel, Chattanooga, Tenn., U. S. Safety strap, August 7, 1875.
5,047.—S. P. Littlefield, Lynn, Mass., U. S. Station indicator for railway carriages, August 7, 1875.
5,048.—H. A. Schandevyl, East Sangus, Mass., U. S. Corset, August 7, 1875.

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 nearly 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 right.

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.

To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention if susceptible of one, or if the in-