

J. H. asks: What is the best method of painting upon glass, so that the coloring will resist the weather? A. First draw the subject on paper, and fasten it, face downward, by pasting it at the ends, to the glass. Turn the glass over, and paint with a camel's hair pencil, the pigments being mixed with varnish. Let the outlines dry before filling in and shading. The painting may be varnished over.

J. B. N. asks: How can I transfer pictures from paper to glass? A. Coat the glass with a varnish of balsam of fir in turpentine, then press the engraving on smoothly and evenly, being careful to remove all air bubbles. Let it stand for 24 hours, then dampen the back sufficiently to allow the paper to be rubbed off by the forefinger, rubbing it till a mere film is left on the glass, then varnish again.

H. H. asks: How are organ pipes constructed, and are they tuned in the shop or after the organ is set up? Do they ever get out of tune? If so, how are they made right again? A. Organ pipes are made of wood or metal. The wooden pipes are generally nearly square across section, varying in size of section according to the length. Metal pipes are of different kinds of pewter, the best being the sort known as spotted metal. Pipes can be tuned before being put in the organ or afterwards. Shortening a tube raises the tone, lengthening it lowers it.

R. H. S. says: By what means can a barometer that has lost a portion of the mercury from the cistern be made to register correctly? A. It would probably be difficult to adjust it without using another barometer, unless the cistern is adjustable.

H. S. asks: 1. How does a chemist earn a living? A. Chemists make analyses, prepare reports of processes, etc. Some of them are professors in educational institutions. 2. Does he ever get rich? A. Good chemists often realize large profits from their profession. 3. What are the best books for a boy to study who wants to learn chemistry, supposing he knows nothing about it? A. "Towne's Elementary Chemistry," price \$2.75, will be a good book for you to have, and you will find in it information in regard to your other questions.

J. S. asks: 1. When in a rotary engine there are two or more pistons to but one abutment and steam port, after the second piston has passed the abutment and is receiving steam, does the steam between the first and second piston cause back pressure by expanding and pressing the two pistons apart? A. In general it does. 2. Are the compound brass fishing reels cast or stamped out of sheet brass? A. We believe the cheaper styles are stamped.

W. W. M. asks: How can I cover wire for insulating it? A. A disk having a large hole in the center, and carrying two spools on which the silk is wound, is made to revolve as the wire is drawn through the hole, the ends of the silk being first tied to the wire. By varying the relative speeds of the disk and wire, the silk may be wound on as closely as may be desired.

J. P. L. asks: How can I prepare bronze powder, to be used in a semi-liquid state upon wood? I want it to dry quickly. A. The best way is to coat the wood with glue or drying oil, and dust the bronze powder over it through muslin. But the bronze powder may be mixed with drying oil, and applied with a brush.

D. B. asks: 1. How can I make small portions of yellow and green bronze, and golden ink? A. For golden ink, see p. 102, vol. 30. Yellow ink can be made with a decoction of saffron. Green ink can be made by mixing indigo carmine with picric acid. 2. Do you know of a simple prescription to taketan off the face and hands? A. Cover the skin with cold cream. 3. Which is the better, to study civil engineering theoretically, or to study it by being the assistant of an engineer? A. The latter way. 4. Name some authors who have written on the "True and Beautiful." A. Ruskin, Taine, Goethe, Matthew Arnold, and the majority of the poets. 5. What is the salary of a United States coast surveyor? A. From one hundred to one hundred and twenty-five dollars a month, we believe. 6. What are the predictions of the coming spring? Will it be early? A. Probably it will be late, but this is a mere guess. 7. Whose work on civil engineering do you regard as the best? A. Professor Rankine's.

H. J. B. asks: Is there any kind of oil that will form an explosive gas by forcing air through it? A. Probably naphtha or some other of the hydrocarbons will answer your purpose.

W. asks: Why is it that, in hewing green wood, a spark of fire is often seen down in the wood next to the ax, where there could be no grit? A. The spark is probably due to the friction between the ax and wood.

R. G. asks: Why is it that a large boiler cannot carry as much steam per square inch as a small one? A. The strength of a cylinder, other things being equal, is inversely as the diameter.

E. J. F. asks: 1. Will the magnet be less powerful in attraction under water than otherwise? A. We think not. 2. What is the best method of causing a magnet to retain its full power of attraction? A. Keep weights suspended from the armature. 3. Which is best, magnetite or iron merely magnetized, or is there no difference in the power? A. The latter is best.

T. S. V. says: I am using a 10 x 20 engine, running at 80 revolutions, with steam at 60 lbs., with a 3 inch exhaust pipe, and I would like to exhaust into the bottom of a tank containing six feet water. How much back pressure will it make on the engine? A. About two and three quarter pounds per square inch.

J. A. B. asks: Would a steam boiler explode with the same noise and throw pieces of the boiler as far if it exploded under hydraulic pressure at 150 pounds to the square inch as it would under the same pressure of steam? A. The explosion would generally be the most violent in the case of steam.

N. L. T. asks: 1. Why can a kettle of boiling water be held on the hand without inconvenience as long as it boils, but as soon as it stops the heat becomes intolerable? A. If such is the fact, it is probably because water in boiling requires so much heat that it is abstracted from surrounding objects. 2. Can heat be transmitted through a vacuum? A. We think so. 3. Why are rifle balls made conical at one end, and flat and sometimes concave at the other? Would they not be more effective if made tapering to both ends, as in that case no vacuum is formed after the ball, the air flowing in behind it instantaneously? A. They are made concave at one end, in order that they may spread, and fill the grooves of the rifle barrel.

O. K. asks: 1. Is the White House at Washington a wood, brick, or stone building? A. It is built of freestone. 2. Has it ever been rebuilt? A. We think not. Why is it called the White House? A. Because it is a white house.

W. B. N. says: A friend claims that, in setting logs for sawing, the eccentric blocks, making two motions for one inch, will not throw the logs hard as setting the log by one motion with the double rack and pinion. There is no backlash in either case, and the log is to be moved the same distance in the same time. I claim that, if there is any difference, it would be in favor of my plan with the double rack and pinion. He is sure that he is right, and will not let any one decide. I ask for your opinion. A. It is difficult to determine which is correct without a practical test with the two devices.—J. E. E., of Pa.

W. M. J. asks: What is the best kind of saw to saw plow beams, wagon felles, and wagon hounds? How many plow beams are a day's work for one man, cut from plank of the proper thickness for common two horse plows? Is cutting the lumber or logs into plank the proper way to get out plow beams, or would it be better to saw the timber or logs to the shape of beam, and then slit up to the thickness of beams? A. The logs are first sawn into plank to the proper thickness for the beams, and then to a pattern marked with the required shapes. A strongly built jig or bandsawing machine is used for sawing the curves or the curved way of the beam. The first cost of a band sawing machine would probably be more than for a jig saw, but it would saw more rapidly. So much depends upon conditions that it is impossible to give an approximate estimate of a fair day's work.—J. E. E., of Pa.

W. J. says: 1. I have a theory that a balloon could be guided at will by attaching to it a conical shaped apparatus, made of light material and hollow, the open and large end to be fastened to one side of the balloon, the other end converging to a point. The theory is based on the principle that the balloon with the above attachment offers less sail-like surface to the wind, and consequently would be enabled to sail against currents of air. What is your opinion? A. We do not think that this arrangement will enable you to do what you propose. 2. Would not perpetual motion be possible if it were not for the law of gravitation? A. Possibly it would. 3. What is your opinion of the following proposition: If perpetual motion is ever invented, will it work by magnetism or attraction of magnetism? A. No. 4. Has there been anything invented to condense all the steam from a steam engine and return it to the boiler. If so, what is the percentage of waste? A. Yes. There is no waste, if the apparatus is tight. 5. Does the patentee of an invention possess any certificate to show that his invention is patented? A. No. 6. Is there any instrument that will detect the presence of a metal in the earth. A. No.

W. S. C. asks: 1. If the same pressure is brought to bear on every part of the interior of a steam engine and boiler, why are they made of different strengths? For example, the boiler is 1/2 inch thick, the live steam pipe is 3/4, and the steam chest and cylinder sometimes one inch and more. A. The strength of a cylinder, other things being equal, increases as its diameter is decreased, consequently small cylinders do not require to be made as thick as large ones. 2. How is it that a steam boiler can pump water into itself? It seems to me that there would be a back pressure on the pump piston head. A. The steam piston is larger than the water piston, so that the pressure per square inch on the water piston is greater than the boiler pressure. 3. If it takes 10 ordinary horses to run a machine at the required space, what sized engine would do the same work? A. An average horse performs about half an engine horse power, when working in a gin or mill, so that an engine of five horse power would generally do the work of 10 horses. 4. Why can a horse pull more when he is hitched directly to the load than he can 100 yards from it by a rope, deducting the weight of rope? A. We are by no means certain that this is a fact.

C. H. W. asks: How is curd soap made? A. By using tallow for the grease and soda for the alkali.

A. B. says: 1. In February last, while plowing a piece of land, I found, at a depth varying from 3 to 6 inches, a large number of honeycombed insect nests. These nests were of various sizes, but, for the most part, varied from 2 1/2 to 3 inches in width, about 4 inches in length, and about 1 1/2 inches thick. These nests are somewhat oval, inclining to flat on the top and bottom, and have quite a number of honeycomb cells, varying generally from six to twenty-four, which contain the cocoon of the insect. These nests are made of clay, somewhat like the dirt doblers. Can you inform me what bug or insect could have made such a nest, what its habits are, etc.? A. The insect which you describe appears to be a kind of wasp, of which there are two descriptions, the social and the solitary. The solitary wasp sometimes builds its nest in the ground, while the nests of the social insect are sufficiently familiar to us hanging from trees and fences. Consult an encyclopedia, article "wasp." 2. What is the best method of mixing white lead or zinc for painting wood? A. White lead and zinc are mixed with boiled linseed oil to a proper consistency for paint. 3. In vol. 28, No. 26, you published a new specific for rheumatism. It will be valuable to many if you republish it. A. Propylamin is the specific referred to. Wertheim prepares it by the decomposition of narcotine and codeine by alkalies. Dose, 5 drops in a tablespoonful of peppermint water every 2 hours.

C. S. A. asks: If a magnet were made in the shape of a ring, of the ordinary thickness, would not each molecule have polarity in the same directions as the whole magnet? A. In a bar magnet the magnetic power is most intense at the two extremities or poles, the middle portion showing hardly any or no magnetism. A circular disk or ring could be magnetized in the same way, the position of the poles depending upon the manner in which it was magnetized.

G. M. G. asks: Why is it that metronomes, for beating time in music, are not made in this country? A. Make one for yourself by taking a cheap clock movement, and substituting for the pendulum a wire with a sliding weight. Mark the wire with a file at the different points of graduation.

R. J. asks: 1. How can I make phosphate of calcium? A. By phosphate of calcium, we suppose, you mean calcium phosphate or phosphate of lime. The former term and analogous ones we consider both confusing and uncalled for in chemical nomenclature, although some chemists affect them. Phosphate of lime occurs naturally in the mineral apatite, and consists to a considerable extent in bones. In chemistry there are various phosphates of lime, depending upon the amount of base present. To form a basic phosphate, add a solution of basic phosphate of soda to a solution of chloride of calcium. 2. Can you tell me how to dissolve old rubber boots, etc., on a large scale? A. Bisulphide of carbon is a good solvent for india rubber. 3. Which is proper in speaking, to say "I can't" or "I can't"? The vowel a in "can't," abbreviation of "cannot," is sometimes pronounced with the short and flat, and sometimes with the broad and long, but never, properly, with any sound of o, as in "cont."

R. F. Jr asks: 1. Will you please give a practical method for testing the explosive nature of the several brands of burning oil? The oil that will not take fire when a lighted match is held to it may be considered tolerably safe. 2. In a recent number you gave a recipe for a paint dryer, which named gum lac as one of the ingredients. Is there any other name for that article more familiar to the trade? A. We think the name gum lac is applied to all the varieties in the market, namely, stick lac, the crude product, seed lac, in a granulated form, and shellac, which has undergone a purification.

J. V. D. says: After getting up steam on a Monday morning, I went to start my engine when, after about five or six turns, there was a loud report inside of the boiler, which jarred the whole mill. In about two seconds there was another and louder one, and then the boilers went on all right. On the next Monday morning they acted similarly. In the first case, the steam fell from 70 to 30 lbs., and in the second from 40 to 20. What was the cause? A. It may be that the pipes connecting the boilers with the steam drum had been choked with ice or something else, which would account for the accident.

E. S. H. asks: How can I make a safety fuse, to burn at least 5 minutes? A. Soak a plated cord in a solution of saltpeter.

S. asks: 1. How may I prove meerschaum to show that it is not imitation? A. This is the work of an expert. 2. How may it be made white, after it has become colored? A. We think it can be done by heating.

H. S. asks: If I fill a cask with steam from water at a heat so that the pressure will raise a safety valve weighted to one pound to the square inch, and then allow the steam to condense, what proportion of vacuum will there be in the cask? What proportion of the cask would fill with water by suction caused by the condensation of the steam, if the cask is connected by a suitable pipe with a water in a well at the depth of 21 feet, the pipe being full of water? A. If the steam is condensed, there will be practically a perfect vacuum, and the cask will become filled with water from the well.

W. F. M. B. and N. C. R. ask: Is the law, passed some time between 1866 and 1869, requiring all persons in charge of steam boilers and engines to be examined by commissioners appointed for that purpose, still in force? A. The United States law applies only to engineers of steam vessels. There are no laws in most of the States. It is very questionable in the light of the working of the present United States law whether government regulations affecting all persons in charge of steam boilers would be desirable.

T. H. E. asks: In soldering two pieces of iron together (a pair of gun barrels, for instance), after they have been thoroughly cleaned, tinned, and fastened together with binding wire, and warmed so that a thin sheet of solder applied to the joint will melt, is there anything besides resin that will make the solder flow as it ought, to make a good job? Resin is disagreeable to the workman, besides leaving a dirty, black color on the iron, which is difficult to remove. A. To 2 ounces of muriatic acid, add small pieces of zinc until bubbles cease to rise. Then put in half a teaspoonful of sal ammoniac and 2 ounces of water.

H. E. F. asks: Is vulcanized rubber the same thing as gutta percha? A. No.

G. M. A. asks: Is there a garden gate which opens and closes automatically? A. Such a gate is described on p. 406, vol. 25. Is there any method to cement mica to copper, tin, glass, or another piece of mica? A. The cement described in our answer to R. L., on p. 90, vol. 30, will answer the purpose.

W. L. asks: Is there any chemical that can be applied on glass, tin, or paper, which will be visible only through colored or stained glass? A. We are not aware of the existence of any such substance.

M. H. A. asks: If I take equal parts of block tin and quicksilver and unite them together by heat, could this be used for a polish for cleaning knives, forks, etc.? I propose to use muriatic acid and then apply the tin and quicksilver; would it adhere so that they could be used? Would there be any danger in using such articles? A. Your process might answer for tinning, and you can easily try the experiment, but amalgamated articles would be objectionable for culinary purposes.

M. B. asks: How can I make molds to cast silver, so that the silver will flow well and cast smoothly in casting small articles? A. You can make molds for silver similar to those which are used for fine cast iron castings. For a smooth facing, fine soapstone or plumbago may be used.

A. A. S. asks: Has hydrogen ever been decomposed? A. We have seen no authentic statement to the effect that it has.

A. S. says: An engineer of some experience has been building engines with concave pistons and corresponding convexity of the cylinder heads, taking steam in the center of the pistons by an arrangement of ports cored out of the heads, claiming that he gains a greater effective pressure on the piston by that shape. He states that, on a 4 inch cylinder, he gains 2 square inches. I claim that, no matter what the shape of piston or head, the size of cylinders being equal, the pressure will be the same as in the common engine. A. We think you are right.

W. S. W. asks: How are Japanese scintilletes made? A. Japanese scintilletes consist of pencils of rolled paper, one extremity of which, to the extent of about half the length of the pencil, is filled with a composition which burns with a red flame. It is ignited by holding the fine extremity in the hand, while the other end containing the mixture is held for a moment in a flame. The composition may be made to suit the fancy, the chief ingredients being probably sulphur, meal powder, or chlorate of potash, etc.

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

S. E. W.—Your oolite sediment consists of some saline material. So far as we can judge without a chemical analysis, it is common salt. The water used is apt not only to form scale, but to corrode the iron. The remedy is to distill, and to use the water from the condensed steam as far as practicable.

G. W. P. Jr.—The stones you send are garnets. When very perfect and of a pure color, they are sometimes reckoned among precious stones. Fine specimens are found in Ceylon and Brazil. We do not consider your specimens of any particular value. The garnet is a double silicate of alumina and lime, colored with manganese and iron.

L. T. H. asks: How can I make imitation ivory billiard balls without pressure?—E. E. S. asks: How

is moss prepared for finishing wax flowers? Can it be bleached and made to resemble white wax, to be put in white bouquets? How can small monopetalous corollas be made of wax, so that they will have the delicate fragile appearance of natural flowers? With what should the colors be mixed, so that they can be put on the wax as evenly as on paper? How can the bloom and flock be made to adhere to the wax?

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 Spider's Web. By J. H. B.
- On the Hot Springs of Nevada. By G. A. F.
- On the Centralization of Matter. By A. D.
- On Ventilation. By A. R. M.
- On the Relative Attraction of the Earth and Sun. By A. R. Jr. and by E. W.

Also enquiries from the following: A. W.—G. A.—S. R.—G. B.—A. P.—J. W. T.—R. J. W.—W. H.—E. C. B.—E. N.—A. Th.—D. A. S.

Correspondents in different parts of the country ask: Who makes match splitting machines? Who makes balanced slide valves for use on locomotives? Who sells a hash machine? Who makes woolen machinery, such as pickers, breaker cards, and finisher cards? Who manufactures balloons? Who makes a machine which prints by touching keys, similar to a piano? Where are machines for making friction matches sold? Who makes movable calks for horseshoes? Who makes broom handle machinery? Who makes ditching machines? Where can machines for pressing coal dust into blocks be obtained? Makers of the above articles will probably promote their interests by advertising, in reply, in the SCIENTIFIC AMERICAN.

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.

OFFICIAL.]

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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:
 27,973.—PRINTING PRESS.—F. O. Degener. April 8.
 28,014.—METALLIC CASE.—W. B. Scaife. April 8.
 28,043.—TEMPLE.—J. H. Woodward. April 8.

EXTENSIONS GRANTED.
 26,891.—SPECTACLE CASE CATCHER.—G. N. Cummings.
 26,902.—PLANING MACHINE.—S. S. Gray.
 26,906.—SEWING MACHINE.—A. F. Johnson.
 26,914.—CLOTHES WRINGER.—R. O. Meldrum et al.
 26,919.—REPEATING FIRE ARM.—W. H. Morris et al.
 26,948.—SEWING MACHINE STITCH.—A. F. Johnson.
 26,952.—LAMP.—G. Neilson.

DISCLAIMERS.
 26,919.—REPEATING FIRE ARM.—W. H. Morris et al.
 26,919.—REPEATING FIRE ARM.—W. H. Morris et al.

DESIGNS PATENTED.
 7,112 to 7,115.—CARPETS.—A. Heald, Philadelphia, Pa.
 7,116.—NECK RUFF.—U. D. Mannville, New Haven, Ct.
 7,117.—BIRD CAGE.—J. Maxheimer, New York city.
 7,118 to 7,124.—OIL CLOTHS.—C. T. & V. E. Meyer, Bergen, N. J.
 7,125 and 7,126.—CARPETS.—C. Righter, Philadelphia, Pa.
 7,127.—OIL CLOTH.—J. Barrett, New York city.
 7,128 to 7,132.—OIL CLOTHS.—J. Hutchison, Newark, N. J.

TRADE MARKS REGISTERED.
 1,598.—FLOUR.—J. Hannan, Chambersburg, Pa.
 1,599.—GYPSUM.—H. C. Hulbert, New York city.
 1,600.—MEDICINE.—J. Pownall, Williamsburg, N. Y.
 1,601.—MATCHES.—W. Roeber, New York city.
 1,602 to 1,605.—WHISKIES.—G. W. Kidd & 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
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 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

[Specially reported for the Scientific American.]
CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA, JANUARY 3, 1873.

3,068.—T. G. Messenger, Loughborough, Eng. Improvement on the coupling of pipes and in the fittings therefor, called "Messenger's Improved Pipe Joints." Jan. 3, 1874.
 3,069.—J. D. Marshbank, Harrisburgh, Pa., U. S., and J. R. Annett, Montreal, P. Q. Improvements on a cupola furnace for melting iron, called "Marshbank's Foundry Cupola." Jan. 3, 1874.
 3,060.—J. Mc. Armour, Syracuse, Onondaga county, N. Y., U. S. Improvements in knitting machines, called "Armour's Improved Knitting Machine." Jan. 3, 1874.
 3,061.—E. C. Goddard, Sweet'sburgh, Missisquoi county, P. Q. Improvements on the Itabca Wheel Rake, called "Goddard's Rake Lever Attachment." Jan. 3, 1874.
 3,062.—J. V. Browne, New York city, U. S., and R. P. Fidler, Sterling, Hastings county, Ontario. Improvements on muclage bottles, called "Vincent's Self Feeding Muclage Bottle for the Economical Use of Muclage." Jan. 3, 1874.
 3,063.—S. Collinson, St. Catharine's, Lincoln county, Ontario. Machine for cutting sickles, called "Collinson's Reaper Sickle Cutter." Jan. 3, 1874.
 3,064.—S. Collinson, St. Catharine's, Lincoln county, Ontario. Improvements on tongs used in machinery, called "Collinson's Patent Tongs." Jan. 3, 1874.
 3,065.—E. Sahn, Greenville, Mercer county, Pa., U. S. A combined square and gage for carpenter's use, called "Sahn's Combined Square and Gage." Jan. 3, 1874.
 3,066.—Wm. Todd, Portland, Cumberland county, Me., U. S. Improvements on car couplings and the method of attaching them to the cars, called "Todd's Car Coupling." Jan. 3, 1874.
 3,067.—G. M. Skinner, Gananoque, Leeds county, Ontario. Improvements on spoon baits for fishing, called "Skinner's Fluted Trolling Spoon." Jan. 3, 1874.
 3,068.—Wm. Gowen, Wanson, Marathon county, Wis., U. S. Improvement on saw mills, called "Gowen's Improvement in Saw Mill." Jan. 3, 1874.
 3,069.—G. B. De Boucherville, Quebec. Amelioration a la maniere de se servir d'une corde pour echapper a un incendie, called "Sauveur d'Incendie." A new mode of using a rope in case of fire. Jan. 3, 1874.

3,070.—J. A. Green, Hamilton, Ontario. Improvements in railway switches, called "Green's Self Adjustable Railway Switch." Jan. 3, 1874.
 3,071.—Wm. Hamilton, Neversink, Sullivan county, N. Y., U. S. Improvements on machines for making ox shoes, called "Hamilton's Ox Shoe Machine." Jan. 3, 1874.
 3,072.—D. J. Casement, Painesville, Lake county, Ohio., U. S. Improvement on seal locks, called "Casement's Seal Lock." Jan. 3, 1874.
 3,073.—J. Wilson, Kingston, Ontario. Improvements on paddle wheels, called "Wilson's Paddle Wheel." Jan. 3, 1874.
 3,074.—A. Amos, Potsdam Junction, St. Lawrence county, N. Y., U. S. Improvements on horse hay rakes, called "Amos' Improved Horse Hay Rake." Jan. 3, 1874.
 3,075.—C. McPhail, Big Harbor, Inverness county, Nova Scotia. Improvements on armor for ships of war, called "McPhail's Armor for War Ships." Jan. 3, 1874.
 3,076.—C. H. Chapman, Shirley, Mass., U. S. Improvements on machinery for weaving tape, called "Chapman's Tape Weaving Loom." Jan. 3, 1874.
 3,077.—Wm. McAllister, St. Lawrence, Mass., U. S. Improvements for protecting buildings from fire, called "The McAllister Fire Protector." Jan. 3, 1874.
 3,078.—I. Woolridge, Dean's Corner, Lake county, Ill., U. S. Improvements on land rollers, called "Woolridge's Improved Land Roller." Jan. 3, 1874.
 3,079.—W. C. Oavol, Jr., Fall River, Bristol county, Mass., U. S. Improvements in hose leak stoppers, called "Davol's Fire Hose Leak Stopper." Jan. 3, 1874.
 3,080.—I. Helton, Carter's Depot, Carter county, Tenn., U. S. Improvements in a medical compound, called "Fever Specific," the title or name whereof is "Fever Specific Compound." Jan. 3, 1874.
 3,081.—R. H. Hudgin, Howard, Kent county, Ontario. Improvements in the formation and construction of gate posts, called "Hudgin's Gate Post." Jan. 3, 1874.
 3,082.—M. Boch, Brooklyn, Kings county, N. Y., U. S. Improvements on fasteners for shoes, etc., called "Boch's Improved Shoe Fastener." Jan. 3, 1874.
 3,083.—J. Rogers, Brooklyn, Kings county, N. Y., U. S. Improvements on apparatus for manufacturing lamp black, called "Rogers' Improved Lamp Black Furnace." Jan. 3, 1874.

HOW TO OBTAIN Patents and Caveats IN CANADA.

PATENTS are now granted to inventors in Canada, without distinction as to the nationality of the applicant. The proceedings to obtain patents in Canada are nearly the same as in the United States. The applicant is required to furnish a model, with specification and drawings in duplicate. It is also necessary for him to sign and make affidavit to the originality of the invention.

The total expense, in ordinary cases, to apply for a Canadian patent, is \$75, U. S. currency. This includes the government fees for the first five years, and also our (Munn & Co.'s) charges for preparing drawings, specifications and papers, and attending to the entire business. The holder of the patent is entitled to two extensions of the patent, each for five years, making fifteen years in all.

If the inventor assigns the patent, the assignee enjoys all the rights of the inventor. A small working model must be furnished, made to any convenient scale. The dimensions of the model should not exceed twelve inches.

If the invention consists of a composition of matter, samples of the composition, and also of the several ingredients, must be furnished. Persons who desire to apply for patents in Canada are requested to send to us (Munn & Co.), by express, a model with a description, in their own language, showing the merits and operation of the invention, remitting also the fees as above for such term for the patent as they may elect. We will then immediately prepare the drawings and specification, and send the latter to the applicant for his examination, signature, and affidavit. It requires from four to twelve weeks' time, after completion of the papers, to obtain the decision of the Canadian Patent Office. Remit the fees by check, draft, or Postal order. Do not send the money in the box with model. Give us your name in full, middle name included.

Inventions that have already been patented in the United States for not more than one year may also be patented in Canada. On filing an application for a Canadian patent, the Commissioner causes an examination as to the novelty and utility of the invention. If found lacking in either of these particulars, the application will be rejected, in which case no portion of the fees paid will be returned to the applicant. Inventors may temporarily secure their improvements in Canada by filing caveats; expense thereof, \$35 in full. For further information about Canadian patents, assignments, etc., address

MUNN & CO.,
 37 Park Row,
 New York.

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 rights.

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, pre-paid. 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.

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.

Value of Extended Patents.
 Did patents realize the fact that their inventions are likely to be more productive of profit during the seven years of extension than the first full term for which their patents were granted, we think more would avail themselves of the extension privilege. Patents granted prior to 1861 may be extended for seven years, for the benefit of the inventor, or of his heirs in case of the decease of a father, by due application to the Patent Office, ninety days before the termination of the patent. The extended time inures to the benefit of the inventor, the assignees under the first term having no rights under the extension except by special agreement. The Government fee for an extension is \$100, and it is necessary that good professional service be obtained to conduct the business before the Patent Office. Full information as to extensions may be had by addressing MUNN & Co. 37 Park Row, New York.

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.

Design Patents.
 Foreign designers and manufacturers, who send goods to this country, may secure patents here upon their new patterns, and thus prevent others from fabricating or selling the same goods in this market. A patent for a design may be granted to any person whether citizen or alien, for any new and original design for a manufacture, bust, statue, alto relievo, orbas relief, any new and original design for the printing of woolen silk, cotton, or other fabrics, any new and original impression, ornament, pattern, print, or picture, to be printed, painted, cast, or otherwise placed on or worked into any article of manufacture. Design patents are equally as important to citizens as to foreigners. For full particulars send for pamphlet to MUNN & Co., 37 Park Row, New York.

Copies of Patents.
 Persons desiring any patent issued from 1836 to November 26, 1867, can be supplied with official copies at a reasonable cost, the price depending upon the extent of drawings and length of specification. Any patent issued since November 27, 1867, at which time the Patent Office commenced printing the drawings and specifications, may be had by remitting to this office \$1. A copy of the claims of any patent issued since 1836 will be furnished for \$1. When ordering copies, please to remit for the same as above, and state name of patentee, title of invention, and date of patent. Address MUNN & Co., Patent Solicitors, 37 Park Row, New York.

MUNN & Co. will be happy to see inventors in person at their office, or to advise them by letter. In all cases they may expect an honest opinion. For such consultations, opinions, and advice, no charge is made. Write plain; do not use pencil or pale ink; be brief. All business committed to our care, and all consultations, are kept secret and strictly confidential. In all matters pertaining to patents, such as conducting interferences, procuring extensions, drawing assignments, examinations into the validity of patents, etc. special care and attention is given. For information and for pamphlets of instruction and advice, Address **MUNN & CO.,** PUBLISHERS SCIENTIFIC AMERICAN, 37 Park Row, New York. OFFICE IN WASHINGTON—Corner F and 7th Streets, opposite Patent Office.