Act, obtain a patent granting to such person an exclusive property therein; but no patent shall issue for an invention having an illicit object in view, nor for any mere scientific principle or abstract theorem.

But an inventor shall not be entitled to a patent for his invention if a patent therefor in any other country shall have been in existence in such country more than twelve months prior to the application for such patent in Canada; and if, during such twelve months, any person shall have commenced to manufacture in Canada the article for which such patent is afterwards obtained, such person shall continue to have the right to manufacture and sell such article, notwithstanding such patent; and under any circumstances, where a foreign patent exists, the Canadian patent shall expire at the earliest date at which any foreign patent for the same invention expires.

The patent may be granted to any person to whom the inventor has assigned or bequeathed the right of obtaining the same, or in default of such assignment or bequest, to the executors or administrators or as signs of the deceased inventor.

The applicant for a patent must make oath (before any Judge in the country where he lives) that he is the inventor, must furnish a full specification of his invention, with drawings in duplicate, together with a neat working model, made on a convenient scale. If the invention is a composition, he must furnish specimens thereof and of the several ingredients.

DURATION AND EXTENSION OF CANADIAN PATENTS.

Patents shall be valid for a period of five, ten, or fifteen years, at the option of the applicant; but at or before the expiration of the said five or ten years, the holder thereof may obtain an extension of the patent for another period of five years, and after those second five years, may again obtain a further extension for another period of five years, not in any case to exceed a total period of fifteen years in all; defective patents may be corrected by reissue or the filing of disclaimers.

The Government of Canada may always use any patented invention, paying to the patentee such sum as the Commissioner may report to be a reasonable compensation for the use thereof.

Patents may be assigned in whole or in part; assignments shall be registered with the Commissioner; the assignment first registered shall be good as against any other assignment of the same patent or interest therein.

INFRINGEMENTS.

An action for the infringement of a patent may be brought before any Court of Record having jurisdiction to the amount of damages asked for, and having its sittings within the Province in which the infringement is said to have taken place, and being, at the same time, of the Courts of such jurisdiction within such Province, the one of which the place of holding is nearest to the place of residence or of business of the defendant; and such Court shall decide the case and determine as to costs. Any Judge thereof, in chambers if the Court be not sitting, may, on the application of the plaintiff or defendant respectively, make such order for an injunction restraining the opposite party from further use, manufacture or sale of the subject matter of the patent, and for his punishment in the event of disobedience to such order, or for inspection or account, and respecting the same and the proceedings in the action, as the Court or Judge may see fit.

MANUFACTURE AND IMPORTATION OF PATENTED IMPROVEMENTS IN CANADA.

Every patent shall be subject to the condition that such patent and all the rights and privileges thereby granted shall cease and determine, and the patent shall be null and void, at the end of two years from the date thereof, unless the patentee, or his assignee or assignees, shall, within that period have commenced, and shall after such commencement continuously carry on, in Canada, the construction or manufacture of the invention or discovery patented, in such manner that any person desiring to use it may obtain it, or cause it to be made for him at a reasonable price, at some manufactory or establishment for making or constructing it, in Canada, and that such patent shall be void if, after the expiration of twelve months from the granting thereof, the patentee or his assignee or assignees for the whole or a part of his interest in the patent, imports or causes to be imported into Canada the invention for which the patent is granted.

Whenever a patentee has been unable to carry on the construction or manufacture of his invention within the two years hereinbefore mentioned, the Commissioner may grant to the patentee a further delay on his adducing proof to the satisfaction of the Commissioner that he was for reasons beyond his control prevented from complying with the same.

CANADIAN PATENT FEES.

The following are the patent fees:

On petition for a patent of 5 years	$20 00
On petition for a patent for 10 years	40 00
On petition for a patent for 15 years	60 00
On petition for extension from 5 to 10 years	20 00
On petition for extension from 10 to 15 years	20 00
On petition for extension from 5 to 15 years	40 00
On lodging a caveat	5 00
On petition to reissue a patent	4 00

CAVEATS IN CANADA.

An intending applicant may file in the Patent Office a description of his invention so far, with or without plans, at his own will; and the Commissioner shall cause the said document to be preserved in secrecy, and such document shall be called a caveat. If application shall be made by any other person for a patent for any invention with which such caveat may in any respect interfere, it shall be the duty of the Commissioner forthwith to give notice by mail to the person who has filed such caveat, and such person shall within three months after the day of mailing the notice, if he would avail himself of the caveat, file his petition and take the other steps necessary on an application for patent.

REJECTIONS.

The Commissioner may object to grant a patent in the following cases:

When he is of opinion that the alleged invention is not patentable in law.

When it appears to him that the invention is already in the possession of the public with the consent or allowance of the inventor.

When it appears to him that there is no novelty in the invention.

When it appears that the invention has been described in a book or other printed publication before the date of the application, or is otherwise in the possession of the public.

When it appears that the invention has already been patented in Canada (or elsewhere, for more than one year), except, however, when the case is one in which the Commissioner has doubts as to whether the patentee or the applicant is the first inventor.

INTERFERENCES.—ARBITRATORS TO DECIDE.

In case of interfering applications for any patent, the same shall be submitted to the arbitration of three skilled persons, one of whom shall be chosen by each of the applicants, and the third person shall be chosen by the Commissioner or his deputy or the person appointed to perform the duty of that office. And the decision or award of such arbitrators, or any two of them, delivered to the Commissioner in writing, and subscribed by them or any two of them, shall be final as far as respects the granting of the patent.

The arbitrators, or any one of them, after having been so worn, s hall have the power of summoning before them any party or witness, and of requiring him to give evidence on oath, orally or in writing (or on solemn affirmation, if the person be entitled to affirm in civil matters), and to produce such documents and things as such arbitrators deem requisite to the full investigation of the matters into which they are appointed to examine, and shall then have the same power to enforce the attendance of such witnesses, and to compel them to give evidence, as is vested in any court of law in civil cases.

The fees for the services of arbitrators shall be a matter of agreement between the arbitrators and the parties.

CANADIAN STAMP PENALTIES.

Every patentee under this act shall stamp or engrave on each patented article, sold or offered for sale by him, the year of the date of patent applying to such article, thus: "Patented 1872," or as the case may be; any such patentee selling or offering for sale any such patented article not so marked shall be liable to the punishment of a fine not to exceed one hundred dollars, and, in default of the payment of such fine, to imprisonment not to exceed two months. The penalty for using the stamp of patented upon an article that has not been patented is a fine not exceeding two hundred dollars and imprisonment not exceeding three months.

The above new Canadian patent law goes into effect Sept. 1st, 1872, when a large number of patents will be applied for by Americans. In fact many persons, desirous of avoiding delay, have already ordered Canadian patents, and their specifications, drawings and models, are now in preparation for deposit in the Government archives at Ottawa. Messrs. Munn & Co. have perfected their arrangements for securing Canadian patents in the most prompt manner, on very reasonable terms, and will be happy to furnish, without charge, further information upon the subject to all who apply. Enquiries may be addressed to them at the SCIENTIFIC AMERICAN Office, 37 Park Row, N. Y.

[Special Correspondence of the Scientific American.]

LETTER FROM PROFESSOR R. H. THURSTON.

PITTSBURGH, Pa., June 25th, 1872,

A visit to the works of Messrs. Sellers. The Giffard Injector. The Baldwin Locomotive Works. Mountain scenery. The Pneumatic Railway Brake. The Water Scoop.

Another of the most interesting among the great manufacturing establishments of Philadelphia is that of Messrs. Sellers & Co., the well known builders of machine tools.

Here about five hundred and fifty men are employed, and, with the ingenious machinery and the effective system adopted in doing work, they produce a larger amount per year than could two thousand men have done ten years ago in even these works, which were then, as now, remarkable as a leading establishment in the business.

The Messrs. Sellers were among the very earliest in the introduction of the system, now almost universal among the best builders, of making all their work precisely to gage, and thus securing the best of workmanship and interchangeable parts. As representing the effectiveness of this modern method of manufacturing, their shops form, as in many other respects, a model establishment. Their machines are as nearly perfect in material and workmanship as it is to-day possible to make them, and they were probably the first to prove by actual experience that such machinery can find a market in this country at remunerative prices. It must be confessed that there are, however, comparatively few builders who adhere, like this firm, to a determination to do none but the best possible work under all circumstances.

The planing machines and the steam hammers made here are, if a distinction can be made at all, particularly noticeable tools. The method of driving the table of the former, by a spiral pinion working into a rack, is found as effective as it is ingenious. The steam hammer has the weight of its drop in its piston rod, which is made very large, and the system adopted in guiding it and thus escaping the serious danger which arises in ordinary hammers from a glancing blow, is peculiarly excellent. The valve gear is at once the simplest and most effective that I have seen. Taken as a whole, it is a splendid tool.

THE GIFFARD INJECTOR.

The Giffard steam boiler injector—that wonderful substitute for the steam pump—is another of the most interesting machines made here. I well remember the incredulity with which I first heard, a dozen years ago, of this apparatus in which steam left the boiler, picked up a quantity of water while passing through the instrument, and carried it into the boiler again without the loss of a drop of water or of a particle of steam. I remember that the story appeared still more absurd when it was added that the new pump needed neither valve, plunger, nor any other moving part. It required a visit to the works of the Messrs. Sellers shortly afterward to remove all doubt, and, as a matter of course, the wonder, once seen, became the simplest thing imaginable. The manufacturers have greatly improved the injector since that time, and now there are few railroads in this country on which it is not in regular use.

Every minute spent in this establishment afforded useful information, and I only regretted that I had not a week to spare, instead of but a few hours.

THE BAIRD LOCOMOTIVE WORKS.

An afternoon was spent very pleasantly, and most profitably, in the great Baldwin Locomotive Works of Messrs. Baird & Co. At this establishment, more than twenty-five hundred men are at work, turning out from seven to nine completed locomotive engines every week, and the orders still increase. The proprietors of the works were working men who have, by their industry, intelligence and good management, become the employers of this industrial army, and who have shown what may be done by labor in the acquisition of capital, teaching the same lesson that may be learned in nearly all of the most successful manufacturing establishments here and abroad. All work is here, also, made to gage, and the several parts are "assembled," to make the complete machine, without the expense attending the old process of "cutting and carving" in fitting up. Some of the engines in progress here are for Russian railroads. Like the majority of great industrial establishments, this immense manufactory has been many years in process of growth. It was established half a century ago, and its first locomotive was built in 1830. In 1831, an engine was built here for the Philadelphia and Germantown railroad, which is said to have run a mile in a minute.

Good material, good work, and a plain finish, seem to be the practice here.

There are many other large manufactories and interesting places that attract the attention and afford valuable information to the engineer, and a dozen of them would each afford material for a full column in the SCIENTIFIC AMERICAN; but my time was limited, and I was compelled reluctantly to leave the "City of Brotherly Love," and to pursue my journey westward over that most excellently managed road, the Pennsylvania Railroad.

THE PENNSYLVANIA RAILROAD AND ITS SCENERY.

The excellence of the road bed and the smoothness with which the train ran—sometimes over forty miles an hour—allowed the passengers to enjoy, without annoyance, the beautiful scenery of the Alleghanies. The atmosphere was slightly hazy, but not so much as to interfere seriously with the view of distant mountains and adjacent valleys. At this season, when every mountain side is clothed with the fresh verdure of early summer, and the atmosphere still gives that softness to the distance that is only seen when the heats of summer or the low temperature of winter has not deprived it of its moisture, the scenery is most lovely. This oldest of our mountain chains certainly presents studies for an artist which, if surpassed in grandeur by those of younger ranges, cannot be excelled in quiet beauty.

The run down the western slope of the mountains gave an excellent opportunity of watching the operation of the Westinghouse air brake, which has been many months in use on the Pennsylvania railroad and, we were told, giving perfect satisfaction. We were much pleased with what we saw of it. A continuous brake, not liable to break down just when most needed to "brake up," powerful but controllable in action, and directly under the hand of the engineer—all of which merits are claimed for this—is a much needed invention, and its successful introduction would undoubtedly save many lives, a large amount of property, and perhaps considerable of the expense of running fast trains making frequent stops; and, still further, it would save time to a very important degree. Something of this kind must, sooner or later, be adopted.

At Altoona, a station house roof truss attracted attention by its neatness and simplicity. We noticed also, at two points on the road, troughs of considerable length laid down between the rails and filled with water. The engine was supplied with water, without stopping, by letting down a curved pipe until its mouth entered the water; and, at the high speed at which it ran, it scooped up a quantity while running the length of the trough to replace that previously drawn from the tender. This device has been for some time in use abroad, but the Pennsylvania railroad is probably the first to introduce it in this country. It will probably be found a very valuable device on long lines of road running through express trains.

We finally arrived at Pittsburgh on time, after a quick and pleasant run, and are perfectly willing to agree with those who claim for the Pennsylvania Railroad the credit of having an excellent road bed, good rolling stock, and the best of management.

R. H. T.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per Line will be charged.

Notes & Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—COLORING LINSEED OIL.—How can I color linseed oil red or brown? Aniline in alcohol will not do.—J. P. W.

2.—TAXIDERMY.—How are birds and animals stuffed?—J. H. Y.

3.—CLEANING MARBLE.—What is the best way of cleaning polished marble slabs from grease, oil, or red wine stains?—C. R.

4.—POLISHING KNIVES.—Will some one inform an old subscriber how the English polish is put on knives, how the wheels are made and what kind of leather should be put on?—J. G.

5.—WALNUT STUMPS.—What is the value of walnut stumps and in what shape should they be sent to market? Are the white walnut, black walnut, or butternut the most valuable?—E. C.

6.—VINEGAR.—Will some practical man inform us of the best mode of making vinegar from the best materials, that the public may not continue to be poisoned by vitriolic and other mixtures?—G.

7.—SKIN DISEASES.—I notice in your paper of May 11th, 1872, a communication from a sufferer from skin disease, attributing the cause to the use of a certain kind of soap. I am one of many shop mates who have the same disease, and I think we contracted it from using sand paper, as it is altogether on the hands. I have had it two months, and have had two of our best doctors here at work on me, but without success. What they give me to use are washes for the hands, which apparently drives it away for a few days; but just as soon as I commence to work, out it comes again. I have been using carbolic acid and glycerin, bathing the hands in strong salt brine, nitrate of lead, and sulphuret of potassium; the latter apparently does the most good, but the cure is not permanent. We should be grateful to you if you could get, from some of your eminent physicians in New York, a radical cure. I think some medicine should be taken to purify the blood, but both the doctors I have seen do not give me any.—C. N.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 1·00 a line, under the head of "Business and Personal."

ALL reference to back numbers must be by volume and page.

J. D., and others.—Multiply together the area of the piston in inches, the mean boiler pressure in pounds per square inch, the length of the stroke in feet, and the number of strokes per minute; divide by 33,000 and you have the horse power of your engine.

To R. P. P.—There are positive and negative poles to the induced currents of the electrical machines that you speak of. As to method of manufacture, consult books on electricity. It is not new to place a wheel at the bow of the canal boat, nor to have side pieces extended forward to prevent lateral movement of swell or waves. This plan was illustrated in last volume of SCIENTIFIC AMERICAN.

W. S. M.—The clearest and most dense ice will keep the longest and produce the most refrigeration. Placed in water, the temperature produced by two cubes of ice, one of porous or snow ice, the other of dense clear ice, will be the same. But the clear ice will refrigerate a larger quantity of water than the porous ice.

MILK SOURED BY A THUNDER STORM.—Milk, beer, and other fluids turn sour by oxygenation. After a thunder storm there is always in the air a considerable excess of ozone, which is oxygen in its most active condition, ready to attack any matter that can be affected by it.—D. B., of N. Y.

PROPORTIONS OF STEAM ENGINE.—D., query 5, page 26, is informed that James Watt determined that the condenser and air pump should each have one eighth the capacity of the cylinder. In more modern practice, however, the air pumps are made larger, especially in marine engines. Some engineers also make their condensers larger, but the practice is not justified by any economical result.—D. B., of N. Y.

DIMENSIONS OF BELT.—Query 7, page 416, Vol. XXVI.—W. J. S. can ascertain the width of belt required for his purpose by calculation from the speed of his driving pulley. A belt one foot wide running at the speed of seventy feet per minute will develop one horse power; a belt three inches wide, to develop the same power, must run of course at 280 feet per minute.—T. L., of Mass.

GILDING ON GLASS.—In answer to J. F., query 5, page 416, Vol. XXVI., I would say that gilding on glass is done by the use of what is termed a water size, made by the use of some mucilaginous substance, such as the white of egg reduced with water. I conclude that English gelatin is best, but great care is necessary not to make it too strong; and it should be perfectly clean. therefore straining it through thin muslin is a good precaution. The gilding is done upon the back side of the glass. First clean the glass perfectly with alcohol; then apply the sizing with a flat camel hair brush, and immediately lay the gold leaf. Stand the glass on edge and allow the surplus size to settle from under the gold. The gold will flatten and have a burnished appearance. When dry, lay out your designs on paper and transfer by the use of some sharp pointed instrument, pricking through the paper; then paint your design on top of the gold; asphaltum varnish is a good material for that purpose. When that is dry, wash off the surplus gold, and shade the letters or other design with paint of any color desired and let it dry. If you desire a colored ground, then paint the whole surface with the color desired. Experience is necessary for this class of work.—R. F., of Mass.

OCEAN CABLES.—H. F. H., query 1, page 416, Vol. XXVI.—The Atlantic cables mostly lie at the bottom of the ocean, but there are many stretches between the submarine mountain peaks. The specific gravity of the cable causes its sinking and remaining at the bottom of the sea.—E. H. H., of Mass.

CEMENT FOR LETTERS ON GLASS.—To J. F.—This is frequently made by diluting white of egg with water to a suitable degree of fluidity, and adding a little carbolic acid to prevent decomposition, and then filtering. Paint the glass by means of a badger hair brush, allow it to partially dry, and apply gold or silver leaf, and allow it to become thoroughly dry. Now put on the stencil plate, and with a needle point mark out, down to the glass, the letters or design. Then put the whole plate into a shallow dish of tepid water, and by means of a stick, finger, or finger nail, etc., rub off the extraneous metal, and you will have your perfect letters left, and if the cement has not been too thick, with a perfect brilliancy.—E. H. H., of Mass.

SLACK COAL AND SAWDUST.—To J. F. T.—Mix them together with enough gas tar to stick and make into bricks. A machine like the pug mill of a brick machine would do, or indeed a brick machine at once would probably answer, especially such a one as would press the mass into a mold, and not such as would drive out the stuff in a stream, then to be cut with wires. This last style of machine would inevitably make very poor work, but by the former you would get, I think, a splendid fuel, and only take a very small quantity of the cheap tar.—E. H. H., of Mass.

SLACK COAL AND SAW DUST.—J. F. T. can burn all his sawdust for fuel if he has proper grates and has a good draft to his fire box. I am sawing green hemlock with a five feet circular saw, and burn every bit of sawdust made. I use no coal or extra fuel.—N. J., of N. Y.

CUTTING STEEL AUGERS, ETC.—To A. V., query 10, page 354, Vol. XXVI.—I would say, first, that the diameter should vary with the diameter and pitch of thread, and should be about two inches for threads from 24 to 32, three inches from 16 to 24. The number of revolutions should be from 12,000 to 16,000 per minute, and a pulley 2 x 2 (on a steel arbor running in Babbitt boxes) will be large enough to run it. A. V. will find he will have to harden his cutters and temper to a straw color in order to have them stand.—C. M. P., of Mass.

TEST FOR ZINC.—To J. B.—The simplest method for an amateur to employ is probably to evaporate a gallon of water to dryness, put the residue on to a platinum wire, and moisten with a solution of protonitrate of cobalt. Apply the blowpipe flame, and the little mass will yield a green colored appearance if zinc be present. Other means of testing are adopted, but to any but a professional will be found complicated. The presence of five grains in a gallon would eventually prove injurious, but it would probably be only after a lengthened use of such water. The antidote for acute zinc poisoning is the exhibition of an emetic, and afterwards the drinking copiously of albuminous fluid and large doses of tannin or oak bark tea, etc.—E. H. H., of Mass.

UNITED STATES COINAGE.—To F. R. E., query 16, page 10.—Copper cents were issued first in the year 1793 and ceased in 1857. In 1815, there were none coined. The half cents made their first appearance in 1793, and were discontinued in 1857. In 1798, 1801, 1812 to 1824 inclusive, and 1852 there were none coined except a few pattern pieces in 1813, 1832, 1840, and the eight succeeding years, and 1852. The eagle head nickels were first issued in 1857, and in 1859 were supplanted by the Indian head.—E. T. P., of N. Y.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

HORSE SHOE NAIL CLINCHER.—Wm. H. Lyman, Springfield, Mo.—Many efforts have hitherto been made to construct this tool so as to afford the greatest leverage to the hand of the smith, to avoid side strain upon the screws and pivots, and to prevent the liability of the jaws to slip from the nail. Some clinchers have one of these advantages and some another, but none have hitherto combined them all. This clincher has the following advantages: 1st: It is constructed so as to take off all side strain from the fastening screws or pivots and thus to allow none of the parts ever to lose their true relative position to the others. 2nd: It is provided with double leverage jaws, so that the grip of one hand will easily and accurately clinch the nail. 3rd: It has a peculiar shape of underjaw which prevents that jaw from slipping and causes it to rock on the nail head. The effect of these several advantages is to give the smith complete control of the horse's foot, while he is being shod to enable him always to turn off perfect work, and with a to furnish him with a most durable tool that is not liable to get out of order.

HARVESTER REEL.—George S. Grier, Milford, Del.—The invention consists in supporting an adjustable reel by means of a pivoted crank shaft, which passes through the hollow shaft of said reel and moves up or down with it.

FIRE KINDLER CASE.—David W. Thompson, St. Joseph, Mo.—The invention consists of a screw capped can for holding the oil and kindler, so that the former is prevented from spilling or waste in the event of the can being accidentally upset, and the latter is kept from rattling or moving about in the can while the can is being handled; at the same time the kindler is always saturated and ready for use.

ROSSING MACHINE.—Charles Gilpin and James T. Hill, Cumberland, Md.—The invention consists in causing the knife of a rossing machine to change its position automatically according to the thickness of bark passing between the rolls, and in the peculiar arrangement of devices by which this new idea is carried out.

PEANUT AND COFFEE POLISHER.—Benjamin F. Walters, Norfolk, Va.—The invention consists in combining a rotary and stationary brush with a feed hopper, so that coffee or peanuts may be readily, conveniently and effectually polished for market.

CIRCLE FOR CARRIAGE.—Edwin Wilson, Prattsburg, N. Y.—This invention relates to an improved method of connecting the reach, front axle, head block and circle of a carriage. The reach and head block are rigidly attached to a three armed plate or strap which rests upon the circle. The straight part of the circle is attached by clips and yokes to the axle. The ring bolt is attached to the upper side of this straight part, and passes through the strap and the head block. The whole is strengthened by braces.

COVERING TUBULAR FABRICS WITH RUBBER.—William H. Bates and Hugh Faulkner, of Leicester, England, assignors to Ezra Thomas Sawyer, of East Hampton, Mass.—This invention relates to a new machine for applying an outside coating of india rubber, gutta percha, or other analogous elastic gum to tubular fabrics that are to be made water tight. It is more particularly adapted to, and intended for, the manufacture of rubber hose, but may also be used for other tubular fabrics. The tube to be covered has a core placed within it and is joined at the ends. It is passed over two drums, and by their means carried repeatedly through the waterproofing solution, drying cylinders, and an annular scraper until the covering is thick enough.

WATER WHEEL.—James P. Lamoree, of Mexico, N. Y.—This invention relates to that class of water wheels in which the buckets are arranged in diametrical pairs, and are thrust in and out as they rotate. It consists in adjusting the throw of the buckets so that the maximum protrusion thereof takes place at different points, which is accomplished by means of a shaft, axle and axis which are arranged adjustably in a rectangular slot in the ymiddle part of each pair of buckets.