

Iron and Steel Exhibits of the West.

Conceding the greatness of the Northwest as an agricultural and stock-raising region, people have been content to think that its progress is comprised in the products which its superiority in these respects so generally yields. The prospect of its great cities assuming an importance as manufacturing points has almost been lost sight of by the masses. The displays made by the iron makers at the Chicago Exposition, says the *New York Times*, show what these products are, and indicate to what extent the mining wealth of the West is being taken advantage of by points brought near to the ore regions by rail and lake navigation.

Among the exhibitors was the North Chicago Rolling Mills Company, of which Captain E. B. Ward is president. These mills have an annual capacity of 25,000 tons Bessemer steel rails, 30,000 tons railroad iron, and 50,000 tons pig metal. The samples which the company expose are very fine and extensive, and attract a large degree of attention. The texture of the metal used in them is illustrated by rails twisted, curled, bent double, and subjected to any process which will show the torsion, strength and ductility of the metal. One of the most curious specimens is that of a polished steel rail, about four feet in length, twisted while cold. The test thus given to the quality of the metal is severe, and certain to bring to light any of its imperfections. The rail in question shows not a fracture, flaw, or even the slightest blemish.

A number of broken steel ingots were also among the exhibition. They weigh from 1,100 to 1,400 pounds each, are perfectly solid, and show a texture and density that is not excelled by any Bessemer steel mill in this or any other country. The company claim that they are making as fine an ingot as is manufactured in the world. The quality of the Lake Superior iron is particularly adapted to the manufacture of steel, and it excels the best brands of the foreign market. The company are the owners of vast mining interests in the Lake Superior regions, and they carry on the process of manufacturing through all the details, from mining the ore to turning out the rails. A piece which had been recently tested was on exhibition. It stood the remarkable test of 73,250 pounds to the square inch, with an elongation of sixteen per cent. A sample of chains manufactured of Bessemer steel, at the Wyandotte (Michigan) Rolling Mills, constituted an interesting feature of the display. A comparative list of these chains with those of English make shows the following result:

Size.	Quality.	Strength.
1½ inch.....	American.....	101,750
	English.....	76,500
¾ inch.....	American.....	28,875
	English.....	19,000
¾ inch.....	American.....	38,000
	English.....	26,000
½ inch.....	American.....	15,825
	English.....	8,500
7-16 inch.....	American.....	10,250
	English.....	5,750

Reduction of Auriferous Pyrites.

Dr. Ira M. Phelps has devised a process which is described as being of the highest metallurgical importance as well as scientific interest. The sulphur contained in the ore furnishes a large portion of the fuel; it being compelled, in a great measure, to consume itself. Oxygen and mercury, the former obtained from the atmosphere without money and without price, and the latter secured against excessive loss by properly constructed amalgamators, are the only chemicals needed except that furnished by the ore itself. The sulphur, which has hitherto been the most troublesome element, is made to do its duty not only in accomplishing its own destruction, but in effecting the release of the golden treasure it has so long and persistently guarded. That a thorough desulphurization of the ore is a necessary prelude to amalgamation is a conceded fact, and it is the difficulty of accomplishing this desulphurization that has led to so many failures. Dr. Phelps maintains that the cause of all the failures has been an insufficient supply of oxygen, the enormous bulk of air necessary to supply it never having been even approximately estimated or conceived. But in addition to this, there are four other conditions, to secure and maintain which is of vital importance: a supply of oxygen sufficient to meet all the demands of oxidation, a proper and timely regulation of the heat, the constant agitation of the ore, and sufficient time to perfect the chemical changes involved.

The importance of fine pulverization is fully recognized by Dr. Phelps, who takes especial care to point out the enormous difference, in the time required, which variation of size makes, a little variation in its superficies making a very great difference in the time required. Dr. Phelps claims to have obviated this difficulty by introducing the ore underneath the draft current, and causing it to pass down the terrace floor of the inclined flue in a substratum of atmospheric eddies, without being once brought in contact with the ascending current.

The Deffilement of Air by Volatile Vapors.

A paper on this subject was read in the Health Department of the recent Social Science Congress, by Mr. W. J. Cooper. Air, the writer held, to be fit for respiration, ought to be of extraordinary purity; but it was to be regretted that some well meaning workers in sanitary science recommended a course of action which (by adding noxious vapors to the impure air, for disinfecting purposes) not only increased the previous deffilement, but prevented clarification, which was the main object to be attained. Air could not be charged with any volatile vapor without detriment, whether it was sewer gas from the drains, carbonate of ammonia from horse droppings, aroma from the dust cart, or the equally vile odor which arose from weak solutions of carbolic acid now used in some towns with the idea that it would destroy the germs

of disease. Eminent authorities had proved the fallacy of this notion. Carbolic acid in a concentrated form would arrest decomposition for awhile, but Pettenkofer's experiments had clearly shown that when the acid was further diluted germ development was actually encouraged; Dr. Dougall's recent experiments had exposed the futility of the use of the vapor of carbolic acid upon infective matter; and it was also known that, during the Franco-German war, although hospitals were saturated with carbolic acid, still hospital gangrene prevailed. With these facts before them, it was intolerable that the air of our public places, our dwellings, and our towns should be daily defiled by the volatile vapors arising from this objectionable substance with the vain expectation of preserving the public from infection, the effect being to encourage a rather expensive method of creating a nuisance.

Where carbolic acid was used, it could not be always ascertained whether the stench operated upon was removed or not, but they know that when applied to urinals the sickly, ammoniacal odor was not affected; the twofold atmospheric deffilement of the carbolic and ammoniacal vapors being distinctly and separately distinguishable. There was much evidence to show that the air could not be impregnated with a vapor sufficiently powerful to destroy germs or infectious matter without damage to the tissue of the lungs. Liebig had stated that lung disease was produced by the use of chlorine as a disinfectant in hospitals. In the last published number of the proceedings of the Chemical Society, it was related that Mr. Ernest Theophron Chapman, an eminent chemist, who recently lost his life by an explosion in a chemical manufactory in Germany, had suffered in health for many years from the effects of the inhalation of chlorine, which brought on hemorrhage from the lungs, a complaint which would frequently occur when he was under the influence of any excitement. It was also known that the strong Highland workmen, employed at the St. Rollox Works in Glasgow, were rapidly destroyed by the chlorine vapor given off from the bleaching powder manufactured there. Bromine, iodine, and ozone were equally mischievous in their action. Before they could use enough iodine to have any effect upon germs, it would produce the well known iodine catarrh. Bromine would overpower the senses with its suffocating stench long before it could disinfect; and if the atmosphere were to be overcharged with ozone, it would be productive of equally deleterious consequences.

Recent investigations had fully exposed the futility of several methods practiced with the intention of destroying the germs of disease by attempting the impossible task of disinfecting air. These delusive theories had been based upon the fallacious supposition that a chemical reagent retained its destructive power when very dilute. Experience has shown, however, that the very reverse happens in many instances. Strong sulphuric acid will set fire to wood shavings, and so destroy them. Dilute sulphuric acid will transform shavings into grape sugar, which is susceptible of fermentation. This was an illustration which held good throughout organic chemistry. Professor Rolleston informs us that unless so much sulphurous acid be put into the air of a room that no one could exist in it for a minute, all fumigation is abortive. Professor Wanklyn, in a recent paper on disinfectants, observes that the wisdom of the physician who places his little saucer with bleaching powder and muriatic acid in the chamber of his patient is comparable with that of the Cattle Plague Commissioners who tied carbolic cloths to the horns of the cattle to disinfect the air of the agricultural districts.

If the air of a room be foul, the obvious remedy is to open the window to let in the external air as the best possible purifier. If the room contains germs, they will probably find surfaces to rest upon, and it is by cleansing all surfaces that the room is to be purified, and not by futile attempts to disinfect an ever changing atmospheric current. As germs of disease must be looked upon as a dangerous enemy, they must be treated as an invading army and deprived of every possible feeding and resting place. As they are fostered in filth and putridity, all filth and decaying matter should be carefully removed, and decomposition should be arrested in sewers, on road surfaces, and in all holes and corners where putrefying matter of any kind is deposited. For the purpose of arresting decomposition, chemical substances should be used which do not by their nature defile the air, and are not dangerous, destructive or offensive; for it is of the utmost importance to make disinfection popular, and it is contrary to human nature to delight in substances which are irritating and obnoxious to the senses, and which have a tendency to cause a positive evil in the attempt to prevent a possible one.

In the discussion which followed, Dr. Carpenter expressed general agreement in the novel and striking ideas promulgated by Mr. Hooper, as did also Dr. Shrimpton, while Dr. Hardwicke fully corroborated the statements regarding the state of some of the hospitals during the Franco-German war. As an instance of the mischievous effect of carbolic acid as a disinfectant, Dr. Hardwicke stated that, finding the milk supplied to him, when mixed with tea, had an unpleasant taste, he made enquiries of the milkman, and found he had been using carbolic acid to disinfect a drain in his dairy, the milk had absorbed the vapor of carbolic, and so made the milk unfit to drink. He had also known many cases of fatal accidents occurring from its use.

THE addition of a small quantity of boric acid to milk retards the separation of cream, and the milk does not become sour when kept several days. Beer also, to which boric acid has been added, does not so quickly become hard. —A. Hirschberg in *Arch. Pharm.*

SCIENTIFIC AND PRACTICAL INFORMATION.**PREPARATION AND PRESERVATION OF MUSHROOMS.**

Dr. Remsch, in *Les Mondes*, proposes to cover the fungus with a film of collodion and place it in an airy position. He states that the contraction of the mushroom is equal in every way, and that the chemical and anatomical constitution remains the same. An exact form, preservative against the destructive action of oxygen, and also against insects and germs, and the keeping of the substance for future experiment, are the advantages obtained.

THE SPECTROGRAPH.

The name is given to a simple little device for copying drawings, exhibited in the French department of the Vienna Exposition. It consists of a board, near the middle of which is a piece of window glass fastened at right angles to it by means of two grooved wooden uprights. When placed near a window, with a drawing or copy on the end of the board nearer the window, its reflection in the glass causes it to appear upon a sheet of white on the opposite side of the glass. In this way quite an accurate tracing can be made by one who is no draftsman.

THE OXYHYDROGEN LIGHT.

Dr. John Nicol describes, in the *British Journal of Photography*, a new mode of making lime cylinders as follows:

Four parts of precipitated chalk are intimately mixed with one part of ponderous carbonate of magnesia, and the whole made into a stiff paste with mucilage of gum arabic. The mass should be well beaten in a mortar, or in any other way to ensure thorough incorporation, and made a little stiffer than glazier's putty. It may then be rolled on a slightly oiled marble or porcelain slab, or smooth board, till it assumes the form of an ordinary ruler, and then cut into suitable lengths. The holes are easily made with a wire of the proper thickness; and if the wire be "olive ended," like those used for piercing tobacco pipe stems—that is, having a tiny bulb or button at the end to be inserted—it will penetrate straighter and easier. The cylinders thus finished only further require drying, which may readily be done in the kitchen oven; and as they must be thoroughly dry, they may be left there for two or three days.

THE VALUE OF SEWAGE.

Commenting on the sewage question and notably with reference to the utilization of the waste soil from Liverpool sewers, a writer in *Iron* estimates that a town of 100,000 inhabitants produces fertilizing material to the value of \$250,000 per annum. In the above mentioned city, it is considered that the sewage, if properly utilized, would be worth fully \$750,000 a year. The entire population of Great Britain, with all her colonies, is about 75,000,000 souls, and each person produces annually about two and a half dollars worth of valuable material. Hence the aggregate amount is valued at \$187,500,000, a sum equal to the joint annual yield of the Australian and Californian gold mines. Applying this vast total to agricultural purposes, it would produce fully ten times its value in breadstuffs, beef, milk, butter, and all kinds of vegetable and animal food. The United States contain about 40,000,000 people, and hence \$100,000,000 worth of useful substance is yearly wasted: a sum, it is hardly necessary to say, which, if added to the finances of the country, would lessen the chances of future panics and aid materially in paying off the national debt.

MEAT FROM AUSTRALIA.

A cargo of Australian meat has recently been sent to England, and its preservation during the voyage is effected by a new process, in which no antiseptic materials of any kind are employed. The beef and mutton is brought on board directly from the slaughterhouse and thrown into an iron tank, no particular care being exercised in arranging the pieces. The reservoir is placed within another and larger receptacle, and ice, produced by artificial means, is packed upon the cover of the inner vessel. The water due to melting runs over the upper surface and down the sides of the latter; and it is collected at the bottom, to be returned by tubes to the ice, to be again refrigerated. The apparatus is built in a kind of well, made between the upper deck and hold of the vessel, about amidships, and is protected by layers of sawdust and other non-conducting material. It is said that meat thus treated has been kept on shore for eighty-five days without losing any of its properties or becoming in anywise decomposed.

THE VIENNA EXHIBITION—AUSTRIAN COURT HONOR TO AN AMERICAN CONTRIBUTOR.**Telegram to the New York Herald.**

VIENNA, Nov. 1, 1873.

The Emperor of Austria has conferred the "Imperial Order of Francis Joseph" upon Hon. Nathaniel Wheeler, President of the celebrated Wheeler & Wilson Sewing Machine Company of New York.

More Distinguished Honors.

BALTIMORE, Md. Oct. 31.

The Maryland Institute has awarded Wheeler & Wilson the gold medal for the new No. 6 Sewing Machine. Other sewing machines received nothing.

Recent American and Foreign Patents.**Improved Middlings Separator.**

Robert L. Downton, Collinsville, Ill.—This invention has for its object to furnish an improved apparatus for separating middlings into grades, so as to enable a larger per cent of first grade flour to be made from the wheat by mixing with the first grade or grades of the middlings. The unsorted middlings pass through a spout against a disk which distributes them centrifugally upon inclined aprons, whence they pass down, the heavier portions to an incline and the lighter into a cylinder. The latter are drawn by a suction fan through one pipe, and discharged through another into a chamber. Here the air blast is regulated to cause a deposit of a second grade, while the lighter passes on to another chamber. This operation is continued until as many grades are obtained as may be desired.

Improved Corn Planter Runner Bending Machine.

Smith W. Kimble, Springfield, Ill.—This invention relates to means whereby the runners of corn planters may be cheaply, conveniently and effectually bent into the desired shape; and consists in a vibratory segment provided with slotted arms, between which are placed side rolls and a reciprocating top roll, combined with a curved former and a superposed bar the subjacent surface of the latter gradually approaching the top of the former from front to rear.

Improved Tanning Compound.

Michael W. Fry, Guyandotte, W. Va.—This invention relates to a method of neutralizing the acid which remains in hides after they have been tanned, and which are calculated greatly to damage the leather. It consists in removing the acid from previously tanned hides by immersing them in a bath or solution of salt and soda, according to a formula fully set forth in the specification of the patent.

Improved Hoe.

Harrison Parkman, Philadelphia, Pa.—This invention is an improvement in that class of hoes which are double bladed, that is, pointed on one side or edge and straight on the other or opposite one, to adapt them for different kinds of work. The invention consists in bending or striking up the hoe blade, so as to form a central rib on the inner side or surface thereof and a corresponding groove on the other side, the same extending from the center to the termination of the pointed end. The object of this construction is twofold: to strengthen the hoe blade and adapt it to work easily in the earth, and to form a suitable recess to receive the end of the handle socket or other devices by which the blade is secured to the handle. The remaining feature of the invention relates to the construction of the handle socket whereby it is adapted for firm and durable connection with the hoe blade and for other purposes.

Improved Blowpipe.

John E. McClure, San Francisco, Cal., and Danforth H. Ainsworth, Salinas, Cal.—This invention relates to a peculiar construction of that class of blowpipes which are used in connection with a lamp, whose flame is expected both to vaporize the liquid in vessel and to be forced upon and melt metals or solder. The invention consists in a blowpipe of two connected chambers, having front convexities with intermediate air space, the ejection being located upon the upper convexity while the lower receives the flame that is to generate the vapor.

Improved Thrashing Machine.

Willard Verill, Elwood, N. J.—The grain is fed to an endless apron by which it is carried beneath the beaters, which are attached, to a shaft, and which are bent at a little distance therefrom, so that, as the said shaft rocks, the said beaters may strike squarely upon the endless apron and platform beneath. The extreme ends of the beaters are bent upward to prevent them from catching upon the endless apron.

Improved Harness Trace Buckle.

Hillery H. Hartzell, Holden, Mo.—The object of this invention is to produce a trace buckle, which forms a strong and more effective connection of the straps the greater strains applied to them, being perfectly free from friction by cutting, or breaking a trace off. The frame of the buckle is provided with an inclined loop at one end, and a loop at the other end, toward the hames. At the turning point is an indentation. A central lateral connecting piece carries the upright tongue of about the height of the end loops, which admit the heaviest and thickest traces in use. The trace is suitably perforated to fit over the tongue. Another loop consists of two parts, of which one connects with the hame strap, and has a side expansion to embrace the curved loop of the frame. A lateral bar divides the double loop centrally, and bears against the indentation, producing thereby a twofold connection of frame with the loop. A strain exerted on the trace and hame strap causes an upward gliding of the bar, and thereby a tightening of the hold on the trace.

Improved Harvester Rake.

John L. Owens, Cambria, Wis.—A tubular standard supports a beveled wheel which turns loosely thereon and carries a horizontal rim turned by the driving wheel. The rake arms are pivoted on the upper side of this rim, and arranged so that the inner ends work upon a stationary cam as they are carried along, which allows the arms to rise at the inner ends and fall at the outer ends to bring the rakes down to the apron. Suitable degrees are provided in order that this cam may allow some of the rakes to pass above the grain on the apron of the machine when the grain is so light that a quantity sufficient for a gavel does not accumulate as each succeeding arm passes. For intercepting some of the rakes, there is a tappet wheel with, say, three rows of tappets on its face, and capable of sliding lengthwise to bring either set of its tappets into action according as demanded by the volume of grain, the said sets each being arranged for having a different effect in throwing out the rakes—that is, varying the order of throwing them out. It is shifted by suitable mechanism arranged in a place where it can be reached conveniently by the operator to shift it at will, and provided with a holder by which it can be held in either of three positions corresponding to three sets of tappets.

Improved Saw Set.

Benjamin S. Castle, Johnstown, O.—In the groove of a bench is arranged a setting plate over which is a setting clamp and setting tool. The clamp consists of a strong bar extending over the setting plate nearly its whole length, then binding horizontally beyond the edge, and then down through the frame to levers, which are forced down by a screw to press the clamp down on the saw, which is laid on the plate. The levers are forced up by a spring. The tool is forced down on the saw teeth by the blows of a hammer, and it is forced up by another spring.

Improved Cotton Gin.

Beall Hempstead, Little Rock, Ark.—The brushes consist of two flanges, in halves, and bolted together around the shaft, with brushes attached to the sides and projecting obliquely forward, or in the direction in which they turn, and meeting together at the middle of the space between the flanges. There are, also, bristles attached to the shaft, between the flanges, and projecting radially from it. The object of having the bristles project forward is to have them impinge with greater force against the sides of the saws than they otherwise would, and prevent them from being sprung backward away from it. A wide, endless carrier of canvas is arranged under the saws to receive the seeds and other droppings, and carry them out through the gin case. There is an endless chain carrier in the hopper, with teeth to convey the cotton along from the place of receiving it to the passage through the top of the gin case. This works in connection with an open wire bottom above the chains, an open wood bottom below them, or other alone, and a gage to spread and equalize the cotton, regulate the quantity supplied to the gin, open the bolls, and remove them and other coarse matters, which are arrested by the teeth of the gage or regulator, and caused to fall, through the open bottoms, to the gin case, from which they are carried, by teeth, into the drawer, which is removed from time to time and emptied.

Improved Machine for Making Chains.

Louis Souther, Springfield, Ill.—This invention has for its object to furnish a machine which shall be so constructed as to bend the iron into link form, weld its ends, and make a complete chain by a continuous operation. Using the machine, the parts being in position, a bar is laid upon the tched upper ends of fingers. As the machine moves forward the former thrown into place and the fingers move upward, bending the bar around a former. Lips descend upon each side of the upper ends of the bent bar, a die comes down, bending the ends of the bar down upon the upper of the former. The die rises slightly, and the lips are forced toward each other, welding the ends of the bar between the lips, the former, and the die. The movement of the lips toward each other allows the lock or ch bar to drop, confining the lips in position. The former is then withdrawn from the link, and the sleeve, the lips, and the link make a quarter rotation, coming into such a position that another bar may be thrust over the link and laid upon the ends of the fingers. A locking bar now descends, bringing its bend in contact with a block, which releases the lips, allowing them to spring apart and the link to drop upon the bar. The lips now return to their former position, the former is thrust forward, so on. The chain, as completed, passes down through a hollow bar.

Improved Wind Wheel.

Nicholas Sheplar and Daniel Sheplar, Murrayville, Ill.—To the upper part of the wheel shaft are rigidly attached four or more short wings, to the outer edges of which are hinged other wings, which are all connected and held in the same relative position by a rope secured to each, and which allows them to move freely upon their hinges. A weight is so arranged as to hold the other wings against the wind in ordinary circumstances, but, should the wind increase in force, it will turn them back upon their hinges into a position more or less oblique according to the force of the wind. As the wind decreases in force the weight draws the wings back into their former position. A hood, made in the form of a half drum, and is designed to cover about one half of the wheel and protect the returning wings from the action of the wind.

NEW BOOKS AND PUBLICATIONS.

ILLUSTRATED BOOK AND DESCRIPTION OF LEFFEL'S IMPROVED DOUBLE TURBINE WATER WHEEL, FOR 1873. Springfield, Ohio: James Leffel & Co.

The authors of this work give not only copious illustrations of their celebrated wheel in this handsomely printed pamphlet, but also a great deal of general information in water power, the best mode of utilizing it, etc., which is important to mill owners generally.

THE PRACTICAL MAGAZINE: an Illustrated Cyclopædia of Industrial News, Inventions, and Improvements. London: 7 Printing House Square. Boston: J. R. Osgood & Co.

This periodical maintains the high reputation which, since its first issue, it has enjoyed in this country and in Europe. It is one of the handsomest of all the journals which reach us, and is edited with great judgment and taste.

PROPORTIONS OF PINS USED IN BRIDGES. By Charles Bender, C. E.

VENTILATION OF BUILDINGS. By W. F. Butler.

These two handy books are Nos. 4 and 5 of Mr. Van Nostrand's Science Series.

ILLUSTRATED CATALOGUE OF THE BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa.

Messrs. M. Baird & Co., the proprietors of the world-renowned Baldwin Works, have published a very handsome catalogue, containing a succinct history of locomotive construction in America, and detailed descriptions of the numerous forms of engine built by them. The latter are illustrated by well executed photographs. The typography and binding are of the highest order, and do credit to the printers, Messrs. J. B. Lippincott & Co.

THE DAILY RECORD, OR EVERYBODY'S DIARY, FOR 1874. Price \$1.50. New York: Hastings & Co., 202 Broadway.

This is a convenient form of diary for commercial use. The space allotted to each day is one third of a page, which shows a week's record in each opening. Its convenience for use is enhanced by it being interleaved with blotting paper.

LOCKWOOD'S DIRECTORY OF THE PAPER MANUFACTURERS in the United States and Canada. Price \$5. New York: H. Lockwood, 14 Park Place.

Mr. Lockwood has evidently spent much time and labor on the compilation of this work, which gives a full description of the locality, capacity and special product of each mill.

Inventions Patented in England by Americans.

(Compiled from the Commissioners of Patents' Journal.)
From October 10 to October 23, 1873, inclusive.

ARTIFICIAL FUEL.—E. F. Loiseau, Mauch Chunk, Pa.
BOAT TENT.—J. R. Adams, Oakland, Cal.
CUTTING CARDS.—V. E. Mauger, New York city.
ELECTRIC SIGNAL.—T. S. Hall, West Meriden, Conn., et al.
FOLDING FABRICS, ETC.—W. F. Jobbins, New York city.
METAL NUTS, ETC.—S. Vanstone et al., Providence, R. I.
ORDNANCE, ETC.—W. M. Arnold, New York city.
STOVE POLISH.—J. Birch, New York city.
TELEGRAPH.—W. E. Sawyer, Washington, D. C., et al.
TUCKING ATTACHMENT.—F. W. Brown, Cincinnati, O.
TWISTING MACHINERY.—W. Cockcroft et al., Chester, Pa.

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. Larger 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, Drawing, 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, New York, 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 save 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.

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.

A patentee may, at his option, have in his reissue a separate patent for each distinct part of the invention comprehended in his original application by paying the required fee in each case, and complying with the other requirements of the law, as in original applications. Address MUNN & Co., 37 Park Row, for full particulars.

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, or bas 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.

Foreign Patents.

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