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Contents:

(Illustrated articles are marked with an asterisk.)

MECHANICS AND THEIR TOOLS.

It is useless to expect first-class work from even good mechanics using strange tools. The hand and the handle, the workman and his tools, should be well acquainted; if such a sentiment could be predicated of inorganic matter, they should be in sympathy. It has been said that "any fool can work with good tools, but it takes a workman to use poor tools." It is much nearer the truth to say that "few can work well with strange tools." Some branches of mechanical business offer advantages in this respect over others. The carpenter or the joiner, for instance, owns his own tools, selected with great care, or made by himself to suit his hand and his peculiarities of workmanship. But the machinist, unless a very ambitious workman and one who has possessed unusual opportunities for working for himself, seldom carries with him anything more than a pair of small callipers and a steel gage. When he goes into a shop, if he works at the bench the vise is strange, the hammers are not handled and balanced to his mind, the cold chisels are "stunt" and misshapen, and the file handles unhandy. If he works on the lathe or planer, he finds the cutting tools entirely different in their forged form and ground edge from those to which he has been accustomed; and until he "gets the hang of the new school-house" his productive work amounts to very little. So well is this understood that the new comer in the shop is generally allowed a day or two with *carte blanche* on the forger to put his tools in shape. This should always be the case, and the machinist ought to be encouraged to occupy his time "between jobs" with the work of finishing his hammers, center punches, scratch awls, etc. until he gets a set fitted to his hand and consonant with his taste. Time so spent and material so used would not be wasted, as the workman, if he is worth anything, would, by his more cheerful and ready interest in his work, soon make up for the time thus spent, while if he did not purchase the tools at the expiration of his term of employment, they would add to the stock on hand, which is always available.

All this can be done under a judicious manager without encouraging finicalness or fanciful notions in the workman, while it would offer encouragement and assist endeavor. The habituation of the workman to his tools has been and still is too much overlooked by employers. If every workman was a machine, merely, what would suit one would fit another; but the human organism is affected and sometimes controlled by circumstances in themselves trivial; every workman should have his own tools, or he should be privileged to select his own style of tools to suit his handiwork. In the end it will be found to be better for both the workman and for the employer.

PRETENSIONS OF MECHANICS.

Assumptions of superior knowledge and pretensions of superior position and acquirements are, under any circumstances, obnoxious. Especially are they so when made in relation to mechanical processes. The workman who descends to this mean trickery of pretension to sustain himself at a fancied elevation above his fellows is either a charlatan, pretender, or miser. If a mechanic has made a discovery of any real value, whether relating to the construction of a machine or to an improved process of manufacture, our patent laws, liberal and just, will protect him in the proprietorship of his improvement; but the attempt to impose upon his fellows by the pretense of a knowledge above theirs, is neither manly nor honorable. Really, there is no reason for keeping a secret in the mechanical arts, and it is as impossible as unreasonable, especially if the improvement is valuable, and if not so, there is no reason for attempting to keep it private. We are aware that some large concerns make it a point to keep some of their processes secret; but out of a number we know, who have preferred this course to a publication by means of letters patent, no one of them has been able to preserve the secret inviolate. Locked doors and "iron-clad" oaths exacted from employés, avail nothing against the insatiable curiosity of men, or the cupidity or interest of employés. In fact, in many cases the product of manufacture, when analyzed by an expert, exhibits the method of production as exactly and satisfactorily as though the process itself had been exhibited.

As the working of steel involves many problems seemingly contradictory, not a few of which are still unsolved, its manipulation is made the occasion for much of this charlatanism. Pretended sleight of hand in heating and hammering, mysteriously compounded baths for hardening, etc., are used to befog the uninitiated and astonish the ignorant. Such nonsense is paltry, and wholly unworthy the dignity of the mechanic. It is highly proper that the mechanic should feel a pride in his superior skill and his superior knowledge, for these have been attained with labor, time, and patience, and are really valuable, but to make pretension where no ground for it exists is childish and foolish.

But if these pretensions are unworthy when made by experienced mechanics, they are simply contemptible in an ignorant charlatan who attempts to impose by loud talk and "blowing." Hardly a concern of any extent but has one or more of these "blowers" about the works. They pretend to know everything, while they really know very little. Such a one we once saw, who attempted to teach a machinist how to use prussiate of potash in case hardening, condemning the plan of one single heating, and insisting on re-heating the article after the flux had melted. When he failed to produce the hardness sought, he condemned the chemical, instead of acknowledging his ignorance of the process.

Running over in our mind the list of the best practical mechanics with whom we have had the honor to be associated and acquainted, we find that almost all of them were reticent of speech, careful of giving counsel or of obtruding their notions, obedient to the directions of those set over them, and otherwise unassuming in manner; while at the same time they were capable of doing, directing, and managing when their duty called. True merit is generally modest. Pretension may for a time impose upon credulity and good nature, but the shop is a great leveler, and the pretender will sooner or later disclose his true character by his assinine bray, in spite of his lion skin disguise.

LAMPBLACK----ITS MANUFACTURE.

A correspondent from North Carolina asks for information in regard to the manufacture of lampblack. He is engaged in distilling turpentine and making resins, and has large quantities of dross, etc., left, which he supposes may be made available in the production of lampblack.

Its manufacture is very simple and the apparatus cheaply built. The refuse tar, resin, etc., is put in iron pots or in a furnace and burned with the least possible admission of air—just sufficient to keep up a low combustion—in order to produce a dense smoke without much flame. The smoke is led into cylindrical upright chambers lined with sheepskin, woolen cloth, or canvas. The roof is conical in form, made of sheet iron, hanging within the cylinder, the circumference fitting the sides of the cylinder. This roof is suspended by pulley and chain, and is occasionally lowered to the bottom, in its progress scraping the accumulated lampblack from the sides and depositing it on the bottom, from which it is removed by means of a hoe or scraper through a small door. A series of these cylinders may be used, communicating with each other by horizontal passages, the roof of the last one being partially open at the apex, to allow for a draft. The lampblack deposited in the last of the series is the finest; but the best of it contains more or less resinous and oleaginous matter, which must be eliminated to purify the product. This is done by heating the lampblack in cast iron boxes with a close cover, raising and keeping the lampblack at a red heat for two or three hours.

Ivory black, used largely by artists as a pigment, and bone black, employed in the purification of sugars, are the product of the destructive distillation of animal bones. Spanish black is the carbon of cork, and has a brownish tinge. Peach black, resulting from the combustion of peach kernels, has a bluish tint. All these forms of carbons are used as pigments.

SIZE OF WHEELS FOR VEHICLES.

A correspondent from a portion of Hartford county, Conn., which is blessed with many hills, says he is in much need of a solution of the question as to the proper size of wheels for teams. He says, "With a team (two horses probably) I can draw a tun of 2,000 lbs., using wheels five feet diameter; how much more can I draw on wheels of seven feet diameter, and how about drawing on a level or on ascent?" He further says: "It has for a long time seemed to me that the principles involved in the above were very important to a large class. I propose to construct wheels of seven feet diameter on trial, as the roads over which I do my teaming are quite hilly."

We are not aware that any rules, practically effective, have ever been published as to the best diameter of carriage wheels. A great change has taken place within fifteen years in this respect, so far, at least, as relates to pleasure carriages. The small forward wheels, with low axles and high bolsters, which were the style ten, fifteen, or twenty years ago, have given place to those which are as large, or nearly so, as the hind wheels, the difference on the draft being made up by the downward rear curvature of the shafts. They run much easier than carriages with diminutive forward wheels. For level traveling it would seem that pretty large wheels, suited to the draft animals, would be preferable to small wheels but on an upward grade they have their objections.

COMMUNISM IN THE SHOP.

Interchange of tools and other appliances in the shop may be made either very pleasant, or a source of great annoyance. The "stealing" of tools is often practiced, but only by those who not only forget their duties as mechanics, but their honor as men. No right-minded mechanic will refuse assistance to his fellow workman, either in advice or in the loan of tools, but it is the hight of impudence to reject the advice without giving a reason, or to return borrowed tools in a condition unfitted for service.

There must be more or less of the apostolic idea of communism in the shop: "all things must be in common" to a certain extent; but it is an evidence of a mean nature when the workman is willing to use the tools of his fellow and return them in a shape unfit for further service until repaired.

The habit of leaving a borrowed tool, when done with, where last used is almost criminal. This negligence—to call it by no harsher name—is very common, but it is dishonest as well as careless. Many valuable tools are thus injured, and sometimes lost. The workman who is so neglectful and careless can hardly be deemed honest. There is, or should be, a sentiment of honor in this repect among workmen, and we are certain that a simple allusion to the matter will induce our careless mechanics to "reform their ways."

UTILIZATION OF TINNER'S WASTE.

In the scraps of the tinshops, thrown away often to hundreds of tuns by the tinners of one single city, we possess two valuable metals, iron and tin. Attempts have been lately made for separating these metals by melting, but the process has been as yet without success. What physical action, however, could not do, chemical affinity, will surely complete. We say this in regard to a process by which the sheet tin may be freed from its coating without being subjected to heat. The process is by first treating the scraps with a solution of caustic lye, thereby obtaining as a product a valuable color base (stannate of soda, resp. potassa), which of late has come into extensive use among dyers. As both the iron scraps and the tin solution serve useful purposes in the arts, we trust that many of our readers will be interested and instructed if we devote some space to the above subject.

PREPARATION OF STANNATE OF SODA.—For fastening and brightening dyes, especially Turkey red from madder, stannate of soda is unsurpassed by any mordant; it is furthermore not poisonous, as is the double salt of arseniate and stannate of soda, a base hitherto employed to some extent for fixing fabrics. For its preparation the tin scraps are rolled up spirally and put in a wooden tub with 10 per cent of sulphur and 5 per cent of solid caustic soda (in manufacturing the resp. potassa salt, take 7 lbs, of the latter), enough water being added to cover them. Then steam is turned on and the same allowed to pass into the liquid, until the scraps are free of tin, when the alkaline liquor is drawn off by a faucet and left to evaporate in an iron kettle until crystallization takes place. From the crystals which simply constitute glauber salt, the mother lye is separated, evaporated to dryness in another vessel, leached out by water and filtered. The product thus obtained is left to crystallize, thus forming the stannate of soda; 100 lbs. of scraps yield 12 to 15 lbs. of the latter.

PREPARATION OF A NEW (TIN) GREEN.—This paint—which we propose to call "Phenician green," because its base, the tin, was first obtained by the ancient Phenicians—is not poisonous like Paris and other greens; it does not bleach; may be used as lime and water color and it deepens in oil. We prepare it by adding a solution of stannate of soda, made of 15 parts of the dry substance to one consisting of 12 parts of blue copperas. The precipitate obtained is collected and washed out; by adding chrome yellow or a decoction of fustic a blue shade may be imparted to it.

PREPARATION OF MOSAIC GOLD.—Bisulphuret of tin forms gold colored, translucent scales, of a peculiar soapy feeling. It is largely employed in bronzing wood. The following is a description of its mode of preparation from tin scraps: Put the scraps in glazed pots, cover them with muriatic acid, and when the tin is all taken up, transfer the liquid into another vessel. Should it yet contain free acid, add new scraps. Then immerse copper plates into the liquid; the tin will thus by galvanic action précipitate upon them as a spongy mass. Collect the tin, wash it with water, dry it and mix it intimately with equal parts of sulphur and salammoniac, fill the mixture into glass retorts and heat them up gradually on a sand blast. The bronze is obtained partly as a sublimate, partly at the bottom of the retort.

FOR THE MANUFACTURE OF COPPERAS.—This process is too well known to be described.

PREPARATION OF A NEW POLISHING FOR OPTICAL GLASSES.—The same is obtained by precipitating a copperas solution by oxalic acid, and drying and heating the precipitate.

PREPARATION OF "IRON GREEN."—First prepare Prussian blue by mixing a solution of copperas with one of yellow prussiate of potassa, solve the same in oxalic acid, and add to the resulting blue liquid a solution of bichromate of potassa and a small quantity of lead sugar. Collect the green precipitate, wash it out, and dry it. You may obtain any intermediate shade, from the deepest blue to the brightest green, in varying the proportions of the three solutions. In closing, we will mention that zinc and cadmium are thrown down in a dentistri from a solution of binoxide of tin in potassa.

A New Vessel of War.

Mr. John Elder, of the celebrated shipbuilders firm, Randolph, Elder & Co., in Glasgow, has recently patented a most original form of iron-clad ram for coast defenses and attacks on sea fortifications. Mr. Elder's vessel is formed below the water line as a segment of an enormouns sphere, say 25 feet deep and 200 feet in diameter, of the circular water-line. This corresponds to a small piece of a sphere, of which the versine over a chord of 200 feet is 25 feet long. Over the water line the armor-clad sides are a short truncated cone, and in the center of this circular deck a high castle or tower, carrying three or four tiers of guns, is arranged. This vessel, being perfectly circular in plan, has neither bow nor stern, nor any of the other steering attributes of ships now in existence; it bears, in fact, the same relation of outline and form to the ordinary ships as the form of a crab bears to that of a fish. The power of locomotion is given to this craft by the reaction propeller. The reaction wheel—probably Mr. Randolph's improved water-jet propeller—is placed in the center of the vessel, at the lowest point of the spherical segment, and the ejection of water can be effected through four openings placed at four equi-distant points in the circumference, so as to command the direction of propulsion without any steering arrangement, by forcing the water through one or two of the passages which command any one of the four quadrants inclosed by them. There are, however, steering or deflection boards fitted to the end of the passages through which the water is ejected; and, by using these boards, a rotary motion can be given to the "crab." By ejecting the water from two opposite passages, or from all four passages simultaneously, and placing the steering boards into a corresponding position, the total engine power of the vessel can be made available for setting the ship into a revolving movement round its own vertical axis. The velocity which the ship is capable of attaining under these conditions, measured at the outer circumference, is very great, since there is no other resistance to this motion except the skin-friction. Mr. Elder proposes to make use of the great momentum which this high velocity of movement will afford for ramming purposes. The whole circular edge of his vessel which is of a sharp angle in section, represents, so to say, the edge of a circular saw or revolving disk wheel, and the accumulated momentum of the rotary movement can be used for producing a destructive effect upon the sides of any vessel with which this revolving turret ship would come into contact. The circular form allows of a very large stowage room as compared with the ordinary form of ships, and it produces a base of such stability as to allow the erection of a tower of great hight in the center, so as to obtain better facilities for attacking objects on shore. Mr. Elder has carried out some experiments as to the resistance to propulsion in a straight line offered by his form of vessel compared with the ordinary forms. He made two models representing equal tunnage, one of the *Black Prince* shape and the other of his spherical form, and the resistance of these two models was measured by an apparatus which afforded a simple mode of comparing the relative proportions of these resistances. The result was only about 10 per cent in favor of the *Black Prince* model, and this seems to indicate that the new vessel would be capable of attaining a fair speed under steam. The advantages offered by this form are of different kinds, the most prominent being a maximum of internal accommodation or stowage room, with a minimum of exposed surface, a circular or turret-shaped armored side, and an extraordinary facility of manœuvring in an action; last, but not least, the total absence of any exposed points of weakness, or "Achilles' heels," such as most iron-clads at present possess.—*Engineering.*

Treating Caoutchouc and other Gums.

J. B. Newbrough and E. Fagan, of New York city, have patented an improved material produced by treating caoutchouc and other gums as follows:

Sulphur is treated by boiling it in turpentine or equivalent oil, a portion of which will be decomposed, and will settle, with the sulphur, to the bottom of the vessel in which the materials are treated. The oil is then poured off, and the solid matter which remains is washed with dilute sulphuric acid, and is dried at a low heat. Iodine is treated in the same manner as the sulphur with oil to which sulphuric acid has been added, to prevent the formation of an explosive composition. Equal proportions of the prepared sulphur and iodine are melted together, and the composition, after cooling and hardening, is thoroughly incorporated with caoutchouc or equivalent gum in the proportion of about three ounces of the composition to one pound of the gum. The gum thus prepared may be molded or otherwise formed of any desired shape, after which it is introduced into an oven the temperature of which, during the first fifteen minutes, is raised to 320 deg. Fah. This temperature is maintained for five minutes, and is then quickly lowered to 250 deg., at which it remains for about an hour, or until the composition is hard. Any color imparted to this composition by the mixture with the same of suitable earthy or mineral matter will not be changed by the hardening process, so that no difficulty is experienced in obtaining a product of almost any desired color; and as but a comparatively low heat is required to harden the composition, the gum is not weakened or injured by the operation in any degree. The product thus obtained is hard, tough and durable, is not affected by nitro-sulphuric or other acid, and is applicable to many useful and ornamental purposes.

The same parties have also patented an improvement in manufacture of articles of rubber, gutta-percha, etc., as follows:

Gutta-percha, rubber, or other similar gum, after being molded, carved, or otherwise reduced to any desired shape. is immersed in bromine and is maintained in the same for such a length of time that, after the article is withdrawn and exposed to the air, the gum will become hardened and otherwise changed in its character so that it can be applied to purposes for which the gum, in its natural state, could not be used. In order to prevent the gum from hardening to any extent before it is withdrawn from the bromine, chloroform, or equivalent solvent of the gum, may be added to the bromine, in the proportion of nine parts of the latter to one of chloroform, and the article of gum is either immersed in the composition, or a portion of gum is dissolved in the same, and the solution is applied, in successive layers or coatings, to a mold on which an article is to be formed, or as a coating to articles of other materials which require to be covered, the gum hardening on the evaporation of the chloroform.

Crystals Containing Fluid.

Mr. J. B. Dancer lately read a paper before the Literary and Philosophical Society, of Manchester, Eng. containing a brief history of the discovery of fluids in crystals, including Sir H. Davy's chemical experiments on the fluids and gases obtained from the cavities in quartz crystals; Sir David Brewster's discovery of the pressure cavities in the diamond, ruby, emerald, amethyst, chrysoberyl, etc.; the existence of minute crystals in these cavities and the two new and remarkable fluids, which are immiscible, but sometimes found together in the same cavity—one a liquid hydro-carbon, named Brewstoline, the other Cryptoline; his experiments and examinations of artificial crystals deposited from aqueous solutions; his examination of the Koh-i-noor diamond and others in the East India Company's museum; and the geological speculations to which these discoveries gave rise. Mr. Dancer mentioned the experiments of his late father and others in producing artificial gems by intense heat, and stated that his own attention was drawn to this subject some twenty-four years since, by Sir David Brewster presenting him with a specimen of topaz containing fluid. Since that time he had examined a large number of crystals of various kinds, from the collections of friends, and had found fluid in quartz from South America, Norway, the Alps, Ireland, Snowdon, and the Isle of Man: and in fluor spar from Derbyshire; this latter specimen contained a considerable quantity of fluid, which burst the crystal of 180° temperature. [After this paper was written, Sir David Brewster informed the author that the fluid contained in crystals of fluor spar was water, and that the cavities burst at a temperature of 150°.] He suggested the employment of the microscope as a valuable assistance in detecting spurious from real gems; very few of the latter are perfect, and the flaws and cavities are so distinct in character from those which are so abundant generally in artificial gems that very little experience is sufficient for the purpose. This mode of testing of course is limited to transparent crystals, but might be employed when the usual methods are not practicable. He also mentioned Mr. Sorby's discovery of fluid cavities in the quartz of granite, in the quartz of volcanic rocks, and also in the feldspar ejected from the crater of Vesuvius, and Mr. Sorby's method of determining the temperature at which various rocks and minerals are formed. At the conclusion of the meeting, crystals containing fluid were exhibited under the microscope, and the expansion of the fluid by elevating the temperature of the crystal while under examination.—*Mechanics' Magazine.*

Compound for Destroying Burrs in Wool.

Patented by William H. Jubb, of Norwalk, Conn. The following are the ingredients for the compound for destroying the burrs: Sulphuric acid, one hundred parts, by weight; refined saltpeter, two parts, by weight, dissolved in the proper and sufficient quantity of water for the purpose regulated by the condition and nature of the wool. After the hard, knotty nature of the burrs is destroyed, which will be by the aforesaid compound, and they are reduced to a state of powder or pasty substance, I then use the following ingredients, compounded together, which will neutralize the injurious effects of the acids employed and completely cleanse the wool from the same and all other impurities, rendering the wool bleached to an excellent whiteness, without the least injury to the fiber: Sal-ammoniac, four parts, in weight; soda ash, thirty parts, in weight; whale-oil soap, ten parts, in weight; lime, five parts, in weight, dissolved in the necessary quantity of water to produce the desired effect. The utility of my compound for cleaning the wool from burrs and other impurities is in its economy; also in its freedom from the excessive and offensive smell when in operation, and the complete extermination of the burrs without the least injury to the fiber of the wool.

Preservation of Wood---Composition for Ships' Bottoms.

Mr. C. F. Raymond, of Norwalk, says he has used hot coal tar with great success in preserving from decay fence posts and other timber exposed to alternate wet and dryness. He places the posts in the boiling tar for a few minutes, then sprinkles them with clean sand. After setting the posts the portion above ground is paid over with hot tar and coated with sand.

He claims also to have a composition of which coal tar is the basis, designed to be used on the bottoms of vessels to prevent fouling and the ravages of the teredo. He claims that a vessel coated with it can make a voyage to the East Indies and back without, on her return, having a single barnacle clinging to her bottom or a worm in her timbers, except such as may have been in before the composition was put on.

Improvement in Artificial Stone, Stucco, Cement, etc.

George A. Frear, of Chicago, Ill., has obtained a patent as follows:—

"The nature of my invention consists in the use of an aqueous solution of gum shellac, or its equivalent, in cementing together particles of silex, alumina, calcium, or other mineral substances, to produce, artificially, a hard and durable stone, stucco, cement, or paint, for useful or ornamental purposes.

"My shellac solution is best obtained by boiling the gum-shellac of commerce in water previously made alkaline by the addition of any suitable alkaline salt, in proper proportion. The proportions of shellac, alkali, and water, may, and necessarily will, vary with the strength and quality of the solution required in producing various descriptions of stones, cements, etc.

"In the manufacture of artificial stones for building purposes, I use a solution obtained by first dissolving from two to four ounces of saleratus, potash, soda, or other equivalent alkali, in about one gallon of pure boiling water, and then adding thereto one pound of gum-shellac, boiling the mixture until the gum is entirely dissolved.

"A firm and durable stone, impervious to moisture, is produced by dampening a mixture of about one part of lime or cement and four parts of sand or other silicious material (with or without gravel or other ingredients) with my aqueous solution of shellac, and then firmly compressing the composition into molds of any desired form, either by suitable machinery or by hand, with mallets or tamping rods.

"The blocks or other articles thus produced will rapidly harden when removed from the molds, and in a few days are ready for building purposes. I prefer to obtain the compression of the material by percussion rather than by simple pressure.

"To produce a more perfect finish, I contemplate washing the surface or face of the artificial stone thus manufactured, five or six days after molding the same, with a weak solution of shellac dissolved in alcohol, ether, or spirits of turpentine (say about one pound of shellac in one gallon of the spirits).

"Instead of using a mixture of lime or cement, and sand, to produce an artificial stone, I contemplate moistening simple sand, clay, lime, chalk, or other earthy or mineral substance, as well as any combinations thereof, with my aqueous shellac solution, and the molding the same, by percussion, into suitable blocks or other devices, so that endless variety may be obtained therein at pleasure.

"To produce a mastic or stucco, I add so much of my shellac solution to lime, sand, clay, or any earthy or silicious material, or to mixtures thereof, so that the material or mixture shall be reduced by the solution to a pasty consistency, which can be readily worked and applied with a trowel. If then applied to any surface it will firmly adhere thereto, and, upon hardening, produce a firm, water-proof surface, which may be made to resemble stone so closely as not to be readily distinguished therefrom. By making the composition still thinner, it may be used as a substitute for paint, and it will also form a strong and adhesive cement for stone work, etc.

"Through a proper choice of the sand or other substances forming the basis of my improved artificial stones, etc., or by the use of coloring matter in connection therewith, nearly all descriptions of natural stone may be imitated, and any colors or shades of material obtained, at pleasure.

"In applying my improved stucco or mastic to buildings, whether of brick or stone, I first wash the surface with my aqueous shellac solution preparatory to laying on the composition hereinbefore described."

The Fine Arts as Applied to Industry.

The Paris correspondent of the New York *Times* describes a new kind of wall decorations for apartments, which is simply an imitation of the old tapestry work so much in vogue during the Middle Ages. The designs, it appears, are executed without weaving, in colors almost as indestructible as the originals from which they are copied. Close, as well as at a distance, the imitation is perfect, the hand and eye both being deceived.

The cloth which is employed for the ground work imitates in its texture the web of the old tapestry, it is composed of a white reps, and the sewings which are necessary to join the breadths for a picture of large dimensions, are made with great care, and follow the lines of the stuff, so that it is almost impossible to detect them, once the painting is finished. When the artist traces a line somewhat oblique with his brush, the effect on the raised lines of the cloth is a sort of a zigzag, like a woolen stitch on the canvas ground. The colors once laid in this way, he passes over them again with lines traversing the original ones, and thus imitates perfectly the web of the old tapestry.

In regard to the process itself, it is similar to that of water color painting, that is to say, it is the cloth itself which gives the lights, while in oil painting they are laid thickly on the canvas. The colors employed are the same as those used by decorative painters, but they are amalgamated by an albuminous composition which fixes them in the cloth so firmly that they become almost unalterable.

A FRENCH PATENT has recently been granted for a new process for the production of sulphuric acid. Its great recommendation is that in the improved method all large leaden chambers are dispensed with. The sulphur or pyrites is burned in compressed air, and the sulphurous acid, first washed to free it from arsenic, etc., is then brought into contact with the nitric vapors in a small leaden chamber of peculiar construction.