Decisions Relating to Patents.

PATENTABILITY—ANTICIPATION.

In letters patent No. 367,484, issued August 2, 1887, to Jeremiah M. Watson, claim 1 is for a machine for compressing shank stiffeners, having "two rotating die or compressing rollers, the meeting faces of which are formed to present a recess, having one straight and one curved face or side, to thereby curve transversely one face of the stiffener," etc. Claim 6 is for a method of finishing the edges of shank stiffeners, consisting "in cutting out a blank from a sheet of material, leaving the same with beveled edges and obtuse angled corners, and thereafter passing the same between rolls having dies with rounded edges or margins in order to round the obtuse angles and beveled portions as cut." The Circuit Court of Appeals decides that the patent was not anticipated by either the "calendering process machine," of the American Shoe Shank Company, or the Blake or Tripp machines. 1.

Letters patent No. 188,079, issued March 6, 1877, to Henry W. Smith, for an improvement in sheet metal roofing, comprises a means for making a water-tight joint, and for securing the sheets firmly to the roof boards by means of an anchor piece of sheet metal, rectangular in form and bent at right angles, so that when one part is nailed to the roof the other stands upright. The adjoining sheets of roofing have upright flanges of unequal height, the anchor piece being between them. The vertical portion of the anchor piece is split centrally, and one leg is folded down over the shorter flange. On the higher flange a hem is turned down so as to embrace the top of the other leg, and then these parts are folded down over the shorter flange and anchor piece, thus completing a joint of six or seven thicknesses of metal. All these elements are old, and the claim is for a combination. It is held by the Circuit Court that the patent is valid, and not anticipated by the Boesch or the Diehl patents (No. 2,850, issued March 12, 1842, and No. 99,656, issued February 8, 1870), both of which, while resembling it in the split anchor and flanges of unequal height, require the folding of several thicknesses of metal at once; or by the Trissler and Stewart patent (No. 15,988, issued October 28, 1856), which has a solid anchor with a scroll, which fits into a similar scroll in the upper flange, while the scroll of the lower flange is inserted thereunder, thus forming a tubular joint. 2.

The Circuit Court holds that letters patent No. 205,816, issued July 9, 1878, to Henry Tibbe, claiming "a smoking pipe made of corncob, in which the interstices are filled with a plastic, self-hardening cement," were not anticipated, although prior to the application the bowls of corncob pipes had been varnished with shellac, unmixed with other substances, and plaster of Paris had been used to fill small cavities or cracks occasionally found in the cob. 3.

UTILITY.

In the same case the court rules that letters patent No. 205,816, issued July 9, 1878, to Henry Tibbe, claiming "a smoking pipe made of corncob in which the interstices are filled with a plastic, self-hardening cement," must be interpreted as for corncob pipe in which the exterior interstices of the cob are filled with a self-hardening cement; and though the invention is not of a high order, yet, in view of the generally recognized merit of the article, the patent is valid. 4.

EXTENT OF CLAIM.

In letters patent No. 230,590, issued July 27, 1886, to George F. Pinkham, as assignee of Jacob P. Tirrell, the claim is for, "in an electric lighting gas burner, a magnet for turning the gas cock by one electric impulse, combined with a fixed electrode, *a'*, and a movable electrode, *c'*, normally in contact, and mechanism connecting the armature with the movable electrode, to break the contact between *a'* and *c'* the instant after the gas is turned on, and create a spark for ignition, substantially as described." In the drawings, *a'* designated a platinum point on the fixed arm, and *c'* a small bent arm normally in contact with the fixed electrode. The Circuit Court of Appeals decides that the word "electrode" generally, and especially as used in the patent, means the platinum or other metal points constituting the poles of the circuit. 5.

ASSIGNMENT.

Letters patent were granted for a new improvement in school desks. The patentees formed a copartnership for its manufacture and sale, which, becoming involved in debt, was dissolved. The plant and manufactory were transferred to one of the firm, who agreed to carry on the business and pay off the indebtedness, and relieve the other member from all liability for the firm's debts. A deed for the plant was executed by the retiring member and placed in escrow, to be delivered on the performance of the condition. There was no mention of the letters patent in the deed or agreement. The Circuit Court lays it down that the right to manufacture and sell the patented improvement continued so long as the condition was complied with, and the custodian of the deed had a right to deliver it upon full performance of the condition. 6.

The purchaser of a patent right cannot rescind the sale on the ground of false representations that the patent was valid, and did not interfere with any prior patent, where the contract of sale itself contains an express warranty to the same effect, and an engagement on the part of the grantor to defend at his own expense all suits for infringement. 7.

1. Watson *vs.* Stevens, 51 Federal Reporter, 757.
2. Canton Steel Roofing Co. *vs.* Kanneberg, 51 Federal Reporter, 599.
3. H. Tibbe & Son Mfg. Co. *vs.* Lamparter, 51 Federal Reporter, 763.
4. Same.
5. Hanzel *vs.* California Electrical Works, 51 Federal Reporter, 754.
6. Routh *vs.* Boyd, 51 Federal Reporter, 821.
7. Reeves *vs.* Corning, 51 Federal Reporter, 774.

Automatic Brakes.

Repeated experiments on the Western Railway of France, especially between Paris and Mantes, have shown that with the Westinghouse brake a train of a verage load running at 80 kilometers (53 miles) per hour is pulled up without disagreeable consequences in a distance of less than 150 meters (168 yards) even without the co-operation of the driver; that is to say, with the regulator open. These experiments were made in connection with a system devised by M. Laffas, engineer to the Compagnie l'Ouest, for preventing collisions and rendering derailments harmless; these two classes of accident being by far the most numerous, and also the most serious in their effects. The Laffas system is divided under the following three heads: (1) The trains protect themselves by closing behind them automatically all the open signals they encounter. (2) All the trains are pulled up automatically; that is to say, without the intervention of the driver, so soon as they pass a signal set at danger. And (3) Signals set at danger cannot be taken off until the danger ceases to exist. By way of solution to the above threefold problem, M. Laffas has designed three appliances. The first consists of a strong cast iron stop placed between the rails, pivoting in bearings attached to a sleeper, and placed in communication by cranks and rods with a hand lever for putting it on and taking it off, the gear being interlocked with that of the signal. When the signal is set to danger, the stop is made to rise between the rails, so as to be struck by a lever on the train for putting on the continuous brake, the last named action constituting the third part of the system. The second consists of a movable bar mounted on links, as in a parallel ruler, so as to rise above the rail when put in action, to be depressed by the wheel tire when passing over it. This bar is interlocked by rods and levers with both the signal and the stop, so that the former is set to danger and the latter raised for putting on the brakes, when the train passes those portions of the line where the bars are to be fixed; these bars being for the protection of places such as crossings, where two trains might otherwise come into collision.

PHOTOGRAPHIC NOTES.

Niepce, not Daguerre.—A proposal to erect a new monument to Daguerre in his native village of Brie-sur-Marne has moved M. Leon Vidal, the editor of *Le Moniteur*, to remark that, but for Niepce, there would have been no Daguerre—photographically speaking, of course. Niepce was really the inventor of photography. Daguerre contributed his brick to the edifice, no doubt; but it is often forgotten that, without Niepce, photography would not have been known, and that in that case Daguerre would not have been the inventor of the Daguerreotype. Niepce was the real father of photography. It is an error to suppose, also, that Daguerre discovered the development of the latent image, inasmuch as a latent image existed in the bitumen process, being developed by dissolution of the unaltered bitumen. Development of the image on silvered copper was a different species of reaction, upon which modern negative processes are based; and, without attempting to minimize the importance of this discovery of Daguerre, M. Vidal concludes by pointing out that he followed Niepce. M. Vidal does service in the cause of historical truth by once more insisting on the relative positions occupied by these two men in the field of photographic discovery. Undoubtedly a great deal of the credit which belongs to Niepce is often given to Daguerre.

Converting Blue Prints into Black Prints.—The *Revue de Chimie Industrielle* says that the prints should be first passed through water acidulated with nitric acid, and thence into—

Carbonate of soda	50 grammes.
Water	1 liter.

In this the picture is changed to an orange tone, when it is removed and placed in—

Gallic acid	50 grammes.
Water	1 liter.

Being subsequently washed in water acidulated with HCl.

Recovering Fogged Plates.—In order to render plates which have been accidentally fogged, or have by mistake received two exposures, or are known to have been over-exposed, in a fit condition to be used again, M. Rossignol recommends their immersion in a bath consisting of—

Bromine water	50 c. c.
Tincture of iodine	20 "
Distilled water	1 liter.

After immersion for two or three minutes the plate is washed and dried. M. Rossignol says that, if the plate has only been partially exposed, it should be exposed to lamplight in order to make the fog impression uniform.

An Intensifier for Gelatine Negatives.—In the *Deutsche Photographen Zeitung* M. Kirchoff gives the following formula for an intensifier. To a solution consisting of—

Bichloride of mercury	10 grammes.
Water	800 c. c.

Twenty-five grammes of iodide of potassium are added until the red precipitate is dissolved, one gramme of hypo being then introduced. For use, the solution is diluted with its own volume of water, and intensification is allowed to proceed until the shadows of the negative are of a yellowish-green. The intensification is not apparent until the negative is dry.

Printing on Silk and Other Fabrics.—*Apropos* of M. Villain's recently published method of photo-dyeing, Mons. A. D. Lavroff writes to the *Paris Photographe*, detailing his method of printing on silk, cotton, etc. He prepares the following mixture:

Tartaric acid	1 gramme.
Common sugar	10 grammes.
Boiling water	100 c. c.

This is boiled for a minute and 0·5 gramme of borax added, the mixture left for six hours, the clear liquid decanted, 4 grammes of common salt added, and the solution filtered. The fabric is coated with the solution, and when dry is sensitized, dried, printed, toned, etc., as usual.—*Br. Jour.*

Music as a Remedy.

The connection between music and medicine was discussed by Dr. J. G. Blackman at a recent meeting of the Portsmouth Literary and Scientific Society. The subject is one of interest, both from a social and professional standpoint. In this instance it was regarded by the lecturer mainly in its medical aspect, and was treated on similar lines to those with which readers of the *Lancet* are familiar. The physiological foundation of musical therapeutics was examined and described as consisting in the power exercised by harmony over the vaso-motor function. Most will acquiesce in this view, which is also corroborated by the experiments of Riegel on the blood pressure and heart action during the performance of music. It follows naturally that the ailments most likely to be benefited by this means are those in which nervous disorder plays a leading part. A number of cases illustrating this point were quoted at the meeting referred to, and we should probably include among these one in which reduction of temperature followed the administration of "a dose" of melody. The violin takes high rank as a vehicle of the soothing property, and the other instruments best adapted to the treatment of disease by musical sounds were in the lecturer's opinion the harp and the pianette (not the piano), with which a few well chosen voices might be advantageously combined.

Dr. Blackman does not consider it feasible as yet to apply the musical method as above described in private practice, though he looks forward to its employment in hospital work, a hall being established in London where the services of musicians trained for this particular branch of their art might be obtained.

While willing to admit the salutary effect of good music in many cases of nervous disease, we confess that an arrangement so elaborate does not seem to us to be called for by the exigencies of illness or justified by the importance of its probable effect. In any case of serious mental or bodily disorder the mild suasion of sweet airs must hold an altogether secondary place in the plan of treatment, and such as could usually be well filled with far less elaborate preparation.—*Lancet.*

Prominent Atlantic Steamers.

The following table shows the dimensions and power of the principal vessels constructed for the transatlantic trade since the Great Eastern was built:

Name.	Date.	Length, feet.	Breadth, feet.	Horse power.
Great Eastern	1858	680	82	7,650
Britannic	1874	455	46	5,500
Arizona	1879	450	45	6,300
Servia	1881	515	52	10,300
Alaska	1881	500	50	10,500
City of Rome	1881	546	51	11,800
Aurania	1882	470	57	8,500
Oregon	1883	500	54	8,375
America	1884	432	51	7,354
Umbria	1884	501·5	57·2	14,321
Lahn	1887	465	49	9,500
City of Paris	1888	500	63	20,605
Augusta-Victoria	1889	480	56	14,110
Columbia	1889	480	56	13,680
Teutonic	1890	550	57·5	13,000
Normannia	1890	520	57·1-4	16,352
Spree	1890	485	52	13,000
Furst Bismarck	1891	502·5	57·5	16,412
Campania	1892	620	65·3	30,000

Motive Power Resources of Maine.

A glance at the map of Maine reveals what seems at first sight a small inhabited streak of land bordering a much indented seacoast, and resting on this streak of land a huge wilderness covered with forests and lakes. This first impression is not altogether an incorrect one, for although the State has an area of 33,040 square miles, or only 385 square miles less than the total area of all the other New England States combined, it has a population distributed almost entirely along the seacoast, according to the census of 1890, of only 661,086, or less than the combined population of Boston, Worcester, Lowell, and Lynn.

It is not what Maine is but what Maine is to be that attracts the attention of the person who examines its wonderful surface and its untold and almost untouched wealth. The annual rainfall upon the area of this State, assumed at 42 inches, if accumulated to the depth of Lake Erie, would cover 871 square miles. In cubic feet the total measure of this immense amount of water is about 3,073,000,000,000. Allowing that only 40 per cent of this rainfall is removed by drainage, there yet remains nearly 1¼ trillion cubic feet of water to be carried by the numerous rivers of the State into the ocean. Assuming the mean height of the State to be 600 feet, it is easy to calculate in general terms the power that is generated by this water before it reaches the sea. Thus allowing that the water carried away by the rivers is annually about 1,229,200,000,000 cubic feet, it is plain that this amount of water falls through the mean distance of 600 feet. At each foot of fall, it is estimated 4,429 horse power are generated, which, multiplied by 600, gives 2,656,200 horse power, which it is not unfair to represent by the working energy of over 34,000,000 able-bodied men (or nearly twice as many as there are at present in the United States) laboring throughout the year without intermission for food or sleep.

This almost inconceivable power is distributed throughout the State in lakes and rivers. The importance of the lake system of Maine is appreciated by no one who has not studied it. There are only three or four districts of the same size upon the globe that can at all compare with Maine in the extent of its lake surface. The Kennebec River has more lakes connected with it than the gigantic Orinoco, and the Penobscot than the Amazon. Without counting the smallest variety, there are in Maine between 1,500 and 1,600 lakes, having a total area of between 2,000 and 3,000 square miles.

Looked at in their relation to power, the lakes have an especial value. They are all, with scarcely an exception, connected with the various river systems of the State, and are, moreover, in the majority of cases at such high elevations that their positions make them storehouses of potential energy, which needs but to be properly tapped to set the wheels of industry in motion even hundreds of miles away. Eight of the large lakes have their surfaces over 1,000 feet above the level of the sea, while the waters of Rangeley are over 1,500 above the ocean, or but a few feet below the level of Lake Itaska, the source of the Mississippi. Connected as they are with the rivers, they act, moreover, as reservoirs for the gathering of the drainage, which can be sent down through the rivers in much more uniform quantities than would be possible were they not present to serve as checks.

It is impossible here to go into details concerning the rivers of Maine and the unrivaled opportunities they present to manufacturers who wish to put up small or large establishments. The rivers are there and are yearly carrying unused into the sea millions upon millions of horse power, fully 75 per cent. if not more, of their energy going at present utterly to waste. The time has arrived for the harnessing of these streams, and the investor or manufacturer who hastens to build beside them the factory or the electric generating station, with its miles of copper wire for power transmission to distant cities, is assured of a return for his capital, his trouble, and his good judgment which he could not so surely obtain in any other way.

There is much which we have not the space to add, but perhaps enough has already been said to awaken the interest of the reader to such an extent that he will investigate the subject for himself; and it is not entirely impossible that at some future time we may return to a subject which is so fascinating, and concerning which it is impossible to say the last word. —*Manufacturers' Gazette.*

Steam Power from House Dust.

The Refuse Disposal Company, London, have lately published a pamphlet on the question as to the practical means by which the dust refuse of towns can be utilized for electric lighting purposes. The company claim that 20,000 tons of house dust, if treated as they suggest, and burnt in suitable boilers, might be made to produce as much as 5,600,000 indicated horse power hours, equal to an engine of 1,183 indicated horse power working for 4,734 hours, for electric lighting.

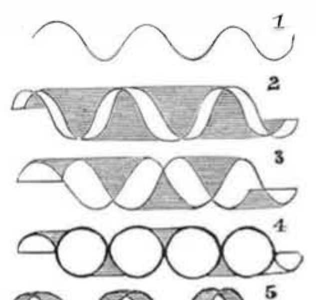
EXPERIMENT IN PERSISTENCE OF VISION.

T. O'CONOR SLOANE, PH.D.

A method of illustrating persistence of vision with the production of very pretty and varied effects is shown in the accompanying illustrations. Briefly stated, it consists in rapidly vibrating different designs. By persistence of vision these designs produce varied effects which change with the amplitude of vibration. While for producing such vibration simple agitation by hand may be measurably successful, a special vibrator is shown in the cut, which is very simply constructed, and which far exceeds in its results the hand of the operator.

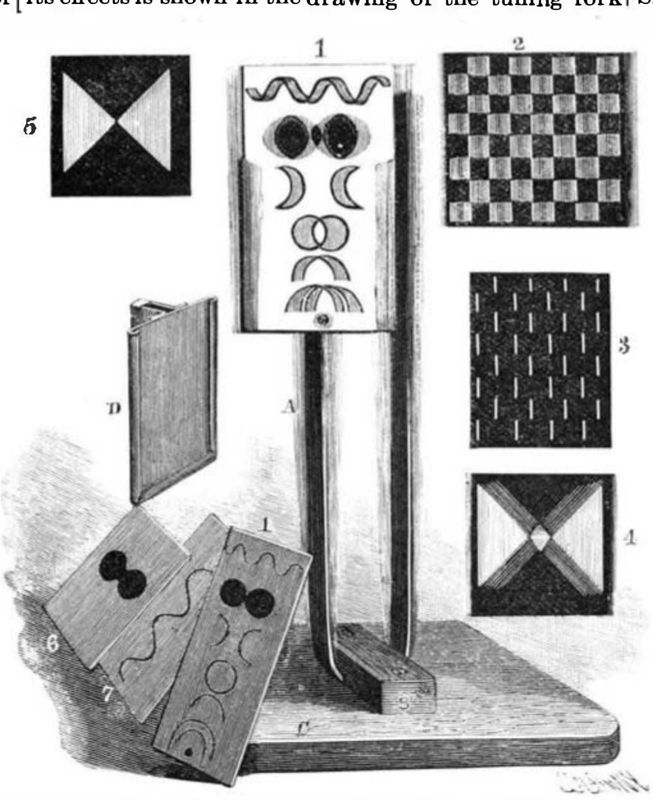
To make the vibrator a long flat bar of brass is bent into U shape. The bar may be 30 inches long, half an inch wide and one-eighth inch thick. This makes a sort of tuning fork, as shown in the cut at A. The block of wood, B, slotted to receive the bend of the tuning fork, is screwed on the base, C, securing the fork thereto.

The fork thus mounted will have an amplitude of vibration of half an inch or more. The designs to be vibrated may be drawn upon paper and may have paper loops pasted on their backs to receive the end of the tuning fork, so as to be thereby secured to it. It is, however, more convenient to make a frame such as is shown at D, of very thin metal or else of paper. At the back is a long band or loop to receive the tuning fork just described. This loop is partly or entirely closed at its upper end to prevent it from dropping down toward the bend of the brass bar. When in place different designs can be inserted into it in front, the inwardly turning portions or flanges holding the design in it.



Various examples of designs are given. Fig. 3 is a blackened piece of paper with short white lines drawn and distributed as shown. When vibrated this seems to widen out, the white lines become squares, and when the proper amplitude of vibration is reached an almost perfect checker board, Fig. 2, results.

Fig. 5 shows another design, which speaks for itself. When vibrated, a very peculiar effect is produced, one of the phases of which is shown in Fig. 4. A variety of designs can be placed on the same piece of paper. Fig. 1 shows such a piece of paper, and one of its effects is shown in the drawing of the tuning fork itself. Crescents, intersecting circles and other peculiar effects are produced from the designs shown in Fig. 1. The most interesting of the figures is the sinuous line with horizontal axis shown at the top of Fig. 1. As the fork's amplitude of vibration continually decreases, each design, as vibrated, produces successively a number of effects, and in none is this better shown than in the horizontal sinuous line.



EXPERIMENT IN PERSISTENCE OF VISION.

In the small cuts the changes such a line undergoes are illustrated. Number 1 shows the line; number 2 the appearance produced with a considerable amplitude of vibration. As the beat of the fork diminishes, number 3 and then number 4 appear. In the latter for an instant almost a perfect series of circles results. This is but for an instant, as, while one watches them, the circles merge into a ribbon as shown in number 5, which grows narrower and narrower as the swing diminishes in extent. In Figs. 6 and 7 other designs are shown. In Fig. 7 will be recognized the sinuous line designed to be vibrated when in a vertical position. A very pretty effect produced by a semicircle with horizontal axis is specially worthy of being noticed. Every design gives not only new effects varying with the amplitude of vibration, but different positions of the same design produce quite different results.

The Action of Alkalies on Glass.

BY F. FOERSTER.

The following facts concerning the action of solutions of alkalies and acids upon glass have been collected from the results obtained by the author and others who have experimented in this direction.

1. Solutions of caustic alkalies act upon glass much more strongly than water, since, except in very dilute solution, they dissolve all the constituents of the glass as such.

2. Of the caustic alkalies, the most active is caustic soda, then follows caustic potash, and then ammonia and baryta water.

3. Rise of temperature increases the action of the alkalies very considerably.

4. The action of the alkaline solution increases with the concentration, at first rapidly, but afterward only very slowly.

5. Highly concentrated solutions at the ordinary temperature have less action than more dilute ones.

6. Pure alkaline solutions, not too highly concentrated, have less action upon glasses than such as have been rendered impure by small amounts of silicic acid.

7. Alkaline carbonates, even in very dilute solutions, attack glass much more strongly than water. Their mode of action corresponds rather with that of other salts than with that of the caustic alkalies. In equivalent concentration, solutions of sodium act more powerfully than those of potassium carbonate.

8. The action of salt solutions upon glass is made up in a manner which varies with the concentration and the kind of salt, of the action of the water itself, and that of the salt which is present.

9. Both these modes of attack are differently influenced by the composition of the glass.

10. These salts act more strongly than water whose acids form insoluble lime salts. The action of these increases with concentration.—*Chem. Tr. Jour.*

Elastic Foundations for Engines.

The desirability of mounting gas engines and other motors used in town industries upon spring foundations having been mooted in *Industries*, Mr. Robert H. Smith, of the Mason College, Birmingham, writes to that paper expressing his views on the subject. He remarks that all foundations are in some degree "springy," and that the really practical question is as to the amount of springiness to give to the foundation under stated conditions of working of the machine, and under what conditions it is desirable to make this springiness as nearly zero as we can get it. He goes on to narrate how a gas engine in Birmingham was lately causing much annoyance by the vibration and noise it created in the building in which it was placed. An attempt was accordingly made to remedy the evil by mounting the wooden sole plate that carried the engine and the dynamo driven by it upon a dozen rubber pillarets, 3 inches diameter and 4 or 5 inches high. The result was a failure; the oscillations of the engine bed plate being excessively violent and irregular. Mr. Smith proceeds to discuss the nature and operation of the stresses tending to produce oscillations in a combined arrangement of gas engine and dynamo; and he concludes that any solution of the difficulty must be of the nature of a compromise between the giving of annoyance by vibration and damaging the machinery by shaking. He recommends, in case a spring cushion and a massive brick, stone, or concrete foundation can be used in combination, the putting of the former underneath the latter, to the top of which the engine bed plate should be bolted as hard and fast as possible. Of course, such a situation for the spring cushion would be a permanent one; and therefore rubber would not be a suitable material of which to make it, because its elasticity is soon lost under severe stress. If they could be secured from rotting, it might be supposed that a pitful of brushwood fascines would be the ideal spring cushion to put underneath a masonry engine foundation. Perhaps alternate layers of tarred felting and corrugated steel sheets would act well. A thick layer of felt is probably the cheapest.

A TRAVELER in the Maine backwoods this season was somewhat surprised on coming upon a lumberman's camp, full thirty miles from any settlement, to hear the music of an organ and the strains of an operatic air. He was met on entering the camp by the organist, a bright, neat Maine girl, who he found was also the cook, who had taken along her parlor organ out to camp to entertain her father and his crew in the long evenings during their stay in the wilderness.