

IMPORTANT PATENT DECISION.

UNITED STATES CIRCUIT COURT, SOUTHERN DISTRICT OF NEW YORK. IN EQUITY. DECISION BY JUDGE BLATCHFORD.

The Bamford Chemical Works vs. John E. Lauer. Opinion of the Court. July 13, 1869.

In this case the original patent was granted to Prof. Eben N. Horsford, April 22, 1855, and was reissued to the plaintiffs, who are assignees, May 7, 1857, and reissued to them a second time, June 13, 1858. The infringement alleged in the bill is the making and selling by the defendant, of pulverulent acid, in infringement of said reissued patent of 1858.

The specification of the plaintiffs' patent states the invention to be "a new pulverulent acid for use in the preparation of soda powders, farinaceous food, and for other purposes." It then describes the acid and the mode of its preparation. It says: "Carefully washed and properly burned bones, after being ground, are put into freshly diluted oil of vitriol, with continual stirring and in the following proportions: Five hundred pounds of the above described bones, (sometimes called bone ash), four hundred pounds of oil of vitriol, and one thousand pounds water. These ingredients are stirred, from time to time, for about three days, when, ordinarily, the action will be completed, and the resultant products will be phosphoric acid, superphosphates and sulphate of lime, or gypsum, with a small proportion of salts of magnesia and soda in a pasty mass. Various methods are then described for making this mass pulverulent: (1st.) Mixing it, while moist, with any farinaceous substance, drying it slowly in the sun or with artificial heat not above 150° F. and pulverizing it; (2d.) Mixing it with freshly burned gypsum drying it in the sun, or by artificial heat, and pulverizing it; (3d.) Mixing it with stearine or other fatty bodies, drying it and pulverizing it; (4th.) Leaching the mass, mixing the concentrate with burned gypsum or stearine, and drying it; (5th.) Drying and pulverizing it without admixtures. All of these modes are stated to have given desirable results, but a preferable mode is then described, which consists in leaching the mass, concentrating the mass to 25° Baume, thereby obtaining a solution consisting of phosphoric acid and acid phosphate of lime, with slight traces of other salts, substantially free from gypsum or sulphate of lime, heating ten gallons of this mixture to boiling, adding four pounds of perfectly white bone ash, continuing the boiling until the concentrated liquid mass, containing in solution the added bone ash, becomes pasty, cooling the mass, adding seventy-six pounds of wheaten flour, mixed to a uniform paste, adding sixteen pounds of potato starch, carefully mixed, sifting it through a sieve of quarter inch meshes, drying it thoroughly at a temperature of not over 200° F., and pulverizing it. The specific mode which has been invented and used by the defendant, is described as follows: (1st.) Phosphate of lime, or of mixed acid phosphate of lime and phosphoric acid, in which the phosphoric acid is the active and valuable constituent, free from the objectionable qualities of the above-mentioned bodies. It is a dry, fine, white, or nearly white, homogeneous powder, unobjectionable on account of odor, taste or composition, is an essential and important element in healthful nutrition, and is suited to be employed as the acid ingredient in the preparation of self-raising farinaceous food. The claims of the patent are as follows: "1st. I claim, as a new manufacture, the above described pulverulent phosphoric acid; 2d. I claim the manufacture of the above described pulverulent phosphoric acid, so that it may be applied in the manner and for the purposes described; 3d. I claim the mixing, in the preparation of farinaceous food, with flour, of a powder or powders, such as described, consisting of products of which phosphoric acid, or acid phosphates, and alkaline carbonates are the active agents, for the purpose of liberating carbonic acid, as described, when subjected to moisture heat, or both; 4th. The use of phosphoric acid or acid phosphates, when employed with alkaline carbonates, as a substitute for ferment or leaven, in the preparation of farinaceous food."

THE DEFENSE.

The defenses set up are, that Horsford was not the original and first inventor of anything which has been made and sold by the defendant, and that the defendant is not infringing on the patent of the defendant, and that the defendant is entitled to the patent of the defendant, as it is known as the three-fourths phosphate of Berzelius, described in the Hand Book of Chemistry by Leopold Gmelin, volume 3, page 195, published in 1846. It is claimed by the defendant, that this three-fourths phosphate is an acid phosphate of lime, possessing all the properties and qualities specified in plaintiffs' patent as being possessed by Horsford's pulverulent phosphoric acid, and as being necessary, in the preparation of self-raising farinaceous food, for the purpose of self-raising farinaceous bread; that it is a dry, non-hygroscopic, fine, white, homogeneous powder, unobjectionable on account of odor, taste or composition; that the phosphoric acid of such powder is the active agent, when the powder is mixed with bicarbonate of soda and moistened, in liberating carbonic acid gas, to give porosity to dough; and that such acid, in uniting with the soda of the carbonate, forms phosphoric acid gas, forms phosphoric acid, which is deposited in the dough. The three-fourths phosphate is so called because it has a chemical composition of four atoms of oxide of lime and three atoms of phosphoric acid. The entire passage in Gmelin describing this phosphate is as follows: "4 Ca O, 3 PO5. c. Three-fourths Phosphate. Aqueous solution of phosphoric acid is saturated with the salt (a) the solution mixed with alcohol, and the white precipitate formed washed with alcohol and dried. White powder, having an acid taste and reddening litmus. With water it separates into the insoluble salt b and an acid salt, which remains in solution (with one atom of acid) (Berzelius Ann. Chem. Phys., 187). If these acids, recently precipitated, is immersed in a solution of hydrated phosphoric acid, ignited just before it was dissolved in water, it gradually changes to a tenacious acid mass, which may be drawn out into threads and sticks to the teeth; after drying, it becomes yellow, transparent, and very friable. This substance has the same composition as c and is decomposed in the same manner by water, but contains metaphosphoric acid as well as ordinary phosphoric acid. Lehmann, Lehrb., 4, 377." Graham regards this compound metaphosphate of lime."

EVIDENCE FOR THE DEFENDANT.

The defendant claims to have shown that one Place, who is not a chemist, prepared, from directions given to him, an acid phosphate, in the form of a powder, which was successfully used in making bread, in connection with the bicarbonate of soda, and that the mode of preparation corresponded with the description in Gmelin.

Professor Austin Flint, Jr., testifies, that, from the passage in Gmelin, he entertains no reasonable doubt that a pulverulent acid phosphate was produced by Berzelius, and that he cannot see that an acid phosphate prepared according to the directions given by Berzelius would not be useful in raising bread, if used in the same manner as the Horsford acid phosphate.

Professor George F. Barker, Professor of Physiological Chemistry and Toxicology in the Medical Institution of Yale College, testifies, that the description in Gmelin of the three-fourths phosphate of lime, as produced by Berzelius, is the first paragraph, that is, the white acid powder, without invention or discovery; that he produced at the first trial, a substance having all the properties described in the first clause of the paragraph of Gmelin; and that, from the results of his own experiments, he could see no difficulty, after producing that acid once successfully, in repeating its production any number of times successfully.

Professor Silliman, Professor of general and applied Chemistry in Yale College, testifies, that the description in Gmelin is sufficiently clear to enable a chemist, without invention or discovery, to produce such a three-fourths phosphate as the specimen produced by him as an exhibit; that such phosphate is an acid phosphate, which, in its reaction with the bicarbonate of soda, involves the evolution of carbonic acid gas, and that the specimen which he produced as an exhibit was prepared by dissolving in water glacial phosphoric acid, boiling the solution until all the metaphosphoric acid was converted into triphosphoric phosphate, diluting to about 1100° or 1150° of concentration, saturating with common commercial bone phosphate in a state of solution, adding alcohol, which threw down a voluminous precipitate of the three-fourths phosphate, throwing it upon a filter, washing it with alcohol, and drying it in the air.

It is shown, by the evidence, that a chemist would properly understand, by the expression "the salt (a)," in Gmelin, what is known as bone earth or bone phosphate or ordinary phosphate of lime. The paragraph in Gmelin plainly describes two substances, and a separate process for making each of the two substances. The first substance is a white powder, to be produced by saturating with phosphoric acid a solution of bicarbonate of soda, and then adding alcohol, with the solution, and thus forming a white precipitate, which is to be washed with alcohol and dried. The second substance is acid, but tenacious and sticky, and is to be produced by immersing the salt a recently precipitated, in a solution of hydrated phosphoric acid, ignited just before it is dissolved in water. The chemical testimony shows that there is a sufficient difference in the two processes, caused by using in the latter one, hydrated phosphoric acid, and igniting it before dissolving it in water, to produce the difference in result.

THE PLAINTIFFS' EVIDENCE.

In reply to the testimony introduced on the part of defendant as to the identity of the powder described by Gmelin, with the powder claimed in the first claim of the plaintiffs' patent, as above defined, Professor Horsford, himself, and Professor R. Ogden Doremus, testify, that they were unable to make, with certainty, from the description in Gmelin, a powder capable practically of being relied on to evolve carbonic acid gas from bicarbonate of soda. Professor Doremus states, that the paragraph in Gmelin does not contain such a description as will enable him, as a practical chemist, to produce pulverulent acid phosphate suitable for use in making bread; that he saturated an aqueous solution of phosphoric acid with phosphate of lime, mixed the solution with alcohol, producing a white precipitate, washed that with alcohol and dried it, and thus produced a white powder, which had an acid taste and reddened litmus, but, after a short time, became inert and would not, when mixed with bicarbonate of soda and water, evolve carbonic acid gas, although, when first prepared, it would, when combined with the bicarbonate of soda, set free carbonic acid; and that he made but one experiment to produce a powder by following the description in Gmelin.

Professor Horsford testifies, that he began his attempt to make a practical pulverulent phosphoric acid, suitable for use in the preparation of bread, with the study of what Berzelius describes; that he devoted a great deal of time to the subject, and found that, when produced in the manner described by Berzelius, the article was sometimes sticky, and uniformly lost strength from day to day, however prepared, until it was finally without any capacity to decompose bicarbonate of soda, and was sometimes, when first prepared, inert; and that he was unable to produce such a powder between the year 1832 and the year 1856, to produce the three-fourths phosphate described by Berzelius, sometimes producing three-fourths phosphates which, for a comparatively brief period after they were made, would decompose bicarbonate of soda, but would uniformly lose their strength and become, in time, substantially inert. He produced some specimens which he stated were made, during the taking of testimony in this case, in accordance with the method given by Berzelius, one of which was inert, and the other three nearly so, one of the latter being sticky.

JUDGE BLATCHFORD'S CONCLUSIONS.

In this condition of the chemical testimony, that on the part of the defendant far outweighs that on the part of the plaintiffs. The former is positive and affirmative, while the latter is merely negative. As the acids produced by Professors Silliman, Barker, and Flint, were not prepared according to the process described in the plaintiffs' patent, or according to the process described in the defendant's patent, they must have been prepared according to the description in Gmelin, which is the method of Berzelius, or the chemists who prepared them must have devised or learned some other method. No suggestions to this last effect is made. Those chemists produced, by following the description in Gmelin, a dry, fine, homogeneous powder containing, as an active agent, phosphoric acid in an available condition to be used as a substitute for other acid, in decomposing an alkaline carbonate, in making bread without the use of ferment, and which was used for that purpose successfully, and the powder did not, by being kept, lose its acid strength or become inert, or absorb moisture from the air, or part with any of the qualities defined in the plaintiffs' patent as necessary in such a powder. Why it is that the chemists who testified on the part of the defendant uniformly succeeded in making, from the description in Gmelin, an article having those qualities, while Professors Horsford and Doremus failed, does not clearly appear, although it is quite probable, from the evidence, that the inertness of the powders testified to by Professors Horsford and Doremus was owing to the use by them of too diluted a solution of phosphoric acid. That the pulverulent phosphoric acid, as a chemical substance, claimed in the first claim of the plaintiffs' patent, existed prior to the invention of it by Horsford, is established by the evidence in this case. The first claim is, therefore, void, for want of novelty.

As to the second claim, if it be regarded as a claim to the process described in the patent for making the acid, the defendant has not infringed it, for his process is as different from that of the plaintiffs as the plaintiffs' different from that described by Berzelius or Gmelin. The defendant dissolves bone black in a mixture of lime acid and water, filters the product, adds sulphuric acid and dries the resulting mass by heat till it crumbles into a powder which is white and acid, and can be used, in connection with bicarbonate of soda, to liberate carbonic acid, to make bread. Bone black is burned bones. The muriatic acid dissolves the phosphate of lime in the bones from the carbon, the filtering gets rid of the carbon, the action of the sulphuric acid creates sulphate of lime, acid phosphate of lime, and free phosphoric acid, and the heat drives off the muriatic acid. Horsford removes the carbon from the bones by fire before he applies the sulphuric acid, while the defendant removes the carbon from the bones by muriatic acid, and then gets rid of that acid by heat. Horsford burns away the carbon from the phosphate of lime in the bones, while the defendant dissolves away the phosphate of lime from the carbon. The products produced by the two processes are substantially identical with each other and with the product produced by the process of Berzelius and Gmelin, as powders containing phosphoric acid as an available agent to decompose alkaline carbonates, for the purpose of liberating carbonic acid, to give porosity to dough, but the three processes differ each from the other, in substance. It appears, from the evidence, that the use of sulphuric acid, to act on what is differently known as bone earth, or bone ash, or bone phosphate, being common bones containing phosphate of lime, and thus form sulphate of lime and liberate sulphuric acid or an acid phosphate of lime, was well known before the date of the alleged invention of Horsford. The defendant does not, by the use of the process described in his patent, infringe the second claim of the plaintiffs' patent, considered as a claim to the process described in that patent for making the pulverulent acid therein described. If the second claim be considered as a claim to the acid, as a product, the conclusions arrived at in regard to the first claim apply to it.

As already remarked, the third and fourth claims of the plaintiffs' are not involved in this case. The questions, so largely discussed by the counsel for the plaintiffs, on the argument, as to whether Horsford was not the first person who used, as a substitute for yeast, a powder containing phosphoric acid as its active agent, and as to whether he is not entitled to a patent for applying such phosphoric acid to the common bones containing phosphate of lime, and thus form sulphate of lime and liberate sulphuric acid or an acid phosphate of lime, are not valid, as containing inventions which involved the necessity of experiments, to determine whether phosphoric acid, when artificially introduced into bread, would be healthful, and whether and how the acid could be mixed with flour and with an alkaline carbonate, and remain inactive until moisture and heat, are questions which will arise on the patent when a suit is brought on it for the infringement of its third and fourth claims, but they are not presented in this case.

It may be that there are claims which Horsford could make and hold in reference to certain constituents and qualities of the pulverulent phosphoric acid that is made by this process, but the broad claim made to the acid described, is not tenable.

The bill must be dismissed with costs. W. WHITING and C. A. SEWARD, for the plaintiffs. E. W. STOUTON and C. M. KELLER, for the defendant.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, give their names, and we have a right to know those who seek information from us; beside, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at \$100 a time, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

C. P. P., of Kansas.—The chemical symbol HO, signifies one equivalent of hydrogen combined with one equivalent of oxygen. The equivalent of hydrogen being 1 and that of oxygen 8, the equivalent of HO, or water, is 9. The equivalent of a substance in the old nomenclature is based upon the weights in which, or in some multiple of which, it generally combines with other bodies. The new nomenclature takes into account the volumes of substances when in a gaseous state, as it has been found that generally the molecules of compound bodies when reduced to the gaseous state occupy equal volumes, and that, also, a simple relation exists between the volumes of any two gases which combine together. It also makes a distinction between the terms equivalent and atomic weight and from the above considerations as well as others equally forcible, makes the atomic weights of many substances just double the numbers assigned in the old nomenclature as their equivalents. Hence, according to the new nomenclature, water is represented by H O. In our paper when we find occasion to use chemical formulae we still use the old nomenclature, as many of our readers, who have all their lives been accustomed to it, have not probably found time to post themselves upon the new, which is now generally adopted in scientific schools, and in very recent treatises involving the use of chemical symbols.

A. M., of La.—We believe that no cheap ice machine suitable for use in families has yet been introduced. A cake of ice weighing 30 lbs may be kept easily 48 hours in a good refrigerator before it melts away, if the box is not too frequently opened. You can filter and cool water by passing it through an underground filter, but with the low head you have got it will not enter the house with much force. It will, however, probably answer your demands.

R. H., of N. Y.—You can cleanse barrels from must, by burning a small quantity of sulphur in each, after which they should be well rinsed with cold water.

M. L., of Vt.—The term isomeric is applied to compound chemical substances, which, having the same elements combined in the same proportions, still exhibit different properties.

A. A. S., of Wis.—The greater the height to which a given quantity of water is raised in a given time, the greater the power required to raise it.

J. B., of Mass.—You will not in our opinion be able to punch wires in the way you described. The temper is already out of annealed wire and we don't see why you should seek to do what is already done.

W. F., of Pa.—Good pine or cedar is the best timber for making vats, etc., for holding boiling water. Soluble glass will not be of service to you for such purposes.

S. H., of Ind.—As soon as we can get a locomotive constructed that will run as fast as the initial velocity of a cannon ball we will try the experiment you suggest, and shall expect to find that the ball will drop perpendicularly from the mouth of the cannon to the ground.

Business and Personal.

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

Send for Agents' Circular—Hinkley Knitting Machine Co., 176 Broadway.

Wanted—A partnership in a machinery furnishing business, or a position as mechanical engineer. Address W. C. Zane, Jr., Phila, Pa.

For Sale—A 20-H. P. link-motion propeller engine, suitable for stationary, good order. Hosford & Garsides, 211 Greene st., Jersey City.

Hoop Iron, 7-8 & inch, cut to any length ordered, 5c. Punched, as many holes as ordered, 6c. per lb. Tubs, barrels, bunching shingles, marble, etc., etc. Pugsley & Chapman, 30 Platt st., New York.

Paper Collars—Wanted, the address of large manufacturers. J. Holley, 14 High st., Brooklyn, N. Y.

State Rights of the "Lesperance Ventilator," for sale, illustrated in Scientific American, July 24. Thomas Howard, Postoffice Box 3083, New York.

Parties who desire to manufacture the best patent revolving road scraper in existence, address J. W. Wilson, Somersford, Madison Co., O.

For Sale—A half interest in a patent saw set, that does its work positive and exact, upon all saws, from a jig or whip saw to a cross cut. No mechanical skill required. Address N. B. Tyler, Warren, Ohio.

Lathe wanted—A screw-cutting lathe, 24-in. swing, to take in 14 ft. Address, stating condition and lowest net cash price, Box 3329 New York Postoffice.

"The Chicago Railway Review (says the Philadelphia Railroad Register),—a paper to which we owe more of our knowledge of railroad matters in the West, than to all our other exchanges put together." \$2 per year. Address Fowler & Brooks, Chicago, Ill. Advertisements received.

Automatic Lathes, for spools and tassel molds, made by H. H. Frary, Jonesville, Vt.

If you want the real oak-tanned leather-belting, C. W. Army manufactures it. See advertisement.

Peck's patent drop press. For circulars, address the sole manufacturers, Milo Peck & Co., New Haven, Ct.

New Machine for Grinding Tools, etc., great saving of files and labor by their use. Address American Twist Drill Co., Woonsocket, R. I.

A good engine & boiler wanted. Wm. Louden, Fairfield, Iowa.

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Cochrane's low water steam port—The best safeguard against explosions and burning. Manufactured by J. C. Cochrane, Rochester, N. Y.

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Send for a circular on the uses of Soluble Glass, or Silicates of Soda and Potash. Manufactured by L. & J. W. Feuchtwanger, Chemists and Drug Importers, 55 Cedar st., New York.

To Manufacturers or Patentees.—Wanted—By a responsible hardware house, long established in the city of New York, the agency or the right to manufacture some good patented article in their line of trade. Address P. D. & Co., Postoffice Box 3, 517.

Mill-stone dressing diamond machine, simple, effective, durable. Also, Glazier's diamonds. John Dickinson, 64 Nassau st., New York.

Leschot's Patent Diamond-pointed Steam Drills save, on the average, fifty per cent of the cost of rock drilling. Manufactured only by Severance & Holt, 16 Wall st., New York.

Tempered steel spiral springs made to order. John Chatillon, 91 and 93 Cliff st., New York.

The Tanite Emery Wheel—see advertisement on inside page.

For solid wrought-iron beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Machinists, boiler makers, tanners, and workers of sheet metals read advertisement of Parker's Power Presses.

Diamond carbon, formed into wedge or other shapes for pointing and edging tools or cutters for drilling and working stone, etc. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

The paper that meets the eye of manufacturers throughout the United States—The Boston Bulletin. \$400 a year. Adv'g 17c. a line.

Winans' boiler powder, 11 Wall st., N. Y., removes incrustations without injury or foaming 12 years in use. Beware of imitations.

Recent American and Foreign Patents.

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

BEEHIVE.—George A. Robinson, Mount Pulaski, Ill.—This invention relates to a new and useful improvement in beehives.

BLIND FASTENING.—Leonard D. Howard, St. Johnsbury, Vt.—This invention relates to a new and improved fastening for blinds and shutters of windows.

SELF-ACTING MULE.—C. J. Greene, Olneyville, R. I.—This invention relates to improvements in self-acting mules, such as are known as Mason's mules, the object of which is to provide more simple and reliable "backing off" and "winding on" motions.

HAIR-CURLING APPARATUS.—Mrs. Marcia Adkins, Oswego, N. Y.—This invention relates to improvements in hair-curling implements. It consists in the application to a hollow heating and curling mandrel of a combing, pressing, and spirally-laying apparatus, whereby the operation may be rapidly and accurately accomplished.

GRINDING EDGE TOOLS.—Lorenzo Zimmerman, Waukesha, Mich.—This invention relates to a new and useful apparatus for holding edge tools in grinding them on a grindstone, and consists in an adjustable bar connected with the frame of the grindstone at its back end, with an adjustable lever attached thereto, with a jaw on the end of the lever for holding the tool to the bar and to the stone.

GAGE FOR SEWING MACHINES.—Mrs. Anna P. Rogers, Quincy, Ill.—This invention consists of an adjustable gage plate having a recess in its front edge, in which a presser pad having inclined serrated grooves on its lower face, is arranged and connected to the said gage plate by an adjustable spring which governs the pressure of the pad upon the cloth.

GUIDE ATTACHMENT FOR BORING INSTRUMENTS.—Arthur Amory, New York city.—This invention relates to improvements in apparatus for indicating the position of boring instruments, to assist the operator to guide them properly for boring horizontally, vertically, or angularly, as required. The invention consists in supporting a pair of spirit levels upon the shank of the boring instrument by a clamp which may be readily attached or detached, the levels being so adjusted as to indicate the position of the boring stock horizontally, vertically, or obliquely.

PLASTERING MACHINE.—Thomas McKinley, New York city.—This invention relates to a new and improved method of plastering, whereby the tedious and expensive operation of covering walls and ceilings of buildings with mortar is greatly facilitated, and it consists in moving over the floor of the room where the plastering is to be done, a machine resting on wheels, consisting of a box containing the mortar, with a piston to fit the box, which piston is forced upward by means of gearing actuated by the supporting wheels, the mortar being forced from the box by the piston in a thin sheet and pressed upon the lathing or wall as by a trowel.

REFRIGERATOR.—S. R. Scoggins, Baltimore, Md.—The object of this invention is to provide for public use a simple, cheap, and convenient refrigerator, which shall be properly ventilated, and shall be capable of keeping food, etc., nearly at the freezing point.