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INVALIDATION OF PATENTS BY PUBLIC USE.

In nearly all foreign countries, if an invention is brought into public use before the application for a patent is filed, the patent will be rendered invalid. In this country the same rule holds, except that no invalidation of the patent will take place unless the invention was in public use for more than two years prior to the application for a patent.

The law applicable to the case is section 24 of the act of July 8, 1870, now embodied in the Revised Statutes as section 4,886, which declares:

"Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, and not in public use or on sale for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law, and other due proceedings had, obtain a patent therefor."

An interesting case that came under this section of the law was that of Worley vs. the Loker Tobacco Company, lately decided by the United States Supreme Court. A patent was granted to Worley & McCabe, August 22, 1876, for a mode of finishing plug tobacco. The invention consisted in heating the plugs of tobacco up to 140°, while they were between metal plates in a press, subject to heavy pressure. The pressing between plates and the heating had been previously done, but separately.

It appeared from the testimony that Worley made the invention for his employer, McCabe, who was the owner of a tobacco factory in St. Louis; and that the invention was there in public use for more than two years before any application was made for the patent. The court said:

"It has been repeatedly held by this court that a single instance of public use of his invention by a patentee for more than two years before the date of his application for his patent will be fatal to the validity of the patent when issued. (McClurg vs. Kingsland, 1 How., 202; Consolidated Fruit Jar Company vs. Wright, 94 U. S. 92; and Egbert vs. Lippman, decided at the present term.) We think the testimony of the appellants themselves shows such a public use of the process covered by Worley's patent as to render it invalid. This evidence brings the case clearly within the terms of the decision of McClurg vs. Kingsland (1 How., ubi supra), where it was declared that if a person employed in the manufactory of another, while receiving wages, makes experiments at the expense and in the manufactory of the employer, has his wages increased in consequence of the useful results of the experiments, makes the article invented, and permits his employer to use it, no compensation for its use being paid or demanded, and then obtains a patent for it, the patent is invalid and void. The inventor cannot relieve himself of the consequences of the prior public use of his patented invention by assigning an interest in his invention or patent to the person by whom the invention was thus used."

The decree of the Circuit Court, which held the patent to be invalid, was therefore affirmed.

THE PROPAGATION OF CODFISH.

The successful propagation of codfish by the United States Fish Commission, at Gloucester and Wood's Holl, Mass., has been followed by a very promising attempt to make this city a center for the distribution of impregnated eggs for restocking our more southern waters.

This important enterprise is largely due to the intelligence of Mr. E. G. Blackford, of Fulton Market. Seeing that large numbers of live cod, many of them ripe for spawning, are brought to this market every season in the wells of fishing smacks, Mr. Blackford suggested to Professor Baird, United States Fish Commissioner, that an almost unlimited quantity of artificially impregnated eggs might be obtained here at small cost. The suggestion was acted upon about six weeks ago, and two of the experts of the commission who had conducted the cod-hatching operations at Gloucester and Wood's Holl were detailed to take charge of the work here. About the middle of February a number of fish taken off Fire Island were stripped, yielding, it was estimated, about 4,000,000 eggs, which were properly impregnated and sent to Washington for hatching there. Owing to faulty packing for transportation the eggs spoiled on the journey. A few days later another large lot of eggs was shipped in jars, kept cool by packing in ice, and arrived in fine condition; and since then several shipments of impregnated eggs have been made, all successful.

Though the operations were begun somewhat late in the season the results seem to show that an abundant supply of cod eggs can be readily obtained here. By beginning the work in the fall it is believed that as many as 100,000,000 impregnated eggs can be secured in a season, with little trouble and at small cost.

The officers of the Fishmongers' Association have placed their rooms at the disposition of the Fish Commission for their work, and the captains of the fishing smacks have been extremely liberal in allowing their fish to be examined by the experts, and in furnishing without charge the fish found suitable for stripping.

The range of the cod along the coast is from the polar regions on the north to Cape Hatteras on the south. It is

found all the year round on the rocky spots, also frequently on sand and clay, but seldom, if ever, on muddy bottoms. Codfish are gregarious in their habits, going in schools of greater or less size, and are governed in their movements by the presence or absence of food, the spawning instinct, and the temperature of the water. In schooling both sexes are always found together. They sometimes make long journeys from one bank to another. They live at a depth varying from a few feet to over a hundred fathoms. The cod seems to have but few enemies, its principal foe being the dogfish. Evidence shows that the cod spawn every year. During the first of the season examination discovered no mature fish; again, later in the season, no spent fish were seen with any eggs remaining. The first ripe females are found in September at Gloucester, and later along the Long Island coasts. The cod deposits its eggs gradually during a long period. When the female becomes ripe she remains near the bottom, while the male often swims higher up. When the sea is smooth the eggs float near the surface of the water; then the chances of impregnation are more favorable. The following numbers of eggs have been known to have been taken from various sized fish: From one weighing 70 to 75 pounds, 9,100,000 eggs; from a 51-pound fish, 8,989,094; from a 30-pound fish, 3,715,687; from a 27-pound fish, 4,095,000; from one of 22 3/4 pounds, 3,229,388; and from a 21-pound fish, 2,732,237.

Mr. Blackford, whose labors in promoting fish culture are so well known, has rented a large room in the new Fulton Market building, and will fit it up and furnish it for the gratuitous use of students of fish culture. There will not only be room for such work as the United States Fish Commission may wish to carry on, but all those interested in zoological and biological research will be welcome. For active research in the marine fauna, New York, with its adjacent waters, presents many advantages, and with the use of such a room, together with the specimens which Mr. Blackford will gladly furnish, the cause of science cannot fail to be notably benefited.

In this connection it is proper to add that the annual trout exhibition will begin in Fulton Market April 1, and the annual meeting of the American Fish Cultural Association will follow on the 3d and 4th. Papers are promised by Mr. G. Browne Goode, of the Smithsonian Institution, Washington, D. C.; Professor Bean, Professor Ryder, of Philadelphia; Professor Atwater, and Messrs. F. Mather, Barnett Phillips, and E. G. Blackford.

THE SMOKE NUISANCE.—PROBLEMS FOR INVENTORS.

An exhibition of appliances for the abatement of smoke has been running for some weeks at South Kensington, England, and its success has been so great that its promoters are talking of holding in London a thoroughly international exhibition of the same character.

Meantime the Common Council of the City of Cincinnati, O., have taken hold of the problem in a vigorous way by passing an ordinance making it an offense punishable by fines to maintain a furnace which needlessly pollutes the air with smoke. The ordinance provides that all furnaces used for purposes of trade or manufacture within the city limits shall be so constructed as to effectually, or in the best possible manner, consume or burn their own smoke. No specific device or mode of furnace construction is demanded; but merely that the best obtainable construction of furnace shall be used and so carefully attended to that there shall be no avoidable discharge of smoke into the air. An inspector of smoke is appointed to see that the provisions of the ordinance are properly executed.

We are informed that a visiting committee from Cincinnati have been to England, where the smoke nuisance has longest been experienced, to study the devices on exhibition at South Kensington, and on record in the British Patent Office, but have returned without finding any adequate remedy for the evil. The means that have been devised for mitigating the smoke nuisance are numerous and ingenious; but there appeared to be nothing entirely satisfactory.

It is unreasonable to suppose that the problem is incapable of solution. The products of the perfect combustion of the smokiest coal are solid ashes, which remain in the crucible or furnace, and colorless gases, which make no visible addition to the atmosphere. The presence of smoke is always proof of imperfect and wasteful burning.

It is the business of our inventors to accomplish, under the varying and often unfavorable conditions of metallurgical and manufacturing processes, as perfect a combustion of the fuel used as is possible in the laboratory; either primarily in the furnace or by the subsequent reburning and washing of the sooty and volatile products which so largely pollute the air of our Western cities and manufacturing towns.

The demand for such inventions is wide and urgent. The action of the City Council of Cincinnati is likely to be generally imitated, certainly if it has the effect of materially abating the nuisance complained of there; and the scope for successful effort in invention in this field is as wide as the demand for an abatement of the smoke nuisance and the almost infinite variety of industrial operations employing soft coal as fuel.

Original Research in Australia.

The Royal Society of New South Wales has undertaken to encourage original research by offering eight prizes of £25 (\$125) each for the best communication containing the results of original study or observation on as many specified subjects. Four of these—"On the Aborigines of New South