Correspondence.

Photographic Decoration of Glass and Porcelain.

To the Editor of the SCIENTIFIC AMERICAN:

I have been much interested in your article taken from the Technical World, re "The Photographic Decoration of Glass and Porcelain," which appears in your issue of August 10, page 90. In the latter part of the article, however, I find that the author has split upon a rock that often falls in the way of novices in photo-ceramics. I need hardly say anything concerning the formula given, as it is so palpably unworkable that we can only suppose it is a printer's error, the amount of solids mentioned being quite insoluble in the quantity of water given. But the chief fallacy to which I beg to call the attention of your readers is one that is bound to fall to the lot of any one attempting to produce a photo-ceramic enamel by the method suggested. The author says, after calling attention to the necessity of coating the powdered image with collodion and then washing out the gum and bichromate, "The film is then dried, and, assuming that the powder employed is of a vitrifiable nature, the tablet is placed in a muffle and heat applied until the fusing point is reached. A porcelain glaze is afterward applied."

Any one attempting to produce a vitrified picture by these means need not be surprised to see the entire film form one or two huge bubbles and then explode. This will be due to the expansion of air present among the particles of powder resting upon the surface of the glaze beneath the film of collodion. The expansion naturally causes the collodion film to swell until it can swell no more, and the fire does the rest. In the production of photo-ceramics by the dusting on process there is one golden rule that must always be observed, and that is to strip the collodion film bearing the powder image and reverse it on to the article to which it is to be fired. In this way we secure the contact of the collodion film upon the final support, and the presence of air is eliminated.

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Small Inventions That Have Brought Fortunes.

No better examples of the importance of small things can be found than among the records at the United States Patent Office, in Washington. There are to be seen certain small objects which, by a lucky turn of affairs or, perhaps, by the ingenuity of the inventors, have become known throughout the United States and even throughout the world, and have been the means of filling the pockets of both the inventors and their representatives. In fact, it would seem as if inventors of small objects have been far better paid than skilled mechanics and engineers who have spent months and years in perfecting elaborate mechanisms. Certainly, in proportion to the amount of work done, the lot of the inventor of small objects is more to be desired than that of the man who spends the best part of his life over an elaborate machine, the merits of which are tardily recognized, not, perhaps, until the inventor, through worry and sickness, is in no condition to enjoy the fruits of his toil. It would seem also as if the inventors of small objects which have paid have not, as a rule, been inventors by profession. They have been for the most part persons who by sheer luck have stumbled upon an idea which somebody else has recognized as a good one. Without the suggestion of this "somebody else," who is usually the one who profits, the great idea, though born, would rarely grow to maturity.

A story current at the Patent Office is told of an old farmer up in Maine. The children of the old fellow, like many other children before and since, had a way of kicking the toes out of their shoes. The farmer was of an ingenious turn of mind, and he cut out a couple of copper strips for each pair of shoes, which were fastened over the toes and between the sole and the upper. The plan proved so successful that the farmer found that, where he had been buying three pairs of shoes, one pair would suffice. There happened along about this time a man from the city with an eye to business. He prevailed on the old man to have the idea patented. This was done, and between $50,000 and $100,000 was made out of it. How much of this the old man got is not known, but it is presumed that the promoter got the larger part. The record at the Patent Office shows only the drawing of the invention as patented on January 5, 1858, by George A. Mitchell, of Turner, Maine.

Another similar invention which made a great deal of money was the metal button fastener for shoes, invented and introduced by Heaton, of Providence, R. I. At the time it was considered a fine invention, for the old sewed button was continually coming off. It has gradually grown in popularity since its introduction in 1869, until now very few shoes with buttons are manufactured without the Heaton appliance.

By a comparatively simple arrangement the shipping tags in use all over the country to-day were made a possibility. The chief trouble with a paper tag was the almost unavoidable tearing out of the tying hole before the package arrived at its destination. A cardboard reinforcement, round in shape, on each side of the tying hole was all that was necessary to make the shipping tag a success. This was the invention of a Mr. Dennison, of Philadelphia, who has made a fortune out of a lucky five minutes of thought.

The chief examiner of the division of toys cites many instances where fortunes have been made on puzzles and similar objects. The pigs in clover puzzle had a curious history. The inventor, Crandall, put it on the market before the patent had been granted, or, in fact, even applied for. Other people, recognizing the value of the invention from a financial point of view, formed companies and began manufacturing the puzzles in even larger quantities than Crandall's company could turn them out. Crandall, of course, contested for his rights and prayed for an injunction. The claim was put into interference, which is a long process and one which tries both the patience of the department and that of the attorneys. The unfortunate part of it for Crandall was that the craze for the puzzle was over before the interference was settled. This is the same Crandall who invented the famous children's building blocks, with dovetailed edges, which had such a run and are popular even to-day.

The return ball, a wooden ball fastened to a thin strip of rubber, with a wooden ring at the other end, which was patented somewhere in the sixties, had a rush of popularity which netted its inventor $60,000, and it is sold widely to-day. The patent has now expired. The flying top, a round tin affair with wings, wound with a string and shot up in the air, made a fortune for its inventor. Several years ago a puzzle appeared which attracted considerable attention. It consisted of two double painter's hooks, which, when fastened together in a certain way, could not be taken apart, except by one who had seen it done. It is said that this invention came about by the merest chance. A painter was standing on his ladder scaffold across the front of a house. He had occasion to use a pair of the hooks, and, picking them up hurriedly, entangled them in such a manner that it was several hours before he could get them apart. He forthwith had drawings made and filed an application for a patent, which was granted. No figures are known at the Patent Office, but it is supposed that he made a large sum of money, for the puzzle was sold for twenty-five cents in all parts of the East, and it cost much less than a cent to manufacture.

A discovery which has been the means of bringing forth a number of inventions, both great and small, was that of Goodyear, the rubber vulcanizer. It was not until the Goodyear discovery of the vulcanization of rubber, in 1844, that rubber could be used, except in a very primitive fashion. Then it was found that, by the use of sulphur at a certain temperature, rubber could be moulded, shaped and worked into any form. Immediately after this discovery, the application clerk at the Patent Office having charge of such matters was besieged by hundreds and hundreds of applications for inventions with the Goodyear discovery as a basis. They related chiefly to matters of form in which it was desired to work rubber. After that time the rubber blanket, the rubber overshoe, the rubber band followed one after the other in rapid succession, and since that time there has not been a month that some patents have not been granted for different forms of rubber.

Now applications are coming in at the rate of four or five a month, involving many applications of the pneumatic tubing or cushioning principle. There are now pneumatic blankets, pneumatic pillows of all descriptions, pneumatic soled shoes for running and jumping and pneumatic car fender guards.

A recent invention which has come into prominence within the last two or three years is the tin cap on the top of beer bottles. This appliance is steadily taking the place of the rubber cork with the iron thumb lever. It is found that the sulphur in the rubber cork is acted upon by the beer, with the result of causing the rubber to deteriorate and spoil the beer. An offer from some whisky makers is attracting the attention of inventors. It is a reward of from $25,000 to $50,000 for an appliance on bottles which will prevent their being refilled. As it is now, all the great whisky and beer manufacturers of the country, and, indeed, of the world, are constantly getting letters from people who complain that they have received inferior qualities of liquids under well-known labels. Of course, it is impossible without some such appliance for manufacturers to guarantee the contents of bottles. All appliances so far with this end in view have been unsatisfactory. The chief difficulty seems to be to make the invention practical and cheap enough for commercial use. The problem has been solved by a number of inventors, but at too great an expense, for it has seemed up to the present impossible to get the cost below $2 a bottle. Completed, the appliance must not cost more than two or three cents a bottle.

Several years ago a patent was granted for an addition to tin cans which made the opening of them a very easy matter, and did away with the old fashioned iron can opener. The can had a small rim just below the top, bent by machinery at an angle just below the breaking point. By a blow on the top of the can around the rim the top would be broken off with a smooth edge. This did not cost the inventor one cent a thousand above the regular price of the cans. Armour, the Chicago meat man, as soon as he heard of the invention, ordered 10,000,000 cans to pack meat in, to fill an order for the German army. The inventor of this can made a fortune in the first six months. His cans are now used all over the United States for oysters and fruits.

The ordinary wood screw, patented August 20, 1846, by T. J. Sloan, is recorded among the simplest inventions that have made the most money. Then screws were cut by machinery, some of which is still used by the American Screw Company, of Providence, R. I.

The man who invented the brass spring fingers one sees on lamps for holding the chimney in place got for a long period a royalty of $50,000 a year. William A. Thrall, a former official of the Chicago and Northwestern Railway, patented, June 1, 1886, a thousand mile ticket which possessed so many advantages that it has been adopted by many Western roads. Several years ago Mr. Thrall resigned his place and is now living on a royalty of $20,000 a year. Within the last two weeks a patent has been granted on a new whistle used principally by bicyclers, and made on the principle of the siren or fog whistle. It is manufactured by a firm in the East, and they have only been able to supply the Eastern trade. The inventor has received for some time past $5,000 a month. Among musical instruments for general use, the autoharp has perhaps made the most money. The first one was patented in 1882. Now they are sold very reasonably, and manufacturers report immense sales every month. The organette, with perforated paper sheets, is another of the money-making musical instruments.—Washington Correspondent to the N. Y. Sun.

The Inventor of the Telephone.

Alexander Graham Bell was born at Edinburgh, Scotland, on March 3, 1847. His father and grandfather were both teachers of languages, and his father, Alexander Melville Bell, long enjoyed a reputation in the field of philology and linguistics, being the deviser of an ingenious system of "visible speech." He intended that his son should follow his profession, and therefore early gave him instruction in the anatomy of the vocal organs, their various functions, and the different subjects belonging generally to the science of vocal physiology.

When quite a child, Bell was told by his father of an automaton speaking machine which he had seen. The boy was so interested that he determined to attempt the construction of such an apparatus himself, and he then and there invented a speaking machine, built it, and made it articulate one or two simple words. In 1865 the family removed from Scotland to London, and about 1866, at Bath, in England, Bell conceived the idea of following up Helmholtz's synthetical experiments in the reproduction of sound, by attempting to transmit speech electrically.

Between the years of 1867 and 1870 he made numerous electrical inventions based on the Helmholtz vowel apparatus, and, before he left England, had resolved to pursue one of these inventions, that of harmonic or multiple telegraphy, to a practical outcome. The idea of actual speech transmission was running in his mind all this time, like an undercurrent of thought that he could hardly formulate in definite expression, but it gradually took clearer shape, and Professor Bell has stated on the witness stand that to friends in England before 1870 he avowed his belief that we should "one day speak by telegraph." In August, 1870, the Bell family emigrated from England to Brantford, Canada, and in April, 1871, Bell went from there to Boston, on the invitation of the Boston school board, to carry on a series of experiments with his father's system of "visible speech," or physiological symbols for the deaf. He remained permanently in the neighborhood of Boston from October 1, 1872, until he removed to Washington in 1881. From the very moment of his arrival in Canada, in 1870, up to the beginning of 1874, his mind was full of the scheme for the multiple transmission of telegraphic messages by means of musical tones, and he had other telegraphic inventions also in hand; but the old idea of speech transmission was persistent in claiming his attention, and gradually his thoughts and energies were narrowed down to this one field of investigation. He has himself narrated more than once the manner in which he proceeded, stage by stage, from his experiments with phonautographic apparatus, human ear drums and apparatus for obtaining undulatory currents, up to the period when he and his assistant, Mr. T. A. Watson, were able to talk to each other telephonically over a short line in the Boston University, and when, by rapid strides, the apparatus was brought to a fair degree of efficiency.—Electrician (U. S.)