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To Advertisers

The circulation of the Scientific American is from 25,000 to 30,000 copies per week larger than any other journal of the same class in the Indeed, there are but few papers whose weekly circulation equals that of the Scientific American, which establishes the fact now generally well known, that this journal is one of the very best advertising mediums

THE MANUFACTURE OF ILLUMINATING GAS.

There have been very few changes in the manufacture of illuminating gas since the time that Westminster bridge and Pall Mall were lighted by it about sixty years ago, or since the organization of the New York Gas Light Company, within the memory of many men now living in our city. The original drawings of retorts, scrubbers, and purifiers, as given in the old work of Accum and Aiken, could be made to serve as guides to the constructing engineers of the present day. But the real progress has been in the grand discoveries of the til the proposed change is certain to be an improvement, beuses to which the incidental products of the distillation of fore asking to have it tried. coal are capable. Our chemists appear to have overlooked the direct product, the illuminating gas itself, and to have devoted all of their energies to a study of the properties and uses of coal tar.

This state of things is now fast changing, and, recently, important progress has been made in the manufacture of illuminating gas, so that it is probable that the crude and unscientific method of distilling coal handed down to us by those who first undertook the manufacture, will be entirely dispensed with, and bituminous coal will be distilled for benzole, anthracene, paraffine, and oil, but not for gas.

Nearly one half of ordinary illuminating gas is composed of hydrogen, which, as is well known, burns without any illuminating power whatever. It is also known, that perfectly pure hydrogen can be prepared by passing illuminating gas over lime heated to cherry redness, the dry residue being carbonate of lime. From recent researches, it would appear that a somewhat similar decomposition of the hydrocarbon generated by the distillation of coal takes place in the retorts, carbonic acid, carbonic oxide, and pure carbon, in the form of gas carbon, and coke resulting.

What the gas company wants is, not hydrogen, but a suitable compound of that gas with carbon; but, in spite of all the precautions of the engineers, half of the product of the manufacture is hydrogen. Since the discovery of this fact, attention has been directed to cheaper methods for the preparethem, has been rendered possible and successful, by the use of States, or of any state or territory thereof, and any person, ration of hydrogen, and the subsequent carbonization of that a flux, the nature of which is not given in the address of Mr. firm, or corporation resident of or located in any foreign gas in an economical way, thus securing a gas entirely com- Lamport—a very important omission indeed, as he seems to country which by treaty or convention affords similar privilposed of hydrocarbons of great illuminating power. This carbonization can be accomplished in various ways, and we may recur to some of them subsequently.

The method for the manufacture of pure hydrogen that appears to be the most practical, at the present time, is the one proposed by M. Tessie du Motay, and consists in heating a mixture of damp coals and hydrates of the alkalies. A mixture of hydrogen and carbonic acid is thus generated, which can be freed from the latter gas by being passed over other alkalies, which, being thus converted into bicarbonates, can acid now extensively required in the arts. The alkalies origihydration of the alkalies, and from the moist coal, and the thickness of zinc plate desired to be cast on the side of the patent, and the stoppage of their works. carbon serves as a reducing agent, to give us a pure gas. It ship. Preparatory to the application of this mold, the scale is is said that hydrogen is more economically made in this way to be removed by the use of a wooden mold, coated with some to invent their own designs, and thereby artistic invention on than in any other. The cost of carbonizing it by passing it substance that will resist the action of sulphuric acid. Be. our own soil will perhaps be encouraged. through benzole, or by synthetical methods, is trifling, and, tween this mold and the side of the vessel the acid is to be We have in preparation, to be issued in a few days, a new

in theory, at least, we here have a simple and cheap method introduced and allowed to remain long enough to remove the for the manufacture of illuminating gas, without the necessi ty of vast retort houses, exhausters, purifiers, condensers, and incidental products of the ancient distillation process. In connection with this method of making hydrogen, and converting it into hydrocarbon, we have the proposition to add flux. The melted zinc is then to be poured into this mold and oxygen at the point of combustion, but this proposition brings allowed to run through urtil such time as the iron is heated up other questions that it is not necessary for us to discuss in to the proper temperature for adhesion, when the flow will be

has been naturally turned to it, and to its products, as a probable cheap source for illuminating gas. Various patents have been taken out, and a number of hotels and small towns in the country are using gas manufactured under one or another of them.

goes over is a highly explosive and volatile compound called naphtha. It would be entirely a waste product, were it not for the fatal and highly reprehensible habit, on the part of some dealers to adulterate and increase the volume of kerosene by its use. In naphtha we have an admirable material for the cheap production of illuminating gas. To prevent danger from fire, the naphtha is converted into a vapor by steam, and it is afterwards superheated and then passed into retorts, where it becomes a fixed gas. It is then conducted into suitable gas holders. As it is free from sulphur, carbonic acid, carbonic oxide, and other impurities, the necessity for purifiers, and other expensive machinery is dispensed with. The gas prepared in this way is free from the volatile and condensable products of the distillation of coal, and hence, is not affected by cold weather, and is not liable to clog the pipes. The manufacture can be conducted very nearly automatically, so that very little labor will be found to be necessary. The heat required is small, and the yield of gas very large for each retort. When tar, dead oil, and other hydrocarbon liquids are used, greater heat and more complicated machinery are necessary; and such material is itself often the product of the distillation of coal, and therefore does not enable us to dispense with the old methods of making gas.

The progress of science, during the last ten years, also points to the probability of our making illuminating gas synmore than allude to it as within the range of possibility. What we particularly need, is an invention that will enable us to dispense with the present crude way of making gas, which creates a nuisance in the city and affords an article of very inferior illuminating power.

It would not appear to be a difficult matter to accomplish this result, and, as we have pointed out in our article, there are a number of methods that have such elements of success in them, that they ought to be thoroughly tested before being abandoned as worthless. But whatever is done, we hope that the streets of our city are not to be dug up for the laving down of pipes, and to give certain people jobs, before the proposed improvement in gas has been fully tested. We have witnessed enough pipe-laying in our day, and have suffered sufficiently from expenditures of gas to be willing to wait un-

COATING VESSELS WITH ZINC.

The protection of iron ships by the application of zinc, or, in other words, the galvanizing of their surfaces, has attracted considerable attention. The process of "galvanizing," as it is called, that is, the coating of iron with zinc, is ordinarily performed by dipping the piece to be galvanized into melted cast, or otherwise placed on or worked into any article of zinc, the piece being previously cleansed from oxide and dirt, manufacture; or any new, useful, and original shape or conand the surface of the melted zinc being covered with sal

Taking this brief description of the process as a starting point, it seems a bold proposition to galvanize a large iron vessel. Yet this is just what is proposed by Mr. Charles Lam. port, who, in an address before the Institution of Naval Architects, at London, at a recent session, gave the details of his plan.

Before we notice these details, however, it will be necessary to notice the difficulties which render them needful.

The first of these is the removal of the peculiar skin, or scale, which is met with on all iron plates, as they come from the rolls, and which prevents the adhesion of the zinc. It is tained in the shape of a patent upon the trade-mark that is also necessary that the plates should be brought to a temperature nearly equal to that of the melted zinc.

It seems, that of late, on the European continent, a method of pouring the zinc over the plates, instead of immersing rely upon its use in the application of his method, which is as follows:

much of a furnace attached as will maintain the zinc in a United States, may obtain protection for such lawful tradefluid state. This bath being in contact with the side of the mark, by complying with the following requirements, to ship, the plate against which it is placed will become of a wit:' temperature, he thinks, sufficient to allow of adhesion, if the scale be taken off.

To remove the scale, as well as to perform the other parts

scale. The flux is to be applied in a similar manner, after which the melting furnace and steel mold, above described, are to be applied, provision being made for its exact accordance with the space previously acted upon by the acid and stopped and the plate will become permanently attached to the Since the introduction of petroleum into commerce, attention metal. At least, that is the opinion of the inventor of the method. Whether he is right or not will appear from the practical experiments he intends to perform during the ensuing year.

Provision for buckling is to be made by allowing portions of the zinc to remain unattached to the iron, a matter recu-When petroleum is distilled, one of the first products that lated, of course by the non-removal of the scale, except of such parts as are desired to unite with the zinc.

> Of course it would be unwise to hazard any positive prediction as to the ultimate success or failure of this method, in anticipation of its practical trial. We cannot fail to see, however, numerous practical difficulties, which will heavily tax the genius of Mr. Lamport to overcome. We shall keep watch of any reports of experiments made in this direction, and, if important results are attained, will lay them before our readers in due time.

THE NEW PATENT LAWS---IMPORTANT CHANGES AF-FECTING AMERICAN AND FOREIGN MANUFACTUR. ERS...FREE TRADE IN PATENTS NOW FULLY ES-TABLISHED.

The advocates of the free trade system, if they did not succeed at the late session of Congress in realizing all their aims, certainly made a clean sweep so far as patents are

This country is now thrown freely open to all foreigners in respect to patents, and the peoples of all countries may come or send here and compete with American genius and industry on the most favorable terms.

The law which required foreigners to put and continue their inventions on sale in this country, within eighteen months after obtaining their patents, has been repealed, and thetically But such a realization is too distant for us to do foreigners, like our citizens, may choose their own time for working their patents.

Another provision of the new law permits a foreigner to patent his invention here at any time, ever after it has been introduced and patented abroad for years, provided it has not been used here for more than two years prior to application for an American patent.

The old law prohibited the grant of a patent for any for eign invention that had been brought into use here, even for a day, prior to application for a patent.

In the same way the new law also throws open to foreigners the right to take out patents for designs, and as this virtually includes all the new figures and pattern for every description of fibrous and textile goods, such as carpets, silks, laces, calicoes, trimmings, etc., the law becomes important to our home manufacturers.

The following is the provision of the new statute in relation to design patterns:

"Any person who, by his own industry, genius, efforts, and expense, has invented or produced any new and original design for a manufacture, bust, statue, alto-relievo, or bas-relief; any new and original design for the printing of woolen, silk, cotton, or other fabrics; any new and original impression, ornament, pattern, print, or picture, to be printed, painted, figuration of any article of manufacture, the same not having been known or used by others before his invention or production thereof, and patented or described in any printed publication, may, upon payment of the duty required by law, and other due proceedings had the same as in cases of inventions or discoveries, obtain a patent therefor."

The Government fee for a design patent is \$10 tor 31 years, \$15 for 7 years, and \$30 for 14 years, with privileges for extension.

Another novel provision of the new law consists in the registration of trade-marks. When a patent has been granted for the article or the pattern, a further security may be obplaced upon the article or goods. The following is the law for trade marks:

"Any person or firm domiciled in the United States, and any corporation created by the authority of the United eges to citizens of the United States, and who are entitled to the exclusive use of any lawful trade-mark, or who intend to Over the sides of the ship he will suspend a bath with so adopt and use any trade-mark for exclusive use within the

The Government fee for registration of a trade-mark is \$25. Duration 30 years, with privilege of renewal.

One effect of the above new laws will be to put an end to of the operation, he proposes to use what he styles molds one that extensive class of American industries which has grown be sold as such, or can be used as sources of pure carbonic of which will be made of a steel plate one fourth of an inch in up and flourished by the manufacture of articles and goods thickness, rolled cold, and having a very fine skin put upon copied from foreign sources. All who undertake such repronally employed can be regenerated, to a considerable extent, it, so as to prevent the adhesion of the zinc to it. Around the ductions without consent of the foreign originator, will be and used over again. The hydrogen comes from the water of edges of this plate will be found a thin edging of metal of the liable to be interfered with at any time, by the grant of a

Another effect of these laws will be to compel our citizens