Scientific Museum.

A New Substance Made From Cannel Coal.

By our cotemporaries, the London Patent Journal and the Mechanics' Magazine, we learn that Mr. James Young, of Manchester, England, has taken out a patent in England for a new discovery in the treatment of coal, which deserves great attention, and which we hope will attract the notice of our friends in Virginia and in the bituminous coal regions of our country. The improvement consists in a peculiar method of treating bituminous coal, and obtaining *parafine oil*. The best coal is the cannel, and clear bituminous, (parott). The principle of the discovery is to submit the coal to the lowest possible heat that will effect decomposition and produce the oil. The coal is broken into small egg sized pieces and placed in a common gas retort. This retort is connected with a worm tube passing into a cooler kept at 55° by means of cold water. The retort is gradually brought to a low red heat, which causes the crude oil containing the parafine to be formed, and to pass off volatilized into a condenser, from which it drops into a suitable receiving vessel. When the oil ceases to drop from the condenser, the operation of that part is terminated, and the coke may be withdrawn from the retort, and a new supply placed in it. A portion of permanent gas is made during the operation; it may pass away or be collected in an ometer. There are a number of impurities combined with the oil which is purified as follows:

The oil is submitted for sometime to the action of heat at 150°, and kept still for three or four hours to drive off some watery matters. It is then poured into an iron still, and distilled over at a low heat, the products passing into a condenser, from which it is removed to a lead vesel where it is subjected to the action of the oil of vitriol, 1 gallon of it, to five of the parafine. These are thoroughly stirred for half an hour, then poured off into another vessel, (leaving the sediment) and ten pounds of soda are added to neutralize the excess of acid. The mass is then left to stand for eight hours, and the clear is re-distilled. After re-distilling a large quantity of volatile fluid—a hydro carbon—isformed, which can only be separated by adding water and re-distilling and condensing the vapor, when the volatile fluid will be found floating on the top, when it may be poured off. It is a clear fluid, and burns finely in a lamp. The water may be driven off in the state of steam by boiling the parafine remaining behind. It is then drawn off into a leaden vessel the second time and acted upon as before described; only ½ of the acid however, is used. After this some lime mixed to a creamy consistence with water is added, and the whole stirred and left for eight hours, should it contain any sulphurous acids, more lime should be added, when it must stand a week, and the parafine oil then be poured off, leaving a sediment of an impure sulphate of lime. The parafine thus produced is laid upon cloth and the superfluous oil drains off leaving the crystalized parafine, when it is submitted to a pressure. This parafine is very valuable for lubricating purposes. Its whole purification can be accomplished by repeated baths of sulphurous acid and alkali as described. This is certainly a new process, and shows how our coal fields may be turned into oil &c. It is, however, too expensive to compete with our other oils at present prices.

Ice Mountain in Virginia.

Near Romoney, in Virginia, in the vicinity of North River, there is a mountain about 500 feet high, in which ice is to be found in all seasons of the year. It is surrounded with hills which rise about 300 feet higher; it is subject to the rays of the sun from 9 A. M. until evening.

The ice is imbedded in the rock, and in some of the crevices snow, friable and crystalline as when newly fallen, is often found even in the month of August. As might be expected, the waters flowing from the mountain are by seven degrees colder than those in the neighborhood.

The rocks are sandstone of a very porous nature and are very poor conductors of heat. One side of the mountain consists of a massive wall, many hundred feet in thickness, and heaped up against this, as an abutment, is a mass of rock containing several thousand cubic feet. As the mountain has a general direction from northeast to southwest, the talus heap containing the ice has a northwest exposure. The cavernous nature of this heap would admit the free entrance of atmospheric waters, which during winter would form ice in the interior of the mass. The ice thus situated would be protected from external heat by the surrounding rocks, as ice in a refrigerator is isolated and protected from the external temperature by the non-conducting sides of the refrigerator. The mountain is, in fact, a huge sandstone refrigerator, whose increased and usual effects, beyond those of the ordinary refrigerator, are due to the increased collection of poor conducting material which forms its sides.

For the Scientific American.

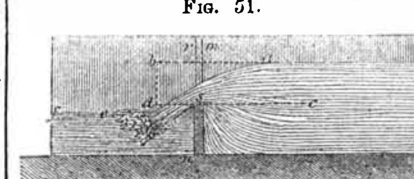
Hydraulics.

(Continued from page 288.)

The height of the fall is the perpendicular distance which the level of the surface of the water in the upper part of the fall, is above the level of the surface of the water in the tail-race or under part of the fall.

The quantity of water which runs over a fall in a minute may at any time be determined by the following method:—Search for a portion of the stream where its velocity is not great, and fix a thin board, *m n*, cut or notched out in the manner shown in figures 51 and 52, in a perpendicular position, and at right angles, across the stream, so that the whole of the water will flow through the notched part marked *r s* in these figures. After this is done, measure the perpendicular distance in inches between the horizontal edge at *s* of the notch, and the dotted line, *a b*, which latter

Fig. 51.



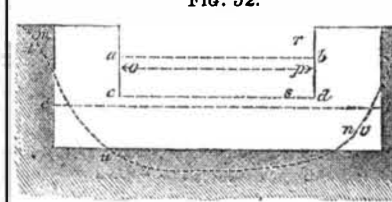
represents the level of the surface of the water above the board, and find a number the same as that of the inches, in column first of the following table; then, in the same line, but in the second column of the table, you will find a number which, if it is multiplied by, *o p*, the width of the notch in inches, will give the quantity of water in cubic feet per minute running along the stream. The perpendicular distance betwixt the edge of the notch at *s*, and the line, *a b*, is represented by *b d*, the dotted line, *c d*, in fig. 51 being on a level with the edge of the notch at *s*, and the line, *c d*, in fig. 52 shows this edge of the notch.

Depth of the upper edge of the waste board below the surface in inches.	Cubic feet of water discharged in a minute by every inch of the waste-board, according to Du Buat's formula.
1	0.403
2	1·140
3	2·095
4	3·225
5	4.507
6	5·925
7	7·466
8	9·122
9	10·884
10	12·748
11	14·707
12	16·758
13	18·895
14	21·117
15	23·419
16	25·800
17	28·258
18	30·786

Let *b d*, the depth, be 10 inches, and *o p*, the breadth of the notch, 47 inches, then opposite 10, in column first of the table, is 12·748 in the second column, and this latter number multiplied by 47 gives 599·156; therefore, 599·156 cubic feet per minute is the quantity of water running past the fall.

A weir is somewhat different from a notch. A weir is a wall built generally of solid masonry running at right angles to the direction of the stream from one side to the other, with a parallel plank fixed on edge along the top of the building, which is horizontal the whole way across. The plank is called the waste-board, and the water flows over it as it does

Fig. 52.



over the level edge of the notch at *s* in figs. 51 and 52. A notch is, as will be already understood, a rectangular opening reaching to the top, and in the centre of the length of a board which is fixed on edge at right angles across the stream, in such a manner that the whole of the water will flow through the opening. The above table was calculated for weirs, and not for notches. Now, a weir will in most cases discharge a greater quantity of water in a given time than a notch, the pressure of water being the same, and the width the same in both, as there is no contraction of the stream at the ends of the former. However, the second column of the table agrees remarkably with the experiments of Smeaton on notches, when the width *o p* is equal to twice the depth that the edge at *s* is below *a b*, and the third column of the table agrees with the same experiments, when *o p*, the width, is twelve times as great as *b d*, the depth: therefore the most accurate results will be obtained from the second column of the table when *b d* is one-half of *o p*.

To Make Copying or Transfer Paper.

A correspondent sends us a letter enclosing some black copying paper, used for "Manifold Writers," and wishes to be informed how *it* is made, also the various colored kinds for copying and transferring leaves, &c. We have never made any of the paper, but we have no doubt from an examination of the sampleeent us, it can be made very easily as follows:—Take and melt some clean fresh butter in a clean glazed ware vessel, dip the paper in it, take it out, let it drip for a few minutes, and then rub it well on both sides with black lead. To make it perfectly jet in the color, it is necessary to rub some fine lamp black over it after the black lead, and then hang up the paper on cords around the room to dry. It will never dry perfectly, but will do so, to answer quite well for the purpose intended. Red transfer paper can be made the same way, only use red lead for the coloring matter. Green and blue may be made the same way, by using any of the green paint powders for the one, and Prussian blue for the other.

Good Summer Bread.

It is a very common custom, during warm weather, to dispense with yeast and *raise* domestic bread by the short process of saleratus. About two years ago, a little sulphuric acid and saleratus was stated to make superior bread to that produced by yeast. We believed, from the many representations which had been made to us, that this was really true, but a number of fair experiments have convinced us of its utter incorrectness. No good bread can be produced unless it goes (the whole of the dough) through the process of fermentation. Properly fermented bread has a sweetness of taste, which all the short process bread lacks. The act of fermentation generates what is termed grape sugar in the bread, whereas the acid and alkali, (sulphuric acid, or cream of tartar and saleratus), when they combine together, form a bitter salt by their combination. The carbonic acid that makes the bread light is generated, but the salt, without the sugar, is left.

Coal of Pennsylvania.

It is estimated that there will be 3,700,000 tons of anthracite coal sent to market this year, which along with the bituminious coal will show a valuation of $17,800,000. The product of Pennsylvania coal has been doubled about every seven years.

Petition for an Extension of Patent.

United States Patent Office, May 6th, 1851. —Administrator &c., of Edgar M. Titcomb, deceased, formerly of Andover, Mass., on the petition of Charles H. Titcomb, of Lowell, Mass., praying for the extension of a patent granted to said Edgar M. Titcomb, for an improvement in machine for spinning woolen roving, for seven years from the expiration of said patent, which takes place on the 29th day of July, 1851. It is ordered that the said petition be heard at the Patent Office on Monday the 21st day of July next, at 12 M., and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted. Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least 20 days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

Thos. Ewbank, Commissioner of Patents.

LITERARY NOTICES.

Hugh Miller's First Impressions of England. —This is a re-publication of an excellent work, by Gould & Lincoln, of Boston, a firm distinguished by the excellency of the bocks which they publish. The author of this book was once a workingman—a worker in a stone quarry, but is now the Editor of the "Witness," one of the most respectable religious papers in Scotland, and he is the author of some of the best works on Geology ever published. He states that in the pursuit of health he took a journey into England to see the working people and study their manners, morals, and qualities. His observations are distinguished for shrewdness, and comparative qualities of the highest order. Those who desire to obtain a good knowledge of many things not treated of in any other work in the world, about the difference in the religions, manners, and customs of the Scotch and English, should read this book. There are some very strange and striking points in it. It is no common-place book.

We have received from Messrs. Dewitt & Davenport the June numbers of Graham's and Sartain's Magazines. They are both finely embellished with steel and wood engravings executed in the highest style of the art, and embrace a great variety of choice literature from our most prominent authors. Terms of each $3 per annum. This number closes the Volume.

Book of the Telegraph.—This is the title of a very well written and useful little work, by Mr. D. Davis, of Boston, and sold by Dewitt & Davenport of this city; it gives a brief but very able history of the Electric Telegraph, and explains with diagrams the various kinds in use in this and other countries.