USEFUL INFORMATION

The *English Mechanic* gives a method of giving new oak wainscotting and other inside finish an antique look. Liquid ammonia of a strength of 880 is exposed to the air in a room or any other compartment which can be made air-tight together with the oak to be stained. The gas combines with the tannic acid of the wood and turns it a deep permanent brown; the darkness of the shade depends upon the amount of ammonia and the length of exposure.

ELECTRICITY ON COOLING IRON. Preliminary tests have shown that iron cooled while a strong current of electricity was passing through it was increased fully one-half in tensile strength and ductility.

TO PROTECT MACHINERY FROM RUST. Machinery in store for sale may be kept in good condition by applying to the finished parts the best sperm oil. A mineral oil is manufactured by a special process which, owing to a peculiar cohesiveness, is very efficient for rust prevention. Ordinary lubricating oils are not suited to this use. They do not have either the heat resisting, the cohesive or the adhesive qualities. Metal coatings of amber color are made from petroleum, which have a melting point of 105 to 125 F.; their consistency is between that of lard and tallow. A cheaper product from earth oils and of less body is obtainable: it is of a dark color and its use can be made efficient and easy, as workmen very readily see if all parts are thoroughly covered with it. For heavy machinery to be long exposed to the weather, or for ocean transportation, the "old-fashioned" mixture of white lead ground in linseed oil and tallow is unrivaled for the reason of its great body and because it is heavier than water. There are patent compounds in which gums of various kinds exist dissolved in solvents, of a very vaporous nature; these do not meet with general favor, as the volatile part renders them dangerous when used in the vicinity of a lamp or gas, and they are liable to give trouble by working into the bearings of machinery not possessing any lubricating properties.

TURPENTINE IN DRILLING.—An experimenter mentions his successful experience in drilling holes three-sixteenths of an inch in diameter through glass plates about one-eighth of an inch thick, by the use of an ordinary bow drill, with spirits of turpentine as lubricant. The holes were drilled from one side until the point of the drill just punctured the opposite side of the glass; then the glass was turned over and the holes finished by drilling from the opposite side.

A NEW PROCESS OF WELDING.—A new process of welding metals, which is the invention of M. Lafitte, is thus described: With a view to overcome the difficulties in spreading the borax or other fluxing materials over the heated surfaces in making welds, M. Lafitte has invented plates, usually consisting of very pliable wire gauze, on both sides of which the flux, being highly vitrified, is evenly spread. Paper may be also used as a support. In cases of small surfaces it is often sufficient to form a sheet of the flux and metal filings agglomerated together. The plates are simply placed between the surfaces in place of the powder being sprinkled on, the wire gauze being welded between the surfaces. A table of tests made was shown on the wall, the results being highly favorable to the system. Mr. Anderson attributed a great part of the success to the much lower temperature at which the welding could be accomplished. Examples of welding by this system were also shown, all of great interest. Perhaps the most remarkable was the case of a hammer head, in which a face of tool-steel had been welded on to an ordinary hammer head forging. This hammer had been in ordinary shop use for six months. To weld tool-steel to iron is certainly a remarkable achievement, and one that marks an era in the history of the smith's handicraft.

HOW OIL WEARS OUT. Oil seems to wear out by long-continuous use, and to lose, to some extent, its lubricating qualities. It has been suggested as a reason for this that the minute spherical globules of which the oil is conceived to be made up become flattened by the wear and pressure, and so do not slide and roll over each other as easily as before.

On the subject of dust explosions in planing and flour mills, Mr. F. Butler writes to the *Scientific American* as follows: Some experiments I made about eight years ago to test this point may be of interest. I placed shingles in a sash and door factory where a sandpaper machine was working. In a very short time they were coated with dust to the depth of an inch. This dust was so wet that when squeezed in the hand, water would run out. I then carried the shingle to my office, where a bright fire was burning, and used a small hand bellows to blow the dust off the shingle so as to come in direct contact with the flame, and the result was an undoubted explosion, of such a force as sufficed to blow the mica lights out of their places in the stove. The result of the few tests I made demonstrated this fact: that if a flame is brought into contact with finely disseminated dust, such as is found in flour mills, sash and door factories, and other works of like nature, an explosion will take place of such violence that no building could withstand it. The factory wherein my experiments were conducted immediately adopted blowers and exhaust fans for the entire removal of all the dust from the building, and this is the only safe way of dealing with this problem.

Some one has recommended the use of turpentine to prevent bugs from destroying bolting cloth. Take a small stick, dip it in the turpentine, and whenever you see a bug or worm on the inside, apply a drop of turpentine, which will kill the bug almost instantly. A little turpentine rubbed on every rib of the reel will destroy their eggs. Always allow the turpentine to dry before starting up. It has been recommended that when the mill is to shut down for a few hours, the bolts and conveyors should be run empty for some time, so as to be perfectly clean. The supposition is that the bugs are busy only when the mill is idle.

GREEY'S IMPROVED FLOUR FEEDER AND MIXER.

The little machine herewith illustrated, and which is manufactured by Messrs. Wm. & J. G. Greey, of this city, is designed to feed evenly and regularly any kind of stock, and can be regulated to feed from the smallest quantity desired up to five barrels per hour. It requires

GREEY'S IMPROVED FLOUR FEEDER AND MIXER.

no attention after being adjusted, and will feed perfectly and regularly any amount at which it is set. It requires a speed of only 25 to 35 revolutions per minute, using an 8 inch pulley. Millers who want a machine for evenly mixing up choke-ups, low grades, flour and other mill stock accumulations, will doubtless look into the merits of the one in question, full particulars of which will be cheerfully furnished by the manufacturers.

DON'T FOOL YOURSELF.

An engineer said to us recently, when taken to task for wasting fuel, that it made no difference to his employers whether he burned much or little, for he got no credit for it when he tried to save, he argued, therefore, that economy was useless trouble. So far as his employers are concerned, he may have been correct, for there are such steam users in existence, but in so far as the engineer himself was involved, he was making a mistake. A man who permits himself to fall into careless ways, simply because he thinks he is not appreciated, or that no one praises him for his work, cheats no one so much as himself. It is very difficult to get out of bad habits, when once formed, and the worst enemy a man can have is, often times, himself. Our constant exhortation in these pages is for engineers, and all other mechanics, for that matter, to bear in mind that they are not working for "the boss," but for themselves, and the only way in which they can get along in life is by being *faithful to themselves. Let a man once get into the* way of thinking that he is putting in so much time for so much money, that he must gauge his service by his pay, his sentence is pronounced, he will be a hewer of wood and drawer of water for others all his days; but if he can grasp the idea that he is his own master, so long as he commands a thorough knowledge of his trade, he will be in demand by the best firms. Faithful, earnest workers are all too few, and no man ever made a bigger mistake than to say no one cared what he was doing. Such persons are sometimes surprised to find their services suddenly dispensed with, when another comes along who seems to promise better things, but there is nothing surprising in it to those who know the laws of trade.

Let every man practice the highest economy he is capable of, for his own sake, if not for those whose money he receives. He will lose nothing, but, on the contrary, will gain in experience and value in other situations, if he seeks them.—*Milling Engineer.*

USING COAL TAR AS A FUEL.

Concerning the burning of coal tar as a fuel an English writer says: *The use of coal tar for fuel is no new* thing. For more than twenty years it has been used for the purpose of firing retort furnaces at the Gasburg gas works, Stuttgart, according to a method devised by Herr W. Boam, the manager. This gentleman succeeded in designing an injector for tar whereby a thoroughly regular spray was produced with very slight pressure, the tar being thrown on the flame in an arched stream, complete combustion resulting without the production of any smoke, soot, or deposit of any kind, and with only the smallest portion of the tar ever reaching the fire bars, on which a layer of coke is laid. Lately a number of English gas companies at West Hartlepool, Malton and Consett have begun to consume it in their retort furnaces instead of coke, with the assistance of steam; and it is found that with attention to the judicious supply of steam and tar no smoke is given out, and the deposit on the tubes is less than in the case of coke. Seeing that the calorific power of coke is placed by some authorities as high as 27,000 British heating units, it is clearly a valuable fuel when sufficiently liquid to permit its being supplied to the furnaces in regular quantities. At Lisle, in France, De Lisle's furnace-feeding apparatus, by which the coal tar is previously heated to give *the necessary fluidity, permits of thickest* tar being used as liquid fuel; and steam has been got up on a 50-horse power boiler to a pressure of 30 pounds in one hour and a half, with 308 pounds of this form of liquid fuel; while to do the same work with solid fuel it took 771 pounds of coal and twice the amount of time. Provided there is no undue inflation in the price of coal tar as compared with that of coal, we may be much nearer the reign of liquid and the abandonment of solid fuel than those interested in steam shipping imagine.

This is a subject of more than usual importance to coke manufacturers. It may not be practical at present for coke makers to save all of the by-products, but the tar can be saved without much expense for plant and can be made a valuable fuel by adopting some of the methods of burning that have been suggested. As showing the amount of this tar it may be stated that about 8,450,000 gross tons of coal are used in gas-making in the United Kingdom every year. Taking the average yield of tar per ton of coal as 12.5 gallons of the average specific gravity of 1.185, the yield of tar from these 8,450,000 tons of coal made into gas would be 105,625,000 gallons, or 528,780 tons. There are three methods given with the experiments in its use: 1. *Injection into the furnace by means of* compressed air, with atomizing apparatus. 2. Injection into the furnace by means of steam, with atomizing apparatus. 3. Feeding into the furnaces by simple gravitation alone or in combination with coke. In using tar it is found that the heat is so intense that only the most refractory of fire-bricks, such as the best Welsh silica bricks, can be found to withstand it. Furnaces lined with the best Stourbridge material would not last out 48 hours, whereas, in ordinary work with coke, they would last over eight months continuous firing. The injection of tar by compressed air for metallurgical uses is of the highest value, as the resulting temperature is immense.

PUBLICATIONS.

The latest addition to our exchange list is the *Progressive Age*, a large, handsome and ably conducted monthly, published in Philadelphia in the interests of gas and electric lighting.

We have received the prospectus of a new publication, called the *Universal Tinker and Amateur's Assistant*, the first number of which will be issued in July next by Messrs. Hodgson & Bertrand, the well-known publishers of mechanical literature, 297 Broadway, New York. The paper is designed to interest and instruct amateurs, and according to its prospectus "will not confine itself to construction work but will take up every subject that may be brought before it and that may be dealt with from an amateur's standpoint." The price of the paper has been fixed for the first year at $1.00, and its size at 16 pages.