A FEW WORDS TO THE BOYS.

BOYS, as you are employed in the mill and schooling your minds and hands in the art of milling, do not forget that there is more to learn than how to clean wheat, grind, bolt, oil and take care of machinery. There are many other things necessary in the education of an accomplished miller, and in which practice only makes perfect. You must be a good judge of wheat, knowing its value by appearance when pricing it, and judging very nearly as to the amount in pounds of the kind of wheat it will take to make a barrel of flour, and as to the amount of stuff not wheat which the article contains. You must know when wheat is or is not merchantable stock—whether it is in or out of milling condition. Some kinds of wheat yield flour largely, and with some it is exactly the reverse. Make a study of this that you may be able to know the kinds on sight. Some wheats make strong flour, others weak. Some wheats yield white flour under any circumstances; some dark or yellow flour under the best milling possible. You must know about this, that you may be enabled to *mix* so that the flour will run uniform in strength and color. Remember that successful milling is money-making milling, and there are many things that must accord to make success. Good flour may indicate nothing as to this success, for the high price it may bring may be more than overcome by the large amount of wheat consumed in its production. Big yield indicates nothing, as in obtaining the big yield the flour may be lowered in value to such an extent that the yield is of no avail in securing profit.

There are many millers in charge of prominent mills to-day who are unable to tell whether or not offal is properly cleaned. Make sure that you do not prove like one of these. Make flour a study, that you can tell something as to its quality at quick sight. Make offal a study, that you may understand its condition at a glance. School yourself in figuring milling problems, particularly those of yields and percentages, and the minute total cost of manufacturing. This will prove a great incentive to watching and understanding the conduct of the business, the advantages of proper stock over the improper, the advantages of the competent over the incompetent engineer, the advantages of the competent mill employing good machines over the poorly-equipped mill employing worthless machines, and those of the fuel saving engine over the wasteful engine. Understanding the control of men, executive ability, is another thing, and is more dependent on training than on natural tact. It is an absolute necessity in the make up of a good miller, for it is not always the man who does the most work, spends the greatest number of hours in the mill and travels the longest distance in looking after affairs, who is the best miller, and accomplishes the most. A head miller may understand his business and work hard in attending to it, and yet fall far short as a competent head-miller, because, instead of being able to direct his men and keep them busy, he may allow them to trifle away their time; and, if not understanding the selection of associates who understood their business, he may choose the incompetent. If not appreciating the value of the faithful man above the unfaithful, he may employ the wrong men and be compelled to make good the inefficiency of help by his own personal exertion.

Remember that properly directed economy in everything, great and small, is a desirable characteristic in the miller. Economy, study and practice makes perfect, and vigilance accomplishes wonders. Train yourself to watch such things as that, the packer does not waste nails, linings, sacks and sack-twine, that the oiler does not waste oil, that the sweeper does not destroy brooms by carelessness. See to it well, that there are no little leaks through the mill or in the conduct of the business that are overlooked because of their insignificance, for wastes, though amounting to but little singly, may aggregate enough to overcome entire profits, or create loss instead of gain when margins are close.

Boys who do not observe and consider closely, who do not get old business heads on their shoulders early in life, are liable to pursue wrong courses, and in following the "showy" example imitate the wrong men. If they see a miller careful and accurate in every detail of his business, they become impatient at what they consider his slowness. For instance, if a miller, engaged in so simple a job as taking up or tightening a belt, is careful in arriving at the exact proper tension before fastening, and in making the tie exercises great care to draw every loop of the whang uniformly tight, they look on him as a "poke," while they will look with admiration on the miller who would quickly decide on proper length by guess, and do the "stretch or bust plan." Yet the "poke" is the worthy example, for, while the belt fixed by the "rapid" workman might prove too loose to perform its work, or seek early destruction while consuming power, by under strain, that fixed by the "poke" is apt to work advantageously in every particular.—*Modern Miller.*

USEFUL INFORMATION

SMOKESTACK PAINT.—A mixture of cole-tar and plumbago, thinned with turpentine or benzine, makes the best paint for an iron smokestack.

PEAT PULP PAPER.—Paper pulp from peat is a new idea. The fibrous peat is dried on trays and then treated so as to separate the clean fibre from which the pulp is made.

One-half ounce of camphor dissolved in one pound of melted lard, the scum removed, and a little graphite mixed with it, is said to be excellent to keep tools from rusting.

TO REMOVE PAINT SPOTS FROM WOOD.—To take spots of paint off wood, lay a thick coating of lime and soda mixed together over it, letting it stay twenty-four hours, then wash off with warm water, and the spot will have disappeared.

TO FASTEN RUBBER TO IRON.—It is claimed that rubber may be fastened to iron by using a paint made by steeping powdered shellac in ten times its weight of concentrated ammonia. It should stand three or four weeks before using.

TO MAKE MALLEABLE BRASS.—Malleable brass is made by forming an alloy of thirty-three parts of copper and twenty-five of zinc. The copper is first melted in a crucible which is loosely covered, after which the zinc, which has been purified by sulphur, is added.

Following is a statement of experiments made to enable an operator to tell the degree of heat in a furnace by the color of the flame: Faint red, 960° F.; bright red, 1,300° F.; cherry red, 1,600° F.; dull orange, 2,000° F.; bright orange, 2,100° F.; white heat, 2,400° F.; brilliant white heat, 2,700° F.

Irregular power and light feed will cause buhrs to "jump." In cases where the mill is geared too high this difficulty increases. Often when buhrs are "jumping" on a light feed with unsteady power, the difficulty may be obviated by increasing the feed, which will make them run steady.

TO REPAIR BOILER FURNACES.—When you have to repair your boiler furnace, says the *Stationary Engineer*, and can't get any fire clay, take common earth mixed with water, in which you have dissolved a little rock, or other salt; use same as fire clay—the furnace will last fully as long.

WIRE BELTING.—A method of manufacturing wire belting consists in interweaving sections of coiled wire to form the length of a belt, interweaving the ends of the sections with independent longitudinal sections of coiled wire to form the edges of the belt, and finally rolling the belt to flatten the links.

BELTING CEMENT.—Belts that have been loosened by getting wet should be thoroughly dried and fastened together by inserting cement into the cracks with a knife, and hammering until dry. A good cement for this purpose is equal proportions of good glue and Prussian gelatine dissolved in the same manner as ordinary glue.

GREEN VARNISH FOR METALS.—For a green transparent varnish for metals, grind a small quantity of Chinese blue with double the quantity of finely-powdered chromate of potash (it requires the most elaborate grinding); add a sufficient quantity of copal varnish thinned with turpentine. The tone may be altered by adding more or less of one or the other of the ingredients.

Steel and Iron says that one of the neatest and best ways of testing the soundness of a boiler plate is to sling it up by the corners so that it will lie in a horizontal position, and scatter a small quantity of dry sand evenly over the surface. By tapping the sheet lightly underneath, the sand will be thrown off wherever the plate is solid, while in places where lamination or blister occurs the sand will remain fixed.

FIRE EXTINGUISHER.—The ingredients of many of the fire extinguishers now before the public are said to be eight pounds carbonate of soda, four pounds alum, three pounds borax, one pound carbonate of potash, and twenty-four pounds silicate of soda solution, these being of course mixed together; one and a half pounds of this mixture is added to each gallon of water when required for use, the timeliness of application constituting the important feature in the matter of efficiency.

TO REMOVE SHEPHERDS' MARKS.—As is well known, the removal of shepherds' marks from the wool occasions great trouble. They are frequently cut out with shears. This however, is difficult, costly, and tedious. A French firm received a patent some time ago for a process by which they remove these marks quickly by submerging the raw or worked wool for from 15 to 20 minutes in a bath heated to 105 Fahr., and containing a sufficient quantity of water glass to raise the solution to 20° B., and besides this 4 pounds of soap.

TO COMPUTE HORSE POWER.—In a single-cylinder, high-pressure stationary engine the horse-power, may be computed by this rule: Multiply the area of the cylinder in square inches by the mean effective steam pressure in pounds; again, multiply this product by twice the length of the stroke in feet, multiplied by the number of revolutions per minute, and divide this last product by 33,000, the quotient will be the horse-power imparted by the steam. From this deduct about 15 per cent; the remainder will be the actual horse-power of the engine.

To remove one troublesome complaint that frequently causes grate bars to warp, have suitable space or clearness at each end of the bar; and grate bar bearers will prove more serviceable if they are placed a short distance from end of the grate bar, leaving space so that whatever falls at the end may not lodge there. Some grate bar bearers are placed up to bridge bar at one end, and join the dead plate at the opposite end. As these places are most likely to accumulate ashes they speedily choke up, if openings are not provided for their escape.—*American Engineer.*

THE WEIGHT OF STEAM.—The weight of steam depends upon the pressure and dryness of the steam. Supposing the steam to be saturated, the weights per cubic foot are as follows: For a pressure of one pound per square inch above vacuum, .0030 pounds; two pounds absolute, .0058 pounds; four pounds absolute, .0112; eight pounds absolute, .0214; sixteen pounds absolute, or 1.3 pounds above atmosphere as registered upon the ordinary steam gauge, .0421; thirty-two pounds absolute, or 17.3 pounds by the gauge, .0789; sixty-four pounds absolute, or 49.3 pounds by the gauge, .1516; and at 128 pounds absolute, or 113.3 pounds above atmosphere, .2911 pounds weight. A cubic foot of water at 62° F. weighs 62.355 pounds.

TO KEEP THE ENGINE CLEAN.—Make a solution as follows: Dissolve a pound of concentrated lye in about two gallons of water and with a mop saturate the engine with the liquid—being careful that it does not get into the oil-holes of journals and bearings. After the lye has "eaten" all the grease and gum from surfaces, clean perfectly by scraping and brushing, and apply a thin coat of lead-paint. After this is thoroughly set, paint a deep black and varnish heavily—striping or decorating can be done according to taste. After this the greater part of the works can be easily and quickly cleaned with a dusting brush or cloth, and escaped oil can be mopped off thoroughly with but little trouble. A very small outlay of money and work thus invested will do away with much work to no purpose, in keeping the engine clean and neat in appearance.

AN ACID-PROOF CEMENT.—A cement for resisting sulphuric acid, even at boiling heat, may be made by melting caoutchouc at a gentle heat and adding with constant stirring from 6 to 8 per cent. of tallow. Then mix therewith enough dry-slaked lime to make the whole the consistency of soft paste; finally add about 20 per cent. of red lead, whereby the mass immediately sets hard and dry. A solution of caoutchouc in twice its weight of linseed oil, aided by heating, and the addition of an equal weight of pipe clay, yields a plastic mass which will resist most acids.

TO CLEAN BRASS.—An exchange gives the following method of cleaning brass: Make a mixture of one part common nitric acid and one part sulphuric acid in a stone jar; then place ready a pail of fresh water and a box of sawdust. Dip the articles to be cleaned in the acid, then rinse them in the water, and afterward rub them with sawdust. This immediately changes them to a brilliant color. If the brass be greasy it must first be dipped in a strong solution of caustic potash or soda. This cuts the grease so that the acid has power to act.

ARTIFICIAL WHITESTONES.—The *Guide Scientifique* gives the following method of making artificial whitestones: Gelatine of good quality is dissolved in its own weight of water, the operation being conducted in a dark room. To the solution 1½ per cent. of bichromate of potash is added, which has previously been dissolved in a little water. A quantity of very fine emery, equal to nine times the weight of the gelatine, is intimately mixed with the gelatine solution. Pulverized flint may be substituted for emery. The mass is molded into any desired shape and is then consolidated by heavy pressure. It is dried by exposure to strong sunlight for several hours.

PRESERVATION OF WOOD.—A simple method of treating wood with preservative solutions is employed in Norway for telegraph poles. After the poles are set in place a man goes from one to another with an auger, with which he bores a hole in each post, beginning at a point about 2 feet above the ground, and boring obliquely downward, at as small an angle as possible with the axis of the post, until the point of the auger reaches the center of the stick. The auger hole should be an inch in diameter, and, in telegraph poles of the ordinary size, will hold easily 4 to 5 ounces of sulphate of copper, which is put into it in the form of coarsely powdered crystals, and the opening then stopped with a plug, the end of which is left projecting as a handle, so that it can be pulled out and replaced. It is found that the crystals of copper sulphate dissappear slowly, so that every three or four months the charge must be renewed; while the wood, both above and below the auger hole, even to the very top of the pole, gradually assumes the greenish tint due to the presence of copper in the pores.

CLEATING HARDWOOD LUMBER.—Cleating is beneficial if done at the proper time, *i. e.*, when the plank comes from the saw and before it has been split by handling. After a split has opened a plank two or three feet, a cleat cannot be put on securely enough to prevent the split from extending the first time the plank is handled or "dumped" from a truck. The proper way is for the mill hands or foreman to select the plank, generally the ones coming from the centre of the log, that indicate by their appearance a tendency, by small checks or free straight grain, to be liable to split perhaps the whole length of the plank, and at once nail on a cleat of some tough, strong wood. Oak or elm is best. Care should be taken that the cleat does not extend beyond the edges of the plank or lap over the sides so as to be easily pulled off in handling, or take up extra room in stowing if shipped where freight is charged by the cubic foot instead of board measure. Plenty of nails should be used. For two inch plank, the cleats should be ¾ inch thick and 6d or 8d nails used. Nailing on strips of lath is only a waste of time and material. Ash splits more readily than any other plank, and the better the quality and the freer from defects, the easier it splits. Inspectors usually take this fact into consideration; and if the plank is otherwise perfect, will measure down in width one or two inches, and grade it as firsts when it would be classed as seconds if ordinary square edged plank. Most of the best ash, oak and hickory is used for carriage material, and consequently cut into small and short pieces, and the quality is more important than the width and lengths. In such kinds of lumber, knots are a much more serious defect than splits. Cleats will help much to prevent the latter if put on as suggested.