Miscellaneous Items.

MECHANICS AS WRITERS.—There is no department of productive business in which a larger proportion of actual brain work is employed than in the building and working of machinery, and there is no class of our producers who offer so little of their experimental knowledge and observant wisdom to the world in printed form. The agricultural papers teem with communications which frequently contain valuable hints, exact information, and suggestive facts. But the publications devoted to mechanical matters and the interests of workers have far less of these voluntary contributions. One of the reasons for this is, undoubtedly, that practical mechanics may be properly considered one of the easiest sciences, and statements that in other departments of industry would pass for mere personal opinion, become of great importance as elucidations of mechanical law or demonstration of facts, which are, too often, deemed by the experimenters as mere tests, lacking the authority of practical use. Yet, in many cases, these tests are more than experiments, and frequently carry with them their own demonstration. The mechanic deals with material substances and mechanical processes that are continually presenting new problems for solution, and are capable of being solved by more than one method. At least, this solution invites attempts in more than one direction. So the mechanic dislikes to provoke criticism and invite comparison, when he knows the field is so large and the cultivators so many. There may be another reason why the mechanic does not "rush into print" as some others. He is not given to talk. His work requires, largely, concentration of attention that leaves little time to talk. Indeed, the mechanic generally prefers to illustrate by sketch or work rather than to elucidate by words. In fact, this method is easier than talking. It is not easy to convey a proper idea of a machine and its operation by words alone. The choice of language and the avoidance of mere "shop talk," necessary to convey to the general reader mechanical ideas, demands a very thorough knowledge of the English language, and some acquaintance with cognate tongues. It is not meant that the writing mechanic must necessarily be a college graduate, or even to have borne off the honors in a high-school class; but choice of language in mechanical writing is a necessity—not a mere convenience. The writer on mechanical subjects ought to know that "rotary" and "revolving" are not synonyms, and that "force" is not necessarily "power"; these, and similar errors, being quite common. There may be other reasons why mechanics are not fond of writing for publication. But it is a fact that the number of really practical workers who are writers on their specialty are very small indeed. The number of practical mechanics who are regularly employed on mechanical papers in this country is so insignificant, when compared with the value of our mechanical interests, as to surprise one who takes the trouble to inquire. There can be no doubt that the welfare of working mechanics would be greatly enhanced by a greater willingness on their part to present the results of their own experience to their fellows, through the medium of the special papers devoted to their interests.—*Canadian Industrial World.*

THE PIEDBOEF BOILER.—This boiler, which has been brought out in Germany and has been exhibited recently at the Duesseldorf exhibition, consists essentially of two cylinders, one above the other, in both of which there is a steam space, instead of the upper one only. The lower cylinder is in this case an ordinary Cornish boiler, with internal furnace exactly as usual. At its back end it is freely connected, by a short pipe of large diameter, with an upper cylinder not quite so long as itself, through which pass, from end to end, a number of ordinary boiler tubes. Inside the Cornish boilers just in front of the vertical connecting pipe, is fixed a diaphragm plate, extending downward from the top of the shell about eight inches, and so coming within four inches of the furnace top. The upper space in front of this diaphragm plate is connected with the steam space of the top cylinder by a pipe having in it a plain single beat valve opening freely upward. As a matter of precaution this valve is connected with a float on the lower cylinder, which opens it as steam is formed and the water level lowered, but this is not an essential part of the system. By this arrangement, as can readily be seen, it is possible to have steam in both the lower and upper cylinders. As it is formed in the lower one it passes quietly off through the stand pipes into the upper steam space, there being always a certain unbalanced head of water in the back part of the boiler (where the two cylinders are connected), to insure the right motion of the steam. The gases are carried up from the bank of the Cornish boiler and to the front through the tubes of the upper cylinder and then back again to the space surrounding the shells, so that there is apparently no danger or the shells being externally burnt. This arrangement also makes the danger of accident from low water a very small one, as the furnace itself cannot be uncovered unless the water level actually falls about seven feet, the water entirely leaving the upper cylinder, which could hardly happen without notice. The boiler has a total heating surface of 1,570 square feet of which 1,100 square ft. is eternal surface and 33.3 square ft. of grate, the ratio of total surface to grate being therefore 47 to 1. It has been used for supplying steam for an engine under trail working at 100 effective horse power and was working nominally at six atmospheres.

RUST-PROOF IRON.—Mr. George Bower has invented, and his son has improved a process for iron with an indestructible surface of magnetic oxide, which is said not to be open to the Barff process.

The Bower process, which is not secret, consists in heating the articles to be coated in a closed chamber by means of carbonic oxide, heated air being made to enter the chamber for the double purpose of burning the gas and for combining with the iron. The excess of air, after burning the carbonic oxide, heated air being made to enter the chamber for the double purpose of burning the gas and for combining with the iron. The excess of air after burning the carbonic oxide gas, combines with the iron, forming first the magnetic oxide, and then the hydrated sesquioxide, or common iron rust. By shutting off the supply of air until only enough is admitted to burn the carbonic oxide, the rust is converted into the magnetic oxide. The process is repeated until the film is sufficiently thick for the purpose of protection. When complete the film has a beautiful French gray tint.

The London *Times* stares that the application of this invention has been undertaken on a large scale, the chamber where the oxidation is now carried being large enough to contain about a ton of miscellaneous articles. The value of the invention, and of the method of applying it, is no longer a matter of doubt, the severest tests having been made of the iron coated. The earliest experiments only produced a film that would peel from the metal; but by the new method a coating is made which is inseparable from the metal; but by the new method a coating is made which is inseparable from the metal. Inasmuch as the cost of oxidation is less than that of a cost of paiut, it has become evident that the next generation, at least may be happy with cheap and indestructible iron.

TO IMITATE MAHOGANY.—This could be best effected with burnt sienna and vandyke brown, ground in water and thinned with weak size, so as to flow very freely. Then take a damp cloth or rag and wipe off the way of the grain. The depth of the color will be given by the appearance after wiping. When the rag gets wet squeeze it out into the color, and so effect a great saving of it; when dry, size and varnish, or polish. In some cases the color must be left on, and softened with a badger, instead of wiping off. For oak; 7 lb. yellow ochre, 1 lb. English umber, and little Venetian red, as above. A more difficult process is as follows: Upon an orange ground rub in with Vandyke brown, burnt sienna, and rose pink (ground in water), thinned with beer to about the depth of color required. Soften it slightly all over with the badger's hair softener, then take a piece of Turkey sponge, and wipe some light streaks the way of the grain of the wood, and let them slightly fold over each other so as to have somewhat of an Honduras appearance, then soften up and down rather smartly at first, and gently after, to give somewhat of a finished appearance, and when to be left for Honduras stipple all over with the ends of the badger, and it is done. But if Spanish is intended, after wiping out with the sponge, and softening gently the way it is sponged, then very gently soften across, then take a chisel-edged camel-hair mottler, well-soaked and wiped clean on the dry sponge, and dot it with the corner down the edges of the sponge marks, and here and there; then holding the mottler between the thumb and fingers, roll it between two or three of the dotted parts, and soften immediately, and observe the effect, avoiding the objectionable parts next time, but keep the figure towards the centre of the panel and the sides plainer. Take care that it is all left soft. When dry take a mahogany hog's hair overgrainer, about 4 in. wide, and a little of the same color, thinned with water, and work up together in a saucer, and pat it at the side so as not to take too much color, then with a coarse hair comb comb the overgrainer out, and draw over the work, carefully following the sponging; then very slightly soften towards one side, so as to raise the grain very slightly, and when dry it is ready for varnishing.