

friends and to conquer enemies. Manners adorn the gentleman and smooth the way of the educated man through the world. Manners are never born in men; but they are bred by association and study. Like oil on the journals of an engine, they avoid friction and aid efficiency. There are many reasons why we should be polite, but the best reason is because it pays; it costs nothing. It is said of William Earl of Nassau that he won a subject from the King of Spain every time he put off his hat. So engaging were the manners of Charles Fox that Napoleon said of him on the occasion of his visit to Paris in 1805: "Mr. Fox will always hold the first place in an assembly of the Tuileries." "My gentleman," said Emerson, "will outpray saints in chapel, out-general veterans in the field and outshine all courtesy in the hall. He is good company for pirates and good with academicians; so that it is useless to fortify yourself against him; he has the private entrance to all minds, and I could as easily exclude myself as him."

Good speech is a rule of manners. It always avoids exaggeration. Moderation in language and tone is the trademark of good breeding, and good breeding is after all mainly a matter of self culture. Madame de Staël valued conversation above everything, and so engaging was she in that art that a prominent lady of France said of her: "If I were Queen I should command her to talk to me every day." The man of education mixes with the right kind of people and reads good books. Books lead us into pleasant paths of culture and happiness. Read that you may avoid worry; read that too much hard thinking may not dull the edge of intelligence and sap the roots of memory; read that you may know what has been done in the world; read that you may acquire that power which comes from knowledge; read that you may learn to value the example of great men's lives; that through them you may know that the grave is not the goal of life. Montaigne had a passion for books and never travelled without them; he said that reading roused his reason and employed his judgment rather than his memory.

But of greater importance than good speech and reading, of higher value to the engineer than manners, is ability to write good English. Engineers are not given to public speaking; they pride themselves in being workers; they compare themselves with General Grant who did things. It is very true that the engineering profession is one of practical work; but no one can hope to achieve prominence in this profession who cannot write good understandable English. An engineer may not talk, but he must make reports, he must write letters; he should draw specifications and plans. To do these things properly he must command and know how to use the tools of language. Lord Bacon tells us that "reading makes a full man, conversation a ready man and writing an exact man." Engineering is an exact science; accuracy is the one column on which the whole structure is reared. To write clearly and accurately can hardly be called an accomplishment; it is really a necessity. No college course is complete, whether it be a classical, scientific, medical or law course, without a thorough training in English. No graduate is worthy to be called an educated man who does not speak and write good English. It lifts a man above the common; it makes him bigger than his business or profession; it trims the ship of knowledge and puts oil on rough places; it makes the man.

Margaret Fuller said that the object of life is to grow, and James Freeman Clarke has written a lecture upon this subject, "Man's Duty to Grow." A post-graduate course in self-culture will tend to upward growth. Such a course is open to every one. The greatest opportunities for that education which unfolds the whole nature of man are those

which are opened when we close the college door behind us. Graduation only marks the beginning of education to one whose face looks forward and upward. Let us build high; "they build too low who build beneath the stars." Build so that life and strength and growth may vitalize the whole structure; build on lines that are straight; build so that every root and branch of the tree of knowledge lends support and does not add a twist to the whole; build that men may see in you not alone skill and wisdom, but honor, culture, manhood, example; study to improve self—

"For virtue only makes our bliss below,
For all our knowledge is ourselves to know."

DRILLING 1 1/16-INCH HOLES IN ONE-INCH PLATES IN FOUR SECONDS AT THE PANAMA CANAL.

For the final riveting of the enormous lock gates at the Panama Canal the McClintic-Marshall Construction Company, of Pittsburg, has installed sixteen special electrically operated machines for drilling and reaming rivet holes. Each of these machines weighs about six tons, and is capable of doing the work of five ordinary type reamers.

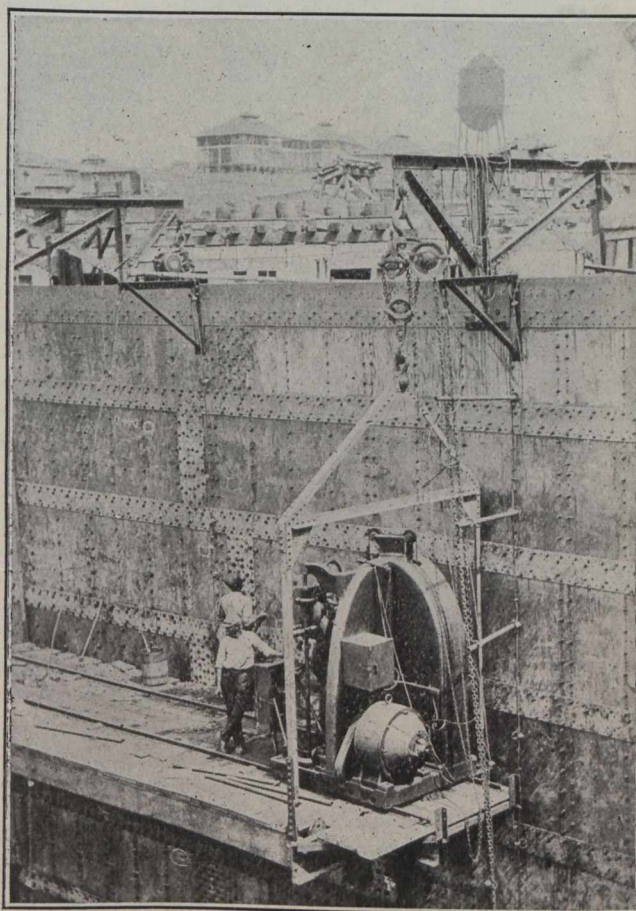


Fig. 1.

The machines are designed to run on a standard gauge track and are mounted on broad adjustable scaffolds, which are suspended from brackets by chains from the top of the gate, as shown in Fig. 1.

The inclined hand wheel shown in Fig. 2 operates through a train of gears and moves the machine along the track. The tool can readily be moved as roller bearings are used.