

THE DOMINION MECHANICAL & MILLING NEWS

DEVOTED ESPECIALLY TO THE INTERESTS OF OWNERS AND OPERATORS OF

Flour Mills, Saw Mills, Planing Mills and Iron-Working Establishments.

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MESSRS. GOLDIE & McCULLOCH'S MANUFACTORY AT GALT, ONT.

THIS well known firm occupies probably the first place of any of its kind in the Dominion, its business connections and its reputation extending throughout the entire Dominion, from the Maritime Provinces in the east to the far Pacific coast. The business was originally commenced, as far back as 1844, by the late Mr. James Crombie, who, beginning in a small way, and manufacturing stoves and such agricultural machines as were then in use, gradually extended his operations to embrace engines, boilers, and flouring and saw mill machinery, and in due course laid the foundation of the present extensive establishment. Mr. Crombie having acquired considerable means, sold out to the present owners in 1859, and under their energetic management, coupled with the excellence and reliable character of their goods and workmanship, the business continued steadily to increase, and has gone on extending till it occupies a position certainly second to none in this country. The manufacture of wool machinery was commenced about 1866, and in this department they are still the only general manufacturers in the Dominion, their list embracing almost all the machinery in use in woollen mills with the exception of spinning machinery and looms. In 1867 they added wood-working machinery, and this line has attained to very large dimensions, embracing an extensive assortment of such machines as are in use by builders, as well as improved shingle and barrel machinery.

In 1880 the manufacture of fire and burglar-proof safes was entered on and now constitutes one of the leading features of the firm's business.

An important branch of the firm's business has always been the erection and refitting of flouring mills, and their great experience in this work has enabled them amid all the transformations in flour milling of recent years to keep pace with the march of improvement. They own or control many valuable patents in flour mill machinery, which our limited space will not allow of specifying—the most recent addition being the Holt Dustless Purifier, which besides being, as its name indicates, entirely free from dust, and consequent waste and loss, is fireproof, and it is claimed can be driven by one tenth of the power of an ordinary purifier.

Among mechanical engineers a leading problem for many years has been to so improve the steam engine as to minimize the consumption of fuel, and the beautiful 200 h. p. Wheelock automatic cut-off engine which drives the machinery in the Goldie & McCulloch workshops, is one of the latest and most signal triumphs of engineering skill. Messrs. Goldie & McCulloch are the sole Canadian manufacturers of these engines. The chief features of the "Wheelock" are the great simplicity of the cut-off gear, the fewness of its moving parts, and the small power absorbed in working. During the past two years the engine department of the works has been taxed to its full capacity to supply the demand for these engines.

The ground covered by the entire establishment amounts to five acres. The buildings are all of solid masonry, two and a half and three stories high, and pre-

sent an imposing appearance. The frontage on the west side of West Main st. is about three hundred feet, and on the adjacent side streets, 350 and 450 feet respectively. On the east side is the pattern storehouse, 86 feet square, three stories high, and the large building in which the safes are finished. All the buildings on the west side have been erected or rebuilt within the past four years. The general offices of the firm are detached, the building being a handsome specimen of cut stone work. We need hardly say that the interior of this fine establishment is fitted up in the most complete style of modern mechanical art. In variety and excellence of the machinery, tools and general equip-



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ment, it is probably not surpassed by any works of a similar character on the continent.

LITTLE THINGS IN THE FOUNDRY.

AN absolutely necessary part of the equipment of a foundry is the cupola, says J. P. Pero in the *Practical Mechanic*, and a good one is a very valuable article. I do not mean by a good cupola, one that will take care of itself; do all the melting and furnish brains for the melter to bring about good results. Such a thing is of course impossible, although I have known of cases in which such a cupola would have been very highly prized. But by a good cupola, I mean one that is constructed upon sound scientific and practical principles; one in which may be realized the results of the study of the principles of combustion and the practical knowledge obtained by experience in the application of these principles. The mere fact of a cupola being constructed upon these principles, does not insure good results in melting unless it is properly managed; but all other things being equal such a one is decidedly superior to the one built hap-hazard, without the slightest conception of either the theory or practice of good melting.

In melting iron there are three results looked for: quality, speed and economy. Quality first, for poorly melted iron makes poor castings; speed and economy are after considerations, though very important ones.

Any cupola properly managed, will melt good iron; but when the requirements of speed and economy are taken into consideration, I think it is safe to say, that

there are more cupolas in operation that do not meet the requirements than there are that do. I do not mean by this, that the patent cupolas are not good ones, for I know several styles that are exceptionally good melters, having personally directed their management, I know just what they are capable of doing; but I mean that when an agent tries to sell the proprietor of a foundry a cupola, he invariably shows him figures of melting done by those that were run to their greatest capacity, but rarely mentions what the same will do in an ordinary melt.

A fair test of the economical points of a cupola is a monthly, quarterly, or yearly footing up of its record;

for the greater the amount melted in any cupola, the greater the ratio of iron to fuel will be, and one that is not economical in an ordinary melt cannot be called an economical cupola. A cupola whose record for three, six or twelve months shows a ratio of fuel to iron 1 to 8 is a good one well managed. There are many where record accurately kept show 1 to 10, and some 1 to 11; but these are exceptions, and it is often a question in my mind whether the melter doesn't throw in a little fuel on each charge "just to fill up the holes," thus helping the cupola in its melting without having been weighed and charged in the record, therefore affecting the ratio. There is one thing certain, that is: there are more foundries in this country that are melting less than eight pounds of metal to one pound of fuel than there are melting more.

In the construction of a cupola, the first question to be considered is the size. In determining the size,

there are two important facts to bear in mind. First, a cupola of a much greater capacity than is required, is not only extravagant in the use of fuel, but is apt to cause inconvenience if not trouble in taking away the iron as fast as it is melted. Second, a small cupola, worked to its fullest capacity, is more economical in the use of fuel, than a large one worked to only a part of its capacity; but a small cupola, (or large one) that is run to a great deal more than its capacity, is a source of great annoyance, trouble, and oftentimes loss.

What is the capacity of a cupola? It is the amount of iron it will melt well without "banging up," or leaving it in such a condition that a melter will spend half a day in getting it ready for the next heat. The capacity cannot be placed at a fixed number of pounds, as there are many different conditions of blast, fuel, iron and management to be considered in estimating it, and not the least important of these conditions is that of management. It is surprising to note the difference in the results obtained from the same cupola under apparently the same conditions, but different management.

A very good practice in getting a cupola "shell" is to get one at least 8" larger than is actually required for the work, then, as the demand for a larger one increases, you have a large one at your disposal. It is an easy matter to make a large one small, by the use of a lining of common red brick between the fire-brick and shell, by which the diameter of the cupola may be conveniently reduced 8" or 4" at your option.

The following table will serve as a fairly reliable guide in determining the size of cupola required to melt a given quantity of iron. It is an extract from "Melting