

With such mineral wealth, and with men who devote both time and money for a good cause, success must eventually come, and come it did, for in 1888 the N. S. Midland Railway and Iron, and N. G. Iron, Coal and Railway Companies were formed. But without going into details, it is only necessary to say that, after working some six months, the Midland Railway and Iron Company stopped work, and up to date have never seen fit to resume it.

On the 16th day of April, 1888, an Act was passed in the Provincial Parliament to incorporate the New Glasgow Iron, Coal and Railway Co., Ltd., at Ferrona, N. S., and from that time the work was pushed forward. Mines were bought and leased at Springville, Bridgeville, Black Rock, and various places. In Pictou and Colchester counties prospectors were set to work, and miners dug ore as fast as possible. The actual work at Ferrona commenced in April, 1891, and was put in operation Aug. 25th, 1892. The works comprise the following departments: A complete railway system 12½ miles long, connecting the ore and limestone deposits with the furnace plant and I. C. Railway at Ferrona Junction; a complete coal washing plant; 55 retort coke ovens (Benard's system); a blast furnace of modern design, and storehouses, blacksmith and carpenter shops. Having traced the furnace operations from the earliest till the present time, I will in the second paper describe the conversion of iron ore into pig iron.

(Concluded in next issue.)

THE RELATION OF THE DRAWING OFFICE TO THE SHOP IN MANUFACTURE.

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[A paper read before the Convention of the American Society of Mechanical Engineers at Montreal.]

The purpose of this paper is to describe the system employed by the writer in the drawing office of his company, in the hope that some of the points may be of use to members of the Society.

The drawing office is the origin of thought and action for the entire works, as far as design and construction of its product are concerned. It is responsible for the accuracy of its drawings and orders, and its authority should be unquestioned and above reproach in the shop. The shopmen should habitually trust and adhere to their drawings, and their faith should not prove to be misplaced. To maintain this there must be unceasing care and vigilance on the part of the office, and full adaptation to the shop needs and capabilities. It goes without saying that every drawing office, whether employing one draughtsman or a hundred, should have its system and methods adapted to the needs of the establishment with which it is connected. As these needs vary with each case, it is not to be supposed that the system about to be described will be of universal application. It will be well, then, to state in a general way the conditions which this system is intended to meet. We will assume, therefore, that the office employs from ten to fifteen skilled draughtsmen, and is in connection with a manufacturing establishment, doing a general engineering business in which there is comparatively little duplication of orders, and in which single orders frequently involve a large amount of detail, of which it is essential to keep exact records. It is also assumed that the drawing office is invested with the sole right and authority to issue orders to the shop for all new work, or all work in which there are changes and variations from previous similar work.

The practice of issuing verbal orders or directions for the conduct of work is productive of misunderstanding and confusion. When no evidence of authority exists no responsibility can be fixed. It is therefore advisable to have a system of written orders to all departments whereby the duty of those concerned is clearly defined, and the responsibility can be fixed for dereliction of duty.

SHOP ORDERS.—An order being once entered on the books of the company, the procedure is as follows: The business office issues a written order to both the drawing office and the shop upon a blank which merely states the general name of the machine, the time of delivery promised, and the number of specifications to be worked to, if any, and the number by which the order is to be known. It is the duty of the drawing office to prepare such specifications beforehand when necessary. On the receipt of these orders in the shop, if it be a repair or duplicate of something already made, so that the shop superintendent has the information by which to execute it, he does so. If, however, it is new, or in any sense special work, he cannot proceed until the orders come down from the drawing office.

The drawing office issues orders upon the pattern shop and foundry by means of blanks headed "foundry" or "pattern shop," as the case may be, arranged thus:

B. S. S. & D. CO. ENGINEERING DEPARTMENT.

FOUNDRY ORDER.

ORDER NO.	DATE.	DRAFTSMAN.
	189	

Countersigned by

Examined by

These are manifolded in triplicate, and can be made out by any draughtsman to whom the job is delegated, but must be signed by the chief engineer, or in his absence, the chief draughtsman. The two copies are then sent down to the shop superintendent's office, who keeps one on file for his own reference and information, and immediately sends the other to the foreman of the department for which it is intended. In this way the shop superintendent retains control of his men in the different departments, and has knowledge of the orders that are issued. He alone is responsible for their proper execution, and undue interference of the draughtsman with the foremen or workmen is obviated.

It is also the duty of the drawing office to order all raw material for new and special work that is not regularly kept in stock. This is done by blank as follows:

B. S. S. & D. CO. ENGINEERING DEPARTMENT.

DATE.	Please order the following
189	for order No.
Ship	
Draftsman	Countersigned, Chief Engineer.

These are simply requisitions on the business office, and the copy goes to the storekeeper as a statement