Supposing there are several sheets of data, add cost of machine; labor; stock material; purchased material, together, and transfer same to estimate form 93 and 94. Supplementing this data with shipping weights and instructions—if there are any—and any additional information which may be of service to the sales division. Then have the requisition for estimate, form 93 and 94, and also estimate form 91 and 104, together with 92 and 104, approved, signed and arranged by the chief engineer who is careful to separate the originals from the duplicates, and binds each bundle with wire staples, so that all the sheets remain in precisely the same order as arranged; thus reducing the chances of losing any of the forms specified. In addition, the chief engineer will sign the time and cost cards, forms 5 and 16—of which there may be any number of the latter, i.e. (16), bunch them together, and secure with protecting rubber band.

The cost cards, 5 and 16, will then be forwarded to the cost department, No. 4, where a report will be made on triplicate forms 105, 106, and 107—one of each of which must be attached to the requisition for estimate, form 93 and 94, and returned with all the other data furnished, to the chief engineer, and he having assembled the whole of the completed data, forwards the same in envelope 90 to the superintendent, whose duty it is—after careful scrutiny and verification of the data entered on the respective forms—to forward originals to the engineering department, for careful filling; and complete duplicate sets on to the managing director's office, where the cost of making the estimate will be carefully noted, and from whence the duplicate will be forwarded finally to the sales division. In all their correspondence wth regard to this particular enquiry and respective job, the sales office staff must use the job number indicated on the forms; since by so doing, much confusion and trouble will be avoided—especially if the estimate is of a heterogeneous and complex character. It may be sometimes necessary to number the differentiated parts of one estimate, by giving the same, several job numbers.

The estimate being completed; having passed in systematic order through the works, and reached the sales division, it is pertinent to enquire what will be its final destiny. As already indicated, all the forms left in envelope 90, after the extraction and retention of original and triplicate, forms 105 and 107, by the cost department, and sales division respectively—having first received the authoritative approval of the superintendent, are returned to the chief engineer, who, after making sure that everything is O.K., returns envelope 90 to the estimating engineer, who retains the same in his possession until the sales division reports that the estimate has been accepted or rejected by the customer. If rejected, envelope 90 and its contents is handed to the engineering office index clerk, who straightway files it away among the records, for future reference.

In the next article we shall consider what happens when an estimate or tender is accepted.

(Continued.)

A LARGE MODERN IRON FOUNDRY

BY THE EDITOR.

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In the autumn of 1901 the writer, having designed the equipment for the large iron and brass foundry extensions to the plant of the Westinghouse Machine Company at East Pittsburgh, U. S. A., was engaged by the British-Westinghouse Electric and Manufacturing Company to do a like service for their immense plant at Trafford Park, Manchester, England. This appointment was gratifying since the plans of the original lay-out for these famous works—covering 130 acres, and designed to accommodate over 5,000 employees—had been drawn by me in August 1899.

It is purposed to give a brief description of the English foundry, not only on account of the fame it has won, but because of some criticisms we made in our August issue when describing the Davenport foundry of the Canada Foundry Company.

Michael Angelo, the architect of St. Peter's, Rome, was observed one day drawing upon the pavement opposite a large statue. When asked what he was doing, replied, "I criticize not by finding fault but by doing something better." While it is not claimed that the "British" foundry—designed in accordance with the latest and best American practice—is perfect, yet it is rightly equipped where the Davenport foundry is defective. So much by way of preface.

The Foundry—illustrated by photo-engravings (Figs. 1 and 2) from my original drawing—is 580'-0" long x 166'-10" wide inside walls; having 80 ft. middle bay, and two side wings, 43'-5" each.

In designing the equipment the leading idea was distribution, not centralization. One had to keep in mind the very important consideration that the work to be done on the moulding floors was not to be limited to parts for electrical machinery—as at the Alleghany shops; or air brake cylinders and connected parts, as at the Wilmerding works; nor engine details, as at the Machine Company's plant East Pittsburgh—but was to embrace all the castings being made at the various Westinghouse establishments. Seeing, however, that the conditions involved in the production of electrical air brake, gas and steam engine castings are so very dissimilar in the matter of metals, cores, and appliances generally, it was found necessary to relegate the respective classes of work to clearly defined departments and sections under the one foundry roof, i. e., machine moulding of duplicate parts in the half wing on right of cupolas, medium engine and electrical work in the wing nearest the reader, while the middle bay was reserved for heavy dynamo fields, armature spiders, generator beds, etc., in the right-hand half, and larger engine cylinders, housings, bedplates, etc., at the left-hand end.

The general plan (Fig. 2), embodying the above ideas, was personally explained by the writer to Mr. George Westinghouse in September 1901, who straightway approved without alteration.

We have not space for a minute description of every part, or inventory of every appliance, but shall confine ourselves to an explanation of the special features in this foundry.

Facilities for Handling Material.

Outside the eastern side of the main building is an annex for pig iron storage, 194 ft. long by 30 ft. wide, having a strong platform level with the cupola staging. Underneath are two tracks parallel with the foundry wall, and connected by switches to the yard railway system. The outer track is used for the conveyance of pig iron and scrap supplies to the cupolas. This material is thrown out of the trucks on to the hydraulic elevator located between the pair of tracks at about the centre of the annex. When the material is elevated to the storage platform—the floor of which is covered with ⅜" steel plates—it is conveyed by roller-bearing hand trucks to certain parts, where it is stacked against the wall and tabulated according to chemical analysis. In this way a thousand tons of valuable metals can be stored conveniently for immediate use in the melting of special mixtures.

On this storage platform is installed a miniature cupola and a moulding bed for the making of test bars.

The inner track under the annex platform is used for the delivery of coke, sand, fire clay, etc. The method of conveying the coke in the cars on this track to the cupola staging above is worthy of note. On Fig.