

1/7/19

Jan. 1919,

Memorandum on Invention and Development.

It is a source of great regret, that during the last years the Company has become increasingly sterile with regard to invention and development of such character as would lead to new lines of business or radical improvements in existing lines of apparatus, and we are becoming more and more dependent upon outsiders.

With the growth of the Company, and the resulting segregation of the Engineering departments as a matter of course, the development work was taken over by the separate departments, and they established separate research and development sections. This, however, left no adequate provision for such inventive and development work which does ^{not} yet belong into any specific department. Furthermore, the more progressive department heads realize that their individual development organization is not as well suited for development work in directions more radically different from their existing practice even in their own field, as shown by the increasing extent to which the Consulting Engineering Laboratory is called upon by such departments as the Switchboard Department, Protective Apparatus Department, Transformer Department, etc.

The Research Laboratory has been of immense value to the Company, but being essentially chemical, it can have neither the facilities, nor the men capable to deal with purely electrical development, though it is of assistance in those features and details of electrical development, which involve chemical questions.

The experimental department of the factory, under Geisenhoner and Miller, has afforded facilities for the execution of development work without serious interference by production, but necessarily can neither originate nor do the engineering.

Within its limitation, general development work has been done or assisted, by the Standardizing Laboratory of Mr. L.T. Robinson, and by the Consulting Engineering Laboratory of Mr. J.L.R. Hayden, and by a closer cooperation between these, and gradual extension, a gradual improvement of the situation may be expected.

There are two classes of such work:

- 1) New inventions or development radically different from existing production, such as the investigation and development of the Arc Process of Nitrogen Fixation; study and if possible, development of radically new methods of direct current commutation, such as would enable the building of large direct current generators and converters of 3,000 to 5,000 volts; universal motors, etc. Such inventions or ideas may originate in the Laboratory, or more commonly, by other engineers of the Company, and this class of work would necessarily have to be carried on by a general budget of the Laboratory.

- 2) Development work for other departments, and on the request and in cooperation with other departments, more particularly work in directions materially different from existing practice such as radical improvements in switching devices, fuses,

protective devices, cables, methods of insulation, etc. The expense of this class of work would be covered by specific manufacturing orders issued by the respective departments - if dealing with a single specific problem - or preferably by budget appropriations given by the respective departments, against which the development laboratory can issue orders, such as has been successful for many years between the Consulting Engineering Laboratory and the Protective Apparatus Department, for some years with the Switchboard Department, the Transformer Department, etc.

The Consulting Engineering Laboratory might be gradually developed into such an organization and it would be very desirable if Mr. L.T. Robinson could be induced to take an active interest in the work of this laboratory and cooperate with it, bringing the work of his department and of the Consulting Engineering Laboratory into closer relations with each other.

A general supervision over the policy of such organization would best be in the hands of an advisory council such as was so successful in former years in the case of the Research Laboratory. I should be glad to take an active interest in such advisory council, and would recommend as one of the members Mr. L.T. Robinson. Mr. A.G. Davis of the Legal Department also should be a member. I think the smallest possible number of regular members would be most efficient for such advisory council, since as a matter of course, such council would invite the attendance of other engineers or commercial men to such meetings, at

which matters of interest to them would come up for consideration. Probably one meeting per month would be appropriate.

I would recommend however, that no radical changes be made immediately, but the above considered as a general policy towards which to work in the gradual development of such organization.

My specific recommendations for immediate action are:

That the Consulting Engineering Laboratory in charge of Mr. Hayden be considered as a nucleus of such an organization and Mr. Robinson be induced to take an active and continuous interest in it, as he is already doing now, and work towards gradually bringing about still closer relations between the Standardizing Laboratory, and the Consulting Engineering Laboratory.

That an advisory council be appointed to assist and generally supervise, consisting of Messrs. A.G. Davis, L.T. Robinson, C.P. Steinmetz, and possibly one or two more men, but limiting the number as much as possible.

That the general budget requested by me for the next year, and the specific budgets recommended by various engineering departments for work to be done for them by the Consulting Engineering Department, be granted.

That other engineers and departments be encouraged to utilize the Consulting Engineering Laboratory to a greater extent.

As regards to the staff of the Consulting Engineering Laboratory, necessarily additional men will be required from time to time as work increases, and this matter will be taken up through the regular channels when the time comes.