

# AN IDEAL FACTORY FOR SMALL MOTORS

## A FRIENDLY RELATIONSHIP EXISTS BETWEEN EMPLOYER AND EMPLOYEE

DECATUR PEOPLE WILL WORK FOR AN INSTITUTION THAT HAS THEIR VERY INTERESTS IN MIND, FIRST, LAST AND ALL THE TIME, SAYS SUPERINTENDENT BARNES.

As I prepare to write a few words descriptive of the General Electric company's policy with regard to its employees, the findings of President Wilson's second Industrial Commission have been released and are being discussed in the press. It is interesting, therefore, to compare these recommendations with the conditions that have existed in our plant for some years; namely, the recognition of the advantage of a friendly relationship existing between employer and employee which can best be promoted by a deliberate, although not aggressive organization in the plant itself to bring about this friendly spirit of cooperation; the object being to utilize the common interests centered in our work and diminish the area of activity. In other words, bringing about on a large scale the human relationship that existed between the employer and the employees when industries were much smaller and the employees were necessarily closer in touch with the aims and the ambitions of the employer, and vice versa. As executives we should know the peculiarities and feelings of our employees just as intimately as we know the advantage of employing one kind of material or metal for a specific purpose in producing the output which we manufacture. By this I do not mean that we should think of our employees in terms of raw material, but in the past there has been a tendency

### Medical Care.

Under this heading we have two dispensaries fully equipped, in charge or trained nurses. We have an industrial nurse to investigate sickness of our employees on the outside, and among our employees there are a number of men and women who are able in case of emergencies to give their services and assist the medical department. We also have a physician on the premises at all times who has authority to call into consultation the best surgeons in the city. This work, as far as first aid and visiting nurse is concerned, is absolutely free to our employees.

### Employment Department.

Our employment department has a very important function to perform; namely, the selection for work in the shop of people who need work, and who will develop into faithful and proficient employees. We look up the record of prospective employees so far as possible to find out just who they are and what their previous experience has been, and then start them out in the plant with some assurance of success.

### Personnel Workers.

Just after the signing of the armistice it was found that a great many of our women employees (we had over 1400 of them), were leaving, and that the new girls employed to take their place did not stay with us, but left after a few days. It was discovered in many instances they left because they felt lonesome and strange in their new surroundings. To overcome this difficulty we picked out from a number of volunteers, 12 young women who had been with us for some years, and delegated one to each department where girls are at work, to take care of the new girls, from the time they were employed until such times as they became fully acquainted with their duties. At all times these personnel workers are smoothing out trivial disagreements and questions that come up, which, if not taken care of promptly, might lead to serious misunderstandings. We have found that this service is a very valuable one and we are entirely satisfied with the results obtained.

### Industrial Service.

Under the general heading of industrial service we have male and female investigators who help in the matter of advertising, arranging for club outings, sports, pastimes and similar functions. These investigators work through the organization and keep in touch with the suggestions and recommendations of our club members, safety committees and others who may have something which they wish to suggest.

We have schools for the training of machinists, pattern makers, foundry workers, draftsmen and specialists. These young men, who are selected because of their promise, are given a regular course in these crafts, at the same time they get one hour and a quarter a day in mathematics, drawing and other educational subjects that go "hand in glove" with their mechanical training. We have a department in the works where our employees can get an upgrading or intensive training in machine shop practice. Many a young man who has toiled faithfully without much apparent prospect of advancement has taken advantage of this training class and is now earning good wages, and has in his possession skill and ability to do things that were heretofore virtually denied him.

Compensation and factory laws are taken care of by the industrial service department. Cases are investigated, and in every instance the interest of the employee is given first consideration. As stated before, it is one of the fundamental principles of our organization to foster and promote confidence and contentment among our employees, and to en-

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## DECATUR G. E. PLANT IS A REALIZATION OF THIS IDEA--LOCAL FACTORY THE MOST MODERN OWNED BY GENERAL ELECTRIC

For a number of years there existed in the minds of all of our engineers and officials a mental picture of an ideal factory for the production of small motors; a plant wherein a given production would be produced with a minimum amount of labor; where the facilities and the arrangement of these facilities would be such that the material would progress from one end of the plant, from operation to operation, and the result would be a finished product ready for shipment to the consumer, at the other end of the plant. With the completion of

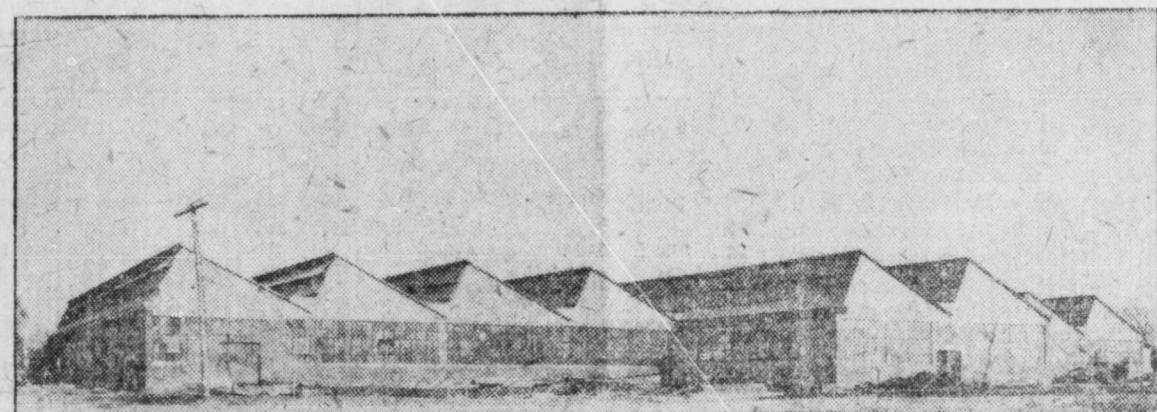
the plant at Decatur we hope that we

will have attained a realization of this big idea.

### Selection of Building Site.

About six months ago it became apparent that we must supply additional floor area and equipment to meet the ever-increasing demand for small motor production. Our engineers began looking for a site on which to erect a plant that would produce a given output. The industrial committee of the city of Decatur called our attention to the plat of ground on which the plant has been built. This plat

seemed to our engineers and officials to be ideally located. The plat of ground being adjacent to the railroad lines, switching facilities were easily attainable, while such other facilities as the proper amount of gas, proper fire protection and water supply, power or energy for running the machinery and lighting the plant seemed to be present in sufficient quantities to meet our early requirements. Investigation of the labor market also showed that it appeared to be such as to warrant the construction of this plant.



VIEW OF DECATUR PLANT, GENERAL ELECTRIC CO., ERECTED IN 60 DAYS BY H. K. FERGUSON CO.

### Size of the Plant and Type of Buildings.

After our engineers had satisfied themselves regarding the general facilities which were necessary for the operation of a plant, the management decided to build a plant that would produce 500 small motors per day; this plant to be so arranged that it could be extended to an ultimate capacity of 2,000 small motors per day. From this information the size of the plant was very readily determined, while from experience and with the desire to produce the most efficient and modern plant conceivable the one-story building seemed most desirable. This type of building built according to what is known as the saw tooth type of building seemed to best fill the requirements. This type of building also had the advantage of properly distributing the light throughout the plant and providing proper ventilation. In fact, it seemed best adapted for making an ideal workshop.

### Construction of the Building.

At this stage Mr. H. K. Ferguson of the H. K. Ferguson company, Cleveland, Ohio, who are specialists in standardized buildings and short-time contracts, was called into consultation, and after several meetings the contract was finally entered into between the General Electric company and the H. K. Ferguson company, covering the construction of a one-story saw tooth type of building for completion in sixty working days, and a few days later, on December 15th, the actual work of construction was begun. After the building was actually started, the contractors encountered a great many difficulties. Weather conditions were adverse, in fact, throughout the entire period of construction the temperature remained at a very low average, while snow was lying on the ground almost the entire winter. Nor were the weather conditions the only difficulties to overcome. There has been a scarcity of material, railroad facilities have not been the best, in fact, it has been necessary to send out personal tracers in order to bring in the material. Regardless of difficulties however, the contractors have persisted and in the sixty working days they have practically completed all work under the contract.

### Design of Building.

This saw tooth type of building is one story in height, has a total floor area of 63,000 square feet, exclusive

of the platforms. It is designed with a self-supporting steel structure, brick curtain walls up as high as the window-sills and continuous sash, the sash being supplied by the David Lupton's Sons company, Philadelphia, Pa. The roof is constructed of 2" yellow pine sheathing, the entire roof being weather-proofed with an asphalt and asbestos built up roof. The end walls above the continuous sash are constructed of wooden sheathing, the outside being fire-proofed with asbestos shingles intended to imitate slate. They are absolutely fire-proof.

The floors are constructed of 2" thick Creosote block, the product of the Midland Creosoting company, Toledo, Ohio. These blocks are laid in the most approved manner on a 6" concrete sub-floor. The inner spaces between the blocks are filled with pitch. This floor represents a very



C. H. MATSON  
Supt. Bldg. and Maintenance Fort Wayne Works.

high initial cost which, however, is expected to render excellent service. It is not an experimental floor.

### Heating Plant.

The heating of this building presents quite a problem. The great amount of glass surface in the building as well as the large exposed wall and roof area makes it necessary to provide a large amount of radiation for heating purposes. It was therefore necessary to install approximately 18,000 square feet of cast iron and pipe radiation in order to maintain a mean temperature of 70 degrees F. in zero weather. The cast iron radia-

tion is placed on the walls under the windows while the pipe radiation is placed in the trusses overhead. A boiler of approximately 200 horse power will be required to generate the steam necessary to heat this building. The system employed in heating is known as the Warren-Webster system. By this system steam is supplied to the radiators by means of overhead supply lines at low pressure, while the condensation is returned to the boiler by means of vacuum pumps and special valves. A vacuum of approximately 8" is maintained on the return lines. Automatically the condensation is discharged into the heating boiler.

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short piece of time, after which they are

## A WASHING MACHINE MOTOR WILL BE MANUFACTURED AT DECATUR PLANT

BUILDING IS SO CONSTRUCTED THAT RAW MATERIAL IS BROUGHT IN AT ONE END AND COMES OUT AT THE OTHER A FINISHED PRODUCT READY FOR MARKET.

The officials of the General Electric company in designing and equipping the Decatur plant have given first consideration to the economical and rapid production of one type and size of washing machine motor. The building is so situated that raw material is brought in at one end of the building and the finished apparatus delivered at the other door. The raw material, consisting of a special grade of sheet iron used in making the rotor and stator cores, round steel for shafts, bronze rod for bearings, copper strip for end rings, copper rods for stator rivets, sheet brass for collector rings, castings for bearing brackets or end flanges, insulated copper wire for rotors and insulating material (consisting of both treated and untreated fiber and varnished cambric), is unloaded and placed in stock in the north end of the building.

Clamp bolts, acorn nuts, rivets and other small parts are made on automatic machinery and delivered to the departments where they are needed. The acorn nuts, after having been properly inspected, are delivered to the nickel plating department, where they are nickel plated and polished. The various collector ring parts are made up from sheet material which is taken from the store room and sheared to proper sizes. From here they are delivered to the punch press department, where the many intricate pieces are punched out. Some of these parts must be zinc-plated and some of them given a bright dip. Other parts for the collector are made in the automatic screw machine department, such as hubs and clamping washers. These hubs in order that the collectors may be properly riveted, must be very carefully annealed. This is done by placing them in an air-tight container and bringing them to a high

temperature, after which they are allowed to cool slowly. These various collector ring parts, after having been completed in the various departments, are brought to the collector ring assembly department, where they are properly fluxed and dipped in a tin bath to insure satisfactory electrical connections between the rivets and the end rings. These stators are now taken to a broaching machine, which broaches the inside, giving them the exact required diameter. From here they are taken to a specially equipped turret lathe, where the outside is finished and the rabbits made for the bearing flange fit. As explained later on the inside diameter and the diameter of the rabbit fit must be very nearly exact in order to secure a motor which will operate satisfactorily. The nameplate holes are now drilled, and after the upper rivets have been assembled into the slots this stator is taken to a very powerful hydraulic press, where the core is pressed to a specific dimension and the rivets are all headed over. From the hydraulic press these stators go to the soldering department, where they are properly fluxed and dipped in a tin bath to insure satisfactory electrical connections between the rivets and the end rings. These stators are now taken to a broaching machine, which broaches the inside, giving them the exact required diameter. From here they are taken to a specially equipped turret lathe, where the outside is finished and the rabbits made for the bearing flange fit. As explained later on the inside diameter and the diameter of the rabbit fit must be very nearly exact in order to secure a motor which will operate satisfactorily. 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