

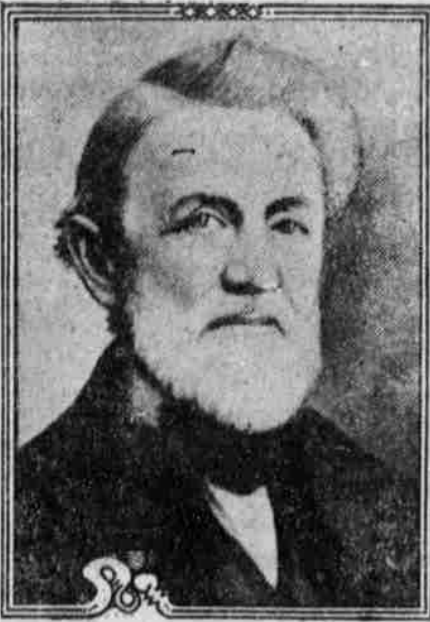
OUR GREATEST ARMS PLANT

The Remington Arms Union Metallic Cartridge Company's
Factory at Bridgeport an Aladdin's Castle
Industrial Army of 50,000 Organized by One Man

By CHARLES WILLIS THOMPSON
(in New York Times).

TWELVE MILLION DOLLARS spent in less than a year have brought into being what will probably be the greatest small arms and ammunition plant in the world—that of the Remington Arms Union Metallic Cartridge Company factories at Bridgeport, Conn. When it is in full operation it will call for the services of from 34,000 to 38,000 employees, bringing the total of the industrial army employed in various places by these companies to 50,000. The Bridgeport plant covers hundreds of acres and is the latest word in factory construction, and yet in its present form it may be said to have actually sprung into existence, to have come before the eyes of Bridgeport in a moment.

The enormous plant of the Remington Arms company was not in existence last March. It was turned over to the company by the contractors in November, so that this immense creation was completed in less than eight



Marcellus Hartley.

months, and even as far back as last August it was so far completed that outwardly it looked as it does today.

It has made such a revolution in Bridgeport that the company has been obliged to build practically another city within the city for the accommodation of the thousands of men who are coming from all parts of New England to form a new colony. It has gone into the work of sewerage and grading and is now about to turn its attention to the question of schooling for the children of its suburb. Eighteen thousand men and women in the employ of the Remington Arms, 10,000 more in that of the Union Metallic Cartridge company, will form the suburb, and with them will come their families. The company is now taking them on at the rate, in the Remington plant alone, of 2,000 a month.

There are thirty-eight buildings in the plant, and of the main units there are thirteen. They are five story brick and steel buildings, 272 feet long by sixty feet wide. Instead of standing separately or being connected only by corridors or extensions, they are connected with each other by five story buildings, called "service buildings," each of which is eighty feet long by forty-eight feet wide, so that the whole mass forms practically one gigantic building. At the end comes a single story building 272 feet by 94 feet, connected on the ground floor to the main units by a service building 80 by 48 feet.

The Guarding System.
To protect this great plant the company has employed a small army of guards with a military organization. They are all honorably discharged soldiers or sailors of the regular army and navy. There are 300 of them, divided into three companies and officered like an army company, with a captain at their head, and lieutenants, sergeants and corporals under him.

Of the 18,000 men who will bring the working force of the Remington company to its full complement there are already 6,100 at work, and the employment department is interviewing applicants at the rate of 500 a day. This department has a building all to itself and conducts its work pretty much on civil service examination principles.

Plants Are Permanent Institutions.
The cartridge factory is an old established institution, but it, too, has been greatly enlarged in these months, its area having been increased by 700,000 square feet. The Remington company has a plant at Ilion, N. Y., where it has been manufacturing arms for the sporting trade for years, but the war in Europe created such a demand for weapons for the belligerent nations that it was determined to put up this great plant at Bridgeport alongside that of the cartridge factory to go into the business of making military weapons and fill the orders that come from foreign governments.

Military arms were not among the industries of this country, and the Remington concern had devoted itself mainly to making sporting rifles and cartridges for that trade. The outbreak of the war offered to a man ca-

pable of recognizing and seizing a great opportunity a field for making a new American industry in a moment.

The plant, of course, is a permanency and does not depend on the war for continuance, but it was the war which brought it into being.

There were 2,500 people working in the U. M. C. plant when the war broke out. Before the end of the year there will be 16,000, so that the two plants together will be employing 34,000 persons. By that time the munitions plant will have a capacity many times that of the United States government.

The Remington Arms company celebrates its centenary this year. In 1816, just 100 years ago, Eliphalet Remington made with his own hands the first rifle and founded the business. He made it for his own use. His father had refused to buy one for him, and Remington collected scrap iron, welded it into a gun barrel and walked fifteen miles to Utica to have it rifled. It was such a good one that his neighbors invited him to make similar ones for them, and before long his forge was a gun factory. At that time all gun barrels were imported from Europe, and there were no real gun factories in America, so that Remington founded a brand new American industry.

Mr. Dodge and His Co-workers.

Marcellus Hartley Dodge is the sole proprietor, and it was he as a young man of thirty-two—who looks like a youth of twenty-one—who waved the magic wand over the swamp lands of Bridgeport and created almost overnight one of the greatest manufacturing plants in the country and a contribution for the military preparedness of the United States that is of incalculable value. Mr. Dodge is an enthusiast over the great enterprise of which he is the head. His mother died in his infancy, and he was brought up in the home of his grandfather, Marcellus Hartley, the owner of the Remington Arms and the U. M. C. It was from Mr. Hartley that he received both his home training and business training, and he lived with the business and in its atmosphere and imbibed his grandfather's feeling toward it until he came to have a sentiment for it not less than second to that of his family. Mr. Hartley's feeling toward it was his. Mr. Hartley died in the traces at a board meeting Jan. 8, 1902, at the age of seventy-five, and the grandson felt commissioned not only to carry it on, but to carry it on worthily. It has been his dream to enlarge the great enterprise his grandfather founded, the apple of the eye to both of them.

In April, 1914, Mr. Dodge associated Samuel F. Pryor with himself in his business. Mr. Pryor had been vice president of the Simmons Hardware company of St. Louis and president of the Southern Car Wheel Company. He is a man of great energy, vigor and business ability, and the two men have worked together like a hand in a glove. Mr. Pryor is a man of fifty, and Mr. Dodge is not yet thirty-two.

Mr. Dodge was in Germany when the war broke out, and he made his way from there to Paris and then to London. He saw the situation and drew his conclusions. When he returned to this country he determined on the great venture and had the courage to go ahead with it without waiting for any country to place an order.

Mr. Dodge was in a peculiarly fortunate position to embark on such a career, for he was entirely unfettered. Mr. Dodge owns all the stock in the Remington Arms and the U. M. C. There were no stockholders to consult, no fears to assuage or yield to and no arguments to make to anybody about the danger or hope that might lie in taking a big chance.

With characteristic dash and energy Mr. Dodge took the hazard of ordering the machinery before any orders for arms had been received by them. Orders were in prospect, but none had been given. It was a chance worth taking, for somebody had to jump in and give the first order for machinery if anybody was to take advantage of the European situation to create a new industry, for the United States was short of it.

There is in this country a limited capacity for such machinery. The erection of buildings was the easiest and simplest part of the work. To get hold of men who understand the making of military rifles and ammunition is not so easy.

There are few army officers in the United States who understand the making of arms and munitions, and Mr. Dodge and Mr. Pryor went about the task of obtaining their services. This was at the very beginning, and by November most of these officers were out of the army and in their employ.

Yet so few were the men in the United States who understood the making of military arms and munitions that it was necessary to import some, and a number of high priced men have been brought over from abroad. It is commonly thought that a man who knows how to make sporting rifles can use his experience in the making of military rifles and car-

tridges, but it is not so. There is such a radical difference that the latter is a business by itself, and in the Remington-U. M. C. plants the two are kept sharply separated.

Men cannot learn quickly how to handle explosives; it is not like other kinds of manufacture. To learn how to handle powder and fulminate takes not only months, but years. This has been the greatest difficulty with which the new American industry has had to contend.

Value of Factory to Nation.

From the government's standpoint this work will be far from incidental. The time may easily come when the Bridgeport plant will be one of the greatest factors in some national crisis. Six or seven thousand rifles a day is regarded as a large output in Europe, but the Remington plant can turn out 10,000 in a day, and the presence here, ready to be called upon, of a great factory with such a capacity is of incalculable value to the nation.

Heretofore this country has been unable to compete with other countries in the military arms and munitions business. Bids have been put in at different times, but except when some foreign country has been in sore straits for delivery the United States has generally lost out.

How the Work Progresses.

The first soil was turned for the foundations of this vast plant on Dec. 19, 1914, but work on the main units was not begun until the following March. The first work was done on the forge shops, which stand apart from the main units, and they were completed within a short time. Eight months after the work on the factory buildings was begun the structural work was done and the machinery so far installed that 3,000 men were able to be at work.

By the end of the year an army of 50,000 will be enlisted in the work of this one concern, 18,000 and perhaps 20,000 in the Remington Arms at Bridgeport, 16,000 across the road in the U. M. C., 15,000 at the Remington plant at Ilion, N. Y., and other forces at their smaller plants.

Testing Raw Material.

One of the most interesting divisions of the plant is the testing department, which is under the direction of W. T. Marshall, formerly professor of machine design at Yale university. This

Gas shop of the army plant is devoted to drilling barrels. It takes from forty-five minutes to an hour to drill a single barrel if the barrel is all right; if it isn't it takes a good deal longer.

Sometimes the drill strikes a hard place, and then it has to be withdrawn and sharpened, and not infrequently this has to be done five or six times. There is a hole through the drill, and the oil is pumped through it. This oil goes into the barrel in a thin little stream, but comes out with a steady rush.

What is done here is only drilling in the rough. After it is finished the barrel goes to another shop, where it is made smooth, just as you sandpaper anything after it has been planed.

One of the buildings is given over to the woodworking department. A little street runs through this building for the transit of trucks bringing in the lumber. It takes thirty-four different operations to make a gunstock, and the whole five stories of this building are devoted to different phases of the work.

The aggregate floor area of the main units and the forge shops is 1,538,000 square feet. The quantity of lumber used in making the buildings was 15,000,000 board feet; of steel, 11,500 tons; of concrete, 20,000 cubic yards; of glass, 250,000 square feet; of putty used in glazing, 100,000 pounds.

Where Employees Eat.

The restaurant seats 550 persons, and in case of emergency there are counters along the walls giving accommodation for 150 "standees." There is also what is called a "cafemobile," a movable dining table and kitchen cabinet in combination, which can be run around to the different departments if desired, so that the men can eat without having to lose part of the half hour allotted to them in going from their respective buildings to the restaurant. This cafemobile moves on wheels and can feed 300 men, and there are eight or nine of them. The kitchen cabinet part of the combination is to keep the food hot and does it by electricity.

A Hospital, Too.

About the middle of the buildings there is a hospital, with a surgeon, two trained nurses and attendants constantly on hand. It is a rule of the company that no matter how slight the wound is, even if it is the merest scratch, the person receiving it must be sent immediately by his foreman to the hospital for treatment. This is to avoid all danger of infection in a place where there is so much oil and grease.

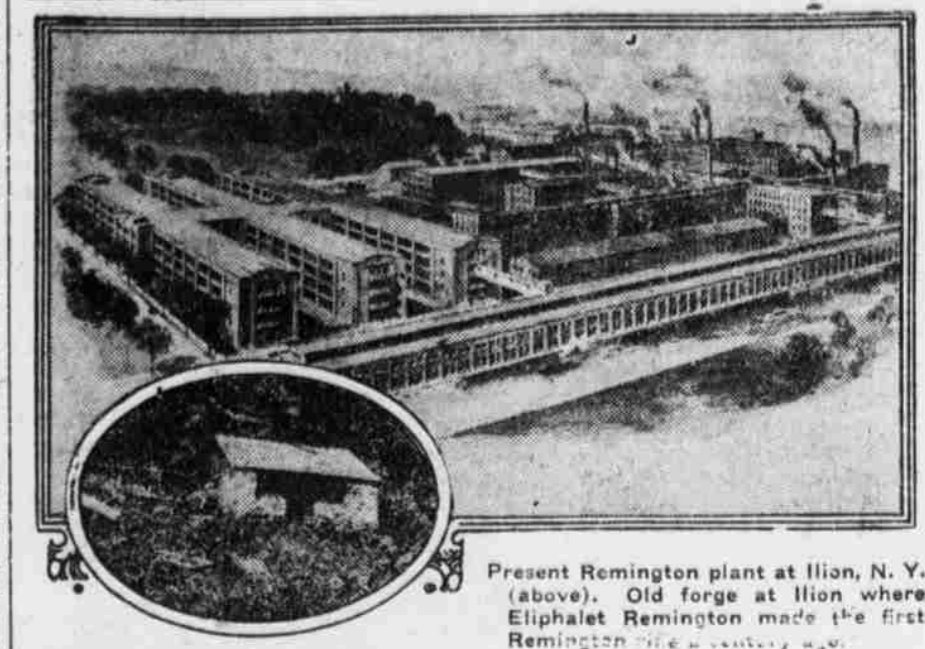
Housing Requires Attention.

The housing problem, which will be a great one when the whole force has been enlisted, was taken up at the outset. The company is busy buying land and erecting houses. Several hundred are in process of construction. Some of them are two family houses, some six family houses and some apartment buildings. Streets are being built; sewers have been made; the lighting and water supply problems have been

bureau takes in all kinds of industries and all classes of employees, so that there can be no just comparison.

This building covers 3,000 square feet. There are four entrances, one for engineers, office people, etc., one for tool makers and gauge makers, one for machine hands and one for unskilled workmen. The staff that deals with them consists of eighteen people.

Individual attention is given to each applicant. There is a heavy demand for tool makers and gauge makers, because the supply is limited, and men expert in that work are eagerly snapped up. In the office staff are two expert gauge makers, whose duty it is to examine all applicants for that kind



Present Remington plant at Ilion, N. Y. (above). Old forge at Ilion where Eliphalet Remington made the first Remington rifle a century ago.

of job. "It is much cheaper," said Mr. Carpenter, "to spend some time examining an applicant than to put him in the shop, pay him for three or four days' work and have him spoil his material." Most of the men taken on are skilled workmen, and the number of common laborers employed is relatively small. In one day as many as 180 men have been chosen from the applicants and put at once to work.

Welfare Work a Feature.

The welfare work is under the direction of Joseph A. Page, who was loaned to the company for the purpose by the Young Men's Christian Association. He was for four years in charge of the welfare work at Panama. Among his duties is to investigate all cases reported to him in which a foreman has discharged a workman. If the man was unjustly discharged that fact is reported to the works manager for action. Another duty is to keep men out of the hands of the loan sharks. When a man needs money if his case on investigation proves worthy he can borrow it from the company instead of from the sharks. Mr. Page has instituted a mutual aid and benefit association, which is run by the men themselves, and a foreman's club, and a part of the barracks is to be used for a club to be instituted among the guards. He also organized a club

to that of brigadier general and went to Europe in July, 1862. President Lincoln gave Mr. Hartley authorization to draw at sight on the United States government for unlimited sums. Never before was such a letter of credit ever given an individual. It involved the expenditure of millions left solely to the judgment and honesty of Mr. Hartley.

His task was twofold—first, to buy all available guns and munitions, and second, to prevent any from falling into the hands of the Confederate government. Both duties were splendidly performed in the face of many obstacles. Long after the war Charles R. Flint gave a dinner, at which the Confederate secretary of the treasury, George A. Trenholm, was a guest. In his speech Mr. Trenholm told his experiences as a Confederate agent for the purchase of munitions in Europe. He told how some mysterious and secret influence baffled him whenever he was just at the point of success. This had always been the greatest mystery of the war to him, and he had never learned who his invisible opponent was. He told of one case in which a Belgian order had slipped away from him just as it was being filled. When he finished Mr. Flint told him that his unknown adversary was present and introduced him to Mr. Hartley, who told him how the trick was turned.

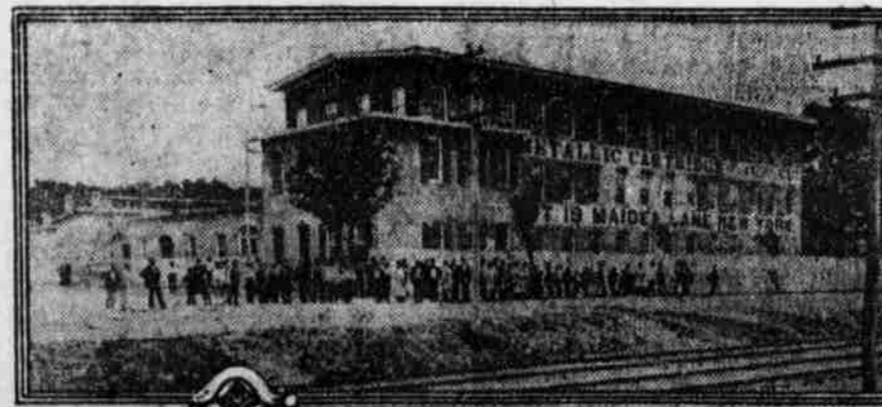
Mr. Hartley's patriotism was not of the kind that fulfills only the appointed task and is satisfied. He took advantage of his presence in Europe to combat and counteract the sentiment in England in favor of the Confederacy and was active in successfully creating a sentiment for the Union. One of the things he did in this behalf was to flood England with copies of John Bright's Birmingham speech for the Union, which he heard and had printed at his own expense.

Mr. Hartley, the Pioneer.

In 1867 Mr. Hartley established the Union Metallic Cartridge Company. At first the business grew slowly, but the Franco-Prussian war gave it a boost. In 1870 France gave a large order to W. W. Reynolds, the company's representative in Paris. But the city was besieged, and there was no way to escape through the German lines with the order. Finally he thought of the air and promptly ordered the construction of a balloon. It took ten days to complete it. It was at this time that Gambetta, the war minister, determined to leave Paris to organize a new resistance to the German armies, and he requested the use of Reynolds' balloon. Reynolds gave it up and began promptly on another. Bad weather prevented Gambetta from leaving at once, and by the time he was ready the second balloon was finished. The two balloons went up together, and the wind drove them toward the Prussian lines. Cannon and musketry opened on them, and they seemed lost, but the breeze turned and sent them out of range, and Mr. Reynolds escaped to New York with his order, which involved 5,000,000 francs. This incident is cherished with pride in the Remington annals as unique in the records of salesmanship.

In March, 1888, the Remington plant was sold at auction and bought by Mr. Hartley and the Winchester Repeating Arms company. He afterward bought out the latter company's interest.

Fifteen years ago Marcellus Hartley was one of the leading financiers of New York, and if he was less known to the general public than other men of his class and standing it was because of his modest, quiet and retiring disposition. He was chairman of the finance committees of the Equitable Life Assurance Society and the Manhattan Elevated railway and an important factor in numerous other large enterprises. It is told of him that at a time, now some twenty-five years ago, when a large banking institution in this city unexpectedly found its capital impaired to the extent of over \$4,000,000, Mr. Hartley saved it by making good the lost sum from his private fortune, without security, and it was many years before he could be fully reimbursed out of the surplus profits of the institution.



Two Views of Remington Arms Plant (Bridgeport) After Less Than Six Months Construction Work. Ammunition Plant Not Shown.

has several subdivisions. Here steel is tested to determine its strength, its resiliency and its resisting qualities.

It is an amazing thing to one unfamiliar with such processes to go through this department and see how they literally pull steel apart as if it were molasses candy. When this is done Mr. Marshall's men measure the force which it takes to pull it apart.

"Some parts of the gun," explained Mr. Marshall to the New York Times representative, "require higher grade steel than others. For instance, the bolt head has to resist the force of the explosion and must be of high grade steel. The spring steels have to be high grade in order to be elastic enough to keep on doing their duty. All steels have to be specified according to the particular work they do."

dent with. This is in itself a heavy engineering job.

No two of the houses are alike, although all the houses of each kind have the same floor space. The company wished to avoid all appearance of a community town, and there are architectural differences which set each house a little apart from the others in looks. The two family houses consist of a living room, dining room, kitchen, three bedrooms and a bathroom.

And this brings us to the employment department. As already mentioned, this department has a building to itself. "It is," said E. W. Carpenter, its head, "the largest individual employment office I know of. The only one that is larger is that in Berlin, which is a public one. And that

among the messenger boys, and of course he investigates all cases of sickness and accident with a view to relief and assistance.

Other Executive Officials.

The manufacturing is under the supervision of Charles C. Tyler, assistant to the vice president, and Major Walter G. Penfield, general works manager. Major Penfield, formerly an officer in the United States army, was responsible for the whole designing and equipment of the new enterprise at Bridgeport, and he left the army to take up this work. Other officers of the company, aside from Mr. Dodge and Mr. Pryor, are George Bingham, secretary and treasurer, and C. I. Reiersen, vice president.

Marcellus Hartley, who founded the U. M. C. and afterward took hold of