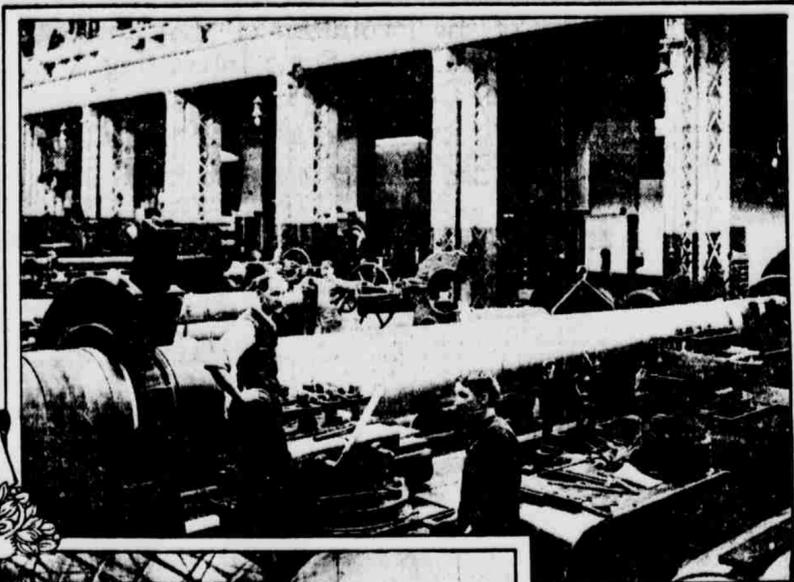


WAR DEMANDS PUT AMERICAN EFFICIENCY ON FIRING LINE



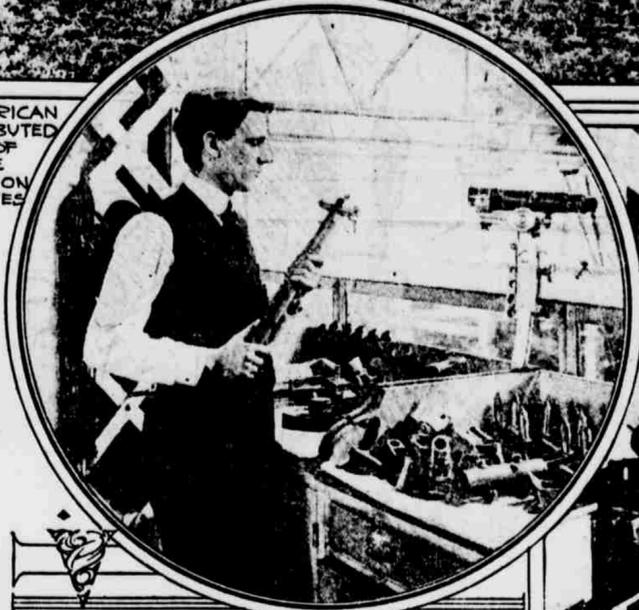
SPECIALIZATION IN AMERICAN FACTORIES HAS CONTRIBUTED ENORMOUS NUMBERS OF MOTOR TRUCKS FOR THE FLEXIBLE TRANSPORTATION OF TROOPS AND SUPPLIES IN EUROPE.



IN THE BREECH MECHANISM OF THESE BIG GUNS ACCURACY TO WITHIN MINUTE FRACTION IS REQUIRED.

Blunders Made in Europe One Cause of the Troubles of Munition Makers in This Country—New Problems Also Had to Be Solved

MILITARY preparedness has been a topic of public interest for months, and latterly industrial preparedness—the real foundation of national defence—has come in for its share of the public's attention. It is therefore something of a shock to the average citizen to be told by an efficiency engineer that the country is sadly lacking in managerial ability and that where manufacturers have turned to the making of munitions with some notable failures the root of unsuccess lies in the prevalence of "incompetence in high places." This does not augur well for the future, because whether it be the struggle of war or the commercial competition of peace, the pain will go only to the thoroughly fit.



AMERICA HAS SUPPLIED EUROPE WITH INSTRUMENTS AND MACHINES HELD TO AN ACCURACY OF ONE THOUSANDTH OF AN INCH, IN THE ILLUSTRATION IS AN EXAMPLE OF THIS IN THE TELESCOPIC SIGHT.

It is no more just to generalize in this matter than it would be to pick out individual deficiencies in any direction and then proceed to condemn a whole class," said Howard E. Coffin, chairman of the Committee on Industrial Preparedness of the Naval Consulting Board, when the criticism was called to his attention. "The work of the committee during the last five months in canvassing the industrial resources of this country has made it clear how capable we are as a nation to provide all of the mechanical thews of modern warfare. Nevertheless, we must recognize that actual readiness imposes a big and an unfamiliar task upon our producers; and this has been emphasized by the difficulties that certain of our manufacturers have had to contend with in supplying munitions to European belligerents. Failures there have been, as the public well knows, but it is doubtful if the man in the street is even superficially aware of the underlying reasons. The explanation is many sided and it should be a source of satisfaction to us that incompetence has played only a small part in the business disappointments.

"In working for the Allies, our manufacturers have had to face entirely new problems—new to their normal activities, and in this their experience has been identical with that of their fellows in Canada, England, France, Russia, Italy, etc., and their failures probably less conspicuous than the failures of their foreign competitors. On the face of it, the making of munitions did not appear to present insurmountable obstacles, particularly because of the facilities offered by American machine tools. Just the same, most of these contracts contained lurking troubles that the manufacturer could not foresee.

"An example can be quoted from one of our leading trade journals; it studies the experience of many of our enterprises that have turned their plants into munition shops: 'A business man whose contract for shells looked like 100 per cent. profit when it was taken home saw that so many unexpected hindrances to rapid and efficient production have turned up that he may not make a dollar.'

rifles were delivered by the foreign Government as samples. Those weapons were thus subjected by the customer and were admittedly 'standard.' So far so good.

"But when these six guns were sent into the shops and examined by the responsible foreman it was found that parts that should have been interchangeable were quite to the contrary, and yet interchangeability was one of the conditions in the contract. The foreign-made rifles were therefore on the face of it, not up to the specifications sent the domestic manufacturer. This at once presented a difficulty that meant delay.

"The American concern's managers said: 'Here, before we go ahead we shall make a sample and have it approved.' This was done, but it took time. The precaution was good business and showed sagacity and competence; but it took weeks and weeks before those guns were passed upon and finally returned stamped with the prospective purchaser's approval. Then in order to duplicate the weapons in quantity it was necessary to have built special machinery and special tools. In the meantime the manufacturer could not go ahead. Months passed, time was lost, and the concern's money otherwise spent in preparation stood idle at a heavy loss. Naturally the guns could not be made and delivered within the time specified originally.

"Now picture the reverse of this story. Fancy an engineering concern undertaking to manufacture projectiles and without ever previously having engaged in ordnance work. No matter how up to date the mechanical part of the plant, no matter how skillful the machinists and no matter how competent the administrative staff, the modern projectile is an exceedingly troublesome proposition when compared with the average run of well-made mechanical products.

question. In justice to our newly embarked munition makers it is only fair to say that they have had to bear the brunt of other people's unfitness. It is a matter of common knowledge that of all the belligerents Germany was the only one well prepared, and even she counted upon a stunning blow and a comparatively brief campaign. She too has no doubt had her hands full maintaining a supply of munitions for the unexpectedly protracted struggle. When war was declared none of the Allies was anything like thoroughly ready and all turned to the United States for assistance. What happened?

"Finding that they could induce some of our industrial establishments to undertake the making of munitions they began distributing orders widely both here and in Canada. As those scattered products had all to be examined at the different factories, it became necessary to multiply drawings and to call into service a small army of inspectors. A great many of these men were absolutely unfamiliar with the tasks set them and they piled up trouble. In some cases they rejected products that were up to standard, at other times they passed shells

and fuses, etc., that reached their destinations only to be condemned by inspection inspectors there. True, they were probably not shipped at the expense of this country in the beginning, but they were not up to specifications and should not have left our shores. The deficiencies, however, were not necessarily due to any lack of thoroughness or competence of our people, and in most instances could have been easily corrected here with little work had their shortcomings been detected by responsible inspectors.

"Not only have these inspectors been often unqualified but the proving grounds sent here for them to use in examining the war materials were not always accurate and, unfortunately, did not agree with the standard gauges employed abroad. Further, in the turning out of a great many plants under pressure a good many of those were faulty because of hasty supervision, and their errors were not discovered until after some of our concerns had made heavy outlays in special tools and had actually turned out a part of the order. This was all the result of hurry to get fighting materials and could not rightly be considered anything but cumulative evidence of their inpreparedness—certainly not proof of any incompetence in our industrial establishments that accepted the data in good faith.

"There is still another lesson in our experience in this new field. Some of the so-called ordnance experts on the other side who drew up the specifications were essentially technical theorists and decidedly lacking in practical knowledge of the possibilities of modern tools. For instance, it is a matter of record that in some cases steel of such hardness was specified to be used in the munitions that no existing tools could have cut them without being ruined. High speed tool steel is exceedingly expensive and the proper forming and dress-

ing of tools takes a good deal of time and demands a high order of workmanship. Manifestly, no manufacturer with extensive tool-making experience would have prescribed any such conditions, and least of all when large quantities of a given product were wanted in the shortest possible time.

"My intention is not to criticize our customers, but to emphasize the outstanding features of our military equipment. It is a matter of record that in some cases steel of such hardness was specified to be used in the munitions that no existing tools could have cut them without being ruined. High speed tool steel is exceedingly expensive and the proper forming and dress-

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"It is in the summer that the baggage man earns considerably more than he gets. Watch him bustling on the hot summer days with traffic in his hand, and he will be glad to get some other easy job like being messenger for a dynamic factory or maybe carrying the bears on Wall Street.

is no wonder that a number of the concerns have been fairly staggered by it, although their efficient work is one of the facts. This was not a question of ordinary managerial competence but a problem for specialists of which there were all too few available.

"Finally, the lackman may have a still better grasp of what has been the nature of the task in the case of shells alone, only a very few of the manufacturers have been engaged in the making of fixed ammunition in its entirety. For instance, one firm would make the shell body or shrapnel case, another entirely separate plant would make the fuses, and a third plant would make the brass cartridge cases containing the propelling charge and fit them to the loaded and fused projectile. The result was not cooperation but dissociated efforts, and yet another grave mistake was made in the matter of quantity production. It is almost too vital to the supplying of munitions for the American manufacturer has led the world for years, thanks to our machine tools and the intensive effort to improve these facilities. The most exact part of the present day production is the intricate fuse, and yet its manufacture is relatively rapid when compared with certain of our popular low priced watches. In the field of machine production we have no peer, and managerial competence has made the possible. Other goods might be cited, but it is not necessary to do so.

"The American worker is both industrious and responsive, but that is no reason why we should expect him to give him an unskilled job and then expect him to improve it to his own normal high standards of efficiency. Like any other skilled labor, he needs time to familiarize himself with the new work and, in the beginning, his audience must be drawn from thoroughly accurate plans. This makes, of course, for comparative slowness at the start.

"It is a grave mistake to charge that we lack in efficiency or competency in high places. Industrial efficiency, in the truest sense of the term, not only had its beginning here, but it has attained astonishing heights in this country. Our industrial engineers have found a fruitful field abroad and know full well how much our needs to find it how it is possible for us to do so much and to do it so extremely well—of course, in directions in which we have specialized. The automobile industry is a shining example of this, and the European belligerents have had to buy our cars, trucks, tractors and kindred vehicles, have belted them. No fault has been found with these machines and there have been no business failures, despite the heavy pressure of increased production. There has been no lack of managerial competence, no want of skill on the part of our laborers, and certainly no professional defect in our multiplicity of machine tools and their associate parts needed.

"As I see it, our problem is one of coordination. We must throw into service the gears that heretofore have largely been idle between our national industries and our arms of national defence.

"We know how, as we did not as a nation, fail to realize that our efforts in the world have been a waste upon excellence in the manufacture of our tools, and still we are in every department of a coordinated industrial and defensive plan. Our work for the Allies has taught us much, and we are no longer blind to the writing on the wall."

Howard E. Coffin of the Naval Consulting Board Refutes the Charge of Incompetence in High Places in American Factories

ence. Our manufacturers and our army and navy must be brought to realize that they are all really sister services. To me the warship and the trading ship do not fundamentally differ when it comes to our national welfare—both are an extension of industrial preparedness and one is as vital as the other to maintaining our position in the world's commercial sun.

"We have the resources, and the committee on industrial preparedness has learned much in the past few months, thanks to the general and generous cooperation of our merchants. We know now that there are more than 20,000 manufacturing concerns in the United States doing a business individually of more than \$100,000 a year. All of these are being inventoried, to say nothing of many smaller plants with equipment peculiarly suited to turn out material for the fighting line. And it is decidedly encouraging to see how resourceful many of the smaller establishments are in pointing out ways in which they can be of use.

"These inventories will constitute the foundation for industrial preparedness by allowing us to pool our resources and in production those plants having an output fully equal to that of any other two countries. But our buyers can all afford to have a few. Knowing what our facilities are, we must put our tools to work, for the newer work of making the thews of war, and establish the fact that they can meet all potential demands should our national dignity be questioned. We cannot afford to have any army of workers withdrawn from the factories, for, as was so extensively the case in certain European countries when the call to arms was sounded, they must remain at bench and machine. That the men in the trenches and on the battle front should have the arms and ammunition needed, this means that after we have, and specialists, craftsmen and other workers carefully trained just like the soldier to do their part, that their training shall continue in time of peace while pushing out our commercial output.

"Fortunately this is now made possible by recent legislation which authorizes the army and the navy to place orders, not exceeding in value in each case a total of \$50,000, without asking for competitive bids. These orders will be for standardized products and will be distributed to the first manufacturer plants capable of manufacturing munitions of war or tools that would be needed. This in order that the men may not lose their numbers and that each establishment may keep pace with progress and have a reserve for the sudden call of a still larger force should the factory be called upon to turn out a certain kind of war commodity nearest allied to its normal output.

"Each factory or plant thus becomes a school of the manufacturing side of national defence. Apart from contributing a suitable production, the procedure will tend to create a large body of new sources for the skilled work and efficient production of munitions. It will spread our manufacturing resources, which in any case are so vital to our continued existence as a republic, over the entire country and safely away from our seaboard.

"This arrangement, I believe, is a part of industrial preparedness. The participating manufacturers thus are assured that they will have a market for their products in time of war and the return of peace. The factory will be ready to begin its production at once.

"Strictly speaking, the product and what it entails is a greater matter than the fact of its production. It is a matter of national interest and business. In addition to the cooperation of our industries 20,000 American engineers of the highest training have subscribed their services and have taken part in the campaign of the last few months. The work of these engineers and the ready response of our citizens of industry are the very best evidence of efficiency and competency in high places.

WHERE'S YOUR TRUNK? DON'T WORRY, FOR THE BAGGAGE SMASHER IS NO MORE

By OLIN L. LYMAN.

IN the old days when the man who ran the funny column in the newspaper was at a loss for material he wrote a skit about the baggage smasher and the unfortunate traveler who lost his duffel. The man who wrote that is under a "Here Lies" somewhere. So is the joke, you don't lose your baggage nowadays, and your trunk isn't smashed. The checking system has been perfected to an exact science.

Witness: The Union Station in Washington was opened over eight years ago. It handles an average of 1,600,000 pieces of baggage annually. In all this time just one piece has been lost, and that a suit case. With this record the railroad people may well be pardoned for laying that one instance to an unknown and traveling passenger. The men of the rails ensure it was none of them. They check upon each other. The modern system of checking baggage is the most marvelous 100 per cent. efficiency arrangement in the world. It is small wonder that the modern humorist has had to turn to the "baggage smasher" for his stock in trade.

What of the volume attained by the baggage business today in the country? These are figures to open the eyes. A conservative estimate, gathered from the best sources, of all baggage handled by the railroad companies in this country during September, 1915, when the autumn rush began, shows that the number of pieces of baggage handled at more than 1,000,000.

As for safe, sure and sure transit 50 per cent. of this vast bulk reaches its owners with such celerity that they look the service as a matter of course. For the remaining 1 per cent. delays reaching a man from a few hours to a couple of days, the carelessness of the travelers themselves was responsible.

Here are the features of baggage handled at the Grand Central Station for 1915. Of inbound and outbound baggage there were 1,800,000 pieces. The record of losses was that reported above for Washington—none. The same is true of Chicago, St. Louis, St. Francisco. It is true of all the big transfer points.

In perfecting the checking system the railroads have guarded against losses and minimized them. There are reserve checks numbering up to a million, given against duplicate bags. The big union stations have rubber stamps, avoiding the need of writing the name of the station. Poor writing caused most of the mistakes of the past which cannot now occur. The case with which baggage can be picked out, in case the traveler has lost his check, is due to the new piling system. Formerly baggage was stacked in piles of the last number, reading from left to right. Your first check was perhaps 120,634 and your next 120,640, and so on. Your baggage was scattered.

Eight years ago the new system was adopted. Suppose you have seven pieces of baggage. They are all together. The third figure in every check of the seven covers baggage from that point on that train is identical. So all the baggage is stacked together under "349" or whatever figure it may chance to be.

It takes five years to develop a full checked baggage man in one of the big terminals like the Grand Central or the Pennsylvania Station. The speed is prohibitive for many an assistant. A man must be quick witted to hold down one of those jobs. The first month or two usually decide. By that time the baggage master has had time to size up the recruit. He is first put at work on inbound baggage and inbound mail, becoming familiar with names of stations and letters to separate mail. He assists in making the written records as they are taken from the train. And so his first year is spent in the inbound baggage room as receiving clerk. The third year he passes in the inbound baggage room. There he matches checks, delivers baggage and makes out exchange checks. His fourth year is spent in the outbound baggage room on exchange checks. The first time he comes face to face with that checking room it looks impossible, but he is amazed at the celerity with which he masters it, because it is built upon simple and common sense. Here he works with long rows of rubber stamps that save time as well as writer's cramp.

The fifth year that young man can stand behind the checking counter and check your baggage to any part of the country. The next time you board a train the fourth year is spent in the outbound baggage room on exchange checks. The first time he comes face to face with that checking room it looks impossible, but he is amazed at the celerity with which he masters it, because it is built upon simple and common sense. Here he works with long rows of rubber stamps that save time as well as writer's cramp.

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