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The productive capacity we have indicated can as readily be adapted to the production of medium-sized or heavy bombers. If these latter types are built rather than pursuit ships, the daily production would be scaled down in proportion to the increased amount of work required on each plane. Nevertheless, our program could build many more bombers, large or small, than are now being built or are contemplated, and in much shorter time.

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The present plans for production of parts for bombers in autoplants is based upon the conception of business as usual. These plans do not contemplate the coordination and full use of facilities which alone can produce a large number of planes within a comparatively short period.

plant facilities can be fully used only by leveling automobile production over a twelve-month period, thus freeing a great part of the industry for defense production. It has been asserted that production cannot be leveled off because the industry cannot anticipate orders for cars and must supply these cars during the seasons when the people want them.

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The persons who argue as speak of mass production quantities but use the mathematics of custom-built production methods. It is an elementary fact that the number of hours spent doing things by hand as compared to the number of hours spent operating machines (machine-hours) varies in ever increasing proportion to the extent that mass production techniques are introduced into the production process.

The number of hours spent in building an automobile is less than one-sixth of what it was when the industry started, and as the overall man hours decrease the machine hours increase in percentage as compared to the work done by hand. One can go into a modern continuous strip steel mill and see this in its sharpest form.

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Custom-building of an automobile, it is estimated, requires 1,100 man hours. At that rate it would have required 4,400,000,000 man hours to build the 4,000,000 cars of the 1940 model. This would have required a force of more than 2,200,000 men working forty hours a week fifty weeks a year.

FLOOR SPACE REQUIRED. This same mistake of thinking of mass production of planes in the mathematics of custom-built hand production also raises the question of the practicality of providing the necessary floor space for assembly work. Another elementary fact is that the number of days necessary to complete the production cycle (in machining and fabricating industries such as autos and aircraft) is shortened in proportion to the extent that mass production technique is applied.

The shorter the production cycle the less floor space is needed. This is true because the number of jobs in the process of production is held at a minimum. If Chevrolet Motor Car Company had to build 6,000 cars a day by the same methods that are now being used to build planes, the total man power and floor space of the entire automobile industry would not be adequate to turn out its present production.

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"A further striking example of available floor space is the Reo plant at Lansing, Michigan, which has the following vacant space: Mt. Hope Avenue plant, 553,237 square feet; Building No. 800, 247,931 square feet; Building No. 4700, 104,247 square feet. In Reo's main plant 500,000 square feet is fully equipped with production machinery. Starting January 13, Reo will be producing five motors or day in a plant that at one time produced 160 truck and 125 passenger cars in one eight hour shift.

"The objections raised on the alleged scores that a prohibitive number of man-hours and plant space would be required for mass production of aircraft do not hold water when considered in the light of the above facts.

DIFFERENCES IN ENGINES. Doubts have been expressed on the adaptability of automobile production machinery to production of aircraft motors because of the reduced weight of aircraft motors. These doubts are without foundation.

The reduced weight of an aircraft motor per hp as compared with automobile motors is secured firstly by the difference in the design of the motor and secondly by the fact that all parts of an aircraft motor are reduced to a minimum weight by removing all surplus metal.

This is done by a process of machining. The same basic machinery is used to machine parts for an aircraft motor as for an automobile motor, excepting that a more complete and precise machining job is done in the case of the aircraft motor. The available machinery in the automobile industry can be retooled to turn out aircraft motors of 1,000 or 2,000 hp of either the air-cooled or liquid-cooled design.

The objection has also been raised that aircraft engines must be made in more precise dimensions that automobile engines. As our original program pointed out, more precise parts are obtained by more precise tooling.

SHORTAGE OF ARMAMENTS. Any possible bottlenecks in armaments, instruments, etc., is not a legitimate criticism of our plan. Such bottlenecks can be met if production of a marmament, instruments, etc. is spread over existing industries whose machine capacities and production facilities are adaptable to such production. The pooling of such productive capacity with central assembly plants using the same approach we suggest for aircraft production will make it possible to eliminate any possible bottlenecks in armament, instruments, etc.

SIMILARITY OF BASIC MACHINERY. In our original report we stated that basic machinery used for automobile production can be adapted for producing aircraft parts. We stated that precise and difficult parts of the Allison engine are being made in the old Cadillac plant in Detroit with machinery which duplicates existing unused automobile plant machinery.

These statements have been challenged in some quarters. Herewith is

a list of machinery, newly constructed and installed in the Allison division, in Detroit, which duplicates existing automobile plant machinery:

"Grinding machines: Cincinnati centerless, Exlo internal and external. Bland, Norton, Landis, Blanchard, Brown and Sharpe, (Bryant) and Held. (These machines are used to produce the following parts which are common to both aircraft and automobile motors: camshafts, crankshafts, bearings, connecting rods, wrist pins.)

Milling machines: Milwaukee, Cincinnati, Sunstrand and Brown and Sharpe.

*Keller machines: Wickes lathes, Greenlee lathes and Cincinnati lathes.

"Spline machines: Sunstrand, and Brown and Sharpe.

"Hones: Exlo and Wickes."

To date these are the major objections raised against the feasability of the CI's program. None of these objections are valid.

Very truly yours,

WALTER P. REUTHER,

Director, 4General Motors Department, United Automobile Workers of America, CIO

The New York Times

Reg. U. S. Pat. Off.
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JULIUS OCHS ADLER,
Vice President and General Manager.

GODFREY N. NELSON, Secretary.

SUNDAY, JANUARY 5, 1941.

specified in the early appeals might be cared for. It was three years before this hope was wholly fulfilled; but afterward the Fund grew year by year and the roll of its beneficiaries became ever greater. Its total was maintained even against the conflicting demands of the last war. It has remained high despite the new woes inflicted on humanity in this new conflict and the large sums which kind-hearted Americans have spent in their alleviation.

Charity fails not. The spirit of good neighborliness on this continent will never die, and its exercise begins, as is fitting, near home, as is exemplified in this Fund for the Neediest. There will always be occasion for such a Fund, and The New York Times is happy to supply one medium between the givers and the benefited. Its columns are still open for contributions to come.

PLANES FROM AUTO PLANTS

The C. I. O. is entitled to insist on a fair and thorough examination of its proposal to produce 500 pursuit planes a day within six months, by utilizing idle plant and adapting existing machines in the automobile industry. It must be said, however, that certain weaknesses in the plan have become more evident on examination.

In the first place, the plan is aimed at mass production of pursuit aircraft, a category in which the aviation industry itself already approaches most nearly large-scale production and a category not nearly so urgently needed, either to bolster Britain or to strengthen our own defenses, as that of bombers. In this matter Mr. Knudsen has told his own industry: "There is no use worrying about light planes—we can get them. On fighting planes we are in pretty fair shape. But bombing planes, from 16,000 pounds up to the heaviest, take time and they must be worked out for real production before we can get quantities." In consequence. plans are being made to utilize important units of the automobile industry for quantity production of bombers by the parts-assembly, subcontracting method. To switch the automobile industry, up to its entire capacity, to manufacture pursuit planes would upset a going undertaking, without furnishing the type of aircraft most needed.

Even if this consideration were to be swept aside, there are other factors in the situation. When it comes to engine production, a large part of the public does not realize the wide difference between the automobile engine and the aircraft power plant. A typical automobile engine, having about 100 horsepower, is not closely limited as to its ratio of weight per horsepower, and for this reason problems of casting and machining are much minimized. An aviation engine for combat aircraft must deliver well in excess of 1,000 horsepower, while individual air-cooled engines of more than 2,000 horsepower have been tested successfully. Every ounce of weight counts. Changes for producing such airplane engines would require complete reconstruction of the machines now used for automobile engine production, including the bases on which the machines are mounted.

Use of idle plant facility, recommended by the C. I. O. proposal, is of course highly desirable, as is the recommendation for the best possible allocation of skilled men. Both are already contemplated by the automobile industry and in part have begun. Other practical suggestions of the proposal doubtless will be adapted by Mr. Knudsen and the mass-production-minded men of the automobile industry. But we should not jump too hastily to the conclusion that we either want or can get

500 combat airplanes a day from auto-

mobile plants.

CTANDADTITUD WE ADONG

Editor, New York limes New York, N.Y.

Dear Sir:

I have read the editorial, PLANES FROM AUTO PLANTS, in the New York Times for January 5th, 1940.

I have been loath for the moment to discuss the few objections which have been raused against the program of the Congress of Industrial Organizations for mass production of aircraft in the automobile industry.

For the most part, excepting some editorial comment, the criticism has been anonymous and some of it inspired, I am informed, by private interests who do not welcome encreachment of the according industry on the according industry. Secondly, the President has according to the new four-man board in charge of defense production to review the proposals and assume that we shall have adequate opportunity to discuss criticisms with that body. After the board has come to some conclusions and has made them known, further public discussion, if necessary, will be in order.

However, your editorial two misconceptiions which have been voiced elsehwre. I should like to comment briefly on these points.

The CI 's proposal does not limit itself to the construction of pursuit ships, as your editorial assumes. The type of plane to be manufactured must be determined by our military and naval strategists. As I have already stated, the CI 's program could produce medium sized bombers as well as pursuit ships. Naturally, we could not produce as many bombers per day as as lighter aircraft the but the number of bombers which could be turned out under the CIO

program would be far in excess of anything now contemplated.

With regard to your objections on the score of differences

between airplant and automobile engines:

Congress of Industrial Organizations 1106 Connecticut Avenue, N. W. Washington, D. C. District 3582

For Release Morning Papers, Thursday, January 16, 1941

Philip Murray, president of the Congress of Industrial Organizations, today made public a detailed reply to objections which have been raised against the feasibility of the CIO's proposal to produce defense aircraft in automobile plants.

The reply, in the form of a memorandum by Walter P. Reuther, official of the United Automobile Workers of America, CTO, and author of the plan, declared that, contrary to a widely current impression, less than 10 percent of the automobile industry's potential capacities are being used or will be used, under present plans, for turning out defense planes.

The memorandum delcared that bombers as well as pursuit ships could be produced under the CIO's program; that adapted automotive industry machinery can turn out plane motors of either 1,000 or 2,000 hp.; and that the number of man-hours required for mass production of planes is not, as critics have maintained, an obstacle.

The Reuther memorandum denied that the CIO plan would "dislocate" the automobile industry. He maintained, to the contrary, that it would permit planned production for a year's period. Manufacture of aircraft in the auto industry, he added, would give the companies a greater return on their capital investment and provide half a million auto workers with more regular employment.

The memorandum, as made public by Mr. Murray today, follows:

"I have read and studied the objections to the CIO's aircraft production program. Virtually all of these criticisms have been anonymous, aircraft and automotive industry executives refusing, for some reason, to lend their names to their printed views. The criticisms do not in any case run against the feasibility of the program. By and large they indicate either a sad lack of imagination or an insistence by automotive interests to continue with 'business as usual'.

"Since most of the criticisms have been anonymous and since we are shortly to have a conference with Mr. William S. Knudsen and defense commission production experts on our program, I have hesitated to engage in public discussion on these matters. However, so many misconceptions on our program have gained credence that I think it advisable to discuss and dispose of these matters at this time.

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"These objections imply that the American public is so slightly concerned with national defense that it will not wait a month or several months for new models. We believe that the car-buying public realizes that new models with the latest gadgets and improved lines will be of little value to a populace that may have to live in subways and air-raid

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