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Iron Man of Hendy

July 1, 1942.

Put ship engines on the assembly line? Impossible! But Charles E. Moore did it

By CHARLES F. BERRY

WHEN machine tool dealer Charles E. Moore first proposed turning out steamship engines on an assembly line like Ford motors, people attributed his zeal to patriotism rather than common sense. Monster three-story-high steam engines, as everyone knew, weren't swung around like flivvers. They were erected slowly on their foundations.

By late 1940 shipping had already become the bottleneck of our war effort, and engine production threatened to become the bottleneck of shipbuilding, especially on the West Coast. Something had to be done—and fast. To Moore it had always seemed that marine power units were built the hard way. If these engines could be manufactured and assembled rather than erected, they could be turned out just as fast as "ugly duckling" freighter hulls.

Some industrialists, accustomed to wartime miracles, were inclined to agree that with unlimited selection of machine tools such an ambitious plant layout was possible. The difficulty was a dearth of power tools. Refusing to be stymied, Moore insisted that if there wasn't new equipment he'd use old.

"New machine tools are great if you can get them," he declared, "but the trick is to get mass production out of whatever you've got. Any machine that runs must be made to do a job."

WAS IT "HERESY"?

Strange words were these from a machinery dealer who gloried in the performance of efficient modern equipment. Charles Moore had spent most of his young business life persuading industrialists to junk outmoded equipment. Now he was preaching a sort of machinery agent's heresy.

Whatever had been Moore's passion for replacing old machinery in peacetime, his determination to put those same discards back to use was sincere.

In fact, Moore talked such an amazing production line that his modern retooling miracle won the financial support of such western industrial giants as the Henry J. Kaiser Co., MacDonald & Kahn, W. A. Bechtel Co., Utah Construction Co., Pacific Bridge Co., and the Defense Corp. Altogether $7,000,000 was raised initially for the venture.

Actually, Moore's ideas landed him one of the toughest industrial assignments to come out of the war—the mass production of 2,500 h.p. triple combustion steam engines for the new 10,500-ton EC-2 freighters. In a little old plant geared to the methods of a generation past he laid out his victory production line with whatever tools he could find — assorted and miscellaneous trade-ins, some Civil War relics, in fact, anything that was repairable or would run. He also managed to get a few splendid new machines.

C. E. Moore

The production of marine engines, however, wasn't quite that simple. On the West Coast foundry facilities had always been extremely limited, and in the face of equipment shortages the starting of a heavy industry from scratch was out of the question. There was available, though, the nucleus of an industry in the historic Hendy Iron Works, near Sunnyvale, Calif. Without undue deliberation the plant, in receivership since the depression, was purchased for $500,000 and Charles Moore installed as president and general manager.

To transform this quaint old family plant with its trim little garden into a booming wartime foundry seemed too much of a miracle even for these times, but 49-year-old Charles Moore, unhampered by previous experience, set about his new job with a will. In World War I days, when the plant's equipment was much younger, this same layout had turned out practically the same engine—10 of them in two and a half years of feverish activity. Moore's task now was to turn out a like volume not in terms of years or months, but in days.

Moore refused to tolerate delays. When he learned how long it might take to get building steel for plant additions, he substituted stout northwest timbers. In less time than it would have required for deliveries of girders and I-beams he had his new shops in operation. Already the plant has expanded six times its former size and it's growing just as fast as Moore can add usable equipment.

VOLUME TRIPLED

Just how well Charles Moore succeeded cannot be translated into present production figures, but it is significant that during the first year while the plant was being enlarged and retooled 40 of the big engines were completed. This year the firm will turn out three times the volume of business that it handled in the previous 89 years of its history. By midsummer the Sunnyvale plant is expected to be producing more than half the nation's output of this Liberty freighter engine manufactured in a dozen big U. S. plants, and by the end of next year some 6,000,000 tons of Allied ships will be powered by Hendy steam engines or turbines.

Had not the need been so acute Charles Moore probably never would have become an engine builder. By way of experience he had little to recommend him except that he knew machine tools and how to use them. Not only had this erstwhile machinery salesman never built marine engines, but he had never managed any heavy industry. Yet in his own machine tool business he had told others how to lay out and run their plants efficiently, and he had production ideas—more by the minute than some engine builders have entertained in years.

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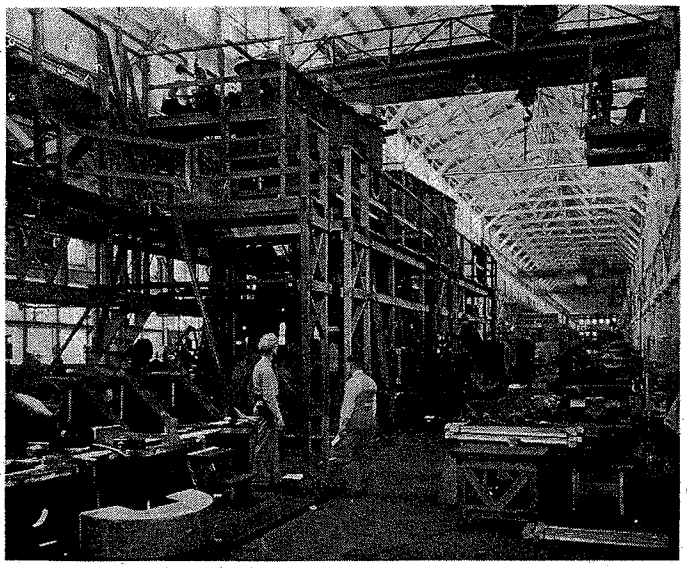
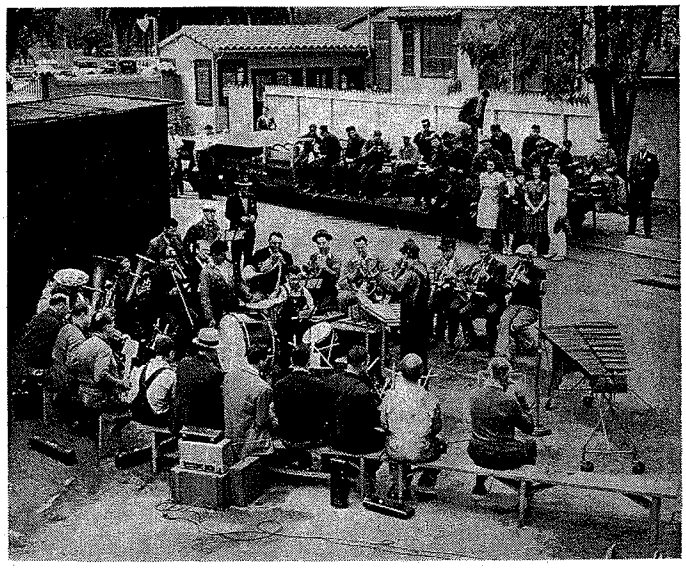


Here's part of the huge Hendy assembly line



Lunchtime brings "uplift" music, free coffee

Returning from the World War at an age when his companions were getting their start in the business world, Moore, a journeyman machinist, entered high school as a freshman. Starting out after graduation as a machinery salesman, he plied his trade the length of the Pacific Coast, continually picking up some new quirk from the old-timers. So well did he learn his business that one day he was to go to London as a machine tool expert for the Harriman Commission.

A PEAR ORCHARD, TOO

To a more experienced industrialist the first inspection tour of the Hendy grounds might have proved sufficiently discouraging. The plant was inadequate, and much of the equipment was of the gay nineties' vintage. As a strictly financial venture, it had two undeniable assets—goodwill and a pear orchard, but neither of these was of much aid in a war emergency. The name of Joshua Hendy was retained as a matter of historic pride. The original Hendy, friend of John Marshall, discoverer of gold in California, had founded the business to turn out equipment for the West's earliest gold mines. The pear orchard Moore put to even more practical accounting—as is indicated by the reorganized company's first profit entry, $1,100 net for fruit crops.

At the start of his engine building career Moore faced staggering problems of organization, both in regards men and machines. Loaded with government contracts that would take generations to fulfill under former Hendy schedules, Moore knew he could keep the big 271,000-pound behemoths moving if only he could find enough skilled workers. Probably there weren't a quarter enough available machinists on the whole Pacific Coast to do the job he had in mind by conventional methods. Nor could they be trained. Fairly efficient welders and riveters could be turned out of schools in droves, but it took years to make a really experienced machinist.

During his "boomer" and salesman years Moore had come to know machinists who were real masters of their trade. Now when he needed key men to help him do a tremendous job he knew where to find them. Soon he assembled as motley a crew as ever put a steam engine together. Smart young mechanical engineers were to work side by side with some of the toughest master machinists that ever came out of Detroit. California Tech and M.I.T. honor men teamed up with journeymen mechanics from the Northwest. Actually, Moore scoured the country for men he could trust, but when he found them he delegated authority to them—great gobs of it.

"One reason we get things done around here," he explained, "is because there just aren't any decisions that can't be made in ten minutes—the time it requires to reach the front office."

It was no small task to rebuild and repair the old Hendy equipment and the "junkpile" that Moore had purchased, but the crew soon caught something of Moore's admiration for old well-built machinery. Far from having the salesman's contempt for all outmoded equipment, Moore displayed the true craftsman's love of a machine that was built to do a job and could still do it after a generation of service.

RETOOLING EXTRAORDINARY

Only a person who really knows power tools could appreciate the genius behind Moore's makeshift retooling. Several of the largest and finest machines in the world are here, horizontal milling and boring mills, a mammoth bed planer from England and huge radial drills. Yet filling in the gaps between these modern wonders are many museum pieces of industry, some 50 to 60 years old, and more. A planer used in a Union arsenal during the Civil War to smooth the plates of the Monitor is being reconditioned to turn out engine parts for another war.

To anyone who remembers the pleasant old days in the Hendy plant, today's activity is almost unbelievable. Overhead cranes with clanging bells swing along at a speed that would warrant traffic tickets on some thoroughfares. Everywhere speed, precision and organization are in evidence. Pouring in the foundry is on almost a split second schedule. No sooner is one casting lifted from its pit in the smouldering ground than another mold is built into place. With no thought of orders or contracts, the foundry keeps pouring 24 hours a day, seven days a week.

In the machine shop rough castings from the outdoor stockpile are passed along at unheard of speed—six to seven days for all machining, two or three days for assembly, disassembly and shipping—a fortnight from scrap iron to magnificent power units which

(Continued on page 291)

IRON MAN OF HENDY

(Continued from page 11)

used to take six months to build. All heavy castings are made in the Sunnyvale plant, but many smaller parts manufactured by 50 outside firms flow in somewhere along the assembly line. Everywhere templates and costly jig forms are eliminating man hours and lightening the load on master craftsmen. Machine time, too, is cut down by "normalizing" all metal castings. Yet in spite of the speed and bustle, precision is never sacrificed, for all over the plant workers are splitting thousandths.

Toward the end of the long production line the big parts are fitted onto the bed and the engines rise abruptly. In the final section, five engines on an average are in the process of being assembled, tested by a small jacking engine and disassembled. So expert have the men become in putting together and taking apart that a unit has been completely disassembled in four hours. Within another few hours the parts are packed, loaded and shipped in routine style on five freight cars.

THE HUMAN TOUCH

With men and machines alike, Moore has respect for those that do a good job. In a plant that has expanded from 65,000 to a half-million square feet, from half a hundred to several thousand employees, Moore sees many strange faces, but he never loses touch with the old-timers, most of whom are busy teaching the rudiments of their trade to the fledglings.

An example of Moore's consideration is seen in his reluctance to intrude upon the province of one of the oldest employees. Throughout the depression period the defunct management employed a combination watchman-gardener. There wasn't much heavy watching to do in those days, but the landscaping around the front office became a task of love. When Moore's new government contracts got under way the part-time watchman was replaced by an alert young anti-sabotage guard crew, 70 strong, but he was retained as gardener. When later shop additions threatened to wipe out the carefully nurtured flowerbeds, a compromise was reached between the exigencies of war and an old man's pride. Today untrampled rows of peonies bloom snugly but defiantly between the new factories of war.

Moore sees nothing unusual in the job he's doing. "If engine building were an art," he confesses, "I'd be scared to death, but it's a science. Everything we do around here adds up. The overall picture may look complex, but broken down into the task of the moment it's very simple."

Maybe simple, but it takes an organization wizard to keep the components in order. If you doubt it, just look over —if the guards will let you—the 360,000 blueprints that cover one government contract.

Despite the millions involved, Moore is little concerned about present profits or post-war markets. Ask him about either and you'll scratch an American. "The future will take care of itself," he snaps. "As far as we're concerned we make just one stipulation—we don't want to find ourselves manufacturing chopsticks or getas."

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The forty-third report of American Car and Foundry Company, for the fiscal year ended April 30, 1942, as released to stockholders today, shows consolidated net sales billed of $216,336,567, with a backlog of business on the books, for the fiscal year now current, of $424,810,772, according to Charles J. Hardy, President. A substantial proportion of both items is derived from the company's normal, as distinguished from its war-time, activities. Sales in the preceding fiscal year were $67,192,012.

Net earnings of the company and its subsidiaries amounted to $9,275,376 after all charges including interest, depreciation, repairs and provision for estimated income and excess profits taxes.

The consolidated balance sheet as of April 30, 1942, shows total current assets of $95,923,736 and current liabilities of $56,553,483.

The report shows that the company has invested in U. S. Government bonds, Treasury bills and Treasury tax notes, at cost, $12,575,747. Also in the current assets column is cash of $15,929,374. Accounts receivable, less reserve, appear as $25,684,581; notes receivable, less reserve, $3,080,187; materials, inventoried at cost or less and not in excess of present market prices, $37,353,797; advance payments to vendors for materials contracted for, $268,314, and marketable securities, at cost or less, $1,031,732. An indebtedness of $10,000,000 to banks, with which the company entered on its last fiscal year, was entirely liquidated.

Of particular significance in regard to the company's war production is an item of $11,143,767, "representing", Mr. Hardy says in his letter accompanying the report, "expenditures made by your Company out of its own resources and for its own account, in providing the additional facilities so sorely needed for the production of materials of warfare of the kind, in the quantities and at the times imperatively demanded by the exigencies of the national need." He adds:

"Governmental policy wisely forbids making public detailed information concerning your Company's activities in the line of war work, but it is not considered to be in violation of that policy briefly to refer to its outstanding achievements in the mass production of the light combat military tanks which have made such an enviable reputation for themselves on the battlefields of Africa and elsewhere abroad, in the production of armor plate, in the manufacture of shells, bombs and fuzes, and in its work for the Navy which has already brought to us the 'Navy E' for excellence in production — to say nothing of the vast quantity of articles of a miscellaneous kind needed and produced as contributory to the main effort. And all this while still conducting its ordinary peace-time operations and maintaining its position as a leading manufacturer of railroad equipment and supplies."

The end of the fiscal year found the company in "excellent condition, financially and otherwise", Mr. Hardy asserts in his letter. "The uncertain factor is as to what of the profit resulting from the year's operations will ultimately be available for distribution by way of dividends—and that question cannot be answered until there is definitively determined the effect of recent legislation bearing on the subject of corporate profits. Shortly before the close of the year, Congress enacted legislation authorizing the appropriate Governmental departments to 're-negotiate' contracts having to do, generally, with the country's war programme — the avowed purpose of such 're-negotiation' being the recovery to the Government of 'excessive' profits resulting from any such contract, without, however, any definement of what constitutes an 'excessive', as distinguished from a fair and reasonable profit. It is possible that under this legislation one or more of the contracts undertaken by your Company will come under review, and until such review is had the 'uncertain factor' will persist — but your Management has no thought that your Company and its stockholders will be deprived of the benefit, by way of profit, to which they are fairly entitled by reason of the foresight, effort and energy shown in meeting the country's demands, the promptness and efficiency with which those demands have been met without calling upon our Government for financial aid in so doing, and the low cost at which that efficiency and the economy of your Company's operations have enabled it to supply the needed product."

AMERICAN CAR AND FOUNDRY COMPANY

June 24, 1942