

Freedom's Forge: How American Business Produced Victory in World War II

By Arthur Herman

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***NEW YORK TIMES* BESTSELLER • SELECTED BY *THE ECONOMIST* AS ONE OF THE BEST BOOKS OF THE YEAR**

Remarkable as it may seem today, there once was a time when the president of the United States could pick up the phone and ask the president of General Motors to resign his position and take the reins of a great national enterprise. And the CEO would oblige, no questions asked, because it was his patriotic duty.

In *Freedom's Forge*, bestselling author Arthur Herman takes us back to that time, revealing how two extraordinary American businessmen—automobile magnate William Knudsen and shipbuilder Henry J. Kaiser—helped corral, cajole, and inspire business leaders across the country to mobilize the "arsenal of democracy" that propelled the Allies to victory in World War II.

"Knudsen? I want to see you in Washington. I want you to work on some production matters." With those words, President Franklin D. Roosevelt enlisted "Big Bill" Knudsen, a Danish immigrant who had risen through the ranks of the auto industry to become president of General Motors, to drop his plans for market domination and join the U.S. Army. Commissioned a lieutenant general, Knudsen assembled a crack team of industrial innovators, persuading them one by one to leave their lucrative private sector positions and join him in Washington, D.C. Dubbed the "dollar-a-year men," these dedicated patriots quickly took charge of America's moribund war production effort.

Henry J. Kaiser was a maverick California industrialist famed for his innovative business techniques and his can-do management style. He, too, joined the cause. His Liberty ships became World War II icons—and the Kaiser name became so admired that FDR briefly considered making him his vice president in 1944. Together, Knudsen and Kaiser created a wartime production behemoth. Drafting top talent from companies like Chrysler, Republic Steel, Boeing, Lockheed, GE, and Frigidaire, they turned auto plants into aircraft factories and civilian assembly lines into fountains of munitions, giving Americans fighting in Europe and Asia the tools they needed to defeat the Axis. In four short years they

transformed America's army from a hollow shell into a truly global force, laying the foundations for a new industrial America—and for the country's rise as an economic as well as military superpower.

Featuring behind-the-scenes portraits of FDR, George Marshall, Henry Stimson, Harry Hopkins, Jimmy Doolittle, and Curtis LeMay, as well as scores of largely forgotten heroes and heroines of the wartime industrial effort, *Freedom's Forge* is the American story writ large. It vividly re-creates American industry's finest hour, when the nation's business elites put aside their pursuit of profits and set about saving the world.

Praise for *Freedom's Forge*

"A rambunctious book that is itself alive with the animal spirits of the marketplace."—*The Wall Street Journal*

"A rarely told industrial saga, rich with particulars of the growing pains and eventual triumphs of American industry . . . Arthur Herman has set out to right an injustice: the loss, down history's memory hole, of the epic achievements of American business in helping the United States and its allies win World War II."—*The New York Times Book Review*

"Magnificent . . . It's not often that a historian comes up with a fresh approach to an absolutely critical element of the Allied victory in World War II, but Pulitzer finalist Herman . . . has done just that."—*Kirkus Reviews* (starred review)

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Editorial Review

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“A compulsively readable tribute to ‘the miracle of mass production.’ ”—*Publishers Weekly*

“The production statistics cited by Mr. Herman . . . astound.”—*The Economist*

“[A] fantastic book.”—*Forbes*

“*Freedom’s Forge* is the story of how the ingenuity and energy of the American private sector was turned loose to equip the finest military force on the face of the earth. In an era of gathering threats and shrinking defense budgets, it is a timely lesson told by one of the great historians of our time.”—Donald Rumsfeld

“World War II could not have been won without the vital support and innovation of American industry. Arthur Herman’s engrossing and superbly researched account of how this came about, and the two men primarily responsible for orchestrating it, is one of the last great, untold stories of the war.”—Carlo D’Este, author of *Patton: A Genius for War*

“It takes a writer of Arthur Herman’s caliber to make a story essentially based on industrial production exciting, but this book is a truly thrilling story of the contribution made by American business to the destruction of Fascism. With America producing two-thirds of the Allies’ weapons in World War II, the contribution of those who played a vital part in winning the war, yet who never once donned a uniform, has been downplayed or ignored for long enough. Here is their story, with new heroes to admire—such as William Knudsen and Henry Kaiser—who personified the can-do spirit of those stirring times.”—Andrew Roberts, author of *The Storm of War*

From the Hardcover edition.

About the Author
Arthur Herman, visiting scholar at the American Enterprise Institute, is the author of *How the Scots Invented the Modern World,* which has sold more than half a million copies worldwide. His most recent work, *Gandhi & Churchill,* was the 2009 finalist for the Pulitzer Prize in General Nonfiction.

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CHAPTER ONE

The Gentle Giant

My business is making things.

—William S. Knudsen, May 28, 1940

On a freezing cold day in early February 1900, the steamer SS Norge pulled into New York Harbor. It was carrying five hundred Norwegian, Swedish, and Danish passengers looking for a new beginning in a new world. One of them stood eagerly on deck. Twenty-year-old Signius Wilhelm Poul Knudsen braced his Scotch-plaid scarf tight against the cold and yanked a gray woolen cap more firmly on his head.

William McKinley was president. Theodore Roosevelt, fresh from his triumph at San Juan Hill in the Spanish-American War, was governor of New York. The United States had just signed a treaty for building a canal from the Atlantic to the Pacific—in Nicaragua.

New York City was about to break ground for a subway system. And six cities—Boston, Detroit, Milwaukee, Baltimore, Chicago, and St. Louis—had agreed to form baseball's American League.

Young Knudsen's first sight after passing the Verrazano Narrows was the Statue of Liberty, holding her barely discernible torch high in the fog. Then, as the ship swung past Governors Island, objects loomed out of the icy mist like giants from Norse legend.

They were the office buildings of Lower Manhattan, the first skyscrapers—the nerve centers of America's mightiest companies. Almost half a century later, Knudsen could recall each one.

There was the twenty-nine-story Park Row Building, topped by twin copper-tipped domes and deemed the tallest building in the world. There was the St. Paul Building, completed in 1898, twenty-six stories, or 312 feet from ground floor to roof. There was the New York World Building with its gleaming golden dome. In a couple of years, they would be joined by the Singer Building, rising forty-seven stories; the Woolworth Building at fifty-seven stories; and then, looming above them all, the Standard Oil Building, its 591-foot tower topped by a flaming torch that could be seen for miles at sea—a torch to match that of Lady Liberty herself.

"When you go to Europe," Knudsen liked to say, "they show you something that belonged to King Canute. When you go to America they show you something they are going to build." No king or emperor had built these mighty edifices, the twenty-year-old Danish immigrant told himself. No king or emperor had built this country of America. It was ordinary men like himself, men who worked hard, who built with their minds and hands, and became rich doing it. Signius Wilhelm Poul Knudsen was determined to be one of them.

He was one of ten children, the son of a Copenhagen customs inspector who had made his meager salary stretch by putting his offspring to work. Work for Knudsen had begun at age six, pushing a cart of window glass for a glazier around Copenhagen's cobblestone streets. In between jobs, he had squeezed in time for school, and then night courses at the Danish Government Technical School. Bill Knudsen was still a teenager when he became a junior clerk in the firm of Christian Achen, which was in the bicycle import business.

Knudsen's first love was bicycles. With one of Achen's salesmen, he built the very first tandem bicycle in

Denmark. In a country with more bicycles than people, he and his friend became minor celebrities. Soon they were doing stints as professional pacers for long-distance bicycle races across Denmark, Sweden, and northern Germany.

But Knudsen had bigger horizons. He knew America was the place where someone skilled with his hands and with a head for things mechanical could flourish. So he had set off for New York, with his suitcase and thirty dollars stuffed in his pocket. Years later, when newspaper articles described him as arriving as "a penniless immigrant," he would archly protest. "I wasn't penniless," he would proudly say. "I had saved enough to come with thirty dollars."

The Norge disgorged its passengers at Castle Garden, the southern tip of Manhattan. Before putting his foot on American soil for the first time, he paused for a moment on the gangplank to gawp at the new world around him.

A voice barked out from behind, "Hurry up, you square-headed Swede!"

From that moment, Bill Knudsen used to tell people, he never stopped hurrying. That is, until he became a living legend of the automotive industry—bigger in some ways than Henry Ford.

Knudsen landed a job not very far from where he had disembarked, in the Seabury shipyards in the Bronx's Morris Heights. Ironically perhaps, his first job in America was in the armaments industry. Knudsen found work reaming holes in steel plate for Navy torpedo boats for seventeen and a half cents a day, then graduated to join a gang of Irish riveters as the "bucker-up," the man who held the chunk of steel behind the hole as the red-hot rivet was hammered into place.

After a long day at the yards, he would go home by a steam-driven train on the Seventh Avenue Elevated to 152nd Street, where he had a shabby room in a boardinghouse run by a Norwegian immigrant named Harry Hansen. There he would wash away the soot and sweat, then head downtown to the beer gardens along the Bowery or to the saloons on Christopher Street in Greenwich Village, which was still a village. There a nickel bought him a dinner of roast beef, smoked fish, pickles, bread, and sliced onions.

"If I had to start over again," he said many years later, "I would start exactly where I started the last time." But it was sweaty, brutally tough work with brutally tough men. Bill Knudsen was big, almost six foot four. So his landlord was amazed when he came home after his second day in the yards with welts across his face, and an eye that was nearly swollen shut.

"What happened to you?" Hansen wanted to know.

"I got into a fight—with a little fellow," Knudsen muttered. "If I could have got my hands on him, I would have broken his neck. But I couldn't. He just danced around and did this—" He waved his arms around like a boxer, and then pointed to his wounds. "And then did this! Where can I learn to do it?"

So Hansen handed him over to a fellow Norwegian named Carlson, who taught boxing at the Manhattan Athletic Club at 125th Street and Eleventh Avenue. There Knudsen strapped on a pair of boxing gloves for the first time. Soon he became so adept at the pugilistic art that he was presiding champ of the shipyards—no small feat—and did amateur bouts at the Manhattan Club and all around New York.

From building ships he graduated to repairing locomotives for the Erie Railroad, and then in 1902 he got the opportunity he had been waiting for. It was a job building bicycles for a firm in Buffalo called Keim Mills.

Buffalo was already New York State's fastest growing industrial town, and John R. Keim was a Buffalo jeweler who had bought himself a bicycle factory. Knowing nothing about bicycles, he left the running of it to his shop superintendent, a Connecticut Yankee named William H. Smith.

Knudsen packed his suitcase and boxing gloves and took the train to Buffalo. If he imagined working in a bicycle plant meant making bicycles, however, he was disappointed. With the new century, the business had fallen on hard times and Keim was turning his machines over to other work. Some of it was for an inventor of a steam-powered horseless carriage called the Foster Wagon. Since Knudsen knew about steam engines, he found himself making engines for Foster.9 In the process, he also learned about machine tools, the machines that made machines, and about toolmaking—and how diagramming out tool-work problems on paper could speed up the manufacturing process.

After his work with machine tools, Knudsen took a course on steelmaking at the Lackawanna Steel Company plant, and later he and Smith developed their own steel alloy. Soon he was supervising the making of brake drums for a Lansing, Michigan–based company called Reo Motor Company, run by Ransom E. Olds. Olds had been making his version of the horseless carriage since 1886, but by 1904 he was finding plenty of competition from an upstart entrepreneur operating out of Detroit named Henry Ford.

Smith and Knudsen learned that Ford, who had been in business barely a year, was looking for someone who could make steel axle housings for his cars. They immediately bought train tickets out to Detroit and met Ford himself at his plant on Piquette Avenue. They spoke amid the placid and rhythmic clop of horses' hoofs and carriage wheels from the street outside, and came back with an order worth $75,000—the biggest in Keim's history.

The partnership would grow and prosper at both ends as the infant automobile industry grew. By 1908—the year the first Model T chugged out of the Piquette Avenue factory and entrepreneur Billy Durant founded General Motors—the twenty-nine-year-old Knudsen was general superintendent at Keim and employing fifteen hundred people. Three years later he proudly took a bride, a girl of German descent named Clara Elizabeth Euler. That same year, 1911, Ford was impressed enough with the Keim operation that he bought the whole company outright. Knudsen suggested Ford think about assembling Model T's right there in the Buffalo plant, as well as in Ford's brand-new setup in Highland Park off Detroit's Michigan Avenue.

Knudsen spent weeks arranging the tools and machines on the Keim floor in order to put together the Model T components. He taught his mechanics how to assemble the car in separate stages, from bolting together the chassis to trimming the body and varnishing. Then one morning Knudsen was stunned to come in and find all the machines idle.

The Keim workers told him they were on strike. They had decided they didn't like the piecework rates they were being paid on some of the outside contracts. Knudsen couldn't believe they were so shortsighted as to break off building the country's fastest-selling automobile over a minor contract dispute. But the men wouldn't budge. He decided this was a crisis requiring the advice of the owner himself. At great trouble and expense, Bill Knudsen managed to reach Ford on the primitive telephone in the Keim office.

Ford listened and said, "That suits me. If the men don't want to work, get some flatcars and move the machinery to Highland Park."

Three days later it was done. Then Ford ordered Knudsen himself, William H. Smith, and other key Keim managers out to Michigan.

They were now part of the team running the most famous factory in the world.

Nineteen hundred and twelve was a crucial moment in the evolution of Ford's business. His Model T consisted of nearly four thousand separate parts. Eight years earlier Walter Flanders, a veteran machinist who had dropped out of grade school and gone to work at Singer Sewing Machine, had shown Ford the value of making as many parts as possible interchangeable. These eliminated the need for custom or form fitting, which slowed production to a crawl. Flanders also showed him and his young engineers—Carl Emde, Peter Martin, and another Danish immigrant named Charlie Sorensen—how to arrange their machines in a priority sequence so that tools and parts were easily accessible.

Flanders had just taught them the rudiments of assembly line production. Ford was lucky to have on hand young engineers like Martin and Sorensen, men whose idea of fun was breaking the assembly of a Model T down into eighty-four discrete stages—from forging the crank shaft and drilling out the engine block to stuffing the seat upholstery—then lining them up to form a single process. Highland Park became the first mass-production assembly line in automotive history. When Knudsen arrived, they were making a Model T every hour and a half, at a rate of five hundred a day.

Outsiders treated Highland Park as a manufacturing miracle. People toured the factory and snapped pictures (Ford sensed that inviting visitors, even other automakers, to see his assembly line would only enhance its mystique).14 Others tried to reproduce its elements, without success. But when Bill Knudsen arrived, he found the surroundings looked rather familiar. He realized he and Smith had used the same techniques at Keim for stamping steel parts for fenders and doors and for Ransom Olds's brake drum assemblies. Instead of being mystified or dazzled by Ford's accomplishment, Knudsen set about finding ways to make it work at a whole new level.

He had learned other things at Keim, especially from its manager William Smith. He had learned he had a special gift for making something with his hands while visualizing its outcome in his mind—and he learned the value of practical experience. When Knudsen was trying to save enough money to get an engineering degree at Cornell University, Smith had told him, "You're a better engineer right now than any college graduate I have ever seen," and he was right.

When Keim was first contracted to assemble Ford cars, Smith had a Model T delivered and then he and Knudsen spent the day taking it apart and putting it back together again. Then Knudsen drove it around the plant floor—it was the first car he had ever driven—and out the door. He took Smith home and then drove to his lodging, where he stayed up half the night studying the transmission and gear system. "By the time I went to bed," Knudsen later remembered, "I had a good working knowledge of the Model T."

From Smith he also learned certain economic lessons. Smith made Knudsen think about a factory as something more than a place for making things. A factory is a place for wealth creation, his mentor would tell him, and a place for practicing the dignity of work. There is something sacred about work, about an honest productive effort that earns the wages that are the foundation of home and health, education and security—and the foundation of the America the Danish immigrant had fallen in love with.

Knudsen took to Ford for the same reason. Its owner paid his men a standard five-dollar-a-day wage and looked out for their welfare. But above all, the factory floor at Highland Park offered a fascinating array of problems and challenges, into which he jumped with the same enthusiasm as a conductor with a new orchestra.

"It takes us too long to make cars," Ford told him the first day. "We are beginning to get good materials, but

we are not moving ahead as fast as we should.?.?.?.?That’s what I want you for.” Ford and his engineers had figured how the assembly line worked. Knudsen’s ultimate feat was to figure out why it worked, and how to make it a continuous process.

Users Review

From reader reviews:

Jennifer Perez:

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