Car

Care makes the Car

THE MEN AND METHODS BEHIND NASH VALUES

THE MEN AND METHODS

NASH SALES TRAINING PROGRAM

"Care Makes the Car"

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FOREWORD

The purchase of a motor car is a serious business. It is one of the major investments of a lifetime to most of us.

Good buymanship begins with knowing something about the background of any product. This is doubly important in the case of a motor car—not only because of the expenditure, but because it has long involved accepting in good faith the word of the manufacturer as to the quality of many by-products hidden beneath the surface.

While it is true that all cars are well built today, it is also true that some cars are built better than others. Where men, methods, materials, and many complex production problems are involved, standards must necessarily vary.

THE PURPOSE OF THIS BOOKLET

This booklet was prepared to tell you about the men, methods, and materials involved in the building of Nash cars. We would like to take you behind the scenes, into the great Nash plants, where you can see for yourself how Nash cars are made—from design to finished product.

Here you will learn the all-absorbing story of a great company—the fourth largest concern in one of our most outstanding industries.

Here you will gain a better understanding of the aims and achievements of the Nash organization, of its policies and personnel.

The Nash goal of "quality in every part—top value in every product" will, we feel sure, become an accepted fact in your mind.

. . . and now let us take you through Quality Headquarters . . .

CARE MAKES THE CAR

ANNOUNCER: Many Nash owners—and thousands of other informed people who have had a chance to learn at first hand about Nash quality—have often asked themselves how in the world can so much quality be built into any car at such low Nash prices!

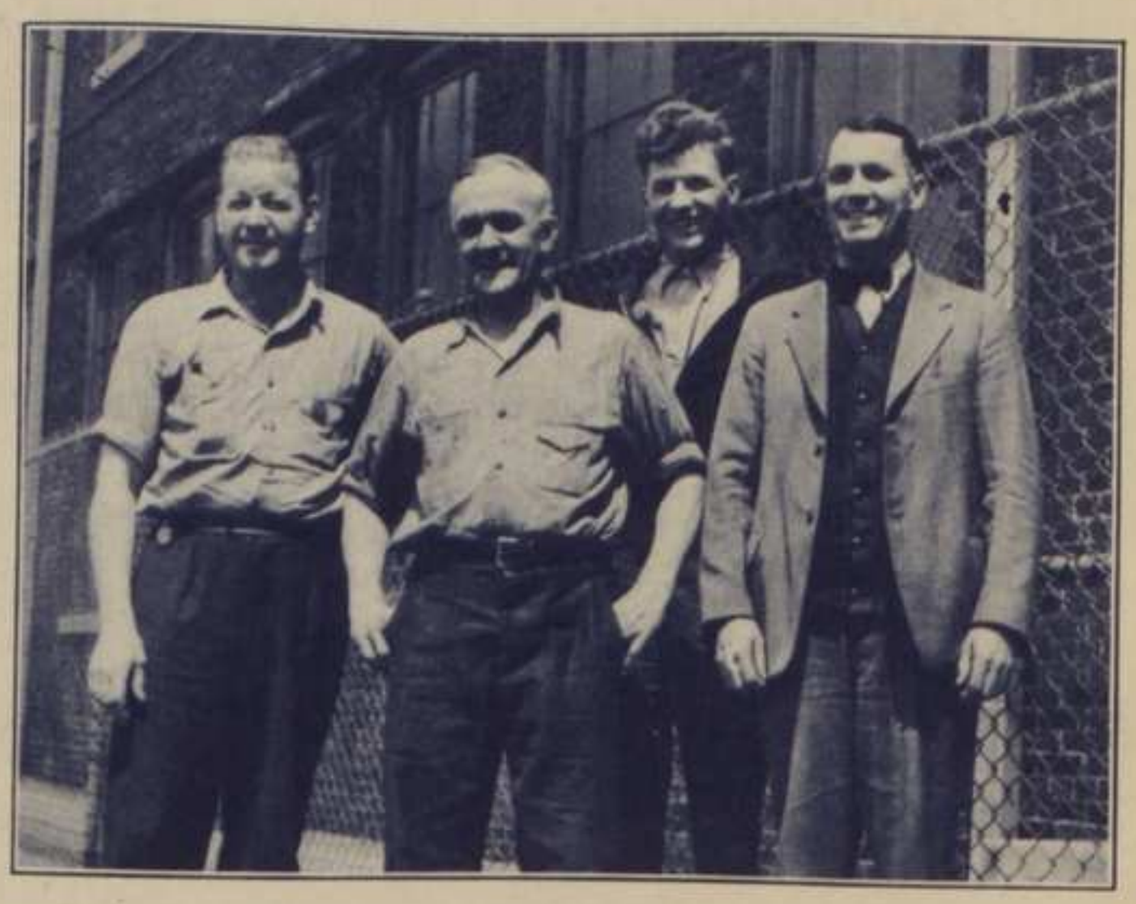
The answer to this question lies in two Wisconsin cities—Kenosha and Milwaukee . . . where Nash quality grows from a designer's dream of something newer, something better into cars which not only are years ahead in outward beauty, but which also are just as far ahead in deep-seated, bed-rock quality.

Nash is proud to invite you to Quality Headquarters—to the one hundred and two acre Nash plant at Kenosha—one of the most self-contained and complete automobile plants in the world . . .

And also we'd like to have you meet some of the men who build Nash cars—for we are as proud of them as of the cars themselves. Probably no automobile company employs such a high percentage of stable, well-educated, self-dependent and quality-conscious workmen as Nash—contrasted with, for instance, the transient, or "floating" labor found in so many industrial centers.

Many Nash families are represented by three generations of fine craftsmen at the Nash factories . . . grandfather . . . father . . . and son. Long-time employment at good wages has enabled an exceptionally big percentage of them to own their own homes . . . to send their children through high school and often college . . . to enjoy the good things of life in accordance with the American and Nash ideals of honest reward for honest labor.

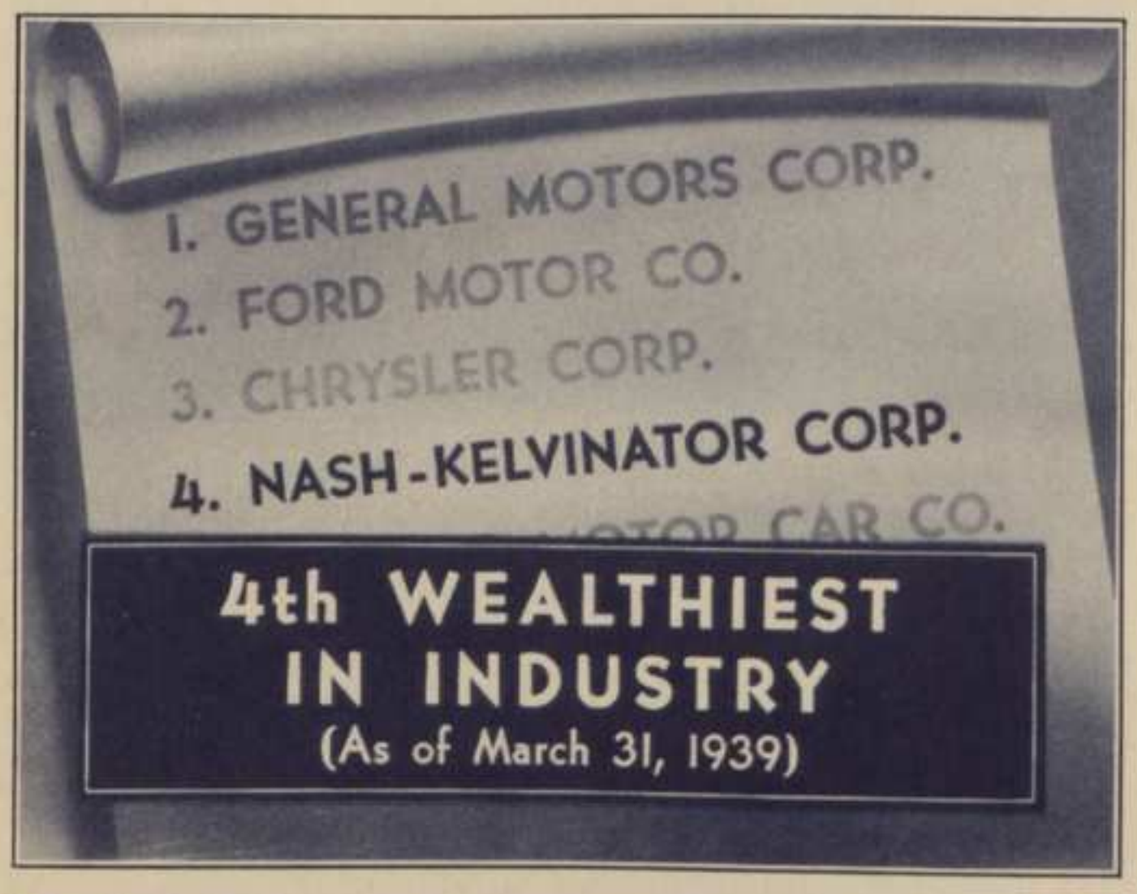
. . . and to the five story, thirty-three acre *body* plant at Milwaukee—which unquestionably *is* the most complete and most modern body plant anywhere on the globe. We're going to take you through these plants today—and show you the fascinating manufacturing and scientific marvels which make them unique in the industry.



Altogether, Nash gives employment to six thousand workmen in the Wisconsin factories . . . as well as affording a livelihood to six thousand dealers and salesmen. Counting dependents probably sixty thousand people throughout the country rely directly on Nash for a living. And Nash is a good company to rely on.

It is the fourth wealthiest automobile company in the United States—ranking in resources next to General Motors, Ford, and Chrysler.

Nash is one of the *oldest* of the automobile companies—builders of quality cars since 1916, almost a quarter of a century—yet young in spirit and progressive in attitude.



The Nash-Kelvinator Corporation has no bonded indebtedness of any kind. It is solidly financed, with over sixty-two million dollars of assets.

The recent union with Kelvinator to form the Nash-Kelvinator Corporation has made Nash's always strong position even stronger. Nash is big enough to pass on to buyers every advantage of mass buying of raw materials, mass production of finished cars, and the economies of latest and most efficient methods.

For instance, Nash recently spent several million dollars for routine plant expansion and modernization. Only a *big* company could afford such an expenditure but every dollar spent means more modern methods, more efficient manufacturing, more value in the finished car.

Every Dollar Spent Means:

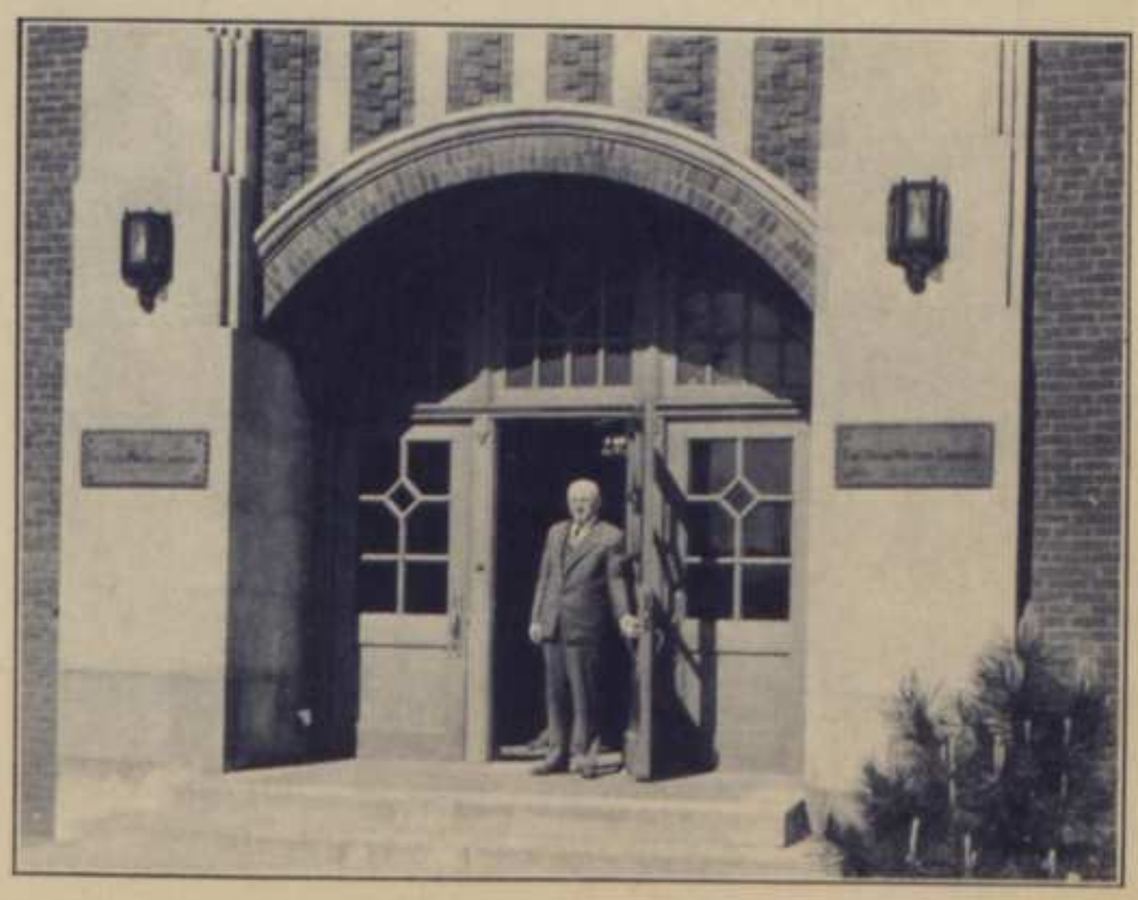
- MORE MODERN METHODS
- MORE EFFICIENT MANUFACTURING
- MORE VALUE IN THE FINISHED CAR

Yet, big as it is, Nash on the other hand, is small enough so that the world-famous Nash quality standards can be and *are* maintained with unhurried craftsmanship—not swallowed in break-neck production.

Once a week the top executives of all departments—engineering, manufacturing, service—must come together, no matter how busy they are.

Nash guards these standards so zealously, in fact that once a week the top executives of all departments—engineering, manufacturing, service—must come together, no matter how busy they are in what is called the Product Quality Meeting—not a monthly or a yearly but a *weekly* review of materials, methods and designs, for the purpose of maintaining the highest possible standards of quality, precision, and efficiency and to insure the closest and most progressive cooperation of all departments in developing *new* improvements and building better and better cars.

Now, as we approach the administration building, we find a pleasant surprise awaiting us, for Nash has placed a special guide at our disposal. He's neither a technician nor an engineer, but a veteran Nash inspector who knows how to describe technical things simply—and who has had almost a lifetime of association with Nash principles and methods. Ladies and gentlemen of the audience, let us introduce you to Herb Ritter.



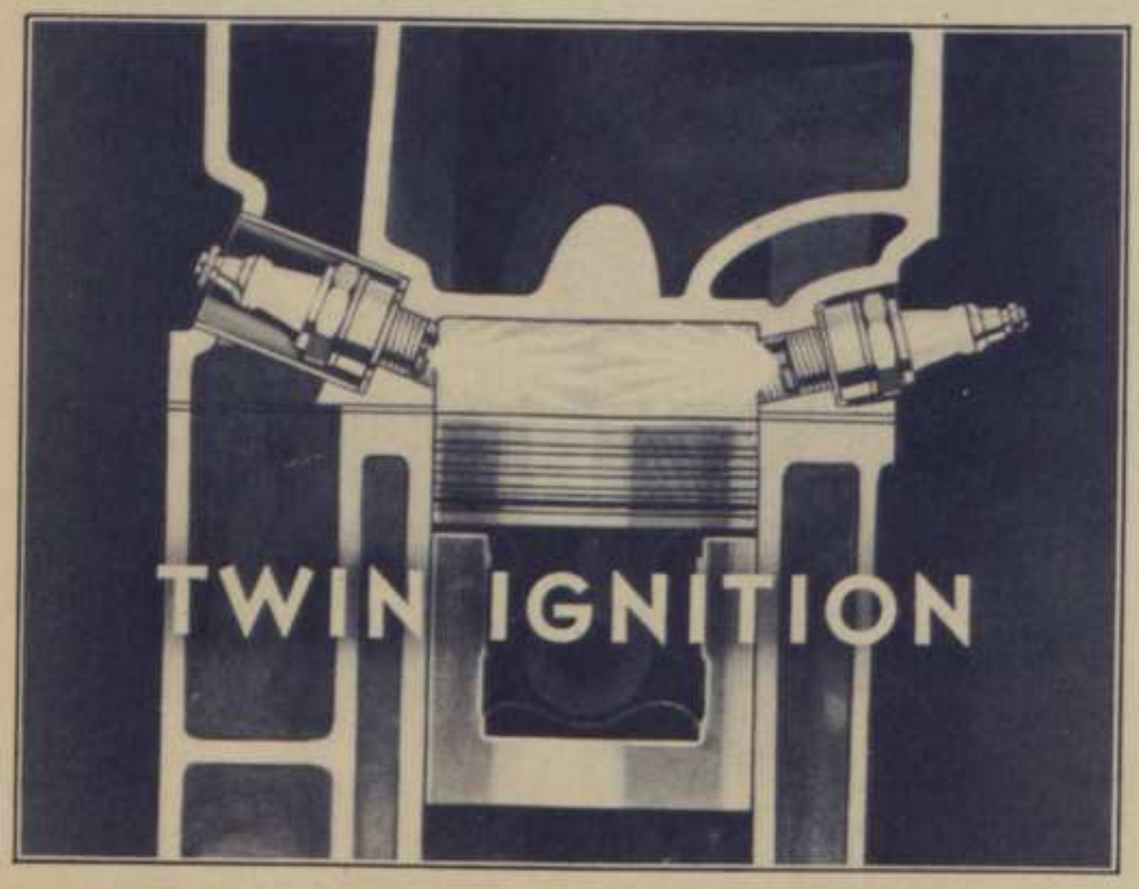
HERB RITTER: Hello, folks. Well, I'll do my best to show you some of the reasons why we at Nash are proud of the cars we build and the plants we work in.

And we'll start at what might be called the nerve center of all Nash operations—the engineering department. Although we never say this to their faces, we're mighty proud of our engineering department. And we have a right to be!

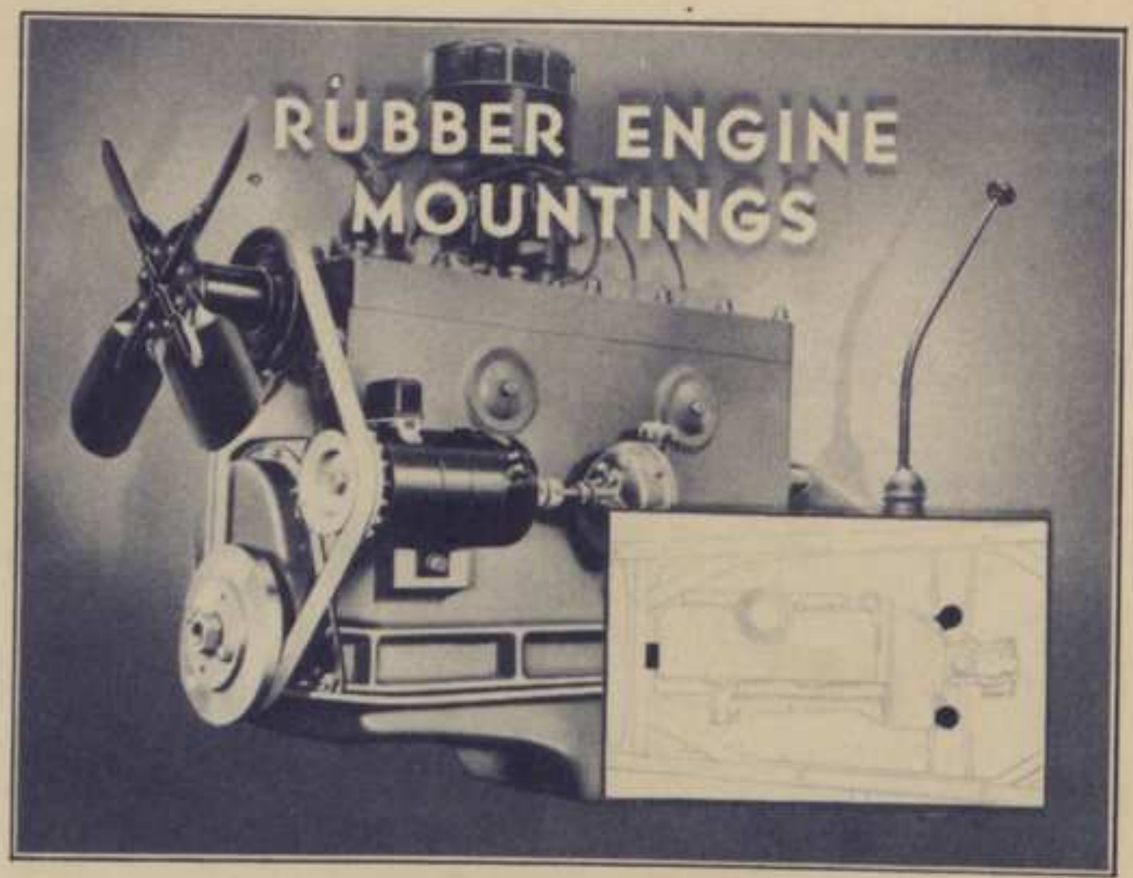
Few companies can lay claim to as many important "firsts" in automobile design as can Nash—and these are the men who created them! Such great engineering advances as . . .

The nerve center of all Nash operations—the engineering department.

. . . Monitor-Sealed Manifolding! . . . An exclusive feature which helps explain Nash's amazing performance and economy . . .

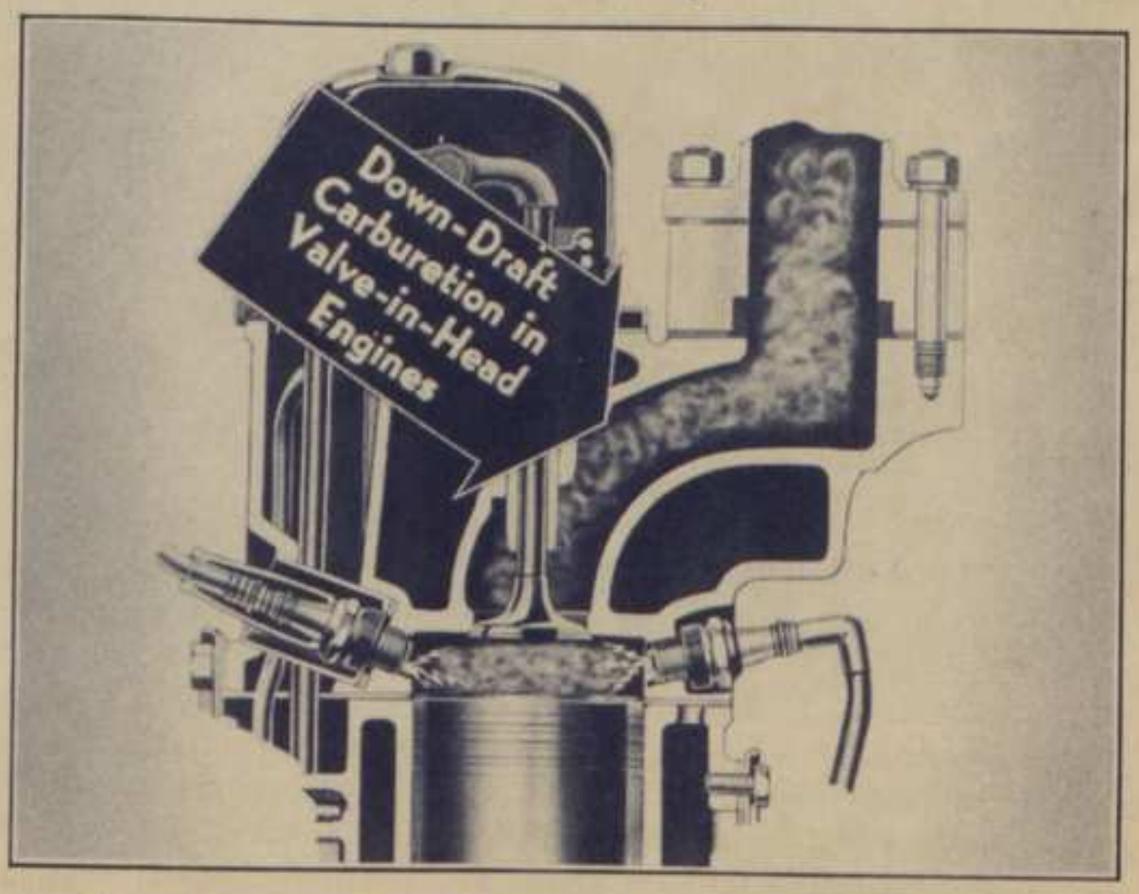


. . . Twin Ignition for medium price cars . . . A fine-car feature which Nash alone has brought to the medium-price field . . .

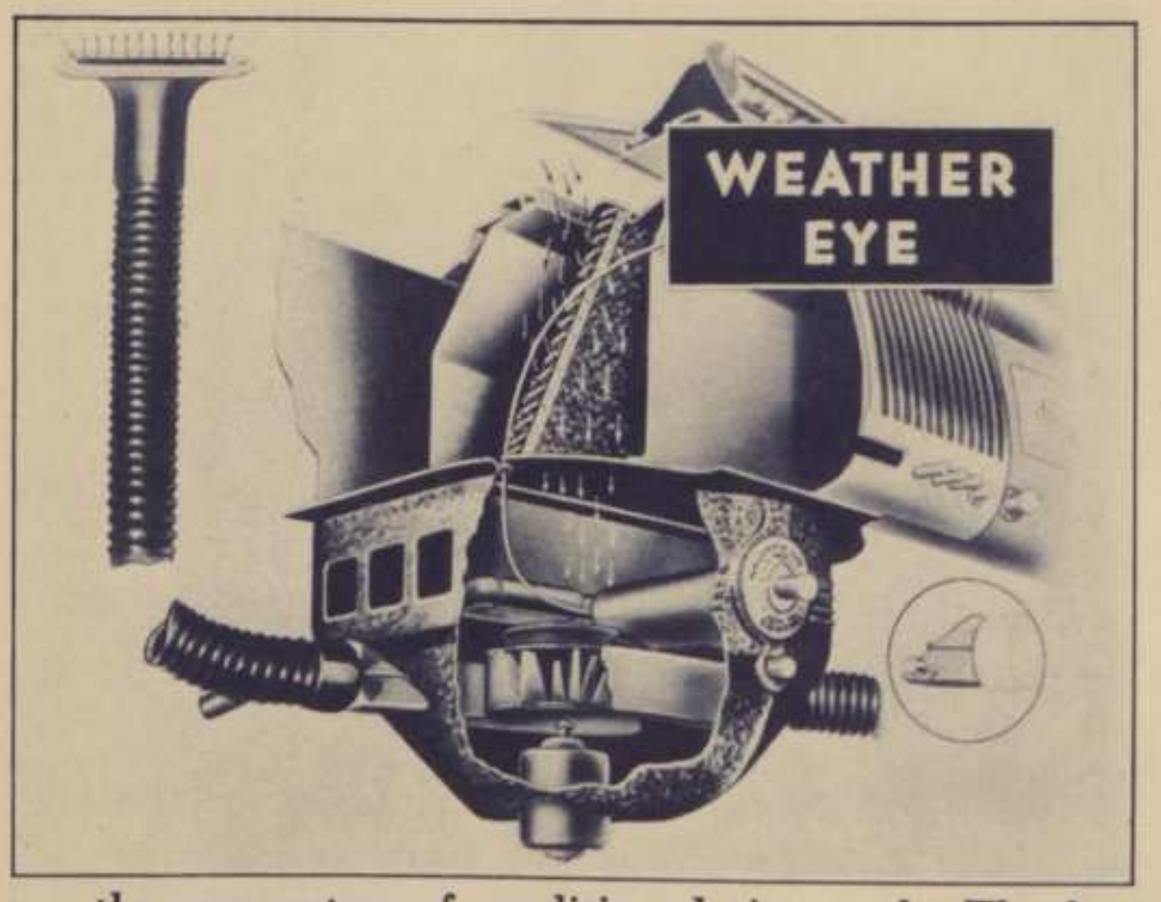


. . . rubber engine mountings, first used in any car by Nash . . . one secret of the quietness and smoothness of Nash engine performance.

. . . synchronized springing, requiring no additional lubrication . . . the famous "first" which added so much to everyone's conception of riding comfort . . .

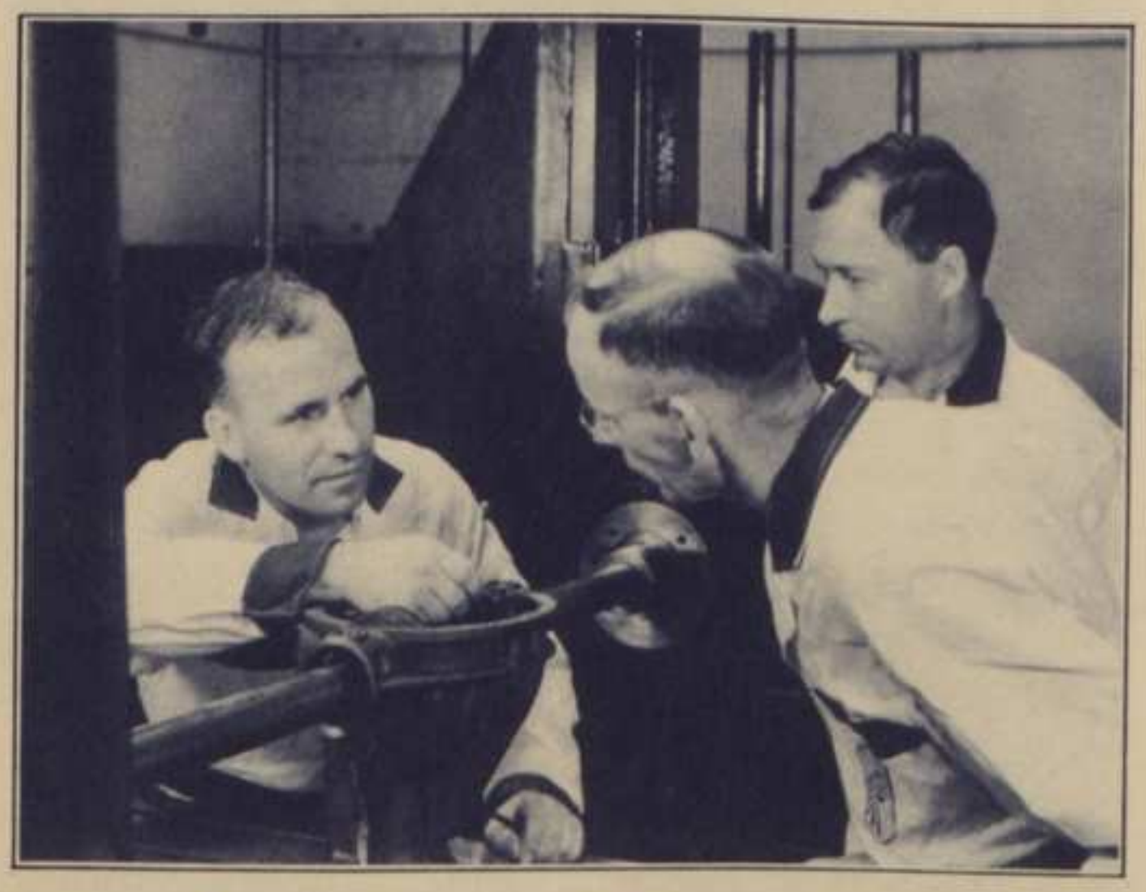


. . . down-draft carburetion in valve-in-head engines . . . another reason for the amazing Nash fuel economy . . .



. . . the new system of conditioned air . . . the Weather Eye . . . the greatest comfort "first" perhaps, in all automobile history and a long list of other "firsts" which were developed in this department. No wonder we're proud of our engineers! And as an idea is conceived every detail first is accurately worked out on paper in the form of a blueprint, in our engineering drafting department.

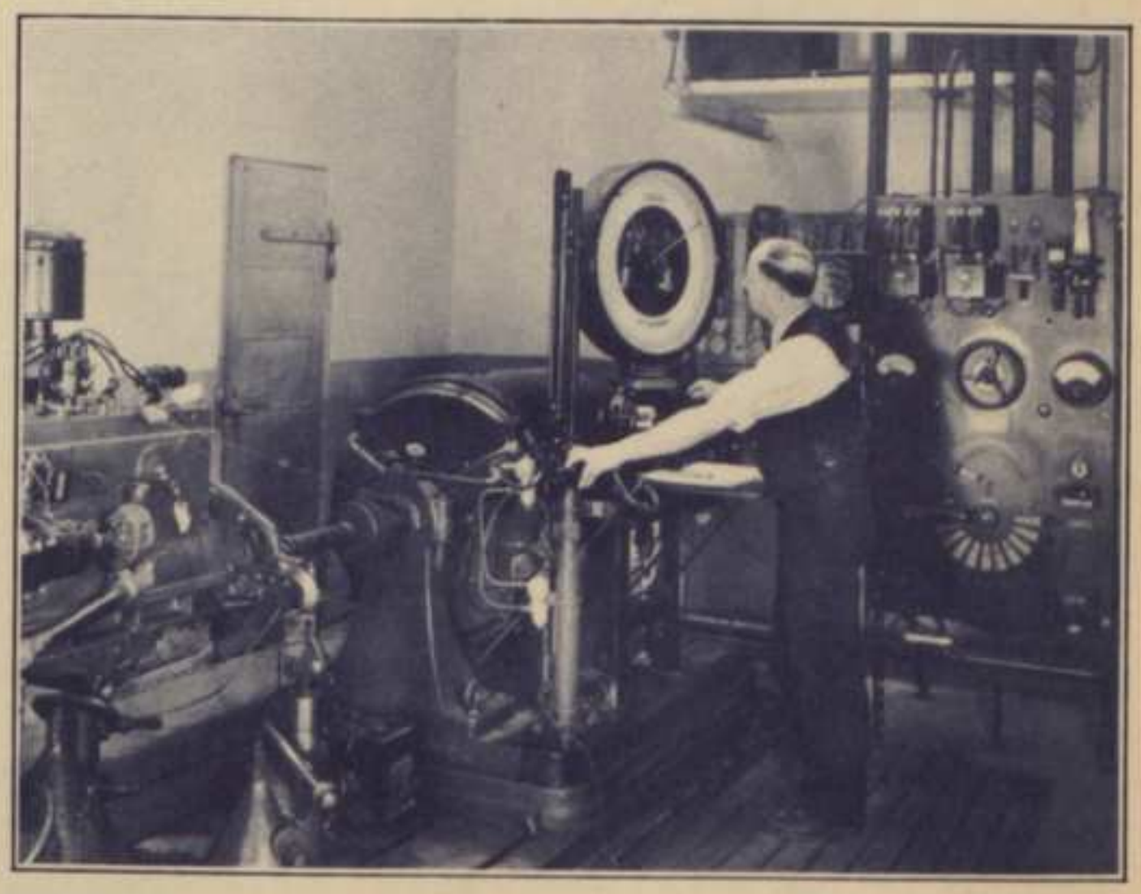
Then the men in the Nash experimental engineering laboratory get busy, for everything at Nash has to be tested for weeks and months before something new is adopted for manufacture. In this laboratory are all the tools needed for building a complete car by hand. A newly designed part or feature is built here for experimental purposes and then endlessly tested.



This machine, for instance, will give a valve spring more wear in a few days than the ones in your car will get in years.

Here's a dynamometer . . . and, believe me, what a Nash engineer cannot learn about any engine from this device just simply isn't worth knowing. Performance, fuel economy, horsepower, torque and other things. From this department experimental and stock cars stream daily to roads . . .

. . . where they are given the toughest possible tests, day after day and week after week, until our engineers have found out exactly how they perform and stand up under all conditions. In addition, test cars are sent to far away places . . . to Death Valley . . . to the Rockies . . . to the back country . . . to the cold North . . . to be tested and re-tested under every kind of condition Nash owners may ever encounter anywhere in the world . . . for Nash does not rely only on specially built tracks where cars are tested under laboratory rather than actual conditions.



Not only Nash cars, but cars of all makes are tested—torn apart and rebuilt—so our Nash engineers always know what's going on in the rest of the industry.

Now, let's leave the engineering laboratory and step into another laboratory, where—not cars—but materials and tools undergo constant testing. This is the Chief Inspector's laboratory, where we check . . .

. . . the strength and hardness of our steels . . .

. . . the shade and tone of upholstery material . . .

. . . the quality of our safety glass and the accuracy of factory gauges and tools. Nash standards are so strict that many gauges, for instance, must be accurate to one ten-thousandth of an inch. They're checked frequently by

Johansson Master Gauge blocks . . . which are accurate to two one-millionths of an inch. Have you any idea how small these measurements are?

Well, if you could split the average human hair lengthwise into sixteen parts, each part would be approximately one ten-thousandth of an inch wide. And as for the even smaller measurement—two one-millionths of an inch . . . a human hair split lengthwise into eight hundred parts would equal approximately two one-millionths of an inch.

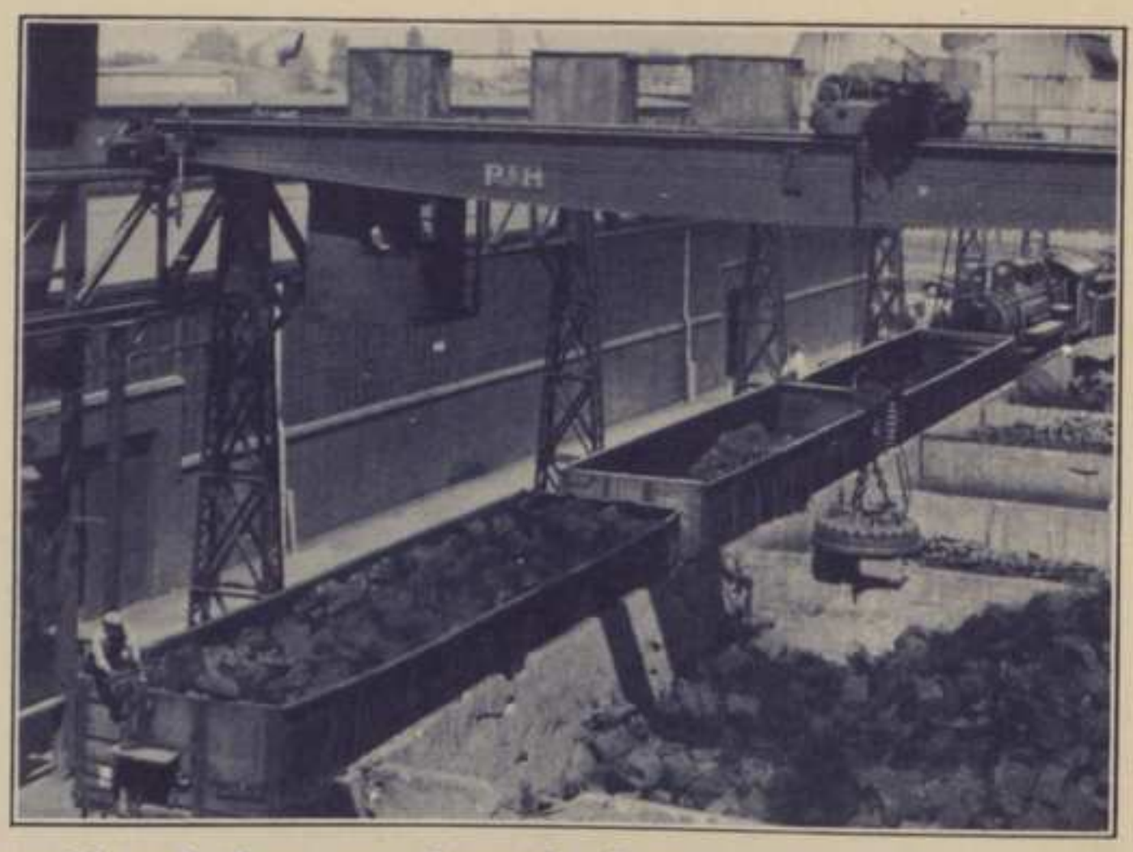
And now—having seen a little of what takes place before manufacturing even begins—let's get a quick idea of the steps that are necessary for turning advanced design and high quality into finished cars. Let's trace first the development of the Nash engine—which we men who make it know is the finest power-plant of its size in the world. First, we'll go to the foundry—and there . . .

. . . I'm going to let Bill Hughes, one of the foundry foremen, tell you about the important steps in his part of the Nash manufacturing operations. How about it, Bill?

BILL: Glad to, Herb.

Here's where the raw materials arrive, folks, and you can bank on it that the raw materials Nash uses are as fine as in any engine in the world.

After cooling, the two engine blocks are taken out of the



mold and then are cleaned, shot-blasted, and painted. Then they're ready for machining.

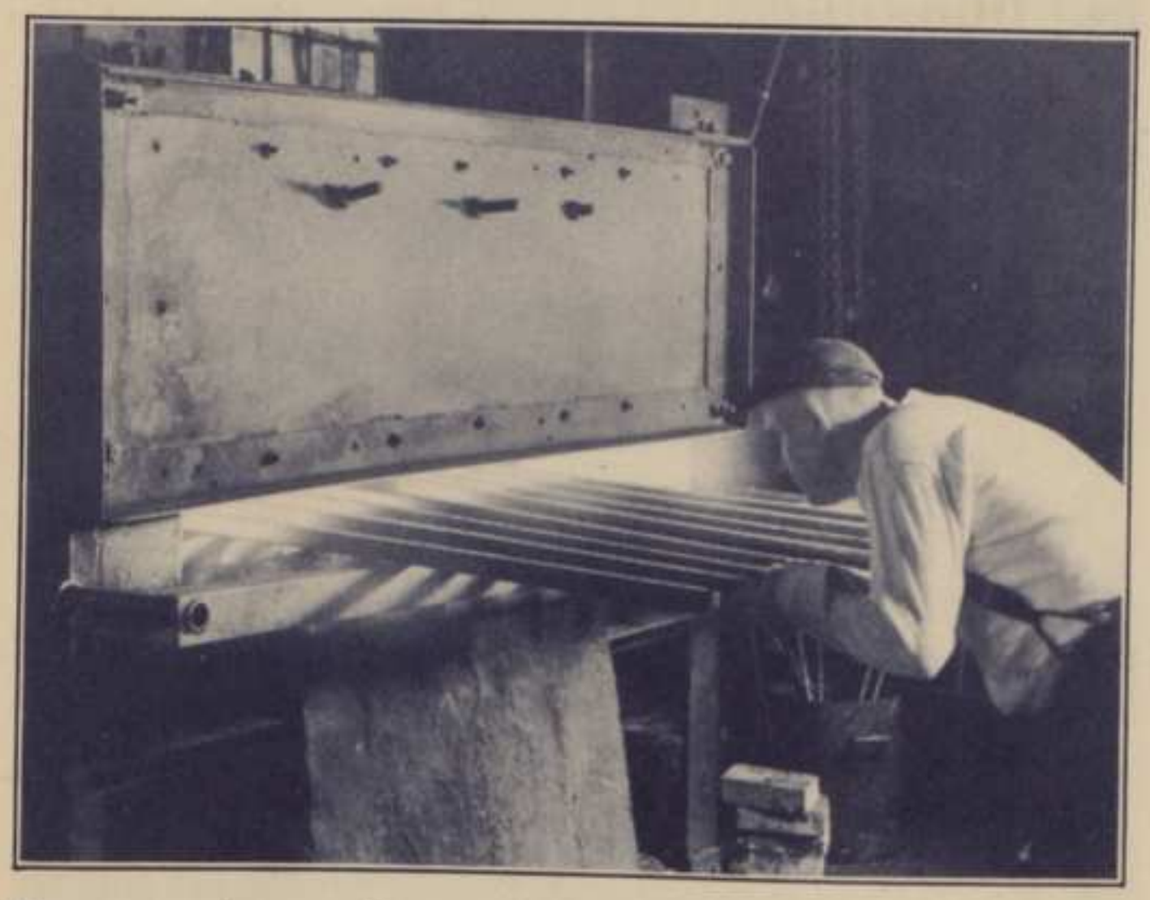
There, Herb. I guess that gives your friends a rough idea of what we do in the foundry.

HERB: Thanks a lot, Bill. Now, let's leave the foundry . . .

. . . and step into the Nash forge—where those parts of the engine which are not cast are forged from fine steel. Let's take, for instance, the connecting rod which begins as a bar of very tough high-carbon steel.

First, it's heated to a malleable state in this furnace, at a temperature of from twenty-one hundred to twenty-one hundred and fifty degrees Fahrenheit.

Then it's placed between the dies of this hammer, and . . .



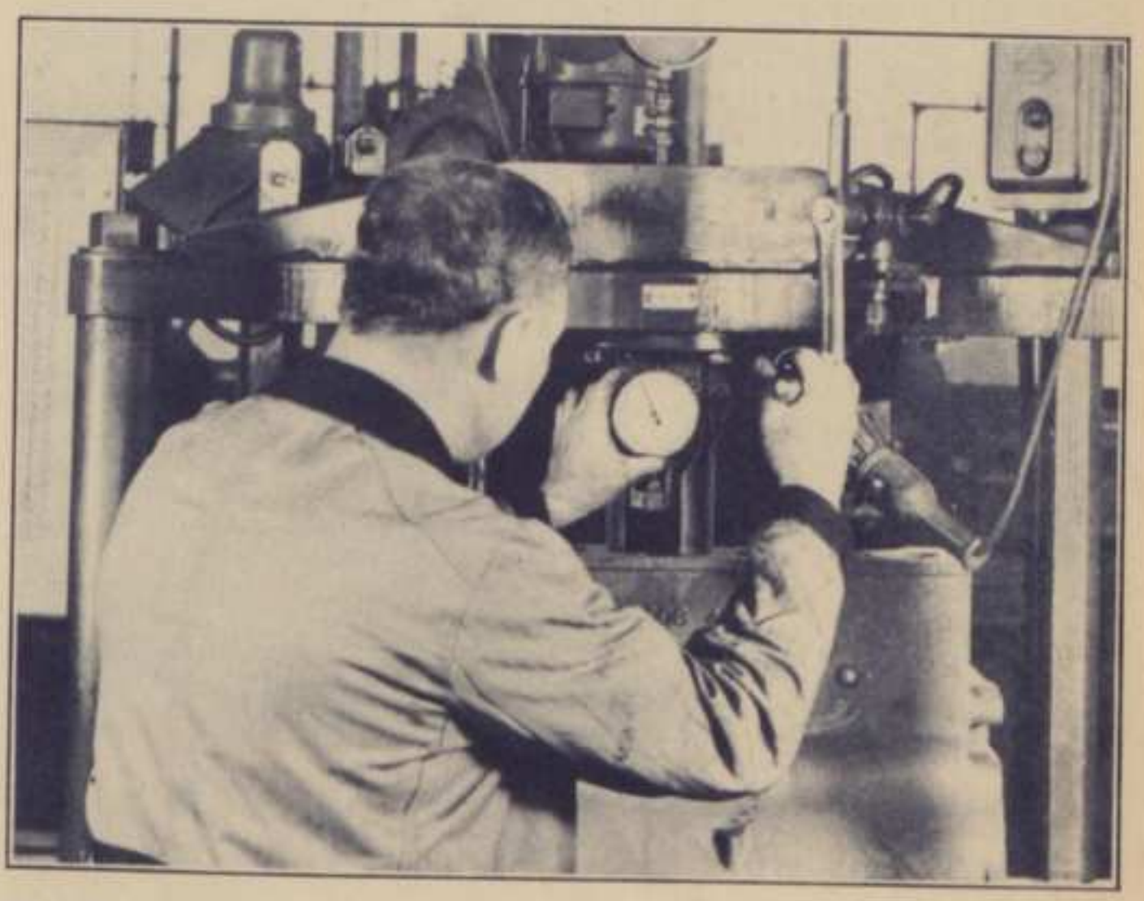
Fourteen thousand pounds of pressure form it into the rough shape eventually to be required of it.

Then, back to the furnace it goes for "heat-treating." Heat-treating is a quality step we take in the case of *all* forgings . . . to obtain a fine balance of all the most desired physical properties of the steel. After this . . .

. . . comes another rigid Nash inspection. Every connecting rod . . . every camshaft . . . every steering knuckle . . . every other Nash forging must meet any one of several tests for hardness.

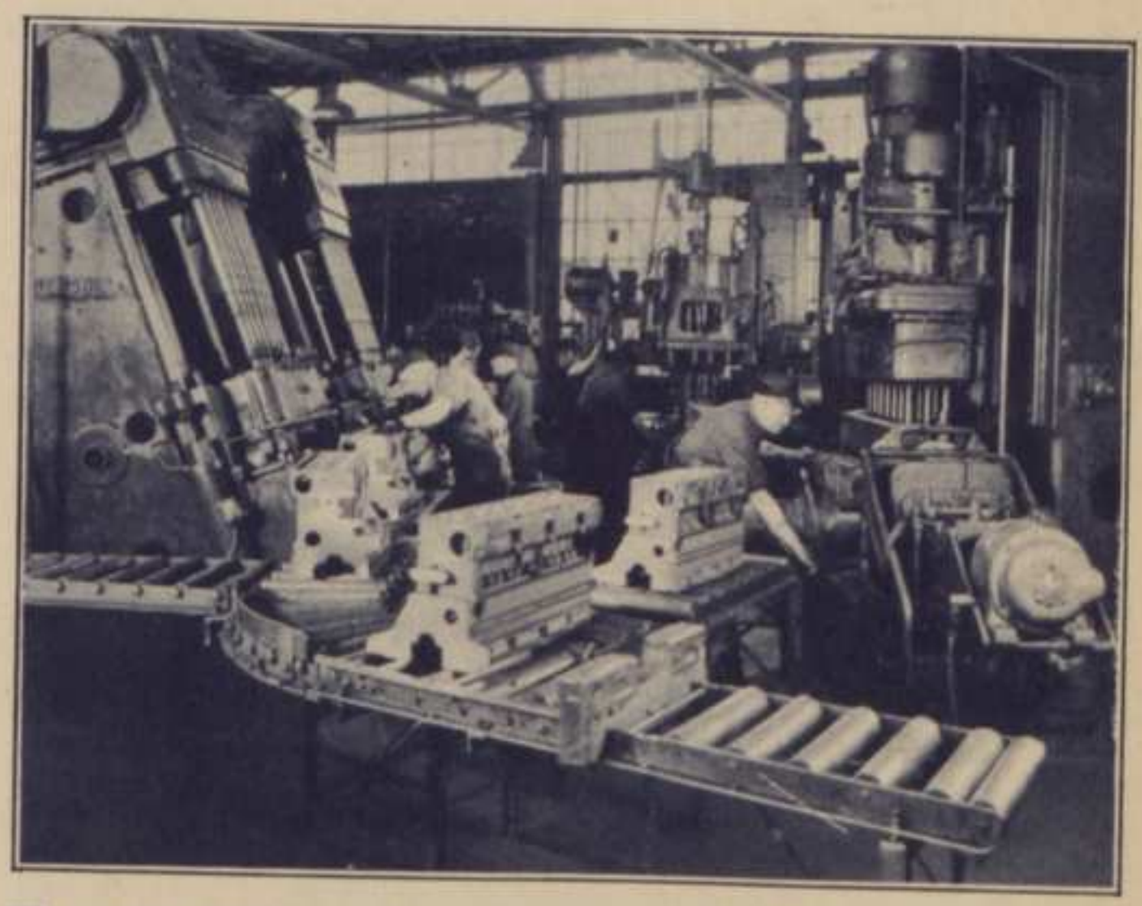
Fourteen thousand pounds of pressure form it into the rough shape eventually to be required of it.

Many companies rely on sample testing . . . choosing a few samples at random for testing, and letting the rest go. But we don't. We feel that every Nash buyer has the same right as any other to be sure that the parts of his car have been completely tested. For instance, every engine block—not just a few, but every one of them—is tested for surface and cylinder wall hardness in this precision testing machine. Hardness, of course, means longer wear.



To the average visitor, this Nash machine shop seems a bewildering place—yet actually order and efficiency rule every inch of it. Let's look at just a few of the most important operations, such as the boring, reaming, lapping, and polishing of cylinder walls—each separate step contributing to the final mirror-like finish of Nash cylinder walls, giving extra smoothness and economy to Nash performance.

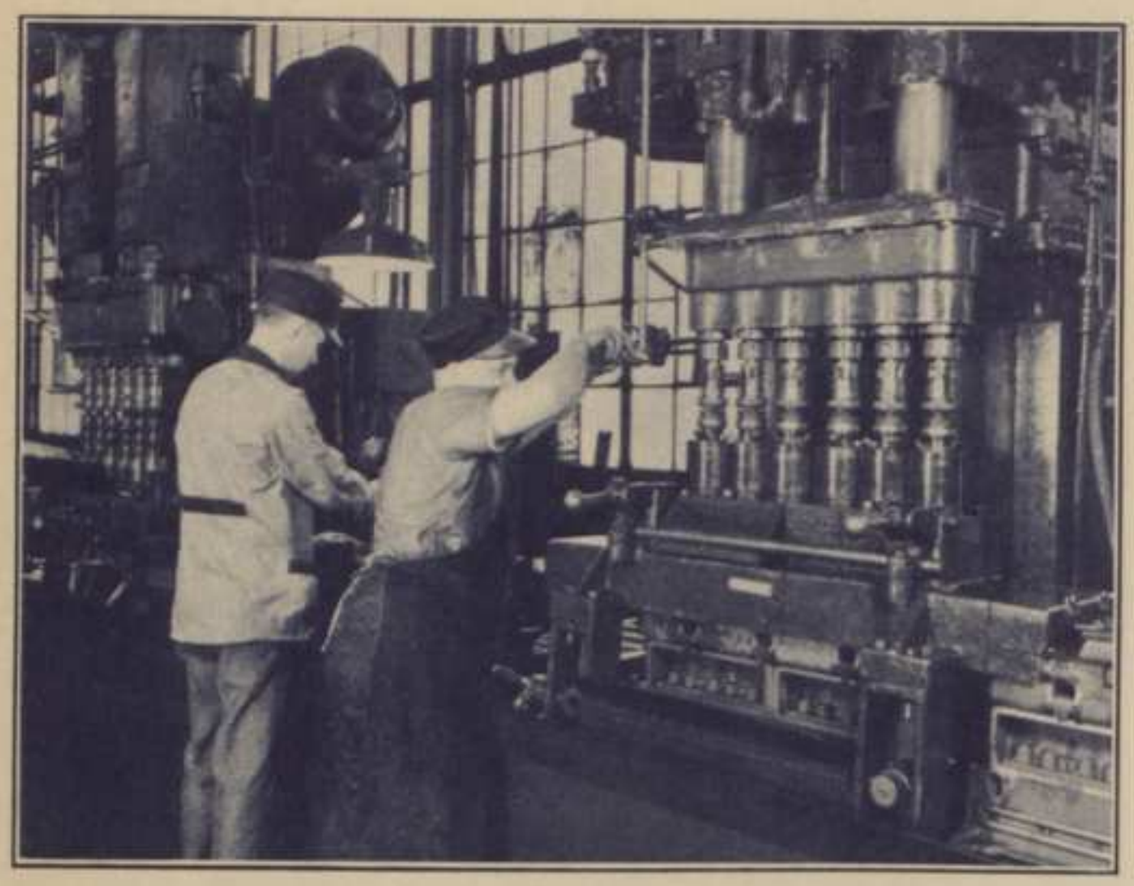
The boring, reaming, lapping, and polishing of cylinder walls.



The rifle-drilling of connecting rods. Rifle-drilling, you know, consists of drilling a small hole the entire length of the connecting rod—so that oil can be forced clear up to the piston pins and cylinder walls.

The finishing of the seven and nine-bearing crankshafts. Our crankshafts, by the way, have from three to five more main bearings than any other cars in the Nash price fields—and each of those extra bearings mean extra smoothness and longer life.

Next we find the precision balancing of crankshafts—an operation so delicate that if you put a wad of gum on the end of the crankshaft during any of several tests, it

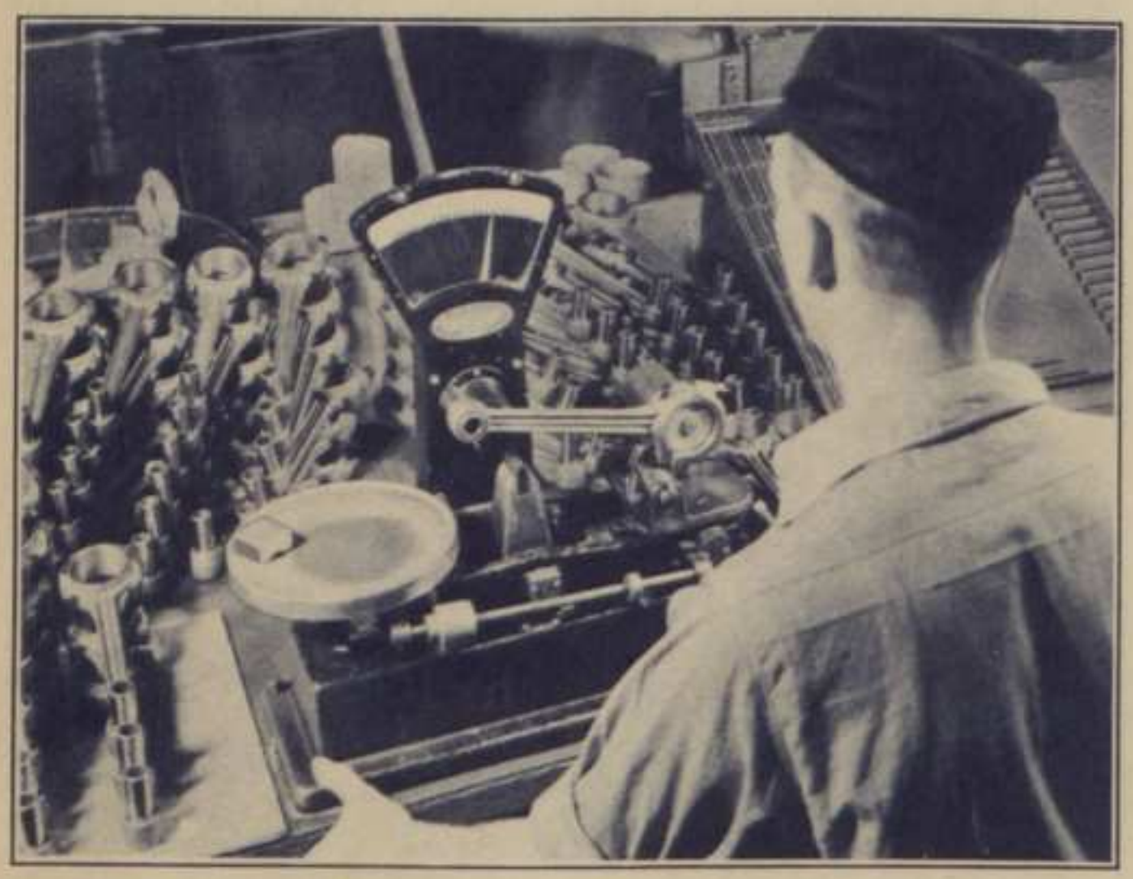


would throw the shaft out of balance eight times farther than Nash standards permit.

Then comes the individual weighing of connecting rods —which are matched in sets of six or eight of exact weight and marked for use in the same engine. This is another way of guarding the engine smoothness and efficiency which Nash buyers demand.

Plus the inspection of every piston, to see that it meets every Nash specification within tolerances too accurate to grasp.

Now comes the job of weighing the pistons and matching them in sets of exact weight . . . and finally . . .



. . . pull-testing of pistons in cylinders . . . a test of almost unbelievable accuracy to make sure the fit is perfect. Believe me, cylinders and pistons that pass this test are going to give the owner the kind of smooth, silent, long-wearing operation people expect of a Nash.

And now—with every part precision machined, precision tested, its quality proved clearly to be equal to rigid Nash standards . . .

. . . the engine blocks go on the engine assembly line . . . where, step by step . . . the engine is assembled.

. . . and finally, the assembled engine comes to the end of the line, with every part and attachment in place except the oil pan.

Oh, Al!

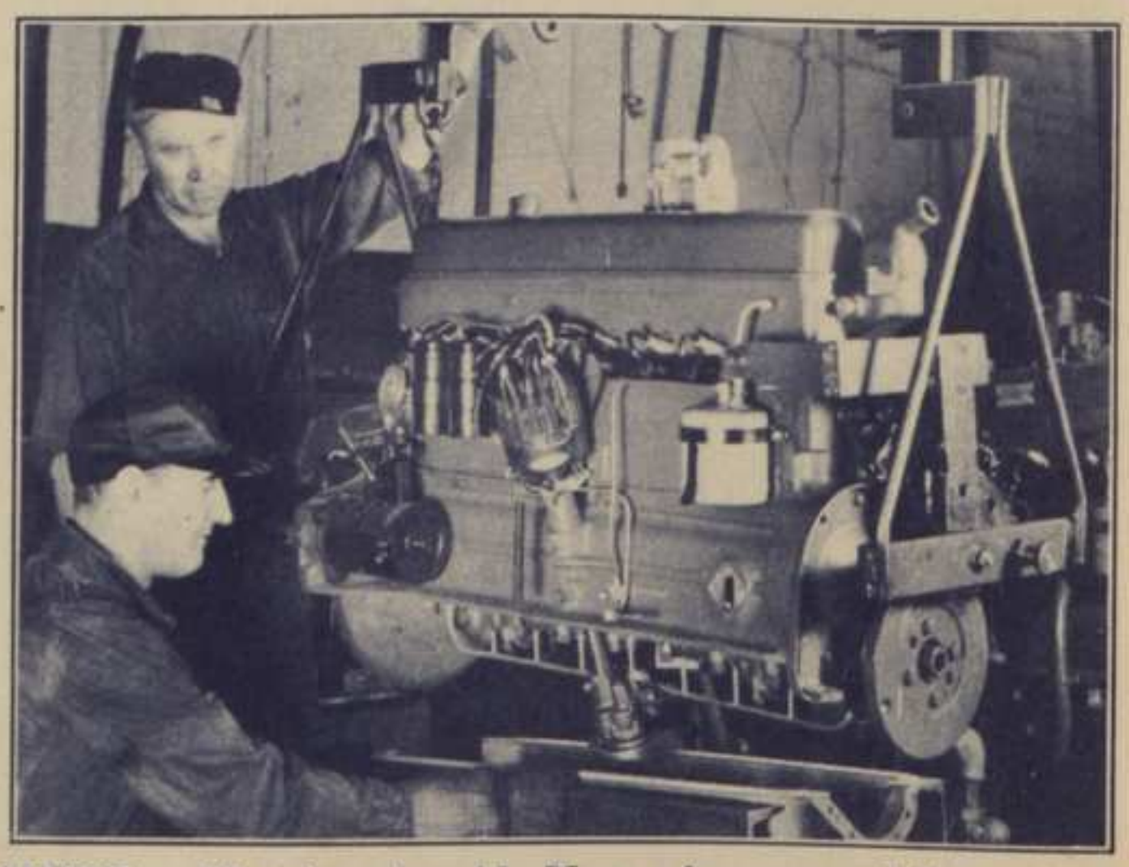
AL: Yeah,—Herb?

HERB: Tell these folks why the oil pan is the only part left off the engine during final engine assembly.

AL: That's for the final engine test.

You see, every engine is lowered onto a stationary oil pan during final testing and run in for two hours during this test. Before we're through with this test, we know that the completed engine is able to live up to Nash standards for performance, economy, and trouble-free wear.

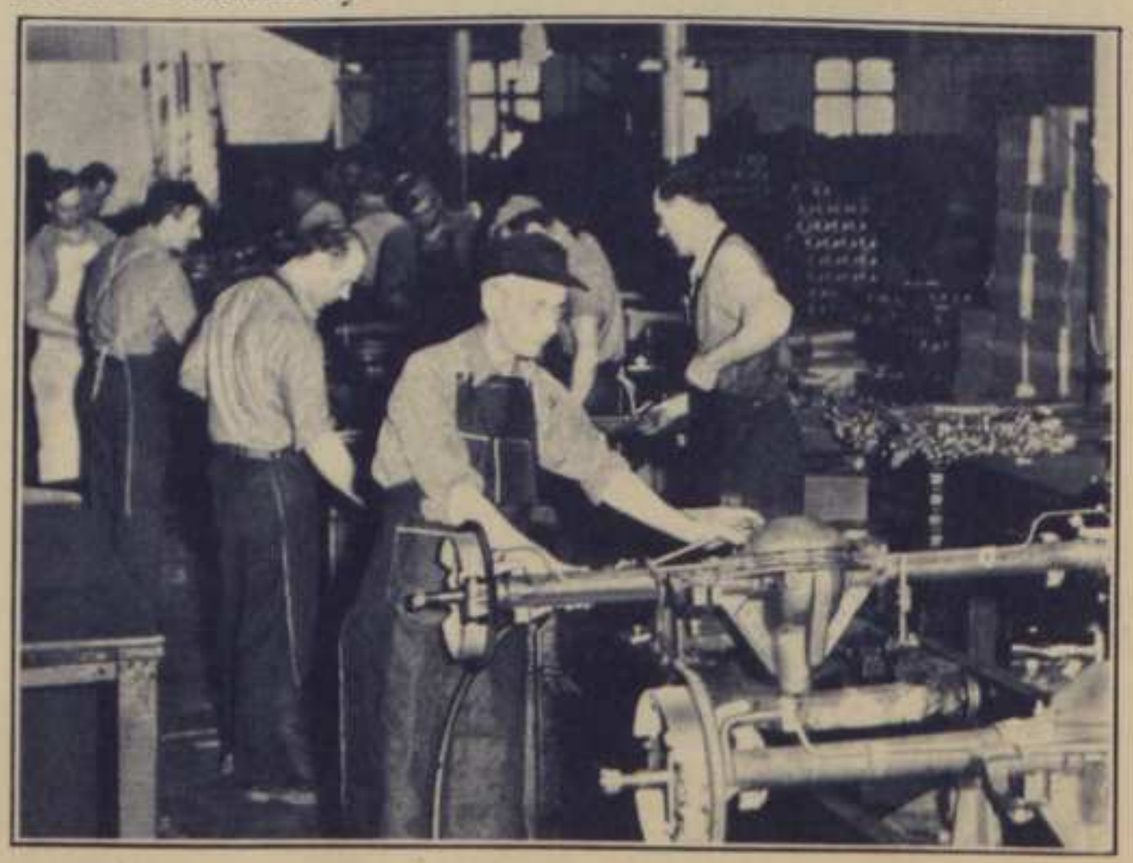
We check every engine for everything that could possibly be wrong with it. And believe me, there aren't many companies in the business that are as particular about everything as Nash.



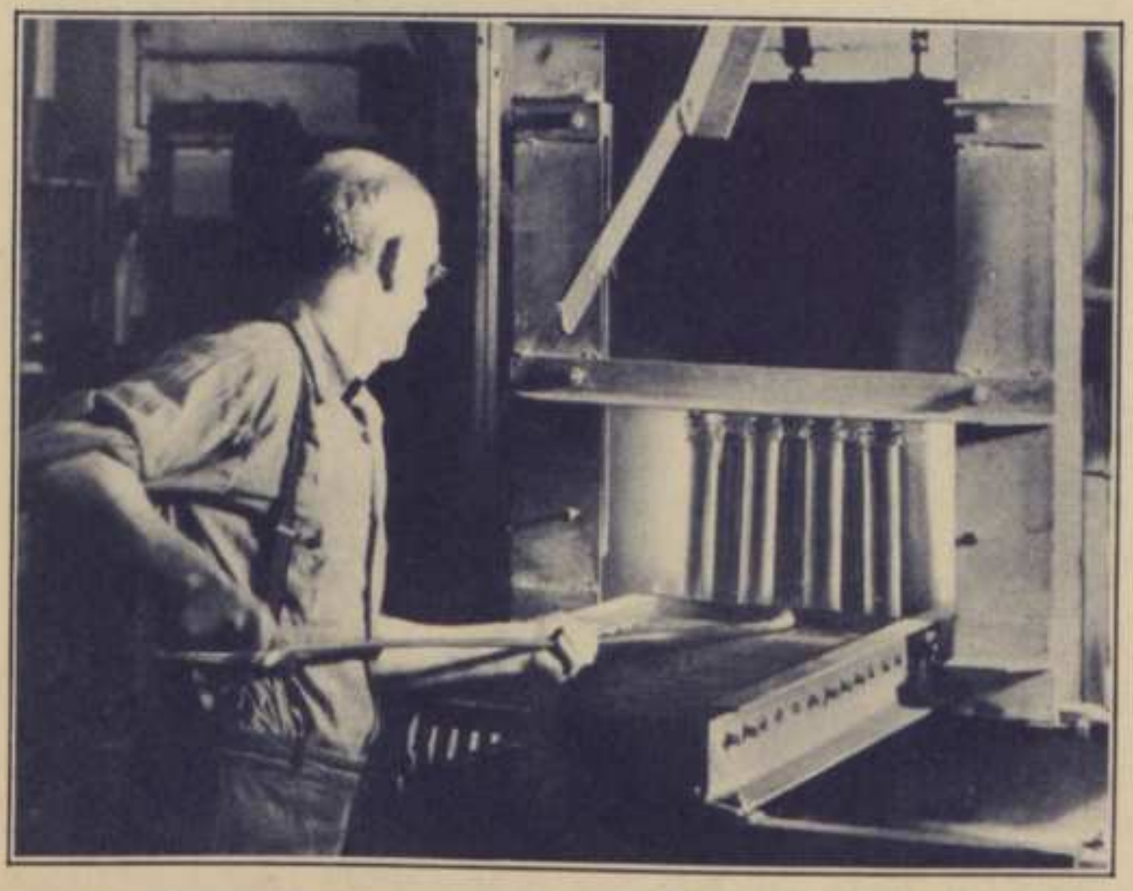
HERB: Thanks a lot, Al. Now, of course, while engines are being assembled . . .

. . . other operations are preparing other parts of the car for final assembly . . . transmission gears are being cut in the latest type precision lathes . . .

Other operations are preparing other parts of the car for final assembly.



. . . then being hardened in one of the few gas carburizers of this kind in the industry . . . to receive a "case" or outer shell of super-hard steel—so hard, in fact, that a finished Nash transmission gear cannot even be scratched by an ordinary steel file. The teeth of the file slide harmlessly over the gear's almost diamond-hard surface. No wonder Nash transmissions are so silent and long-wearing.

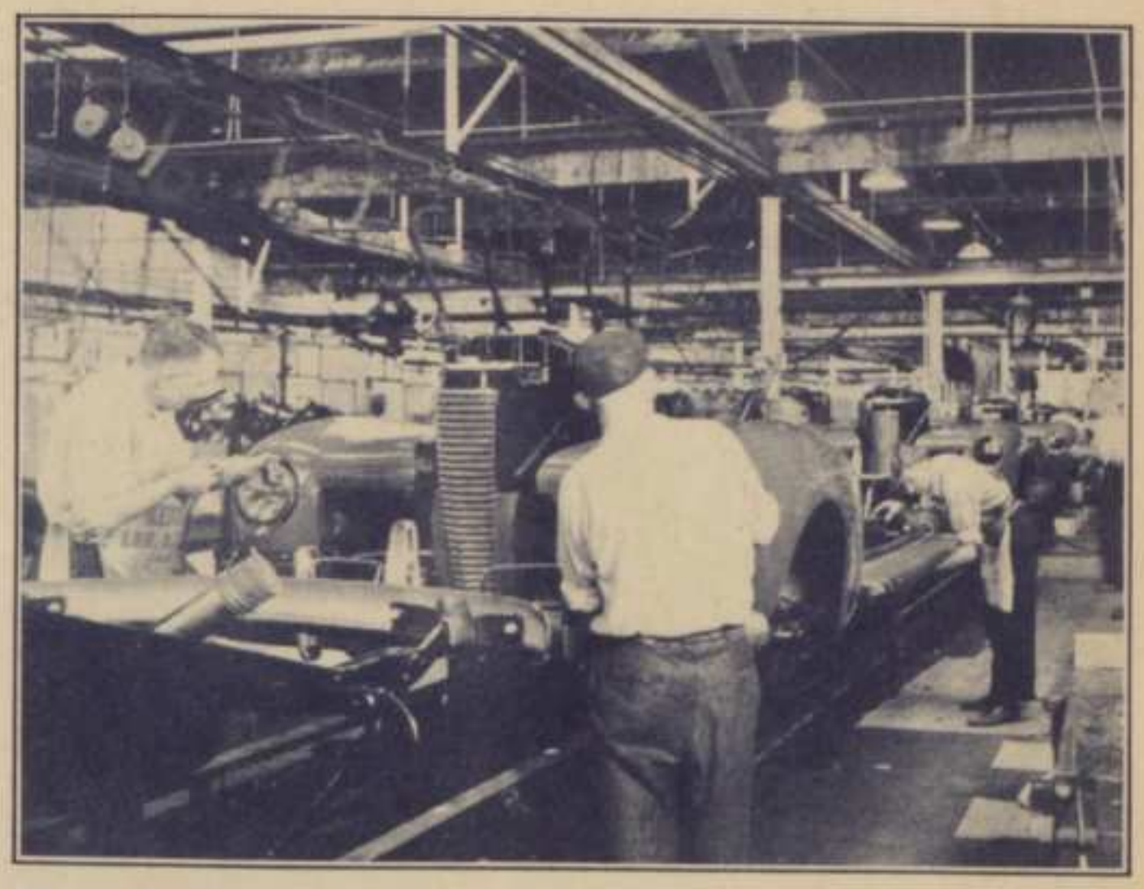


Ring gears and pinions are being slowly cut—in new machines recently installed by Nash at the cost of thousands of dollars . . . the latest and best of their kind. Ring gears and pinions, too, are carburized and then are placed in a specially constructed press and hardened in oil. The press holds the gear to absolute measurements during the hardening, and prevents any possibility of warping.

Frames, wheels, and other chassis parts are finished and inspected.

And all the other parts which eventually will take their places in the finished Nash engine and chassis have been formed, finished, inspected, tested, and proved.

And like soldiers on parade, will find their way to the final assembly line with split-second efficiency. Now, you notice I haven't said anything about bodies.



That's because we'll go to Milwaukee in order to see the building of the Nash all-steel body which is made in an entirely separate plant.

And here we are—at the most modern self-contained body plant in the world. Now, to take you through this plant . . .

. . . I'm going to turn you over to my old friend, Ed. Siebert—who's spent about as many years here as I have with Nash in Kenosha. Haven't you, Ed?

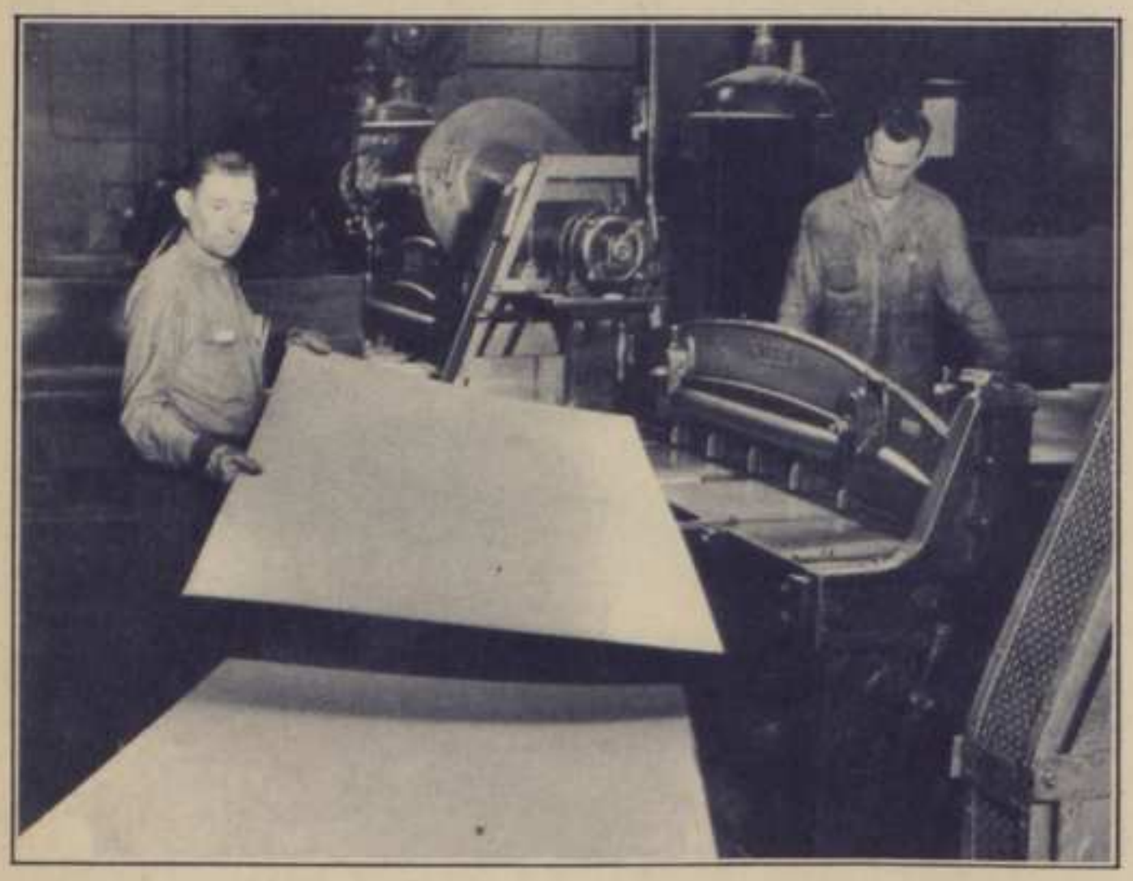
ED: Guess I have, Pete.

Well, folks, you're going to see the finest bodies in the medium-price field built here today. In fact, we confidently believe that custom-built bodies are the only other bodies that compare with Nash—and even they are not as strong, for they are not all steel.

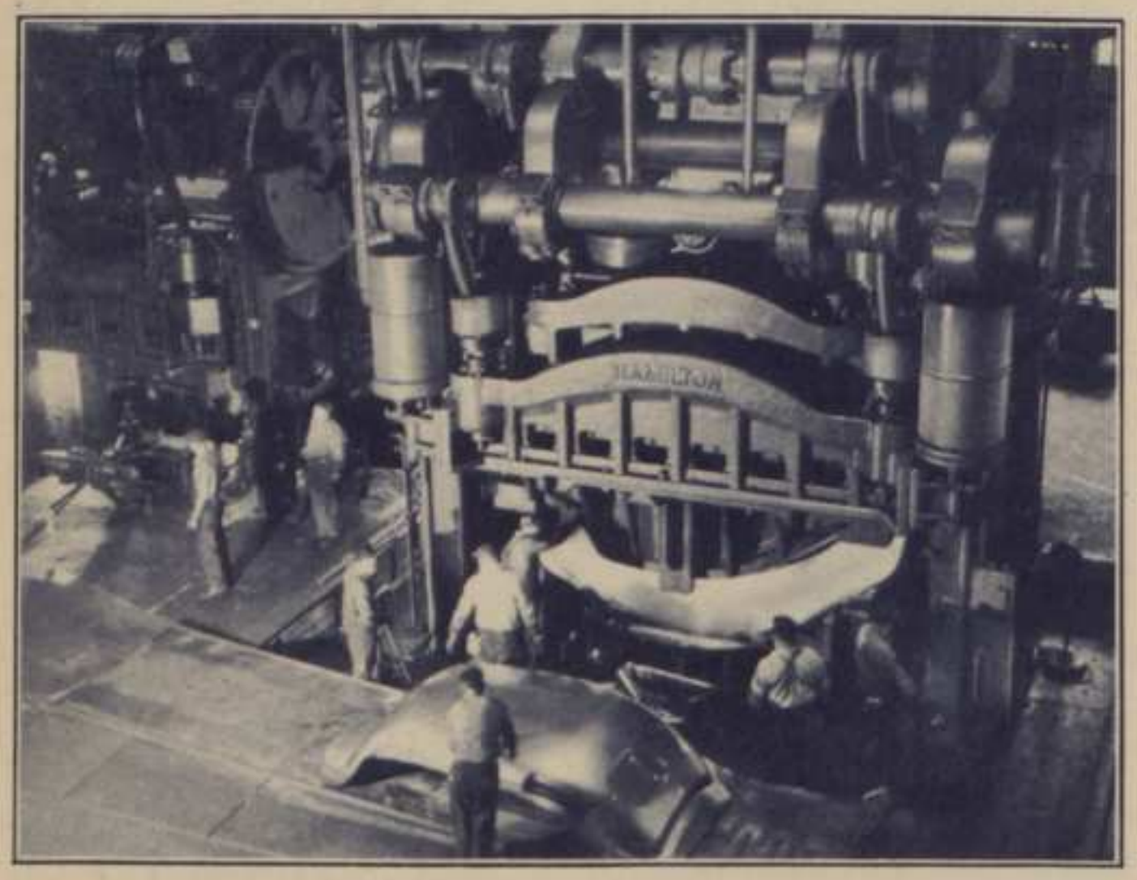
The first step, of course, is the arrival of the raw materials—particularly steel. And notice this, we insist that the smooth, polished steel sheets must come to us carefully wrapped against air and corrosive elements.

If we're this careful about steel, you can tell how careful we are about every other material and every manufacturing step throughout the whole process.

After the large sheets have been sheared down into workable size they go to what we might well call "the Hall of Giants." Here you see just a few of the 185 huge presses which are used in shaping and forming Nash all-steel bodies.



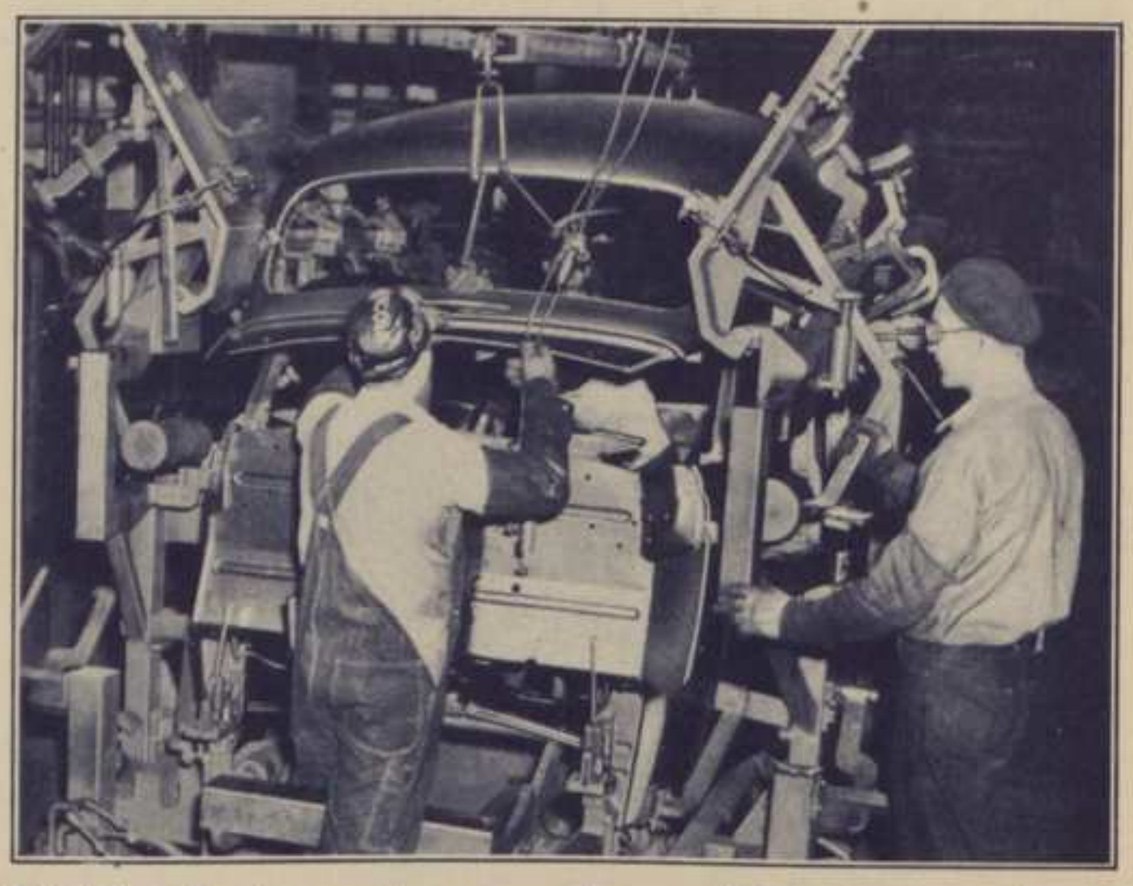
And look particularly at this press! It is the world's largest . . . three stories high . . . weighing one million pounds, and exerting 3,000,000 pounds pressure. The dies for this press alone weigh 150,000 pounds. In this press the beautiful Nash one-piece steel top is formed . . . one unbroken piece of glistening steel from the hood separation line to the rear trunk or luggage compartment line.



In other presses the Nash underbody or reinforced all-steel floor, as well as the side panels and cowl are stamped.

Here you see just a few of the 185 huge presses which are used in shaping and forming Nash all-steel bodies.

After final stamping, spot welders get busy to put in the exceptional number of box sections and extra bracings which, I'm telling you, make the Nash all-steel body by far the safest and strongest in the business. The all-steel floor, for instance, contains 7 box-sections and 8 other braces—fifteen in all. Later on, when this is bolted to the chassis frame, it makes the famous Nash Dual Frame—the only one of its kind in the industry.



Finished body sections are clamped in automatic framing jigs—automatic because faulty clamping is an utter impossibility. Panels must fit together with absolute precision—or not at all.

Then the body sections are spot-welded together. Nash does not use flash-welding—a faster, and cheaper method—because it weakens the metal at the weld and is not nearly as controllable. Nash uses the slower, costlier quality method.

For instance we put two hundred separate welds along the seam where the side panels are welded to the all-steel top. This means two hundred welds for each side.

Equal thoroughness is used at all other points . . . main body seams, pillar post box sections, door sills, and every other place where metal must be welded to metal to create the fortress-like body which makes Nash easily one of the safest cars on the road.

The steel body shells then go into a cleaning and rust-proofing tunnel and baking oven which is more than half a city block long . . . from which they emerge completely rust-proofed—every inch treated with a rust-preventive material which also forms a hard, bonding surface for the baked enamel finish.

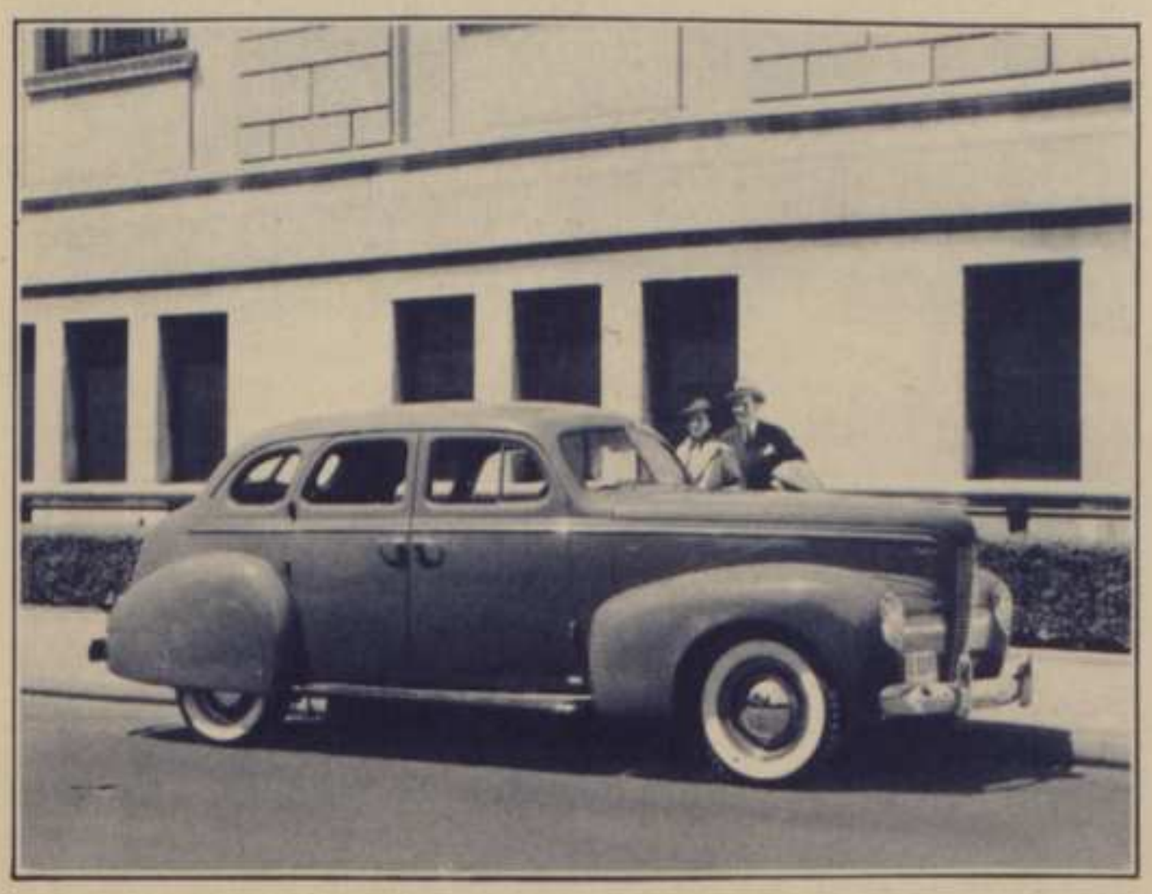
Most cars—particularly in the lower price fields—are rust-proofed in only a few places . . . and cannot have a finish as long-lasting and rust-resistant as Nash's.

A heavy priming coat is added over this prepared surface . . . after which the bodies return to the baking ovens for two more hours of baking at 290 degrees.

The famous Sand-Mortex insulation—the new insulation developed by Nash-Kelvinator engineers—is added to the floors and trunk. Sand-Mortex makes all Nash cars 25% more quiet than cars without Sand-Mortex.

And now the bodies are ready for the lustrous final baked enamel finish. The enamel is applied in glass booths filled with filtered air—filtered so that no speck of dust can mix in with the finish. Then the bodies go back again into the baking ovens for more baking. Nash bodies are baked a total of six and a half hours in finishing. Most companies use heat mainly for fast-drying . . . a "quick-fry" versus Nash's "slow bake." The result . . .

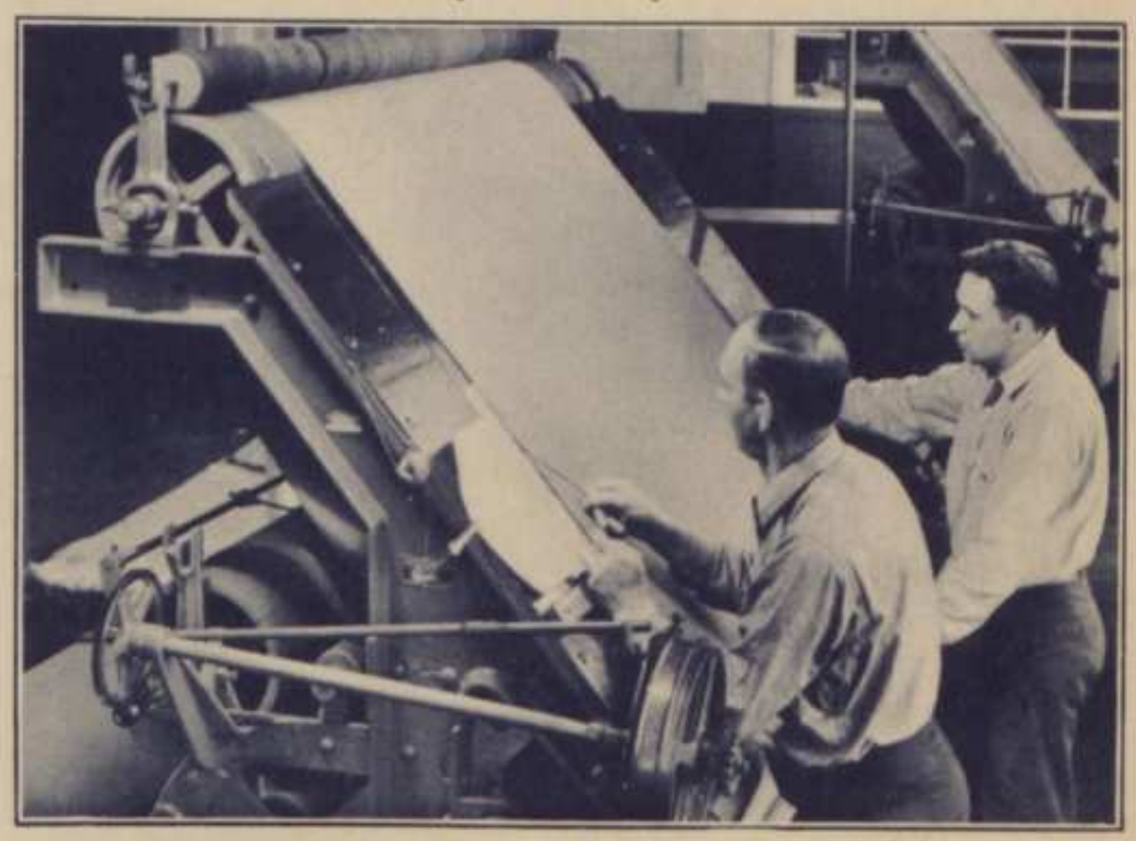
Nash buyers get an extra value in the finish of their cars . . . a deeper, longer-lasting, baked-in enamel that keeps its lustre longer without polishing than most cars do with polishing.



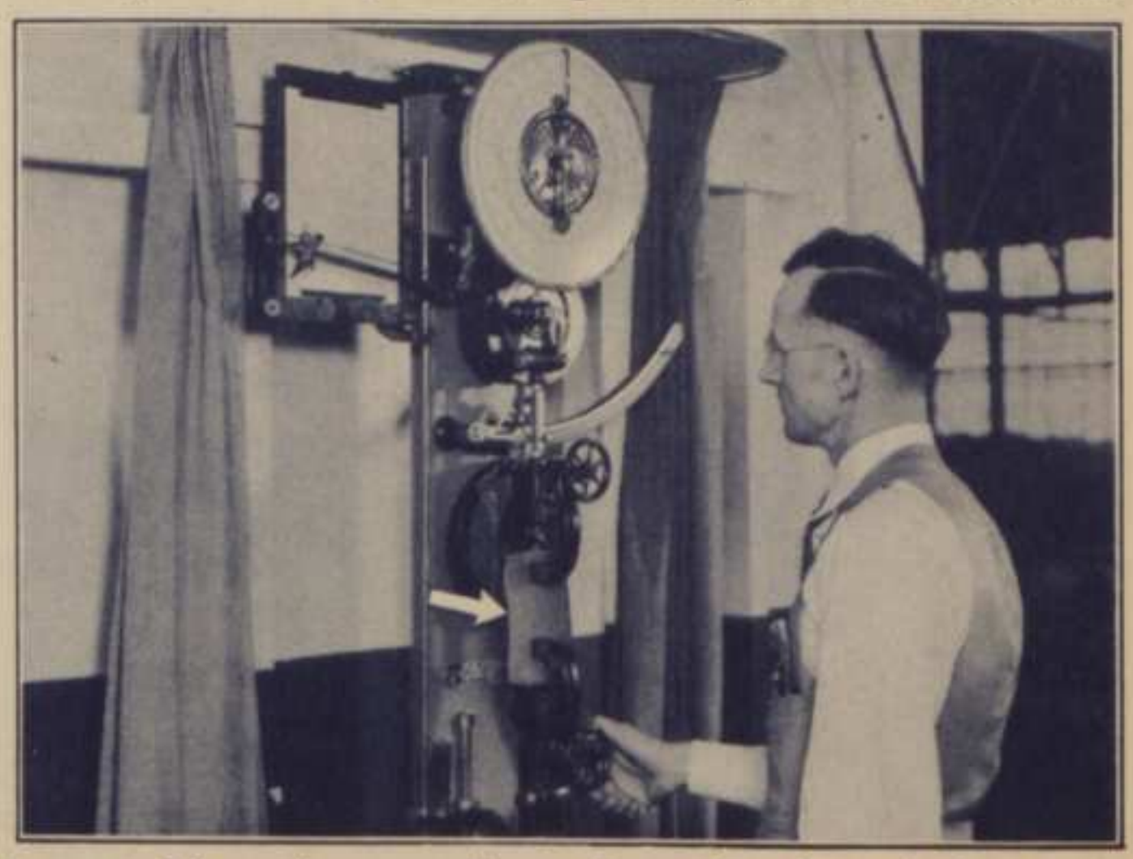
Nash owners save money because of less frequent washing and polishing . . . and the longer-lasting Nash finish adds greatly to resale value. And now . . .

. . . comes the first of many finish inspections . . . this one under intense Mercury lamps which would bring out any color imperfections—if there were any imperfections. After several other inspections . . .

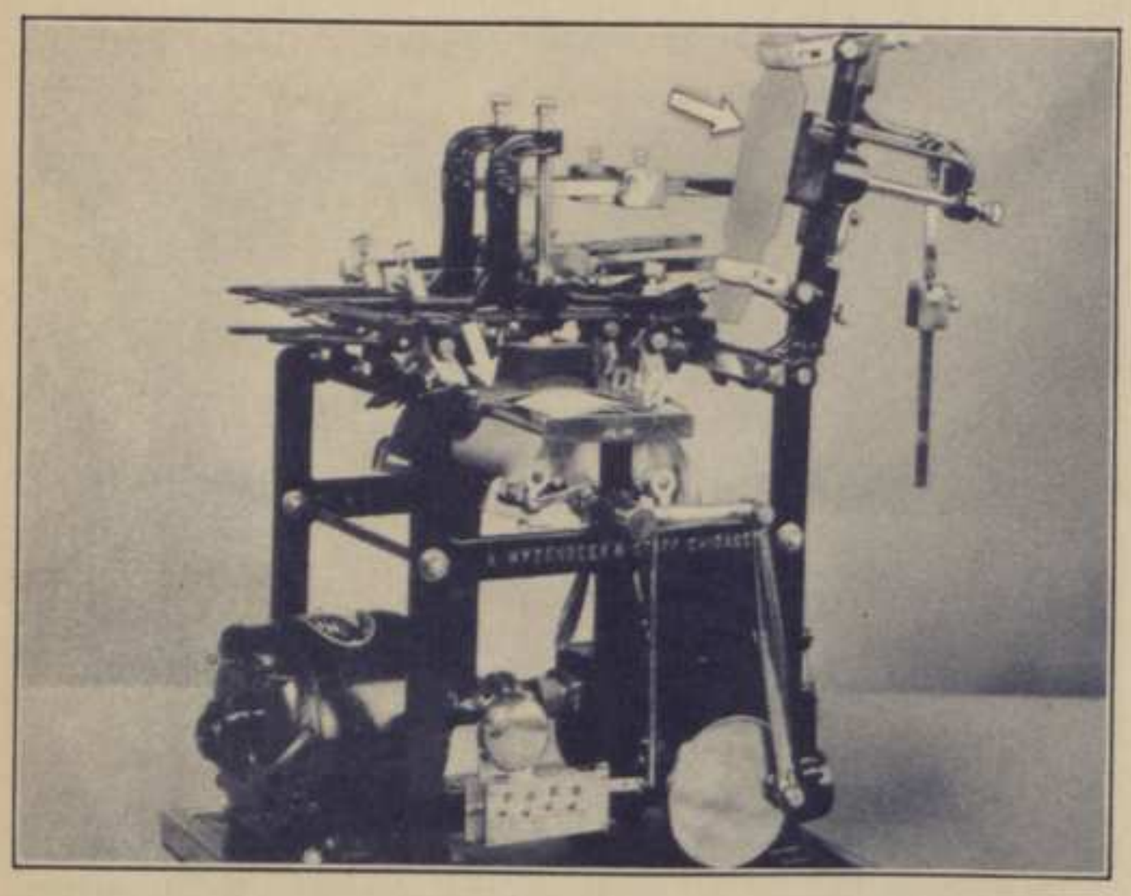
. . . the body shells go to one of the world's longest body assembly lines . . . 2900 feet, or more than half a mile long . . . for final body assembly. But in the meantime



other materials for the finished body have arrived at other parts of the plant . . . upholstery for the seats, cushions and interiors . . . fine safety glass for windows . . . chromium-plated, rust-resistant hardware.



Every roll of Nash upholstery arrives carefully wrapped —and, of course, every roll is rigidly inspected . . .



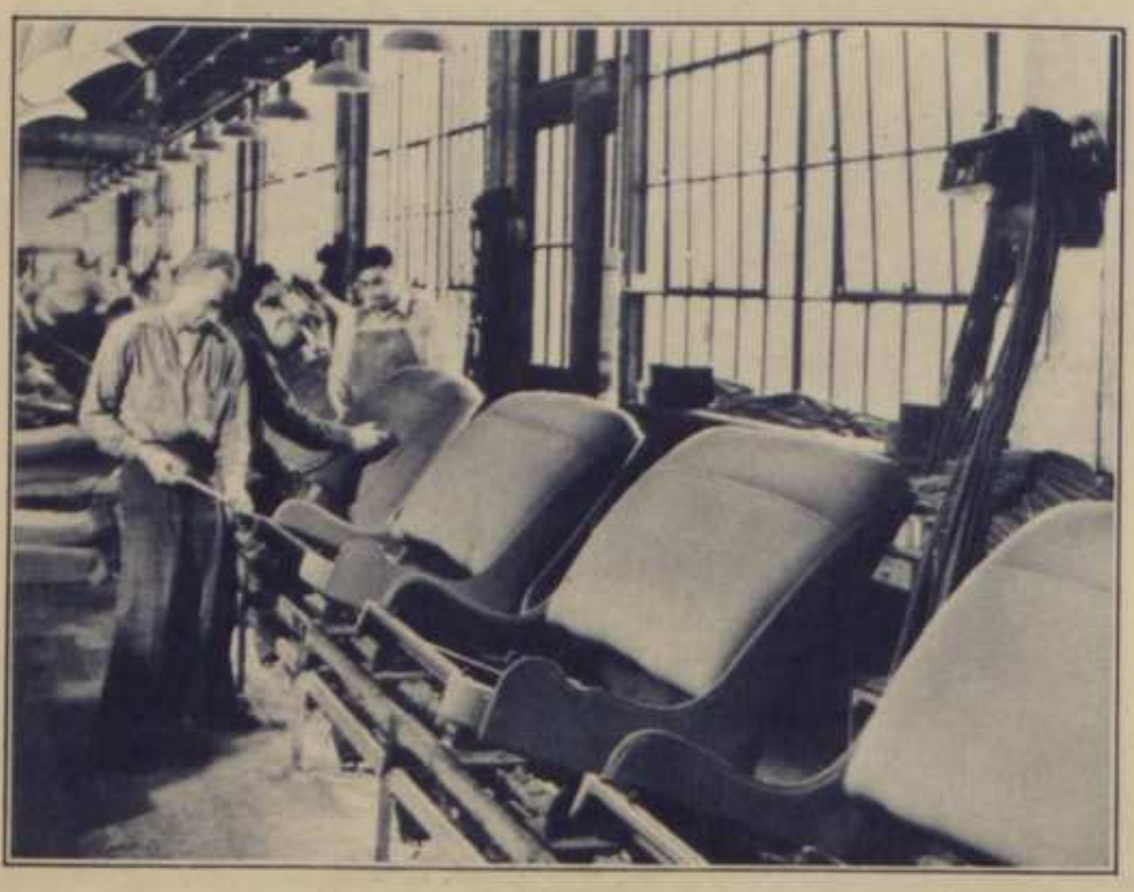
. . . first on this machine, which passes each inch under the eyes of a trained inspector. Then, strips cut from each roll . . .

. . . are tested for tensile strength and exposed to ultra-violet rays for long periods to check resistance to fading . . .

. . . then given this wear-test, in which, in a few hours, the upholstery sample receives and resists more wear than your upholstery will get during the entire life of the car. And this beautiful upholstery is used, of course, as the covering material for the firm, soft springs and luxurious padding of Nash seat cushions and backs.

The seat assemblies are finished in every detail on a long assembly line . . . Now, let's follow them back to the main body assembly line—where the beautifully finished, all-steel bodies receive all their interior fittings.

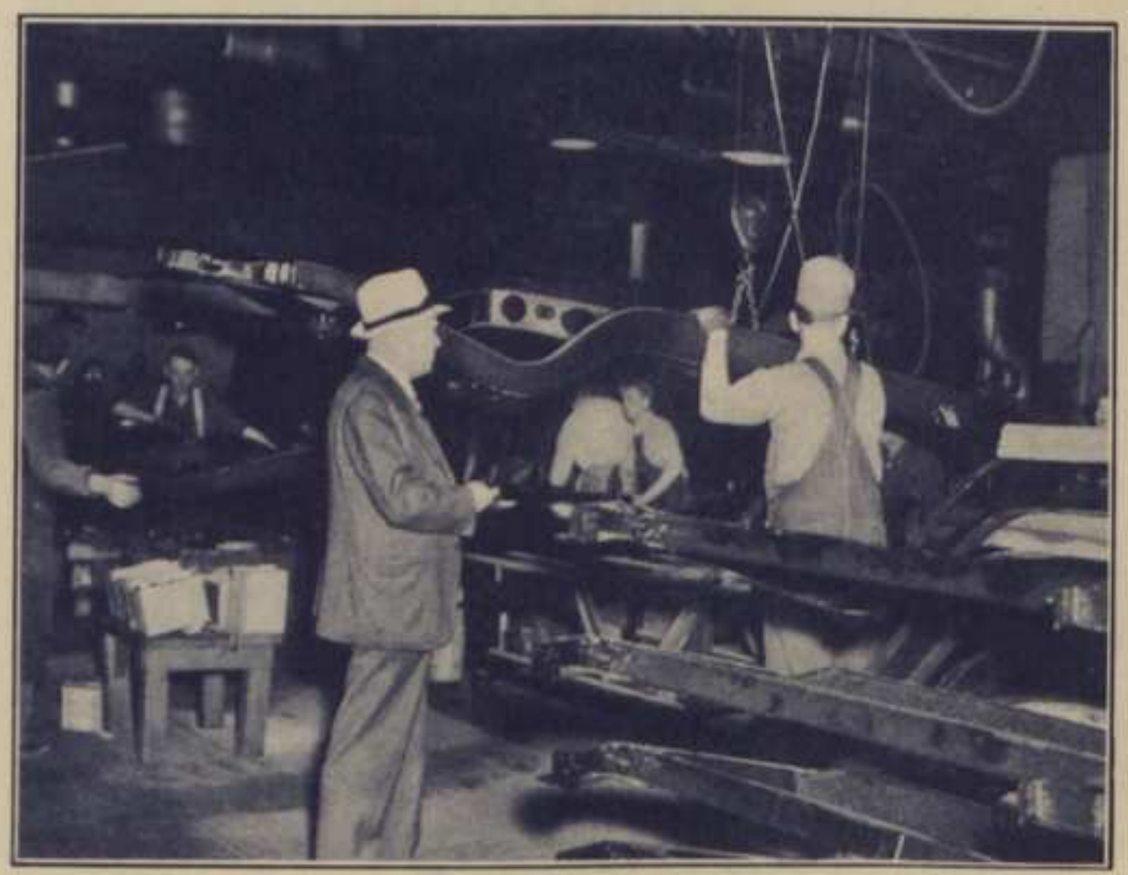
. . . and pass on to the end of the line, ready for transportation to Kenosha and the final assembly line.



HERB: And now, folks, we'll follow the finished bodies back to Kenosha . . .

. . . to see how all the precision-built and precision-inspected parts and sub-assemblies of Nash cars meet on the final assembly line to take their proper place in the finished Nash cars.

The Nash assembly line is like a river . . . with tributary streams joining the main channel . . . each bringing exactly the right part to the main line at exactly the right place and time for steady, efficient progress. Here we see the massive Nash box-type, x-braced frames placed on the conveyor as the foundation for the car. This is one of the strongest frames in the industry—yet, as you know, it is only one of the two parts of the famous Nash Dual Frame.



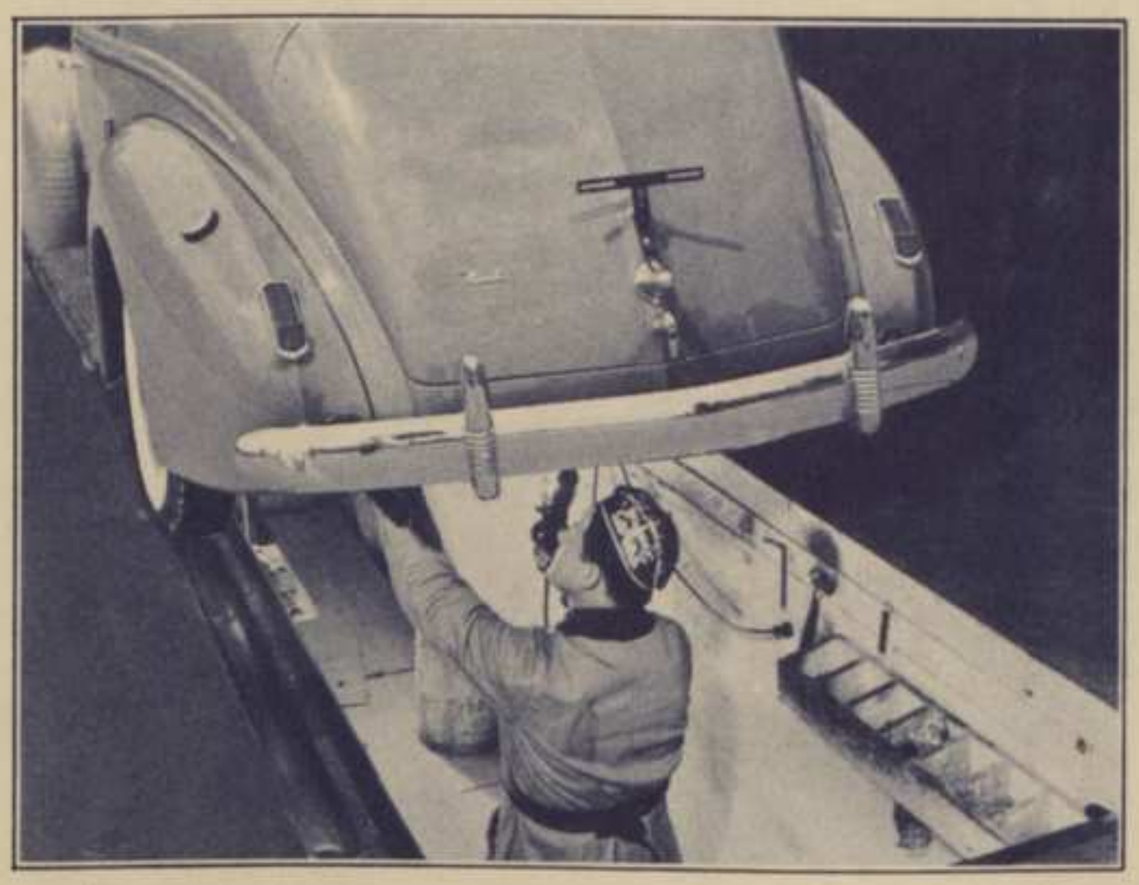
Axles and brakes are added to the frame . . . those over-sized Nash brakes which give Nash cars such quick, sure stopping and long lining life.

Steering gear, engine assembly and fenders are fitted into place.

The finished body is lowered onto the assembled chassis.

As the final touch, the hood is lowered into place, and another car that everybody likes is ready to say, "Let's go!" Well—not quite, for again it must endure a series of exacting tests before it is ready for the road.

First is the pit inspection. Inspectors in the pit check everything that can be seen from below—brake tube attachments, wiring, springs, shock absorbers, and so on.



Then comes the treadmill test . . . We run each car on these rollers at varying speeds while all final engine checks and adjustments are made, then a final finish inspection—in addition to all those which took place before the body ever left the Nash body plant in Milwaukee . . .

. . . and even a final headlight inspection. This is the last of a total of over 6,000 inspections made from beginning to end in the manufacture of Nash cars. When this is over we know these cars are ready to go—and so the last step at the factory for these beautiful new cars is the beginning of their journey to the four points of the compass—to the salesmen and buyers who are eagerly awaiting their arrival.

ANNOUNCER: Thank you, Herb Ritter. We haven't seen everything in these great plants that there is to see, of course. But we've seen enough to appreciate the exacting precision . . . the exceptional quality . . . the rigid insistence on highest standards which make Nash cars so outstanding on the roads.

We've seen enough to get a new idea of the tremendous size and scope of Nash operations and a fresh realization of the importance of Nash in the American industrial and economic scene . . . Now we know some of the deeper reasons . . .

. . . why the new Nash cars are the quality leaders in every one of their price groups . . . why they have created a new kind of motoring and a new kind of value for American car buyers . . .

. . . why the Nash truly is the Car Everybody Likes and why it offers more of everything that counts to the people who demand the most for their money in modern motoring.

NASH

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