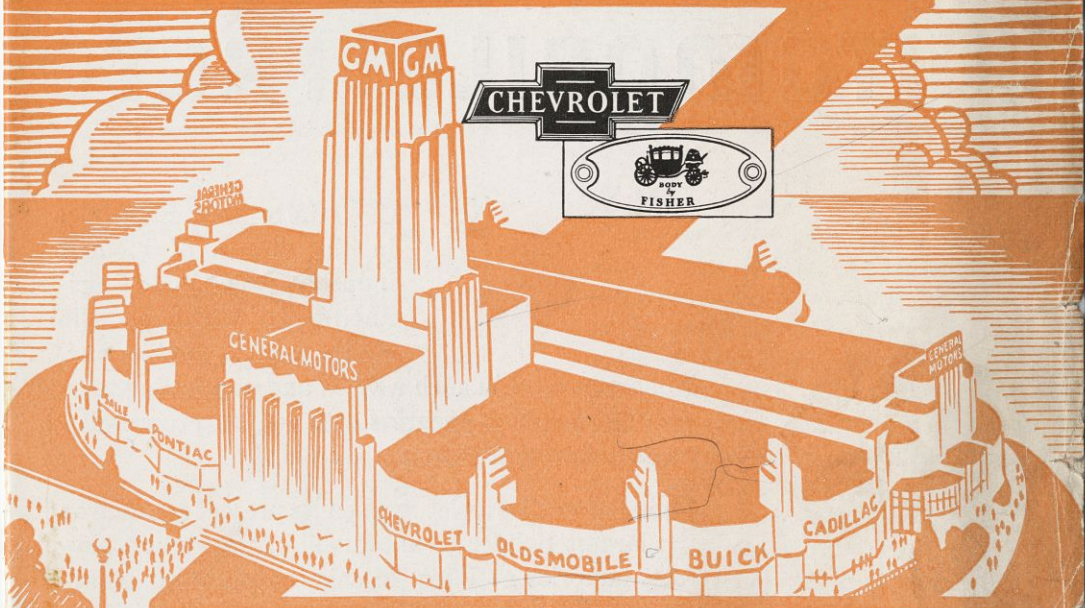


# THE MAKING OF



# A MOTOR CAR ..

SOUVENIR GUIDE BOOK TO THE  
 CHEVROLET-FISHER MANUFACTURING EXHIBIT  
 GENERAL MOTORS BUILDING

A CENTURY OF PROGRESS  
 INTERNATIONAL EXPOSITION  
 CHICAGO, 1933

A MODEL . .

## AUTOMOBILE FACTORY AT THE FAIR



Of all the brilliant spectacles in the drama of modern industry, none is so fascinating to watch as the making of a motor car.

None expresses in such a vivid and compelling way, the high point of progress attained by present-day manufacturing science.

Long before Chevrolet reached its present position as the largest builder of automobiles, the great Chevrolet factories at Flint, Michigan, and other points throughout the country, were besieged with visitors, eager to see just how Chevrolet cars were built and assembled. So today, Chevrolet feels that a *model automobile factory, at the World's Fair, would be a welcome and fitting contribution from the world's leading builder of motor cars.*

At the General Motors Building in "A Century of Progress Exposition," Chevrolet takes you behind the scenes of a modern automobile plant, and shows you just how the bodies of a car are built, and the car itself assembled. This Chevrolet exhibit is the only one at the World's Fair in which automobiles are produced right before the public eye.

NOTE: *In following the operations in Chevrolet's World's Fair Factory in their proper sequence, open up the folder at the right—start with operation number 1, and proceed from right to left. Then, after reaching number 12, turn the folder over, start with number 13, and proceed again from right to left. The final operation, in which the car rolls off the line, ready for the road, will be found in number 24. Incidentally, the operation numbers given in this booklet correspond with the operation numbers displayed on sign posts located on the factory floor.*

As you enter the Chevrolet Amphitheater and stand on the balcony at the south end of the building, you look down on two parallel factory "lines." On the left is the Fisher Body line (operations 1-12), which starts directly beneath you, and extends northward, forming the shape of an inverted letter "J." On the right, and beginning at the opposite (north-east) end, lies the Chevrolet car-assembly line (operations 13-24). The movement of the two lines is so timed that when a Chevrolet chassis with the wheels, fenders and hood for a particular body type and color combination arrives at a designated point, the corresponding Fisher body will arrive at the double-back part of the "J" at the same time, ready to be mounted.

It must be remembered that the operations here are the *final twenty-four operations* required in the building of a car. There are, of course, hundreds of other operations that take place *prior* to these *last twenty-four*, such as the stamping out of fenders and body panels, the fabrication of crankshafts, camshafts, radiators, et cetera. While many of these operations are highly interesting, the most exciting drama of all is to watch the car grow out of the assembly of these hundreds of individual parts, starting with the bare frame of steel and winding up with the completed product as it rolls off the line—ready for its buyer.





**12 Final Fisher Body operations.** Now, at Post Number 12 in the center of the room, we watch the final body operations preparatory to swinging the body over to the Chevrolet line. First, the body surfaces are given a final buffing with dry fleece pads. Next, the glass is washed. Then follows the striping of the belt-moulding (above). This is done with a special apparatus designed and built by Fisher engineers. A gravity tank filled with striping lacquer feeds the paint through a rubber tube to a striping pencil. A skilled operator wields the pencil, just as he would a fountain pen.

**11 Installing interior trim, hardware, seats.** Seated on little padded stools inside the bodies, workmen now put in headlining, interior trim, inside door panels and garnish mouldings (11). After this come the smaller fittings and hardware parts such as door handles, foot rests, locks. Meanwhile at the side of the main assembly line, workmen have been busily engaged in assembling front seats, seat cushions, and rear seat backs, putting together springs, padding, framework—and covering them with rich broadcloth or mohair upholstery. Now comes the actual installation of the seats and cushions, as illustrated above (11A).

**10 Installing glass and "dressing" roof.** At the side of the assembly line stand trucks with racks full of windshields, window glass and Fisher No Draft Ventilators. At Post Number 10 these glass parts are carefully installed by hand. After that, the body moves between parallel working platforms for the final roofing operations (10A). Standing on these platforms, craftsmen install Chevrolet's built-in radio aerial, add the sound-proofing roof pads, put the roof fabric (or top decking) in place, and also the crown mouldings (the weatherproof bindings and edgings for roof fabric).

**9 Oil-sanding, machine polishing and "spot spray."** One reason for the high quality of finish on Fisher Bodies lies in the care taken in oil-sanding and machine polishing. Using fine sandpaper dipped in oil, workmen rub down every inch of the body-surface. Then, by means of portable electric polishers equipped with rotating pads of fleecy wool, they start machine polishing. The material used is a special buffing compound, virtually identical with the polish used in manicuring finger nails. After machine polishing, there follows an inspection, plus a "spot spray" operation to remedy imperfections.

**8 Spraying on Duco and drying in ovens.** Now we come to a highly important step which takes place in the second of the glass-topped booths: the application of the Duco color. Duco is sprayed on by spray guns, operated by compressed air, and connected by rubber hoses to large drums (buckets) of paint which stand outside the booth. Three different coats of Duco are applied. After the first two, the body is dried in the oven located under the spectators' balcony at the north end of the building. After the final coat, it is dried in the "U" shaped oven which arches over the curve at the end of the line.

**7 Inspecting, water-sanding and applying undercoat touch-up.** Now, the truck loops back through the drying ovens into the glass booth again, and workmen, by the aid of powerful floodlights, inspect it carefully, to make sure the "glaze coat" is okay. Next, the painted body is rubbed down with wet sandpaper (above). Then comes a thorough-going inspection to detect spots where sanding might have rubbed through. Finally, comes the "undercoat touch-up," in which "priming" paint is re-applied not only to spots which have been rubbed thin, but also to points where heavy wear will occur.

**6 Washing body, applying "prime" and "glaze" coats.** Now, the body progresses slowly onward to a pair of long parallel troughs containing a dilute acid solution. Here it is washed, to remove every trace of grease and insure the adherence of the finish. Next, it moves into a glass-topped booth (above) where workmen spray on a coat of paint, called the priming coat. Then, it is detoured into an oven, beneath the balcony. It loops back under the balcony and emerges at the upper end of the oven, ready to go through the glass booth again. This time it gets a "glaze" coat, is dried again.

**5 Installing the Chevrolet-Fisher Body doors.** At the side of the line, leaning against the wall, are the doors which are ready to be mounted on the bodies. These doors have already been assembled complete, with hinges as well as window regulating mechanisms, before being brought to the World's Fair Factory. Fisher craftsmen now take them and fit them carefully onto the body. In passing, it is important to note the large size and rugged construction of these Chevrolet-Fisher doors. . . . They are much heavier and more substantial than the doors of any other low-priced car.

**4 Encasing hardwood framework with steel panels.** Fisher craftsmen first take the cowl stamping, and install it in position on the forepart of the hardwood framework. Next, they take the "U" shaped steel panels which have come from the fusion welders, place them over the hardwood frame and fasten them securely. Then, the body moves under an arched framework (4A) supporting an electric welder which welds the cowl to the windshield header rail. Finally the body moves down the line to a point (4B) where men, wearing goggles to protect their eyes, use acetylene welders to fuse all joints perfectly.

**3 Preparing steel panels for frame.** Note the big, impressive-looking machine shown above. That is a 14-ton fusion welder which welds together the side steel panels and back steel panels. Into this machine workmen place the steel parts. The current is switched on. A mighty roar follows, together with a dramatic shower of sparks. And the three steel parts are *one!* Near Post Number 3 is another smaller fusion welder, which fuses the roof rail cover panels to the front ends of the side and rear panel assembly. After this, all seams are further reinforced by welding. Then surplus metal is ground off each seam.

**2 Assembling hardwood parts on "Set-up Buck."** The "Set-up Buck" is the wooden structure which holds the parts in place for the purpose of assembly. Craftsmen take the sub-assemblies, and clamp them to the "Set-up Buck," where joints are screwed and bolted, forged steel reinforcements are placed at points of extra stress, and wood-to-metal joints are insulated. When these sub-assemblies come off the "Set-up Buck," they form a sturdy hardwood framework. This framework is then removed (above) and placed on a truck which carries it through the remaining operations.

**1 Preparing hardwood parts for assembly into body framework.** Our starting point is the southwest corner of the Amphitheater, at the beginning of the Fisher Body series of operations. Here we find Fisher craftsmen taking individual hardwood parts and putting them together into combination sections (called sub-assemblies) such as the rear body frames, front frames, and roof assemblies. A typical sub-assembly is illustrated above: The two workmen are putting together the roof rails, the transverse bows of hardwood, and the slats of Douglas Fir plywood to form a complete roof section.

← UNFOLD IN THIS DIRECTION

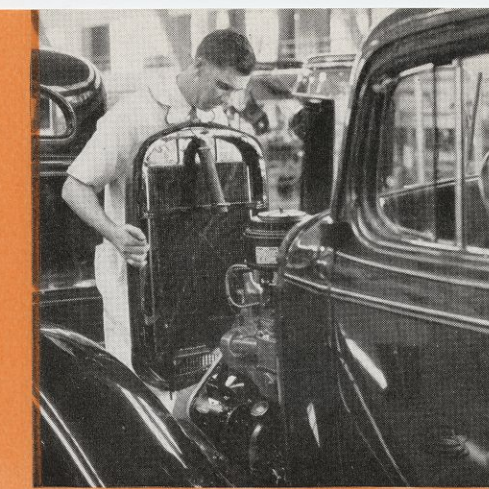
SEE REVERSE SIDE FOR CHEVROLET ASSEMBLY



PANORAMIC VIEW FROM WEST BALCONY SHOWING CHEVROLET-FISHER BODY OPERATIONS IN THE FOREGROUND



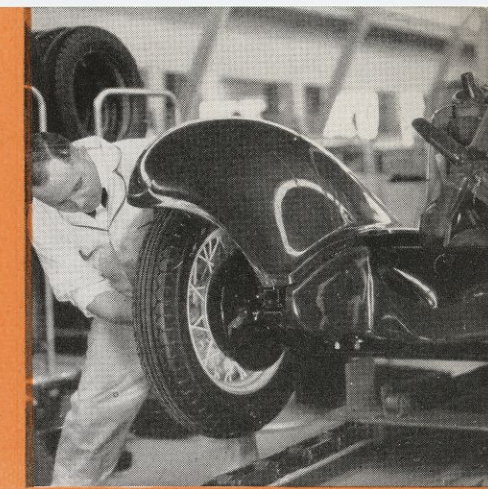
**24 Getting the car ready for the road.** Water is put into the radiator, and fuel into the gasoline tank. Then, using a long rubber hose (above), the radiator core shell and grill are assembled, off to one side, into one single unit, ready for the main assembly. Hinges and hood catches are also put in place on the hood. Then, in the "final car assembly" (23A), all the finishing touches are added. Electric wiring is hooked up. So are the various engine controls. Toe boards are screwed into place. Bumpers, hubcaps, and headlights are installed. Finally, the radiator (above) and hood are mounted in front.



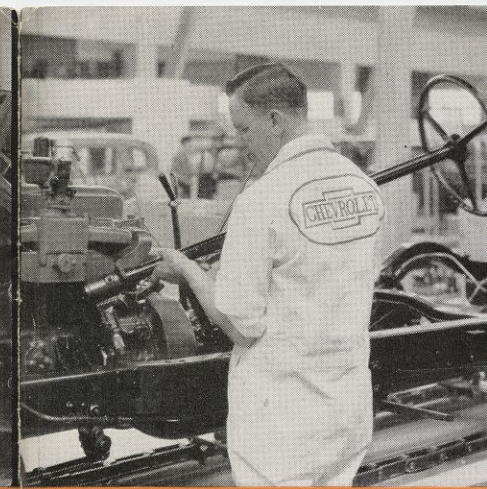
**23 Assembling radiator and hood.** Installing them along with bumpers, headlights. At Post Number 23, the radiator core shell and grill are assembled, off to one side, into one single unit, ready for the main assembly. Hinges and hood catches are also put in place on the hood. Then, in the "final car assembly" (23A), all the finishing touches are added. Electric wiring is hooked up. So are the various engine controls. Toe boards are screwed into place. Bumpers, hubcaps, and headlights are installed. Finally, the radiator (above) and hood are mounted in front.



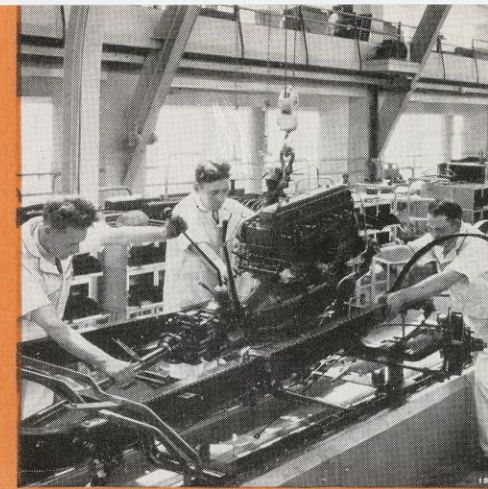
**22 Mounting body on chassis.** Of all the steps taken so far, the next is unquestionably the most dramatic. The body is picked up from the Fisher line by a hoist suspended from arched supports, and swung through the air (22A) over to the Chevrolet line. There it is slowly, carefully, brought into position over the chassis and lowered. One workman on each side lines up the points where body bolts are inserted. Then all is ready. Down goes the body on its supporting brackets. The jaws of the crane are released. The body and chassis are now one unit! And men get busy tightening the bolts.



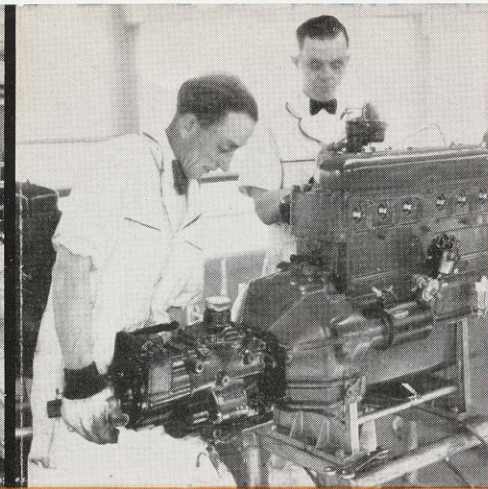
**21 Mounting wheels, preparing fenders, adding finishing touches to body.** Now, we turn to a familiar operation: mounting tires on wheels and attaching the wheels to the car. This is done at Post Number 21. Meanwhile, notice at the side (21A), how the running boards are being assembled, together with the front and rear fenders. Notice also, how these parts are then added to the chassis. Now, we are about ready for the body. At the end of the Fisher line (21B) workmen are installing electric wiring in the body, adding the instrument panel, putting in lights and switches.



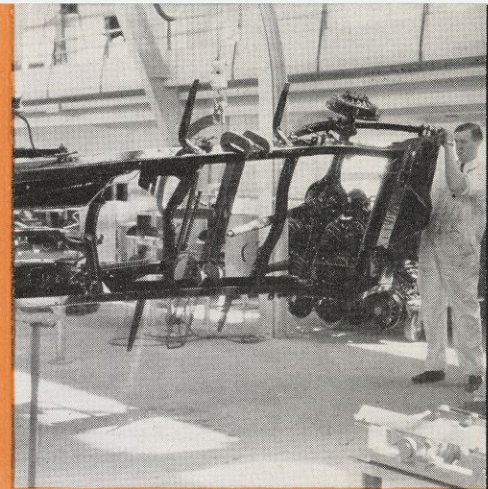
**20 Putting steering mechanism together, installing it on chassis, and adding motor pans, brake pedals, battery.** Scene Number 20 consists of another interesting "side" operation, in which the various parts of Chevrolet's steering mechanism are put together. The steering wheel, the steering column and cover, and the steering gear unit are assembled, apart from the main assembly line, then anchored to the chassis (illustrated above). Following that, the motor pans are added, the battery is mounted, brakes are adjusted, and muffler and tail pipe installed.



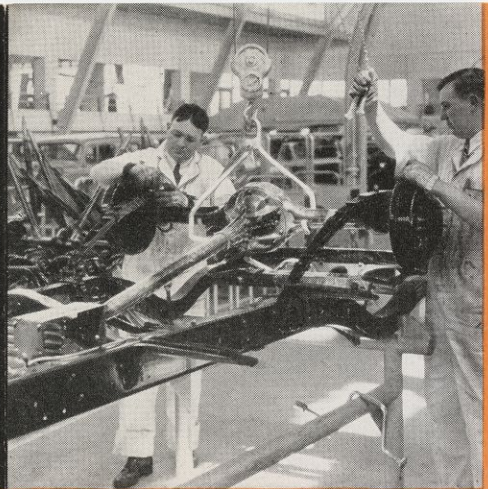
**19 Mounting motor on chassis.** This is one of the most interesting steps of the entire assembly line. Chevrolet craftsmen take the engine, which has been made ready in the previous operation, and carry it over to the chassis by means of a hoist, then gradually lower it into its proper place in the frame. After that, the propeller shaft is inserted, and as the motor is rocked back and forth, the shaft is forced gradually inside the universal joint. Then, after everything is in the right position, the engine is lowered onto its cushion-balanced mounting and bolted into place.



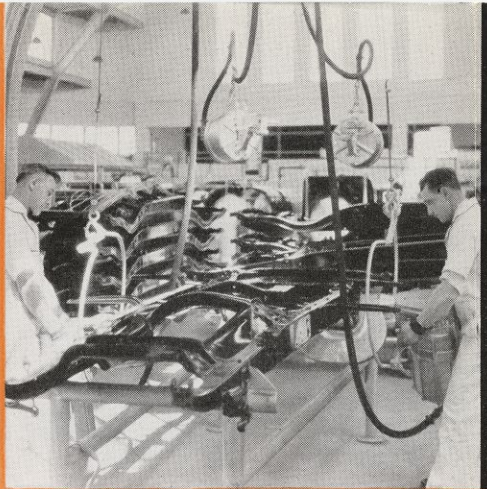
**18 Getting engine ready for frame.** Now that the frame is ready for the engine, the next move is to get the engine ready for the frame. So now, we turn away from the main assembly line to Post Number 18, where a workman is adding various parts to Chevrolet's big, powerful, six-cylinder valve-in-head engine. Here the carburetor is installed. The spark plugs are inserted. The generator is attached. The under parts of the motor are put in place. The Syncro-Mesh transmission is added (above), along with the Free Wheeling unit. Finally, the valves are checked and the motor timed.



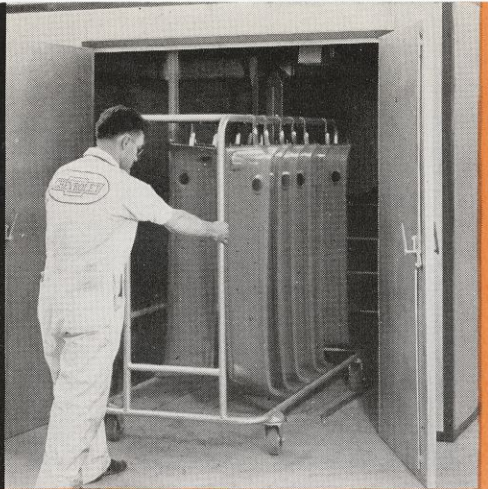
**17 Turning frame over, right side up, and putting it on conveyor.** The preliminary work on the frame having been completed, the next step is to set the frame in the proper position for later operations, in which the motor and body are installed. So, at Post Number 17, workmen turn the frame from *upside down to right side up*, in which position it remains throughout the rest of the assembly. After that, the frame is placed on the conveyor. The conveyor consists of an endless chain, running half the length of the assembly line. The frames are carried slowly down the line, about six feet apart.



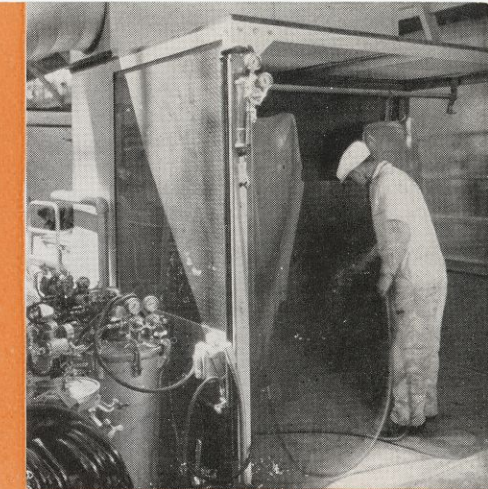
**16 Installing springs, axles and torque tube.** To the frame, which hangs *inverted* from an overhead support, Chevrolet workmen now begin adding several of the most important units of the car: Four semi-elliptic springs are attached to the self-adjusting spring shackles. The rugged Chevrolet I-beam front axle is then taken from the stack of parts and securely joined to the front springs. Then comes the most exciting operation at Post Number 16: The rear axle (together with the torque tube) is carried by means of a hoist over to the frame, then lowered, hooked onto the springs, and securely bolted.



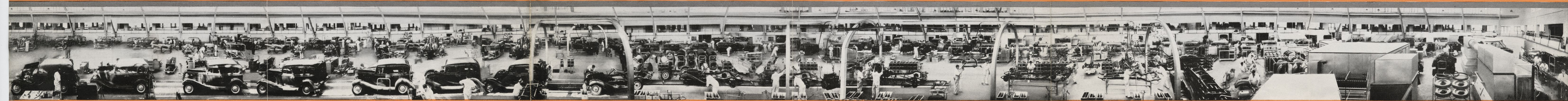
**15 Preparing frame for installation of various related parts.** Now, the rugged 200-pound Chevrolet frame is carried from the stock of parts to a point underneath two giant arched supports, turned *upside down*, whereupon the actual work of assembling the car begins. First, the step hangers (steel brackets which support running boards) are riveted on by powerful pneumatic riveters, suspended from the arched supports (above). Second, the body hangers are bolted to the frame. Then follow the battery hangers, the spring pins, gas feed line, the 14-gallon gas tank, and hydraulic shock absorbers.



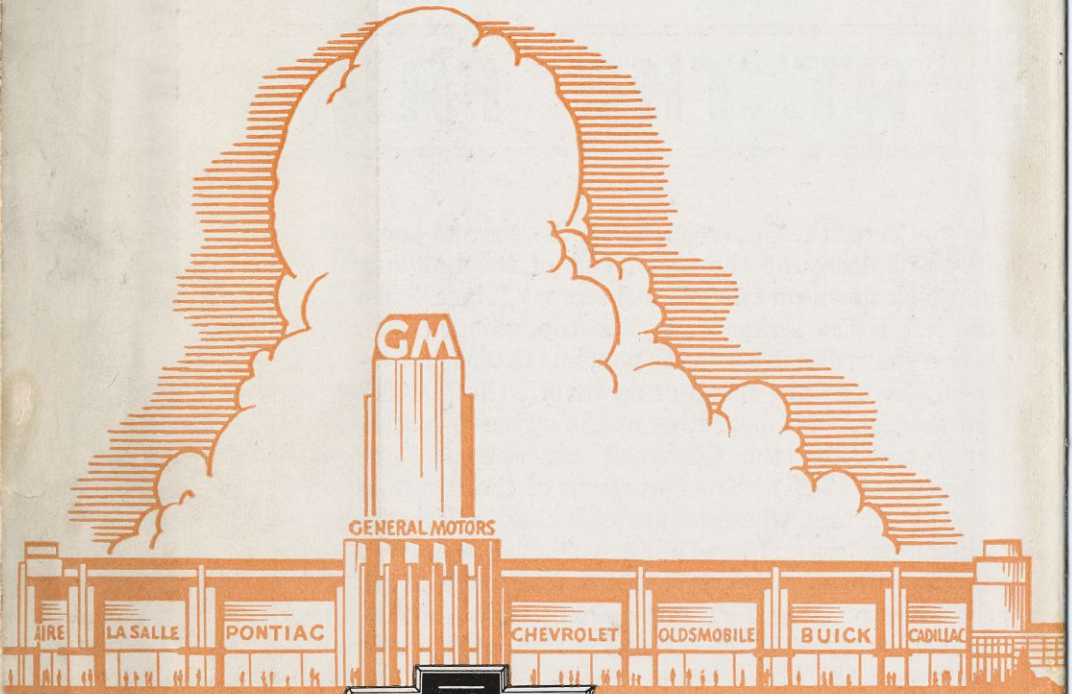
**14 Baking and polishing the newly painted parts.** These parts are now wheeled into large metal ovens (above). There they are baked under high temperatures to harden the paint applications and make them more resistant to marring and scratching. After the parts are thoroughly dried, they are taken from the ovens, sanded down to a smooth finish, and then put through the next operation (14A): *polishing*. A rubbing compound is first daubed on the surfaces, after which an electrically operated buffer rubs them down. Then, another workman rubs them down with a finer, softer electric buffer.



**13 First Chevrolet operation—preparing sheet metal parts as well as hood and radiator for assembly into car.** The starting point of the Chevrolet line is at the northeast corner of the room. Here, Chevrolet craftsmen take such parts as fenders and hoods, and rub them down with sandpaper to make all surfaces smooth. Then, these are taken to a glass-enclosed booth (above), where they are sprayed with four coats of Duco and hung on racks to dry. Next, in another glass booth, Duco is applied to hood, radiator shell and small parts. Here, also, wheels are given a coat of Dulux Enamel.



PANORAMIC VIEW FROM EAST BALCONY SHOWING CHEVROLET CAR-ASSEMBLY LINE IN THE FOREGROUND



**CHEVROLET**

