

AUTO MAKING DESCRIBED

By C. M. ZIMMERMAN.

C. M. Zimmerman, Willys-Overland dealer in this city, who is one of the 5000 dealers visiting the great Toledo plant in connection with the immense convention now in progress, recounts his experiences in this entertaining letter to the Outlook:

Nothing was ever so impressive as our tour of the great plant that turns out Willys-Overland cars.

Our Pullmans all parked in the company yards. There was room enough, for there are seven and three-quarter miles of track within the plant.

Each man got a card containing a picture of Mr. Willys and an autographed message of welcome from him. Next thing I knew we were lined up on the steps of the stunning new administration building getting photographed.

Elevators shot us to the company's own restaurant on the sixth floor. There we had a corking breakfast. At each plate was a copy of the live new Willys-Overland house organ "The Starter." It mapped our day's program.

Then started our tour of the plant. Our guides were carefully picked men. They knew the plant from end to end, and the parties were small so that each member of the party could have his questions answered.

Nobody ought to try to sell Willys-Overland plant products without knowing this plant. You can't grip the immensity of the proposition till you do.

It is no piker business. Twenty-five million dollars are tied up in land, buildings and machinery, not to say a word about the stock of parts and raw material.

From the roof of the wonderful administration building, which stands out like a state capital, you get a great panorama of the plant. You can then readily believe that it occupies 103 acres, with 4,486,680 square feet of floor space in daily use and a production capacity of 1000 cars per day.

You can appreciate the growth from 250 employes in 1908 to 17,300 in 1916.

One thousand persons, more than the entire manufacturing force of many a company, work in the administration building alone. This structure, 375 feet long, has every facility for rapid work, including dictaphones, its own telegraph and telephone system and a mail handling department that does about everything but write the letters.

Three hundred and eighty-eight persons can be fed in the restaurant at one time.

But this is nothing to what hits when you cross into the shops. It is a whirl of action, yet all is system.

Parts by the untold thousands are here, with a value into the millions of dollars. There are lines of motors. I never saw so many crank shafts together. Our guide said 6,000—I'd have believed 60,000.

There is stock in bins, stock in yards, stock along the walls, connecting rods, frames, fenders, mudguards, hoods, rims, springs, axles, torsion tubes, transmission gears shafts, brake parts, steering rods, pedals—it is an unending procession.

Every thirty days sees an average of 1,000 tons of steel come in. It is handled by a magnetic crane that enables two men to do a work that formerly required thirty.

There are amazing machines.

The toggle press, for example, held us all. This monster, with its pressure of 1,000 tons, shapes cold steel like cardboard. A piece of metal fed to it comes out as a side frame. It can make 2,000 of these in an eight hour day.

Other mighty machines stamp out radiator shells, fenders, cowi dashes and doors.

You take off your hat to the drop forging machines. Down comes the hammer and the fiery piece of iron is beaten into shape. The complete drop forging of the front axle can be accomplished with one heat.

Every kind of part requiring strength was drop forged while we looked on, azies, crank shafts, brake assembly rods, brake and control rods, spring shackles, gear blanks and brake rod sectors.

We saw the company's accurate system of die making. It calls for a special workman on each detail. One works on the shaper, another on the planer and a third on the die sinking.

The multiple spindle drill in one operation drills all the holes in the front axle. This is a guarantee that each will be in right relation to the other.

It was hard to drag us away from the automatic turret lathe that surfaces and finishes fly wheels. It works as though somewhere within

its metal vitals a brain was concealed. The workman has only to put on the rough fly wheel, adjust the first set of tools, push the lever, and let the machine do the rest.

The cast iron is peeled off as readily as wax. Sometimes four or five operations are performed at once. When one set of cuttings is done, the machine stops automatically, and the next set of tools comes automatically into place. Twenty operations are performed in fourteen minutes. Twenty-six pounds of metal are removed from the wheel. One man can watch three of these machines.

The vertical cutter of gears on fly wheels almost matches the turret lathe in interest.

Moving up and down, the cutter at the same time slowly revolves, the fly wheel turning in the opposite direction. By the time a complete revolution of the fly wheel has been accomplished all the gears are cut.

We all fell for the aluminum foundry and for the machines that finish the aluminum parts.

The multiple spindle drill bores 81 holes in the crank case in one operation. This is a proof of the superiority of machine processes, for the holes must be in the right relation to each other.

Another machine smooths the surfaces of the crank cases, finishing seven in nine minutes.

Diamonds, real diamonds, are consumed with apparently reckless indifference in the wet grind room. Placed in small tools they are used to true the emery wheels on which are ground the bearing surfaces of the crank shafts.

They are bought in \$15,000 lots. We looked on while whole forests of lumber were being turned into bodies in the wood work department. This lumber comes by carloads. As 214 feet of wood is required on a small touring car, we could readily see why so much was required.

You make this round and you can understand this company's immense consumption of material—18,000,000 pounds of solder annually, 2,500,000 pounds of tin and lead for smelting, 10,000,000 pounds of brass and copper, 12,000,000 feet of steel tubing and 125,000 tons of steel.

But what impressed me more than all was the department in which materials are tested. They have to know a thing is right before it goes into a Willys-Overland car. That's how they safeguard the public.

Tests in the physical and chemical laboratories are made in two ways. Completed steel parts are subjected to terrific tests. Axles are twisted like rolls of taffy candy. Small bits of steel, six inches long, cut from completed axles, are attached at both ends, and literally pulled apart. The registering machine shows 200,000 pounds to the square inch necessary to accomplish this, whereas a resistance up to 125,000 pounds would be proof of ample tensile strength. Springs are tried for their resistance.

Steel articles are also put through both heat and chemical tests. The former determines the amount of carbon, an important factor; the other determines the chemical composition of the steel.

Naturally every operation in all the plants tends finally toward the assembly conveyor tracks. There are four of them, each 645 feet long.

We followed the whole operation. We began at one end where the frames and rear systems are put in place. By the time the other end of the conveyor is reached the frame has grown into the finished car.

From overhead parts are lowered by chains. Along the way men are attaching the parts. The frame is not in motion all the time, but can be instantly connected with the links of an endless chain and sent on its way whenever desired.

Top quality of workmanship is assured by having each man do work on which he is an expert, if it be only to tighten a bolt.

Lines of motors, already tested, wait on both sides of the conveyor. These are put into place, cantilever springs are put on, steering mechanism and lighting and starting systems are adjusted. Gradually the car takes form.

Instead of painting the chassis with a brush, a sprayer is used. It does the work more rapidly, more uniformly and at a lower cost.

The tracks of the assembly lead directly through ovens in which the paint is baked. Fenders and running boards come into their places.

Wheels with the tires on are brought along on a runway. First comes a front wheel, then a rear wheel. You ought to see them put on the tires. It is lightning. By a special device, invented by one of the men in the department, the tire can be put on a wheel in three seconds.

From overhead bodies are dropped down on to the chassis and soon made fast.

The car is now ready for its tests. Rapidly revolving wheels in the floor engage the wheels of the car, and send them at high speed to make sure that they are operating freely. This is not a test under the power of the car.

Gasoline and water are then put

into the car. It is pushed off the track into another room, till its wheels are in contact with wheels in the floor.

With the use of the self starter, the machine gets its first chance to prove the success of its construction.

It surprised me the way the motors started. They were off with a rush. There was no hitch or delay. All the work had been done right. In a few minutes the motor was working apparently almost as smoothly as if it had been a year on the road.

We saw how the cars were shipped. The export department has the big feature in this line. The finished car undergoes preparation by having its wheels taken off and fastened on the under side of the frame which forms the top covering for the car.

The top is covered with tar paper as a protection against the elements and all is securely boxed.

Along comes a big crane running in an overhead groove a quarter of a mile long. The operator sits in a small cab not unlike that of a railroad engineer. Chains grab the box containing the car, and within forty-five seconds have carried it outside the building and placed it on the flat freight car.

It is processes like these, all that I have described, that explain why every car in the Willys-Overland line is what it is at so low a cost. Making so many is the answer, making them to go all over the world and having profited by the experiences of users everywhere. Quantity production, immense and costly machines, skilled designing, careful inspection, accurate tests of material, efficient factory methods, rapid assembly and advanced methods of handling, all these we saw; all these tell why the Willys-Overland company lives up to its ideals of a car for every need or taste, price, class and service right.

From the lowest priced to the headliner. It will be the marvel of the automobile shows.

This sightseeing tour is only one angle of this convention. Tonight we will hear policy defined by the various officials.

The two day's program includes a rollicking beefsteak dinner, a more formal banquet, a minstrel show, a concert by the famous Overland band and a concert by the Glee club.

Finally there will be a speech by the moving genius of it all, Mr. Willys himself.

You will agree with me that this is some project to have been put over all within one plant and by the people of the organization.

DEBATE DATES SET FROM 67 SCHOOLS

In a few days debaters from 67 Oregon high schools will be hard at it. Many teams have been working for weeks on this year's subject, which is:

"Resolved that Oregon should adopt a health insurance law embodying the essential features of the Standard Bill of the American Association for Labor Legislation."

The league officers intend that the debates within the districts shall be ended in time to permit final dual debate among winners on February 2. Elimination of schools is very rapid under the district plan of organization.

The top two teams will debate for the University of Oregon cup, which carries the league championship, at Villard hall next May. Crook county high school, of Prineville, holds the cup at present. The schedule in the local district follows:

Lower Columbia.—W. I. Wight, Clatskanie, director.

January 12.—Single debate unless otherwise stated: Astoria vs. Seaside, dual; Corbett vs. Scappoose; Clatskanie vs. Corbett. January 19.—Clatskanie vs. Scappoose; winner of Astoria and Seaside vs. winner of Corbett and Scappoose. Winner of Astoria and Seaside vs. winner of Clatskanie and Corbett. January 25.—Winner of Clatskanie and Scappoose vs. winner of Astoria-Seaside and Corbett and Scappoose. February 2.—Winner Astoria-Seaside and Corbett vs. winner of January 25.

CHICKEN SUPPER AT ROCKWOOD GRANGE

Rockwood grange is going to provide a chicken supper for its members and visiting grangers on the evening of January 3d, in connection with the installation of the new officers and the initiation of several new candidates.

Every member is expected to attend and bring something to add to the feast. This meeting will be the first of the new year for Rockwood grange and a large attendance is expected.

Bucharist, the capital of Roumania, has a population of 400,000 and is said to be the gayest city in the world. The Roumanians are a Latin race and Bucharist is a deliberate imitation of Paris.

In a new form of electric fan vertical blades draw in the air from beneath and distribute it equally in all horizontal directions.

HARD PROBLEM DISCUSSED BY EDUCATORS

Continued from page 1

tenable objection to the biblical text-book on morals.

Australia, one of the most progressive Commonwealths in social progress, has adopted the Bible in the schools. The social background there is essentially the same as ours. A half century has cancelled all fears of the practicability of such teaching. Queensland, one of the provinces, in 1910 by initiative and referendum, adopted the New South Wales plan, adopting specific selections for junior and senior grades. It may be worth while to note at this place that the man who initiated and put through Bible study in the schools of Australia was the chairman of the commission of education in New South Wales, the Right Honorable Jno. Herbert Plunkett, an ardent Catholic. Australia is no mean commonwealth, having a population of nearly 5,000,000.

The following states, by supreme court decisions have declared the Bible non-sectarian and a proper subject of study in the schools. Maine, Massachusetts, Ohio, Michigan, Iowa, Kentucky, Kansas, Texas, Nebraska.

Also in the celebrated Gerard case, the supreme court of the United States has declared the Bible to be non-sectarian and a proper subject of instruction in the schools of the country. Arizona, by statute, prohibits the Bible in the school.

In the Gerard case, the supreme court of the United States, said: "The form of oath universally prevailing, concluding with an appeal to the Almighty; the custom of opening sessions of all deliberative bodies and most conventions with prayer; the prefatory words of all wills; 'In the name of God, Amen'; the laws respecting the observance of the Sabbath, with the general session of all secular business and the closing of courts, legislatures, and other similar assemblies, on that day; the churches and church organizations which abound in every city, town and hamlet; the multitude of charitable organizations existing everywhere under Christian auspices; the gigantic missionary association with general support and aiming to establish Christian missions in every quarter of the globe—these, and many other matters which might be noticed, add a volume of unofficial declarations to the mass of organic utterances that this is a Christian nation."

Louisiana, Illinois, Wisconsin and Nebraska, by supreme court decisions, have discontinued the Bible in the schools. Colorado, Minnesota, Wisconsin and Missouri have done so by opinions of Attorney General. Montana and New York, (outside the city), by State Superintendent of Education.

In most of the states not mentioned above the status is that local option prevails and the book may be put in or kept out by the school board.

In Oregon the state superintendent favors it, the attorney general countenances it and his opinion is to be found on the report of the attorney general of 1913.

A NEW ROAD FROM HALEY TO ANDERSON

Through the efforts of Edmund Gurney and others, a new county road will be opened between Haley and Anderson station. The county court of Clackamas county made the final order on Saturday last, having received satisfactory assurances that the property owners through which the road will pass have been satisfied.

The new thoroughfare is to be known as the Telford road. In order to get the consent of A. W. Anderson he was paid \$75 by Mr. Gurney and others, the sum of \$250 allowed by the court, brick suitable for walling up a well, delivered at the Unique Brick & Tile Company's yard of the value of \$25; a promissory note for \$100 which is to be raised by subscription from others whom the road will benefit, and a deed to a small strip of land from the Frank Bathelup property east of the P. R. L. & P. Company's tracks.

The work of opening the new road is expected to begin shortly after the opening of the new year.

List of Letters

Remaining letters uncalled for in the Gresham postoffice for week ending December 16, 1916:

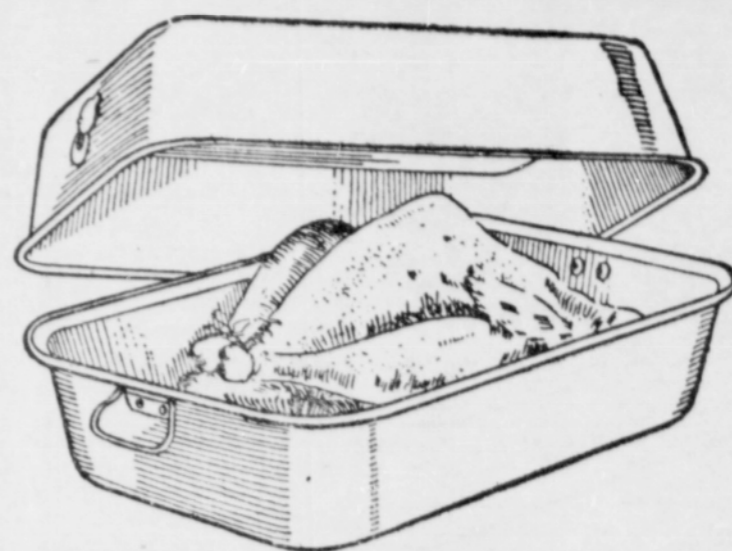
Letters—Union Stage, Billy Sanns, Mr. J. H. Stout, Mr. John Simonson, R. F. Lauden, Mr. C. E. Johnson.

These letters will be sent to the dead letter office on Dec. 20, 1916, if not delivered before. In calling for the above, please say advertised, giving date of list.

D. M. ROBERTS, P. M.

Sweden is having its alum shale deposits investigated by experts, in the hope of obtaining illuminating oil, sulphur and other products.

10% Discount

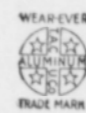


"Wear-Ever" Aluminum Roasters

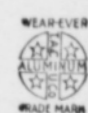
December 18 to 23, Inclusive

"WEAR-EVER" ROASTER WEEK

Christmas of 1936
SHE will use the "WEAR-EVER" Roaster—a gift from yourself
Christmas of 1916



Replace utensils that wear out with utensils that "Wear-Ever"



Most roasters are used only once or twice a year. The "WEAR-EVER" roaster can be used every day—for steaming fruit in jars, for baking on top of the stove, for steaming fish, corn, asparagus, etc.

You can prepare a whole meal at one time in the "Wear-Ever" Roaster. Ask for booklet

Order Your Roaster

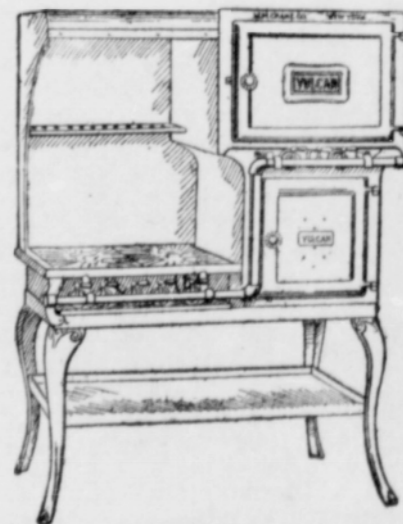
On or Before December 23 and

Get 10% Discount

Cook With Gas

We have all said, "If we could only have Gas to cook with in Gresham." The Dream Has Come True!

You Can Now Have the Conveniences of the Larger Cities



WE HAVE JUST INSTALLED THE

Vulcan Line of Gas Ranges

which can be had in many styles, including Baking Oven, Broiler Oven, Giant, regular and simmering burners, Warming shelf, etc. They are very convenient, in fact save the housewife much time and worry.

We can quote you price installed in your kitchen ready to use. Drop in to our store and see the many excellent features of the Vulcan.

—AT—

L. L. Kidder Hdw. Co.

GRESHAM, OREGON