



THE WORLD'S
GREATEST LIGHT CAR

MOTOR CARS

Vulcan Ideas

THE BIG IDEA responsible for the Vulcan can be expressed in one word—efficiency—the elimination of waste.

The evolution of the motor car has gone from the primitive to the heavy expensive cars, and thence to the very cheapest. From these extremes the next tendency will be for the industry to readjust itself to the production of the "common sense" type, the car of greatest efficiency for the investment—the cheapest and most satisfactory in the end.

The Vulcan sets a new standard of motor car value for this era of the industry.

Designing Idea The Vulcan "27" is designed to fill the strong demand for a reliable, low priced, light car equalling in quality and performance the higher priced cars on the market. As will be seen from the illustrations, both Vulcan models have an appearance far superior to the average one thousand to fifteen hundred dollar cars but the price is only slightly more than the extremely low priced types.

The Vulcan is not designed along radical or freakish lines, but on standard principles of proven practicability. Its superiority has been attained through the perfection of details. Simplicity and durability have been the two main features aimed at throughout. Nevertheless ease of operation and comfortable riding qualities have been attained in a degree to please the most fastidious.

Manufacturing Idea A large part of the success in furnishing a car of this type is due to the fact that the Vulcan is not an "assembled" car. The *Vulcan Idea*, from its first inception, comprised the building of the chassis complete, including axles, transmission, steering gear, clutch, frame, and every part that enters into these various units. This is the *only way* that the cost of production can be reduced to a point where it is possible to furnish a high grade completely equipped car of the desired power and specifications for a popular price.

To accomplish this, means quantity-production and an immense number of special tools and fixtures for machining and finishing the various parts. In no other way can every operation be performed at the necessary minimum of labor cost, and at the same time maintain the highest degree of perfection.

Such a high standard of factory efficiency is possible only under the direction of men of extraordinary mechanical genius. The engineers behind the Vulcan "27" are men of automobile experience dating back to the beginning of the industry, as well as possessing natural mechanical ability of the highest type. The preparatory work in connection with making the Vulcan car has covered a long period of years. Car after car has been made, tested, and improved upon during the process leading up to its present perfection.

Selling Idea It is our policy to get the cars from the assembling room of the factory to the owner's private garage with the least possible intermediate expense. In determining the selling price, no allowance has been made for large commissions to district sales agents, distributors, etc. We have simply added to the cost of manufacture the legitimate percentage for the local dealer, who rightfully earns his profit in service to the car owner.

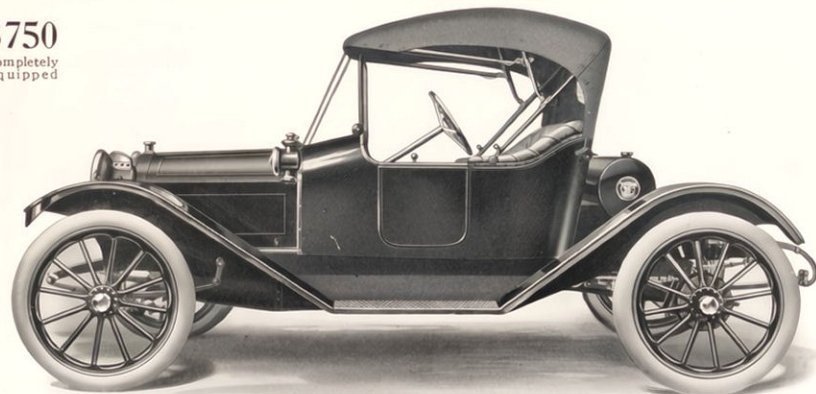
The most practical advertising policy is to let the *owners do the boosting* and put the real value into the car itself, giving every owner ample reason for taking pride in his car.

The above short summary shows why the Vulcan is the "World's Greatest Light Car." In explanation of this slogan, which we have adopted as typical of the Vulcan car, we wish to say this does not mean the greatest in size, nor the greatest in production, but the greatest in *performance and efficiency*—the light car that gives users the *greatest value* for the money.

VULCAN MFG CO.

Painesville, Ohio, U. S. A.

\$750
Completely
Equipped



THE VULCAN "SPEEDSTER"

Two-Passenger Type. Note the long, rakish effect due to drop frame and "stream line" body design. (Wheel base 105 inches.)

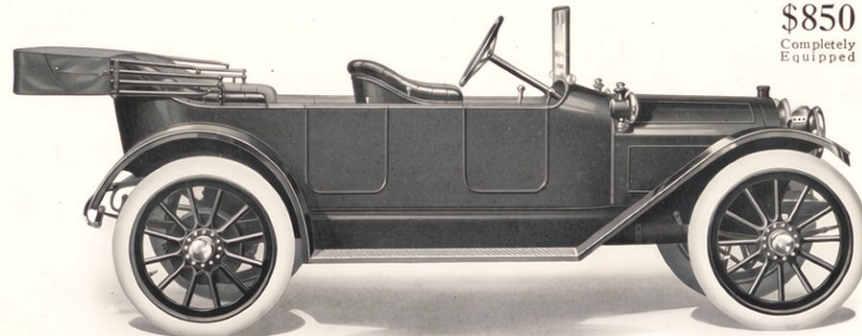
Models The main idea toward which all details have been focused is to produce a long, low, rakish looking car and still have ample road and spring clearance.

Both "Speedster" and Touring Car bodies are built with the attractive "stream line" effect and finished to please the eye of the ultra-critical. In fact, the owner of a five thousand dollar limousine who needs an everyday car, can place the Vulcan alongside his more expensive vehicle and it will suffer in comparison only in size.

As will be seen from the illustrations, the Vulcan is built low to the ground, with drop frame and front axle. This design possesses practically all the advantages of an underslung with none of the disadvantages. All freakish details have been carefully omitted, and everything clumsy or complicated has been discarded by the Vulcan designers. The result is a clean-cut, practical car that will stand up under severe usage and give service 365 days in the year.

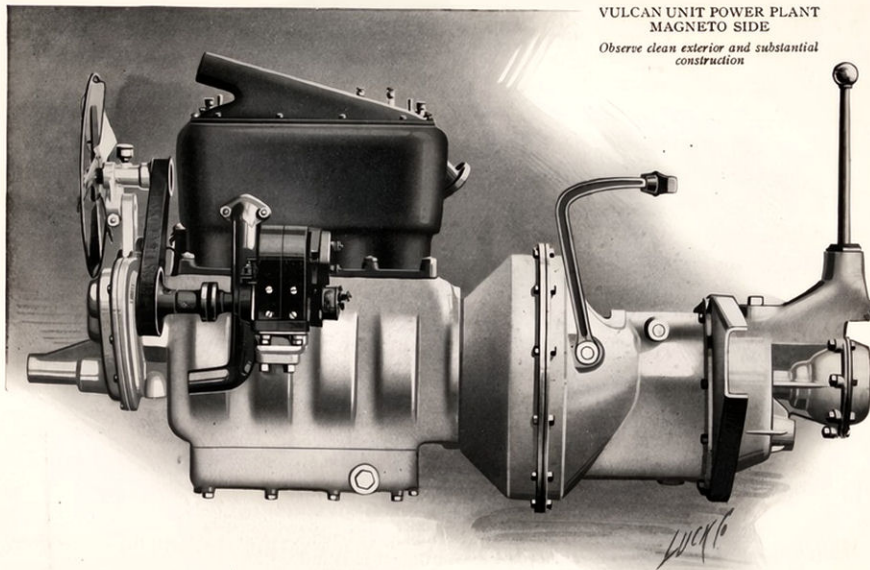
(For mechanical specifications see two center pages)

\$850
Completely
Equipped



THE VULCAN TOURING CAR

Five-Passenger Type. Note the extremely graceful lines and classy appearance, clean running boards, etc. (Wheel base 115 inches)



VULCAN UNIT POWER PLANT
MAGNETO SIDE
Observe clean exterior and substantial
construction

Mechanical Features

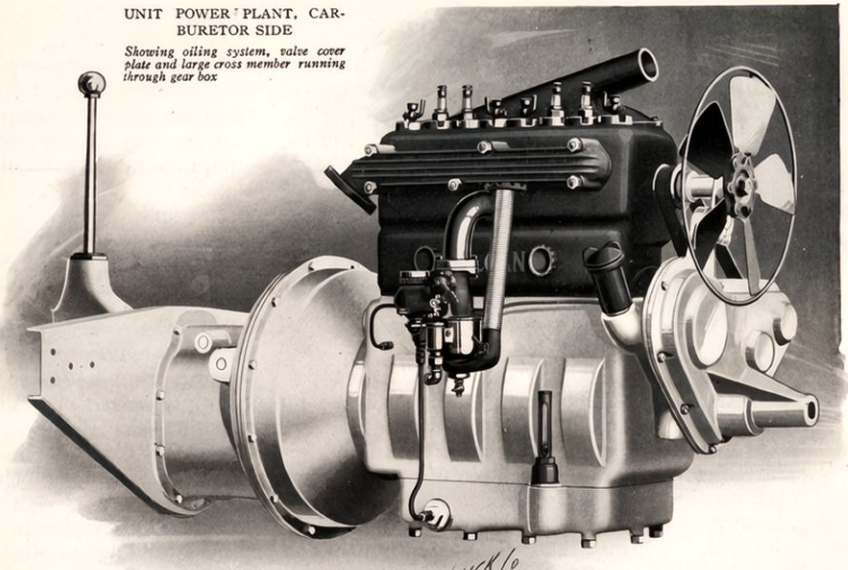
Unit Power Plant The Vulcan motor is the four cylinder, long stroke, L Head type, cylinders cast enbloc. The $3\frac{3}{8}$ " bore by 5" stroke is conceded to be the most efficient proportion both in the matter of fuel economy and durability. This motor is conservatively rated at 27 H.P., but is capable of developing considerably more, as proven by dynamometer test, and its almost incredible hill climbing ability. It also possesses the very desirable feature of smooth pulling power at very low speeds.

The motor is liberally proportioned throughout. Bearings are exceptionally large. The pistons and connecting rods are very long, which reduces by a large percentage, the wear on the pistons and cylinder walls and consequently increases the power of the thrust at each explosion.

The crank shaft is a heavy drop forging with fly wheel flange forged integral at the end. Bearings $1\frac{7}{8}$ " in diameter, rear main bearing being $5\frac{1}{2}$ " long. Both main bearings and connecting rod bearings are provided with heavy boxes, die cast from non-friction white bronze possessing great wear resisting qualities.

The cam shaft is a solid drop forging with all cams integral, supported at the center by a wide bearing to avoid springing. Cam surfaces are ground true to form after hardening.

Oiling system is a combination of the positive feed and constant level splash type. A plunger pump forces oil from the oil reservoir to all bearings and gears, keeping the bottom of the crank case constantly filled to a certain



UNIT POWER PLANT, CAR-
BURETOR SIDE
Showing oiling system, valve cover
plate and large cross member running
through gear box

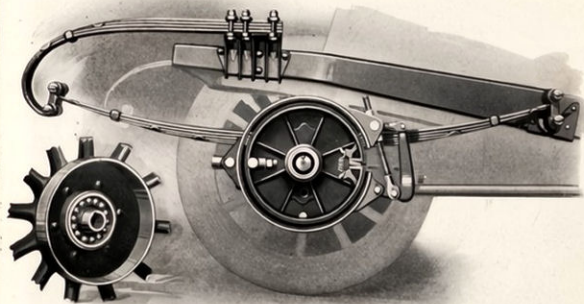
level. Quantity of oil in reservoir is shown by float gauge at base of motor. A clean motor exterior is obtained by reducing the number of joints through simplified construction. All joints are carefully fitted and the best grade of gaskets are used wherever required.

The entire power plant, including the motor, clutch, transmission, universal joint and all operating levers, is built as one unit, the whole being suspended at one point on the forward end and two points at the rear.

The cross member at the rear of the power plant is a radical departure from the usual type. This cross member on most cars lacks the rigidity and strength required to resist the torsional and thrusting strains brought upon it by the driving force of the motor and the twisting movements of the car over uneven roads. On the Vulcan it is bolted through the center of the transmission case, the logical place of support.

Clutch The Vulcan clutch is of the most simple and unique design. The large diameter, leather faced cone engages into a taper on the inner surface of the fly wheel rim. Smoothness of operation is enhanced by a set of springs and plungers in the face of the clutch, causing the two surfaces to come together gradually. The pressure is maintained by eight expanding spiral springs, pressing against the aluminum clutch wheel at one end, and a pressed steel spring spider at the other. Clutch is released by a yoke actuated by foot pedal, the leverage being so nicely proportioned that a pressure of only a few pounds will disengage the clutch—a feature especially desirable for women drivers.

The yoke is provided with tapered roller bearings which engage into a deep



BRAKES AND REAR SPRING SUSPENSION
Notice ample braking surface, large ball bearing and extremely long springs

This feature is also found extremely desirable for driving over bad places in the road, pulling out of mud or negotiating a difficult garage entrance.

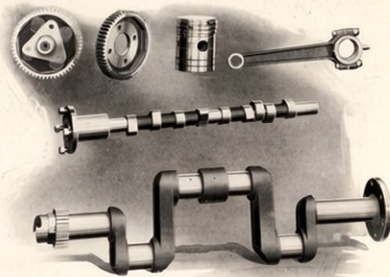
Transmission gears are made from 3½% nickel steel, all carefully heat treated. The teeth are exceptionally wide, being from ¾" to 1⅛" face. The teeth on the clash gears are chamfered by special machinery, rendering the gear shifting quiet. The gear shift lever is set in a ball and socket below which is the "H," cast into the transmission housing. The operating lever is of the "cane handle" type, with aluminum ball at the top, which fits the palm of the hand.

Universal Joint The front half of the housing for the universal joint is cast integral with the rear half of the transmission case. This, with the pressed steel cap, which is bolted to it, forms the socket for the ball, which is a drawn steel part, pressed and riveted to the end of the torsion tube. This hollow ball and socket forms a grease tight housing for the universal joint, and also transmits the driving force from the rear axle to the car.

The joint itself is constructed of two very heavy drop forgings with center block and pins hardened and ground—all wearing surfaces are very large and are bushed with phosphor bronze.

Brakes The service brake is external contracting, operated by the foot. The emergency brake is internal expanding operated by hand lever. The leverage of both brakes is so nicely proportioned that a gentle pressure is sufficient to stop the car. Both brakes are constructed entirely of pressed steel and drop forgings. The bands are lined with asbestos and operate on a large pressed steel drum.

Wheels The wheels are made of Grade A, second growth kiln dried hickory, twelve 1¼" spokes in each wheel, malleable iron hubs, pressed steel rims and hub flanges. Hub flanges are 6" dia. making an especially rigid wheel. 32"x3½" tires. The wheels are mounted on ball bearings, ⅝" balls on the inner bearings and ½" on the outer.

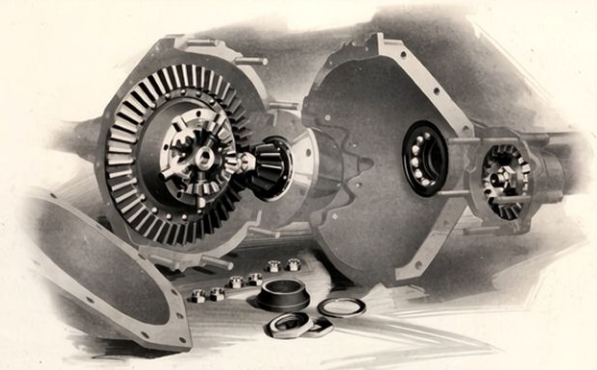


A FEW WORKING PARTS OF THE VULCAN MOTOR
Showing husky proportions

groove or roller race in the clutch wheel hub. Clutch wheel is mounted on ball bearings. The housing is provided with an opening at the top, making the parts easily accessible.

Transmission Three speed, selective sliding gear describes the type of the Vulcan transmission. The low gear is very low, which makes starting gradual and pleasant.

Front Axle The front axle is tubular with graceful drop at center. The steering knuckle, steering levers and axle yokes are drop forged from special alloy steel, selected for its great tensile strength. The yoke and knuckle are as large and strong as those used in many cars weighing three times that of the Vulcan and they are designed so that the axle itself is dropped four inches below the center of the wheels.



REAR AXLE
Showing Five-Pinion Differential, exceptionally large Driving Gear and Pinion, Heavy Duty Ball Bearings, etc.

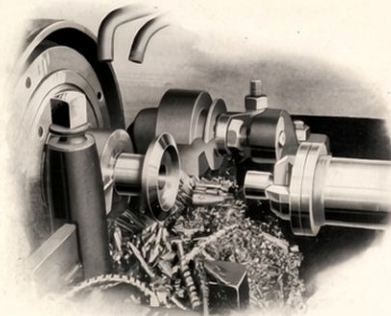
Rear Axle Rear axle is the semi-floating type, the weight of the car being carried on the large ball bearings mounted on the tubular housing.

All bearings in connection with the driving line and axles are ball bearings of sizes used in many cars twice the weight of the Vulcan.

Main Driving Gear and Pinion The main driving gear is machined from a solid drop forged ring of 3½% nickel steel. The pinion from bar steel of the same alloy. The teeth are planed with the Gleason Gear Tooth Generator, insuring a perfect shape and noiseless operation. These teeth are large enough for a much heavier car, being 1¼" face. The teeth on the driving pinion are reinforced by an added brace running back ⅜" of an inch beyond the tooth on the gear hub. These gears are very carefully heat treated and hardened. Immediately back of the main driving pinion is a large New Departure ball bearing of the combination annular and thrust type which takes the strain at this point.

Differential is the bevel gear type, employing five pinions instead of two, three or four, as found on all other cars.

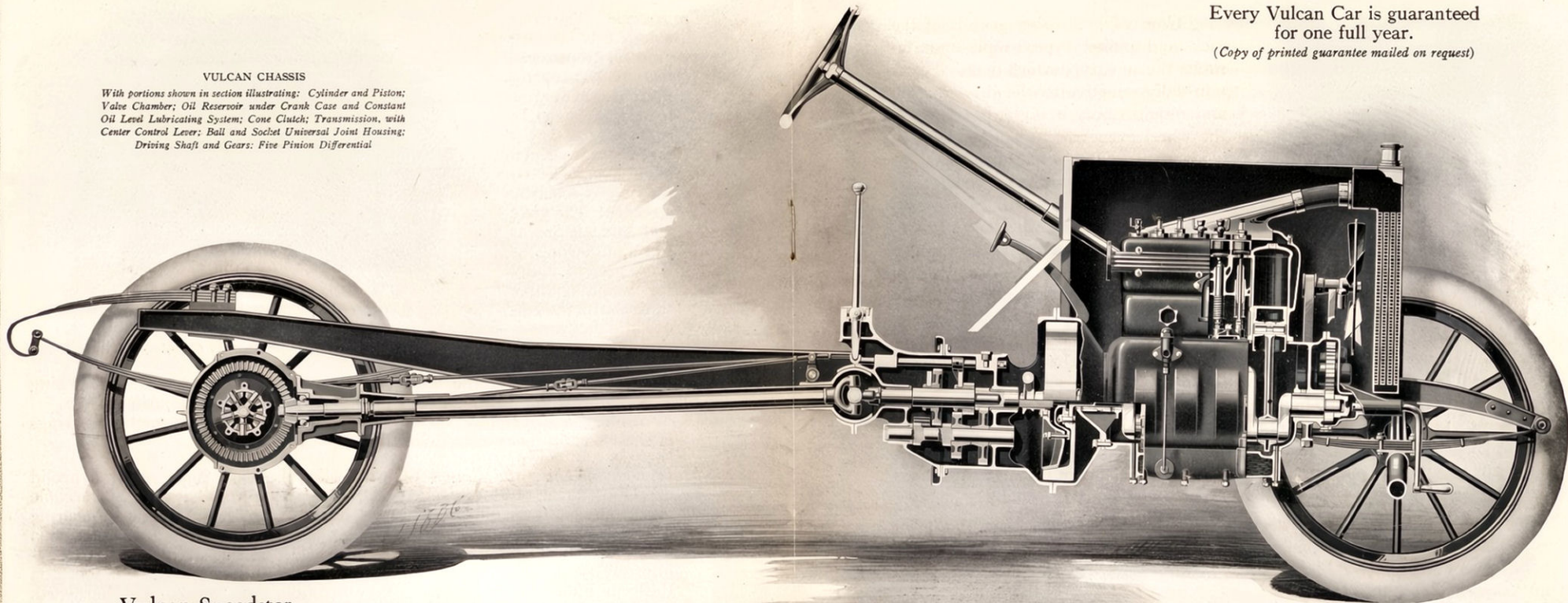
These added pinions increase the life of the differential from 35% to 50%. The pinions are nickel steel, phosphor bronze bushed, and revolve on a drop forged spider, which is also provided with a bronze bushing at the center to accept the live axle ends. The bearings between the live axle and the differential housing are 4⅛" in diameter, using ⅝" balls. The rear axle housing is liberally ribbed and the pressed steel cover at the rear of the housing is easily removable, exposing the gears for examination and changing grease.



SPECIAL TOOL EQUIPMENT
For cutting Differential Gear Blank from solid bar of 3½% nickel steel

VULCAN CHASSIS

With portions shown in section illustrating: Cylinder and Piston; Valve Chamber; Oil Reservoir under Crank Case and Constant Oil Level Lubricating System; Cone Clutch; Transmission, with Center Control Lever; Ball and Socket Universal Joint Housing; Driving Shaft and Gears: Five Pinion Differential



Every Vulcan Car is guaranteed for one full year.

(Copy of printed guarantee mailed on request)

Vulcan Speedster

Unit Power Plant—Includes motor, clutch, transmission, universal joint, and all control pedals and levers, three point suspension.

Motor—Vulcan long stroke, 27 H.P., bore 3 3/8", stroke 5", L head, four cylinders cast en bloc.

Ignition—High tension magneto. Fixed spark. No batteries or coil.

Carburetion—Latest improved carburetor of highest efficiency for the Vulcan Motor. 1" intake. Hot air connection and dash control. Priming device. Handy to starting crank.

Valves—1 5/8" diameter, all enclosed within cover plate removable with two hand screws. Tappets adjustable to take up wear.

Muffler—Russia iron drum, 24" long, 5" diameter, with baffle plates. Pressed steel ends. Very silent. No back pressure.

Cooling—Thermo-syphon system. Ample size water jackets, hose and radiator insure free circulation. Radiator vertical tube type; 12" fan.

Lubrication—Combination positive feed and constant level splash system. Six quart oil reservoir beneath crank case, quantity of oil in reservoir indicated by float gauge at base. Plunger pump forces oil to all bearings.

Clutch—Cone type, 13" diameter, 1 1/2" leather faced.

Transmission—Selective sliding gear. Three forward speeds and reverse. Direct drive on high.

STANDARD SPECIFICATIONS (Condensed)

3 3/4% nickel steel gears. Gear ratio on high 4 to 1. Speeds on high gear, 5 to 50 miles per hour.

Control—Left side drive. Gear shifting and emergency brake levers in center. Clutch lever operated with left foot. Service brake pedal and foot throttle with right.

Universal Joint—Heavy drop forged toggle joints enclosed in ball and socket grease tight housing.

Drive—Shaft through torsion tube. Large ball bearings.

Steering Gear—Rack and pinion type. No "back lash." Drop forged steering knuckles. 16" steering wheel.

Axles—Rear axle, semi-floating. Driving axles 1 1/8" diameter. Five pinion bevel gear differential. Front axle tubular with drop at center. Heavy end yokes drop forged. Axle tubing is best cold drawn, seamless—2" diam. by 3/8" wall.

Frame—Pressed steel U section. Four cross members rigidly braced.

Springs—Front, semi-elliptic. Rear, 3/4 elliptic. 46" long, 1 3/4" wide. Made from high grade special alloy spring steel. Very flexible.

Wheels—Grade A. Kiln dried hickory. Twelve 1 1/4" spokes, both front and rear. Malleable iron hubs with pressed steel flanges 6" in diameter. Quick Detachable Rims.

Brakes—Service brake external contracting, 10" dia., 1 1/2" face, foot pedal. Emergency, internal expanding, hand lever. Asbestos brake lining. Large pressed steel brake drum. Bolted to wheel hubs.

Tires—32"x3 3/4" on all four wheels. Straight side type for Q. D. Rims. Plain tread. Best standard makes.

Wheel Base, Speedster—105".

Clearance—10 1/2"; center of front axle lowest point.

Fuel Tank—12" in diameter. 30" long. Capacity 14 gallons. 20 gauge, lead coated steel, with convex ends. Lap seamed.

Body—Double fore doors. Wide and roomy. Steel body, deeply upholstered. Seat 39" wide, 18" deep, 11" high on front. Distance from back cushion to foot-board 43". Very comfortable riding position.

Fenders and Steps—Pressed from 22 gauge fender steel. Graceful design. Rigid, drop forged brackets. Front fenders and steps tied together with angle irons running across entire width of car.

Finish—Running gear and fenders, black japanned. Body and wheels attractive shade of dark Brewster green. Nickel and aluminum trimmings.

Equipment—Large gas head lights. Prest-O-Lite tank, with gauge. New type oil side and tail lights. Mohair top, with side curtains. Automatic wind shield. Horn. Speedometer. Full kit of tools. Jack. Tire repair kit and double action pump.

Extra Equipment—Vulcan cars will be fitted with ELECTRIC LIGHTS for \$25 extra—(Net.) Special quotations on Self Starters and other extra equipment furnished on request.

Weight—Car complete, 1750 pounds.

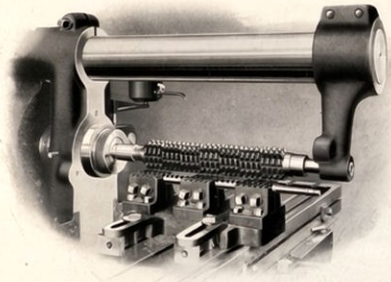
Price—Completely equipped \$750. F. O. B. factory, Painesville, Ohio.

Terms—Deposit with order. Balance on delivery of car.

Touring Car

Same specifications as Speedster, except 115" wheel base. Five passenger body. Weight, 1950 lbs. Heavier rear springs, frame, etc.

Price—Complete \$850. F. O. B. factory.



GANG CUTTER MACHINING 27 TEETH IN STEERING RACK

with one cut, exemplifying the Vulcan method for maintaining uniformity and economical production

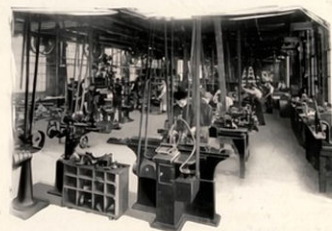
Steering Gear The steering gear is of the rack and pinion type, simple and durable; the new type which makes the car unusually sensitive to the driver's will, and requires only a slight pressure on the wheel even when running through heavy roads. The usual "back lash" or play, found in the worm and sector steering gear is done away with, thus avoiding wobbling of front wheels.

The steering column is set at a rakish angle which brings the 16 inch wheel in the most comfortable position for the driver. The pinion end of the steering

column is hung to the front cross member just to the rear of the front axle in a convenient location to the steering levers. This location avoids a surplus of rods and joints, commonly employed.

The front wheels being hung at an angle of three degrees, and the knuckle pivot at the reverse angle of four degrees, brings the point of tire contact in a direct vertical line with the steering knuckle pivot. This greatly helps the steering qualities of the car and prevents road shocks from being transmitted to the steering wheel. Then, too, the unique manner in which the steering lever is attached to the steering knuckle reduces the turning radius so that the car can be turned within a circle thirty feet in diameter; probably the shortest turning radius of any car on the market regardless of wheel base.

Methods of Manufacturing During the last few seasons nearly all of the new automobiles brought out have been the product of "assembling companies," the various parts and units being made by automobile parts and accessories manufacturers. This method presents an easy way to get started in the automobile business without much capital, but invariably results in one of two things—either the price for the complete product has to be set much higher than the intrinsic value warrants, or the quality has to be cheapened in order to sell the product at a popular price. These results are the effect of natural causes. The parts manufacturer must so design his product that it will fit the greatest range of cars. Anything so designed is either too heavy for the light car or too light for the heavy car, which makes it mechanically unfit for either. The parts manufacturer must also receive a liberal profit and charge enough to cover his



SECTION OF TOOL ROOM

where special jigs, dies, cutters, reamers, etc., are made by expert tool makers

overhead expense' as well, which in some cases is highly extravagant.

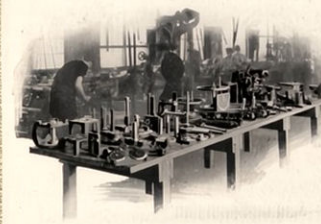
When this extra expense on all the various parts so purchased is added together, the necessary increase in the list price of the car runs from 20 to 75 per cent.

After carefully analyzing these facts, the Engineers of The Vulcan Mfg. Co. determined to start right, not only to manufacture all the parts and units entering into the construction of the Vulcan chassis, but to equip the Vulcan factory with such special machinery, dies, jigs and tools that the labor cost might be reduced to a minimum.

There is not a single operation in the machining of any part accomplished by ordinary hand methods, but a special tool, die or jig, and in some instances complete special machines are employed for doing the work. In many cases this cuts the cost of production down to 1% of its usual cost when done by the ordinary hand process.

Everything is put through the Vulcan works in large quantities. The equipment is designed for thousands of cars instead of dozens or hundreds. All this results in the production and marketing of a \$1200 car for \$750, and still allows a reasonable profit for the manufacturer. The Vulcan owner gets full value for his money and enjoys the knowledge that every component unit in the Vulcan was especially designed and machined for the purpose for which it is intended, and harmonizes with the other parts adjacent to it.

Dealers of experience will appreciate the great advantage of a "manufacturer" over an "assembling company." On the question of duplicate parts, for instance, where is an owner going to get repair parts for his transmission or steering gear if the accessories company who made them for the car "assembler" has gone out of business? What is the dealer going to do when the rush season is on and the assembling company can't deliver because they are held up for axles or clutches? The wise ones look ahead and consider these things which is the only successful way.

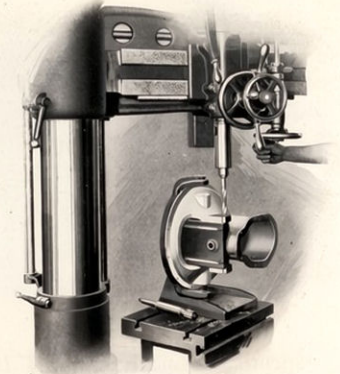


THESE FEW SPECIAL TOOLS, JIGS AND GAUGES

will give an idea of the extensive equipment required for machining and inspecting Vulcan parts

Inspection In addition to the tool equipment described above, every Vulcan part has to pass through a set of limit gauges, the purpose of which is to insure accuracy and uniformity from one year's end to the other.

This avoids assembling room trouble as well as difficulties in the repair shop while replac-



EXAMPLE OF LABOR SAVING EQUIPMENT

Radial drill and jig for drilling and reaming all holes in part without removing part from jig, insuring perfect alignment of bearings, and minimum labor cost





INSPECTING PARTS

by use of accurate limit gauges. No parts are allowed to pass to Assembling Room without first going through Inspection Department

ing damaged parts. Interchangeability of parts is directly an important item to the car owner, as well as greatly appreciated by the garage man. The greatest benefit, however, accrues to the manufacturer, which in turn reverts to the car purchaser in the form of lower prices. No files and reamers are required in the Vulcan assembling room. Everything slips into place with a perfect fit. There are two sets of gauges, the "master gauges" being used at the In-

spection Department and the "service gauges" by the machine operators.

With this system, we do not depend upon the care or accuracy of the machinists in our employ. It is practically impossible for a single part to get into a Vulcan car unless it is accurate to a fraction of one thousandth of an inch.

Materials Every piece of material which enters into the Vulcan is very carefully selected by men who possess complete scientific knowledge of its adaptability for special requirements. Drop forgings are used wherever possible throughout the car, not only because a drop forging is the best whenever it can be used, but because when ordered in large quantities it is the cheapest, and can be machined with greater economy than any substitute. Whenever strength and lightness are required, pressed steel parts are employed, with special care as to the analysis of the steel plate used.

An unusual fact in automobile practice is that all castings are made in the Vulcan foundry, permitting constant supervision and avoiding the necessity of paying a profit to any outside foundry.

Three cupolas are operated for grey iron, so that the proper alloys and analysis of pig iron for the different requirements can be introduced without mixing the heats. Charcoal iron is used exclusively. The Vulcan Mfg. Co. does not depend upon the honesty or care of outside foundries, for there is always a temptation to throw in a large percentage of scrap iron with unknown qualities.

Vulcan castings are very low in sulphur and high in silicon and manganese, causing the grain of the metal to be close and homogeneous. The splendid foundry equipment and scientific management produces castings free from blow holes or chilled spots. All this is of great importance to the car owner, as well as a large factor in the cost of production and subsequent selling price of the car.

Body The Vulcan body combines attractive design with maximum comfort and roominess. The double foredoor permits entrance from either side of the car. It is built with a live oak frame, reinforced with drop forged body irons,

securely bolted. This frame is covered with heavy bright finish body steel. The seat is much wider than usual, and the back is high, supporting the shoulders. The relative position of the cushion, back and foot board has been carefully figured out to give the most comfortable riding position. Long, hard rides can be taken in the Vulcan without fatigue.

Unlike most moderate priced cars, the upholstery used in the Vulcan is luxurious and durable.

The long spiral springs are covered with a thick padding of curled hair which will stand up without matting. The interior of the body is completely trimmed and presents that same finished look as found in high priced cars.

Springs The springs are long, with ample clearance, so proportioned to give that soft, velvety effect so much desired but seldom realized in the average automobile. Rear springs are $1\frac{3}{4}$ inches wide by 46 inches long, and fasten to large spring pads on axles by drop forged clips. The steel used in Vulcan springs is a special alloy which, while very flexible, will not set or break. The spring eyes are bushed with Tobin bronze, spring bolts are carefully ground to size, and provided with grease cups. This construction insures the longest wear and the absence of annoying squeaks usually found in moderate priced cars.

Gas Tank The gas tank is round, with convex ends. Heavy gauge lead coated sheet steel prevents rust. The joints are lap seamed and soldered, making the tank absolutely leak proof. Its high position at rear of seat insures ample gravity pressure on the carburetor, even when ascending steep hills. The space beneath and at the rear of the tank is all utilized for storage room, and is accessible from back of car without lifting up the cushion. Space for two suit cases or a small trunk is provided in back of the gas tank.

Fenders The fenders and skirts are made of heavy gauge, bright finish fender steel with lips and beads to give stiffness and permanency to their shape. The bracketing is accomplished in a most ingenious manner, which combines light weight with stiffness and economy. The headlight brackets and front fender cross tie rod are combined in one forging, so that all these parts are fastened together, making them practically one unit. The steps on either side of the car are supported by strong irons, running across the entire width of car beneath the steps. These irons are suspended from the main frame by pressed steel brackets. This construction avoids twisting and vibratory strains on the side members and adds stiffness to the entire car.



"POURING OFF A HEAT"

in the Vulcan foundry, a department of great importance but maintained by only the largest automobile manufacturers

Finish The hood, fenders, gas tank and running gear are finished in black japan, baked on over a special metal primer, which positively prevents rust and causes the japan to adhere to the metal. The body and wheels are finished in a pleasing shade of olive green. A beautiful deep finish is obtained by the use of five coats, each being thoroughly baked and rubbed before the next one is applied.

The whole effect when ready for the road is extremely attractive and tasty. The Vulcan is distinguished from other moderate priced cars by the absence of that "cheap look" so noticeable on some which are rushed through with no more attention to the finish than is given to the average farm implement.

Not "Made to Sell," but made to "stay sold."

The Vulcan is put together to stay. There is no loosening or dropping off of nuts. We use either a lock washer, cotter pin with castilated nut, or some other good method of securing all nuts to prevent any possibility of trouble of this kind.

The Vulcan is practically a renewable car. There is no wearing part that cannot be renewed when necessary. All bearings and surfaces subject to wear are provided with bushings made from metal best suited to the purpose. This is a feature which should not be overlooked. There is no other car at the price so completely bushed as the Vulcan. It will give service for many years with ordinary care.

Equipment **WINDSHIELD**—The Windshield is of the single glass type, 16x38 inches, bound with a tubular frame, with "hard rubber" finish. Automatic hinges—folds front.

TOP—The Top used on the Vulcan is well proportioned and covered with mohair, having a drab back to avoid the dusty appearance usually present when the covering material is black on the inside. **SIDE CURTAINS**—Nicely fitted and can be quickly attached in case of storm. **TOP COVER** is also of heavy mohair except the bottom section, where rubber buckram is used so that road oil and mud can be easily washed off.

LIGHTS—The Vulcan is provided with two large gas head lights with Prest-O-Lite tank, oil side and tail lights of latest design. The 9-inch lens with the new combination mirror and parabola reflectors throws a light which turns night into day as far as the road ahead is concerned. The lights are set well up where they throw their rays over the crest of approaching hills. The side and tail lights are so constructed that there are no parts which rattle and vibrate. The combustion has also been perfected so that smoking is eliminated.

SPEEDOMETER—Every Vulcan is provided with a high grade speedometer without extra charge.

TOOLS—Complete set of tools is provided, all contained in a brown duck kit holder, having a pocket for each tool. Compound tire pump, tire repair kit and jack.

Extra Equipment Vulcan cars will be fitted with **ELECTRIC LIGHTS** for \$25 extra. (Net.) Special quotations on Self Starters and other extra equipment furnished on request.



Vulcan Test Chassis Climbing Hog's Back Hill

The Vulcan in Action

Entirely aside from the appearance and quality of material or workmanship of a motor car, is its action—a more important qualification—and this is by far the greatest achievement of the Vulcan designers.

There is a big difference in the "handling qualities" and "road ability" of different cars. This is where many of them fall down completely.

When the Vulcan motor is started, the operator is conscious only of a soft "purr"—no vibration and no rasping noise like that of a mowing machine so noticeable in certain cars. As the throttle is opened the sound develops into a smooth hum—not unlike an electric motor. This silence and the absence of vibration are due largely to the sound mechanical principles upon which the motor is built, as well as the snug fit and ample proportion of every bearing and perfect balance of moving parts. The average fuel consumption of the Vulcan motor is about 26 miles per gallon, depending upon the grade of gasoline and other conditions.

When the car is started it makes a quick "get-away," so much sought for by those who are proud of the manner in which they handle their cars. Or it can be started as slowly as the occasion requires, when in a difficult place.

When traveling at high speed, this long, low car shoots ahead like a bullet and seems to hug the road, lending a sense of security to the passengers which is not present when riding in the high built machines. If in a hurry, the average curve or corner can be taken at a fair speed without danger and speed can be instantly increased after rounding the corner without going into second gear, as many cars have to do.

When turning around in the average width street, it is seldom necessary to back, as the car will make a complete circle of 15 feet radius.

Another Vulcan feat is very slow speed on high gear—at five or six miles an hour the motor will still run smooth and regular with hardly a sound.

As for hills, the Vulcan motor does not appear to notice them. The accompanying illustration shows a "stripped test chassis" in the act of ascending the "Hog's Back" as the hill is called. Any resident of Lake County, Ohio, will verify the statement that this is the worst hill in this part of the state and we doubt if there are many as steep and dangerous in the country—a sharp hairpin turn about a quarter way up makes it impossible to get any start going up and also makes it very hazardous coming down, as on the outer edge of this turn there is a cliff sixty feet high. The only automobile besides the Vulcan that ever tried to negotiate this hill was that of a local doctor and the machine failed to round the turn and was dashed to pieces as it plunged over the cliff.



One of the most difficult hills any automobile ever attempted to climb. A sharp hairpin turn about a quarter way up makes a running start impossible.

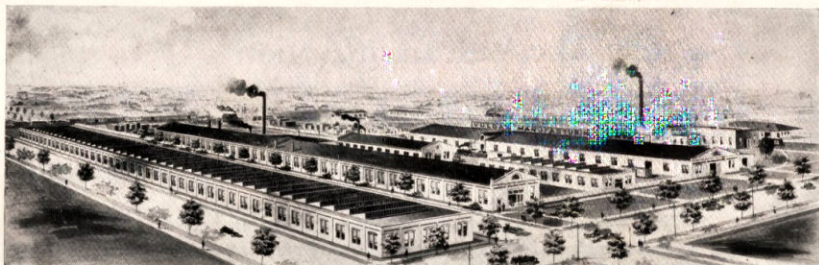
It taxes the strength of a farm horse to draw an empty buggy up "Hog's Back" hill—the passengers always get out and walk.

This is only one of the many difficult parts of the regular Vulcan testing course. With apparent ease the Vulcan does this stunt both up and down. It takes all ordinary hills on high gear and maintains a speed of 50-55 miles per hour on the level before receiving the tester's O.K.

The man on the curb admires the Vulcan for its classy appearance, but the man in the car values it for what he knows it can do.



Every Vulcan Guaranteed For 1 Full Year



Factories Behind the Vulcan Motor Car

The location of the Vulcan plant is ideal. From the first inception of the Vulcan Mfg. Co., the south shore of Lake Erie has been constantly kept in mind as the logical location for an extensive automobile industry, on account of it being the focusing point of all the metal trades. Painesville was finally selected as the most satisfactory from every standpoint. Transportation facilities are unexcelled; three main railway lines, The N. Y. C., B. & O. and Nickel Plate connect with the Vulcan switch, and two Great Lakes steamship lines are at hand.

Labor conditions are very satisfactory, Painesville is almost next door to Cleveland and Detroit—the two largest automobile centers in the world, thus the highest grade of mechanical skill is always available, and yet we are far enough removed to avoid the labor difficulties which constantly harass many other manufactures.

Our factory buildings are modern throughout with unexcelled facilities for the economical production of motor cars. The finest Automatic machinery and every possible labor saving device has been installed. We have our own power plant where we generate electric current for lighting and power. All departments are equipped with compressed air, permitting the use of portable drills, riveting hammers, etc.

The Vulcan plant is not only on the main highway between the East and West, but is within a few miles of the center of population of the country, making it an ideal distributing point.

Large tracts of surrounding land have been secured in anticipation of extensive buildings which will be erected as fast as the growth of the business demands.

VULCAN MFG CO.

Painesville, Ohio, U. S. A.

"The prettiest Little City in the United States"