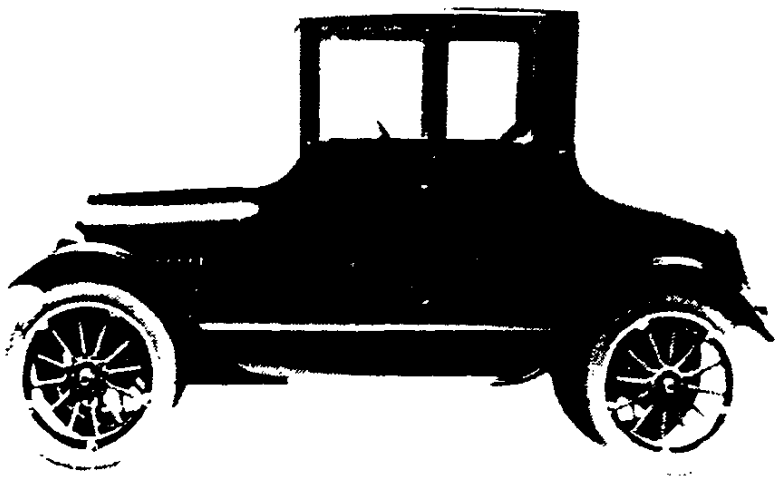
CHEVROLET



1920 Chevrolet, coupe, HAC

1920

Details of Construction Model "Four-Ninety"

Motor The motor is of the four-cylinder, four-cycle type, 3-11/16 inch bore, by 4 inch piston stroke, which gives the best combination of power at low and high speeds. Flexibility, silence and durability characterize the Chevrolet valve-in-head engine. The horsepower rating (A.L.A.M.) is 21.7. This rating is made on an arbitary formula and does not express the real power of this engine. The horsepower it actually develops cannot be determined by a formula based on bore, stroke, compression and piston displacement. The Chevrolet motor is capable of developing 25 horsepower at 1800 revolutions per minute because of its design, workmanship, and valve-in-head construction, which develops from 15 to 20 per cent more power than engines of similar bore and stroke of the "L" or "T" head type.

The Chevrolet motor has many advantages in its cylinder construction—first, absence of chambers and pockets, which makes possible the full machining of the combustion chamber, making fewer recesses for the accumulation of carbon. Second, all the gasoline vapor explodes directly on the piston head and all the power goes to turn the crankshaft. Third, all cylinder surfaces are exactly alike, and each cylinder will handle its charge in exactly the same way under all speeds. Fourth, it cleans the cylinders of burned gases more completely on the exhaust stroke of the piston, which forces the burnt gases straight out through the exhaust valve at the top of the cylinder. The fresh gas introduced through the inlet valve on the next charge finds a clean cylinder, which produces a greater expansion and a correspondingly greater piston pressure when fired. Fifth, the detachable head makes possible the easy installation of valves and springs, and insures rapid and accurate valve grinding.

Motor Support The motor is supported at the front by a malleable iron cross arm securely fastened in front of the case, the outer ends of which are securely riveted to frame side members. The motor is securely bolted to this member by two heavy bolts. Two malleable iron arms bolted on integral cast brackets on the cylinder block extend rearward and bolt on the transmission; these also support the transverse clutch operating shaft, pedals, and electric starting motor, making a unit type power plant and insuring a perfect alignment between crank shaft, clutch, and transmission shaft. These arms rest on and are securely bolted to a pressed steel cross member. The transmission is also supported by a V-shaped diagonal support from the rear and top of the cylinders. This form of motor suspension insures practically all the advantages of the so-called "three point" method, without any of the disadvantages of instability, vibration and undue wear.

Cylinder Material The cylinders are made of selected close grain gray iron properly seasoned, cast integral with the upper half of the crank case, resulting in remarkable rigidity. The joint at the base of the cylinders is eliminated and the cylinder resistance load is spanned to the crank case walls and bearings through continuous walls properly placed to distribute each strain. The strain on each cylinder is greatly reduced because of the support given by the adjoining cylinders and the ribs in the casting.

Removable Heads The removable cylinder head is a one-piece casting, which contains the spark plugs, valves and their upper actuating parts, such as valve rocker arms, which can be easily taken off, and permits the grinding of valves, removal of carbon, and cleaning out of water jackets. It is different from the ordinary valve-in-head motor in that it has no valve cages, and by this form of construction the

possibilities of leakage are removed, with a corresponding reduction of many parts. Thus, also reducing the weight and permitting the necessary direct cooling of the valve seats and valves as these parts are entirely surrounded by water. The intake and exhaust passages are water-jacketed where they pass into the cylinder head proper, which aids in carburetion. The exhaust passages from valve openings lead straight to the manifold at center of right side of cylinder head with the least possible resistance to exhaust gas flow, then with the most direct line to muffler. The cylinder head is secured to cylinder casting by eight bolts, the joint being made by a gasket built of layers of sheet copper and asbestos.

Valves The intake and exhaust valves are alike and interchangeable; the bevel seated type, 1½ inches in diameter, giving a 1-5/16 inch clear opening, insuring the maximum flow of gases to and from the cylinders. The valves are operated by rocker arms and push rods working against a cam shaft having integral cams with a lift of 7/32 of an inch. The valve stems are cold drawn steel fused to annealed cast iron heads, which gives the greatest resistance to heat but will not warp nor pit.

The valve lifters which operate against the cam shaft are made of steel, hardened and ground. The lower end which comes in contact with the cam is flat and is allowed to turn in the long guides of the cylinder block. This takes all the side thrust from the lifters, insuring longer life and quietness.

Adjustment The valve push rod fits into a hole drilled in one end of the valve lifter. At the other end a hardened cap having a ball socket is pressed on which engages with a ball attached to the rocker arm. This ball is threaded and locked by a special nut. The adjustment can be made at the top, which insures greater accuracy as well

as convenience. The valves operate as smoothly and quietly as a sewing machine.

Camshaft The camshaft is a drop forging of high carbon steel, with integral cams, heat treated and ground to .005" limits on bearing surfaces and cam lobes. The cams are of the largest oval type, which raise and lower the valves gradually assuring quietness. The shaft is of liberal diameter to avoid deflection when lifting valves and is supported on three plain bearings, the front, being 2-3/8 inches long by 1-5/16 inches diameter; center 2 inches long by 1-9/32 inches diameter; rear 1-7/16 inches long by 1-1/4 inches diameter. The camshaft is located on the right side of the motor and completely housed in the cylinder block, but it can be readily removed through the forward end. The camshaft and also the shaft which drives the generator are driven by the crank shaft through the medium of helical gears of wide face, enclosed in a dust proof case in front of the engine and running in oil, which insures quietness and long life. The gears are so mounted that they can easily be removed after the cover is taken off.

Pistons and Piston Rings The pistons are of selected gray iron and undergo an annealing process which prevents the heat of the motor from distorting them. They are accurately finished by grinding and carefully fitted with proper allowances for expansion. The pistons, with the rest of the reciprocating parts are balanced before assembling, and parts of corresponding weights are placed in the same motor to reduce vibration to the minimum. Each piston is fitted with three concentric rings, having joints cut diagonally and all three are in grooves above the wrist pin. They are made of cast iron, which gives exceptional spring qualities not easily affected by the heat.

A recessed oil belt is cut slightly below the lower ring groove and ten ⅛" holes are drilled at an angle of 45 degrees with the

side of the piston through which any surplus oil is wiped off by the lower ring and drains back into the crank case. This prevents the oil from working past the rings and accumulating on the top of the pistons.

The pistons are machined oval, being less in diameter through the wrist pin bosses than through the opposite diameter. This accommodates the greater expansion through the thick part of the piston and prevents scoring of cylinder walls.

The wrist pins are hollow and made of high carbon steel, 27/32 of an inch in diameter, heat treated and accurately finished by grinding.

Connecting Rods The connecting rods are of deep "I" beam section, drop forged from high carbon steel, heat treated, and carefully machined to reduce reciprocating weight to a practical minimum. They are fitted at the crank shaft end with integral die cast babbitt bearings of two halves, 1⅞" long by 1⅜" diameter. This method of integral casting of babbitt metal to the connecting rod insures complete radiation of all heat and makes certain that the bearing will not burn easily. The bearing caps are secured to the connecting rods by chrome nickel steel bolts, especially heat treated, and held by cotter pinned nuts. Shims of varying thickness, .002" and .003", are placed between caps and connecting rods to simplify tightening of bearings.

Crank Shaft The crank shaft is a drop forging of high carbon steel and especially heat treated. It has liberal proportions and is accurately balanced. It has three main bearings and all bearing surfaces accurately ground to .0005" limits. The front bearing is 2-5/16 inches long by 1⅜ inches diameter; center 1½ inches long by 1-21/32 inches diameter; rear 2-11/16 inches long by 1¾ inches diameter. The crank shaft at the third or rear bearing is hollow, being drilled and fitted with a square steel plug, the tapered conical end of which projects into the rear throw of the fourth connecting rod bearing. The function of this plug is to supply a small amount of oil to the clutch thrust bearing. The front and rear bearings are die cast babbitt and the center bronze backed with babbitt lining and accurately scraped and "run in." All are split in half, which allows them to be either taken up or new ones easily installed, being supported by rigid caps, which are held to the cylinder block by studs and cotter-pinned nuts. Removing the oil pan allows inspection or adjustment of main bearings, connecting rods, cam shaft, etc.

Crank Shaft Offset The crank shaft is offset; that is, instead of being placed directly in line with the middle of the cylinders, it is set ⅜" to the right of the center line of the cylinders.

By this method, the force of the explosion is expended to greater advantage, and pushes the piston down on the power stroke with greater leverage than would be possible to obtain if it were on the dead center line.

Flywheel The flywheel is a gray iron casting accurately machined, extra heavy with gear teeth cut on its perimeter for the electric starting motor pinion. The flywheel is bolted to an integral flange of the crank shaft.

Lubrication The motor lubrication is known as the constant level splash system. The oil is circulated by means of a gear pump mounted on the gear case and driven by the generator armature shaft. It draws the oil from the lowest point of the oil pan and distributes under pressure to the center main bearings and into small oil pockets under each connecting rod into which the connecting rod spoons dip at each stroke; the spray of oil caused by the rapid splashing of the connecting rod spoons lubricates the cylinder walls, cam shaft, wrist

pins and other interior motor parts, collecting in pockets above crank shaft bearings and cam shafts, from which holes lead to the bearings. The excess oil falls back to the reservoir to be used over again. The oil pan is of pressed steel secured to the cylinder block with bolts and sealed by a cork gasket. A breather and oil filler pipe is conveniently located on left side of the motor. The oil level is determined by opening the upper level pet cock on the left side of the oil pan. A suitable oil pressure gauge located on the instrument board indicates the pressure of oil in the system.

Carburetor Zenith improved double jet carburetor is used. It is the simplest in construction and most efficient and economical carburetor ever designed. The intake manifold is seamless steel tubing. Carburetion is aided by the utilization of heated air from a jacket on the exterior of the exhaust tube, passing through a flexible tube to carburetor air intake. The generous application of heat prevents condensation of low grade gasoline in the manifold, and produces better economy and performance. The carburetor is equipped with a dash choke for easy starting in cold weather. Throttle is controlled by a lever below the steering wheel and is also operated by an accelerator pedal. The gasoline is "fed" to the carburetor by gravity direct from gasoline tank, under the front seat, at a sufficient elevation above the carburetor to insure a steady flow of gasoline at all times. A shut-off cock is provided on gasoline pipe line at the tank. The gasoline tank is of heavy gauge tinned steel, with a capacity of ten gallons, and is clamped to steel brackets supported from the frame side member.

Cooling System The motor is cooled by a belt-driven centrifugal water pump, fan and a cellular type radiator of generous capacity. Both the fan and water pump are driven from the crank shaft. The pump is

connected by a hose to the bottom of the radiator, or outlet, and forces a supply of cooled water to the water jackets surrounding the cylinder walls, thus insuring proper circulation at all motor speeds. When cold the motor and radiator have a capacity of 1¼ gallons. The water pump is readily accessible by removing the bolts which fasten it to the cylinder block.

Fan The fan consists of a hub to which is riveted four pressed steel blades. The hub has an adjustable flange which tightens or loosens the fan belt, depending on whether the flange is screwed in or out of the hub. Screwing it in tightens, while the reverse loosens the belt. A grease cup in the pump housing lubricates the fan and pump shaft.

Radiator The radiator has a graceful appearance, and conforms with the lines of the hood. It is supported by bolts to the frame cross member, and held in a vertical position by a tie rod to the dash. This method minimizes the tendency to leak.

Clutch The clutch is a pressed steel cone, embodying durability, strength and lightness. Its frictional surface faced with leather directly engages with the inner beveled edge of the fly wheel. The clutch cone is held against the flywheel by a heavy coil spring enclosed in the clutch hub. Pressing down upon the clutch pedal disengages the clutch cone from the fly wheel. Six adjustable compensating springs make the clutch engagement easy.

Clutch Control The clutch operating mechanism is exceedingly simple, consisting of a transverse clutch operating yoke upon which are secured the clutch pedals, and the clutch collar operating against the face of the clutch hub.

Clutch Collar The clutch collar is one of the greatest refinements made in the history of automobile construction. It is a patented device, covered by eleven claims,

owned by this Company and used exclusively on Chevrolet cars. It consists of a cored bronze casting holding about a cupful of oil, sufficient for three hundred miles' use and easily refilled by raising the floor board. In the frictional surfaces, wood plugs are inserted extending into the oil receptacle. Through these plugs, the oil exudes (or sweats), lubricating the frictional surfaces of collar and clutch hub, and prevents heating and cutting. To some extent, the clutch collar acts as a brake, so that when the clutch is disengaged it will stop, which in turn stops the transmission gears, and they may be easily shipped without clash.

Transmission The transmission is of the selective sliding gear type. There are three speeds forward and one reverse. The gears and shafts are of high carbon alloy steel, heat treated. The gears have deep cut teeth with a wide face. The main and clutch gear shafts revolve on two large annular ball bearings; the countershaft gears revolve on plain bronze bearings. All the gears, shafts and bearings are encased in a dust-proof and oil-tight malleable iron housing, which is very accessible. A V-shaped diagonal support extending from the top of the motor to the transmission case makes practically a unit power plant. The shifting rods and interlocking pins are mounted in the malleable iron cover. The centrally located gear shifting lever, pivoted by a ball and socket on the extended part of transmission cover, has short travels in all directions of speed changes and operates with perfect ease.

The heat treatment given to transmission gears is not to make them hard and brittle, but rather soft and tough.

The most beneficial result obtained is the ability of a correctly heat treated steel to withstand to a degree of very high efficiency the wear placed upon it. The next result, of almost equal importance, is the corresponding reduction in weight possible, both of

which reduce the cost of maintenance and insure a prolonged life for the car.

Transmission Gear Reduction

This is based on Engine Speed

1st Speed	3.32 to 1
2nd Speed	1.77 to 1
3rd Speed	Direct
Reverse	4.2 to 1

Universal Joint The universal joint is the ring and yoke type and extremely strong. It is of low carbon steel, case hardened and ground. All moving parts have large bearings, which are lubricated automatically from the transmission case.

Rear Axle The rear axle is the three-quarter floating type, extremely strong, light and of simple construction, of our own design and built by us. The rear axle housing consists of malleable iron differential case of two halves, firmly bolted together. Seamless steel tubing connects the malleable iron supports for brakes and wheel bearings to the differential housing. A truss rod is suspended underneath and supports the complete housing. The differential is mounted on inner ends of axle shafts. The thrust action of the differential is taken by a large thrust bearing of special design on the left half of the differential housing. Inner ends of the axle shafts revolve on liberal size Hyatt roller bearings. The rear wheel hubs are keyed directly to tapered ends of the axle shafts. Liberal size Hyatt high duty roller bearings, the rollers of which are heat treated high carbon steel, revolving between hardened and ground bushings, comprise the rear wheel hub bearings. The inner bushing is an integral part of the hub and the outer bushing is pressed into the axle housings, placing the bearings almost in the direct load carrying center of the rear wheels. By this construction, the side pressure or skidding force due to uneven pavements, ruts, and turning corners is sustained by the axle housing, while the axle shafts merely transmit the turning

power from the differential to the wheels. A tubular housing encloses the pinion or propeller shaft, which extends forward from the rear axle, terminating in the splined end of the universal joint. The universal joint ball moves in its retainer, which is secured to the transmission case. The pinion or propeller shaft revolves at its lower or pinion end on two high duty annular ball bearings, and at its forward end on a cast iron bushing pressed in the tubular housing. The pinion gear hub fits into the lower single row annular bearing, giving support to the gear at its most necessary point. The end thrust is carried by a heavy duty double row annular bearing. Means are provided for the adjustment of pinion to bevel gear. Ample provision is made for the lubrication of the working parts of the rear axle, through a filler plug in the differential housing and grease cups in brake flanges.

Differential The function of the differential is to permit one rear wheel to travel faster than the other, or independent of the other when required. If such a device were not used, turning corners would be almost an impossibility, as without it, both wheels would move at the same speed and have the same tractive force, whereas to turn demands that one wheel travel faster than the other. The differential accomplishes this feat in the following manner:

Three small pinions, called differential spider pinions, mounted on as many axles of a small spider, mesh with two larger gears called the differential side gears, which are keyed to the axle shafts. The differential case, which consists of two halves, bolted together (one carrying the bevel ring gear), form the bearings for the spider axles. When the car is moving forward in a straight line the complete differential turns forward, being driven by the drive pinion through the bevel ring gear. When the car turns a corner and one wheel is required to travel slower than the other, this difference in rate of speed of the axle shaft is taken up in the action between the differential side gear and the spider pinion. In other words, the twisting tendency of the shafts is taken up in the differential pinions and gears.

Bevel Drive The driving gears are specially cut spiral bevels, having large tooth bearings which insures strength and quietness. The teeth are further strengthened by heavy fillets at the base of each tooth. They are made from special nickel steel, case hardened and heat-treated by a special process.

The gear ratio of the rear axle is 3-2/3 to 1. The propeller shaft is a special chrome nickel alloy steel, specially heat treated.

Driving Torque The spring seats of the rear axle are carried on bearings surrounding the axle tubes and mounted near the brake support, which places the load of the car almost in the direct load carrying center of each rear wheel. The driving thrusts from the rear wheels are transmitted to the frame of the car through rear springs, thus eliminating the complicated, extra weight radius rods, and giving flexibility of drive obtainable in no other way. The torque reactions from the bevel pinion and brakes are provided for by the propeller shaft tubular housing.

Brakes The brake equipment consists of two pair of powerful, double acting bands, operating directly on the rear wheel brake drums, which are ten inches in diameter, with faces 1¼" wide. The service brakes contract upon the outside of the drums and are operated by the right foot pedal. The emergency brakes expand within the drums and are operated by a hand brake lever mounted on the transmission case cover. The brake bands are lined with asbestos containing a reinforcement of fine copper wire. The lining is riveted to the band by copper countersunk

rivets. The connections between brakes and pedals are by rods from the pedals to intermediate levers supported on the propeller shaft housing. Complete adjustment of the brakes may be made by lifting the floor board under driver's feet, and by a few turns of the turn-buckles on brake rods all play or wear is taken up.

The connections from the intermediate brake levers and shaft on the propeller shaft to the brakes are by cables, which do not rattle like rods. All brake adjustments are easily made and maintained.

Front Axle The front axle is of the "I" beam type—one-piece drop forged with integral yokes and spring seats, made of special steel, double heat treated; it is extremely strong, so as to withstand both the horizontal and vertical stress to which the axle is continuously subjected. The steering knuckles and arms are drop forged of special chrome nickel steel, heat treated. Bushings are pressed in each of the steering knuckles and arms. They are reamed in place so that a perfect bearing fit may be had on the king bolts, which are hardened and ground and secured by cotter-pinned nuts. The king bolts are lubricated by means of a grease cup mounted on the steering knuckle. This, being placed in the center of the barrel, insures positive lubrication to both upper and lower bushings.

The steering plain arms are specially reinforced and are provided with heavy tapered shanks where they attach to the steering knuckles.

Wheels The wheels are the artillery type, having twelve strong spokes, made of second growth hickory, thoroughly seasoned. The felloe is made of steel to which is attached four lug bolts. The lugs are attached to and remain a part of the rim. By removing the four nuts on the lug bolts, the rim may be easily removed. The increased strength of the steel felloe adds rigidity to

the wheel not obtainable with the ordinary wood felloe.

Clincher demountable rims are standard.

They are mounted on substantial hubs with large flanges on the outside and six hub bolts, which pass through the spoke. The front wheels revolve on tapered roller bearings, fully adjustable as to wear. This is the best known bearing construction.

Frame The frame is channel section, pressed steel, of liberal proportions; the side members being 3-9/16" maximum depth, and tapering towards front and rear without sudden change of cross section. It is provided with three cross members securely fastened to the main members with good-sized hot driven rivets. The frame consists of very few parts, which obviates the necessity of excessive riveting and thus preserves the full strength of the frame. It is tapered from 28" wide in front to 37⅛" at rear, insuring that the body rests solidly on the frame its complete length. The frame being exceptionally narrow in front permits the car to turn in a small circle.

Steering Gear The steering gear is of our own design. It is of the compound reduction spur gear type neatly and compactly designed with ample bearing surfaces, and adjustable for wear, mounted on the frame and secured by bolts. The shaft carrying the steering or Pitman arm has a bearing on the motor front cross member. The steering wheel is wood, 15" in diameter. The steering column is of large diameter and enameled black, and the spark and throttle rods are fastened on the outside.

The steering drag link or connecting rod is the connection between the steering gear and the steering arm on the front axle. The ends are provided with ball and socket joints between spring cushions, which form the bearing surfaces for the balls on the steering arm and the Pitman arm.

Springs The front and rear springs are cantilever type. The leaves are of high carbon steel triple heat treated. The ends are secured by clips and bolts to box brackets on the frame and to the front axle spring seats.

The rear axle and wheels, in going over obstructions or depressions, move in an arc approximately described above the point of anchorage of the forward end of springs. The springs are made long so the axle and wheels practically travel in a vertical line.

There are no shackles to become loose and cause rattling. The springs extend fore and aft from the frame side members to the front and rear axles.

Spring flexibility is as follows:—All front springs on all "Four-Ninety" Models test 300 to 325 lbs. to the inch. The rear springs of "Four-Ninety" Coupe and Touring Models test 145 to 155 lbs. to the inch. Rear springs of the "Four-Ninety" Roadster test 115 to 125 lbs. to the inch. Rear springs of "Four-Ninety" Sedan and Light Delivery test 185 to 200 lbs. to the inch.

Electrical System The electric system for ignition, starting, and lighting is a separate unit and consists of an electric generator, starting motor, wiring harness, starting switch, lighting and ignition switch, coil and distributer.

Wiring for Ignition and Lighting The wires in every part of the chassis are protected by flexible metal conduits, and are covered with an insulation which is impervious to oil, heat or water, and which at the same time affords perfect electrical insulation. The wiring system is the single wire ground return type, only one wire being required to each connection, the chassis frame serving as a return path for the current.

Generator The electric generator is of a high efficiency type; light in weight and small over all dimensions. It is operated at one and five-eighths times engine speed, and is mounted on the engine timing gear housing. All parts are entirely enclosed, which protects the interior from dirt, oil, and water. The armature revolves on bearing adaptors and is driven by the timing gears of motor. The brushes are accessible for inspection by removing an easily detached cover. Its electrical control is absolutely automatic with a circuit breaker in the line; its function being simply to break the circuit between the generator and battery, whenever the car stops.

Storage Battery The 6 volt, 3 cell Willard Threaded Rubber Storage Battery has a capacity of 5 amperes for 18.75 hours. In other words it will hold enough electric energy to last 18.75 hours, if the energy withdrawn is five amperes per hour. It is suspended from the chassis frame and beneath the body front floor board, which makes a perfectly accessible place where it can be inspected and filled.

Starting Motor The electric starting motor is of the 6 volt, double wire system. It is a separate unit, small and compact, weighing 20¼ pounds. It is of extremely high efficiency and will turn the engine at 150 to 160 revolutions per minute. The engaging mechanism is of the most advanced type, and the simplest, no reduction being necessary beyond the starting motor pinion gear to the flywheel. When the current is supplied to the starting motor, the pinion gear is instantly and automatically drawn in mesh with the flywheel gear, and when the engine starts under its own power, the pinion gear automatically draws out of mesh.

The starter switch is located on the diagonal brace of engine with its push button

extending above the toe board. It is operated by the driver's foot.

Ignition The Ignition current is drawn from the storage battery, passed through ignition switch, a coil and igniter to the spark plugs. This system supplies a current of uniform strength regardless of motor speeds.

The distributer is neatly and compactly designed. It can be taken apart without disturbing the timing, and it is impossible to reassemble it incorrectly, or cause any variation in the timing on account of special locating lugs. The contact points are extra heavy and will, as a rule, outlive the car. It is mounted in a vertical position, where all its parts are very accessible and is driven by spiral gears from the rear end of generator shaft.

The coil has a heat proof case, neat in appearance, with absolute protection of terminals. The windings will carry voltage strain far in excess of the rating, and its internal construction makes impossible the snapping of connections so commonly occurring in coils.

Lighting and Ignition Switch The lighting and ignition switch is mounted on the instrument board. The lights are turned on and off or made bright or dim by turning a knob. The ignition is turned on or off by inserting a key through a slot in the knob and giving it a quarter turn. The removal of the key automatically locks the switch and prevents theft.

Lamps The electric head lamps are 9 inches diameter, finished in black enamel, each fitted with a 12 candle power bulb. National approved anti-glare lenses are standard. The tail lamp is 3½ inches diameter, finished in black enamel, fitted with a 4 candle power bulb. At the side a white light illuminates the license plate.

A fuse is located in the lighting switch, to protect the system against short circuits, and may be easily removed when necessary. Head lamps are set high for appearance and to lessen the road shadows. They are supported on heavy pressed steel brackets, which are bolted to the front fender irons. The brackets are so designed as to allow the adjustment of the lamps to any angle for convenience in focusing.

Horn The electric horn is concealed under the hood. The push button is located on a bracket under the steering wheel, and is operated by the left hand.

Control The gear shift lever is located at the center of the driving compartment, and operated by the right hand. The clutch is operated by a single pedal under the foot. The service brake is operated by the right foot pedal. The emergency brake is operated by a hand brake lever with ratchet lock. The hand operated spark and throttle levers are conveniently located underneath steering wheel on a stationary friction sector. The throttle is also operated by a foot accelerator conveniently located on the toe board to the right of the service brake pedal.

"Four Ninety" Body The body is streamline type, long and graceful, all angles having been eliminated. The construction is sheet metal over strongly built hard wood frames, securing the desirable combination of lightness and strength. The doors are of unusual width and offer easy entrance and exit; the hinges are concealed, the door handles are inside, the front door is cut back of the forward edge of the front seat cushions, thus giving easy entrance to the front seat. The rear seat accommodates three people comfortably, and the tonneau is roomy, with plenty of leg room. The front seat has ample room between dash and seat, providing most comfortable position for both

driver and passenger. The rear edge of the front seat is lowered.

Upholstering The upholstering is fastened over hair interlaced. The method of upholstering is the "straight pipe" type which has advantage over the tufted type in that it provides for a neater and softer finish and a more secure binding of hair. No clinch buttons are used, and the springs are only slightly compressed in this type of upholstering, thus giving greater spring play and improving the riding qualities of the car. This style is also more sanitary. The backs and seats are provided with springs. The cushions are deep and durable.

The tonneau floor is covered with a carpet and the front floor and the toe board are covered with linoleum and bound with metal moulding.

Characteristics of "Four-Ninety" Upholstery Material

Beautiful—As handsome, luxurious and satisfying to sight and touch as the finest grain leather.

Strong—Its super-strong base and extra tough coating will stand up under any service. It has twice the tensile strength of ordinary split leather.

Impervious—Absolutely water, grease, stain, dust and germ proof—nothing gets under its skin.

Cleanable—May be kept as clean and sanitary as glass by washing with soap and water.

Lasting—Unaffected by sunlight, heat, cold, smoke or fumes. Does not oxidize nor grow hard. Insects do not attack it.

Windshield The rain vision and ventilating windshield is fastened to brackets which are integral with cowl dash. It is quickly adjusted for rain or ventilating purposes. The lock is of the pivot construction.

Top The top is held to the windshield by clamps and the rear by straps. It is made of Chevrolet Rayntite material with black lining. Is easily cleaned, durable and fast color. Side curtains are standard equipment.

Finish The complete car is finished in black. After the first operation of polishing and buffing the metal parts of the body, it is then black enameled and baked for a number of hours, at a very high temperature.

Fenders and Running Boards The fenders and side aprons are of heavy gauge sheet metal, the lines of which blend into those of the body and hood in the most effective and pleasing manner. The fenders are slightly crowned, coming well over the wheels, with ample clearance for wheels and skidchains. Fully enclosed by side aprons to prevent mud and water being splashed between the wheels, running boards and body. They are finished in black enamel and baked to give a lasting finish and to prevent spotting.

The running boards are oil treated hard wood, suspended at easy stepping height, covered with linoleum and bound with metal mouldings.

Hood The ventilated hood is of sheet steel with hinged panels, finished in black enamel and baked. Carefully fitted to prevent squeaks. The sides are clamped by means of hinged type spring catches, two on each side; also a handle is riveted on each side. No thumb screws to remove. An upward pull on the hood catch releases it.

Tires Four-Ninety Models (Touring, Roadster and Light Delivery) both front and rear, are 30 x 3½ non-skid tread, clincher all around. Sedan and Coupe: Front and rear 30 x 3½ straight side cord, non-skid.

Wheelbase The wheelbase is 102".

Tread 56 inches.

Weight The combination of correct weight with liberal size car is due to the wonderful simplicity of design. This gives low consumption of fuel and a minimum cost for tire maintenance. The weight is equally distributed over the chassis, which eliminates swaying of car and minimizes skidding. This car holds the road well and is easy to handle.

Turning Radius Steering is so designed that the car can turn in either direction in a circle with a radius of 20 feet. This feature is of great advantage while operating in crowded thoroughfares.

Dimensions Over All Length over all, including fenders, top down: Touring 12'-6", Roadster 11'-6". Width over all, including fenders, 5'-6".

Road Clearance 9½ inches.

Enclosed Models

Four-Ninety Sedan This new Chevrolet has a threefold value. It presents the most advanced qualities of closed car design, construction and refinements. It has all the mechanical improvements of Superior Chevrolet models. It combines all these with a low price and economy of operation that represents material savings for Chevrolet owners.

Exterior The body is low, strongly built, and beautifully balanced throughout for greater comfort and economy of wear, fuel, and tires. A moulding around the body gives a more finished appearance and carries out the streamline effect.

Four wide doors afford easy entrance and exit to and from both front and rear seats. Three doors have inside latches—the right foredoor has an outside Yale lock and key. All doors are equipped with anti-rattlers.

The color is black on upper structure, hood, running gear and wheels. Cowl and lower body panels are a toned Brewster green.

Cord tires, straight-side, non-skid 30" x 3½" are standard equipment. Demountable split rims are mounted on steel felloes.

Fuel supply is from 10-gallon gasoline tank on rear, with Stewart Vacuum System.

Top Material all in one piece and held under drip moulding positively prevents leakage.

Interior The front seat is undivided for greater comfort and convenience of passengers, and adds greater stability to the body frame. It is low, allowing ample head room and comfortable back rest.

Rear seat is removable, affording easy access to back body panel.

Both front and rear seats are deep and are finished in striped French Plait Velour over long coil springs. A cord robe rail with nickel fittings is attached to the rear of the front seat.

Clutch and service brake pedals, foot accelerators, starting button, emergency hand brake and gear shift levers and 16" steering wheel are arranged for greatest driving convenience.

The windshield is adjustable both top and bottom. Additional protection from glare and storms is furnished by a permanent black metal visor, with rain gutter.

Windows are easily raised and lowered with Ternstedt Window Regulators. Rear window has a silk curtain.

Mahogany Garnish Rails around all windows add to the effect of stability and custom coach work.

Polished Nickel Hardware—door latches, window regulators, door-pull-to handles and dome light add to the distinctive interior appearance.

All floor space is carpeted.

Specifications
Model "Four-Ninety" Touring

Motor: Four-cylinder, valve-in-head type, 3 11/16" bore, 4" stroke.

Cylinder: Cast en-bloc (including upper half of crank case). Head detachable.

Valves: 1½" diameter.

Connecting Rod Bearings: 1⅜" diameter, 1⅞" long.

Crankshaft Bearings Front, 1⅜" diameter, 2-5/16" long; Center, 1-21/32" diameter, 1½" long; Rear, 1¼" diameter, 2-11/16" long.

Camshaft Bearings:. Front, 1-5/16" diameter, 2⅜" long; Center, 1-9/32" diameter, 2" long; Rear, 1¼" diameter, 1-7/16" long.

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward and reverse.

Cooling: Water pump; radiator extra size.

Front Axle: Drop-forged I-Beam. Tapered roller bearings.

Rear Axle: Three-quarter floating, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft. Special Spiral cut Bevel Driving gears mounted on heavy duty annular ball bearings.

Brakes: Emergency, internal expanding type; service, external contracting type; 10" brake drums.

Wheels: Wood, artillery type, steel felloe, demountable rims, large hub flanges.

Tires: 30" x 3½", non-skid front and rear.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Spur and gear. 15" steering wheel.

Springs: Cantilever type, front and rear.

Body: Five-passenger Touring Car.

Wheelbase: 102".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment; universal adjustment on read lamps; top, and side curtains; tilted windshield; speedometer; electric horn; extra rim and carrier on rear; complete tool equipment, including pump and jack. Foot rest, robe rail.

Specifications
Model "Four-Ninety" Roadster

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 4" stroke.

Cylinders: Cast en-bloc (including upper half of crankcase). Head detachable.

Valves: 1½" diameter.

Connecting Rod Bearings: 1⅜" diameter, 1⅞" long.

Crankshaft Bearings: Front, 1⅜" diameter, 2-5/16" long; Center, 1-21/32" diameter, 1½" long; Rear 1¼" diameter, 2-11/16" long.

Camshaft Bearings: Front, 1-5/16" diameter, 2⅜" long; Center, 1-9/32" diameter, 2" long; Rear, 1¼" diameter, 1-7/16" long.

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward, and reverse.

Cooling: Water pump, radiator extra size.

Front Axle: Drop-forged I-beam. Tapered roller bearings.

Rear Axle: Three-quarter floating, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft.. Special Spiral cut Bevel Driving gears mounted on heavy duty annular ball bearings.

Brakes: Emergency, internal expanding type; service, external contracting type; 10" brake drums.

Wheels: Wood, artillery type, steel felloe, demountable rims, large hub flanges.

Tires: 30" x 3½", non-skid front and rear.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Spur and gear. 15" steering wheel.

Springs: Cantilever type, front and rear.

Body: Two-passenger Roadster.

Wheelbase: 102".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment; universal adjustment on head lamps; top, and side curtains; tilted windshield; speedometer; electric horn; extra rim and carrier on rear; complete tool equipment, including pump and jack.

Specifications
Model "Four-Ninety" Sedan

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 4" stroke.

Cylinders: Cast en-bloc (including upper half of crankcase). Head detachable.

Valves: 1½" diameter.

Connecting Rod Bearings: Front, 1⅜" diameter, 1⅞" long.

Crankshaft Bearings: Front 1⅜" diameter, 2-5/16" long; Center 1-21/32" diameter, 2" long; Rear 1¼" diameter, 1-7/16" long.

Oiling System: Splash gear pump and individual oil pockets. Pressure to center bearing. Oil pressure gauge on instrument board.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward, and reverse.

Cooling: Water pump and fan; radiator extra size.

Fuel Supply: Stewart vacuum system, gasoline tank on rear.

Front Axle: Drop-forged I-beam. Tapered roller bearings.

Rear Axle: Three-quarter floating, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft. Special Spiral cut Bevel Driving gears mounted on heavy duty annular ball bearings.

Brakes: Emergency, internal expanding type; service, external contracting type; 10" brake drums.

Wheels: Wood, artillery type, steel felloe, demountable split rims, large hub flanges.

Tires: 30" x 3½", cord, straight side, non-skid front and rear.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Pinion and gear. 16" steering wheel.

Springs: Cantilever type, front and rear.

Wheelbase: 102".

Body: Low, strongly built and beautifully balanced throughout for greatest comfort and economy of wear, fuel and tires. A moulding around the body gives a more finished appearance and carries out the streamline effect.

Four wide doors afford easy entrance and exit to and from both front and rear seats. Three doors have inside latches—the right foredoor has an outside Yale lock and key. All doors are equipped with anti-rattlers.

Window regulation is by a revolving handle mounted on side of door and to which is attached lifting mechanism. Positive—will not get out of order.

The color is black on upper structure. Cowl and lower body panels are a toned Brewster green.

Coach work and appointments are as fine as those found on much more expensive cars.

Equipment: Electric lights and starter; highest type 2-unit system, double wiring used. Complete lamp

ent, including headlight dimmer; universal ent on head lamps; speedometer; electric extra rim and carrier on rear, complete tool ent, including pump and jack.

Specifications
Model "Four-Ninety" Coupe

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 4" stroke.

Cylinders: Cast en-bloc (including upper half of crankcase). Head detachable.

Valves: 1½" diameter.

Connecting Rod Bearings: Front, 1⅜" diameter, 2-5/16" long; Center 1-21/32" diameter, 1½" long; Rear, 1¼" diameter, 1-7/16" long.

Camshaft Bearings: Front, 1-5/16" diameter, 2⅛" long; Center, 1-9/32" diameter, 2" long; Rear, 1¼" diameter, 1-7/16" long.

Oiling System: Splash, gear pump and individual oil pockets. Pressure to center bearing. Oil pressure gauge on instrument board.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward, and reverse.

Cooling: Water pump and fan, radiator extra size.

Fuel Supply: Stewart vacuum system, gasoline tank on rear.

Front Axle: Drop-forged I-beam. Tapered roller bearings.

Rear Axle: Three-quarter floating type, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft. Special Spiral cut Bevel Driving gears mounted on heavy duty annular ball bearings.

Brakes: Emergency, internal expanding; service, external contracting; 10" brake drums.

Wheels: Wood, artillery type, steel felloe, demountable split rims, large hub flanges.

Tires: 30" x 3½", cord, straight side; non-skid front and rear.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Pinion and gear. 16" steering wheel.

Springs: Cantilever type, front and rear.

Wheelbase: 102".

The New Superior Chevrolet Coupe contains all the mechanical refinements and interior equipment of the Sedan and is distinguished by an unusually commodious body that affords convenient access and seating comfort for four passengers.

This new Chevrolet has a threefold value. It presents the most advanced qualities of closed car design, construction and refinements. It has all the

mechanical improvements of Superior Chevrolet models. It combines all these with a low price and economy of operation that represents material savings for Chevrolet owners.

Exterior

The body is low, strongly built and beautifully balanced throughout for greatest comfort and economy of wear, fuel, and tires. A moulding around the body gives a more finished appearance and carries out the streamline effect.

Two wide doors afford easy entrance and exit. Both doors are equipped with anti-rattlers.

The color is black on upper structure, hood, running gear and wheels. Cowl and lower body panels are a toned Brewster green.

Cord tires, straight-side, non-skid 30"x3½" are standard equipment. Demountable split rims are mounted on steel felloes.

Fuel supply is from 10-gallon gasoline tank on rear with Stewart Vacuum System.

Top material all in one piece and held under drip moulding positively prevents leakage.

The luggage compartment on the rear of the body is unusually wide and deep.

The drivers seat is low with broad curved back set slightly forward within convenient reach of steering wheel and all controls. The rear seat has ample width for the comfort of two passengers.

An extra seat unusually large and sturdy accommodates a fourth passenger and folds under the dash when not in use.

Back of the driver's seat is a small compartment.

Interior

All seats are deep and are finished in striped French Plait Velour over long coil springs.

Clutch and service brake pedals, foot accelerator, starting button, emergency hand brake and gear shift levers and 16" steering wheel are arranged for greatest driving convenience.

The windshield is adjustable both top and bottom.

Additional protection from glare and storms is furnished by a permanent black metal visor, with rain gutter.

Windows are easily raised and lowered with Ternstedt Window Regulators. Rear window has a silk curtain.

Mahogany garnish rails around all windows add to the effect of stability and custom coach work.

Polished nickel hardware, door latches, window regulators, door-pull-to handles and dome light add to the distinctive interior appearance.

All floor space is carpeted.

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; adjustable head lamps; speedometer; electric horn; extra rim and carrier on rear, complete tool equipment, including pump and jack.

Specifications
Chevrolet "Four-Ninety" Light Delivery Wagon

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 4" stroke.

Cylinders: Cast en-bloc (including upper half of crank case'. Head detachable.

Valves: 1½" diameter.

Connecting Rod Bearings: 1⅜" diameter, 1⅜" long.

Crankshaft Bearings: Front, 1⅜" diameter, 2-5/16" long; Center, 1-21/32" diameter, 1½" long; Rear, 1¾" diameter, 2-11/16" long.

Camshaft Bearings: Front, 1-5/16" diameter, 2⅜" long; Center, 1-9/32" diameter, 2" long; Rear, 1¼" diameter, 1-7/16" long.

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Transmission: Selective type, sliding gear; three speeds forward, and reverse.

Cooling: Water pump, radiator extra size.

Front Axle: Drop-forged I-beam. Tapered roller bearings.

Rear Axle: Three-quarter floating, wheel bearing carried on the wheel-hub and in axle housing, not on axle shaft. Special Spiral cut Bevel Driving gears mounted on heavy duty annular ball bearings.

Brakes: Emergency, internal expanding type; service, external contracting type; 10" brake drums.

Wheels: Wood, artillery type, steel felloe, demountable rims, large hub flanges.

Tires: 30" x 3½", non-skid front and rear.

Drive: Left side; center control; spark and throttle under steering wheel. Foot accelerator.

Steering Gear: Spur and gear. 15" steering wheel.

Springs: Cantilever type, front and rear.

Wheelbase: 102".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, four-post top, side curtains; adjustable windshield; speedometer; electric horn; complete tool equipment, including pump and jack.

Model "FB" Specifications

Motor The motor is of the four-cylinder, four cycle type, with cylinder dimensions 3-11/16 inch bore, by 5¼ inch piston stroke. The horsepower rating (S.A.E.) is 21.7. It is capable of developing 34 horsepower on block test.

Cylinder head removable. Three exhaust ports prevent over-heating.

The motor is supported at the front by a pressed steel cross arm bolted securely to the front of the case, the outer ends of which are securely held to frame side members in special supports. The rear end of the motor is supported on a motor arm, of pressed steel, and is held securely to the frame side members in special malleable iron brackets, the most desirable form of suspension possible. The transmission case of malleable iron is bolted directly to the rear motor support, being so constructed as to completely cover the fly-wheel; bendix drive gear; clutch and equalizer shaft, making a most complete unit power plant.

Valves The intake and exhaust valves are alike and interchangeable; of the bevel seated type, 1½ inches in diameter, giving a 1-5/16 inch clear opening, which gives a maximum flow of gases to and from the cylinders. They are operated by rocker arms and push rods, from cams having a lift of ¼ inch.

Camshaft The camshaft is a drop forging of low carbon steel, with integral cams, heat treated and ground to .005" limits on bearing surfaces and cam lobes. The cams are of the large oval type, which raise and lower the valves gradually, which assures quietness. It is located on the right side of the motor and completely housed in the cylinder block, but readily removed from the forward end. The shaft is of liberal diameter to avoid deflection when lifting valves, and is supported by three plain bearings, the front 2¼" long by 1-9/16" diameter; center 2" long by 1½" diameter; rear 2" long by 1-15/32" diameter.

Pistons and Piston Rings The pistons are lynite, accurately finished by grinding and carefully fitted with proper allowances for expansion. Extra long (being 3⅝" over all) in order to better distribute the side thrust between the cylinders and pistons and thus reduce the wearing of both.

Connecting Rods The connecting rods are of "I" beam section, drop forged from high carbon steel, heat treated, and carefully machined to reduce reciprocating weight to a minimum. At the crank shaft end they are fitted with babbitt bearings, brass backed, of two halves 2.12 inches long by 1.5015 inches in diameter. The bearing caps are secured to the connecting rods by chrome nickel steel bolts, especially heat treated, and held by cotter pinned nuts. Thin shims of varying thickness, .002" and .003", are placed between caps and connecting rods in order to simplify taking up when they become loosened from use.

Crankshaft The crankshaft is a drop forging of high carbon steel and specially heat treated. It has liberal proportions and is accurately balanced. All bearing surfaces are accurately ground to .0005" limits. It has three main bearings, the front and rear are die cast while the center is babbitt, brass backed. The front bearing is 2-11/16" long by 1½" diameter; center 1-31/32" diameter by 2" long; rear 3½" long by 2" diameter.

Lubrication The motor lubrication is known as the constant level splash system. The oil is circulated by means of a gear pump mounted on the gear cam and driven by the generator armature shaft. It draws the oil from the lowest point of the oil pan and distributes it to the center bearing under pressure, and into small oil pockets under each connecting rod into which the connecting rod spoons dip at each stroke; the spray of oil caused by the rapid splashing of the connecting rod spoons lubricates the cylinder

walls, camshaft, wrist pins and other interior motor parts, collecting in pockets above the cam shaft bearings, from which holes lead to the bearings. The excess oil falls back to the reservoir to be used over again. The oil pan is of pressed steel, secured to the lower crank case with bolts and sealed by a cork gasket. A breather and oil filler pipe is conveniently located on left side of the motor. The oil level is determined by a gauge located on the left side of the cylinder block. A suitable oil pressure gauge located on the instrument board indicates the pressure of oil in the system.

Carburetor The intake manifold is of cast iron with a warm air jacket, which surrounds the manifold with hot air, to aid carburetion. Hot air from the exhaust manifold is also utilized, passing through a flexible tube to the carburetor air intake. The jacketed intake manifold permits the use of smaller jets in the carburetor, which results in increased gasoline mileage.

Gasoline Tank The gasoline is "fed" to the carburetor from the gasoline tank, which is at the rear of the frame. The Stewart Vacuum System insures a steady flow of gasoline at all times and altitudes. The gasoline tank is of heavy gauge steel, rectangular in shape, with a capacity of 17 gallons, clamped to steel brackets at the rear of the frame.

Radiator The radiator has a graceful appearance, and conforms with the lines of the hood. It is supported by bolts to the frame cross member, and held in a vertical position by the top section of the hood, which is securely fastened to the radiator and to the dash. This method minimizes the tendency to leak, since the radiator is held firmly in place.

Clutch Its frictional surface, faced with leather, directly engages with the inner beveled surface of the flywheel. The cone is provided with adjustable spring

pressed plungers or expanders, which are under the clutch leather, the proper adjustment of which prevents so-called "grabbing" and causes the load to be picked up evenly and smoothly.

The clutch spring tension rod seats into the flange on the rear end of the crank shaft, and is equipped with a clutch thrust bearing. The rod then passes through the flywheel and supports the clutch hub, which in turn encases the spring. The clutch spring is actuated by the clutch pedal, through the fork and clutch collar. The expansion or contraction of the clutch spring engages or disengages the clutch in the flywheel. The hub is machined with a splined hole in the rear end, which slips on the splined end of the transmission main drive gear.

Clutch Control The clutch operating mechanism is exceedingly simple, consisting of a transverse clutch equalizer shaft, which transmits the impulse from the clutch pedal to the clutch drive ring through a circular clutch collar on two equalizer levers. The pedals are set forward on a separate pedal shaft and act upon the equalizer shaft through a clutch lever.

Transmission Sliding gear, selective type with three forward speeds and reverse. Direct drive on high speed. Shafts are of high grade steel heat-treated operating on New Departure ball bearings.

Transmission spline or main shaft: 1⅝" large diameter, 1¼" small diameter.

Gears are of special alloy steel, heat-treated.

Pitch of gears 6-8.

Face of gears ¾.

The transmission is carried on a frame, bolted to flywheel housing and can be quickly and easily removed. It is located immediately under driver's floor boards, permitting direct connection with the gear shift lever and gives the utmost accessibility for inspection and lubrication.

Transmission Gear Reduction

1st Speed.....3.525 to 1
2nd Speed .....1.736 to 1
3rd Speed..... Direct
Reverse .....3.966 to 1

Front Axle The front axle is of the "I" beam type—one-piece drop-forged with integral yokes and spring seats, made of high grade steel, heat treated; it is extremely strong, so as to withstand both the horizontal and vertical stress to which the axle is continuously subjected. The steering knuckles and arms are drop-forged of special chrome alloy steel, heat treated. Bushings are pressed in each of the steering knuckles and arms. They are reamed in place so that a perfect bearing fit may be had on the king bolts, which are hardened and ground and secured by cotter-pinned nuts. The king bolts are well lubricated by means of grease cups conveniently located.

Rear Axle An adjustment for the bevel pinion has been provided. This consists of a cage which screws into the propeller shaft housing, and supports two heavy duty ball bearings. This new feature makes it possible to adjust the meshing of the bevel pinion and drive gear without the use of shims or the removal of the axle. Access to the adjustment is had through a small hand hole plate on the housing.

Differential The gear ratio of the rear axle is 4⅝" to 1 adopted as best suited for power, economy, speed, and hill climbing.

Brakes The brake equipment consists of two pairs of powerful, double acting bands, operating directly on the rear wheel brake drums, which are 12 inches in diameter, with faces 2" wide. The service brakes contract upon the outside of the drums and are operated by the right foot pedal. The emergency brakes expand within the drums

and are operated by the hand brake lever, which has a fine tooth ratchet mounted on the transmission cover. The brake bands are lined with asbestos containing a reinforcement of fine copper wire. The lining is riveted to the band by copper countersunk rivets. The connection between brakes and pedals are by rods from the pedals to intermediate levers on the brake equalizer shaft, which is supported on the frame center cross member. Complete adjustment of the brakes may be made by a few turns of the wing-nuts on brake rod at the pedal or hand brake lever.

The connections of the intermediate brake levers and shaft on the cross member to the brakes are by rods, which have drop forged steel yokes on the ends—one end being adjustable. All brake adjustments are easily made and maintained.

Drive The driving load is transmitted from the crank shaft to flywheel to clutch, to transmission, to universal joint, to propeller shaft, through the pinion and bevel ring gear, to the axle shafts, to the rear wheels.

Wheels The wheels are the artillery type, having twelve strong spokes, being made of second growth hickory, thoroughly seasoned. They are mounted on substantial hubs with large flanges on the inside and eight hub bolts on the front and twelve on the rear, which pass through the spoke. Straight side demountable rims are standard. The front wheels revolve on special Chevrolet cup and cone type ball bearings, made by Chevrolet under the direction of New Departure. They have eleven 9/16" steel balls in inside cup and nine 15/32" steel balls in the outside cup, which are well adapted for the purpose because they are designed to take care of end thrusts, which occur in turning corners, in addition to the ordinary radial load.

Frame The frame is channel section pressed steel of liberal proportions, the side members being 4½" maximum depth, and tapering towards front and rear without sudden change of cross section. It is provided with three cross members securely fastened to the main members with good size hot driven rivets. The frame consists of very few parts, which obviates the necessity of excessive riveting and thus preserves the full strength of the frame. It is tapered from 29" wide in front to 34" at rear, insuring that the body rests solidly on the frame its complete length.

Steering Gear The steering gear is of the worm and gear type, neatly and compactly designed with ample bearing surfaces, and adjustable for wear. The worm wheel shaft projects through the frame and the steering or Pitman arm is clamped to its square end. The steering wheel is wood rim with spider 18" in diameter. The steering column is of large diameter with Japanned finish. The spark and throttle rods are encased in the tube, together with the steering shaft.

Springs The spring suspension is the best that has yet been devised for the comfort of the passengers. One has but to ride in a Model "FB" to fully appreciate its extremely easy riding qualities. The springs extend fore and aft from the frame side members to the front and rear axles.

Flexibility of front springs on all "FB" Models test 350 to 375 lbs. to the inch. The rear springs of "FB" Touring and Sedan test 135 to 145 lbs. to the inch. The rear springs of the Roadster and Coupe test 115 to 125 lbs. to the inch.

The front springs are semi-elliptic type, high carbon steel. The ends are secured by clips and bolts to lower sides of frame brackets and front axle seats.

The rear springs are semi-cantilever type. High carbon spring steel has flexibility of 135

to 145 lbs. per inch. The rear axle and wheels in passing over obstructions or depressions move in an arc approximately described about the point of anchorage of the forward end of the springs. The spring being long, the axle and wheels practically travel in a vertical line, insuring easy spring action without strain.

Storage Battery The 6 volt, 3 cell Willard Threaded Rubber storage battery has a capacity of 5 amperes for 23.5 hours. In other words, it will hold enough electric energy to last 23.5 hours, if this energy is withdrawn at the rate of five amperes per hour. It is suspended from the chassis frame and beneath the body front floor board, which makes a perfectly accessible place where it can be inspected and filled with ease.

Starting Motor The electric starting motor is of the 6 volt, single wire system. It is a separate unit, small and compact. It is of extremely high efficiency and will turn the engine at 140 revolutions per minute. The engaging mechanism is of the most advanced type, and the simplest, no reduction being necessary beyond the starting motor pinion gear to the fly wheel. When the current is supplied to the starting motor, the pinion gear is instantly and automatically drawn in mesh with the flywheel gear, and when the engine starts under its own power, the pinion gear automatically draws out of mesh.

Starter Switch The starter switch is located on the toe board with its push button extending above the board. It is operated by the driver's foot.

Lighting and Ignition Switch The lighting and ignition switch is mounted on the instrument board. The lights are turned on and off or made bright or dim by turning a knob. The ignition is turned on or off by inserting a key through a slot in

the knob and giving it a quarter turn. The removal of the key automatically locks the switch and prevents theft.

Lamps The electric head lamps are 10⅛" diameter, finished in black enamel with nickel rims, each fitted with a 17 candle power bulb. National approved lenses are standard. The tail lamp is 3¼ inches diameter, finished in black enamel, fitted with a 4 candle power bulb. At the side a white light illuminates the license plate.

A fuse is located in the lighting switch to prevent damage to the system, which may be easily removed when necessary. Head lamps are set high for appearance, and to lessen the road shadows; they are supported on heavy brackets and are bolted to the front fender irons and connected by a tie rod.

Control The gear shift lever is located in the center of the driving compartment and operated by the right hand. The clutch is operated by the left pedal. The hand brake lever operates the emergency brake. The service brake is operated by the right foot pedal. The hand operated spark and throttle levers are conveniently located above the steering wheel on a stationary sector. The throttle is also operated by a foot accelerator conveniently located on the toe board to the right of the service brake pedal.

Top The top is the conventional "one man top" held to the windshield by clamps and to the rear by straps. A wide beveled edge rear curtain light gives a clear view to the rear.

Tires The "FB" cars have the following tire equipment, the front and rear being 33 x 4 non-skid tread, cord.

Wheelbase The wheelbase is 110". This length gives ample room in the body so that there is no crowding or pinching of the seats.

Weight Weight of the touring car is 2504 (shipping weight) pounds.

Turning Radius Steering so designed that the car can turn in either direction in a circle with a radius of 21 feet.

Dimensions Over All Length over all. Touring, 14 feet 3 inches; Roadster, 13 feet 7 inches. Width over all, including fenders, 5 feet 6 inches. Height with top up, Touring, 6 feet, 7⅛ inches; Roadster, 6 feet, 3 inches.

Upholstering "FB" Models are trimmed with leather with the exception of doors and cowl panels. The top for "FB" Model is made from double texture rubber with a kahki back. Curtains are made from single texture material, kahki colored inside. The curtains open with the doors.

Enclosed Models All closed car skeleton bodies are made of maple and oak wood, first and second grade, and covered with sheet steel.

Model "FB 42" Sedan The four doors are hinged from the front posts on three hinges, and have "L" type handles; the entire deck or top is crowned slightly so as to give it a more rounded appearance. The battery is suspended from brackets attached to the frame, which permits more room under the seat which may be used for tools or other purposes. The front floor board and toe board are covered with carpet the same as in the tonneau.

The front seat is of the solid type to give greater stability to the body. All fixtures have satin finish and corner lights which give an added touch of refinement.

This model is equipped with an 18" steering wheel. The right hand rear door is made secure with a Yale lock and the other doors are provided with inside catches. The rear side and back windows are fitted with silk

curtains. Windows are adjusted by mechanical lifts. All doors have a double latch safety device.

The body is upholstered in velour and the head lining or the portion above the windows is plain taupe, while the body cloth or seat trimming and lower part of the body is taupe with a wide brown stripe and a narrow black line.

Model "FB 22" Coupe The "FB 22" Coupe is arranged for four passengers, having an extra folding seat in front. Radiator and hood are same as Model "FB 32." The right door is made secure with a Yale lock, and the other door is provided with an inside catch. The rear side and back windows are provided with silk curtains. Windows are adjusted with mechanical lifts. This model is equipped with an 18" steering wheel. Both doors have a double latch safety device, upholstery and fixtures will be the same as in "FB-42" Sedan.

Top Material The decks of Model "FB" Tops are made of double texture Luxar. Its waterproof qualities are about three times that of a single texture material. First, the outside rubber coating is a high grade compound which makes the fabric thoroughly impervious. Next, the upper and lower fabrics are firmly cemented together with a plastic waterproof cement containing live rubber. Finally, the heavy drill backing is itself treated by a rubberizing process. When the completed material is vulcanized, the different elements are incorporated in such a way as to make the top material waterproof clear through. All the surface compound could be removed, yet the rubber combining compound would keep out the water. It is evident that this top material would remain waterproof until it was cracked clear through.

The "FB" top material runs from 34 to 36 ounces per lineal yard of 54 inches width. It is the ideal weight for double texture top material. In that weight, the strength and heft of the fabric used and the thickness of the coating are perfectly adjusted in a finished material which has the utmost possible tensile strength and weather resistance, without the tendency to stretch and sag which heavier coated top materials develop. The strength of the material is also greatly increased by the combining adhesive which is forced between and intimately binds the fibres of the fabric. The material is splendidly adapted for all-around rugged service under the trying conditions to which automobile tops are subjected.

This material is the type known as French Long Grain, and in the Medium Finish. This finish results in maintaining the initial good appearance of the top much longer than when a dull finish is used. A special varnish which is in itself weather resisting and retards the oxidization of the rubber coating is used. As a result, the medium finish top material slowly declines in lustre; until at the end of six months, it becomes a good dull finish. On the other hand, a material which is dull at the start, will usually become a dusty dirty gray by the end of six months.

"FB" owners who are in the habit of raising and lowering their tops will find that the material remains soft and flexible, and because of the quality of the combining compound, they will have no trouble with it cracking. More and more, however, car owners are leaving their tops up permanently, and this is a very wise practice, as you know, for there is no top material made but what will remain far more shapely when the tops are left up.

Curtain Material "FB" curtain material matches the top material in grade and finish and color of back, and except that it is made upon a somewhat heavier drill, it is identical with the curtain material on model "Four-Ninety."

Double texture Luxar is one of the Du Pont Fabrikoid advertised top materials, and one which sells with a guarantee stated as follows in the company's printed matter:

"Luxar is guaranteed for one year from date of shipment against leaking, cracking, peeling, blistering or blooming."

Specifications

Chevrolet "FB 32" Touring Car

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 5¼" stroke. Lynite pistons.

Cylinders: Cast en-bloc with upper half of car and case. Head detachable.

Valves: 1½", enclosed.

Connecting Rod Bearings: 1½" x 2⅛".

Crankshaft Bearings: Front, 1½"x2-11/16"; Center, 1-31/32" x 2; Rear, 2" x 3½".

Center Main Bearings: Die cast, bronze back.

Camshaft Bearing: Front, 1-9/16" x 2¼"; Center, ½" x 2"; Rear, 1-15/32" x 2".

Oiling System: Gear pump, Oil pressure gauge on dash.

Carburetor: Zenith improved double jet.

Electric System: Auto-Lite generator, starting motor, and lighting system. Two-unit type.

Ignition: New improved Remy system.

Clutch: Cone, leather faced, with adjustable compensating springs.

Transmission: Selective type, three speeds forward and reverse.

Front Axle: Drop-forged I-beam with integral yokes. Wheels fitted with New Departure ball bearings.

Rear Axle: Three-quarter floating type. Shafts run on Hyatt roller bearings.

Cooling: Water pump; radiator extra size.

Brakes: Service, external contracting; emergency, internal expanding (hand-controlled); 12" brake drums.

Springs: Front, semi-elliptic; rear, semi-cantilever.

Tires: 33" x 4", non-skid cord. Front and rear.

Drive: Left side, center control.

Steering Gear: Worm and gear wheel; 18" steering wheel with inserted spider.

Gasoline Supply: Seventeen-gallon tank hung on rear, with gauge. Stewart vacuum system.

Wheelbase: 110".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; top; electric horn; speedometer; demountable rims, with extra rim; tire carrier; license holder.

Specifications
Chevrolet "FB 12" Roadster

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 5¼" stroke. Lynite pistons.

Cylinders: Cast en-bloc with upper half of crank case. Head detachable.

Valves: 1½", enclosed.

Connecting Rod Bearings: 1½" x 2⅛".

Crankshaft Bearings: Front, 1½"x2-11/16"; Center, 1-31/32" x 2; Rear, 2" x 3½".

Center Main Bearings: Die cast, bronze back.

Camshaft Bearings: Front, 1-9/16" x 2¼"; Center, 1½" x 2"; Rear, 1-15/32" x 2".

Oiling System: Gear pump. Oil pressure gauge on dash.

Carburetor: Zenith improved double jet.

Electric System: Auto-Lite generator, starting motor, and lighting system. Two-unit type.

Ignition: New improved Remy system.

Clutch: Cone, leather faced, with adjustable compensating springs.

Transmission: Selective type, three speeds forward and reverse.

Front Axle: Drop-forged I-beam with integral yokes. Wheels fitted with New Departure ball bearings.

Rear Axle: Three-quarter floating type. Shafts run on Hyatt roller bearings.

Cooling: Water pump; radiator extra size.

Brakes: Service, external contracting; emergency, internal expanding (hand-controlled); 12" brake drums.

Springs: Front, semi-elliptic; rear, semi-cantilever.

Tires: 33" x 4", cord, front and rear.

Drive: Left side, center control.

Steering Gear: Worm and gear wheel; 18" steering wheel with inserted spider.

Gasoline Supply: Seventeen-gallon tank hung on rear, with gauge. Stewart vacuum system.

Wheelbase: 110".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; top; side curtains; electric horn; speedometer; demountable rims, with extra rim; tire carrier; license holder.

Specifications
Chevrolet "FB 42" Sedan

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 5¼" stroke. Lynite pistons.

Cylinders: Cast en-bloc with upper half of crank case. Head detachable.

Valves: 1½", enclosed.

Connecting Rod Bearings: 1½" x 2⅛".

Crankshaft Bearings: Front, 1½" x 2-11/16"; Center 1-31/32" x 2; Rear, 2" x 3½".

Center Main Bearings: Die cast, bronze back.

Camshaft Bearings: Front, 1-9/16" x 2¼"; Center, 1½" x 2"; Rear, 1-15/32" x 2".

Oiling System: Gear pump. Oil pressure gauge on dash.

Caburetor: Zenith improved double jet.

Electric System: Auto-Lite generator, starting motor, and lighting system. Two-unit type.

Ignition: New improved Remy system.

Clutch: Cone, leather faced, with adjustable compensating springs.

Transmission: Selective type, three speeds forward and reverse.

Front Axle: Drop-forged I-beam with integral yokes. Wheels fitted with New Departure bearings.

Rear Axle: Three-quarter floating type. Shafts run on Hyatt roller bearings.

Cooling: Water pump; radiator extra size.

Brakes: Service, external contracting; emergency, internal expanding (hand-controlled); 12" brake drums.

Springs: Front, semi-elliptic; rear, semi-cantilever.

Tires: 33" x 4", non-skid cord. Front and rear.

Drive: Left side, center control.

Body: Five-passenger Sedan, solid front seats.

Steering Gear: Worm and gear wheel; 18" steering wheel with inserted spider.

Gasoline Supply: Seventeen-gallon tank hung on rear, with gauge. Stewart vacuum system.

Wheelbase: 110"

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers, electric horn; speedometer; demountable rims, with extra rim; tire carrier; license holder.

Specifications
Chevrolet "FB 22" Coupe

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 5¼" stroke. Lynite pistons.

Cylinders: Cast en-bloc with upper half of crank case. Head detachable.

Valves: 1½", enclosed.

Connecting Rod Bearings: 2⅛" x 1½".

Cranksraft Bearing: Front, 1½" x 2-11/16"; Center 1-31/32" x 2; Rear, 2" x 3½".

Center Main Bearings: Die cast, bronze back.

Camshaft Bearings: Front, 1½" x 2-11/16"; Center 1½" x 2"; Rear, 1-15/32" x 2".

Oiling System: Gear pump. Oil pressure gauge on dash.

Carburetor: Zenith improved double jet.

Electric System: Auto-Lite generator, starting motor, and lighting system. Two-unit type.

Ignition: New improved Remy system.

Clutch: Cone, leather faced, with adjustable compensating springs.

Transmission: Selective type, three speeds forward and reverse.

Front Axle: Drop-forged I-beam with integral yokes. Wheels fitted with New Departure ball bearings.

Rear Axle: Three-quarter floating type. Shafts run on Hyatt roller bearings.

Cooling: Water pump; radiator extra size.

Brakes: Service, external contracting; emergency, internal expanding (hand-controlled); 12" brake drums.

Springs: Front, semi-elliptic; rear, semi-cantilever.

Tires: 33" x 4", non-skid cord. Front and rear.

Drive: Left side, center control.

Body: Four passenger type with folding auxiliary seat.

Steering Gear: Worm and gear wheel; 18" steering wheel with inserted spider.

Gasoline Supply: Seventeen-gallon tank hung on rear, with gauge. Stewart vacuum system.

Wheelbase: 110"

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment, including headlight dimmers; electric horn; speedometer; demountable rims, with extra rim; tire carrier; license holder.

Specifications and Details
Model "T" Truck

The motor is of the valve-in-head type, four cylinder, four cycle, vertical, water cooled, bore 3-11/16"—stroke 5¼", piston displacement (4 cylinders) 224.3 cubic inches.

Motor is in unit with clutch and transmission; located in front of dash under hood. The motor arms extend to each side of the frame, the rear being carried on two heavy malleable iron castings riveted to frame and held in place by two drop forged U bolts.

The front of motor is hung into shackles which are securely bolted to motor arms and to two substantial malleable iron brackets riveted to frame. This construction absolutely relieves the power plant from all strains due to road variations, and starting with a heavy load.

Cylinders cast enbloc integral with crank case.

Cylinder head removable.

Three exhaust ports prevent over-heating.

Combustion chamber all machined.

Compression pressure 92 lbs. per square inch.

Both manifolds bolted on.

Pistons: Lynite.

Piston rings: Three—diagonally split.

Camshaft drive: Helical gears.

Three bearings on camshaft.

Crankshaft: Three bearings.

Gear driven oil pump directly connected with generator.

Lubrication: Pressure and splash system.

Diameter of valves: 1½" both intake and exhaust.

Lift of valves ¼".

Carburetor Zenith 1 inch Q-4C. Hot air jacketed intake manifold. Throttle advance is controlled by lever mounted above steering wheel, and by foot accelerator. All the air enters the carburetor through a combined strangler and temperature regulator which provides a cold air opening dur-

ing warm weather. The strangler is operated from the driver's seat and is a great aid in starting the motor in cold weather.

Governor A Monarch Governor is installed between the carburetor and the intake manifold. It is adjusted to limit the maximum speed to 25 miles an hour. This is a safeguard against overspeeding or racing the motor, and a protection against abuse in driving.

Gasoline supply, gravity feed, from a tank located under driver's seat.

Gasoline Tank Gasoline Tank is of heavy terne plate absolutely non-leakable holding 13 gallons. It is securely fastened so it cannot jolt around and break the gas pipe. The filter cap is large in diameter and is located under the seat cushion where it is readily accessible for filling.

The outlet fitting is located at the extreme rear of the tank and is provided with a sediment cup to catch dirt and other foreign matter, and can be drained by removing a plug in the bottom. The gasoline line to the carburetor is of double annealed 5/16" copper pipe, and has plenty of slack in it to allow for any movements without straining or breaking it.

Frame Frame side and rear cross members are of open hearth rolled steel channel, depth 4", weight per foot 6.25 lbs. The rear cross member is securely riveted to side members by two 4 x 4 x 5/16" angle iron brackets, and a 1½ x 2½ x ¼" angle iron brace running diagonally across each corner. This is also riveted to frame side members, and rear cross member.

Second cross member is of open hearth rolled steel channel, depth 3", weight per foot 4 lbs., and is well riveted to frame side member by means of two 4 x 4 x 5/16" angle iron brackets.

Front cross member is a 2 x 3 x ¼" angle iron, hot riveted to two heavy malleable iron brackets extending from frame side members,

these brackets being dropped so as to make the cross member come right for supporting the radiator. All holes are accurately drilled instead of being punched, as punching frequently starts minute cracks which later spread and become dangerous. All brackets or castings are accurately drilled and machined where they fit against frame and great care is taken to solidly fasten them. All rivets are driven by pneumatic hammers and presses.

Width of frame Out. to Out. of side members (Rear, 35⅛"; Front, 30½").

Length of frame back of driver's seat 109".

Overhang of frame behind center of rear axle 47⅝".

Height of frame at center of rear axle from ground with load approximately 23½".

Cowl, Dash and Instrument Board The cowl is of heavy sheet steel riveted to angle iron frame. The corners are well braced with ¾" square forged tee irons. These irons support also the windshield, the dash, and instrument board, and are of heavy sheet steel well riveted to cowl frame, making the cowl in general very strong and rigid. The instrument board carries the speedometer, carburetor choke, ammeter, oil pressure gauge, lighting and ignition switch, all of which are high-class instruments neatly and conveniently arranged, and are mounted flush with the board.

Seat and Seat Riser Seat riser is of selected kiln-dried hardwood, well braced in corners, and has two compartments, in one of which the gasoline tank is securely strapped and well protected. The other compartment is of ample size and can be used for luggage. The seat is wide enough to seat three people, and has a good wide upholstered lazy back which extends the full width of the seat and is so secured by neat, substantial irons which extend around on the ends of seat. The seat cushion is upholstered with hair and panta-

sote, and is built up on a wood frame with a sufficient number of steel springs to make it very comfortable.

Hood Hood over motor is of heavy sheet steel with three hinge rods. Center hinge rod is fastened at both ends so that it will not get out of place when sides of hood are raised. A heavy anti-squeak is used under both ends of the hood to prevent rattling. There are seven louvres, or air outlets, in each side of hood to permit a good circulation of air by fan. There are two catches on each side of the hood of the wing-nut type, which hold the hood firmly in place.

Fenders Front Crown fenders are of heavy gauge pressed steel in one piece rigidly attached to frame side member by a heavy pressed steel "U" section iron. A heavy sheet steel apron extending to frame and completely enclosing sides, protecting running boards from mud and water.

Fenders Rear Crown fenders are of heavy gauge pressed steel in one piece rigidly attached to body side boards and cross sills by a heavy pressed steel "L" shaped iron.

Ignition Remy Distributor, Hand Control.

Electric Generator The machine is enclosed in a dust and moisture proof case to protect it from oil, dirt, and water, and is gear driven from the camshaft gear in the gear case at the forward end of the motor. The voltage output is controlled by a third brush, which increases or decreases the field strength in proportion to the motor speed; thus doing away with mechanical governors and clutches, which are liable to get out of adjustment. The generator begins to produce a charging current at a car speed of about ten miles per hour.

Starter Electric Auto-Lite Company, Toledo, Ohio.

Six volt Bendix drive and is securely mounted on the rear motor arm. The brushes and commutator are easily accessible for examination by removing a sheet metal cover on the commutator end of the machine. The starter switch is located on the toe boards to the right of the accelerator pedal.

Exhaust The exhaust pipe is of steel tubing, large in diameter, and free from short bends so as not to put any back pressure on the motor. Movements of the motor on its shackle suspension will not cause the pipe to leak or strain the muffler. It is securely anchored both in muffler and in the exhaust manifold of the motor.

Muffler is built up of pressed steel and has sufficient volume to permit expansion of the exhaust gases with very little noise.

Cooling System Water capacity 13 qts. Water jackets in cylinder block castings are amply large, thus insuring proper distribution of water and uniform cooling of all motor parts. There are no pockets in which steam can form or accumulate to impede circulation.

Pump is of the centrifugal type with extra large bearing fitted with stuffing box.

Radiator is of the honeycomb type. The core is of heavy brass. The shell is of pressed steel and bolted to the core. The core has a heavy steel strap running completely around it, to which two heavy "V" shaped slotted steel springs are securely riveted. These springs rest on two steel washers and are bolted to front cross member, making radiator adjustable. These springs absorb all vibration and shocks due to extreme road conditions. The entire cooling system can be quickly drained of all water by opening drain cock conveniently located.

Pressed steel fan 15 inches in diameter is mounted on front of motor and the proper distance from the radiator to maintain a draft

through the radiator and under the engine hood. The fan shaft has ample bearing surface and is driven by a "V" shaped composition belt. This type of belt does not have to be tight to prevent slipping, the fan pulley being adjustable so as to get any tension on the belt that may be desired. Ample openings are provided in the side of the hood and under the dash to allow the ready escape of the air driven in by the fan which permits the fan to develop its full efficiency. Radiator hose connections are of best quality.

Clutch Cone type with leather face and is provided with springs under leather to insure gradual engagement. Diameter of cone 14 inches. Face of cone—2 inches.

Transmission Sliding gear, selective type with three forward speeds and reverse. Direct drive on high speed. Shafts are of high grade steel heat-treated operating on New Departure ball bearings.

Transmission spline or main shaft: 1⅝" large diameter, 1¼" small diameter.

Gears are of special alloy steel, heat-treated.

Pitch of gears 6-8.

Face of gears ¾.

The transmission is carried on a frame, bolted to fly-wheel housing and can be quickly and easily removed. It is located immediately under driver's floor boards, permitting direct connection with the gear shift lever and gives the utmost accessibility for inspection and lubrication.

Gear Reductions

In Transmission

1st Speed	3.525 to 1
2nd Speed	1.736 to 1
3rd Speed	Direct or 1 to 1
Reverse	3.966 to 1

At Rear Axle

Worm and Worm Gear	7 to 1

Total Reduction Between Motor and Rear Wheels

1st Speed	24.67 to 1
2nd Speed	12.15 to 1
3rd Speed	7 to 1
Reverse	27.76 to 1

Control Gear shift and emergency levers are located in center, clutch and service brake pedals are located respectively on left and right side of steering column. Throttle and spark control levers are located above steering wheels. Accelerator pedal is located at right of service brake pedal.

Drive Shafts From the transmission the drive is through a seamless steel tubing propeller shaft with three universal joints to a worm and worm gear mounted with the bevel pinion differential on rear axle shafts.

This construction prevents vibration, whipping and springing out of shape to which a long shaft is liable if it is not supported at its center with resultant strain and wear on the universal joints and bearings at each end. By using three universal joints the two sections are so shortened that steel tubing can be used and fastened directly over the universal joint hub, thus making a very strong construction.

Drive shaft is of high carbon seamless steel tubing 1⅝" diameter. It is in two sections and is supported at its center on an S. K. F. self-aligning ball bearing.

The bearing housing is filled with lubricant and is provided with a compression grease cup for re-filling it.

Universal Joints The moving surfaces are very large so that the efficiency is high. All parts are hardened and accurately ground to size. They run almost indefinitely without any appreciable wear. The average position through which the joints work is nearly a straight line. This keeps the joints in good condition and improves their efficiency.

Brake System There are two separate sets of brakes and are of the internal expanding type, acting on rear wheel brake drums. The service brake is operated by a foot pedal. The emergency brake is

operated by hand lever. The brake lining is of Raybestos. Each brake shoe is 14" in diameter and 2" wide. Both sets of brake rods are provided with turn-buckles conveniently located to take up all brake wear.

Rear Axle Axle Wheel Bearing and Worm Gear Housings are of malleable iron and are assembled to a 3-15/16" O. D. Wrought Iron Tube, parts being firmly riveted together. Axle shafts are of the semi-floating type made of chrome nickle steel, heat treated, 1-7/16" diameter on inner end tapering to 2" diameter at outer end where bearing is located. The inner end of each shaft is splined, i. e., it has six keys formed on the upset end which fit into keyways in the differential gear hub. The outer ends are mounted on large double row New Departure ball bearings.

Worm and Worm Gear Worm and Worm Gear are built by the Cleveland Worm and Gear Co. The steel worm is cut, hardened, and then finished by grinding, all by special machines and with great degree of accuracy. The bronze gear is a special alloy accurately cut and having teeth burnished to reduce friction. No adjustment is required at any time. Gears run in oil and worm gear acts as a pump which picks up and circulates oil over the worm and through the bearings. All radial loads and thrusts are taken by New Departure Bearings.

Differential Differential is of the bevel pinion type, with four (4) hardened pinions of 7/8" face, 5-7 pitch mounted on standard New Departure single row ball bearings.

Torque Torque is taken through the springs instead of through a torque arm. This construction cushions the entire power plant every time clutch is engaged. Spring seats are a part of the axle housing and are very strong.

Front Axue Drop forged I-section 2⅝" high by 1¾" wide made of open hearth steel, heat-treated.

Steel knuckles and knuckle arms are amply large, drop forged and heat-treated.

Knuckle bolts and tie rod bolts are hardened and ground and securely fastened to prevent their turning anywhere except in the bushings provided as bearings for these bolts. The steering tie rod is back of the axle where it is safe from accidental bending. Both ends of rod are adjustable to enable accurate lining up of front wheels. These ends are securely locked to prevent working loose.

Wheels Artillery type, standard dimensions, and have twelve hickory spokes, front and rear. Front wheel spokes are 1½ x 1⅜" oval section while rear are 2 x 2" and are of square section with slightly rounded corners. There is ample bearing surface on the felloe to prevent loosening.

Front wheels are equipped with Timken tapered roller bearings of extra large size, insuring safety against all rated loads and thrusts, and are fully adjustable for wear.

The hubs are of malleable iron, flanges of pressed steel and of large diameter, giving a good hold on the wheels and giving them ample support.

Hub caps on front and rear wheels are of malleable iron, very neat in appearance, and heavy enough so they are not easily damaged, by collision.

Brake drums are steel stampings centered on hubs, and are held in place by twelve ½" hub bolts. No bolts go through the spokes to weaken them.

Tires Front—33" x 4". Straight Side, Non-Skid; Rear—35" x 5" Non Skid, Cord.

Springs High carbon spring steel semi-elliptic front and rear exceptionally long and wide, and the following dimensions:

Front Spring

Length 37½ inches, free length.
Width 2¼ inches.
Depth at center 2-5/32 inches.
Number leaves 8.

Rear Spring

Length 53 inches, free length.
Width 2½ inches.
Depth at center 3-13/16 inches.
Number leaves 12.

Each leaf is given a number of heat treatments which are carefully controlled and checked by a most accurate system of instruments, so that each leaf is in exactly the same condition. In hardening, the greatest possible care is taken to see that the steel is heated to an exact temperature before quenching to avoid the different leaves having varying hardness and internal fracture. The leaves are kept in position by a double nib punched in each leaf, which fits in the depression formed by punching the corresponding nibs in the leaf below. These nibs are punched up, while the leaf is hot, and no metal is removed. This construction eliminates holes in the leaves, which take out enough metal to seriously weaken a spring where the greatest strength is needed, as most springs break at this point.

Rebound clips are fitted near the ends to tie several leaves together. This relieves the top leaf of taking all the upbound load when rebounds are severe. These rebound clips are so made and attached that they do not interfere with spring action in any way. A strong plate which fits the curve of the spring is put on top of the spring, and properly spaces the clips which fasten the springs to the axle. When the spring is completely assembled and lubricated, it is given an accurate test on a special testing machine to see that it checks to our requirements of capacity at certain

heights and load capacity per inch of deflection. The spring eyes are made absolutely true and at right angles to the spring, and are provided with a funnel-shaped hole to allow an ample amount of lubricant to flow to spring bolt. The spring bolts are hardened and ground, grooved for the distribution of lubricant, and are so designed that they will not turn in the brackets. All spring and shackle bolts are fed with lubricant by wicks leading from oil tanks cast in the brackets.

Steering Gear

16" Steering Wheel

Worm and Gear type.

Ratio: 7½ to 1.

Steering Arm—Drop forged alloy steel, heat-treated.

Size of ball on Steering Arm 1⅛" diameter.

Body Length: from inside of tail board to inside of head board 114½".

Width: inside of boards 44".

Height of top from frame to highest point of top 63¼".

Length of top overall 156¼".

Top supported on each side by four stanchions whose cross sections are 1½" x 2".

Top is removable by releasing stanchions at sill cross members.

Inside dimensions from top of floor to top of sides 14¼". Mounted thereon on each are flare boards having a width of 8¼" on the slope and over hanging the vertical sides of the body approximately 6". These are braced from the sill cross member to under side of boards.

Body equipped with head board substantially fastened in place as well as a tail board supported by 3 sets of hinges.

Windshield Windshield is mounted on the cowl in the conventional manner supported by brackets of sufficient size to hold same firmly in place.

The windshield is the double ventilating type, both upper and lower sections being adjustable.

Weight Truck weight front end — 1350. Truck weight rear end—2040. Total weight of truck—3420.

Wheelbase 125 inches.

Specifications
Model "T" One-Ton Truck

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 5¼" stroke.
Cylinders: Cast en-bloc with upper half of crankcase. Head detachable. Lynite pistons.
Valves: 1½" diameter.
Connecting Rod Bearings: 1½" x 2⅛"; Doehler bronze back.
Crankshaft Bearings: Front, 1½" x 2-11/16"; Center, 1-31/32" x 2"; Rear, 2" x 2-15/16".
Center Main Bearing: Doehler bronze back.
Camshaft Bearings: Front, 1-9/16" x 2¼"; Center, 1½" x 2"; Rear, 1-15/32" x 2".
Oiling: Pressure and splash system; gear-driven oil pump; oil pressure gauge.
Carburetor: Zenith improved double jet.
Ignition: New improved Remy system.
Governor: Governor is provided and set for 25 miles maximum. It is locked.
Clutch: Cone, leather-faced, with adjustable compensating springs.
Frame: 4"; width, rear, 35⅛"; front, 30½". Length back of driver's seat, 109". Height, 25" loaded.
Transmission: Selective type; three speeds forward, and reverse.
Cooling: Water pump and fan. Radiator extra size.
Front Axle: Drop-forged I-beam. The steering knuckles and knuckle arms are ample in size, drop-forged and heat-treated.
Rear Axle: Semi-floating type, made of carbon steel, heat-treated.
Control: Hand throttle; foot accelerator.
Springs: Semi-elliptic front and rear. Front springs are 38" long and 2¼" wide. The rear springs are 54" long and 2½" wide.
Worm Gear Drive: The steel worm is cut, hardened and then finished by grinding. No adjustment is required at any time.
Tires: Front, pneumatic, 33" x 4". Demountable S. S. type, non-skid, wrapped tread. Rear, 35" x 5", pneumatic, cord type.
Wheels: Artillery type, standard dimensions, twelve hickory spokes each; front wheels equipped with tapered roller bearings of extra large size. Demountable rims.
Steering Gear: Worm and gear type, 16" steering wheel. Steering arm of drop-forged steel, heat-treated.
Gasoline Tank: Capacity, 13 gallons; tank non-leakable. It is located under the driver's seat.
Wheelbase: 125".
Carrying Capacity: 2,000 pounds. Weight of chassis, 2,840 pounds; with body 3,420 pounds.
Body: Length of body from inside of tailboard to inside of headboard is 114½". Width, inside of boards, 44".
Equipment: Electric light sand starter, highest type two-unit system; complete lamp equipment, including headlgirt dimmers; electric horn; speedometer, ammeter, side curtains for driver's seat; windshield; complete tool equipment.

Specifications and Details
Model "G" Light Truck

The motor is of the valve-in-head type, four cylinder, four cycle, vertical water cooled; bore, 3-11/16"; stroke, 4"; piston displacement (four cylinders), 171 cubic inches.

Motor is in unit with clutch and transmission; located in front of dash under hood. A malleable iron cross arm, securely fastened in front of the case, supports the motor at the front. Rivet supports hold this arm firmly to the frame side members. Two malleable iron arms bolted on integral cast brackets on the cylinder block extend rearward and bolt on the transmission. They also rest on and are securely bolted to a pressed steel cross member. The tranverse clutch operating shaft, pedals and electric starting motor are supported by these arms. This results in a unit type power plant. Perfect alignment between crankshaft, clutch and transmission shaft is assured. The transmission is further supported by a V-shaped diagonal brace from the rear top of the cylinders.

Cylinders cast en bloc integral with crank case.

Cylinder head removable.

Combustion chamber all machined.

Compression pressure, 87 lbs. per square inch.

Both manifolds bolted on.

Pistons: cast iron.

Piston Rings: Three, diagonally split.

Camshaft drive: Helical gears.

Three bearings on camshaft.

Crankshaft: Three bearings.

Gear-driven oil pump directly connected with generator.

Lubrication: Pressure and splash system.

Diameter of valves: 1½" both intake and exhaust.

Lift of valves, 7/32".

Carburetor Zenith 1-inch T-4. Intake manifold in seamless steel tubing. Throttle advance is controlled by lever

mounted under steering wheel, and by foot accelerator. All the air enters the carburetor through a combined strangler and temperature regulator which provides a cold air opening during warm weather. The strangler is operated from the driver's seat and is a great aid in starting the motor in cold weather. Gasoline supply, gravity feed, from a tank located under driver's seat.

Gasoline Tank Gasoline Tank is of heavy terne plate absolutely non-leakable, holding 10 gallons. It is securely fastened so it cannot jolt around and break the gas pipe. The filler cap is large in diameter and is located under the seat cushion where it is readily accessible for filling.

The outlet fitting is located at the bottom of the tank and is provided with a sediment cup to catch dirt and water and can be drained by removing a plug. The gasoline line to the carburetor is of double annealed 5/16" copper pipe, and has plenty of slack in it to allow for any movements without straining or breaking it.

Frame All members are pressed steel channel.

Frame Side Members: Depth, 5"; width, 1¾".

Front cross member: depth in center section, 1½"; depth where riveted to frame, 1-15/16", width, 1½".

Center cross member rivets to brackets that are riveted to both frame and step hangers; depth in center, 2½"; depth where riveted to bracket, 3½"; width, 1½".

Third cross member: depth in center, 2½"; depth where riveted to frame, 4½"; width, 2".

Rear cross member: depth, 4⅜"; width, 1¾". Riveted to frame with 4 gusset plates for strengthening the joint.

Size of top gusset plates, 10⅛" x 10⅛" x 5/32" thick. Bottom plates, 4⅛" x 4⅛" x 5/32".

All brackets or castings are accurately drilled and machined where they fit against frame and great care is taken to solidly fasten them. All rivets are driven by pneumatic hammers and presses.

Width of frame Out. to Out. of side members: Rear, 37"; Front, 28".

Length of frame back of driver's seat, 76".

Overhang of frame behind center of rear axle, 19".

Height of frame at center of rear axle from ground with load, approximately 23½".

Cowl, Dash and Instrument Board The cowl is of wood framing covered by heavy sheet steel with well-braced corners. Irons also support the windshield, dash and instrument board. The latter is of wood covered with heavy sheet steel, well riveted to cowl frame, making the cowl in general very strong and rigid. The instrument board carries the speedometer, carburetor choke, ammeter, oil pressure gauge, lighting and ignition switch, all of which are high-class instruments neatly and conveniently arranged, and are mounted flush with the board.

Seat and Seat Riser Seat riser is of selected kiln-dried hardwood, well braced in corners, and has two compartments, in one of which the gasoline tank is securely strapped and well protected. The other compartment is of ample size and can be used for luggage. The seat is wide enough to seat three people and has a good, wide upholstered lazy back which extends the full width of the seat and is secured by neat, substantial irons which extend around on the ends of seat. The seat cushion is upholstered with hair and Fabrikoid and is built up on a wood frame with a sufficient number of steel springs to make it very comfortable.

Hood Hood over motor is of heavy sheet steel with three hinge rods. Center hinge rod is fastened at both ends so that it will not get out of place when sides of hood

are raised. A heavy, anti-squeak is used under both ends of the hood to prevent rattling. There are six louvres, or air outlets, in each side of hood to permit a good circulation of air by fan. There are two catches on each side of the hood of the spring tension type, which hold the hood firmly in place.

Fenders Front Crown fenders are of heavy gauge pressed steel, in one piece, rigidly attached to frame side member by a heavy pressed steel channel section iron. A heavy sheet steel apron extending to frame and completely enclosing sides, protects running boards from mud and water.

Fenders Rear Crown fenders are of heavy gauge pressed steel in one piece rigidly attached to body side boards.

Ignition Remy Distributor, Hand Control.

Electric Generator The generator is enclosed in a dust-and moisture-proof case to protect it from oil, dirt and water and is gear-driven from the camshaft gear in the gear case at the forward end of the motor. The voltage output is controlled by a third brush, which increases or decreases the field strength in proportion to the motor speed; thus doing away with mechanical governors and clutches which are liable to get out of adjustment. The generator begins to produce a charging current at a car speed of about ten miles per hour.

Starting Motor The electric starting motor is of the 6 volt, double wire system. It is a separate unit, small and compact. It is of extremely high efficiency and will turn the engine at 150 to 160 revolutions per minute. The engaging mechanism is of the most advanced type, no reduction being necessary beyond the starting motor pinion gear to the fly wheel. When the current is supplied to the starting motor, the pinion gear is instantly and automatically drawn in mesh

with the fly wheel gear, and when the engine starts under its own power, the pinion gear automatically draws out of mesh.

The starter switch is located on the toe board with its push button extending above the board. It is operated by the driver's foot.

Exhaust The exhaust pipe is of steel tubing, large in diameter and free from short bends so as not to put any back pressure on the motor. It is securely anchored both in muffler and in the exhaust manifold of the motor.

Muffler is built up of pressed steel and has sufficient volume to permit expansion of the exhaust gases with very little noise.

Cooling System The motor is cooled by a belt-driven centrifugal water pump, fan and a cellular type radiator of generous capacity. Both the fan and water pump are driven from the crank shaft. The pump is connected by a hose to the bottom of the radiator or outlet and forces a supply of cooled water to the water jackets surrounding the cylinder walls, thus insuring proper circulation at all motor speeds. When cold the motor and radiator have a capacity of 1⅞ gallons. The water pump is readily accessible by removing the bolts which fasten it to the cylinder block.

Clutch Cone type with leather face and is provided with springs under leather to insure gradual engagement. Diameter of cone, 12⅛". Face of cone, 1½".

Transmission Sliding gear selective type with three forward speeds and reverse. Direct drive on high speeds. Shafts are of high-grade steel, heat-treated, main shaft operating on New Departure ball bearings.

The transmission is located immediately under driver's floor boards, permitting direct connection with the gear shift lever, and is

readily accessible for inspection and lubrication. The shifting rods and interlocking pins are mounted in the malleable iron cover.

Transmission spline or main shaft: 1⅜" large diameter, 1⅛" small diameter.

Gears are of high carbon alloy steel, heat-treated.

Pitch of gears 6-8
Face of gears, ⅝".

Transmission Gear Reduction

Based on Engine Speed

1st Speed.....3.32 to 1
2nd Speed.....1.77 to 1
3rd Speed.....Direct
Reverse .....4.2 to 1

Control The gear shift lever is located at the center of the driving compartment and operated by the right hand. The clutch is operated by a single pedal under the foot. The service brake is operated by the right foot pedal. The emergency brake is operated by a hand brake lever with ratchet lock. The hand operated spark and throttle levers are conveniently located underneath steering wheel on a stationary friction sector. The throttle is also operated by a foot accelerator conveniently located on the toe board to the right of the service brake pedal.

Drive Shaft From the transmission the drive is through a solid steel bar encased in a tubing to a spiral drive pinion and ring gear mounted with the bevel pinion differential on rear axle shafts. Drive shaft diameter, 1-1/32".

Universal Joint The universal joint is the ring and yoke type and extremely strong. It is of low carbon steel, hardened and ground. All moving parts have large bearings, which are lubricated automatically from the transmission case.

Rear Axle An adjustment for the bevel pinion has been provided. This consists of a cage which screws into the propeller shaft housing and supports two heavy duty ball bearings. This new feature makes it possible to adjust the meshing of the bevel pinion and drive gear without the use of shims or the removal of the axle. Access to the adjustment is had through a small hand hole plate on the housing.

Axle housings are of malleable iron and are welded to a 3⅜" O. D. Wrought Iron Tube. Axle shafts are of the semi-floating type made of high grade alloy steel, heat treated, 1⅝" diameter. The inner end of each shaft is splined, i. e., it has ten keys which fit into keyways in the differential gear. The outer ends are mounted on large Hyatt roller bearings. Spring seats are welded to brake flanges.

The gear ratio of the rear axle is 5.42 to 1, adopted as best suited for power, economy, speed and hill-climbing.

Differential Is of the bevel pinion type, with two hardened pinions of ¾" face, 5-7 pitch, mounted on standard New Departure Radax Ball Bearings.

Brakes There are two separate sets of brakes, internal expanding and external contracting, acting on rear wheel brake drums. The service brake is operated by a foot pedal. The emergency by a hand brake lever. The brake lining is of Raybestos; each brake shoe is 12" in diameter and 2" wide. Both set of brake rods are provided with Adjustable Yoke Ends conveniently located to take up wear.

Torque Torque is taken through the springs instead of through a torque arm. This construction cushions the entire power plant.

Front Axle Drop-forged I-section, 1¾" high by 1¼" wide, made of open-hearth steel, heat-treated.

Steering knuckles and steering arms are drop-forged and heat-treated. They are amply large.

King bolts and tie-rod bolts are hardened and ground and securely fastened to prevent their turning anywhere except in the bushings provided as bearings for these bolts. The steering tie rod is back of axle where it is safe from accidental bending. Both ends of rods are adjustable to enable accurate lining up of front wheels. These ends are securely locked to prevent working loose.

Wheels Artillery type, standard dimensions, and have twelve hickory spokes, front and rear. Front wheel spokes are 1⅛" diameter while rear are 1-9/16" diameter. There is ample bearing surface on the felloe to prevent loosening.

Front wheels are equipped with Timken tapered roller bearings of extra large size, insuring safety against all rated loads and thrusts, and are fully adaptable for wear.

The hubs are of malleable iron, flanges are of pressed steel and of large diameter, giving a good hold on the wheels and giving them ample support.

Hub caps on front and rear wheels are of cast iron, very neat in appearance, and heavy enough so they are not easily damaged by collision.

Brake drums are steel stampings centered on hubs, and are driven by twelve ½" hub bolts. No bolts go through the spokes to weaken them.

Tires Front—31" x 4", Clincher Non-Skid Fabric. Rear—34" x 4½", Straight Side, Non-Skid Fabric.

Springs High carbon spring steel, cantilever front and half-elliptic rear, exceptionally long and wide, with the following dimensions:

Front Spring

Length, 21⅞", free length.
Width, 1¾" inches.
Depth at center, 1⅞".
Number of leaves, 10.

The leaves of Front Springs are of high carbon steel, triple heat-treated. The ends are secured by clips and bolts to box brackets on frame and to the front axle spring seat.

Rear Spring

Length, 43¼", free length.
Width, 2½".
Depth at center, 2¾".
Number of leaves, 10.

Each leaf is given a number of heat treatments which are carefully controlled and checked by a most accurate system of instruments, so that each leaf is in exactly the same condition. In hardening, the greatest possible care is taken to see that the steel is heated to an exact temperature before quenching to avoid the different leaves having varying hardness and internal structure. Rear Spring leaves are kept in position by a double nib punched in each leaf, which fits in the depression formed by punching the corresponding nibs in the leaf below. These nibs are punched while the leaf is hot, and no metal is removed. This construction eliminates holes in the leaves, or center bolts, which take out enough metal to seriously weaken a spring where the greatest strength is needed, as most springs break at this point.

Rebound clips are fitted near the ends to tie several leaves together. This relieves the top leaf of taking all the upward load when rebounds are severe. These rebound clips are so made and attached that they do not interfere with spring action in any way. A strong plate which fits the curve of the spring is put on top of the spring, and properly spaces the clips which fasten the springs to the axle. When the spring is completely assembled and lubricated, it is given an accurate test on a special testing machine to see that it checks

to our requirements of capacity at certain heights, and load capacity per inch of deflection. The spring eyes are made absolutely true and at right angles to the spring, and are provided with a funnel-shaped hole to allow an ample amount of lubricant to flow to spring bolt. The spring bolts are hardened and ground, grooved for the distribution of lubricant, and are so designed that they will not turn in the brackets. All spring and shackle bolts are fed with lubricant by elbow oil cups.

Steering Gear The steering gear is of the compound reduction spur and gear type, mounted on the motor front cross arm and secured by bolts. It is compact and has ample bearing surfaces. Steering column is of large diameter, enameled black. Spark and throttle rods are on the outside.

Steering wheel is of wood 16" in diameter.

Body The body is furnished as special equipment only.

Length: from inside of tail board to inside of head board, 97⅞".
Width: inside of boards, 46".
Height of top from frame to highest point of top, 56½".
Length of top over all, 140-5/16".
Top is supported on each side by two stanchions whose cross sections are 1¾" x 1⅝".
Top is removable by releasing stanchions at sill cross members.

Inside dimensions from top of floor to top of sides, 11¼". Mounted on side boards are flare boards having a width of 6" on the slope and overhanging the vertical sides of the body approximately 1¾". These are braced from the sill cross member to under side of boards.

Body equipped with head board substantially fastened in place as well as a tail board supported by 3 sets of hinges.

Windshield Windshield is mounted on the cowl in the conventional manner supported by brackets of sufficient size to hold same firmly in place.

The windshield is of the double ventilating type, both upper and lower sections being adjustable.

Weight Truck weight, front end — 990. Truck weight, rear end—1480. Total shipping weight of truck, 2470.

Wheelbase 120 inches.

Specifications
Chevrolet Model "G" Light Truck

Motor: Four-cylinder, valve-in-head type, 3-11/16" bore, 4" stroke.

Cylinders: Cast en-bloc with upper half of crank, case. Head detachable.

Valves: 1½", enclosed.

Connecting Rod Bearings: 1⅜" x 1⅜".

Crankshaft Bearings: Front, 1⅜" x 2-5/16"; Center, 1-21/32" x 1½"; Rear, 1¾" x 2-11/16".

Center Main Bearings: Die cast, bronze back.

Camshaft Bearings: Front, 1-5/16" x 2⅜"; Center, 1-9/32" x 2"; Rear, 1¼" x 1-7/16".

Oiling System: Splash, gear pump and individual oil pockets. Oil pressure gauge.

Caburetor: Zenith improved double jet.

Ignition: New improved Remy.

Clutch: Cone type with adjustable compensating springs.

Frame: 5" width rear 37"; front 28". Length back of driver's seat, 76". Height, 23½" loaded.

Transmission: Selective type, three speeds forward and reverse.

Cooling: Water pump.

Front Axle: Drop-forged I-beam. The steering knuckles and knuckle arms are ample in size, drop-forged and heat-treattd.

Rear Axle: Semi-floating, shafts of nickel steel, heat-treated.

Control: Hand throttle; foot accelerator.

Springs: Cantilever front, one-half elliptic rear. Front springs are 21⅞ inches long and 1¾ inches wide. The rear springs are 43¼ inches long and 2½ inches wide.

Tires: All pneumatic. Demountable type, non-skid, fabric. Front, 31" x 4"; Rear, 34" x 4½". Non-skid.

Wheels: Artillery type, standard dimensions, twelve hickory spokes each; front wheels equipped with Timken tapered roller bearings of extra large size.

Steering Gear: Spur and gear type. 15" steering wheel. Steering arm of drop-forged steel, heat-treated.

Gasoline Tank: Capacity 10 gallons, tank non-leakable. It is located under the driver's seat.

Wheelbase: 120".

Carrying Capacity: 1,500 pounds.

Body: Length of the body from inside of tail board to inside of head board is 97⅞". Width inside of boards, 46".

Equipment: Electric lights and starter, highest type two-unit system, double wiring used. Complete lamp equipment; side curtains; adjustable windshield; speedometer; electric horn; complete tool equipment, including pump and jack; demountable rims.

Chevrolet Features

Power The question of power is important and is usually discussed by the man buying his second car. He looks for power and pick up "ability." To him the pretty car that stalls on a hill or in traffic is useless.

Chevrolet power is sure. The valve-in-head type of power plant insure it. This construction means maximum power for the reason that the gasoline vapor explodes directly against the piston head. The gasoline vapor does not reach the explosive chamber in a round about way. This is the reason for Chevrolet superiority over the ordinary L-head or T-head type of motor.

It is also necessary for the salesman to keep in mind that the bore and stroke, number of cylinders, valve diameter, type of ignition, weight of reciprocating parts, lubrication and cooling systems, and the general accuracy of construction—all have something to do with the power.

Use the words "motor power" in the proper sense. Please remember that it is not what the motor actually develops that counts, but what reaches the rear wheels—where it is used.

Study the Chevrolet transmission system. You will see how the internally oiled clutch collar insures elimination of power waste. You will see the correct alignment of units in the accessible open power plant housing. You will see how the rear wheel hub arrangement leaves the axle shafts free of all load and ready for the strong thrust to turn the wheels.

It is easy to understand, also, that the number of bearings, and the thoroughness of lubrication play an important part in a smooth running chassis.

All units back of the power plant and straight through to, and including the rear axle, are really a part of the power developing system.

Durability The average buyer wants to know something about the life of his purchase, especially if his purchase involves considerable money.

When we are in the act of purchasing anything, and it does not make much difference what it is, one of the first thoughts that enters our mind is the question "Will the article endure—last—will it give satisfactory Service?"

How long will a Chevrolet last?

The use of high carbon special alloy steel heat-treated at every point that must stand wear, where unusual strength is necessary, or where the strain is severe, is sufficient evidence that long life is assured.

And this same care has been exercised in the selection of material for every part. In many cases, the material used in the lowest priced Chevrolet car is as good as can be found in any car regardless of price.

Not only has the necessary care been taken to insure mechanical durability, but equal attention has been given to body construction, upholstery, finish and all details. It is obvious that the purchaser does not expect the detail and finish or a thousand dollar car that he would be entitled to if he were paying twice the sum.

We use every precaution in the selection of material and we make sure of it after it is received by us. The inspection system is most thorough, and not a single item is passed on to the manufacturing department that does not come up to the required standard.

Convenience We are living in a convenient age. We look for it on all sides—we want convenience in everything and everywhere. Why? Convenience implies freedom from effort, and that seems essential these days.

We like to have things "handy" and simple about an automobile, and this is especially true if the owner makes his own adjustments and takes care of the car himself.

Probably as important as any single feature relating to convenience, is the detachable head of the Chevrolet Motor. This is true convenience. It means saving in labor when it is desired to examine the pistons or the interior; or to grind valves and removal of carbon.

The clutch and transmission assemblies have been mounted conveniently. This has been so accomplished as to make inspection and removal easy. These two units in other cars are sometimes difficult to examine and lubricate.

Beauty In a medium priced car like the Chevrolet, the question of looks is one of the things that salesmen have every reason to be proud of.

After all, pride of ownership plays an important part in the motive behind a purchase no matter what the price of the article may be. Each Chevrolet model is good looking. The good looks is there. You are able to see it. So is the prospect. This is true of model "Four Ninety" models. The "FB"—all types are splendid looking cars—all of them.

Streamline construction stands for good looks. The body lines of each model are composed of curves. Not an angle anywhere—only curves from the front to rear.

The shape of the radiator and hood are important. The symmetrical radiator, sloping to a broad base, is not only attractive but efficient, because it exposes more radiating surface than the square type. And the streamline form of the hood is just as useful, due to the scientific fact that this shape decreases air resistance.

Comfort Comfort is an important point, and one of the first items a woman prospect inquires about—that and appearance. These mean more to her than any other one thing—for these are the features she knows something of and is intimately familiar with; and the thoughtful salesman must never forget to mention these points to the woman interested in the purchase of a car.

Point out the provisions made in the Chevrolet car for comfort.

Show your prospect how the low running boards and the wide doors afford utmost ease of access.

Point out how the angles of cushions and backs enable the occupant to sit back in comfort and relaxation. Spring suspension and the type of spring used also have a bearing on the comfort of the passengers.

Easy Riding Ease in riding is looked for in the reliable automobile. This point is especially true with women prospects. They are very much interested in it, and it is important that you convince them that the Chevrolet possesses it.

Easy riding depends on the length of the car springs, the cushion springs, style of the upholstery, distribution of weight—all these items enter into easy riding.

In discussing this feature, show how the points have been effectively taken care of in the Chevrolet.

Above all, the design and type of the springs help, in a great measure, to secure this desirable feature.

In the Chevrolet the size of the car lends itself to poise and balance—the size of the tires help to increase the resiliency and gripping power.

In discussing the body, point out the location of the seats, the low center of gravity of the car. These, too, are important and have a bearing on easy riding. See to it that the prospect appreciates the improved type of steering gear, the location and type of control mechanism.

Safety The safety of a car depends on the sturdiness of the units employed in its construction. It means the use of sturdy wheels. It means using a steering gear that can be depended upon at all times, made of a metal having great strength—this is true of

all parts having to do with the safety of the car.

Secondly, the safety of the car depends on its ability to start and stop instantly.

The Chevrolet will start at once—a good electrical system guarantees that. We use a system we are sure of—that we know we can depend upon. With the thousands of cars we turn out each week we would hear of any trouble that developed in no time. A Chevrolet will stop instantly. Ample braking surface on each model places the machine under complete control of the driver.

Owing to the many accidents that occur, there are a number of prospects who are nervous about operating a car. To this class you should play up in every way you can the dependability of the car in these respects. High carbon special alloy steel in parts like the following: steering knuckles; propeller and transmission shafts; crank shaft; and camshaft—these insure as much safety as man has been able to provide.

Easy to Take Care of There are two points that stand out prominently under this heading. Ease in caring for a car depends on the method of construction, and the attention given a car in use. It is plain enough to see that if a car is neglected, it is going to be difficult to take care of when the owner does give it attention.

It will be easy to prove to your prospect, that owing to the simplicity of design, a Chevrolet is easy to take care of.

Detachable cylinder heads allow easy access for inspection purposes and removing carbon.

The car simply constructed is efficient, and insures uniform, consistent service. For this same reason, the car is not a burden in the matter of attention required. It is not meant to have you infer to a prospect that a Chevrolet will run on and on without attention, but that if given the care any piece of machinery requires, or with the same thought and attention given the horse, it will give in return steady service.

Cost of Maintenance Cost of maintenance, as a rule, is the all-important subject to the prospective motor car owner. And each Chevrolet salesman is able to prove to the prospect that each model is not a burden in expense. Here is the first important point to win. An automobile, to make the most of its power, requires the least burdensome weight of body and chassis. Each Chevrolet is of the right weight in proportion to its horsepower.

Material Specifications of Important Units

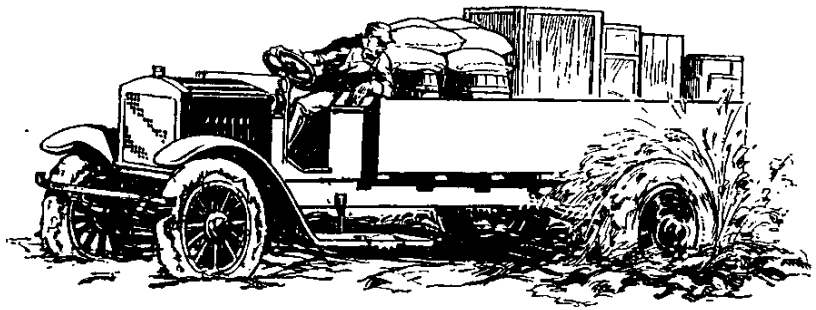
Frame—Pressed Steel	"490"	"FB"		"G"
"T" use Rolled Steel				
Springs—High Carbon Steel, heat-treated	"490"	"FB"	"T"	"G"
Front Axle I Beam—Drop Forged Carbon Steel	"490"	"FB"	"T"	"G"
Steering Knuckle—Drop Forged Chromium Nickle Steel	"490"	"FB"	"T"	"G"
"FB" use New Departure Ball Bearings on steering knuckles				
"Four-Ninety," "G" and "T" use Timken Roller Bearings on steering knuckles				
Bevel Ring Gear—Drop Forged high carbon alloy steel	"490"	"FB"	"T"	
Pinion Gear—Drop Forged high carbon alloy steel	"490"	"FB"		"G"
Pinion and Ring Gear—Mounted on New Departure Ball Bearings	"490"	"FB"		"G"
Worm Gear—Drop Forged high carbon Steel			"T"	
Worm Gear—Mounted on single and double row New Departure Ball Bearings			"T"	
Main Axle Shaft—Cold Drawn Alloy Steel	"490"	"FB"	"T"	"G"
Hub and Axle Shaft Bearings—Hyatt Roller Bearings	"490"	"FB"		
Hub and Axle Shaft Bearings—New Departure Roller Bearings			"T"	"G"
Brake Lining—Raybestos	"490"	"FB"	"T"	"G"
Crankshaft—Drop Forged high carbon Alloy Steel	"490"	"FB"	"T"	"G"
Connecting Rod—Drop Forged carbon Alloy Steel	"490"	"FB"	"T"	"G"
Fly Wheel—Gray Cast Iron	"490"	"FB"	"T"	"G"
Cam Shaft—Drop Forged carbon Alloy Steel	"490"	"FB"	"T"	"G"
Piston—Cast Iron	"490"			"G"
Die Cast Lynite		"FB"	"T"	
Valve—Cast Iron Head with cold rolled Steel Stem	"490"	"FB"	"T"	"G"
Clutch—Cone. leather faced	"490"	"FB"	"T"	"G"
Transmission—Main Drive Gear Drop Forged Alloy Steel	"490"	"FB"	"T"	"G"
Transmission—Sliding Gear Drop Forged Alloy Steel	"490"	"FB"	"T"	"G"
Transmission—Spline Shaft Drop Forged Alloy Steel	"490"	"FB"	"T"	"G"
Spline Shaft and Main Drive Gear mounted on New Departure Single Row Ball Bearings	"490"	"FB"	"T"	"G"
Clutch Collar—Phosphor Bronze	"490"			"G"
Malleable Iron (fibre insert)		"FB"	"T"	

WEIGHTS	Road	Shipping	Passenger	Total	Horse Power	
Model, Passenger and total.	Weight	Weight	Weight	Weight	A.L.A.M.	Brake
"Four-Ninety" Touring Car	1900	1740	775	2675	21.7	25
"Four-Ninety" Roadster	1820	1660	310	2130	21.7	25
"Four-Ninety" Sedan	2160	1997	775	2935	21.7	25
"Four-Ninety" Coupe	2040	1880	310	2350	21.7	25
"Four-Ninety" Light Delivery	1980	1855	1000 Load	2980	21.7	25
"FB-32" Touring	2745	2504	775	3520	21.7	35
"FB-12" Roadster	2640	2401	310	2950	21.7	35
"FB-42" Sedan	2947	2708	775	3722	21.7	35
"FB-22" Coupe	2818	2579	465	3273	21.7	35
"T" with express body and top	3420	3300	2000 Load	5420	21.7	35
"T" Chassis	2840	2720	2000 Load	4840	21.7	35
"G-62" Chassis and Cab	2167	2020	1500 Load	3667	21.7	25
"G-82" with Express body and top	2617	2470	1500 Load	3667	21.7	25
"G-2" Chassis only	2000	1920	1500 Load	3500	21.7	25

CHEVROLET PASSENGER CAR COMPARISON

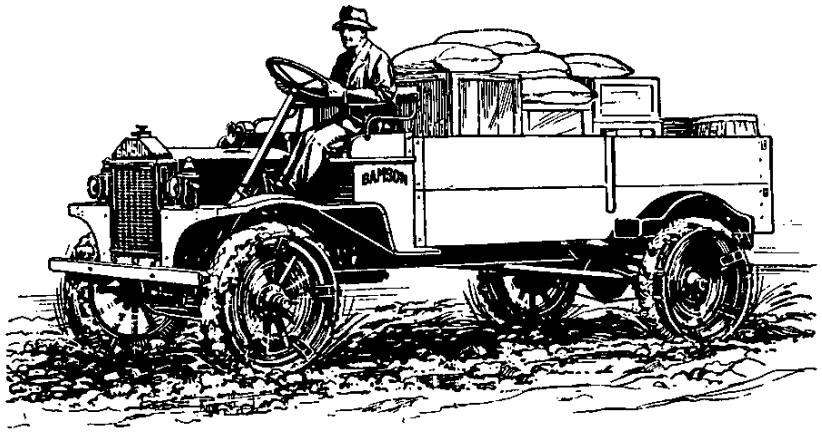
1920 vs 1941

Model Year	1920	1941
Model	"490"	"BH" Fleetmaster
Type	Sedan	Sport Sedan
Capacity	5-pass.	6-pass.
Wheelbase	102"	116"
Shipping Weight	2160 lb.	3125 lb.
Curb Weight	2255 lb.	3250 lb.
Number of cylinders	4	6
Bore x stroke	3-11/16" x 4"	3-1/2" x 3-3/4"
Piston displacement	170.8 cu.in.	216.5 cu.in.
Rated horsepower (SAE)	21.7	29.4
Max. gross horsepower	24.5 @ 1800 rpm	90 @ 3300 rpm
Fuel consumption (min.)	.7 lb./BHP-hr. @ 1200 rpm	.55 lb./BHP-hr. @ 1200 rpm
Max. car speed (Approx.)	45 MPH	83 MPH
Tires	31 x 4	6.00-16
List price	$1245	$810
Chev. U.S. pass. car prod.	125,767	939,513
Total (all makes) U.S. pass. car production	1,905,560	3,744,300



In the soft ground up to the hubs—a terrific strain on the engine and on every part

The ordinary truck with full load in soft ground



It cannot sink in soft ground. The Extension Bases hold it up

The Samson equipped with Extension Bases —see it float

Announcing

The New Line of

SAMSON TRUCKS

Combining new ideas of great utility and economy in two models of motor trucks for city, town and country use—and at prices within the reach of everybody.

SAMSON Trucks in ¾-ton capacity at $655.00 and 1¼-ton capacity at $1095.00 are new, different and outstanding. They fill the long-felt, urgent need of thoroughly dependable trucks at right prices for hauling and delivering every kind of commodity in city, town and country.

The superior points and special features of these two trucks put them in a class by themselves—entirely apart from every other truck on the market. The special features are worthy of the most rigid and closest investigation from truck buyers of every class.

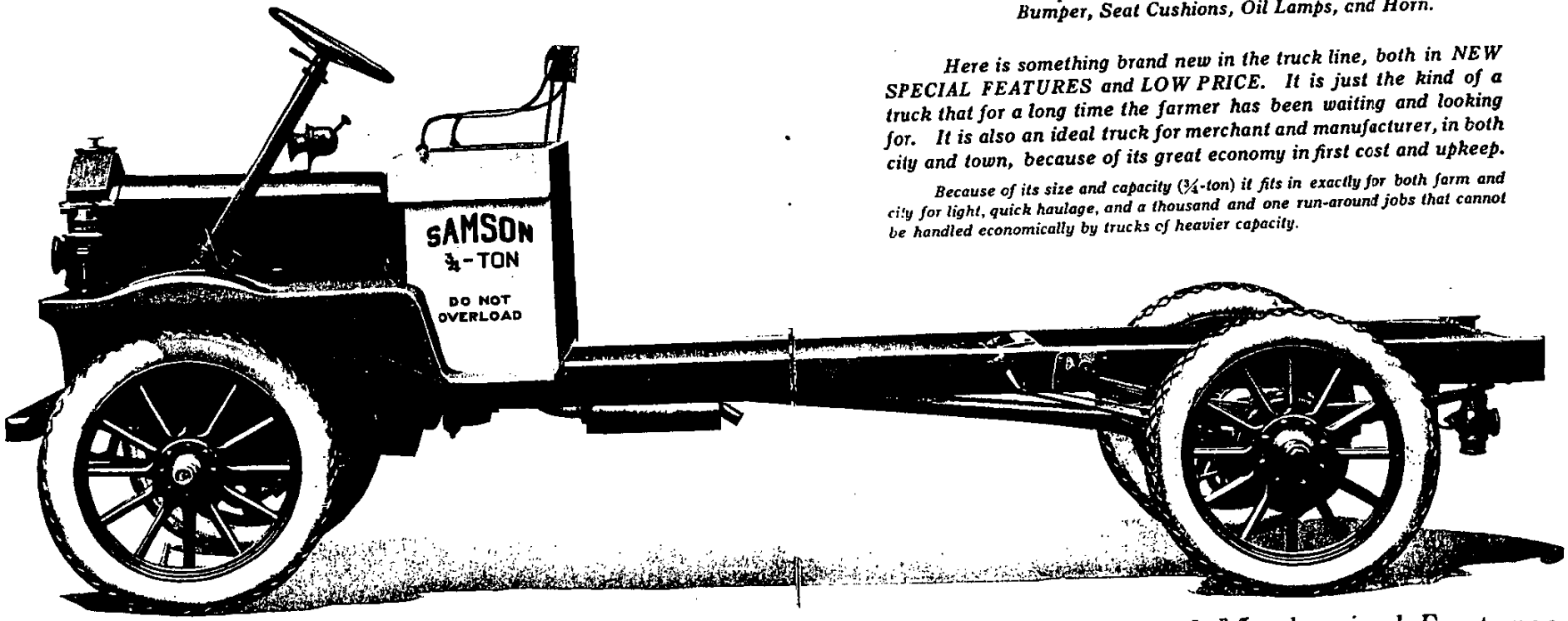
The new Samson Trucks have the very rare combination of wide utility and great economy in first cost and upkeep, due to the fact that they are the result of ripened experience in invention, designing, engineering, and manufacturing. Our astonishing low prices are simply the result of tremendous quantity production of correct models.

Before you buy any truck from anybody at any price, read the full details and particulars of the special features of these trucks on the following pages.

Samson Tractor Company
DIVISION OF GENERAL MOTORS CORPORATION
Janesville, Wisconsin, U. S. A.

The Samson ¾-Ton Truck Chassis $655

Complete with Front Fenders and Platform, Bumper, Seat Cushions, Oil Lamps, and Horn.



Here is something brand new in the truck line, both in NEW SPECIAL FEATURES and LOW PRICE. It is just the kind of a truck that for a long time the farmer has been waiting and looking for. It is also an ideal truck for merchant and manufacturer, in both city and town, because of its great economy in first cost and upkeep.

Because of its size and capacity (¾-ton) it fits in exactly for both farm and city for light, quick haulage, and a thousand and one run-around jobs that cannot be handled economically by trucks of heavier capacity.

Extension Bases—Wonderful New Invention

Some of the greatest inventions of modern times are the simplest. Everybody who sees the new extension bases for front or rear wheels of the Samson Trucks invariably says, "Why didn't somebody think of that before?"

This new device puts the Samson Trucks absolutely in a class by themselves, because they enable the owner to drive where it would be impossible to go with any other truck, through mud, snow, deep sand, plowed ground, cultivated fields, soft stubble and pasture.

Everybody who drives a truck or automobile knows what it means to go down to the axle, hub-deep in mud, snow, or soft ground and have to be pulled out by a team or another automobile, costing valuable time and money—making the truck a dead investment for many months in the year, requiring horses part of the time when the truck is needed most.

This new invention makes the Samson a continuous day-in-and-day-out truck. With these new extension bases, rear wheels carrying demountable cleat bands (equipped with grouters) sure traction is provided at all times for every difficult road and field job. The cleat bands can be applied or removed almost instantly without jacking up the wheels or removing the load.

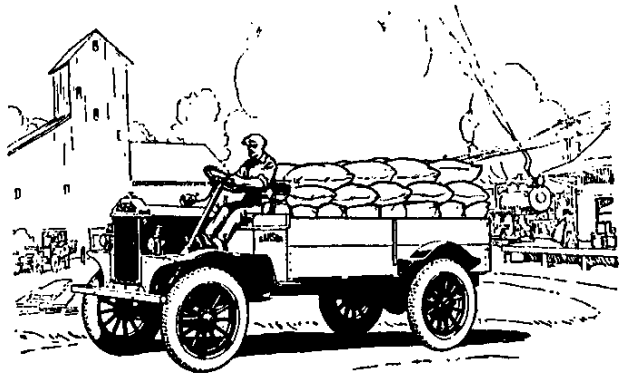
Specifications and Mechanical Features

Wheelbase	118 inches.
Motor	4 cylinder cast en bloc—171 cubic inch displacement. Three-point suspension.
Ignition	High-tension magneto, (set spark).
Cooling	Tubular type radiator, belt-driven centrifugal water pump.
Oiling	Gear pump, combination force feed and splash system; oil pressure gauge on dash.
Front Axle	Drop forged I-beam with integral yokes.
Steering Gear	Screw and nut type—adjustable.
Transmission	Three speeds forward, one reverse.
Clutch	Single plate, dry disc.
Rear Axle	Spiral bevel gear, heavy t design.
Springs	Half-elliptic, front and rear.
Brakes	Emergency, internal expan type; service, external tracting. Foot control.
Tires	Pneumatic, front and rear.
	Extension bases with re demountable cleat b $75.00 extra.
	Extension bases with s demountable cleat band sand, $80.00 extra.
Body Styles	See models and prices on f ing pages.
	(All prices f. o. b. Jane Wisconsin, and subjec change without notice.)

Samson Trucks For Every Farm Use

Farmers can cut hauling and delivery costs right in two with Samson Trucks. According to statistics compiled by the United States Department of Agriculture, it costs an average of twice as much to haul by wagon as it does by motor truck.

On account of its adaptability to the unusual and different conditions of f hauling on muddy roads and in soft fields, there is no other truck like the Sam

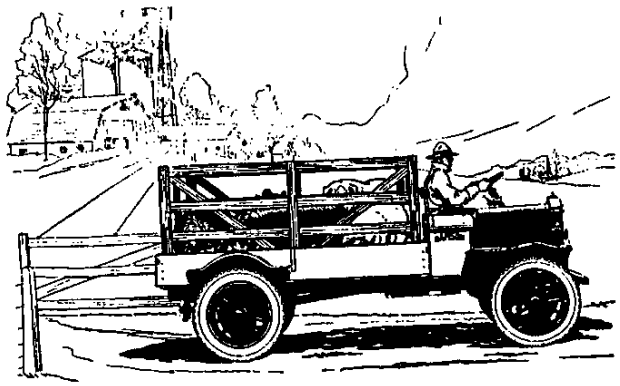


Hauling Grain

On account of the fact that you can haul three loads of grain to town with the Samson in the same time it takes to haul only one load by wagon, valuable time is saved. In comparing hauling costs per ton-mile of motor trucks and wagons from the reliable information compiled by the Department of Agriculture, it costs 15 cents per ton to haul corn to town by trucks and 33 cents by wagons; wheat, by truck, 15 cents, by wagon, 30 cents; cotton, by truck, 18 cents, by wagon, 48 cents.

Hauling Produce

With the Samson Truck and its extension bases — a great invention — you can drive right out into the soft fields, gardens and orchards, for watermelons, cantaloupes, pumpkins, squash, sweet corn, tomatoes, potatoes, root crops, fruit, etc. And when you drive out on to the hard road you haul the entire load of perishable and breakable produce on pneumatic tires, without a change as the pneumatic tires lift the extension bases right off the road.



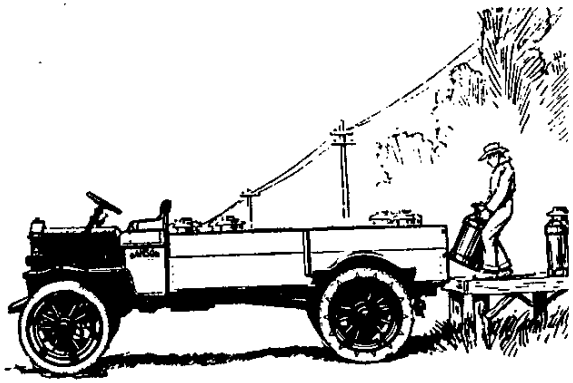
Hauling Live Stock

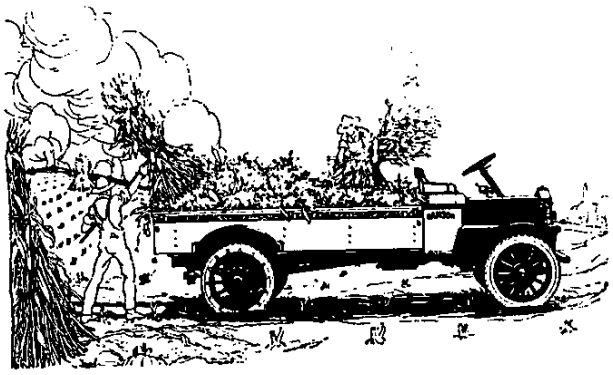
When the market is right and you wish quickly to move your fat hogs, sheep, baby beef, veal or poultry, regardless of roads, the Samson Truck, equipped with hog rack will give you quick service. It will pay big dividends through avoiding shrinkage. It will enable you to reach early markets.

In hot weather you will not suffer fat hog death losses from heat on account of the slow, long trips to markets by wagon. The quick movement of the truck fans the hogs and keeps them cool.

For the Dairy

This, the toughest, day-in and day-out, all year 'round, wagon job, can be easily handled with Samson Trucks. Many farmers consume the best part of the day, the forenoon, hauling milk and cream to the creamery by wagon on account of the loss of time because of bad roads. The Samson Truck is master of this situation because of its extension bases and demountable cleat bands (a new invention) which provides traction in snow, sand or mud.





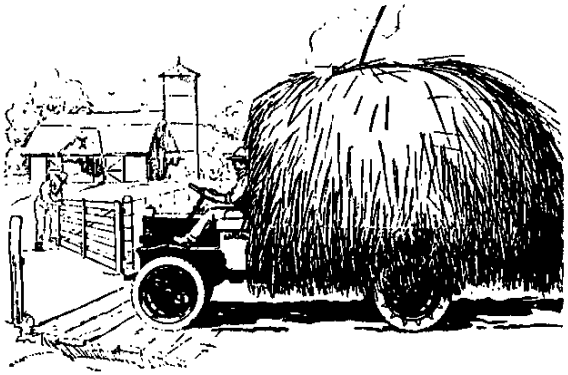
In the Field

Without the patented extension bases of the Samson Truck, jobs in the field could not be done, as the ordinary tires would mire down.

The Samson can be used for hauling corn to fill silos, hauling grain bundles to the threshing machine, snapping or shucking corn, hauling in fodder, etc.

Hauling Hay

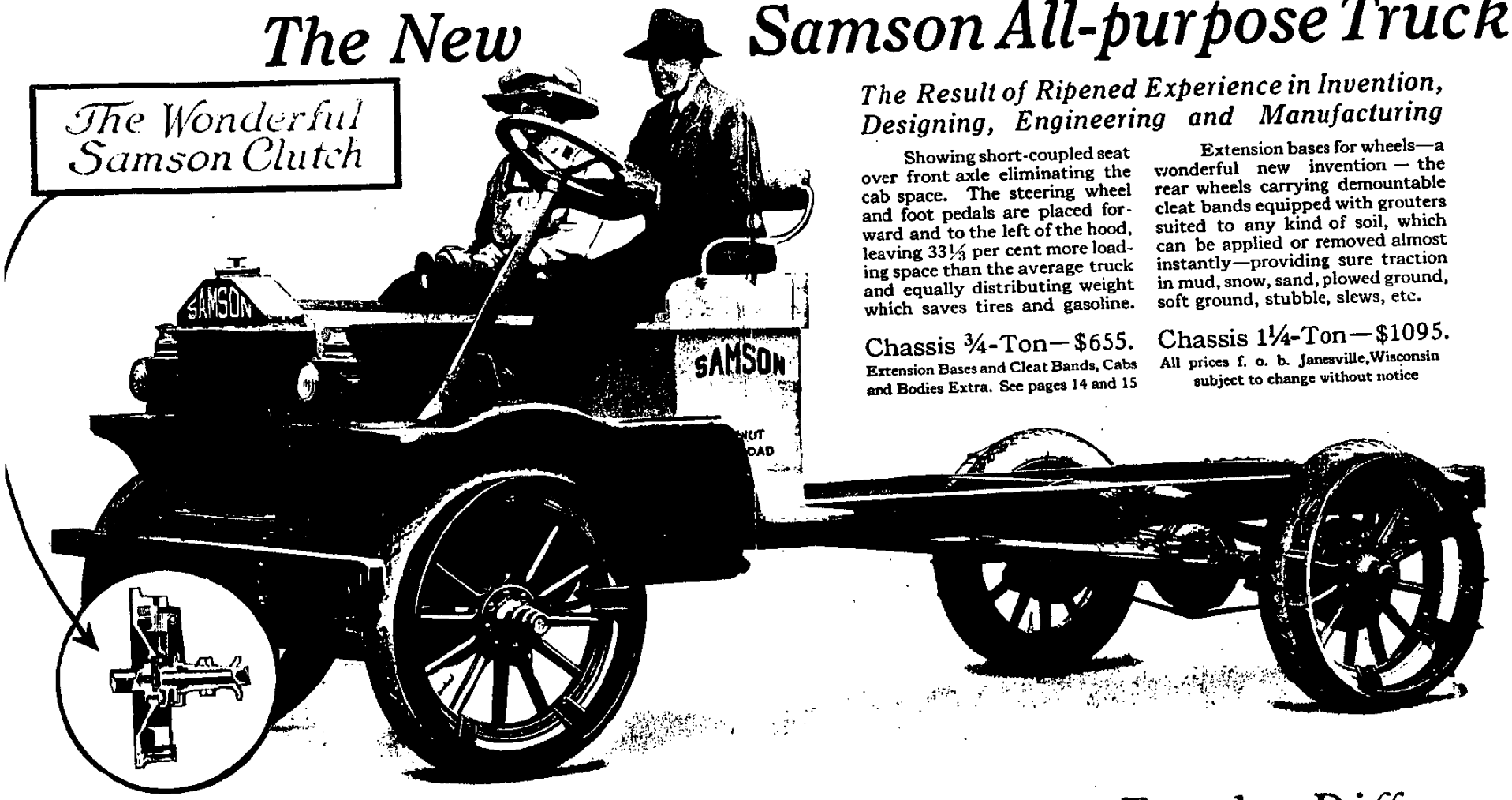
The Samson can be equipped with hay-rack body for hauling hay, straw or forage of all kinds, either in the slew or on the hard road, saving lots of valuable time and doing this work at lower cost than can be done by any other method. The Samson Truck will pay big dividends on any farm.



The New Samson All-purpose Truck

The Result of Ripened Experience in Invention, Designing, Engineering and Manufacturing

The Wonderful Samson Clutch



Showing short-coupled seat over front axle eliminating the cab space. The steering wheel and foot pedals are placed forward and to the left of the hood, leaving 33⅓ per cent more loading space than the average truck and equally distributing weight which saves tires and gasoline.

Extension bases for wheels—a wonderful new invention — the rear wheels carrying demountable cleat bands equipped with grouters suited to any kind of soil, which can be applied or removed almost instantly—providing sure traction in mud, snow, sand, plowed ground, soft ground, stubble, slews, etc.

Chassis ¾-Ton—$655.

Chassis 1¼-Ton—$1095.

Extension Bases and Cleat Bands, Cabs and Bodies Extra. See pages 14 and 15

All prices f. o. b. Janesville, Wisconsin subject to change without notice

Here are the Features that Make Samson Trucks Differen

Close Coupled Seat

Here is one of the most radical improvements ever made in motor truck construction. By placing the driver's seat well forward and locating the steering wheel post and foot pedals at the left-hand side of the engine, the cab space is eliminated. This adds about 33⅓ per cent more loading space attainable between front and rear wheel.

Extension Bases for Wheels

The farmer-owner of a motor truck often needs to drive right out into the field and load crops, or spread straw, fertilizer, or manure. Ordinary tires would quickly mire. The new Samson wheel extension bases give a surface resistance that assures sure traction in plowed or soft fields, stubble, or in mud, snow or sand, under the most adverse conditions.

The Samson Clutch

The new Samson clutch will start the truck under a full load on any gear, smoothly and without a quiver; relieving shafts, bearings, universal joints, and gear teeth from any undue strains. Starting, stopping, and gear shifting made easier. Samson clutch has twelve steel springs held in position against the flywheel by steel pressed spacer. Pressure is distributed evenly keeping plate and discs in alignment and tightly together at all points.

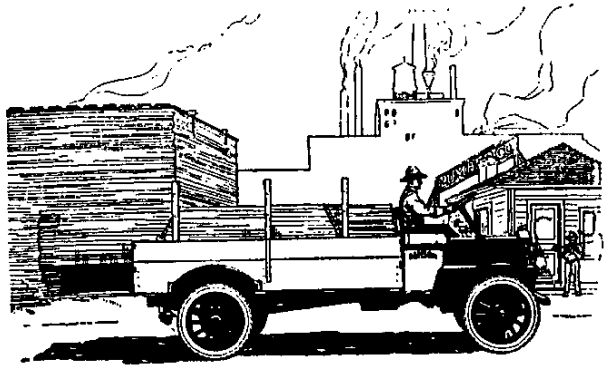
Weight Evenly Distribut

Correct distribution of weight is an important factor in designing a motor truck. The weight must be evenly distributed—not putting too great a burden on either front or rear wheels. The even distribution of weight in the new Samson Trucks assures tire economy and fuel economy. Extra-size tires not required.

Samson Trucks for All City Deliveries

The new Samson Trucks will save big money for the grocer, butcher, hardware man, implement dealer, florist, ice man, and every other line of retail business, because they will not eat up all the profits in first cost and upkeep.

Samson Trucks are economical on gasoline and tires, and will do the delivery wo quickly and economically every day in the year regardless of weather or roads. Sams equipment of extension bases and bands make them ideal for suburban deliveri

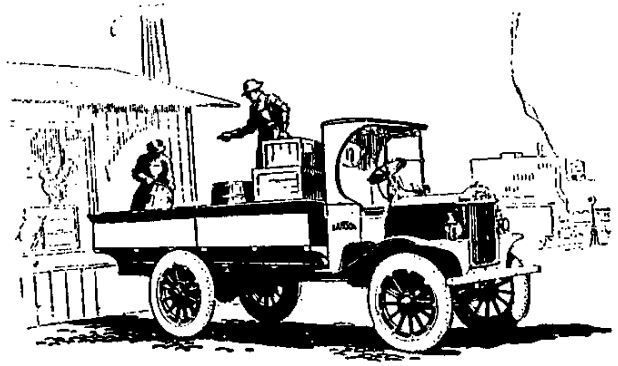


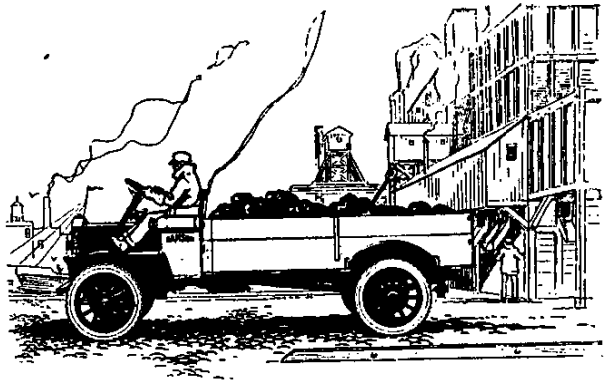
Lumber Deliveries

Every lumber yard and planing mill has dozens of small daily deliveries to make. Why use a heavy cumbersome 2 to 4-ton truck to do this work when either of the Samson models will fit in according to the amount of delivering you have to do? This also applies to flour mills, feed stores, and commission merchants. With the Samson you can cut your delivery costs.

Freight Haulage

If it were not for motor trucks, the railroads of the country would be unable to handle the short-haul freight. With the good roads we are getting in every locality, the coming permanent way for the wholesalers and jobbers of every kind is to haul by truck, because it saves high freight charges, practically two hauls besides the aggravating railroad delays.



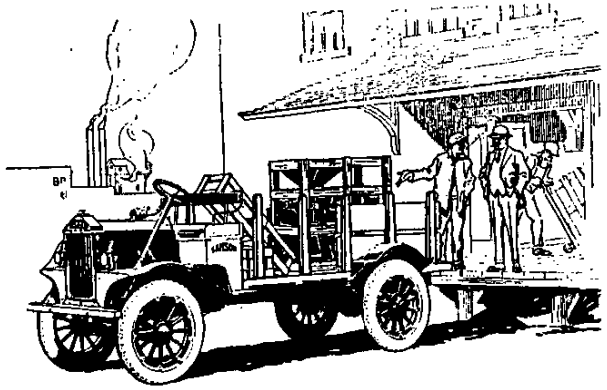


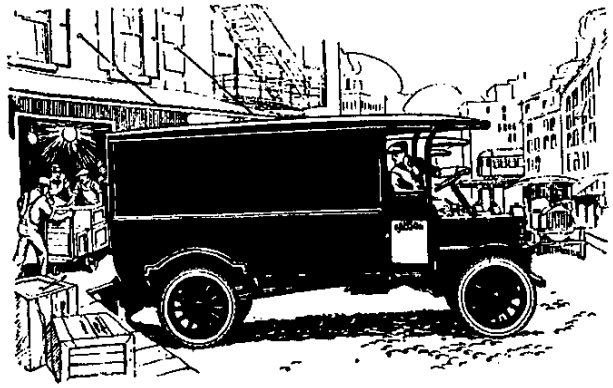
Coal Deliveries

The big 5-ton truck has its place, but on small short orders of coal and wood, gasoline and kerosene oil, the Samson are just the trucks. They are also admirably suited to take the place of water sprinkling wagons in cities.

For the Factory

All the large and small factories of the country have dozens and dozens of hurry-up jobs to and from station, express and post office. The Samson Trucks fill these needs to a nicety, saving dray bills and heavy feed bills.



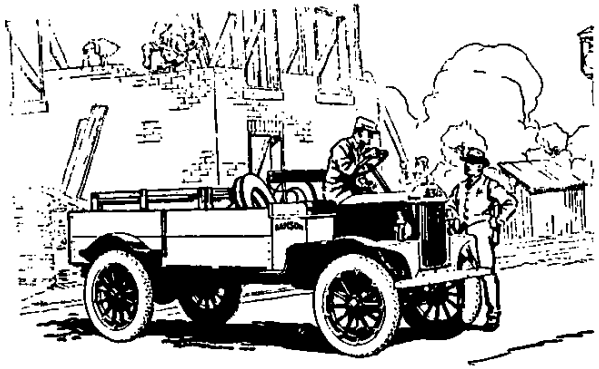


Department Stores

Nothing can approach the utility and economy of a new Samson Truck when employed in the class of delivery service demanded by the average modern department store. Speedy, dependable service at minimum upkeep expense is assured. Samson Trucks in fleets will improve the department stores delivery service at a very economical cost.

For the Plumber

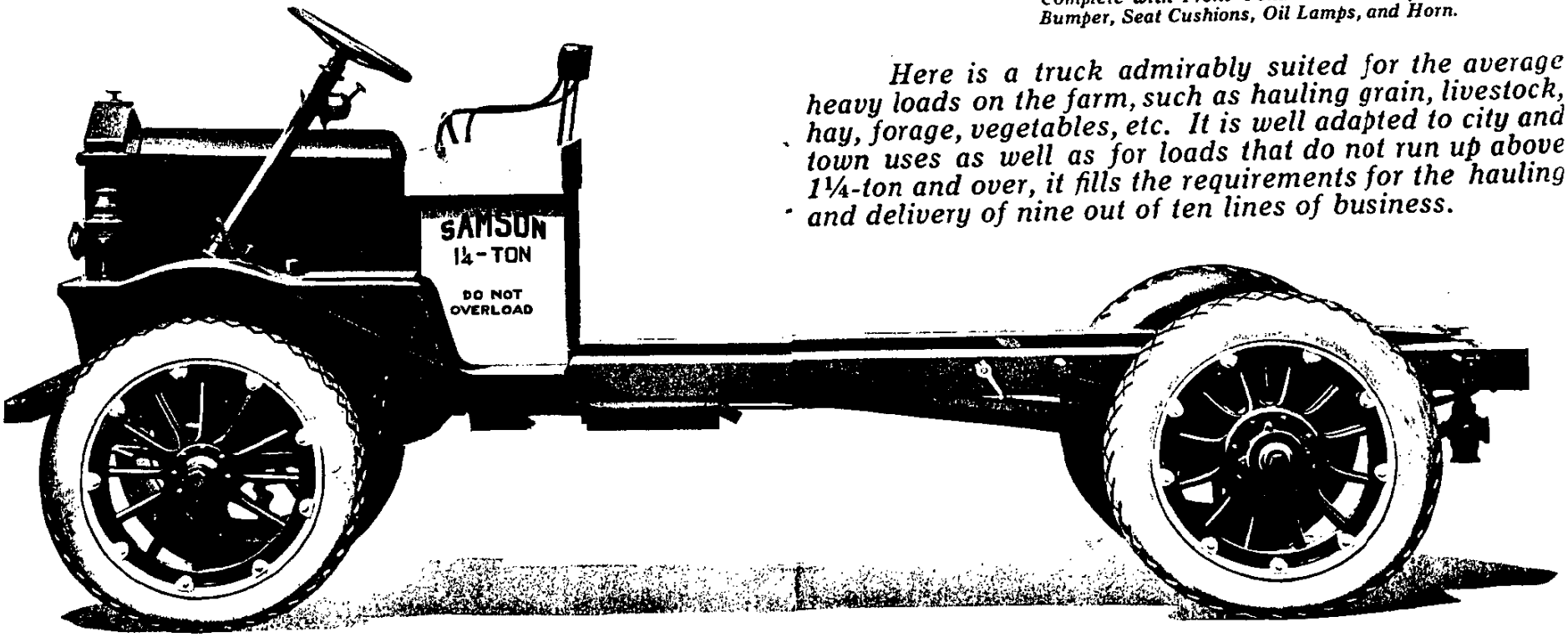
A plumber's call — like a doctor's—is usually a hurry-up call. The Samson Truck will put new tools and stuff on the job in a jiffy. The time saved, the convenience of getting from job to job, the small first cost combined with the extremely low maintenance cost of the new Samson Truck is worthy of consideration.



The Samson 1¼-Ton Truck Chassis $1095

Complete with Front Fenders and Platform, Bumper, Seat Cushions, Oil Lamps, and Horn.

Here is a truck admirably suited for the average heavy loads on the farm, such as hauling grain, livestock, hay, forage, vegetables, etc. It is well adapted to city and town uses as well as for loads that do not run up above 1¼-ton and over, it fills the requirements for the hauling and delivery of nine out of ten lines of business.



Distinctive Samson Truck Features

This truck is also equipped, if desired, with our new patented extension bases for wheels, carrying demountable cleat bands on rear wheels (equipped with grouters) which can be applied or removed almost instantly, providing sure traction on muddy roads, in snow and sand, plowed ground, soft ground, pastures, stubbles, or slews—making it possible for the owner of the Samson Truck to use it at the time of the year he needs it most, both in the field and on the road, in places and at times when he would not dare venture out with the ordinary truck of this size and capacity, because it would mire down.

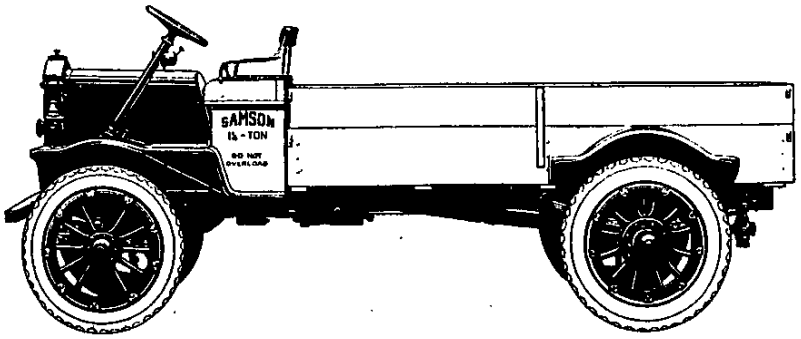
This truck is extra-well suited, when equipped with special body, for all kinds of field work in the spring when the ground is soft and you want to haul in hay, straw, cornstalks, wood, etc.

This 1¼-ton truck, the same as the ¾-ton, is so designed that by placing the seat forward alongside the hood, it gives 33⅓ percent more body space for the load, besides distributing the load evenly between the two axles, which is a great saving on both tires and gasoline.

Both sizes of Samson Trucks are also provided with the famous Samson single-plate dry-disc clutch fully described on pages 8 and 9, which feature alone is worth hundreds of dollars, when you stop to consider what it saves you in repairs by the elimination of sudden strain on motor transmission and rear axle common on ordinary trucks.

Specifications and Mechanical Features

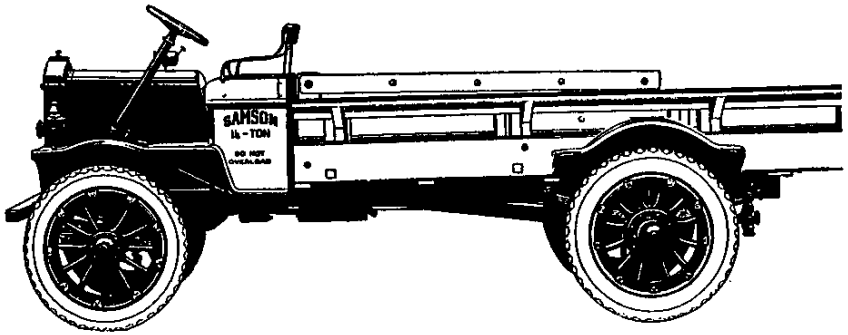
Wheelbase	118 inches
Motor	4 cylinder, cast en bloc—224.3 cubic inch displacement. Three-point suspension.
Ignition	High-tension magneto, (set spark).
Cooling	Tubular type radiator, belt-driven centrifugal water pump.
Oiling	Gear pump, combination force feed and splash system; oil pressure gauge on dash.
Front Axle	Drop forged I-beam with integral yokes.
Steering Gear	Screw and nut type.
Transmission	Three speeds forward, one reverse.
Clutch	Single plate, dry disc.
Rear Axle	Spiral bevel gear, heavy tooth design.
Springs	Half-elliptic, front and rear.
Brakes	Emergency, internal expan type; servic, external tracting. Foot control.
Frame	Extra deep, pressed steel, cha section.
Tires	Pneumatic, front and rear.
	Extension bases with reg demountable cleat ba $85.00 extra.
	Extension bases with sp demountable cleat bands sand, $100.00 extra.
Body Styles	See models and prices on fol ing pages.
	(All prices f. o. b. Janes Wisconsin, and subject change without notice.)



Samson Bodies for the Farm

The double-box body illustrated above is the type for general farm use. It is suited for the many jobs around the farm, such as hauling loose and sacked grain, fruit, produce, wood, etc. The upper panels of the double-box sides are removable, making a single-box body for hauling milk cans, carrying hog or stock rack, implements, etc. The close-coupled seat gives one-third more loading space.

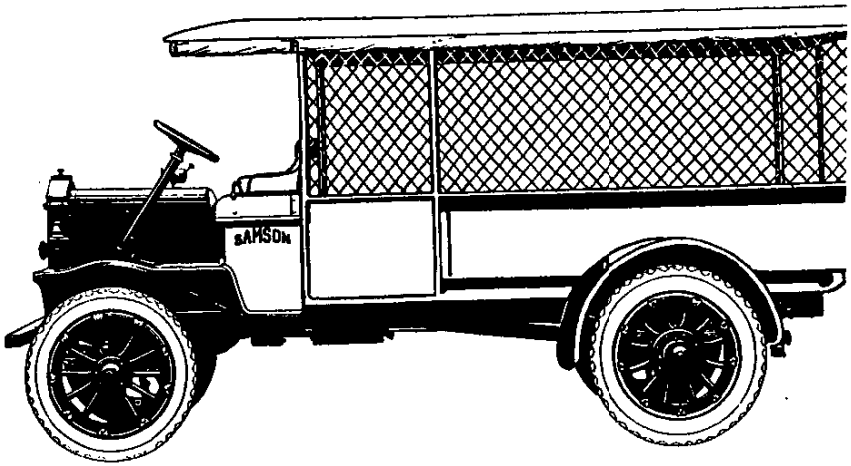
Chassis—¾-ton	$ 655.00
Chassis—1¼-ton	1095.00
Double-box body and fenders for ¾-ton chassis	45.00
Double-box body and fenders for 1¼-ton chassis	75.00
Extension bases and cleat bands	$75 and $85
Drivers Cabs for both the ¾ and 1¼-ton chassis, with special seats, including sheet metal detachable front at radiator, with sides extending back to Cab, (entirely enclosing platform) windshield and curtains	$100.00



The Samson hay rack body is specially built for hauling hay, straw, or forage of all kinds. With the third more loading space due to close-coupled seat and extension of space at the rear this body provides much more loading space than average hay rack.

Chassis—1¼-ton	$1095.00
Hay rack body with ladder and fenders	40.00
Extension bases and cleat bands	85.00

All prices F. O. B. Janesville and subject to change without notice.

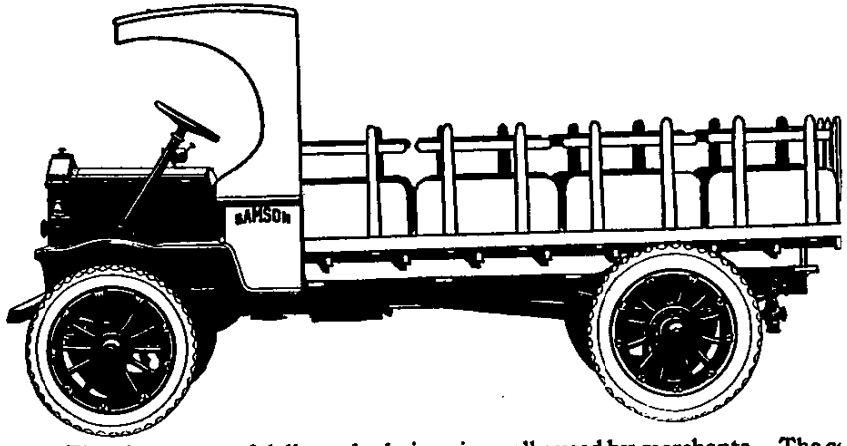


Special Bodies for City Use

The express body meets the requirements for all express deliveries. It can equipped with full canopy top, completely enclosed with wire screens and adju able storm curtains. This express body on either Samson chassis provides ex loading space because of close-coupling of driver's seat.

Chassis—¾-ton	$ 655.00
Chassis—1¼-ton	1095.00

For express body see Samson Dealer.



The above type of delivery body is universally used by merchants. The c pactness of the Samson driver's section and simplicity of control afford the m mum loading space, while the distinctive lines of the hood enhance the bo natural beauty.

Chassis—¾-ton	$ 655.00
Chassis—1¼-ton	1095.00

For delivery body see Samson Dealer.

All prices F. O. B. Janesville and subject to change without notice.

Samson Trucks with Samson Wheel Equipment are Masters of All Roads at All Seasons

Chevrolet One-Ton Worm-Drive Truck

THE Chevrolet one-ton worm-drive truck is a thorough Chevrolet product.

Thoroughness in the best manufacturing sense.

Thoroughness in design; thoroughness in selection of material; thoroughness in the building.

The Chevrolet truck meets all Chevrolet standards of construction. To build a truck is a public responsibility. The Chevrolet Motor Company appreciates that responsibility.

A truck to do the work required of it, must be built with a complete understanding of what a commercial vehicle is called upon to do.

The dependable truck must be correct in design, and be simple in construction. It must be sturdily built, of durable material to withstand its loaded capacity and be able to absorb the daily shocks and strains it must endure.

Correct weight is essential to economical operation. Undue weight is an extra burden, for it costs extra money to carry the extra weight. Proper lubrication and ample bearings are important for they reduce friction to the minimum. These two features help to reduce the maintenance cost.

All these points are mentioned here for the purpose of illustrating the fact that they were all taken into consideration in building the Chevrolet one-ton truck.

The Chevrolet truck is equipped with a valve-in-head motor. This means responsive, direct power. No waste whatever. The gasoline vapor is introduced directly to the combustion chamber where the explosion takes place.

This commercial car solves the delivery problems of many lines of business. It will carry two thousand pounds of merchandise economically. It will do this day in and day out. It was designed for that purpose. The material used was meant for that load—all of it. It is a truck complete in every detail—worthy of its name.

MECHANICAL DETAILS

Motor: Four-cylinder, valve-in-head type, 3 11-16″ bore 5 1-4″ stroke.

The front of the motor is hung into shackles which are securely bolted to the motor arms and to two substantial brackets which are hot riveted to the truck frame. This construction absolutely relieves the power plant from all strain due to road variations, and the strain of starting with a heavy load.

Cylinders: Cast en-bloc with upper half of crank case. Head detachable.

Valves: 1 1-2″ enclosed.

Connecting Rod Bearings: 2 1-8″ x 1 1-2″; Doehler bronze back.

Crankshaft Bearings: Front, 2 11-16″ x 1 1-2″; Center, 2″ x 1 31-32″; Rear, 3″ x 2″.

Center Main Bearings: Doehler bronze back.

Cam Shaft Bearings: Front, 2 1-4″ x 1 9-16″; Center, 2″ x 1 1-2″; Rear 2″ x 1 15-32″.

Oiling: Pressure and splash system. Gear driven oil pump.

Carburetor: Zenith improved double jet.

Ignition: New improved Remy System.

Governor: Governor is provided and set for 25 miles maximum. It is sealed.

Clutch: Cone, leather-faced, with adjustable compensating springs.

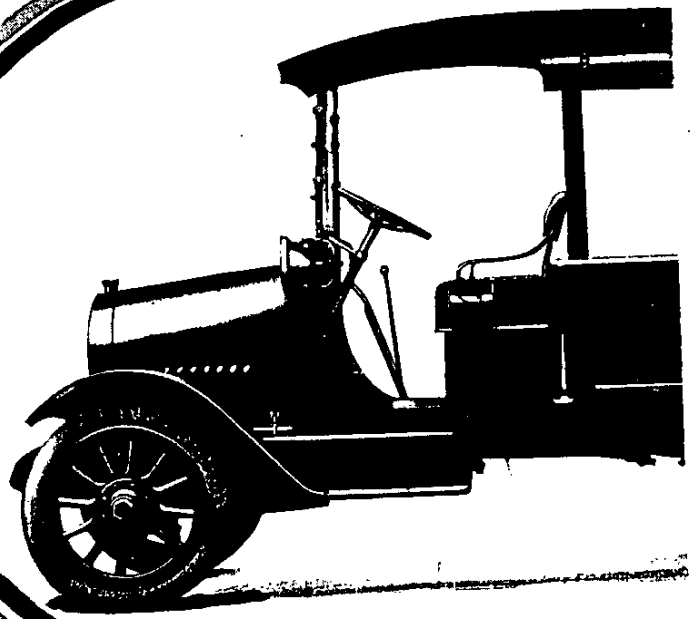
Frame: 4-inch; width, rear 35 1-8 inches; front, 30 1-2 inches. Length back of driver's seat, 109 inches. Height, 23 1-2 inches loaded.

Transmission: Selective type; three speeds forward and reverse.

Cooling: Water pump.

Radiator: The radiator is of vertical type, honey comb. The core has a heavy steel strap running all the way around, to which two heavy "V" shaped slotted steel springs are securely riveted. These springs rest on two steel washers and are bolted to the front cross member of the truck frame, making the radiator adjustable. The springs absorb vibration and shock due to varying conditions. The entire cooling system can be drained of all the water by opening the conveniently located drain cock.

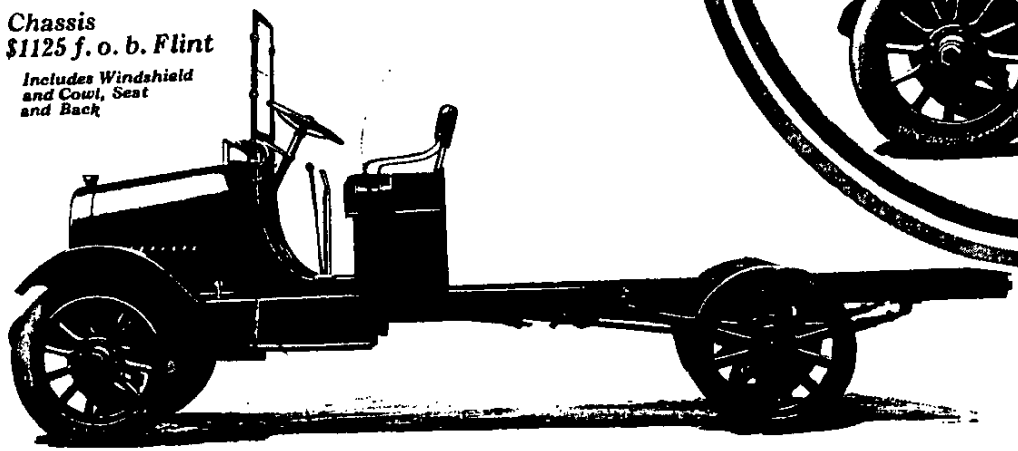
Chevrolet One-Ton Worm-Drive Truck

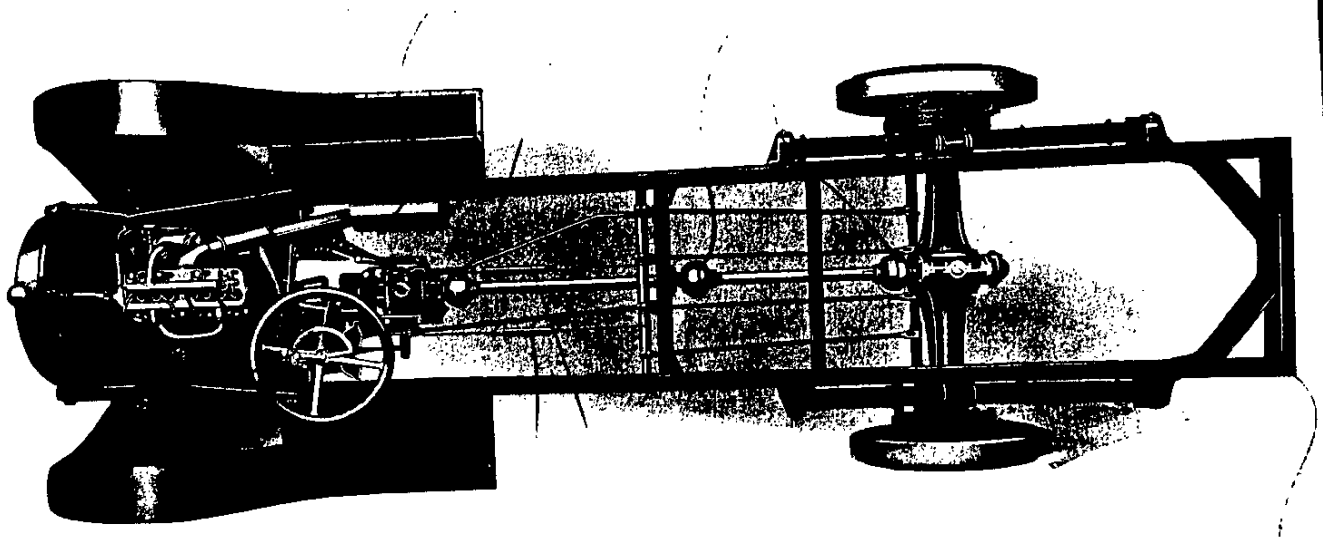


Complete with Express Body and Ei

Chassis
$1125 f. o. b. Flint

Includes Windshield and Cowl, Seat and Back





CHEVROLET ONE-TON WORM-DRIVE TRUCK

Top view of the Chassis, showing ideal arrangement of power plant, transmission, and ideal balance for distribution of weight.

Carrying Capacity: 2000 pounds. Weight of truck with body 3560 lbs.

Body: Length of the body from inside of tail board to inside of head board is 114 1-2 inches. Width, inside of boards, 45 3-4 inches. Height of top from frame to highest point of top, 63¼ inches. Length of top over all, 156 1-4 inches.

Top: Top is supported on each side by four posts, whose cross sections are 1 1-2 x 2 inches. It is removable by releasing the posts at sill cross members. The inside dimension from top of floor to top of sides is 14 1-4 inches. Mounted on the sides are flare boards having a width of 8 inches on the slope, and overhanging the vertical sides of the body approximately 6 inches. Flares braced from the sill cross members to under side of boards.

Body equipped with a head board securely fastened in place; also tail board, supported by three ~~sets of~~ stout hinges.

Seat: Two compartments under seat, in one of which the gasoline tank is securely strapped and well protected. The other compartment for carrying purposes. The seat is wide enough for three persons, and very comfortably upholstered.

Equipment: Electric lights and starter; highest type, two-unit system, ~~single wiring used~~; complete lamp equipment, including head-light dimmers; electric horn; speedometer; side curtains for driver's seat; windshield; complete tool equipment.

Price: Chassis, $1125; Truck with Express Body, $1245; Truck, with Express Body and Eight-Post Curtain Top, $1320, f. o. b. Flint, Michigan.

CHEVROLET MOTOR COMPANY

FACTORIES:

Flint, Michigan; Tarrytown-on-Hudson; New York City; St. Louis, Missouri
Oakland, California; Oshawa, Canada; Toledo, Ohio; Bay City, Michigan
Fort Worth, Texas

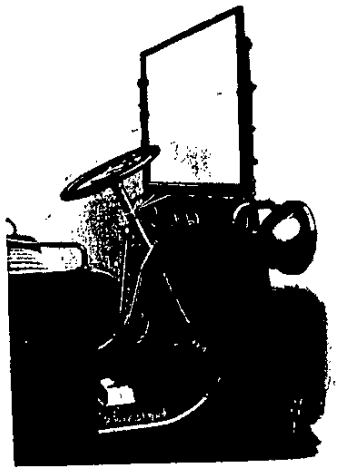
DISTRIBUTING BRANCHES:

Atlanta, Georgia; Kansas City, Missouri; Minneapolis, Minnesota

Built for a Continuous Service of Full Capacity Loads

WHEN you buy a truck you make an important investment. Buy carefully. Know the truck. Know the company that makes it.

When you buy the product of a company having an established reputation and ample resources to guard the future of your purchase, you buy safely. Chevrolet reputation is world-wide and permanently established. The Chevrolet Motor Company enjoys the public good will in a broad way, for it merits this good will by producing thoroughly worthy products.

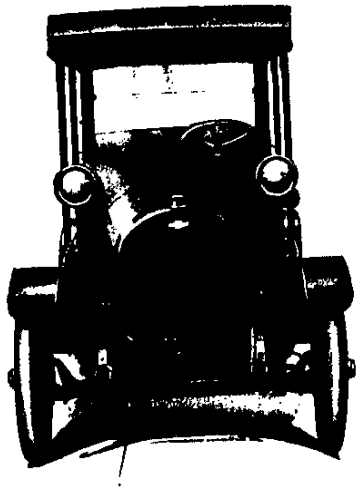


Gear shift, emergency brake lever and dash equipment. Note accessible position of levers—right at hand without groping about for them. Gives driver instant control in emergency. Dash equipment consists of speedometer, carburetor, adjustment, ammeter, oil pressure gauge, lighting and ignition switch—all conveniently arranged.

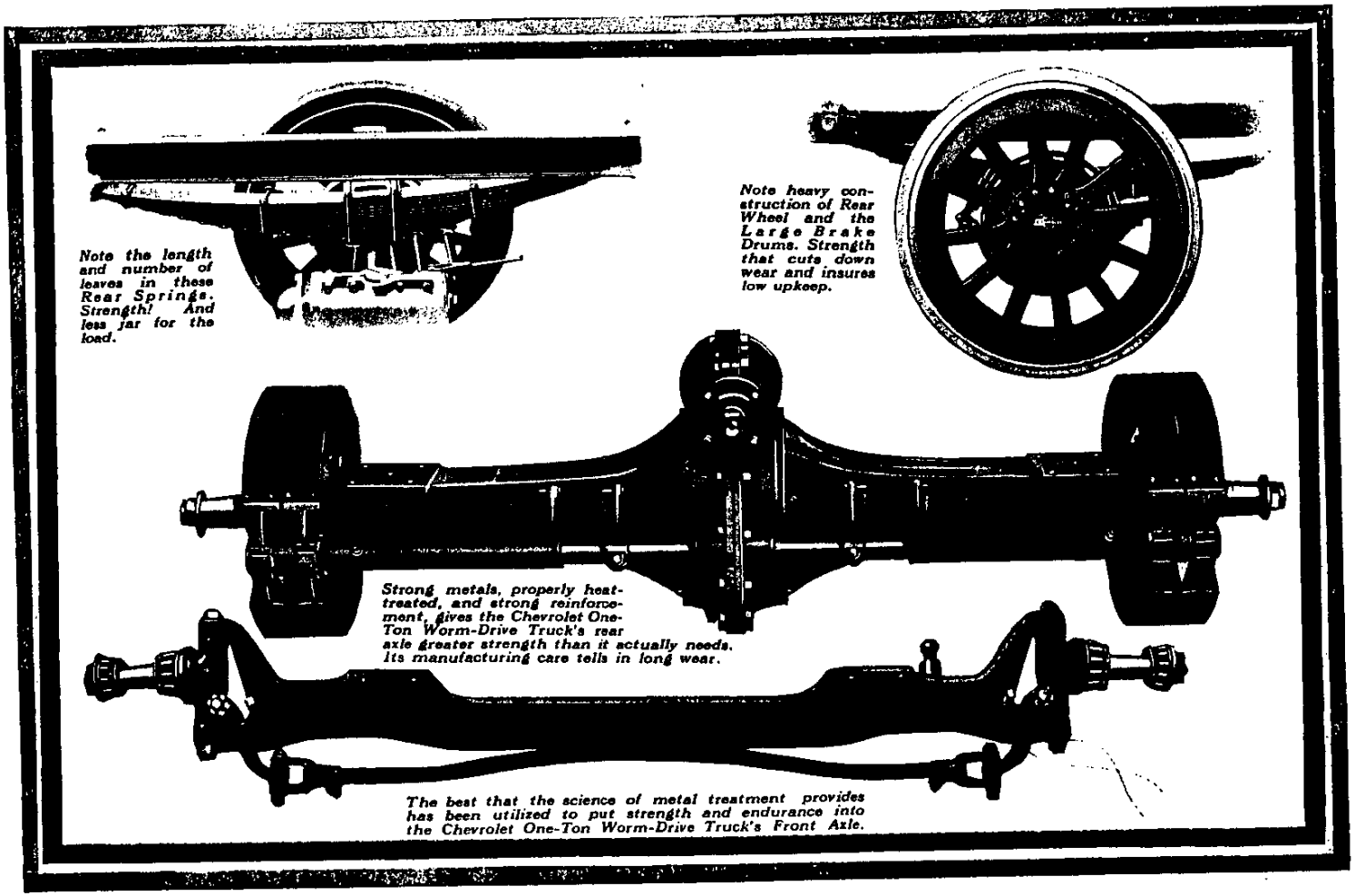
Chevrolet success is the natural outcome of a manufacturing policy high in ideals.

It is the Chevrolet policy to build sincerely and honestly. The Chevrolet needs no better recommendation than the truck itself.

Chevrolet ideals demand that the highest standard of quality materials be used in building the Chevrolet One-Ton Worm-Drive Truck and the description which follows proves that Chevrolet standards have been adhered to in every detail.



Front view. The lines are graceful. The Chevrolet combines good looks with maximum utility. A good-looking truck attracts attention to your name on it—good appearance is always good advertising.

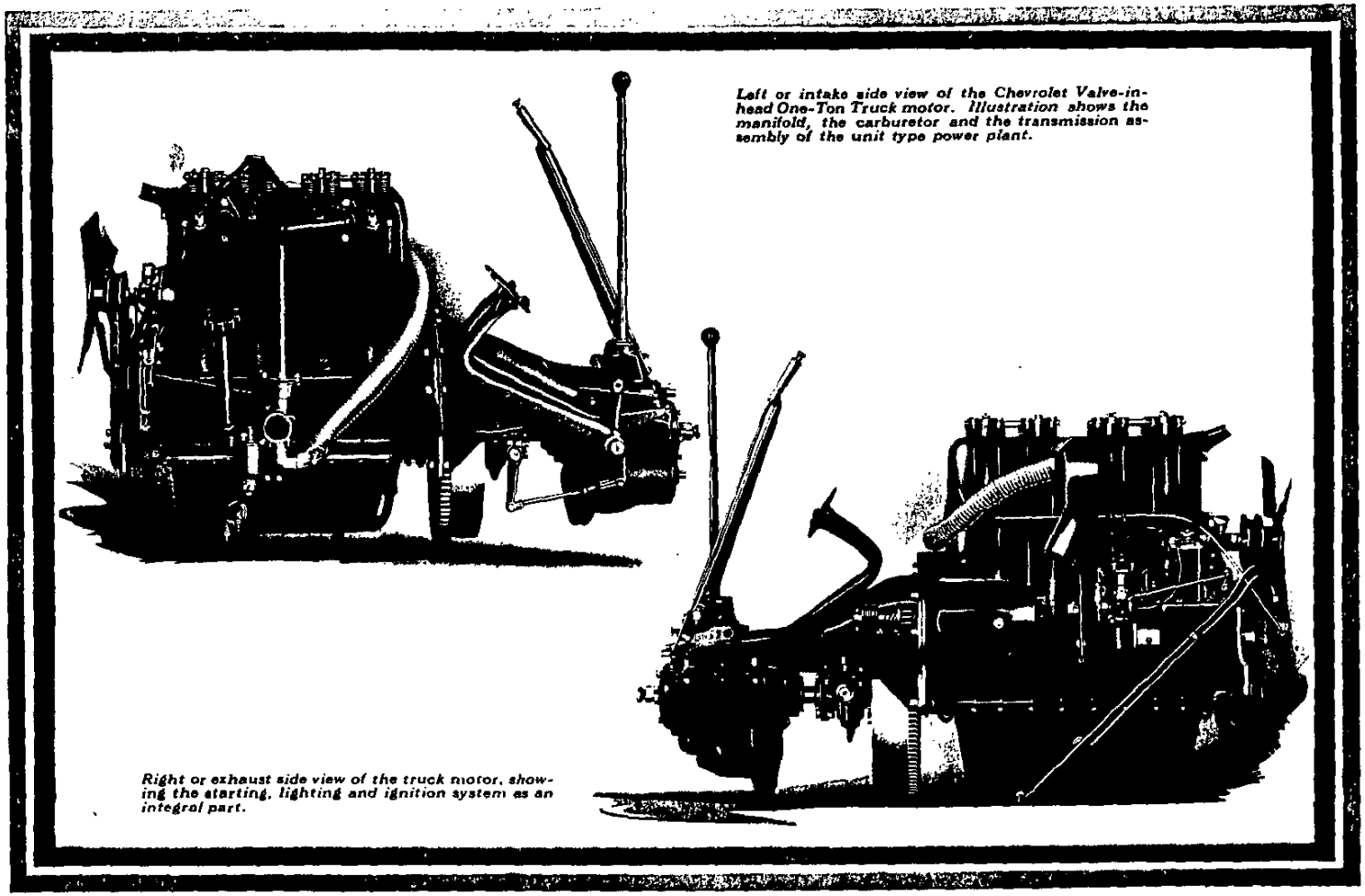


Note the length and number of leaves in these Rear Springs. Strength! And less jar for the load.

Note heavy construction of Rear Wheel and the Large Brake Drums. Strength that cuts down wear and insures low upkeep.

Strong metals, properly heat-treated, and strong reinforcement, gives the Chevrolet One-Ton Worm-Drive Truck's rear axle greater strength than it actually needs. Its manufacturing care tells in long wear.

The best that the science of metal treatment provides has been utilized to put strength and endurance into the Chevrolet One-Ton Worm-Drive Truck's Front Axle.



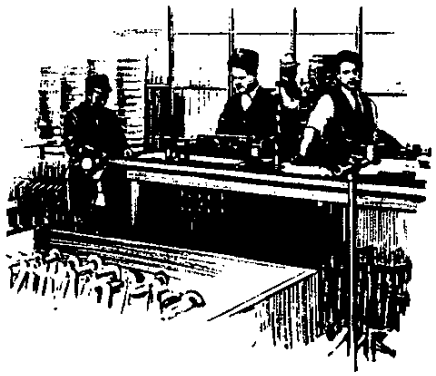
Left or intake side view of the Chevrolet Valve-in-head One-Ton Truck motor. Illustration shows the manifold, the carburetor and the transmission assembly of the unit type power plant.

Right or exhaust side view of the truck motor, showing the starting, lighting and ignition system as an integral part.

Worm Gear Drive: The steel worm is cut, hardened and then finished by grinding. All work is done by special machines. The bronze gear is of special alloy, accurately cut, and having teeth burnished to reduce the friction. No adjustment is required at any time. The gears run in oil and the worm gear acts as a pump which picks up and circulates oil over the worm and through the bearings.

Drive Shaft: From the gear case the drive is through a seamless steel tubing propeller shaft, with three universal joints, to a worm and worm gear mounted with the bevel pinion differential on the rear axle shaft.

The drive shaft is of high carbon seamless steel tubing, one and five-eighth inches in diameter. The center of the drive shaft is supported on a double row self-aligning ball bearing, close to middle universal joint. The bearing housing is filled with lubricant, and is provided with a compression grease cup for refilling.



Upon the accurate grinding of the camshaft depends the successful valve action of the motor. Here the slightest inaccuracy would result in faulty service. No operation outside of the timing of the ignition needs to be so precisely right in design and dimension as the one illustrated here.

Tires: Front—Pneumatics, 31" x 4", clincher type, non-skid, wrapped tread. Rear, 32" x 4" solid.

The Wheels: Artillery type, standard dimensions, twelve hickory spokes each; front wheels equipped with Timken tapered roller bearings of extra-large size, insuring safety under all rated loads and thrusts; completely adjustable for wear.

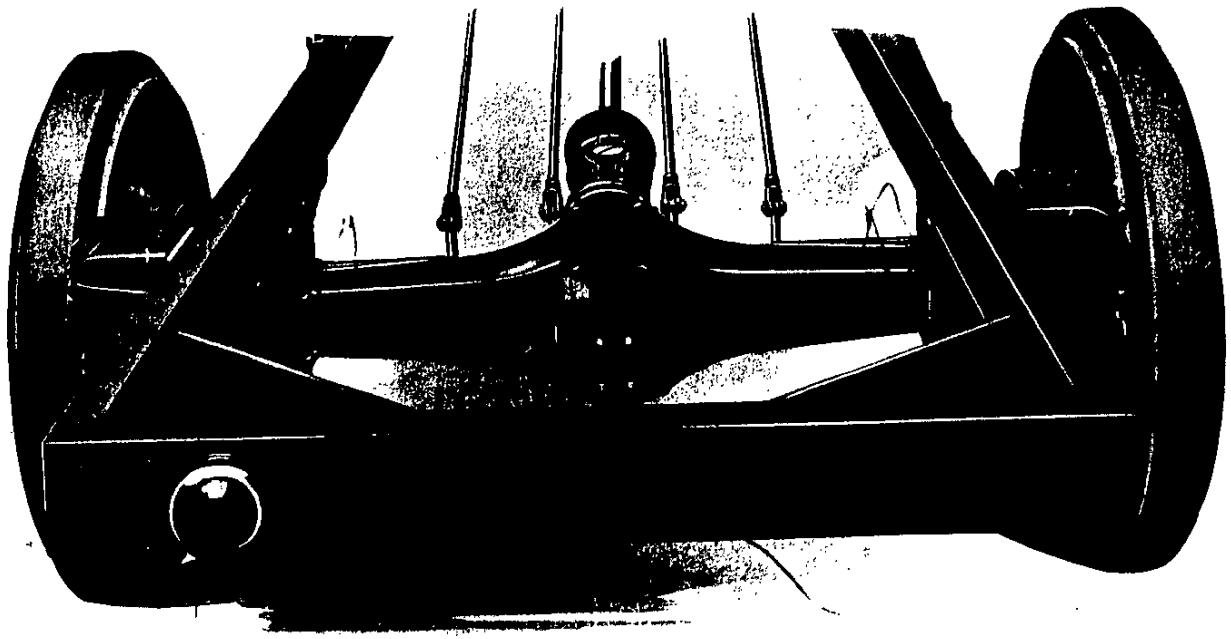
Steering Gear: Worm and gear type, seventeen inch steering wheel. Steering arm of drop-forged steel, heat treated.

Gasoline Tank: Capacity 13 gallons, tank nonleakable. It is located under the driver's seat and is securely fastened.

Fenders: The fenders are made of heavy gauge pressed steel in one piece, rigidly attached to the chassis frame side members by heavy pressed steel "V" section irons. Heavy sheet steel aprons extend to the frame, enclose the sides and protect running boards from mud and water.

Wheelbase: 125 inches.

Tread: 56 inches.



The sturdy rear construction of the Chevrolet One-Ton Worm-Drive Truck is readily apparent in this illustration and insures maximum service and minimum wear