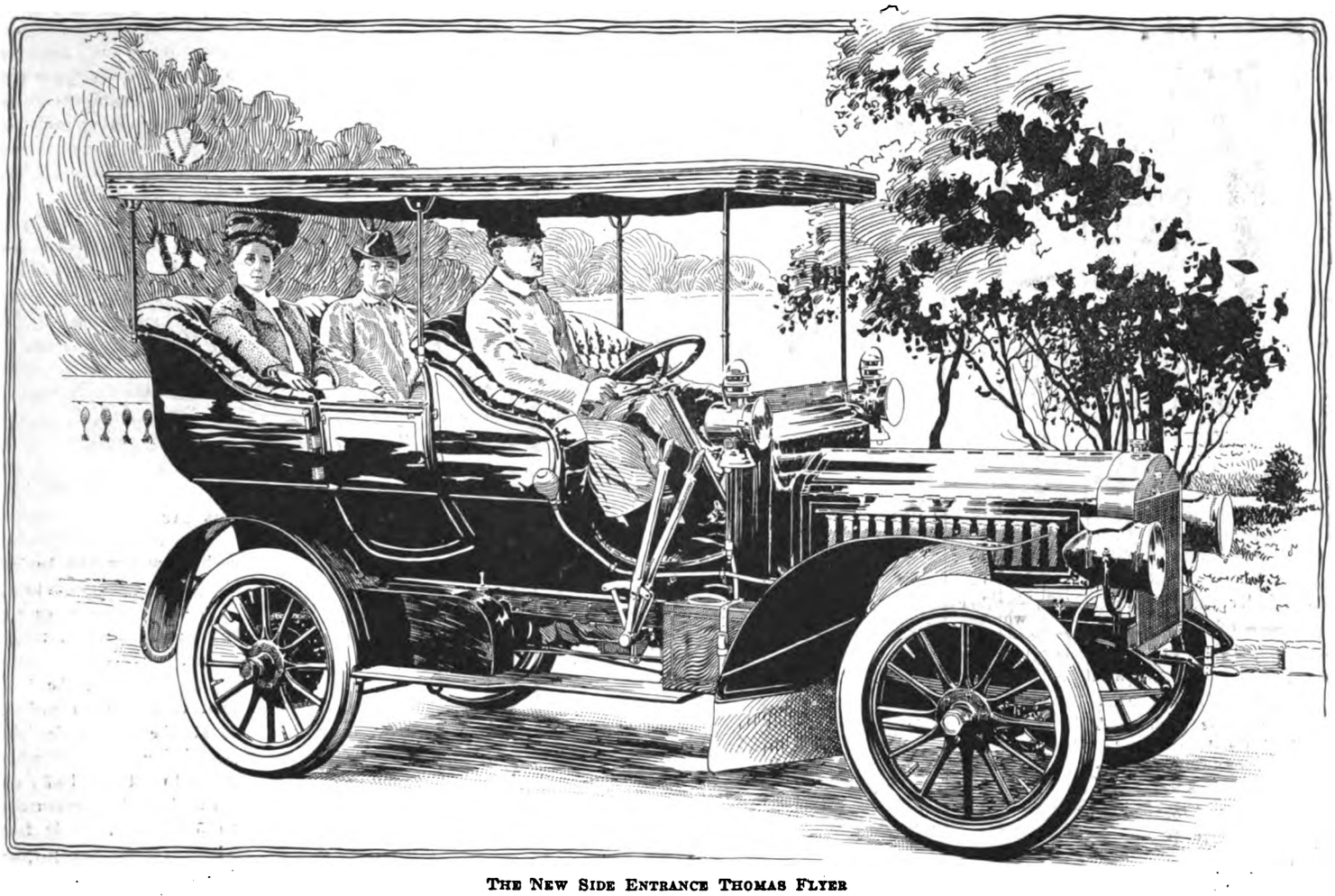


THE NEW SIDE ENTRANCE THOMAS FLYER

glass upon the dash, in view of the driver.

The power transmission is by a rear axle set such as used on the Model L, in which the transmission gearing forms an integral part of the rear axle set, condensing these parts into a unit, and doing away with an independent transmission gearing, case and sub-frame. The final drive is the regular Packard bevel gear system. The transmission gear, driving gear, and the rear axle are mounted on double ball bearings, and the driving gear is also provided with ball thrust bearings. The transmission gear gives three speeds ahead and one reverse, the shafts being operated by two levers at the right of the car. The clutch is also a special Packard feature, being of the self-contained expanding pattern used on the Model L. The clutch is operated by a pedal.

The brakes are duplex, and act directly upon the rear wheels. The regular brake is operated by a pedal and is of the external band type clamping onto a drum secured directly to the rear wheels. The emergency brake is of the expanding type and operates upon the inner surface of the same drums. It is actuated by a hand lever at the right of the car. The movement of the lever also acts to automatically release the clutch when the brake is applied.

MUFFLER WITH WHISTLE

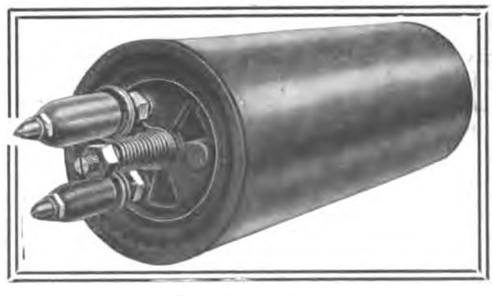
The Dayton Electrical Mfg. Co., of Dayton, O., has added to its line of ignition apparatus the Gray muffler, which is unique in that it is provided with a chime whistle alarm. In the head of the muffler are four port holes and over this head is fitted a revolving disk, having similar openings and two whistles. The disk is held in place by an adjustable coil spring, allowing it to separate from the head and the gases to escape through the ports should a muffler explosion occur, thus tending to prevent back pressure and an excessive strain on the muffler. The spring also revolves the disk to close the whistle or cut-out.

The outer drum is made double with a layer of asbestos between the two metal shells tending to protect the automobile from heat and to deaden the sound. The muffler is furnished regularly in three sizes, each of which is listed with or without the whistle attachment.

MAGNETIC SPEED INDICATOR

The Warner Instrument Co., of Beloit, Wis., is introducing the automobile speed and distance meter shown in the accompanying illustration. This instrument is a combination of the company's peculiarly constructed speed meter and a regular Veeder odometer with both trip and season dials. The principle of construction of the speed meter portion of the device is different from that of other speed meters, the instrument being operated by the "drag" of a dial under the influence of a permanent magnet. This dial is pivoted on sapphire jewels, and is held in the zero position by a hair spring. The magnet is permanently fastened to the flexible driving shaft so that as the shaft revolves the magnet revolves with it, and in turn actuates the dial.

Motion is communicated to the shaft through a single set of gears, a steel pinion on the lower end of the shaft and a gear of gun metal, which is fastened to the hub of the front wheel. The lower end of the shaft is securely clamped and pinned to the steering knuckle of the car so that the gear cannot get out of mesh. The shaft is of ample size to transmit considerable power, and as its maximum speed in operation is only 850 revolutions per minute there is no reason why it should not wear well. The shaft itself is enclosed in a woven brass and steel casing which is oil tight, so that it can be filled with oil. The friction is further reduced by the fact that the shaft is supported at both ends by double ball bearings.



THE GRAY MUFFLER

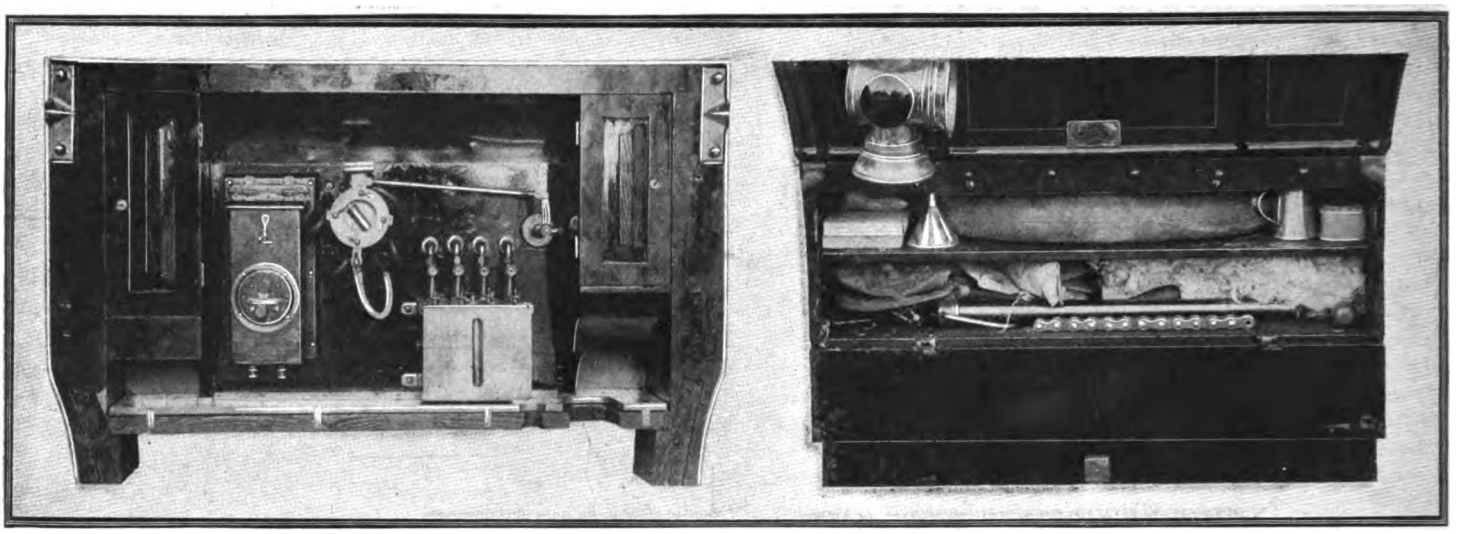
THE NEW THOMAS

For 1905 the E. R. Thomas Motor Co., of Buffalo, N. Y., supplements its well known three-cylinder Thomas Flyer with four and six-cylinder patterns, all being substantially alike in general construction.

In its general features and in many of the more minute details the 1905 Thomas is similar to the 1904 three-cylinder car. The car will have, however, a longer wheel base, 104 inches, to admit the use of a side entrance tonneau. Special attention has been paid, also, to the design of the body, it being claimed for the new body that it has peculiar properties of deflecting dust so that passengers in the tonneau do not suffer from it.

As heretofore, all of the steel work of the car is done at the Thomas factory. Even steering wheels are made by the Thomas people. The car is a Thomas production from stem to stern.

A particular feature of the Thomas is the unusual amount of storage room provided in the car without the use of baskets. In the tonneau, under the forward seat, is a closet, fitted with a door and lock, containing 4,388 cubic inches of space. Two suit cases



INTERIOR OF THE THOMAS DASHBOARD

STORAGE ROOM UNDER THOMAS TONNEAU

be here stowed away conveniently, or the compartment may be fitted with shelves or drawers. Under the tonneau seat is another storage space of 4,752 cubic inches, while under the tonneau floor is a compartment divided into two parts, one for spare tires and the other for a pump, oiler and tools. The combined space is 5,900 cubic inches. This compartment is fitted with a door hinged to fall downwards out of the way when opened. Large flap pockets on the tonneau doors and two lockers on the dashboard bring the total of storage room in the car up to nearly 16,000 cubic inches, or over 9 cubic feet.

The car has an exclusive safety device by which the rear wheels can be locked in case of accident on a hill. There is a ratchet in the drum of each rear wheel into which a dog is dropped by means of a chain placed conveniently to the hand of the driver. When the dog is in place the only way for the car to move is to slide.

The main frame of the car is of pressed steel sides having a depth of 4¼ inches, tapering to 2 inches at the ends. The motor and transmission are carried on a sub-frame which is securely fastened and braced to the main frame. This sub-frame is made of angle steel, is 3 inches deep and has a base of 2 inches. The rear axle, yokes and knuckles are steel forgings and heavy gauge seamless steel tubing. The wheels run on Timken roller bearings.

The springs have six leaves and are 40 inches long in front and 44 in rear. The 34-inch wood artillery wheels are fitted with any standard American make of tire. The tread is 56½ inches.

The motor is vertical, of three, four or six cylinders, and is mounted in front under the hood. The four-cylinder motor is said to develop approximately 40 horsepower at its normal speed. The base is so arranged that it is possible to get at the connecting rod, cam shaft and all working parts without pulling the motor to pieces, or throwing it out of alignment. By removing the splash pan or under section of the base access can be had to the crank shaft, connecting rod and to all bearings. The crank shaft is hung on the base and can also be removed without taking the base from the frame.

Each cylinder is cast separately, the head being an integral part, requiring no gaskets. By a new arrangement the automatic inlet valves are accessible, it being claimed by the makers that it is possible to get at all of them for examination and to replace the domes ready to run in from 3 to 5 minutes. Only four screw bolts need be loosened for the purpose and one connection has to be broken.

Ignition is by jump spark. The current is furnished by a storage battery and an auxiliary battery of dry cells. The commutator and distributor are on the dashboard, as is also the single-cylinder coil.

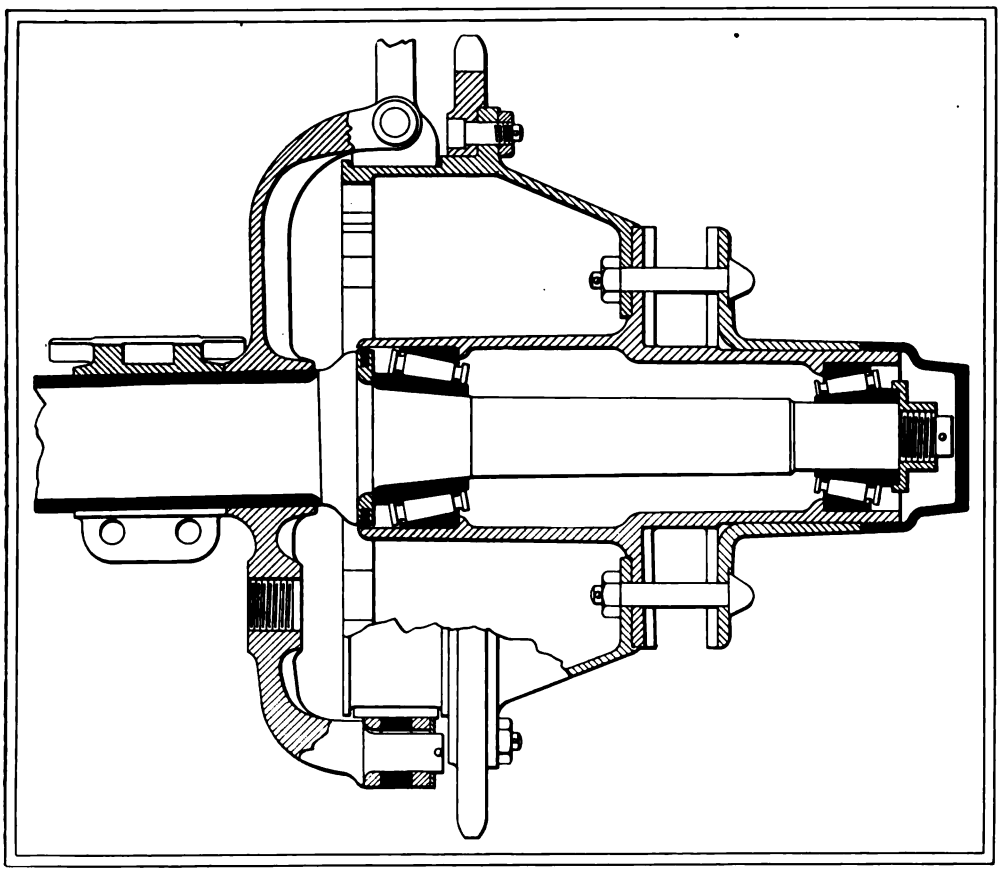
The gasoline tank has a capacity of 19 gallons and is placed under the front seat. The tank has a partition so that 2 gallons are held in reserve to meet an emergency. This device offsets negligence in filling the tank and makes if often possible for the driver to get home or to a supply station when otherwise his car would be disabled.

The throttle control is by a foot lever which can be set at any desired point and can be instantly released by pressure on the brake pedal or by putting on the emergency brake. This arrangement tends to prevent the motor from racing when the car is slowed. The lever controlling the timing of the spark is located directly under the steering wheel.

The radiator is of the cellular type, a fan being used to draw the air through the cells. The circulating pump is geared on the main shaft and has a capacity of 15 gallons a minute, the car running at ordinary speed. Approximately 5 gallons of water are carried in the radiator and cylinder jackets. At ordinary speed, therefore, the entire amount of water circulates three times a minute. The steering device is a worm and sector adjustable for wear.

The motor crank shaft and connecting rod bearings are lubricated by the splash system. The outside bearings on the motor are lubricated by the chain system. The cylinders are lubricated by a force feed pump which is geared to the cam shaft. The sight feeds are in the dash. The bevel gear and ball thrust bearings run in an oil bath. The outside bearings are oiled by the chain system the same as the outside bearings of the motor.

The transmission is of sliding gear style and



SECTION OF THOMAS REAR HUB SHOWING CHAIN LINE BETWEEN THE BEARINGS

has three speeds forward and a reverse. The high speed drive is geared direct, the counter shaft remaining idle, the gear being substantially like that of 1904. The feature of having no gears in mesh on the high speed, saves, it is claimed, 5 to 10 per cent in power and makes possible the driving of the car on the high speed more than 90 per cent of the time. The ratios of speed are 2.4 to 1 on the high; 3.9 to 1 on the intermediate; 7.8 to 1 on the low, and 10.7 to 1 on the reverse. The standard sprockets have twenty-five teeth in the front and forty in the rear, but nineteen, twenty-two, twenty-eight, thirty and thirty-two-tooth sprockets will be supplied if wished.

The final drive is by double chain. The sprockets on the counter shaft are interchangeable. The differential is within the transmission base and forms a part of the bevel gear set.

One brake on the counter shaft is operated by the foot pedal and two emergency brakes on the rear wheel drums are operated by lever. The emergency brake lever when operated is pulled toward the driver and is automatically fastened. The short lever which operates the safety device on the rear wheels is placed on the edge of the dashboard within easy reach.

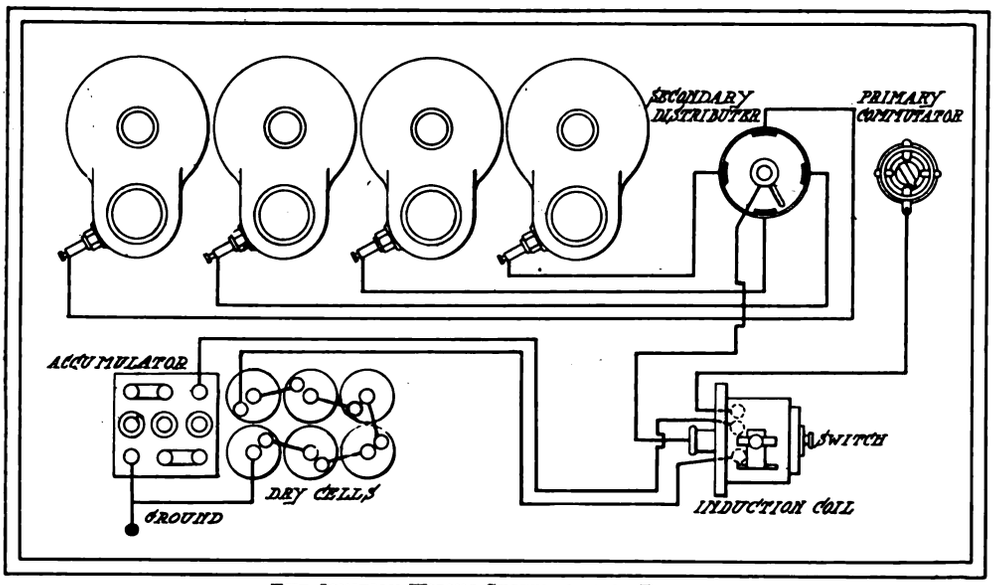
TRADE LITERATURE

The Jumpflame Autocoil is listed in a circular issued by the Autocoil Co., of Jersey City, N. J. The coil is shown in three different grades, and in both vibrator and non-vibrator patterns, each pattern being listed for single, double, triple and four-cylinder motors. Brandenberg Bros. & Alliger, of New York and Chicago, are the selling agents.

The American Lava Co., of Chattanooga, Tenn., has issued a booklet presenting the advantages of lava as applied to the manufacture of gas burner tips, and in electrical insulation. It is an interesting treatise on the subject.

The Harry Wood Machinery Co., of Santa Barbara, Cal., has published a rather interesting booklet descriptive of its garage. From the illustrations in the booklet, the garage itself appears to be modern in every respect. The matter in the booklet is a good story of the establishment of a first-class shop and station. The story is well worthy of attention.

Gray & Davis, of Amesbury, Mass., have issued an artistic folder calling attention to the fact that in the production of the Boston Herald cup, given as a trophy at the Readville race meet, paid the Gray & Davis Bullet reflector lamp a high compliment, by placing two miniatures of it over the handles of the cup.



THE IGNITION WIRING SYSTEM OF THE THOMAS

GASOLINE STORAGE APPARATUS

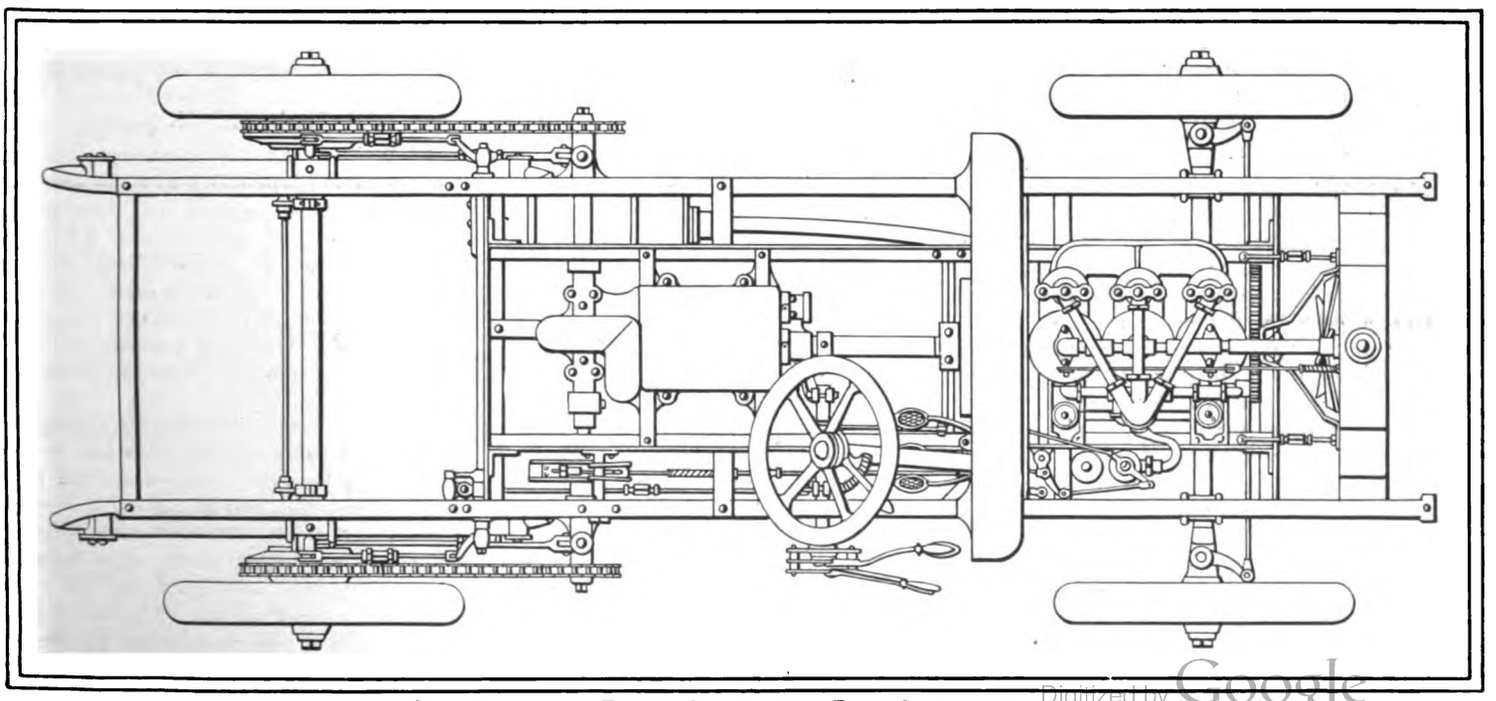
A hydraulic system of storage and distribution of gasoline that is especially applicable to the uses of an automobilist and of garages, is described in a booklet issued by the Van Husen & Farr Co., of Detroit, Mich. Briefly, the Snell system, as it is called, comprises a storage tank that may be located underground, and a drawing cabinet located wherever it is desired, the pressure for forcing the oil from the tank to the measuring cabinet being that of water introduced underneath the oil in the tank. Inside the measuring case above the cabinet is a series of metal disks providing for the accurate measuring of quantities of oil from ½-gallon upward. This obviates the ordinary measuring methods, it simply being necessary to watch the glass gauge with which the device is equipped. The principal advantages as stated by the manufacturers are that the apparatus obviates pumping, prevents evaporation, and furnishes clean gasoline untainted with water and sediment.

NEW GERMAN CAR

The Hermes-Simplex is the name of a new German heavy gasoline car being built near Strassburg at the Grafenstaden plant, which employs 3,000 workmen. The car is made after plans of E. Bugatti, one of the best known German automobile engineers. E. E. C. Mathis, who is the sole agent for de Dietrich cars in Germany, Austria and Switzerland, has been given the sole agency for the new product. A number of racing cars are now being completed which are to compete in the German eliminating race for the James Gordon Bennett race.

NEW NEUSTADT BODIES

The side entrance tonneau body shown in the illustration is one of the most recent additions to the line of bodies manufactured by the J. H. Neustadt Co., of St. Louis. This body is furnished with either an open or divided front seat, and while regular patterns are carried in stock, dimensions are optional upon order. The single seat car with removable



PLAN VIEW OF THE THOMAS CHASSIS WITH THREE-CYLINDER MOTOR