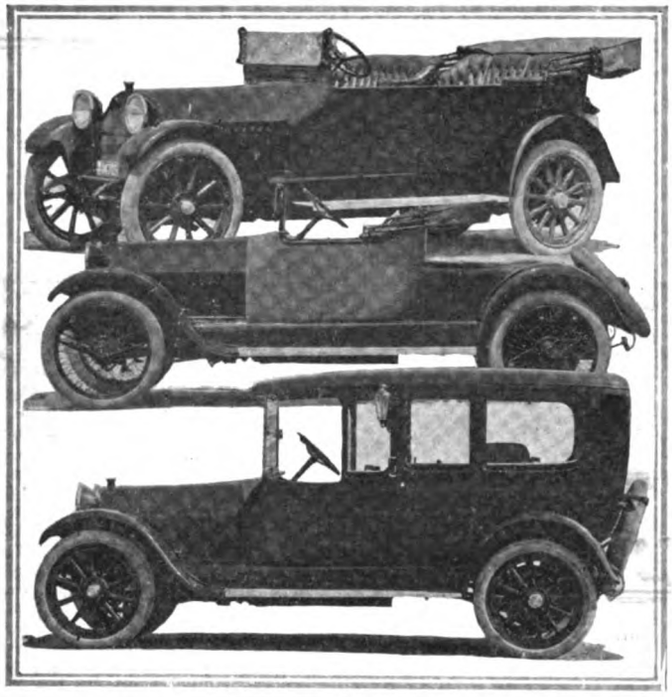


Fig. 1—Three body types seen at a glance—touring, roadster and limousine

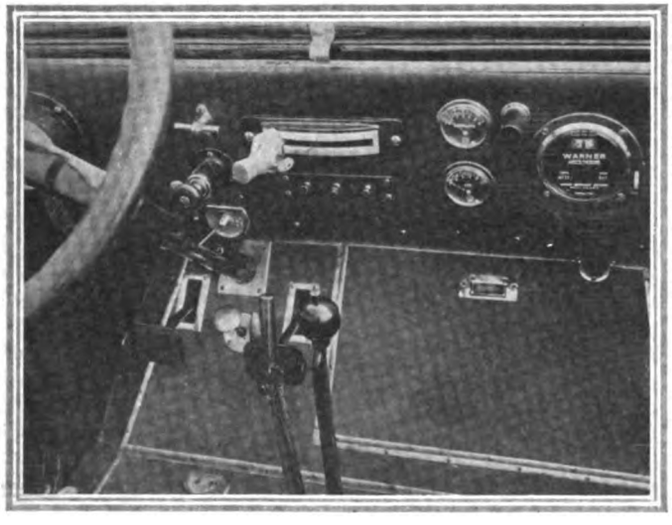


Fig. 2—Left side of dash, showing arrangement of control features

New Chalmers Six for 1914

Air Starters Superseded by Electric—T-Head Motor Another Innovation—Uses Left Drive

THERE is an entirely new Chalmers six for next year—model 24. The motor is quite new, differing greatly from all previous Chalmers designs. It uses T-head cylinders, has an electric starter, possesses a new forced-feed oiling system, and has inclosed valve parts. The gearset is still a unit with the motor. The multiple-disk clutch has cork inserts in one set of disks. There is a new torsion rod design, rear springs are underslung, the steering wheel has been put on the left side for the first time in a Chalmers model, with the levers in the center; the gasoline tank is now carried at the rear for the first time and pressure feed is used; the spare rims or wheels are carried in the rear; and lastly, but by no means least, there is an entire new body design with a host of meritorious features incorporated in it. In a word, model 24 must be looked upon as a brand new Chalmers product to take the place of the 1913 six.

Compared with the present Chalmers six it has a slightly smaller motor, a wheelbase 2 inches longer and lists at $225 less in roadster and four and five-passenger models; $325 less in the six-passenger types; $100 less as a limousine; and $50 more as a coupé. The new models are completely equipped in all body types. The new Chalmers-Entz combined electric-starting and lighting system supersedes the air starting system on the 1913 model; single Bosch ignition takes the place of the previous dual type; and numerous other minor changes will be referred to later.

Introduces T-Head Motor

The new motor is one of the major features of model 24. It marks the debut of this company in the T-head field, having previously used a cylinder casting with the intake valve in the head. Now the exhausts are at the right, the intakes opposite and with the inclosed valve operating parts a very quiet motor has been obtained.

The cylinders in groups of threes are very clean-cut castings

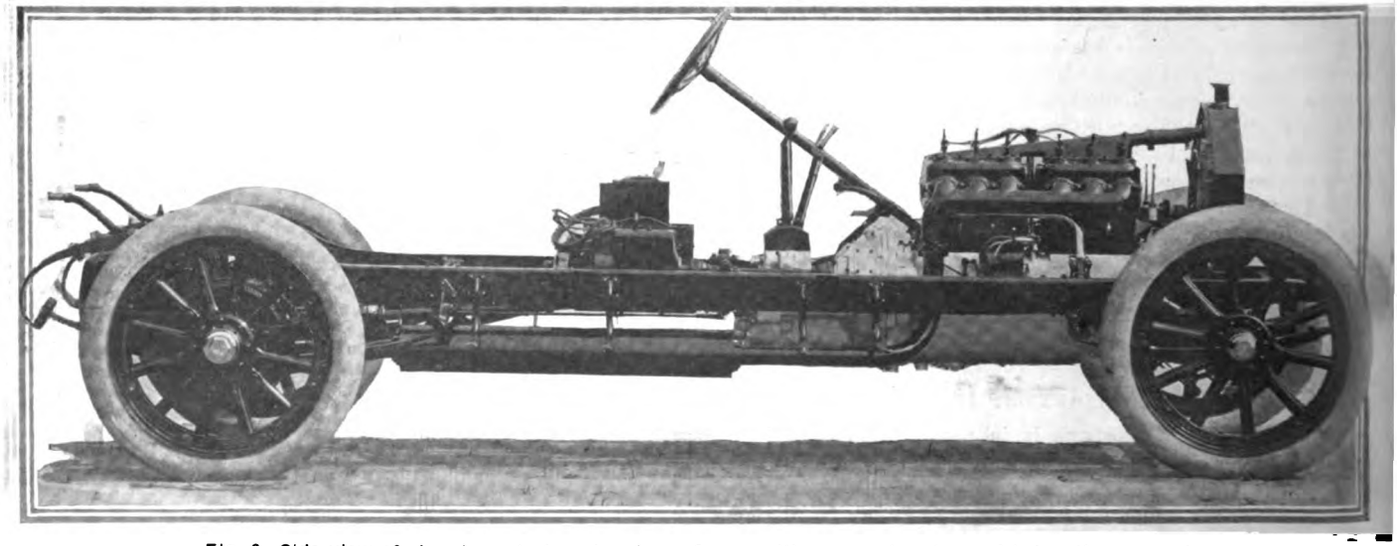


Fig. 3—Side view of chassis; note long low-hung frame with rear spring dropped below the rear axle

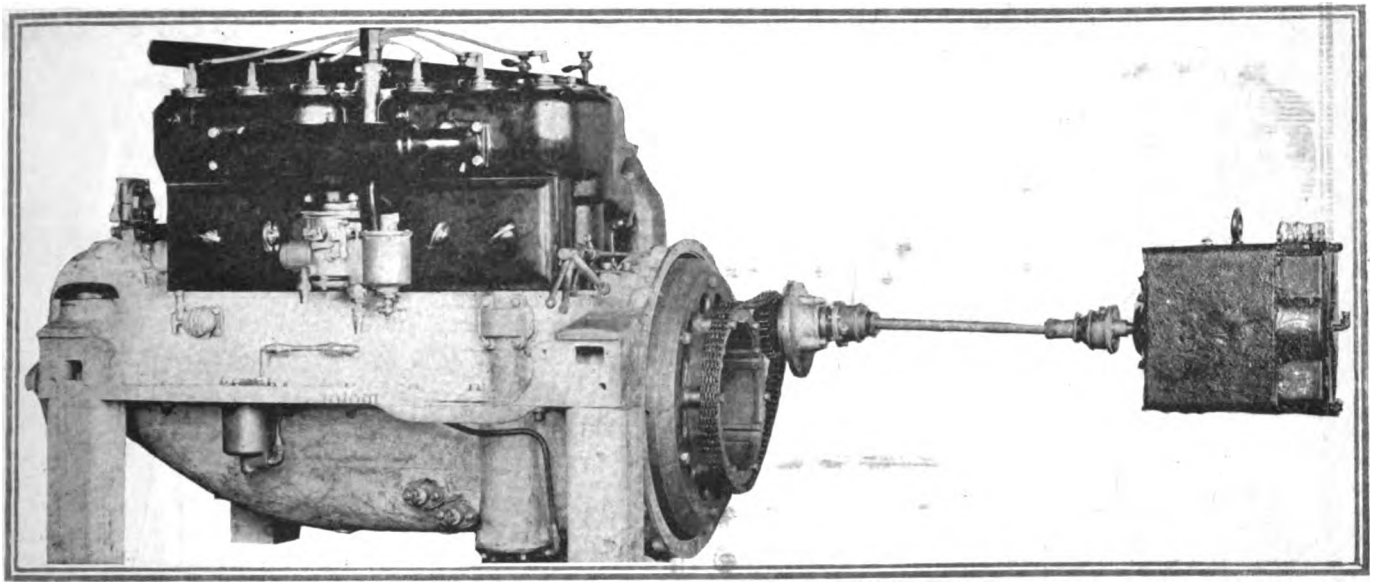


Fig. 4—Intake side of motor and method of mounting the combined lighting and starting unit

with good waterjacket spaces not only around the cylinders but also around the valve seats and partly surrounding the valve stem guides. The jacket heads are formed integrally with the water header, or return pipe to the radiator, and in the head of the combustion chamber is a 2⅜-inch threaded plug which when removed gives access to the entire combustion chamber for carbon removal without removing the cylinder castings. The water enters the rear face of each cylinder group, this being the hottest part.

The cylinder dimensions, bore 4 inches, stroke 5.5 inches, gives an S.A.E. rating of 38.4 horsepower, a piston displacement of 414.7 cubic inches and a stroke-bore ratio of 1.333 to 1.

These are smaller than in the 1913 six which is 4.25 by 5.25, 43.85 horsepower, 446.7 cubic inches and a ratio of 1.23 to 1.

The new 24 shows a stronger inclination to the long-stroke design as well as following the general tendency in having a smaller piston displacement, giving a more economical motor with a greater horsepower output per unit of piston displacement.

More power has been obtained with lighter reciprocating parts, better materials and better cylinder castings. The connecting rods are 40 per cent. lighter than in 1913. They are nickel steel instead of open hearth, and are made with a thinner section. At the lower ends there are but two bolts securing the cap instead of four.

Lighter Pistons with Special Rings Used

The pistons are lighter in spite of the fact that they are longer than formerly, which has been necessitated by the longer stroke used. They are better castings and carry four section-type rings. Each slot carries a complete outer ring, but inside of it is a series of arc-shaped segments forming an inner ring, with each segment pressed outwardly by a small leaf spring, used to assure even pressure of the outer ring against the cylinder wall. The constant pressure obtained by this construction of piston ring results in good compression being maintained for a longer period than is possible with the older type.

The crankshaft, a Wayman & Gordon forging, 40 per cent. carbon, has curved cheeks which bring their weight into the center of the shaft axis, thereby assisting in giving a good rotary balance, a design brought out 2 years ago and one that is coming

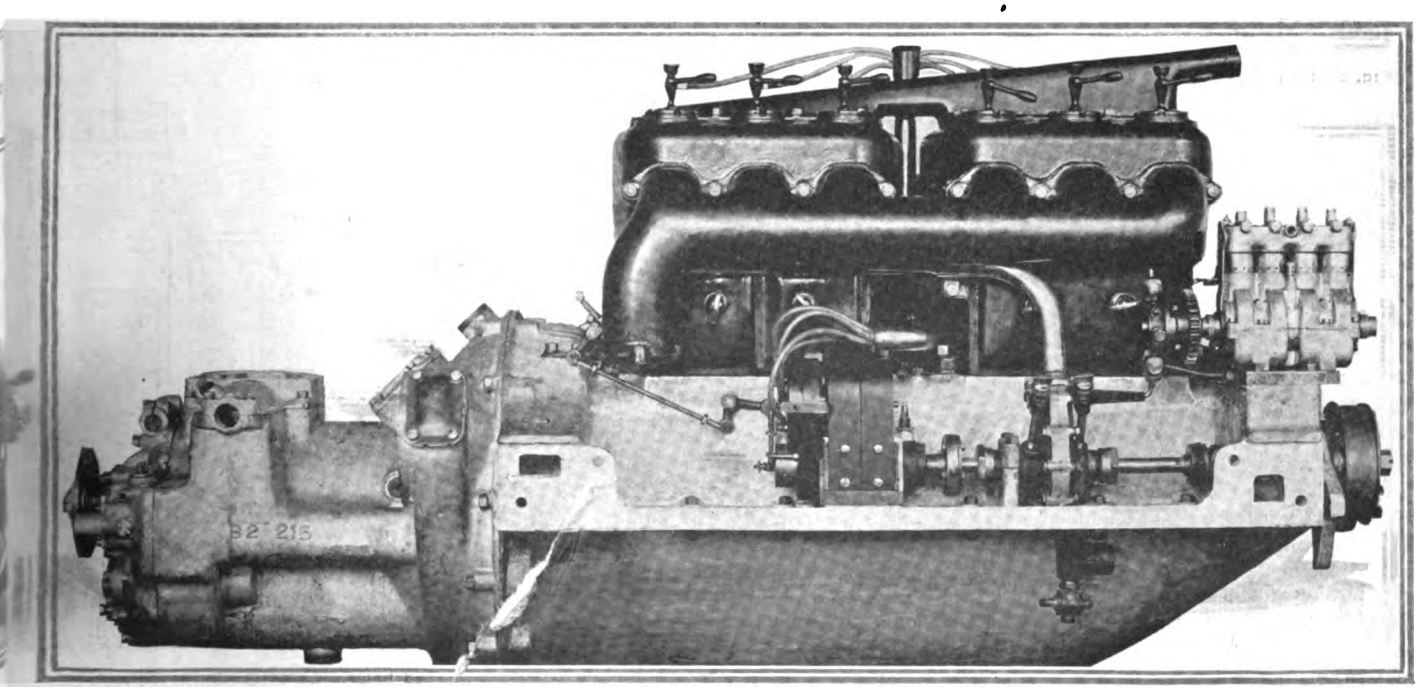


Fig. 5—Magneto and exhaust side of motor. Note mounting of air pump and bridged water outlet manifold

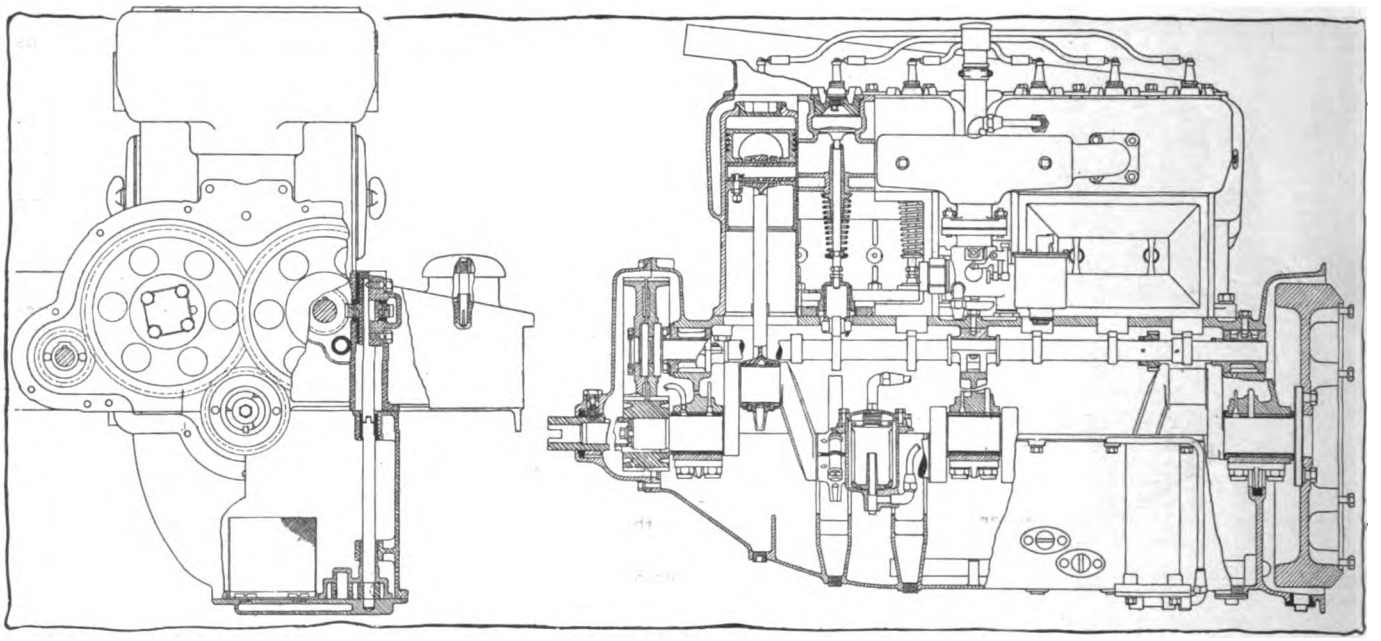


Fig. 6—Part sectional end and side views of motor used in the 1914 Chalmers six, showing force-feed oiling

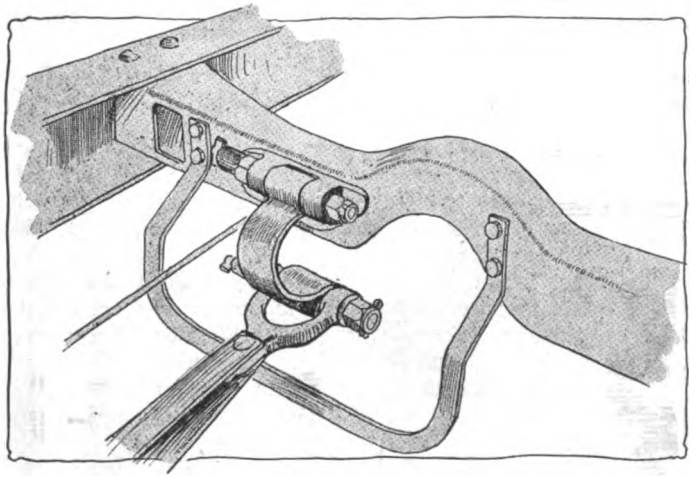


Fig. 7—New connection designed for the attachment of torque member

into use. The shaft is carried on three plain bearings of bronze with a babbitt lining, 2 1-8 inches in diameter.

A motor improvement, and one that is coming in for much attention throughout the country, consists in using tungsten steel intake and exhaust valves, which are described as being proof against pitting. This type of valve is being used quite generally in racing cars with commendable results. The valves, both sets, are 2⅛ inches in diameter, have 7/16-inch lift and 85-pound pressure springs are used on both sets.

In the new oiling system a gear pump in the crankcase sump delivers to a large-diameter pipe extending from end to end of the crankcase and carried inside of it. From this pipe are three branches to the crankshaft bearings. The overflow oil from these bearings instead of dropping into the sump is led out of the opposite end of the bearing from which it enters through a short pipe and drops into little trays integral with the sides of the crankcase base and from these trays it flows into the oil troughs beneath the connecting rods. The connecting-rod scoops dip into these troughs. The final overflow from the troughs falls into the sump for re-circulation.

An improved form of accessible oil strainer is mounted on the left side of the crankcase in the web between the front and rear legs. It is a cup-shaped casting 3 inches in diameter and about 5 inches high. Inside it is a readily removable screen forming a loose lining for the cup. The oil enters from the base at A, Fig. 8, passes outwards through the gauze, escaping by exit E. Should for any reason the screen become clogged then the inner cover C_1 is lifted by the pump pressure overcoming the spring over the cover, thus permitting the oil to flow over the top of the screen to the exit. The upper cover C is readily removable. Mounting this strainer in so accessible a position is assuranec that it will receive attention. Timing gears are oiled direct from the overflow of the front bearing by means of a short pipe which pours the oil onto the pinion on the crankshaft.

Chalmers-Entz Starting System

The Chalmers-Entz combined electric motor and generator for cranking the gasoline motor and also charging the storage battery is one of the neatest jobs of its kind on the market. The motor-generator instead of being mounted alongside the motor is located under the right front seat and is driven by a short propeller shaft extending forward to the near rim of the flywheel where it carries a small sprocket driven by silent chain from a large sprocket on the flywheel. This is a novel drive for a self-starter unit, but it is positive and entirely inclosed.

The motor-generator will spin the gasoline motor at 100 revolutions per minute and in starting it is but necessary to move a small switch on the dash. As a generator for delivering current to the storage battery it being charging at car speeds of 7 to 8 miles per hour and reaches its maximum charging rate at 18 or 20 miles per hour when the rate of charge is 15 amperes. The motor-generator is geared 2.6 to 1.

This motor-generator is made en-

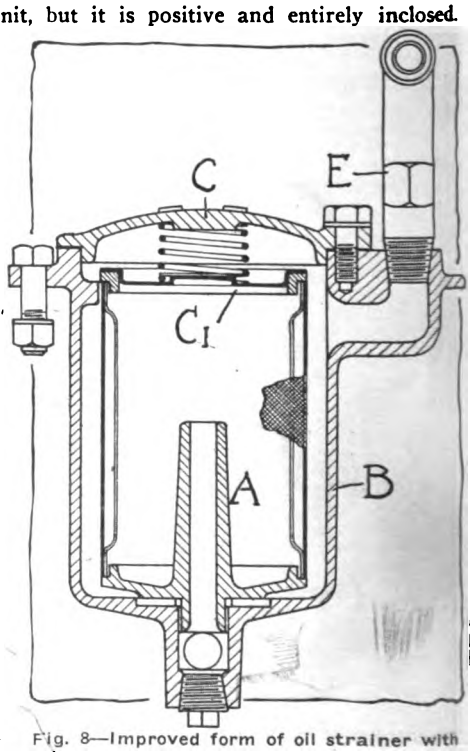


Fig. 8—Improved form of oil strainer with removable gauze strainer

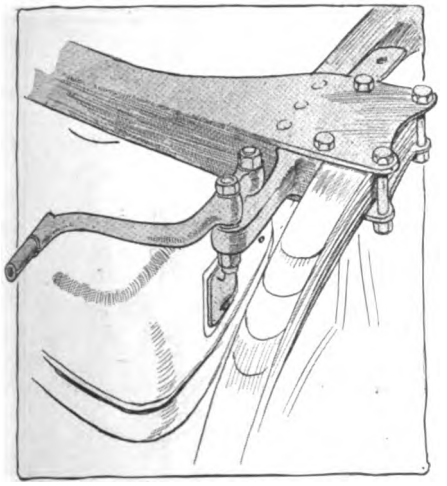


Fig. 9—Rear spring and tire carrier attachment

tirely in the Chalmers factory and is an 18-volt system. The complete unit approximates 230 pounds in weight, 100 pounds for the motor-generator, 100 pounds for the battery and 30 for the driving parts and attaching brackets. The motor-generator is located on a neat pressed steel bracket from the frame side member and on the opposite side of the frame is a similar bracket supporting the battery, giving an evenly balanced distribution of the weight on the chassis.

Clutch Oiled from Motor

The multiple-disk clutch has been improved by inserting cork inserts in one set of disks and operating the entire clutch in oil.

A torque rod improvement consists in supporting it at the forward end through a curved leaf vanadium steel spring, which leaf while offering the same freedom of movement of the previous support does so at a saving of 25 pounds in weight.

The front axle has a double tilt at the steering parts. There is a backward tilt of from 1.5 to 2 degrees and the knuckle pins point slightly outward.

The frame is heavier than formerly, being of stock 1/16 inch thicker. The side members are dropped in advance of the back axle, but are not inswept at the dash. Front springs measure 39 inches with 2-inch leaves; and the three-quarter rears are mounted under the axle not because this mounting affords any lower body suspension but rather that it gives approximately double the radius of spring movement. The top leaf is of vanadium steel. The measurement is 52 inches with 2¼-inch leaves.

Brakes are much as this year, being internal and external rear wheel sets. The external or service ones act on drums 16⅛ inches in diameter and 2¼ inches wide. The internal emergencies operate on drums 16 by 2 inches. Both are asbestos faced and work through equalizers.

It is in connection with the bodies that almost countless changes have been made, the bodies being stream-line designs in which the hood is widened and heightened as it converges into the cowl, where the transition into the body has been all the more accomplished by leaving off dash lights and using a combination headlight which has double bulbs, 24-candlepower ones for headlight purposes and 6-candlepower ones mounted above the lens exits for use instead of dash lights.

Many anti-noise features have been introduced, the most noteworthy being the rubber buffer inserted in the door jamb, Fig. 11. The connection at the base of the door for the circuit operating the electric horn is shown in Fig. 12. The door hinges are entirely inclosed, Fig. 13.

The model 24 chassis is made in one wheelbase length and to this is fitted seven body styles all interchangeable and all carried on eight small stamped brackets carried on the outside of the frame side members, four to the side. This mounting is aimed to eliminate body squeaks and also to give a quick demountable feature.

The roadster and four and five-passenger bodies list at $2,175, the six-passenger at $2,275, coupé $2,850, and limousine $3,600. With McCue wire wheels $80 is added. There is one other option, namely, Kellog tire pump, an extra rim casing and tube and tire cover, $75. The regular list includes mohair top, rain vision windshield, demountable rims, speedometer, rear tire carrier with extra rim, electric horn, electric starter, electric lighting, etc. Tires are 36 by 4½ all around.

The standard colors for open cars are Brewster green, grey and meteor blue; for closed cars, valentine coach blue.

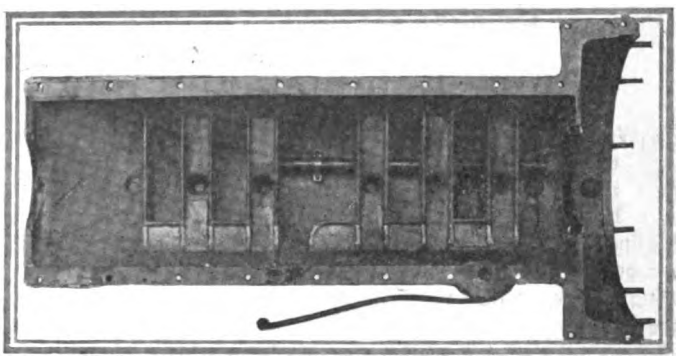
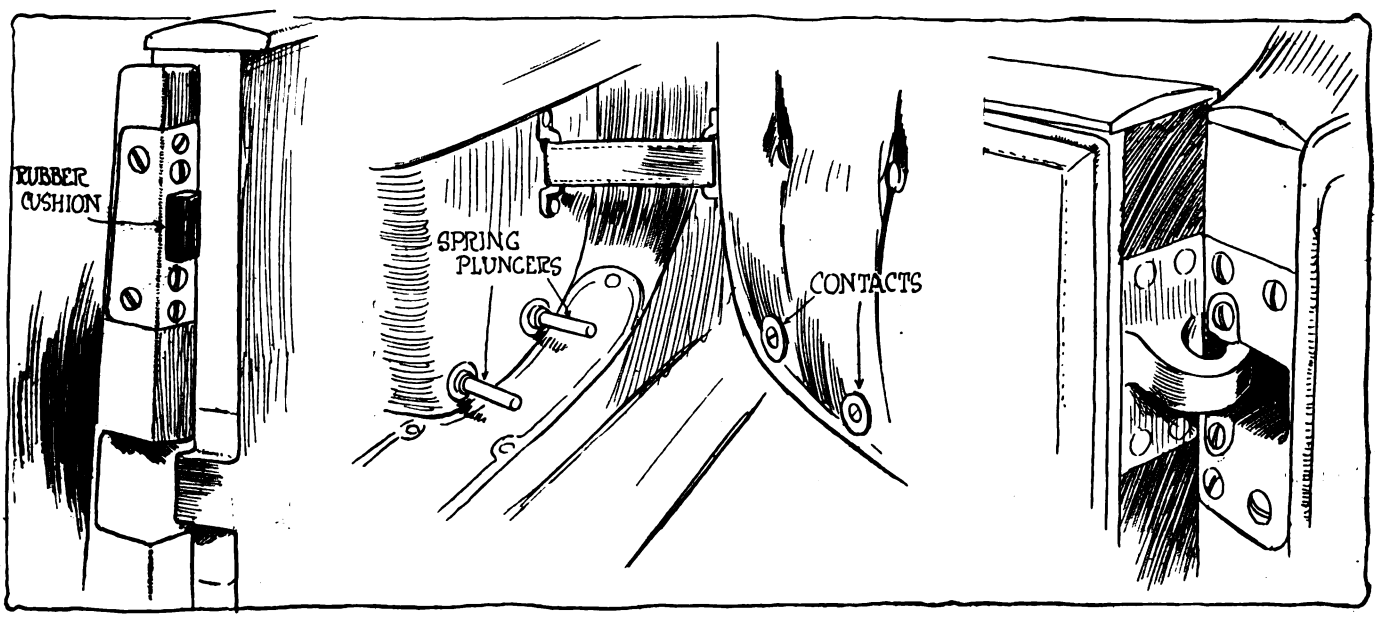


Fig. 10—Form of crankcase used in connection with new force-feed oiling



Figs. 11, 12, 13—Anti-rattling feature, electrical connectors for horn and concealed hinges on the door of the 1914 Chalmers