

The "Car De Luxe."

The manufacturers of this car have evidently endeavored to make it exactly what its name implies. With this end in view each part has been designed for maximum strength, lightness and efficiency by a liberal, one might almost say lavish, use of chrome nickel steel. D. W. F. bearings are used in almost every journal, and the finish of all bearing surfaces is of a grade to correspond.

The work of design was subdivided among specialists; one taking charge of the motor, another of the transmission system, while a third looked after the running gear, and a fourth devoted his entire attention to body design and the general appearance of the car.

The first cars are being built by the De Luxe Motor Car Company in their plant in Toledo, but in the meantime they are rushing the work of remodelling the factory on Clark avenue, Detroit, which they recently purchased. When completed this factory will surround three sides of a rectangular court with a two story building; while up the middle of the court will run a single story structure meeting the first mentioned building at the short side of the rectangle. The open end of the rectangle will be the shipping and receiving part of the plant. Raw material will enter at one wing and pass through successive stages, with the machine work on the ground floor and the body work on the floor above, until the completed bodies are sent down and placed on the finished chassis in the other wing. The central building will contain the tin shop, and the finished radiators, mud guards, etc., will meet the chassis midway in its journey. The administration building will be located across the street from the receiving and shipping departments, directly on the lake front. It is planned to eventually make



DE LUXE

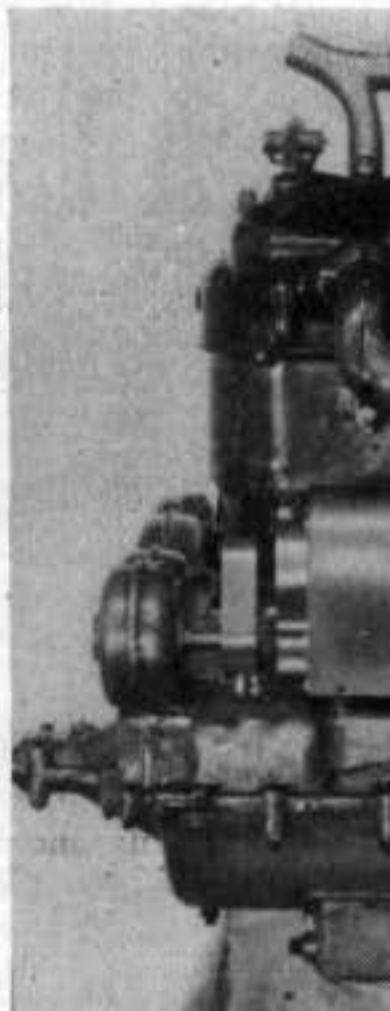
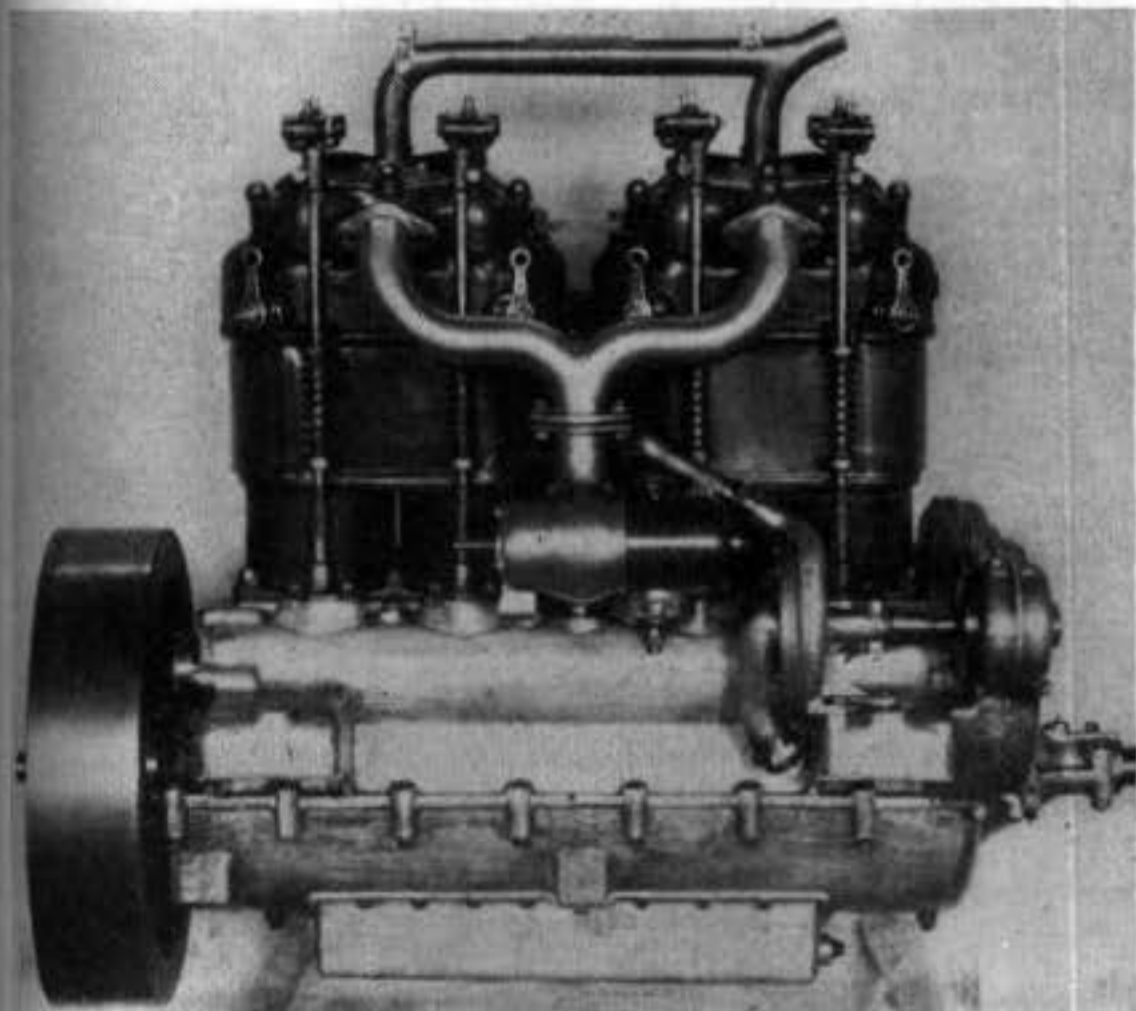
every part of the cars, except tires and equipment, in this factory.

The car is a large seven passenger touring car with 121 inch wheel base and 36 inch wheels, shaft driven by a 50-60 horse power motor.

THE MOTOR.

A four cylinder vertical motor with 5 inch bore and $5\frac{1}{4}$ inch stroke is employed. The cylinders are cast in pairs, with a water space between integral jacketed heads, and applied copper jackets below. These copper jackets are kept tight by being metal calked into dovetailed grooves where they join the cylinder walls, and are slightly corrugated to prevent bursting in case of freezing. The cylinder walls are prolonged some distance below the bottom flange and fit bored holes in the crank case, which insures correct location. Each cylinder casting is secured to the crank case by six studs.

The crank case is aluminum and is split





DE LUXE CAR.

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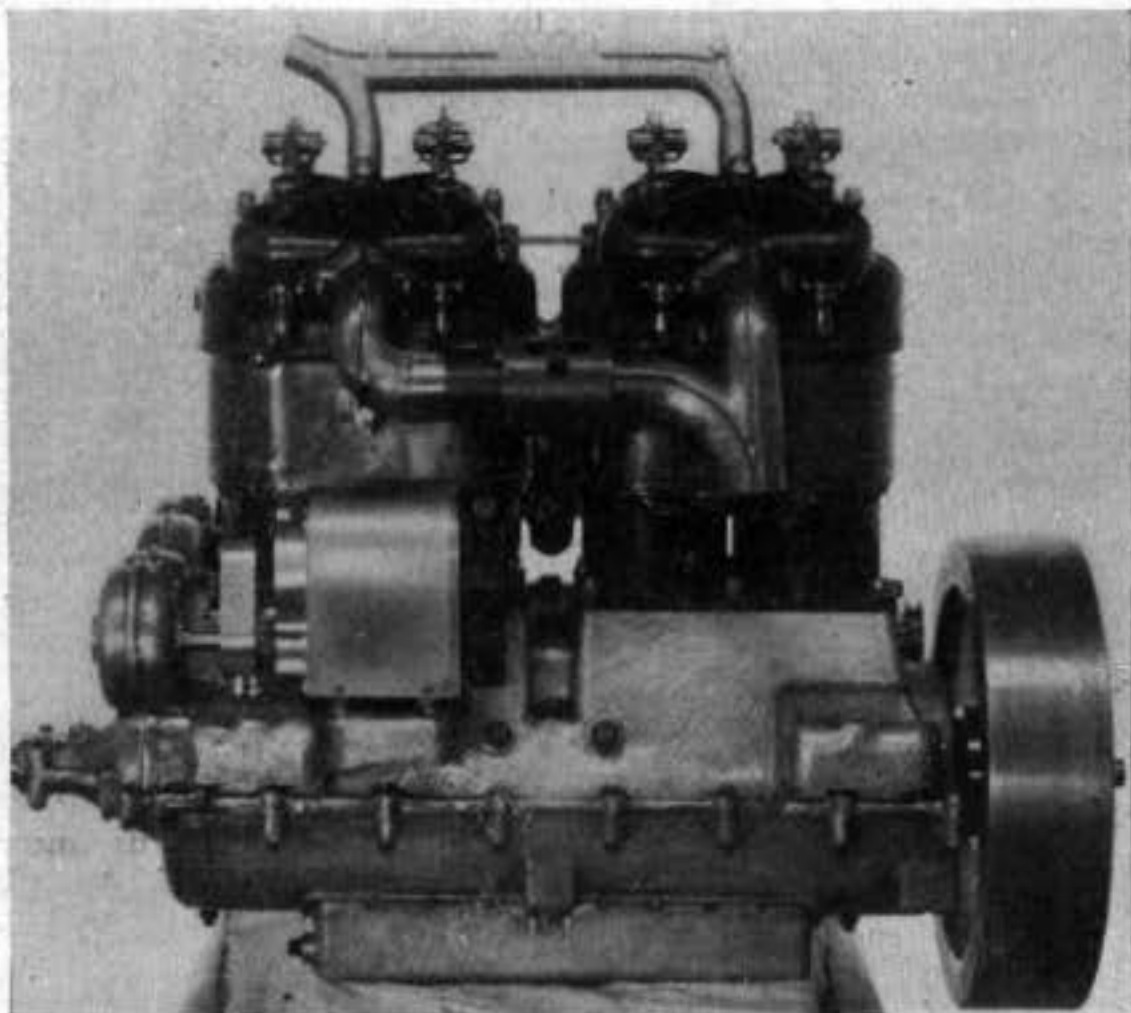
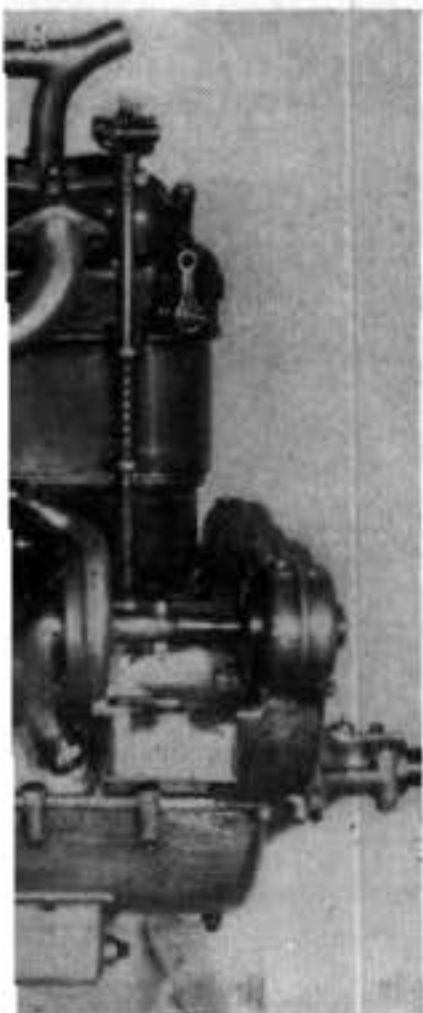
THE MOTOR.

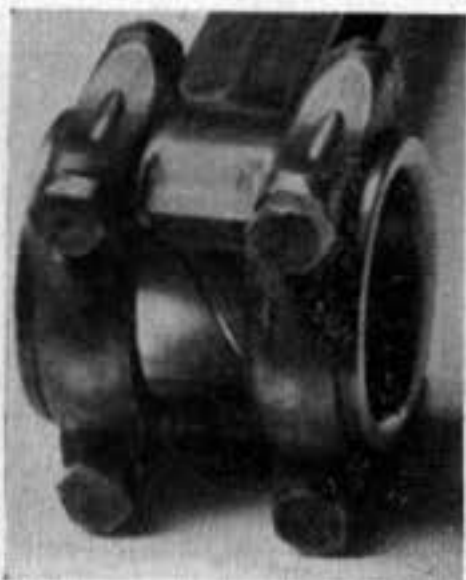
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horizontally. The upper portion has four substantial legs which rest on the sub-frame. It extends back to enclose the rear bearing and provides a packing box behind and forward to form a casing enclosing the rear half of the gears for cam shaft and accessories. The front part of the gear housing also contains the upper part of the bearing for the starting crank. The lower part of this bearing is in the bottom portion of the case. A spring pressed plunger holds the starting crank in a vertical position, and it cannot be engaged with the crank shaft until it is turned downward. The crank shaft is cut from a billet of chrome nickel steel and runs in three large D. W. F. bearings held by steel caps against steel seats cast in the case. The flywheel is secured by studs to an integral flange.

The connecting rods are chrome nickel I section forgings, bushed with phosphor bronze at the upper and white brass at the

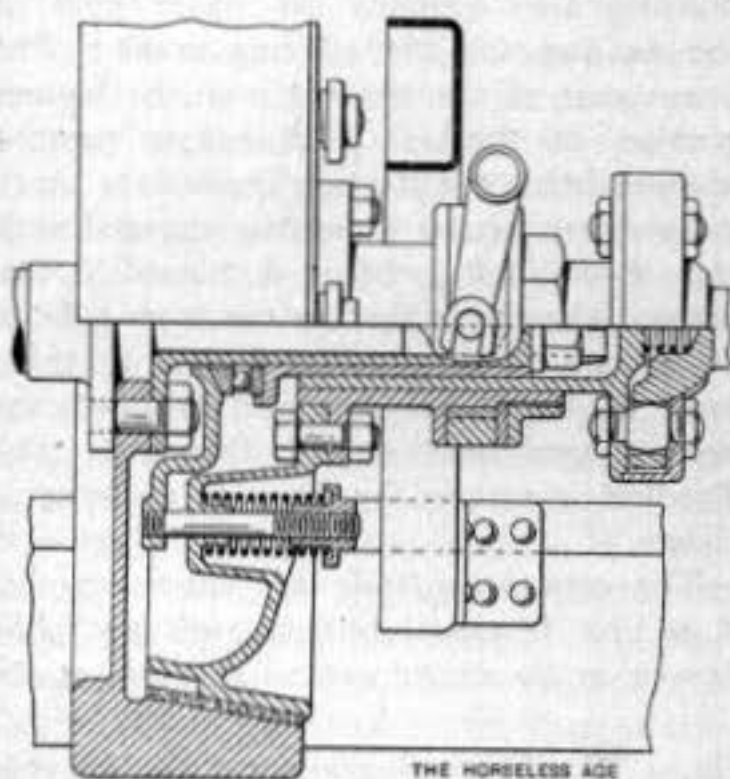




CONNECTING ROD HEAD.

lower ends. The centre portions of the caps are cut away, leaving only two bands opposite the bolts and exposing the crank pins to the oil in the case. The piston pins are chrome nickel steel hardened, and secured by taper pointed set screws which are held from turning by cotter pins through their heads.

The flat topped pistons are fitted with four Westinghouse type rings above the pin; these consist of a triangular section outer ring and an inner ring consisting of triangular section segments, with a chordal flat spring to each segment pressing the outer ring into even contact with the cyl-

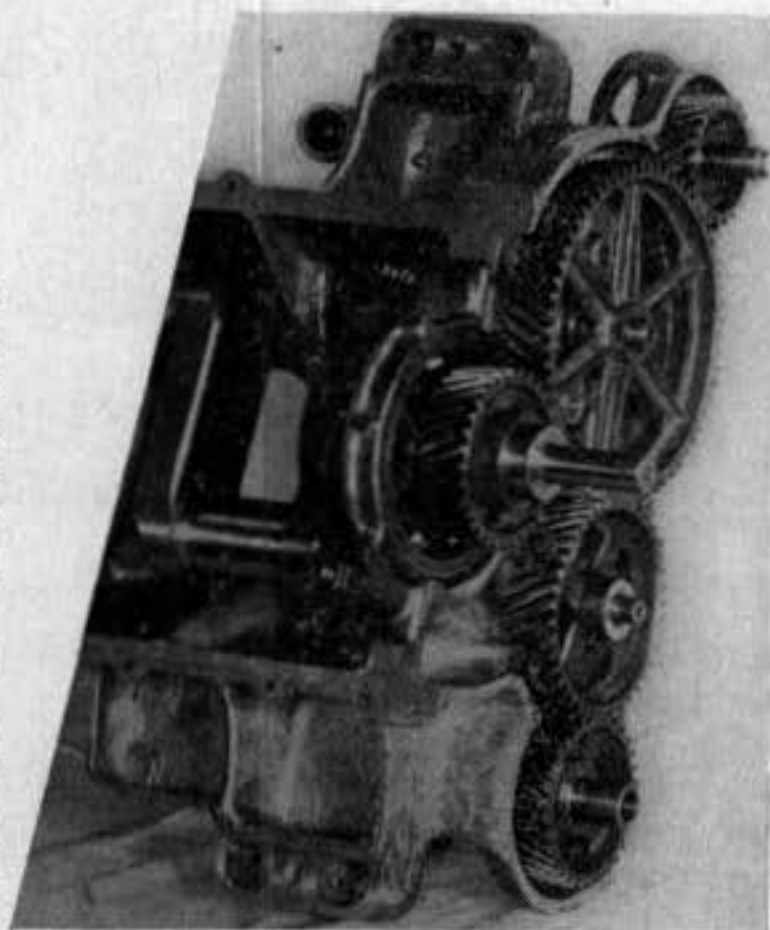


CLUTCH.

inder throughout its circumference. Toward the bottom of the piston is a single rectangular section cylindrical oil ring.

The driving gears for the cam shaft, pump and magneto are spirals, there being a steel pinion on the crank shaft, and all gears meshing being of steel and bronze respectively. The cam shaft removes through the front of the case and runs in plain bearings with a large outside diameter, which are expanded into their seats in the case by a wedge and screw. The inlet and exhaust valves are in the head, making a 20 degree angle with the cylinder axis, and those for each cylinder are operated by a double cam through an overhead walking beam. The exhaust valve is opened by the point of this cam, which lifts the push rod; while the inlet is opened by the large spring surrounding the push rod forcing the roller into the hollow on the cam. This hollow is shaped to give constant gas veloc-

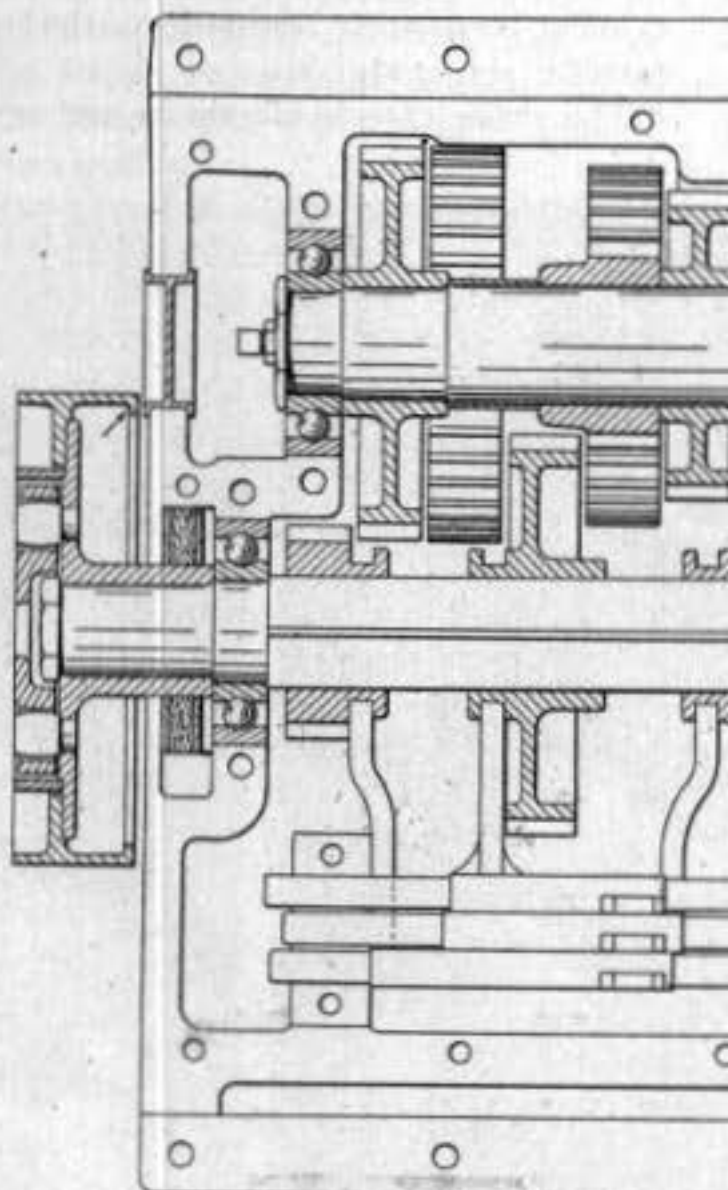
ity. Valve timing may be adjusted to one-fortieth inch by screwing the stud which forms the rocker arm fulcrum, in or out. Both valves are of nickel steel, with flat seats, and are located in cages. Each pair of exhaust valve cages is held by a spider secured by a single stud, and each pair of inlet cages is secured by a manifold fastened



DE LUXE MOTOR CAM SHAFT, PUMP AND MAGNETO GEARING.

by three studs. To these manifolds is secured the symmetrical aluminum carburetor pipe.

The carburetor is of special design, of the three nozzle type, the nozzle opening being controlled by a piston throttle. At the front is a damper for adjusting the cold air inlet, while between the cylinders



DE LUXE CHAM

Note Flange on brake drums (indicated)

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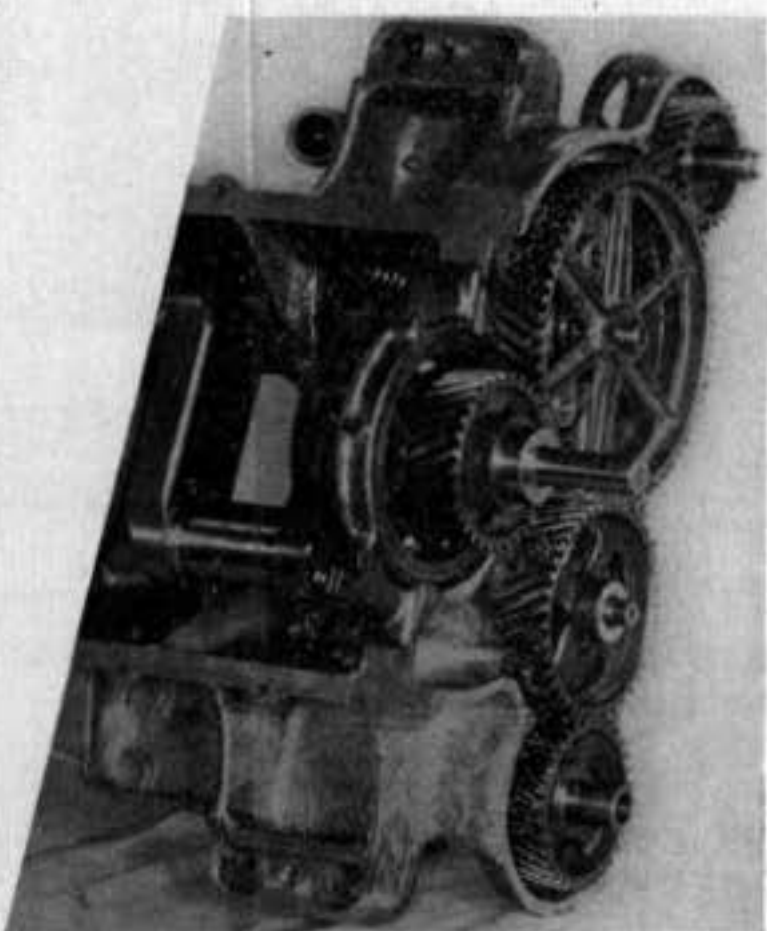
passes a tube which conveys hot air from the casing surrounding the exhaust manifold. In this hot air pipe is a butterfly valve interconnected with the piston throttle, so as to shut off the supply when the motor is running idle. The care that is taken to ensure correct mixture may be judged by the fact that stuffing boxes are placed around the inlet valve stems.

Twenty gallons of gasoline are carried in a cylindrical tank at the rear, with a large accessible filling cap. An exhaust pressure system fitted with a relief valve forces the fuel into a tank on the dash, fitted with a constant level float and glass gauge. From here it is fed by gravity to the carburetor. For starting after the car has been standing idle for a long time, pressure may be put on the gasoline in the main tank by a hand pump whose handle projects through the foot board at the left.

Lubrication is secured by a six feed Lunkenheimer oiler, driven by a spring belt from the rear of the cam shaft. One lead goes to each cylinder, one to the pump gear, and one to the clutch operating yoke. The crank pins are also furnished with eccentric oil rings which feed into the hollow pins by centrifugal force.

Excess oil passes through standpipes to a compartment at the bottom of the case and this compartment is arranged with an overflow which will drip, attracting attention when the oil level gets too high.

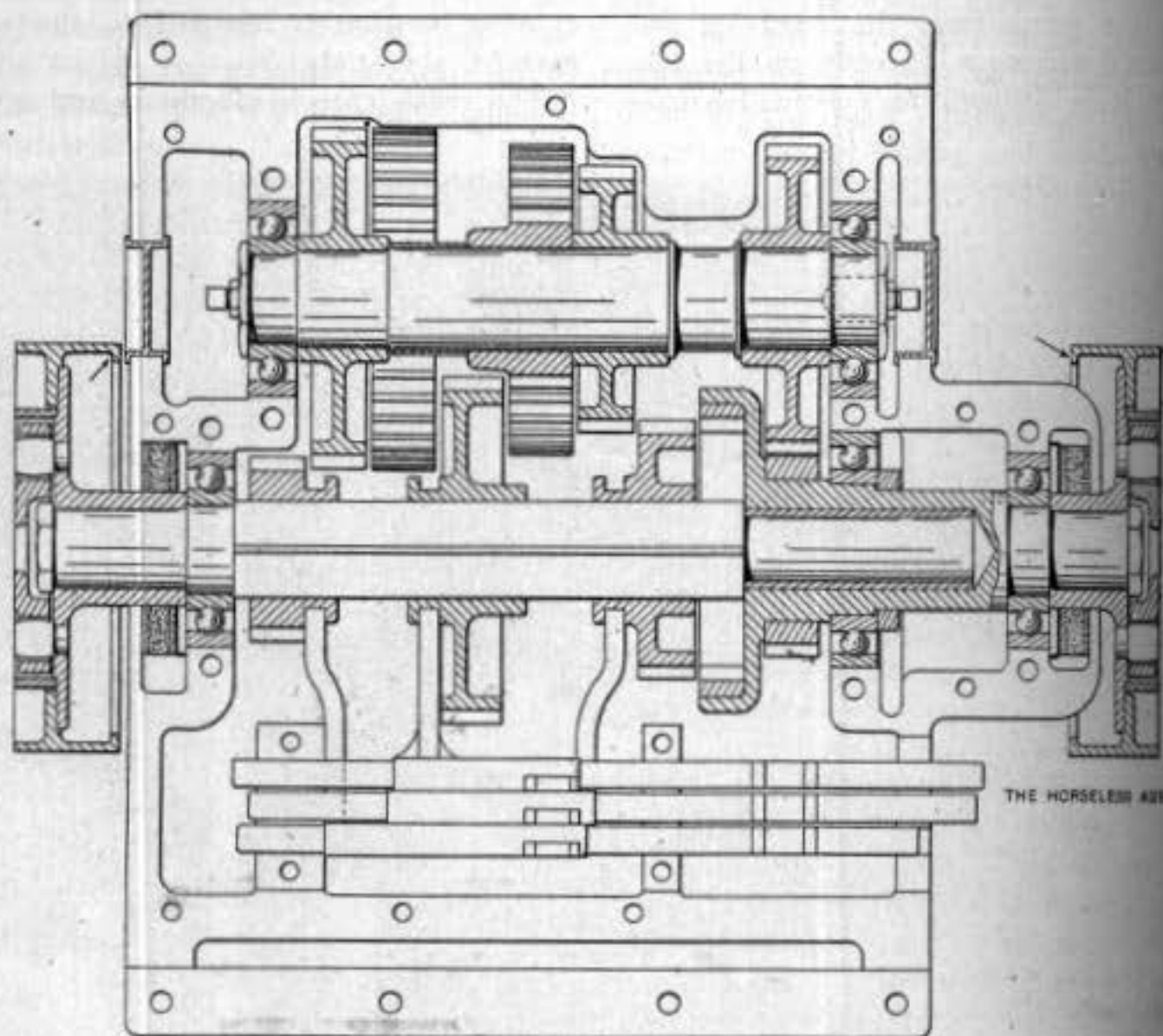
Water is circulated by a centrifugal pump on the right side, whose inlet connects to the bottom of the cooler and whose outlet passes between the cylinder pairs and enters the jackets on the left side, just below the exhaust ports. The stuffing box to the pump is very accessible. The return leads from the top of the cylinders



DE LUXE MOTOR CAM SHAFT, PUMP AND MAGNETO GEARING.

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DE LUXE CHANGE GEARS.

Note Flange on brake drums (indicated by arrows) to retain cooling water.

through a rubber hose to the top of the radiator. This is of the flat tube variety, and the water is circulated back and forth horizontally, first passing in one direction through a given number of tubes, then back through a smaller number, and so on, its passage growing continually smaller from top to bottom. The fan is an eight blade affair of sheet aluminum, runs on ball bearings and is driven from the pump shaft by a spring belt. At the front beneath the cooler is a little lever, the movement of which serves to "tickle" the carburetor float. On the left side are special relief cocks with large ends which may serve for priming cups. These ends are covered by hinged caps, which only open about 60 degrees and are therefore closed by gravity on the suction stroke, preventing the admission of cold air to the cylinder. The relief cock handles are connected, and are opened from in front by turning a small crank below the radiator. Ignition is on the jump spark system, the plugs being located beneath the inlet valves. Current is supplied by a gear driven magneto with attached vibrator, and a storage battery is carried as a reserve.

CLUTCH AND CHANGE GEAR.

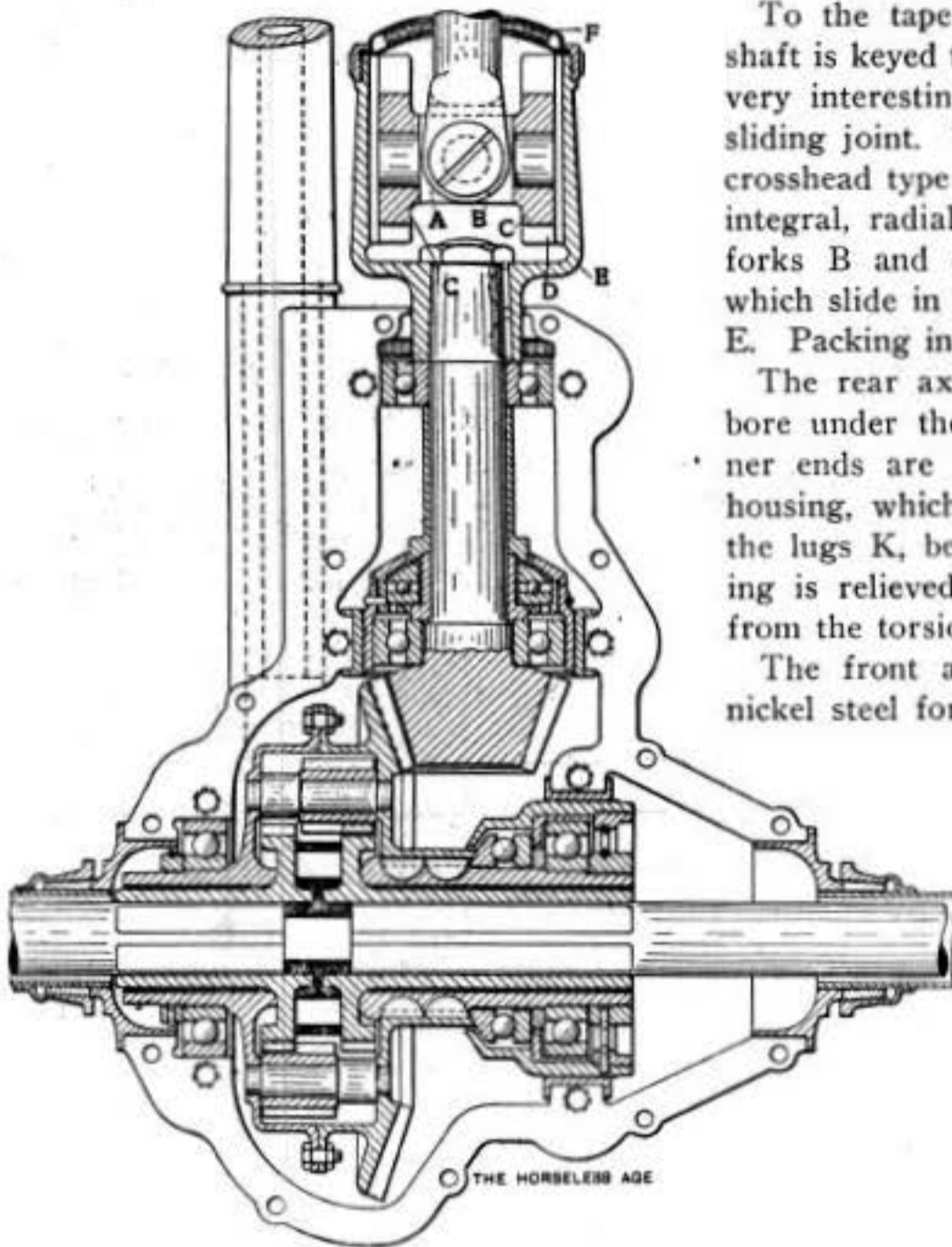
The clutch is a leather faced cone of large diameter and small angle, with a spring under the leather to give gradual engagement. It is pressed into its seat in the flywheel by small helical springs which allow ready adjustment.

The change gear is of the Mercedes type, and gives four forward speeds and a reverse on the selective system, with direct drive on the third speed. All the gear shifting mechanism is enclosed. The hand lever moves over a gridiron quadrant, and a latch operated by a thumb button prevents entering the reverse slot. The shaft runs on large D. W. F. bearings secured to the bottom of the case. Gears and shafts are of a special chrome nickel steel. A large hand hole is provided in the top of the case and if a closer inspection than thus possible is desired, the entire top of the case may be removed and the gears run in full view.

The driving shaft is "universal-jointed" to the change gear shaft, and has a sliding joint at its rear end inside the driving gear housing. It is practically horizontal when the car is loaded. The driving gear housing is so made that its entire top may be lifted off, exposing the driving gears, differential and all bearings. Its lower part has lugs which straddle the rear axle and are bolted to it.

AXLES.

The rear axle construction is unique, and combines the mechanical advantages of the ordinary types of solid and live axles. The axle itself is an I section chrome nickel steel forging A; the ends are forked, the lower and smaller branch forming the bracket for the brake anchor, while the upper forms the spring seat and extends outward in tubular form, making the seat on which the wheel bearings are mounted.



DE LUXE UNIVERSAL JOINT, BEVEL DRIVE AND DIFFERENTIAL.

Thus forging A is in itself a solid one piece rear axle. Each wheel runs on two D. W. F. bearings; an inner bearing B, locked by nut C, and an outer D, locked by nut E. To drive the wheels, brake drum and hub flange H, also outer flange J, have their outer ends cut into a jaw clutch into which clutch F, formed integral on the end of the axle shaft, fits. It is retained by the closely fitting hub cap G.

The inner ends of the axle shafts are squared for a long distance, and fit snugly in the long hubs of the differential gears. The driving gears are of large diameter and large face, and the driving pinion is integral with its shaft. Every adjustment in this entire assemblage may be made and tested for its accuracy with the top part of the case removed.

To the tapered front end of the pinion shaft is keyed the containing member of the very interesting combination universal and sliding joint. This combines the block and crosshead type of joints. Block A has four integral, radial pins. On two of these are forks B and on the others are shoes C, which slide in grooves D integral with case E. Packing in shield F excludes dust.

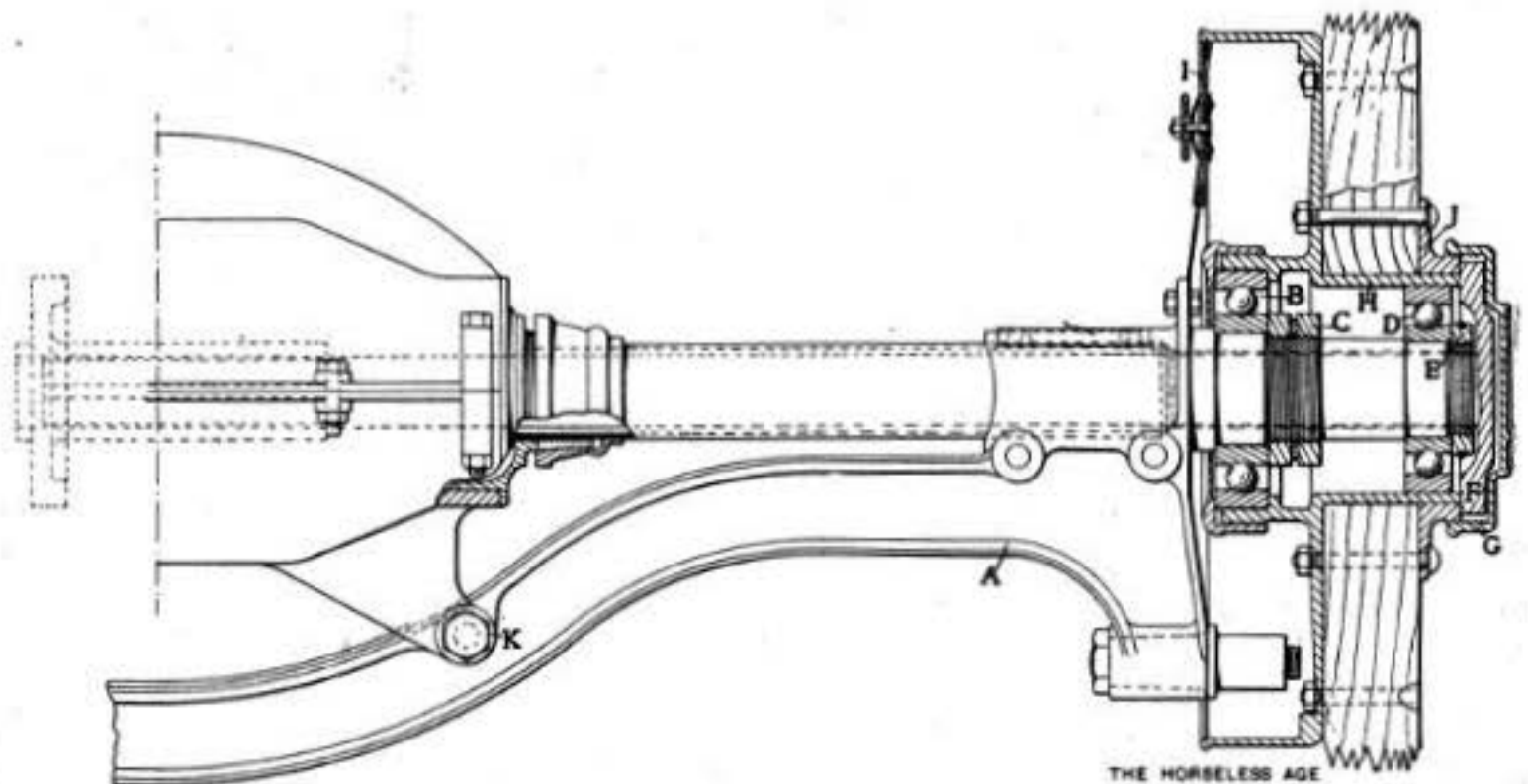
The rear axle tubes fit into an enlarged bore under the spring seats, and their inner ends are secured to the driving gear housing, which is fastened to the axle by the lugs K, before mentioned. This housing is relieved of all strains, except those from the torsion rod.

The front axle is an I section chrome nickel steel forging with Elliott type pivots mounted at both top and bottom on D. W. F. bearings, which take thrust and bearing strains. The front wheels run on D. W. F. bearings. They are 36 inches in diameter and shod with 3½ inch tires, while the rear are 36x4½ inches.

SPRINGS AND FRAME.

The front springs are semi-elliptic, 38 inches long and 2 inches wide, and have 7 leaves. The rear springs are also semi-elliptic, 52x2 inch, with 9 leaves; they are shackled at both ends and the axle is held in alignment by tubular struts with ball and socket joints at each end. The braking strains are taken by a tapered tubular torsion rod with a ball and socket front end between helical springs in a vertical tube attached to a cross member of the frame.

The frame is of chrome nickel steel. The side members are of an inverted U section, with the bottom folded back on itself for one inch. The rear cross member is of the same section, and the underframe is a plain U. The other cross members, which are greatly dropped, are channels. All corners are reinforced by angle braces, and the rear corners have gussets in addition.



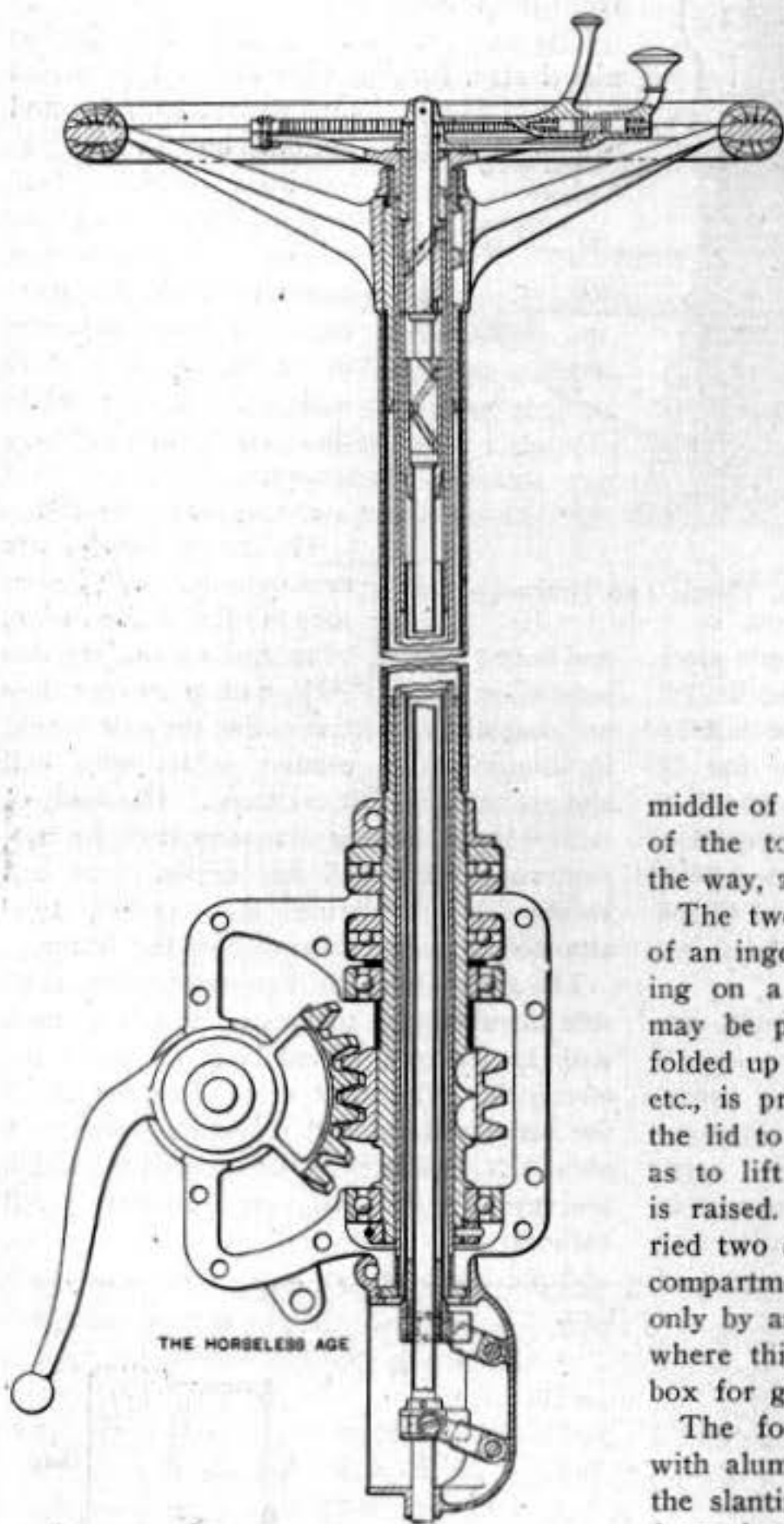
DE LUXE REAR AXLE.

BRAKES, STEERING AND CONTROL.

Three sets of brakes are fitted—one between the motor and change gear, another just back of the change gear, and a toggle-expanded brake in each rear wheel. The forward transmission brake is of the band type, anchored to the sub-frame and kept from dragging by being supported on a cross member. It is applied by the left pedal, which also releases the clutch. The middle pedal is for clutch operating, and nothing else. The rear transmission brake is designed so a shoe is clamped around a drum by the action of two face cams. It is anchored to a cross member of the

worm and connected ball joints, and throttling moving over wheel, and provided.

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DE LUXE STEERING GEAR.

frame and may be adjusted by a thumb screw. It is applied by the right pedal. The wheel brakes are completely enclosed, but are easily adjusted by a large thumb wheel, reached through a readily removable door. They are equalized and are applied by the outer hand lever. All brakes are Gandy faced, and where the car is to be used in a mountainous country a one gallon water tank is fitted to cool the drums of the transmission brakes.

Steering is accomplished by means of a

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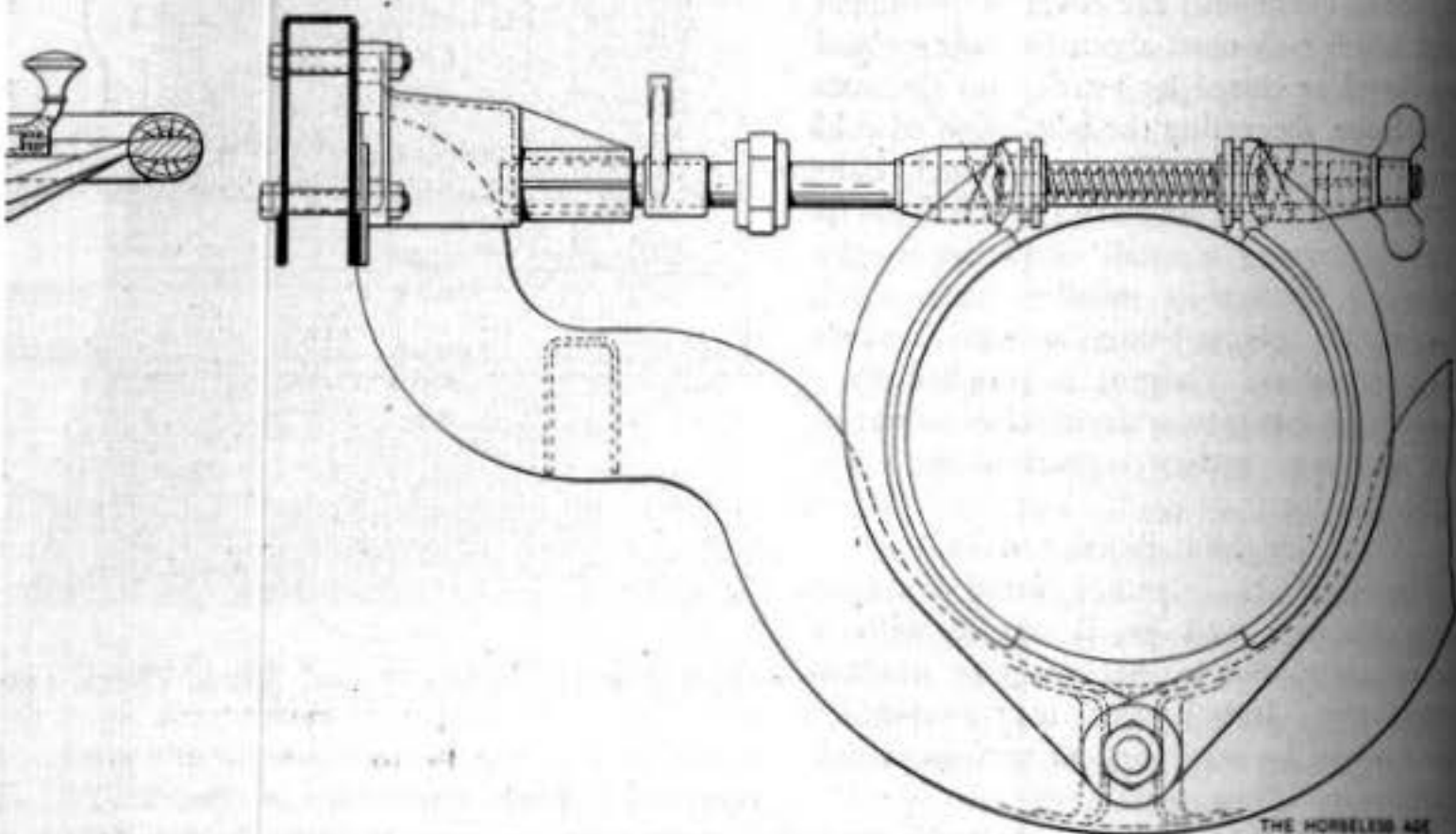
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worm and sector gear whose drop lever is connected by a tube, with spring cushioned ball joints, to the right pivot lever. Spark and throttle are controlled by finger levers moving over stationary sectors above the wheel, and an accelerator pedal is also provided. The dash is of African vermilion with a pressed steel shield.

In the body a straight line effect has been secured without the use of straight lines. The rear corners are nearly square, giving good dust shedding properties, yet viewed from the rear the tonneau has a victoria effect. Handles covered with leather are fitted to the dash at each side and at the



DE LUXE TRANSMISSION BRAKE.

middle of the forward seat, and at each side of the tonneau doors. These doors, by the way, are 24 inches wide.

The two extra seats in the tonneau are of an ingenious folding construction, working on a double jointed bracket so they may be placed in almost any position or folded up out of the way. Space for tools, etc., is provided under the rear seat, and the lid to this compartment is so arranged as to lift automatically when the cushion is raised. Under the front seat are carried two special suit cases made to fit this compartment. The front seat is divided only by an arm, and in the triangular part where this joins the seat back is a little box for goggles and small articles.

The footboards and steps are covered with aluminum. The pedals come through the slanting portion of the footboard, and from there to the rear seat the entire floor is removable, making access to the machinery easy without removing the body. The standard color is blue, with cream running gear and black stripe.

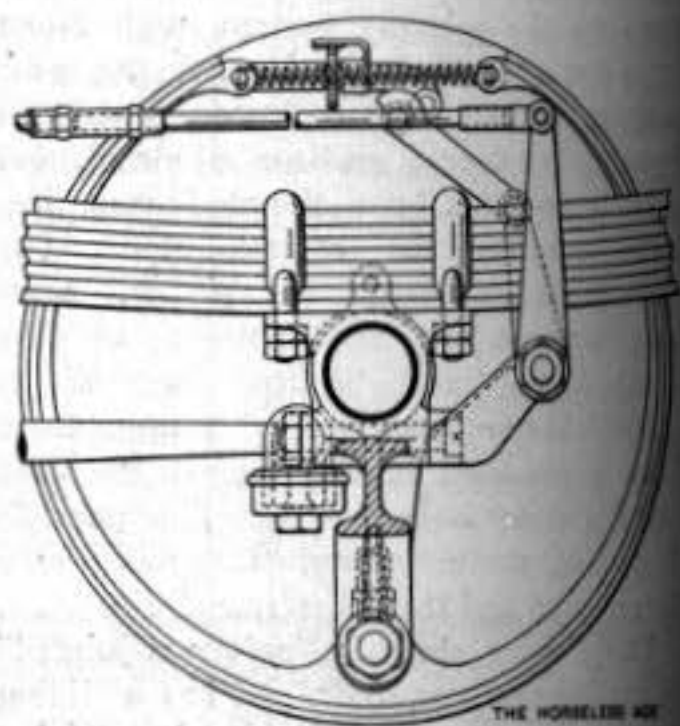
In spite of its large size the car is said to weigh only 2,950 pounds, which weight is made possible by the use of nickel steel not only in the parts named but in all small levers, etc.

The weight limit on racing cars will be removed and instead a fuel limit will be imposed in the Grand Prix race next year.

Napier 1907 Model.

The Napier Motor Company of America, of Boston, are this season confining their production mainly to the 60 horse power, six cylinder touring car which was placed upon the market last season. Some changes are announced for 1907, and certain details are obtainable which have not previously been mentioned in these columns.

The pressed steel frame, with side members of 5½ inch maximum spread, is carried in front upon eight leaved semi-elliptic springs 42 inches in length, and in the rear a platform spring is employed, the side members of which are 46 inches long and



DE LUXE HUB BRAKE.

built up of nine 2 inch leaves. The cross portion of the platform is 36 inches in length and of eight leaves. Special imported alloy steel is used in these springs, and each spring bolt is provided either with a compression grease cup or with a central grease cavity which is closed by a screw. The radius rods, which are centered with the rear axle and universal joint, are steel tubes with ball end bearings.

Shock absorbers form a part of the regular equipment both front and rear. These are of the friction drum type, with very large adjustable wearing surfaces. In this year's car 36 inch wheels are employed, 130 millimetre tires being used in the rear and