

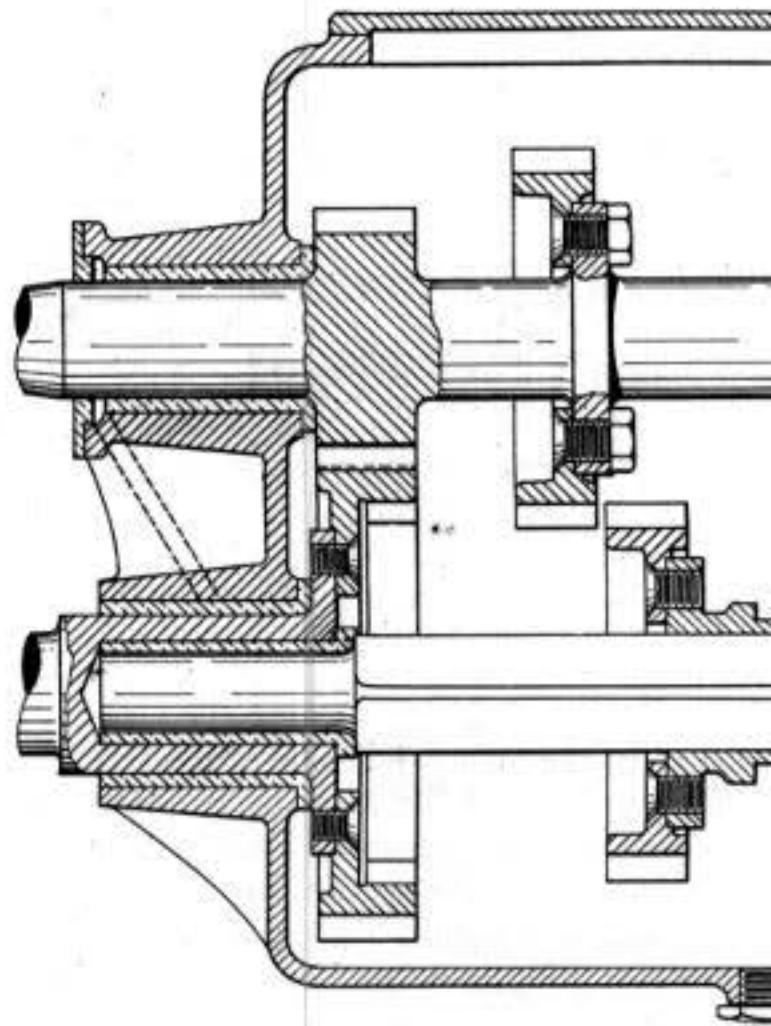
New Vehicles and Parts

New Yale Models.

The Kirk Manufacturing Company, of Toledo, are bringing out two new Yale models. The smaller one is of the double opposed cylinder type, with engine under the front seat, similar to their last year's model, but it is said to embody several improvements in details.

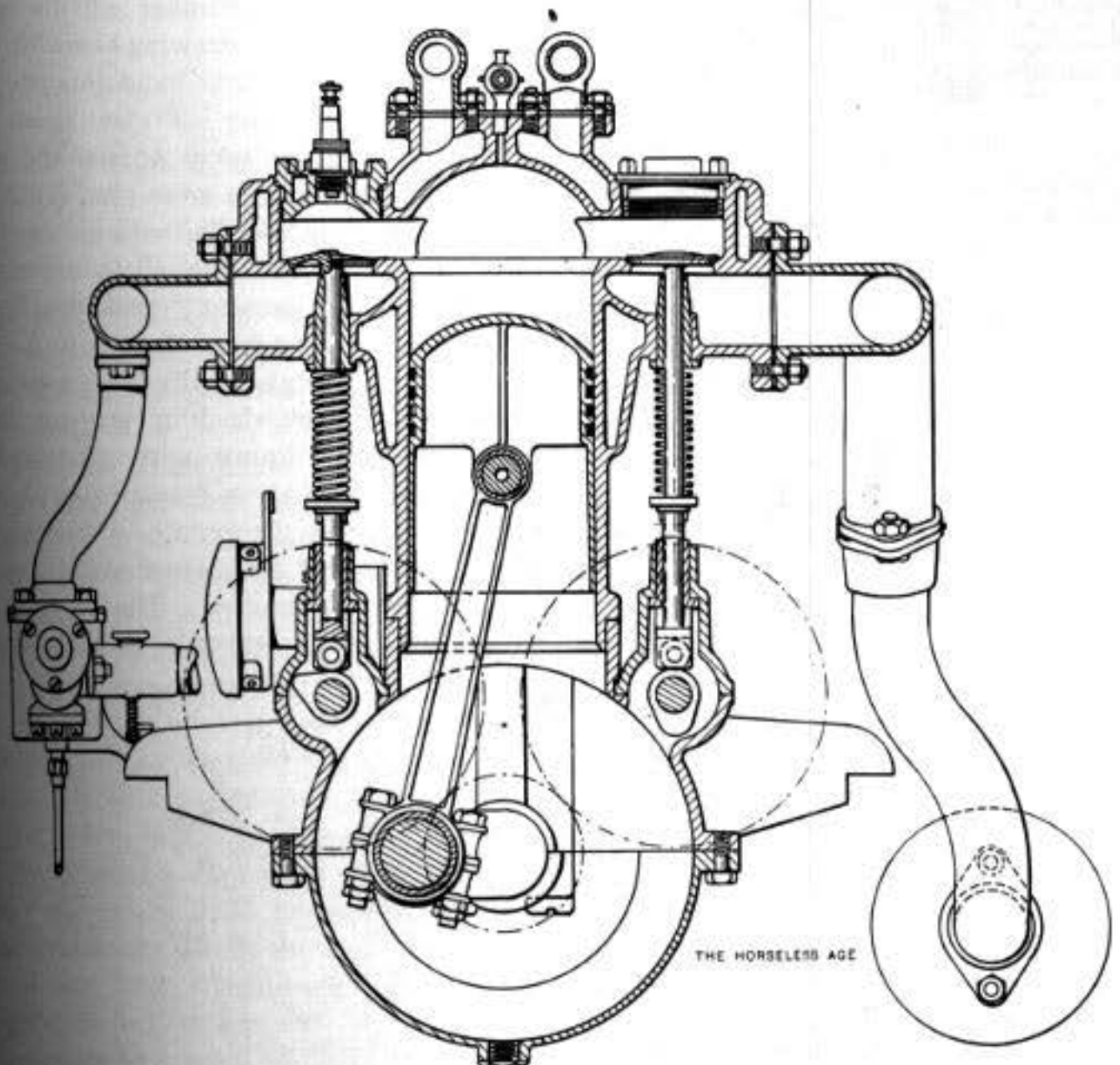
The larger car has a four cylinder vertical engine, rated at 24 to 28 horse power, the bore and stroke of which are $4\frac{3}{4}$ by $4\frac{1}{2}$ inches, respectively. All valves are mechanically operated, the exhaust and inlets being located on opposite sides of the engine. The cam shafts are driven by gears located outside the crank case. The valves are made from single piece drop forgings, and are interchangeable, are $2\frac{3}{8}$ inches in diameter and have $\frac{3}{8}$ inch lift. To obtain a high compression the piston has a high dome. It is 6 inches long and has four rings above the wrist pin, the latter being hollow.

The connecting rod is a drop forging of the regulation I section, with the crank hub slightly offset, and bronze bushed, the upper bearing being $2\frac{1}{4}$ inches long by 1 diameter, and the lower one $2\frac{7}{8}$ by $1\frac{1}{4}$. The cylinders are individual, with integral heads, the jackets extending down to the bottom of the stroke. The crank shaft has one central bearing $2\frac{3}{8}$ inches long. The three bearings are oiled by sight feed in addition to the splash, and the pistons are entirely lubricated by splash. The crank case, cast



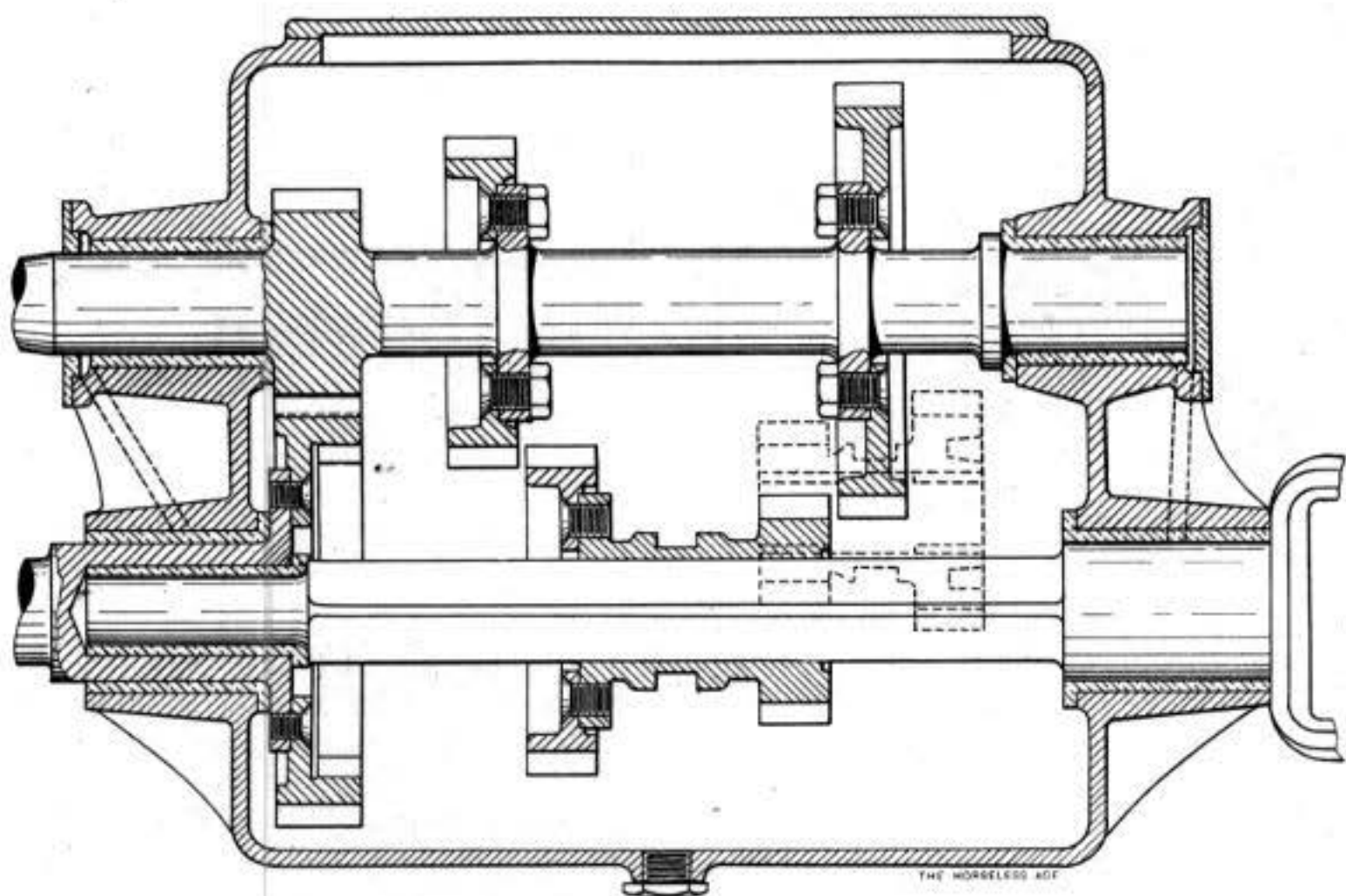
YALE CHANGE

of aluminum is scalloped on the bottom to give stiffness and also to prevent the oil from running from end to end. It is split horizontally, with bearings attached to the upper half. Drain plugs are screwed into the bottom. The cam shafts may be removed without detaching the bottom of the case, as the latter is also horizontally split on the centre line of the cam shaft the upper part containing the tappets, thereby being readily detached by the removal of a few screws. The tappets have a round shank, but square heads containing a roller which bears on the cam, the square part moving in a flat



THE HORSELESS AGE

SECTIONAL VIEW OF THE YALE MOTOR.



YALE CHANGE GEAR BOX.

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track. The shank works through a bronze bushing.

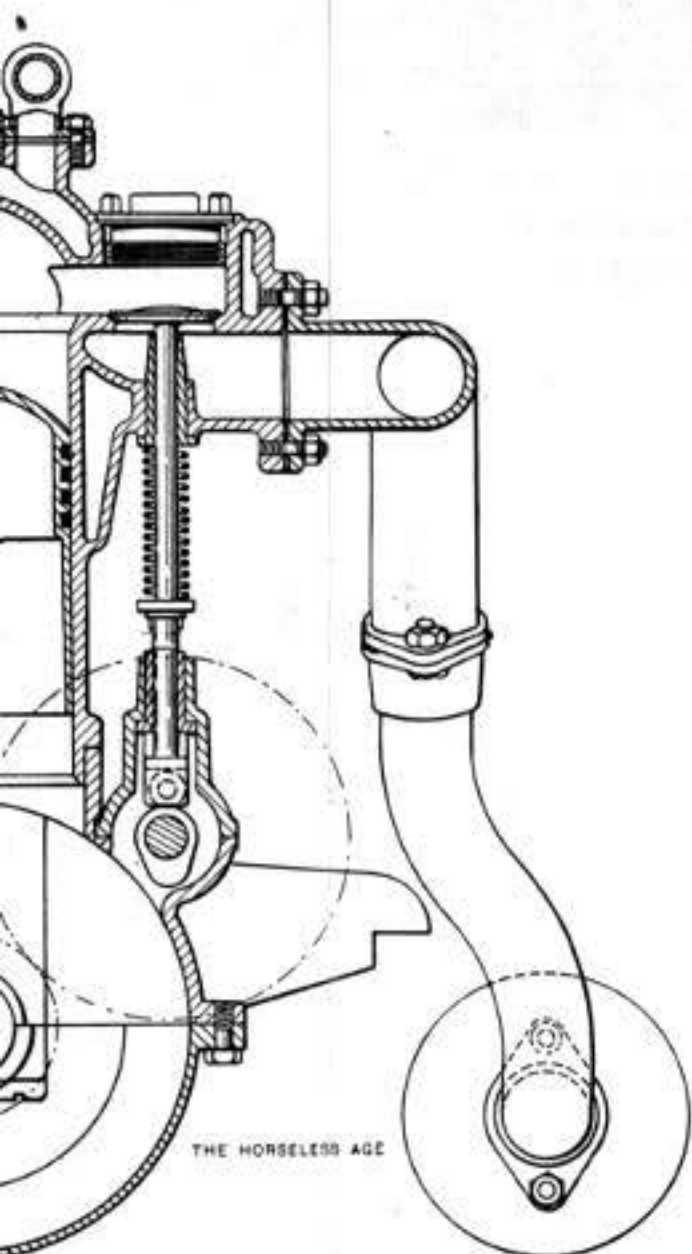
The jump spark plugs are screwed into the plug caps that cover the inlet valves. Both lines of water pipe, ingoing and outgoing, are attached near the top of the cylinders. The flywheel is bolted to a flange which is securely fastened to the crank shaft. Steel bushings through which the bolts pass serve as dowel pins for alignment. The inside of the rim is coned to receive the movable clutch member, the latter being pressed in by a spring and released by foot pressure, a ball bearing taking the end thrust. It is flexibly connected by means of a universal joint with floating member to the change gear group of the typical sliding type, which gives three speeds forward and one reverse. All large gears are bolted to flanges forward on the shafts.

The emergency brake operates on an extension of the counter shaft.

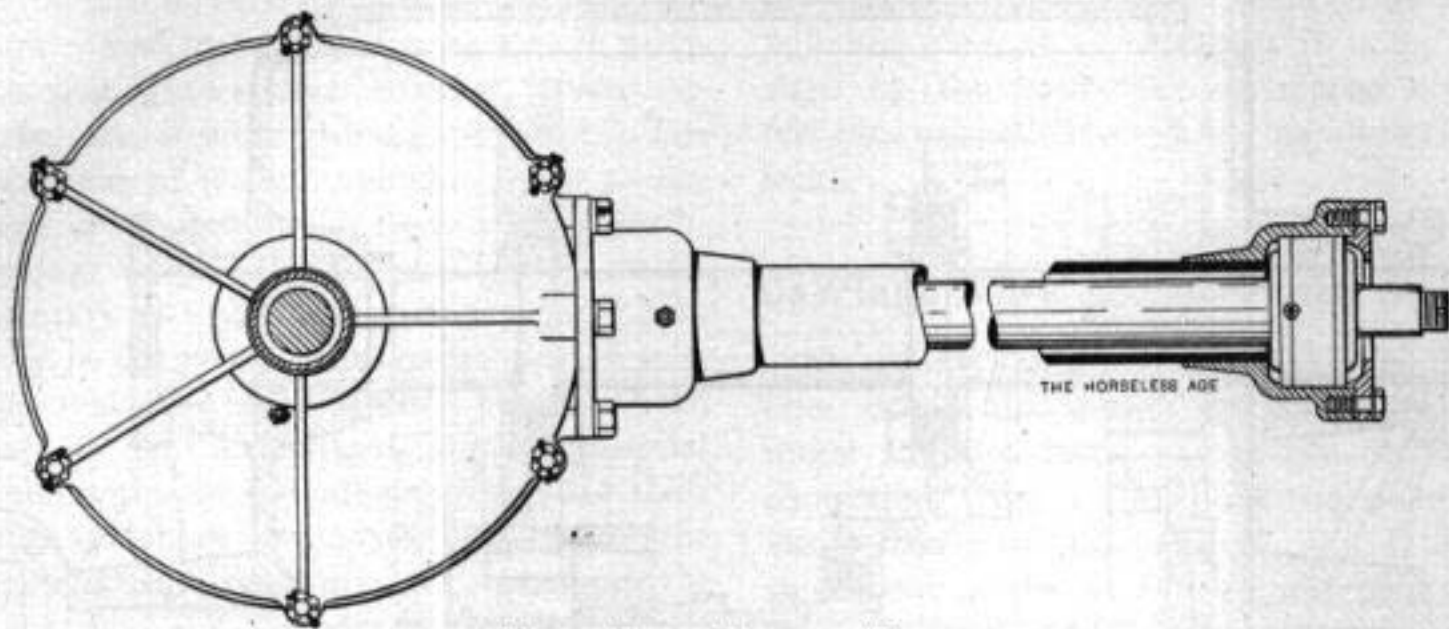
The drive to the rear axle is by Cardan jointed shaft, the pivotal points of the joints all being in the same plane. The bevel pinion has ball thrust and roller shaft bearings. The differential cage also has a side ball thrust and roller bearings for the driving axles, which also turn in roller bearings near the wheel hubs. The rear axle gear case is split vertically and a truss rod runs beneath it. Expanding rings act as brakes on the inside of the brake drums, which form part of the hub castings. The wheels are of wood, artillery type, and are shod with 32x4 inch tires.

The main frame is of 3x2 inch angle iron, while the sub-frame, also of angle iron, is of 2x1½ inch sections.

The vaporizer is of the float feed type, with provision for regulating the mixture to correspond to the change of throttle, but is not automatic, according to the



THE HORSELESS AGE



YALE CAR—DRIVING SHAFT.

present time understanding of the word. Four coils are used for ignition, and the commutator is driven by spiral gears from the cam shaft, and is located at the side of the engine.

The Reo Touring Car.

The new Reo car, of the Reo Car Company, Lansing, Mich., is equipped with a

inches in diameter and have five-sixteenths inch lift. Mr. Olds lays great stress on having the valves on the upper side of the cylinders, as it keeps all oil away from the valves, causing less sticking, pitting, dropping from valve mechanism, etc. There



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