

## CONTROLS

### THE OLDSMOBILE CHASSIS.

By constructing their chassis so that either a touring car, a limousine, or a runabout body can be fitted,

the Olds Motor Works have confined themselves to the production of a single standard model chassis for their three types of 1907 cars. This chassis is fitted with a  $4\frac{1}{2} \times 4\frac{3}{4}$ -inch, 4-cylinder, vertical motor rated at 35-40 horse-power. The motor is much the same as that used last year, its principal feature being the method of lubrication, which is effected by an oil pump that forces oil through passages in the crank case, and continually deluges the main bearings with a liberal supply of lubricant. These bearings are of Parsons white

metal, and they are of exceptional length. A novelty about the clutch is the use of an extra spring between the cone and the flywheel, which makes it possible to let in the clutch more easily, as it forms a spring take-up for the load. The transmission is of the three-speed selective type, and the final drive is by propeller shaft and live floating rear axle. Roller bearings are used in the axle and front wheels. Expanding brakes are fitted in the rear-wheel hub drums, while the regular running brake is mounted just back of the transmission and is of the usual contracting type, lined with camel's hair felt. One of our illustrations (on page 32) shows the runabout with rumble seat, while the other picture, showing the control, displays the rather unusual use of doors at the front seat on the touring car. As can be seen in the latter picture, the spark and throttle control levers are on the steering column below the wheel—a rather unusual place for them on a 1907 model. The spark coil and mechanical oiler are placed upon the dash. The floor boards have several trap doors, thus making the clutch and the transmission easily accessible.

The emergency brake is applied by pulling back on the lever instead of pushing it forward. This is a practice which is in vogue this year on many of the new cars. The Oldsmobile was one of the gold medal winners in last year's Glidden tour, one of these cars, driven by the late Ernest Keeler, having made a perfect score, though driven at a rapid rate over extremely rough roads. One of the 1907 touring cars is at present engaged in a long-distance touring race from New York to Ormonde Beach, which it is expected to reach in time for the races on January 22. The progress has been very slow, however, on account of extremely muddy roads filled with deep sink holes, encountered in Virginia,

### THE ROYAL TOURING CAR AND LIMOUSINE.

The handsome limousine shown on page 33 is the latest product of the Royal Motor Car Company, of Cleveland, Ohio. This company, like many other large automobile concerns, is this year building but a single standard chassis, to which any one of a considerable number of different bodies, such as the limousine

The top of the gear box is visible in the foreground, and above and in front of this are to be seen a couple of toothed sectors. One of these sectors is mounted upon the sleeve that carries the gear-shift lever on the outside of the frame, and when the lever is moved back and forth, the sector revolves a pinion with which it meshes. On the same shaft with the pinion is a second sector meshing with a rack on the sliding gear-shift bar. Through this second sector and rack, therefore, the movement of the gear-shift lever is transmitted to the rod that slides the gears. This arrangement is shown in detail on page 56. It is a positive method of shifting the gears. The brakes used on this car are of very liberal dimensions, and the brake shoes can be readily renewed. The car is provided with sheet-metal pans, which completely enclose the under side of the engine and trans-

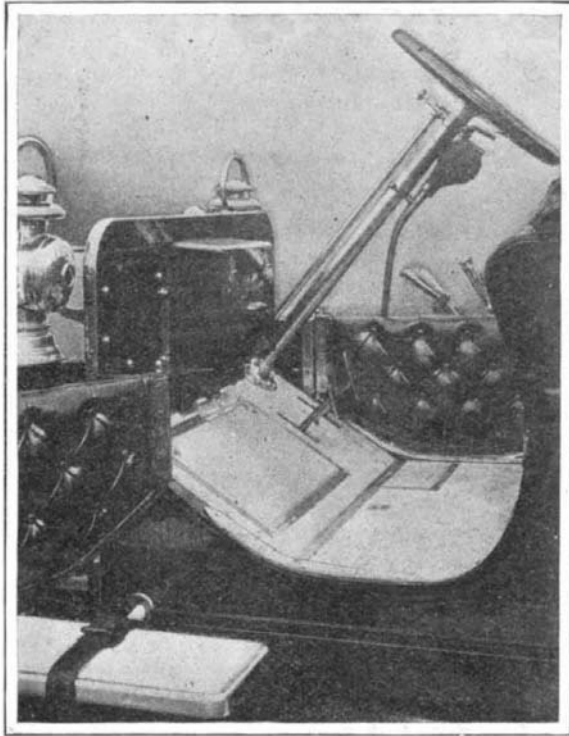
mission. These pans can be readily removed for cleaning, but they are so arranged that adjustments can be made without the necessity of taking them off. Another feature is a ratchet wheel at the rear of the transmission, for the purpose of checking the car from running downhill backward should the brakes fail.

### AN IMPROVED TYPE OF LIVE REAR AXLE.

The rear axle of the new Car de Luxe is similar to that used on the De Dion runabouts for a number of years past. A solid I-beam rear axle, with a downward curve in the center, is used to support the usual form of revolving rear axle contained in an outer tubular sleeve. The rear axle proper has the usual spur gear differential, *D*, with a large driving bevel gear, *B*, attached to its casing, *C*, which is supported upon the I-beam rear axle at points, *F F*. The usual square end drive shafts, *E E*, extend from each side of the differential through holes in the solid axle, *X*, and through the wheels, which they drive through suitable clutches, *K*, on the outside of the hubs. These drive shafts are protected by an outer tubular casing, *H*, which is fastened to the stationary axle, *X*, at the springs and is also clamped to the differential casing, *C*, at the center, thus serving to tie together this casing and the stationary axle. The result is that the inner floating axle, *E*, is thoroughly protected, and its inclosing tubes are rigidly tied to the differential casing and the solid rear axle. The wheels run on ball bearings on hollow spindles, which form part of the end of the solid rear axle.

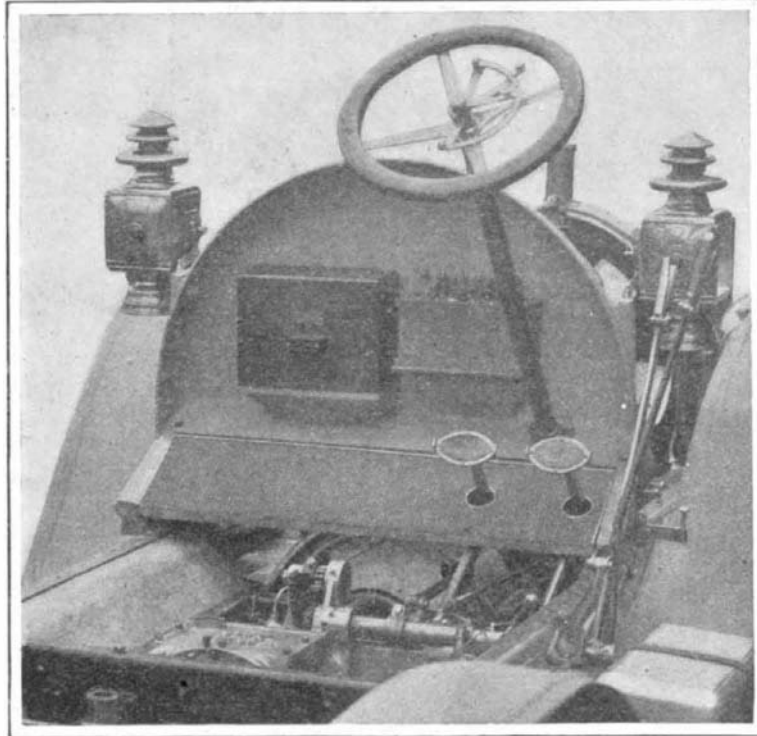
### THE NORTHERN FOUR-CYLINDER 50-HORSE-POWER CAR.

After carefully testing the air-control features during last sea-  
(Continued on page 53.)



DASHBOARD OF OLDSMOBILE, SHOWING CONTROL LEVERS AND PEDALS.

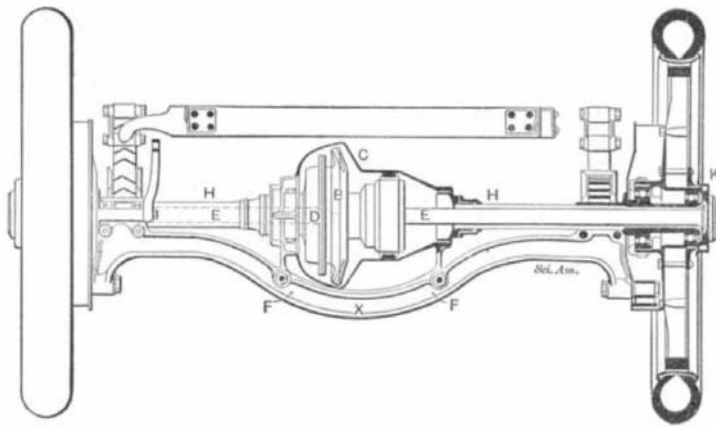
Note the push pedals on long levers passing through slots in floor, the throttle and spark levers on steering column below wheel, and the gear-shift and brake levers at side. Small doors at the front seat entrances are also a feature of this car.



CURVED METAL DASH OF ROYAL TOURIST CAR, SHOWING CONTROL MECHANISM.

The spark coils and oiler are supported on brackets formed in the dash. The pedals are fitted with removable rubber pads and have a downward movement through round holes in the floor boards. The gear-shift lever operates two toothed sectors and pinions (seen at the center) for shifting the gears.

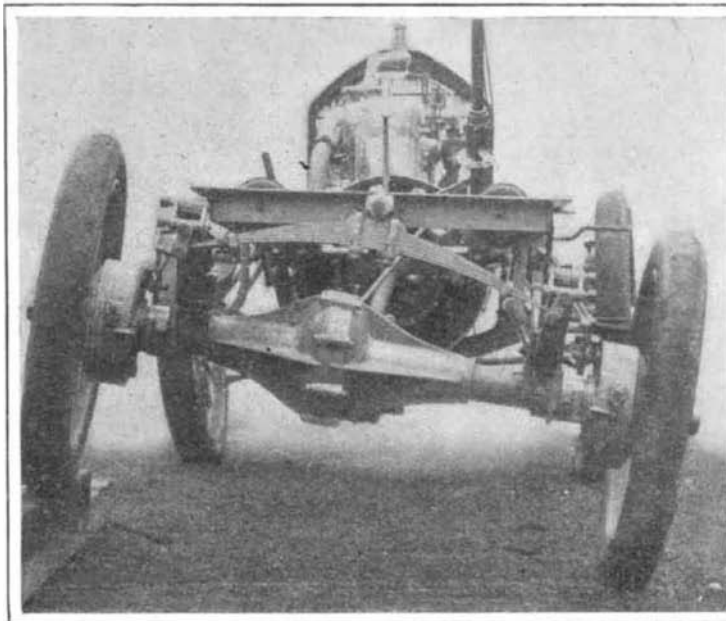
just mentioned, can be fitted. This chassis is built up on a pressed-steel frame which carries a  $5\frac{1}{2} \times 5\frac{1}{2}$ -inch, 4-cylinder, water-cooled engine of 45 horse-power. The picture of the dashboard and control levers,



SOLID I-BEAM REAR AXLE OF CAR DE LUXE, COMBINED WITH FLOATING-TYPE, LIVE, DRIVING AXLE.

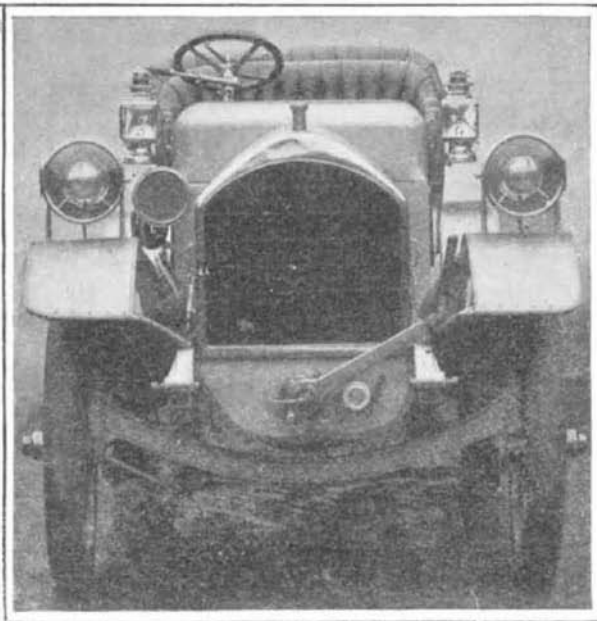
shown herewith, gives a good idea of the neatness and the simplicity of the mechanism. The cone clutch is seen in the flywheel, as well as the two rubber-padded push, pedals that operate the clutch and the brake.

the hubs. These drive shafts are protected by an outer tubular casing, *H*, which is fastened to the stationary axle, *X*, at the springs and is also clamped to the differential casing, *C*, at the center, thus serving to tie together this casing and the stationary axle. The result is that the inner floating axle, *E*, is thoroughly protected, and its inclosing tubes are rigidly tied to the differential casing and the solid rear axle. The wheels run on ball bearings on hollow spindles, which form part of the end of the solid rear axle.



REAR END OF NORTHERN CHASSIS, SHOWING PIVOTED TRANSVERSE SPRING.

The rear axle is of the live floating type, the outer casing being strongly reinforced by ribs, as shown. The propeller shaft is seen running forward to the air clutch in the flywheel. The wide band brakes are operated by compressed air. Grease cups are fitted to all the pivot pins on the springs. By pivoting the rear transverse spring the twisting effect of the latter upon the body is done away with.



FRONT OF NORTHERN CAR, SHOWING LEVER CONTROL ON STEERING COLUMN.

The front axle is a heavy I-beam manganese bronze casting. The tie rod connecting the steering lever arms is behind the axle. A long lever is used for starting the engine instead of the usual crank. Pulling this lever automatically retards the spark. The lever on the steering column below the wheel shifts the gears, while by twisting the grip the clutch can be applied or released. The spark and throttle levers are above the steering wheel. Note also the location of the acetylene lamps on fenders.

charge. A slight comparison of the duties of this valve with the crankshaft of the same engine is interesting. The area of the 5-inch piston is approximately 20 square inches, while the area of the exposed surface of the valve is but a little over one-tenth this amount, being less than 2¼ inches. The bearing surface of the valve shaft extends the full width of the cylinder, whereas the bearing surface of the crankshaft does not total one-half of this amount, because of the crank-sides and crankpins which must be provided for. From this it will be seen that the work done by the valve is but 1/20 the work done by the crankshaft, and yet to provide ample packing surface, the valve diameter and consequent surface is 30 per cent greater than the crankshaft diameter. From this comparison, as well as from the results given in practice, it is readily seen that the life of the valve should be very long under normal usage.

Experiments have been made with tapered valves fitting their bushings as does an ordinary stopcock, but trial of both kinds has convinced Mr. Duryea that even the slight added cost and complexity of the tapered form is not necessary to secure the desired results.

In service, the rotary valve engine runs almost like a steam engine. The mechanical operation of the inlet permits perfect admission of the attenuated charge admitted at low throttle, and secures a wide range of speed because of this smooth running at low speeds, as well as because of the lack of reciprocating parts, which clatter and pound badly at high speeds. The crankshaft bearings are made quite large, and the connecting rods are forged and of so strong a design that high speeds cannot damage them.

The prediction is freely made that this invention is one of the most marked improvements in the four-cycle gasoline automobile motor that have been made in recent years. Mr. Duryea has several patents pending upon this device.

**THE 50-HORSE-POWER NORTHERN ENGINE.**

(Continued from page 25.)

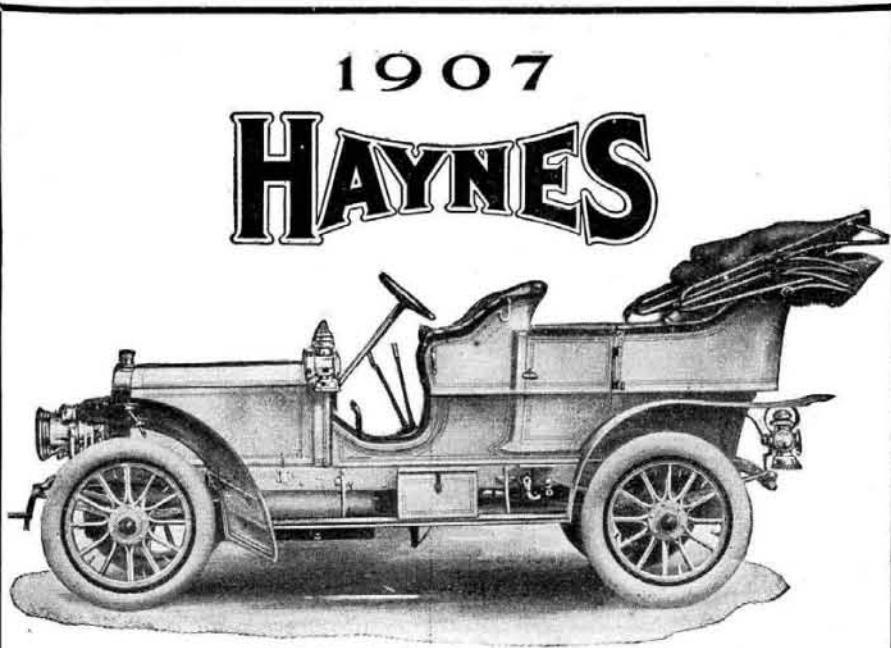
arate steel pan. Nipples screwed into the cylinders just above the highest point of piston travel carry horizontal pipes with three vertical outlets, the center one of which carries a spark plug, the right-hand one a priming cock, and the other a patent relief valve for each cylinder. The relief valves are all connected together so that the chauffeur can, by pulling a handle, put them all in operation when turning over the engine. These valves only open when the compression occurs, and as soon as an explosion takes place, they instantly close.

The motor is started by a long lever having a pawl that engages the teeth of a ratchet wheel on the crankshaft. The movement of the lever in starting the engine automatically retards the spark. The two-to-one gears are shown incased at T, and are used as a water pump to force the cooled water received from the bottom of the radiator through the large pipe, W, leading to the bottom of the water jackets. The bracket for the fan belt pulley, seen at the front end of the engine, is mounted on a vertical spindle that can be raised or lowered by turning the star wheel on top. Thus the fan belt can be easily and quickly tightened. The cylinders of the Northern engine are slightly offset, which gives a more direct thrust on the working stroke.

**A SUCCESSFUL FRICTION-DRIVE AUTOMOBILE.**

(Continued from page 26.)

tenber engine rated at 40 H. P. at 1,000 R. P. M. The timer is shown at T. P is one of the connections between the timer and the base of the steering column, V, for advancing the spark by means of one of the levers that travel over the stationary segment in the steering wheel. The motor is provided with an 8-feed mechanical oiler, which efficiently lubricates it.



**The Haynes Standard 50 H.-P. Touring Car for 1907, Model "T," the highest powered shaft driven car built.**  
Price, \$3,500.00.

THE same attention to mechanical detail, the same care devoted to materials and style and luxury and convenience that has marked Haynes Models for the past thirteen years, is found in those of the coming season.

Exclusive mechanical features in 1907, as in 1906, make it the car of maximum road performance, dependable, reliable, the car the repairman seldom sees.

Send at once for full information and advance specifications, addressing Desk H 1.

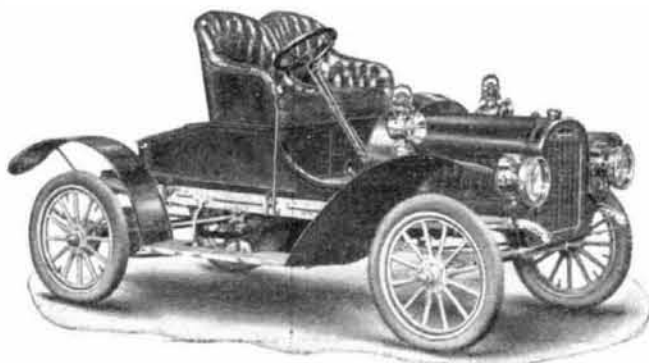
In New York we shall exhibit at the Seventh National Automobile Show, Madison Square Garden, January 12-19, 1907.

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**Model 27, Price \$950.**

Equipped with acetylene head lamps with separate generator, oil tail lamp, and 6-volt 60-ampere storage battery, \$1,000.

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In this is embodied the new Rambler unit power plant comprising a double opposed horizontal motor, planetary transmission and multiple disc clutch entirely enclosed with three-point support.

No moving part of the motor or transmission gear is exposed, and every part is entirely accessible from above.

You will not appreciate the many valuable features of this model without our new catalogue containing complete description of this and other 1907 models. Mailed upon request.

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**Thomas B. Jeffery & Company**

**A NOVEL INDIVIDUAL CLUTCH TRANSMISSION.**

(Continued from page 29.)

the end of the sliding shaft, C, the ends of which press the internal expanding wedge, M, forward, thus causing the four wedge pins, K, to protrude beyond the periphery of the shaft, C, opening the frictions, AA, against the internal wall of the bronze ring gear, B. This action makes the whole mechanism integral. To change the speed the sliding shaft is simply located under any gear desired and the operation repeated. D is the differential from which the jack shaft, J, protrudes from either side, to the sprockets. The reverse is accomplished by an intermediate gear which is located in a pocket at the bottom of the case under another gear (which is shown as not in mesh and on the shaft, E.)

**THE GROUT 35-HORSE-POWER CHASSIS.**

(Continued from page 31.)

tion is by accumulators and a single spark coil. The high-tension distributor is combined with the commutator, C, which is operated by a lever in the steering wheel. The muffler appears at M. The engine and transmission are mounted on an angle steel sub-frame, as shown.

Lever A and B operate the three-speed progressive sliding-gear transmission and the expanding emergency brakes on the rear wheels. The former lever is connected through the horizontal lever, D, with the sliding rod, R, that extends into the gear case, and shifts the gears, while the latter lever, B, when drawn toward the driver, applies expanding brakes in the rear wheels. The pedal, E, operates the contracting brakes on the rear wheel hubs, while the pedal, F, controls the clutch, which is of the ordinary leather-faced cone type. There is a large universal joint, U, between the clutch and the gear box, and the countershaft is provided with Oldham universal couplings between the gear box and the frame. One of the driving sprockets on the countershaft is seen at J. A cylindrical gasoline tank of 15 gallons capacity is placed under the front seat, and the pipe, P, extending from its lowest point to the carbureter, feeds the latter by gravity.

**THE NORTHERN FOUR-CYLINDER 50 HORSE-POWER CAR.**

(Continued from page 34.)

son, the Northern Motor Car Company has placed on the market a 50-horse-power car embodying all the essential features of the air control. Clutch and air control features remain practically the same as last year, with the exception that the parts are increased in proportion to the larger car, which is rated at 50 horse-power.

It will be noticed that the entire control is placed on the steering column, and that all side levers are omitted. The gear-shift lever is placed horizontally just below the steering wheel, and the small lever which operates the shift gears controls the clutch. A slight turning motion of the hand grip on this lever throws in or releases the clutch. It will be seen that practically the same motion that shifts the gears operates the clutch at the same time. The reverse operation is taken care of with the right foot by pressing on a pedal projecting from the steering column. This reverse position is interlocked in such a way that the reverse can only be operated in a certain position of the gears. The transmission is placed on the rear axle. It is very compact, and runs on roller bearings of the Timken type. Easy adjustment and accessibility are marked features of this arrangement. Ball bearings are provided for the steering spindles as well as the worm and segment mechanism, which renders steering very easy.

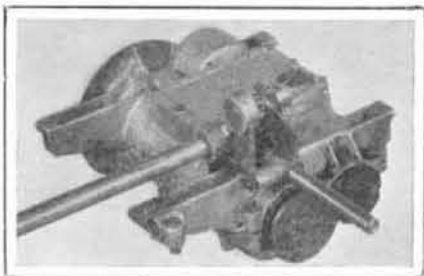
Special attention is directed to the pivotal rear platform spring, which permits of either of the rear wheels passing over an obstruction without imparting any shock to the car frame. It will be

(Continued on page 56.)

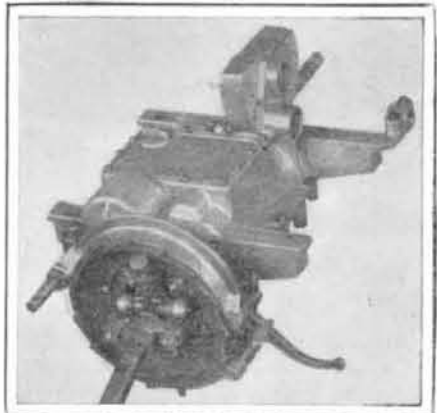


noticed that if one of the rear springs rises over an obstruction, the rear platform spring serves as an equalizing lever, depressing the spring on the opposite side an equal amount. The center, or pivotal point, on the platform spring is not raised, as it remains neutral, and thus no shock is imparted to the body or passengers. With this construction it is claimed that the passengers in the rear seats ride as comfortably as those in the front seats of the car. The rear side springs are 60 inches in length, and serve a twofold purpose as springs and strut rods. These springs, owing to their length, render a support to the frame at points which are well forward and under the load which the car is designed to carry. The wheel base is short considering the high power of the engine, and the turning radius is extremely short, thus making the car very easy to drive through crowded traffic and narrow streets.

The gas lamps are placed on top of the front fenders for the following reasons, which have been worked out and demonstrated in practice: (1) The lamps



FRONT OF ROYAL TRANSMISSION, SHOWING PINION AND SECTOR FOR SHIFTING GEARS.



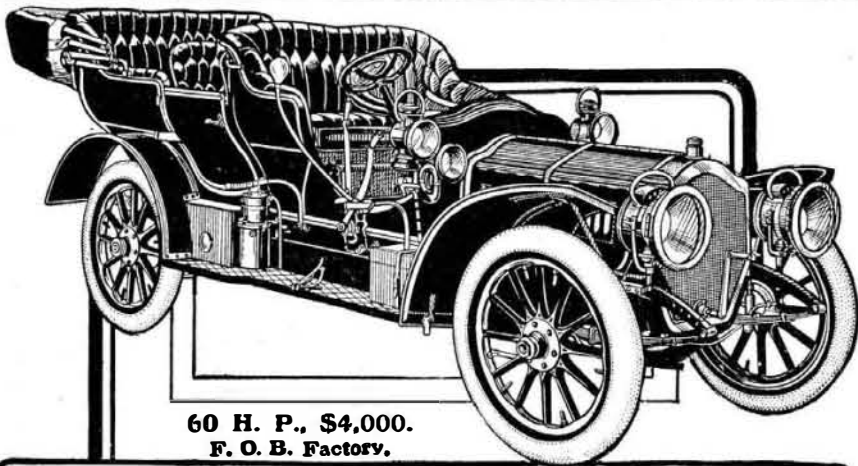
REAR OF ROYAL TRANSMISSION, SHOWING BRAKE, SAFETY RATCHET RING, AND UNIVERSAL JOINT OF PROPELLER SHAFT.

are removed from the point where they are in danger of being smashed in traffic and in collision. (2) The focal plane is materially raised, thus throwing a better diffused light and eliminating long shadows on a rough road, which would be made most apparent with lamps in a lower position. (3) The direct line of travel of the wheels is lighted. (4) The lamps being placed at the outside edge of the car, at once establish to the other driver the clearance that is necessary in passing. (5) The lamps are thus removed from being in close proximity to the starting arrangement, which gives ample room to take care of the initial start of the car.

**SOME INTERESTING MECHANICAL LUBRICATORS.**

(Continued from page 36.)

ing in the cover of the lubricator. In this shank is the stud which bears against the cam, and it may be adjusted by means of thumb nuts to vary the stroke of the piston. The pistons are formed with slots at each side which are not directly opposed. While the piston is being drawn upward, it is rotated to bring one of the slots into engagement with the suction port. This draws oil into the bottom of the cylinder. On the downward stroke, the piston is rotated to bring the opposite slot into registry with the delivery port, so that the oil in the cylinder is then forced out to the points of application.



60 H. P., \$4,000.  
F. O. B. Factory.

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THE reliability of the 60 H. P. Thomas has at once been demonstrated and developed by two vitally important factors.

The use of the car in the hands of more than a thousand owners has proven its reliability; and the invaluable information gained by this experience has perfected that reliability.

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Years of exhaustive experience devoted exclusively to building high-powered cars; a corps of the most eminent engineers in Europe engaged with our own splendid mechanical force; and four of the most perfectly equipped factories in the world—is it surprising that a thousand owners testify to its unvarying reliability?

Last year the 60 H. P. Thomas literally stamped the market. This year with vastly increased facilities history is repeating itself. We are perfectly disinterested in advising you to confer as soon as possible with your Thomas representative.

The Thomas Forty—a fit companion to the Superb 60 H. P. Thomas Flyer, price \$2,750 f. o. b. factory.

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Franklin air-cooling has nothing to freeze; no plumbing to mend; no thawing out or warming up to do, but maintains a perfect cylinder-temperature from the first explosion—on the coldest day, in the hottest weather, and under the hardest driving.

On smooth roads or on rough and heavy mountain grades, through snow, sand or mud, Franklin air-cooling always means great and ready motor-efficiency, relieved of needless weight and thus transformed into the highest ability at the lowest operating-cost and tire-cost. And the light weight Franklin jar-absorbing structure means full power usable on all roads, and a luxury of speed and comfort not known in any other car.

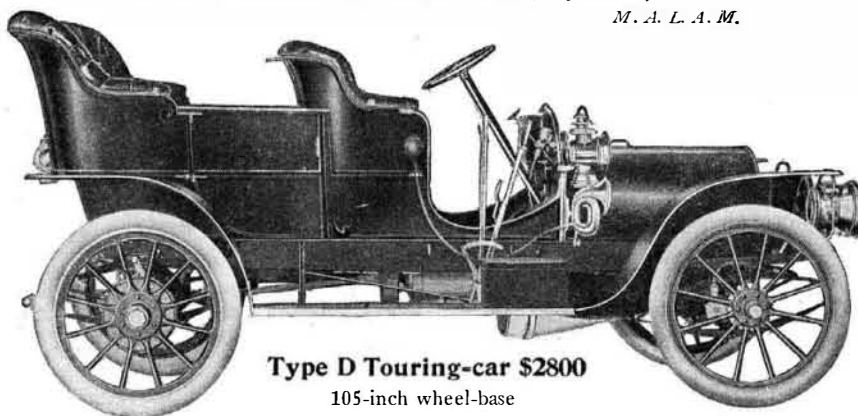
"Motoring Luxury," the subject of the latest 1907 Franklin Catalogue, is not mere upholstering and appointment. It is absolute comfort and enjoyment on long tours, freedom from annoyance, unhampered use of power. Send for this handsome and clear-thinking book; also for Whitman's clever story "Across America in a Franklin."

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4-cylinder Light Touring-car \$1850 6-cylinder Touring-car \$4000

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Special upholstery, equipment and colors extra.

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M. A. L. A. M.



Type D Touring-car \$2800

105-inch wheel-base

**AN INSTRUMENT FOR TESTING SHOCK ABSORBERS.**

(Continued from page 38.)

it may be stated that the second line, No. 10 of Fig. 2 corresponds very nearly with the second line No. 9 of Fig. 1. For the portion of the diagram between a and b the average motion of the car body toward the axle for the diagram of Fig. 2 is 1.12 inches, against the average of the similar motion for diagram Fig. 1 of 0.94 inches. In other words, the average motion toward the axle has been reduced 16.1 per cent. The average motion away from the axle for the same portion of the diagram in Fig. 2 is 1.02 inch, against an average of 0.71 inch in Fig. 1, giving a reduction in the average motion away from the axle of 30.4 per cent.

The total average motion of the car body relative to the axle without eliminators for this portion of the diagram (Fig. 2) is 1.12 + 1.02, or 2.14 inches; while the total average of the same motion when the shock eliminators were applied is 0.94 + 0.71, or 1.65 inches, which gives a reduction of the average motion of the car body while passing over this crosswalk of 22.9 per cent.

The maximum motion of the body toward the axle Z in the diagram Fig. 2 is 2.58 inches, against the similar motion Z in the diagram Fig. 1 of 2.22 inches, or the maximum downward movement of the body was reduced 0.36 inch, or 14.0 per cent. The maximum motion toward the axle Y in Fig. 2 is 2.40 inches, against 1.52 inch in Fig. 1 or the upward motion of the body was reduced 0.88 inch, or 36.7 per cent. The maximum vibration, then, without the eliminators, Fig. 2, was 2.58 + 2.40, or 4.98 inches, against 2.22 + 1.52, or 3.74 inches, in Fig. 1, with the eliminators applied, which gives a reduction in the maximum vibration of the body by the use of the eliminators of 1.24 inches, or 24.9 per cent.

**INDEX OF INVENTIONS**

For which Letters Patent of the United States were Issued for the Week Ending January 1, 1907.

AND EACH BEARING THAT DATE (See note at end of list about copies of these patents.)

Acetylene generator, A. G. Odell.....	\$40,361
Adjustable bracket, G. Cutter.....	\$40,046
Advertising apparatus, K. J. H. Klempau.	\$40,134
Aerial cables, apparatus for erecting, R. S. Peirce.....	\$40,009
Aerial ropeways, clutch for, G. Ceretti....	\$40,109
Agricultural implements, spindle or hub for, W. C. Barker.....	\$40,288
Air brake, L. E. Black.....	\$40,197
Air brake, automatic, A. Parker-Smith....	\$39,881
Air brake safety appliance, W. H. Winks..	\$40,279
Airship, J. Meden.....	\$40,078
Airship, H. H. Johnson.....	\$40,339
Alarm in case of burglary, etc., apparatus for automatically giving, J. Carter....	\$40,432
Amusement device, F. T. Hoover.....	\$40,214
Amusement device, J. E. Cisco.....	\$40,298
Angle-iron and the like into different shapes of curves, machine for bending, E. O. Havig.....	\$40,217
Animal trap, J. Gass.....	\$40,206
Apartment house with disappearing bed, L. Holmes.....	\$39,996
Arch and analogous structure, D. B. Lutten..	\$40,224
Automatic lubricator, M. Klemm.....	\$40,345
Automatic signal, J. Sheeraft.....	\$40,095
Automobiles, radiator for, F. A. Bryant....	\$40,296
Axle box, J. S. Taylor.....	\$40,339
Axle box lid, car, A. C. McCord.....	\$39,871
Axle box lid, car, W. G. Dunham.....	\$39,922
Bag, K. Oswald, Jr.....	\$40,086
Bag fastener, safety, F. E. Jacob.....	\$40,218
Bag holder, J. W. Gregory.....	\$40,316
Bait, trolling artificial, W. D. Chapman....	\$39,917
Ballot and distributor box, secret, G. L. Murden.....	\$40,151
Banding machine, A. Shedlock.....	\$40,022
Bank, portable savings, W. E. Sexton.....	\$40,262
Barrel follower, C. Kuehm.....	\$39,859
Barrel hoop, C. Hoff.....	\$40,212
Bathing hood, R. Stalberg.....	\$40,169
Batteries of electrolytic apparatus, manufacture of elements for, F. A. Decker..	\$39,815
Battery elements, coupling for, F. A. Decker	\$39,817
Bearing, roller, L. P. Walter.....	\$39,873
Bearing, thrust, T. S. Patterson.....	\$39,855
Bearings, adjusting device for cone ball, F. T. Farmer.....	\$40,306
Bed, couch, Frank & Taylor.....	\$40,450
Bell, P. C. Arnold.....	\$40,417
Belt fastener, Reed & Duecker.....	\$39,955
Belt shifting apparatus, N. H. Andersen....	\$39,915
Belt stretcher, W. Baker.....	\$40,191
Bicycle support, E. G. May.....	\$40,357
Blind and fixings for same, multiple roller, H. Graff.....	\$40,313
Blind apparatus, spring roller, W. McLaren	\$39,948
Boats, knockdown sailing attachment for row, C. L. Burgoyne.....	\$40,198
Boiler, M. Davis.....	\$40,114
Bottle tube cleaner, C. S. Knight.....	\$40,221
Bolt extractor, W. McCormick.....	\$40,233
Bosh plate, W. D. Berry.....	\$40,195
Bottle cleansing, process of and apparatus for, E. Wagner.....	\$40,273
Bottle closure, J. W. Zimmerman.....	\$39,977
Bottle corking machine, F. Alexander.....	\$40,100
Bottle, non-refillable, E. Weber.....	\$40,403
Bottle, non-refillable, Gelman & Giannone..	\$40,453
Bottle rinsing, spraying, and brushing mechanism, C. H. Loew.....	\$39,864
Bottle, safety, Wiegand & Brauersreuther.	\$40,031
Bottle tap, W. H. Hommel.....	\$39,930
Box, J. H. Williamson.....	\$40,277
Boxes, press for pressing lids on, A. McHenry.....	\$40,236
Brading machine, E. Ancher.....	\$40,414
Brake and brake rod operating device, G. W. Barlow.....	\$40,183