

than it will percolate through chamois skin. Furthermore, chamois skin does not efficiently separate water from gasoline, automobile superstition to the contrary notwithstanding. Water settles, being heavier than gasoline. Hence the pressure of the inpouring gasoline forces the water through the skin, with the possible exception of a few drops left on the surface. Again, only one out of a hundred new chamois skins is thick enough and uniform enough to remove some water from gasoline; on the other hand, gasoline runs through this kind of a skin very slowly.

The new automatic separator mentioned prevents water from entering the carbureter, even if the gasoline tank is full of water and dirt. When a certain amount of water has accumulated in the separator the gasoline line is automatically shut off, until the water is drained by opening a pet-cock at the bottom of the separator. Water being heavier than gasoline, will naturally settle to the bottom. Therefore, when the pet-cock, which is the lowest point in the gasoline tank, is opened, all the water will run out of the tank through the separator, taking the dirt with it. As soon as the water has escaped, the gasoline line is automatically opened. The motor will start on the first turn of the crank. The gasoline flows downward into the separating chamber and thence upward through an extremely fine mesh wire gauze to the outlet. Clogging of this gauze is impossible because the gasoline flows against gravity.

A NOVEL SPEED-CHANGING GEAR.

(Concluded from page 58.)

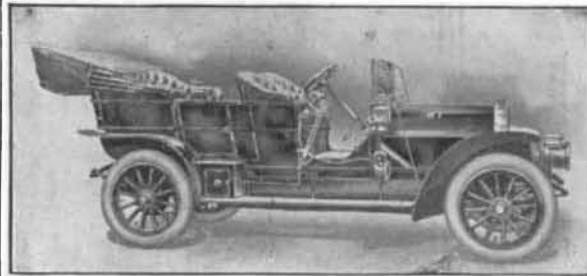
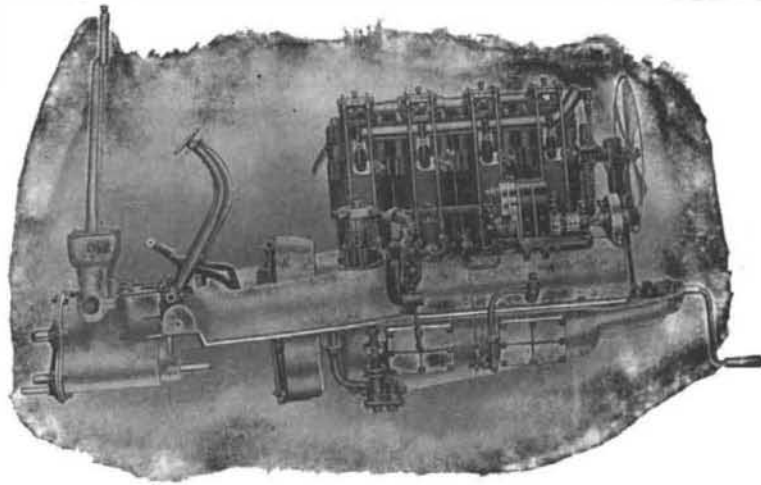
are two lugs which move in the spiral annular grooves in the member *c*. A twist of the conical sleeve *s* by means of the levers *a* will cause them to travel parallel with the shaft and will permit the pawls to engage in the ratchet wheels or will prevent the pawls from thus engaging. The shaft transmits the power through a rigid pin to the ratchet wheel, by which it is in turn transmitted to the four pawls. From the pawls the power is transmitted through the lugs located on the hub of each pawl, or through the disk to which the pawls are attached, to the gear. When the gear is the driver and the shaft is the follower, the power is transmitted in the reverse order.

The clutch *E* is operated when it is desired to drive the countershaft through the gear *A*, but when it is desired to drive the rear axle shaft directly from the engine shaft without going through the countershaft, the clutch *F* can be operated. The lower view illustrates this. The line *x*, the dividing line of the shafts, lies inside of the disk *b*, so that the shaft can never get out of line. The hub of the disk *b* is keyed to the driving shaft by the pin *f*, so that *b* always turns with the driving shaft. The ratchet wheel *d* is keyed to the driven shaft at *e*. The disk *b* forms a part of a casing which holds the pawls *p*. When these pawls are in mesh with the ratchet wheel *d*, the rear axle shaft will be directly and rigidly connected with the engine shaft.

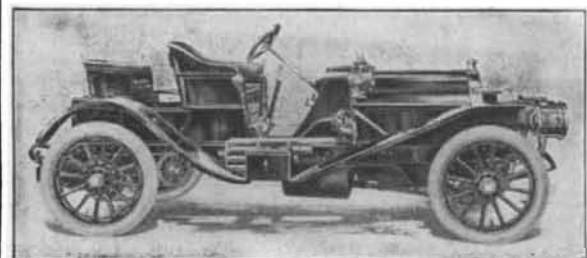
When the engine shaft and rear axle shaft are direct connected, the countershaft and none of the gears are running; all the clutches except *F* are out; and the wheels *A*, *B*, *C*, and *D* are loose upon their shafts. Any number of gears can be used and therefore any number of speeds obtained.

The device furnishes a positive drive with no chance of slippage, without lost motion and with inappreciable wear because the gears run in oil. There is no possibility of stripping because the gears are always in mesh. The pawls in the opinion of Prof. Williston are "superior in strength and reliability to gear teeth as a means of transmitting power," and transmit the load "more nearly in direct compression than is the case with gear teeth." The conical sleeve is about as simple a disengaging and engaging mech-

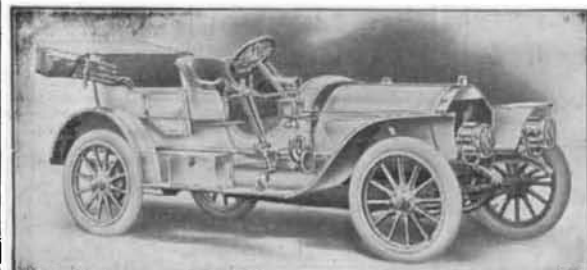
KNOX 1909 MODELS and What Makes Them Go



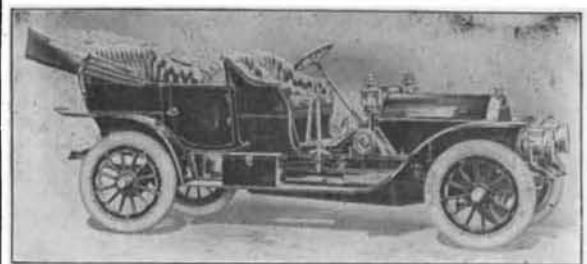
"M" Touring Car



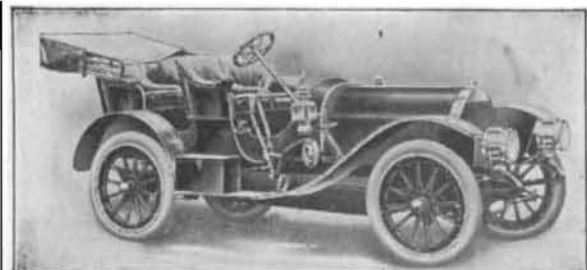
"M" Sportabout (Single Rumble)



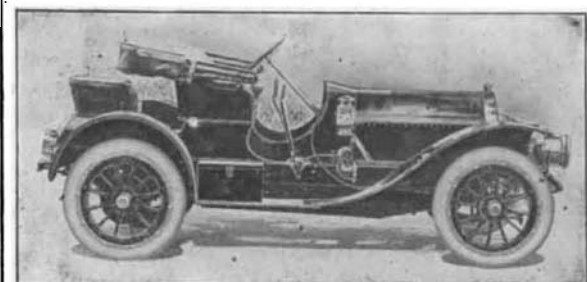
"O" Tonneauette



"O" Touring Car



"O" Sportabout (Double Rumble)



"O" Sportabout (Single Rumble)

KNOX MODEL "M" SPECIFICATIONS

BODY, straight line design, made from steel and aluminum.
 COLOR, auto gray, royal blue, brewster green, carmine.
 UPHOLSTERY, best quality hand buffed leather, in following colors: Gray, black, red.
 MOTOR, Knox water-cooled three-point suspension. 4 cylinders, 5 1/2-inch bore, 5 1/2-inch stroke, made with detachable heads, valves in the head.
 POWER, 55.89 H.P., A.L.A.M. standard.
 TRANSMISSION, selective Mercedes type, four speeds forward, one reverse.
 CLUTCH, three-plate type incased in fly wheel, fitted with cork inserts.
 DRIVE, through bevel gear and side chains.
 IGNITION, jump spark, two complete systems, high tension magneto, vibrating coil and timer, two sets of plugs.
 WHEEL BASE, 127 inches.
 TREAD, 56 inches.
 WHEELS, 36 inch Schwarts make with interlocked spokes.
 RIMS, Flak Demountable, Marsh or Standard Clincher.
 LUBRICATION, De Dion system.
 EQUIPMENT, artificial leather or Mackintosh cloth top, side curtains, folding glass front, mirror lens headlights, generator, baggage rack, square oil side and tail lights, mat, extra rim, tire repair kit, pump, tire carrier, tire cover, jack and full set of tools.

KNOX MODEL "O" SPECIFICATIONS

BODY, designed on latest approved lines, made from steel and aluminum.
 COLOR, auto gray, royal blue, brewster green, carmine.
 POWER PLANT, Knox unit construction three-point suspension.
 MOTOR, Knox water cooled, 4-cylinder, 4 1/2 x 3 1/2 inches, made with detachable heads, valves in the head.
 POWER, 38.025 H.P., A.L.A.M. standard.
 TRANSMISSION, selective type sliding gear, three forward speeds and reverse.
 CLUTCH, three-plate type incased in fly-wheel and running in oil, cork inserts.
 DRIVE, straight line shaft through bevel gear.
 IGNITION, jump spark, two complete systems, magneto and dry cells.
 CARBURETER, automatic.
 WHEEL BASE, 114 inches; front axle directly under radiator.
 TREAD, 56 inches.
 TIRES, 34 x 4 inches.
 RIMS, Flak Demountable, Marsh or Standard Clincher.
 LUBRICATION, De Dion system.
 BRAKES, both acting on rear wheel, separate drums, service brake by foot pedal, emergency by hand lever.
 SPEED, 50 miles with 3 to 1 gear ratio.
 EQUIPMENT, artificial leather top coverings, both seats, side curtains and storm front, 8-inch mirror lens headlights, generator, square oil side and tail lights, flog mat, extra rim, tire repair kit, tire pump, tire carrier, tire cover, jack and full set of tools.

THE KNOX POWER PLANT

The Power Plant is the heart of the automobile and should be the first point to be considered by the purchaser in the selection of a satisfactory automobile.

The motor car with a perfect power plant, although poorly designed otherwise, will give good service some of the time, while the car equipped with a power plant that proves a failure, cannot be depended upon at any time, and is a continued source of trouble, and no matter how perfect the car may be otherwise, it must have a power plant to run at all.

1909 Knox Models not only are perfect in design, equipment and finish, but they have this first and most important step toward the perfect automobile, a POWER PLANT that has proved to be the most efficient and satisfactory, and its ability has been demonstrated fully in contests of 1908.

In Hill Climbs, Speed Contests, long distance races and endurance tests, having defeated 165 cars including every well known make, regardless of power or selling price, and last but not least, THEY ARE WINNERS OF CUSTOMERS.

The Knox Models "O" and "M" cars combine the very latest ideas:

- Unit construction.
- Three point suspension.
- Reliable and economical lubricating system; no smoke or odor.
- Cylinders cast separately, with detachable heads with valves in the head, without cages.
- Straight line shaft drive, made possible by slanting the power plant.
- Three plate clutch, with cork inserts, encased in flywheel.
- Accessibility of all working parts.
- Double system of ignition.

Mr. Dealer: The cars with the most good qualities are the easiest and best to sell.

Write for Catalogue "B."

KNOX AUTOMOBILE CO., Springfield, Mass.

Member A. I. A. M.

anism as can be imagined. The clutch, moreover, can be operated in all positions, which is not the case with sliding gear devices. Any clutch can be operated regardless of the position of the other clutches, so that it is unnecessary to pass progressively from low speed through the intermediate to high speed.

One hand lever only is required to operate all gears. The dotted lines in Fig. 1 indicate shafts leading to hand and foot levers. The hand lever operates clutches *E* and *F* in Fig. 1, which it will be noticed face each other, thereby causing pawl *K* of clutch *E* to be thrown in at the same time pawl on clutch *F* is cut out. In this position the spiral grooves run in the same direction. It is possible to connect the small cranks of clutches *E* and *F* to the same hand lever, and operate both clutches with one movement of hand lever, thus throwing the power from the direct drive to the countershaft or from the countershaft to the direct drive as desired. The low and intermediate gears are operated by foot levers. The low gear has an automatic reversible clutch. If power is stronger to go forward, the forward pawl will engage, and if the power is stronger backward, the backward pawl will engage. For example: If a car is coasting down hill and the engine is working on the low gear forward, the speed of the car is greater against the low gear and acts as a brake.

RECENTLY PATENTED INVENTIONS.

Pertaining to Apparel.

HEAD-COVERING.—W. BERNSTEIN, New York, N. Y. The object of this invention is to provide a head covering for infants and children, arranged to properly fit the head and to allow convenient washing and cleaning of the covering with a view to insure long service and to maintain the covering in a neat and tidy condition.

Electrical Devices.

COMBINED FUSE-PLUG AND CIRCUIT-CLOSER.—F. F. VINDEMORE, Fairview, N. J. Means provide in this case for closing one electric circuit of high potential, by the operation of an electromagnet energized upon the closing of a second circuit preferably of low potential, and more particularly to certain improvements, whereby the circuit closer is combined with the fuse plug, and the two supported upon a single base.

Of Interest to Farmers.

BET-TOPPING MACHINE.—J. N. HANNA and D. K. WAUGH, Ordway, Colo. Swiveled colters are placed at opposite ends of the apparatus and in advance of the guard wheels on the tapping mechanism to cut off tops and trash and assist in guiding the wheeled truck; shovels are arranged having landsides to throw the tops, etc., cut by the colters to the outside of the topping mechanism. Means provide for taking the weight from the wheels as the guard passes over a high beet top and thus prevent the wheels from striking the beet, which avoids breaking the high tops. A mold-board cutter forward of the colters removes to one side all rank tops standing upright.

DEVICE FOR SUPPORTING AND ADJUSTING THE CONCAVE OF A GRAIN-THRESHER.—P. HASTER, El Paso, Wis. The thresher affords inexpensive and convenient means for reliably supporting the toothed concave of the machine in a substantial upright position, in front of the toothed cylinder thereof, and enables the speedy outward rocking adjustment of the concave while the machine is running at full speed, thereby facilitating the tightening of loose teeth thereon or replacing a broken one, as occasion may require.

Of General Interest.

EXTENSIBLE PICTURE-FRAME.—C. VAN DER BOOM, Platte, S. D. The object here is to produce a frame which can be adjusted so as to hold pictures of various dimensions within certain limits. Further, to enable the frame to be hung with its longitudinal axis in a vertical or a horizontal position, and to provide means for removably attaching a supporting leg to the back of the frame in such a way that the frame may rest upon a support with its longitudinal axis in a vertical or horizontal position.

BOTTLE.—F. SONNENFELD and R. FISHER, New York, N. Y. The bottle has a valve-controlled discharge nozzle carried by the neck and communicating within the neck with a tube extending substantially to the bottom of the bottle. In combination with this form a stopper having a valve-controlled passage therethrough is employed, the means for operating the valve being below the top of the stopper, so that it cannot be operated acci-

(Continued on page 69.)

dentially. This passage permits withdrawal after the bottle is inverted of that part of the contents of the bottle which is not forced out through the first-named passage by pressure of the gas.

Heating and Lighting.

FURNACE ATTACHMENT.—F. L. WATSON, Leeds, England. The object of this invention is to provide an apparatus, arranged for cooling the clinkers, cinders, or like hot material discharged from the furnace, for recovering the heat contained in the hot material by heating air, and for forcing the heated air into the fire box of the furnace, to insure complete combustion of the fuel burning in the box.

FUEL-REGULATOR.—C. B. WIESER and F. E. WIESER, Paso Robles, Cal. The cylinder in this invention has a working piston in communication with the boiler pressure, with means in connection with the piston for moving the fuel regulating valve in a direction to cut down fuel supply when the piston is removed by the steam pressure in one direction, and means tending to move the piston in the opposite direction against the steam pressure, the last means being variable, whereby it is possible to maintain desired boiler pressure within certain limits.

Legal Notices

PATENTS

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MUNN & CO., 361 Broadway, New York Branch Office, 625 F St., Washington, D. C.

INDEX OF INVENTIONS

For which Letters Patent of the United States were issued for the Week Ending January 5, 1909, AND EACH BEARING THAT DATE

[See note at end of list about copies of these patents.]

Table listing various inventions with their respective patent numbers, including items like abdominal supporter, acetylene burner, acid making apparatus, etc.



Mechanical engineers of authority who have inspected the Premier plant and observed its shop practice have declared the

Premier

“The Quality Car”

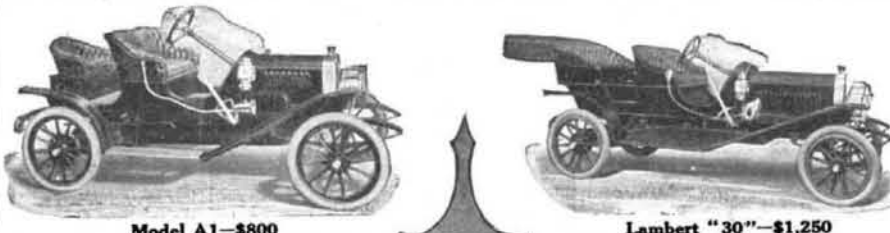
to be “the car of standard practice par excellence.”

While possibly more features of advanced design are found in the Premier than in any other of the leading American cars, you may be assured that they are mechanically correct.

It is this combination of correct design and sound shop practice that gives the Premier its prominence as a simple, reliable and durable car.

Premier Motor Mfg. Co. Indianapolis, Ind.

R. M. Owen & Co. Distributors East, North and Northwest



LAMBERT FRICTION DRIVE CARS

The Economical Automobile

ONE thing, and one thing only, makes possible the manufacture of the Lambert Car at a cost permitting us to sell it at the low price we do.

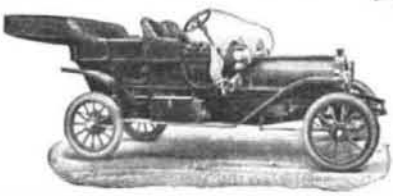
This one thing is the simple Lambert Friction Drive transmission of which the Scientific American has said: “The simplicity of this device is as great as its antiquity. Its cost of maintenance is extremely low, while its reliability is very great.”

The cost of producing this most efficient (proven) transmission is so much lower than the cost of any type of the complicated gear transmission that we can—and do—put more real automobile worth into every Lambert Car than the manufacturer of any gear-transmission car can give for the same money.

The Lambert Car—each of our six models—has a full dollar's worth of power, speed, endurance, style and finish for every dollar of the price—and more too, if judged by ordinary standards. Each Lambert model, from the \$800 Runabout—Model A-1—up to the big roomy 7 passenger Lambert at \$2,000, is a positive leader in its class—the choice of people who “find out” before they buy.

We want you to “find out.” Let us tell you more about the Lambert. Write for catalogue. Address, Buckeye Mfg. Co., 1814 Columbus Avenue, Anderson, Indiana.

Buckeye Mfg. Co., Anderson, Ind.



Model 19—\$1,750



Model B2—\$2,000

Table listing various mechanical inventions and their patent numbers, including items like brooder or foster mother for chickens, brush holder, button setting machine, etc.