Scientific American

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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 verv 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 KNOX simple a disengaging and engaging mech-





"M" Touring Car



"M" Sportabout (Single Rumble)



"O" Tonneauette



"O" Touring Car



KNOX MODEL "M" SPECIFICATIONS

BODY, straight line design, made from steel an COLOR, auto gray, royal blue, brewster gree

CULOR, auto gray, royal olue, browster green, carmine. UPHOLSTERY, best quality hand buffed leather, in following colors: Gray, black, red. MOTOR, Knox watercooled three-point ampen-sion. 4 cylinders, 52, finch bore, 52, finch arons, made wijh detachable heads, vaives in the head. POWER, 52,89 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 bavel gear and side chains. IGNTION, jump spark, two complets systems high tension inageneto, vibrating coll and timer, two sets of plays.

where so in the second second

RIMS, Fisk Demountable, Marsh or Standar

Clincher, LUBRICATION, De Dion system. EQUIPMENT, artificial leather or mack elobit jon, sude curatians, folding glass front, leas headlights, generator, baggage rack, son aide and tail lights, may extra rim, titre repai pump, tire carrier, tire cover, jack and full

KNOX MODEL "O" SPECIFICATIONS

BODY, designed on latest approved lines, COLOR, auto gray, royal blue, brewster green, carmine. POWER PLANT, Knox nnlt construction three point suspension. MOTOR, Knox water cooled, 4-cylinder, 47-8x43-4 inches, made with detachable heads, valves in the

ches, made with descutate and the sed. POWER, 38.025 H. P., A.L.A.M. standard TRANSMISSION, selective type aliding

TRANSMISSION, selding and a solid selding gear. thread of the solid selding selding gear. In the solid selding selding selding gear. In the solid selding s

nder radiator. TREAD, 56 inches. TIRES, 34 x 4 inches RIMS, Fisk Demou untable, Marsh

lincher. LUBRICATION, De Dion system. BRAKES, both acting on rear wheel, rums, service brake by foot pedal, eme:

Frums, service brake by foot pedal, emergency hand lever. SPEED, 60 miles with 3 to 1 gear ratio. EQUIPMENT, artificial leather top cover both seats, side curtains and storm front, 8, mirror lens headlights, generator, square oil alda isil lights, fibre mait, extra min, the repair kit, pump, the carrier, the cover, jack and full se 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.

of a satisfactory automobile. The motor car with a perfect power plant, although poorly de-signed otherwise, will give good service some of the time, while the car equipped with a power plant that proves a failure, can-not 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 1909 Knox Models not only are perfect in design, equipment and inish, 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 satisfac-tory, and its ability has been demonstrated fully in contests of 1908 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 CUS-TOMERS.

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

Reliable and economical lubri-cating system; no smoke or odor.

Cylinders cast separately, with detachable heads with valves in

Straight line shaft drive, made possible by slanting the power

Unit, construction,

the head, without cages.

Three, point suspension.

latest

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,

BEET-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 AD-JUSTING 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 Intere EXTENSIBLE PICTURE-FRAME.-C. VAN DER BOOM, Platte, S. D. The object here is to produce a frame which can be adjusted so to hold pictures of various dimensions 88 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 valvecontrolled 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.)

"O" Sportabout (Double Rumble)



"O" Sportabout (Single Rumble)

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." AUTOMOBILE CO., Springfield, Mass.

Member A. L. A. M.

plant.

dentally. 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 in vention 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

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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:]

Barrel stand, R. Dumesnil Barrels, machine for cutting head linings for, L. Y. Williams Bath-tub trap and outlet construction, J. F. Eichenlaub Bearing, ball, G. O. Leopold. Bed-spring, W. W. Vincent Beds, etc., gate for, H. & A. Thurm.... 909.045



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The Economical Automobile

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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 doput 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-1-908,872 908,524 up to the big roomy 7 passenger Lambert at \$2,000, is a positive the choice of people who "find out" before they buy.

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