

National

1908

National

MOTOR CARS

NATIONAL MOTOR VEHICLE CO.
INDIANAPOLIS, IND., U. S. A.

General Offices and Main Factory: E. 22d St. and Monon R. R.
Factory No. 2: W. 23d St. and Belt R. R.

MEMBERS AMERICAN MOTOR CAR MANUFACTURERS ASSOCIATION, NEW YORK

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1900
1904

rs, 5 x 5 inches

National Motor Cars



Front View New Pattern
"Straight Line Radiat"

M

THE present National cars, the result of seven years' experience in Motor Car construction, are similar in general design to their predecessors, improved and refined in all details to the highest possible degree.

By adhering to the one general principle of construction it has been possible to develop a car which is admirably suited to American roads and which affords flexibility, control, power, speed, durability and comfort required by the most exacting purchaser.

National motor cars are
is equipped with
essary adjunct

in our own motor plant, which
modern type of machinery, a
action of high class, accurate work.

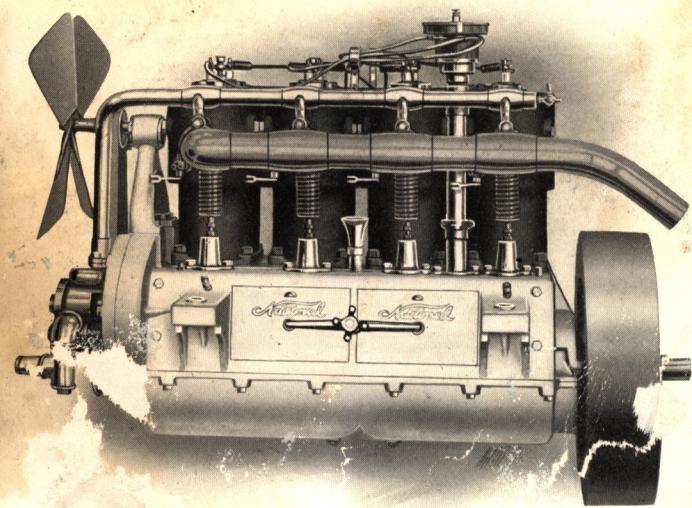
As well as the four cylinder Nationals are continued
models K and N, while the present popular
six cylinder Models R and T proves the wisdom
of the six cylinder type of construction, placing the
American six cylinder stock touring car on the market
in the following year.

National Four and Six Cylinder Motors

Motor National four and six cylinder motors are of the four cycle, high compression type, mounted on the sub-frame under the hood in the front of the car. The ratio of the power to the area of the cylinders exceeds that of any other make of motor on the market. The integrally cast cylinders mounted on the upper half of the aluminum crank case are vertical and water cooled. The motors in Models K, N and T have separately cast cylinders, while in Model R the cylinders are cast in pairs.

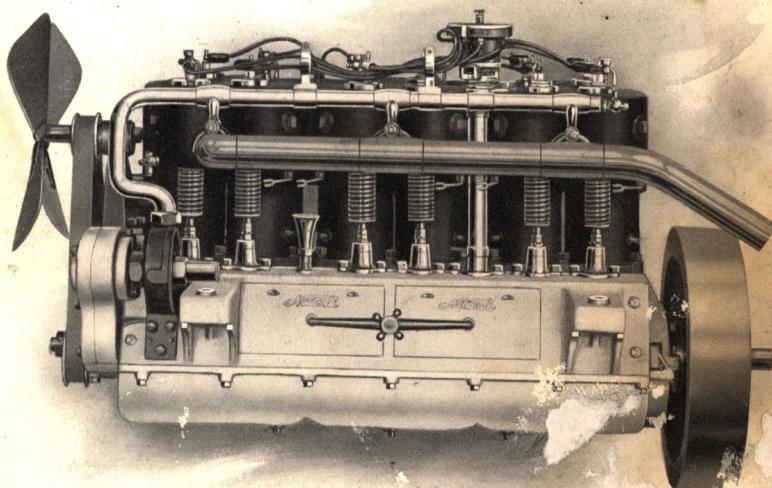
After the first machining the cylinders and pistons are annealed to relieve the castings of all strain, after which they are finished and ground. The interchangeable nickel steel admission and exhaust valves of liberal dimensions on opposite sides of the cylinders are mechanically operated by two separate ball-bearing cam shafts. Each cam shaft revolves inside of the engine case in annular type D. W. F. ball-bearings and can be removed without removing the lower half of the crank case. The valve lifters have large wearing surfaces and are adjustable to thus insuring silent running after long service.

The crank shaft is a steel bar, hammered and bent into shape and consequently is much superior to the drop forged shafts so commonly used or t



V Motor, Four Cylinders, 5 x 5 inches

those cut out of solid slabs. It revolves in large imported D. W. F. annular ball-bearings, and has a ball thrust bearing at its forward end. Each bearing is held in place by a cap, and the lower half of the crank case can be removed without disturbing the shaft or its bearings. Tapered and ground nipples are used in attaching the admission, exhaust and water pipes, thus eliminating the troubles due to packing. The removal of the yokes on each side of the engine detaches the admission, exhaust and water systems as desired.



National

Model R Motor, Six Cylinders

The valve caps over both the intake and exhaust have a tapered seat and are ground in. They are held in place by bronze threaded rings, thus avoiding troublesome leaks and loss of compression. Each cylinder is equipped with relief, drain and priming cocks.

The oil tight aluminum crank case is partitioned into compartments, effectually preventing an excess accumulation of oil at one end of the case in ascending or descending a steep grade.

The drop forged connecting rods are fitted with Parsons white bronze adjustable bearings. Each bearing is held by four studs, which are readily accessible through two inspection ports of liberal dimensions conveniently located in the side of the crank case, which may be easily removed by releasing a hand wheel.

The pistons are fitted with exceptionally large, hardened hollow wrist pins and have four compression rings, each of which are carefully ground on three sides. The wide faced spiral gears operating the ball-bearing cam shafts are encased in a separate compartment, accessibly located at the front end of the crank case.

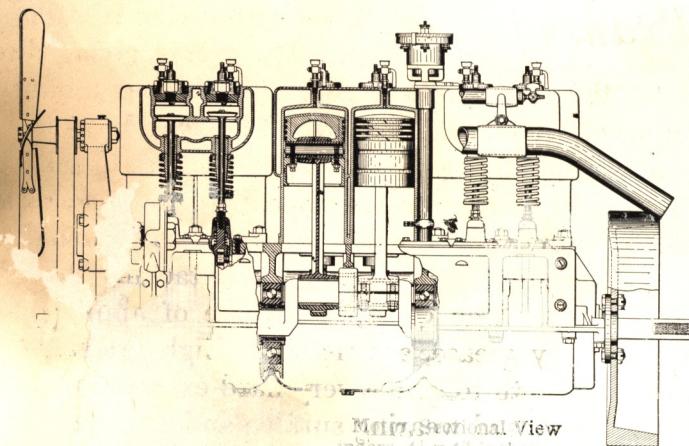
The exhaust pipe is so constructed as to eliminate all troubles from expansion and contraction due to its changes in temperature. The use of ball-bearings on the crank shaft and cam shafts materially increases the power by reducing friction. They require no adjustment, are very economical of oil, and allow of extremely long connecting rod bearings in a short motor.

To dispense with troublesome key-ways the fly wheel is bolted to a flange on the crank shaft.

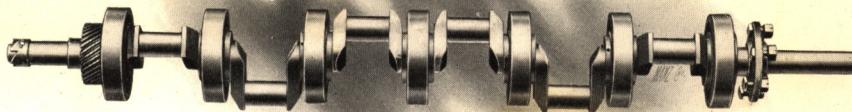
Radiator and Cooling System

large filler cap is furnished at the option of the purchaser. Each shape presents an attractive appearance, and with their greatly increased radiating surface have remarkable cooling qualities. A large ball-bearing fan with an eccentric belt tightener is mounted on the engine base behind the radiator and draws a powerful current of air throughout its entire area. The water is circulated by a pump so located that it is readily accessible

The well known National round radiator or the new National straight line radiator with oval top and



Motor, Sectional View
Cylinders, 4½ x 4½ inches



National Six Cylinder Model T Crank Shaft with Bearings

kept engaged by a heavy, adjustable, spiral spring until released by the clutch pedal or simultaneously with the application of either brake. The flexible, sliding, double universal clutch coupling connects it with the main transmission shaft and permits the removal of the clutch without disturbing the transmission.

Transmission

The transmission is of the selective, sliding gear type, with three speeds forward and one reverse, giving direct drive on high speed. The main and countershafts are in the same vertical plane, the former mounted on three and the latter on two large annular type non-adjustable ball-bearings. The rear bearings on the main shafts are self-contained in a tubular cylinder and the whole enclosed in a rigid oil tight aluminum case. The case is fitted with a large hinged inspection plate accessible through the floor of the car and is so divided that the main and countershafts, with their gears and bearings, may be readily removed without detaching the case from the sub-frame to which it is bolted. The gears, which are oil or heavy grease are made of brass in proportions and are submerged in machine steel, case hardened to a while maintaining a soft core, thereby providing a hard wear

Clutch and Coupling The self-contained, aluminum, leather surfaced cone clutch is fitted with eight flat springs placed under the leather in recesses cut in its face. These springs permit the starting of the car gradually, and entirely eliminate all sudden strain on the driving mechanism. The clutch is



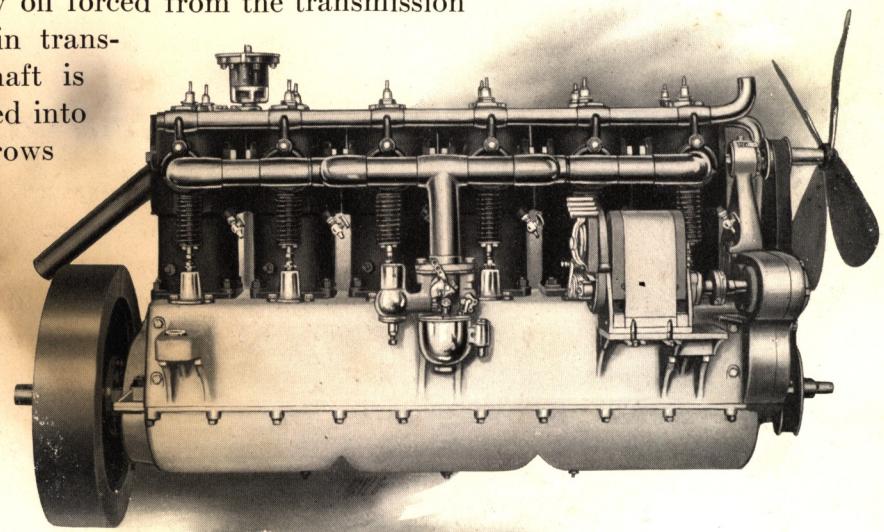
National
Crank Shaft
Bearing

The double reduction reverse, which allows a very slow backward speed, remains disengaged when not in service. Each of the two sliding pinions is shifted by separate shafts extending from the front of the transmission case through packing boxes, and operated by a single speed lever.

Universal Joint and Driving Shaft

shaft, transmitting power from the motor to the rear axle in nearly a horizontal line. Lubrication for this joint is supplied by oil forced from the transmission case by means of a spiral groove on the main transmission shaft. The driving or propeller shaft is enclosed in an extra heavy seamless tube brazed into the spherical gear case, and revolves on two rows of large annular type ball-bearings; one bearing is inside of the gear case, with a ball thrust bearing back of it, and the other at the forward end of the tube, where the shaft, tube and universal joint are supported by a special swivel device bolted to the center cross member of the main frame in such a way that all strain is relieved in traveling over rough roads. A four-pitch, nickel steel bevel pinion fitted to the driving shaft, inside of the gear case, engages the large driving gear and is readily accessible through the opening in the top of gear case.

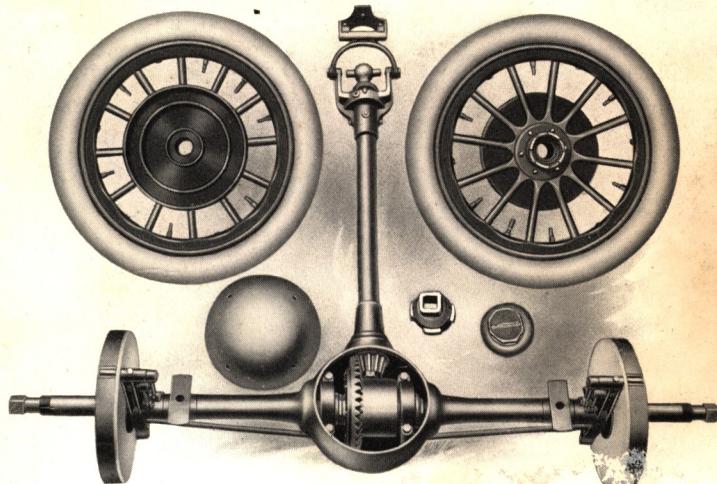
An enclosed, sliding universal joint connects the main transmission shaft and the driving



National Model T Motor, Six Cylinders, 5 x 5 inches

Front Axle

The front axle, of heavy, seamless, cold drawn tubing, is fitted with extra heavy forged steering knuckles and deep drop yokes. The knuckles are secured to the yokes by large steel bolts, which pass entirely through both yoke and knuckle and are securely fastened by a nut and cotter pin at their lower ends, the weight being carried on ball thrust bearings at the top of the yokes. The steering knuckles are connected by an extra heavy, adjustable connecting rod in front of the axle. Each spindle for the front wheels is equipped with two large annular type ball-bearings. The fore and aft steering is controlled by means of an inclined steering post fitted with a non-reversible steering chuck of the adjustable gear and sector type. The drop yokes with their ball-bearings, the improved steering chuck and the large hand wheel combine to make a remarkably easy steering car.



National

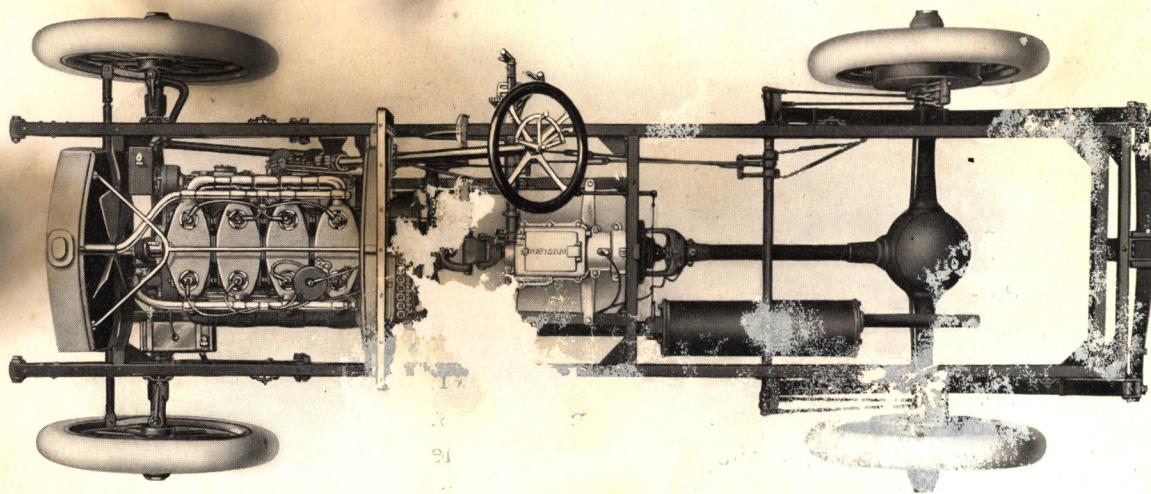
National Rear Axle, Gear Case and Wheels

Rear Axle and Gear Case

The peculiar design of the rear system which has been used so successfully on Nationals for several seasons past, is one of the most attractive and meritorious features of the car. It not only affords great strength and rigidity, but places the driving gears and differential in such an accessible position that they may be inspected, adjusted or even removed without removing the propeller shaft or taking off the rear wheels, which revolve on double rows of large annular type ball-bearings, thus reducing to a minimum the strain and friction at this vital point. The spherical gear case is divided near the top in a horizontal plane, and is fitted with a screw cap, which when removed, leaves an opening of sufficient size to allow the withdrawal of

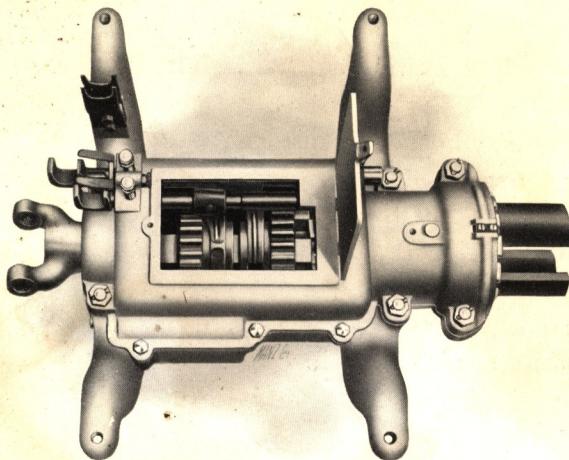
both driving gear and differential. The exterior axle is constructed of two sections of cold drawn seamless steel tubing, securely brazed into the gear case. These tubes extend through the rear wheels to the outer edges of the hubs. This puts the load entirely on the outer axle, removing all weight from the inner live axle. The differential with the large four-pitch bevel driving gear attached is separately mounted on two large annular type ball-bearings inside of the gear case. Each of these bearings is fitted with a cap, held in place by two studs, which when removed, allows the withdrawal, through the opening in the gear case, of the driving gear and differential complete. The inner live axles are squared at each end and fit into squared holes in the differential, transmitting power to the wheels by means of dog clutches, engaging corresponding clutches on the hubs. Large semi-spherical dust caps screwed to the hubs and locked in position hold the dog clutches securely in place and make the bearings of the rear wheels oil tight and dust proof.

Frame The frame is made of deep, channel section cold pressed steel with wide flanges and is tapered at each end. Four cross members unite the two side members; the front and center cross members supporting a substantial



National

Model N Chassis, Four Cyl. 4 1/2 x 5 inches



National Transmission

Brakes The vital question of brakes is amply provided for by the use of a double system of exceptional efficiency, consisting of four powerful, enclosed, dust proof, internal expanding, double acting, metal to metal hub brakes engaging 11-inch and 15-inch drums cast integral with the hubs of the rear wheels. Two of these are operated by a hand lever conveniently located at the driver's right, while the other two are operated by a foot push pedal.

Ignition and Wiring Two systems of jump spark ignition with two separate sets of spark plugs are supplied. One system consists of a gear driven high tension magneto supplying one set of plugs, the other system consists of a storage battery with single vibrator coil and distributor, the latter located at the top of a vertical shaft driven by spiral gears from one of

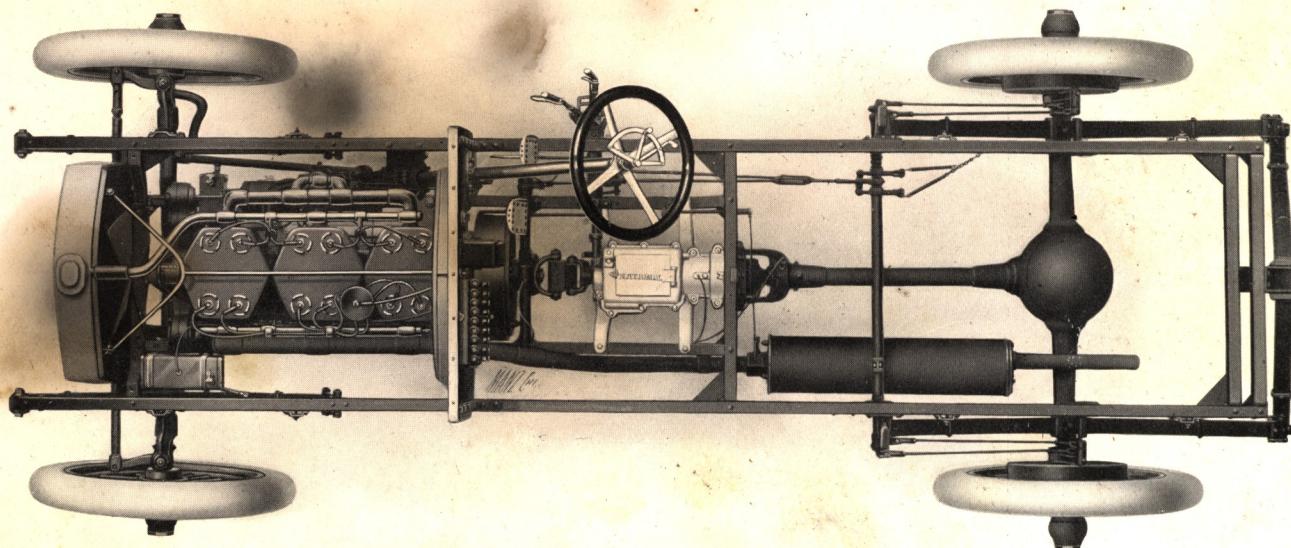
the ball-bearing cam shafts. The operator can use either or both of these systems at will. The wiring in each system is thoroughly insulated and protected.

The spark plugs are located in the valve caps in the cylinder heads, where they are least susceptible to fouling, one set being placed over the admission and the other set over the exhaust valves.

The storage battery is carried in a water tight metal case, located on the running board on the right side of the car where it can easily be examined or removed.

Control The National is recognized as having the simplest and most sensitive control of any car on the market. By the merest pressure of the foot on a spring throttle pedal the car can

be accelellated from its minimum to its maximum speed while running on direct drive. A lever for setting the foot throttle for any given speed, as well as a spark lever for controlling both ignition systems are con-



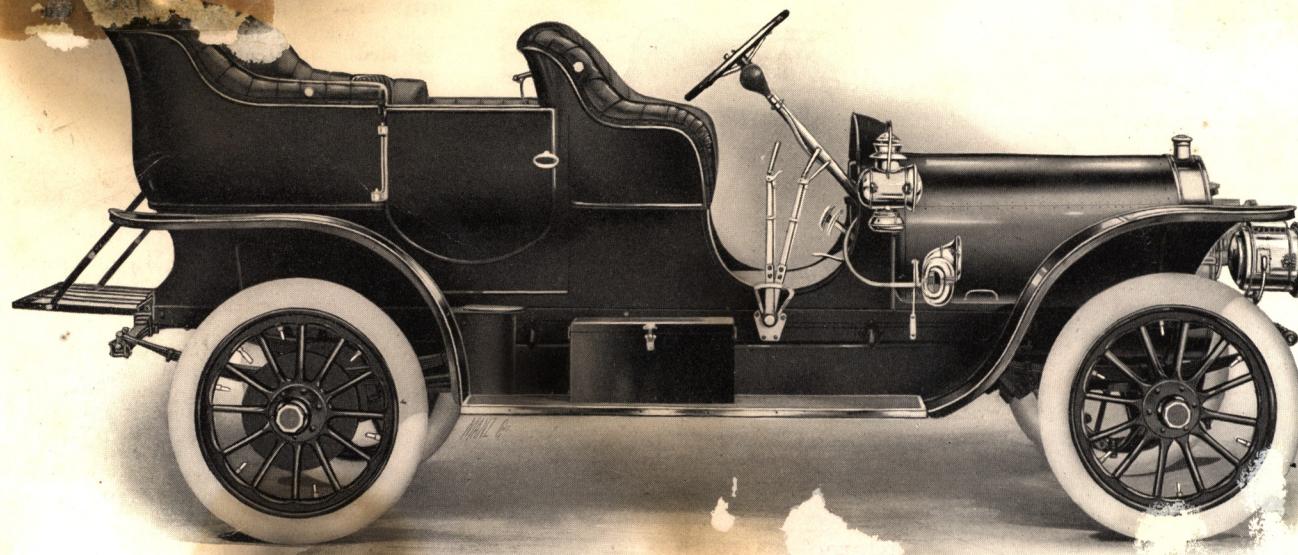
National

Model R Chassis, Six Cylinders, $4\frac{1}{2} \times 4\frac{3}{4}$ inches

veniently located on top of the steering wheel. The inner lever at the driver's right applies one pair of hub brakes and simultaneously releases the clutch, while the outer lever, working in an "H" slot, shifts the transmission gears, giving the low and intermediate geared speeds and the direct drive speed forward; also a very low double reduction reverse speed. A neutral or power-off position is obtained when the lever stands in a vertical position. The clutch is disengaged by the left foot push pedal. The right foot push pedal operates the auxiliary brake and releases the clutch at the same time.

Lubrication The lubricating oil is carried in a copper tank beside the gasoline tank, under the front seats, and is distributed to the various bearings through sight feed oilers on the dash by means of a gear driven, mechanically operated, adjustable Crandall oiler, mounted at the front of the engine.

Bodies The bodies of National touring cars present an attractive appearance with their beautiful outline and superb finish. They are arranged with individual front seats and roomy, side entrance tonneaux which seat five passengers comfortably, three on the rear tonneau seat and two on very convenient folding seats. The popular, symmetrically curved National cast aluminum body, with detachable tonneau, luxuriously upholstered in a fine grade of leather, with soft, comfortable spring backs and cushions is furnished regularly on all models, though on Models N and R the new National sheet aluminum straight line body is offered as an option. Convenient pockets are supplied in the upholstering of the tonneaux. The side doors swing to the rear and afford unusually wide entrances. A large locker space is located under the rear seat and is readily accessible through a door in the rear of the tonneau or through a trap door under the cushion. A trunk carrier is attached to the rear of the frame. The tonneau is equipped with a coat rail and an adjustable foot rest.



National Model K, Four Cylinders, $4\frac{1}{2} \times 5$ inches

Specifications—Model K

MOTOR—Four cylinder, $4\frac{1}{2} \times 5$ inches, vertical, individually mounted on sub-frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball bearing crank shaft and ball-bearing cam shafts. Two separate sets of spark plugs. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear driven distributor. Divided aluminum crank case. Interchangeable parts.

CLUTCH—Self-contained, aluminum cone, leather faced, spring cushioned.

TRANSMISSION—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type ball-bearings on main and counter shafts. Gears run in oil.

WHEEL BASE—112 inches.

DRIVE—Bevel gear through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

BRIDGES—Annular type ball-bearings throughout.

CHASSIS—Seven feed Crandall mechanical gear driven oiler, oiling direct to each cylinder and crank case of engine, transmission, clutch and rear system.

GUARDS—Continuous enclosed metal guards front and rear. Metal dust shield between frame and running board.

IGNITION—Two separate, complete systems. One a gear driven high tension magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

GASOLINE CAPACITY—17 gallons.

WATER CAPACITY—6 gallons.

WHEELS—Wood, artillery pattern, twelve $1\frac{1}{2}$ -inch spokes front and rear.

TIRES— $34 \times 4\frac{1}{2}$. Diamond or G & J.

BRAKES—Two systems. Four dust proof internal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies the second set.

FRAME—Pressed steel $4\frac{1}{2}$ -inch channel section with sub-frame firmly riveted and braced.

FRONT —Sea less, cold drawn steel tube, forged yokes.

REAR AXLE—Compound construction, inner axle used only as a driver, wheels turn upon double annular type ball-bearings on hollow axle which carries all weight.

COOLING SYSTEM—Cylindrical cooler, ball-bearing fan attached to engine base. Circulation by direct driven gear pump.

DUST PAN—Metal dust pan under all working parts.

BODY—Curved line coach body. Foldable tonneau, piazza type, side entrance. Divided front seats. Carrying capacity, seven passengers. (Two on folding seats in tonneau.)

BODY FINISH—Coach carmine, black stripes.

GEAR FINISH—Coach carmine, black stripes.

UPHOLSTERING—Luxuriously upholstered in bright or dull black leather. Special spring mattress cushions.

STEERING SYSTEM—Hand wheel, inclined post. Double screw and nut, non-reversible chuck. Ball joint connections to double connecting rods, front and rear of forged steering knuckles.

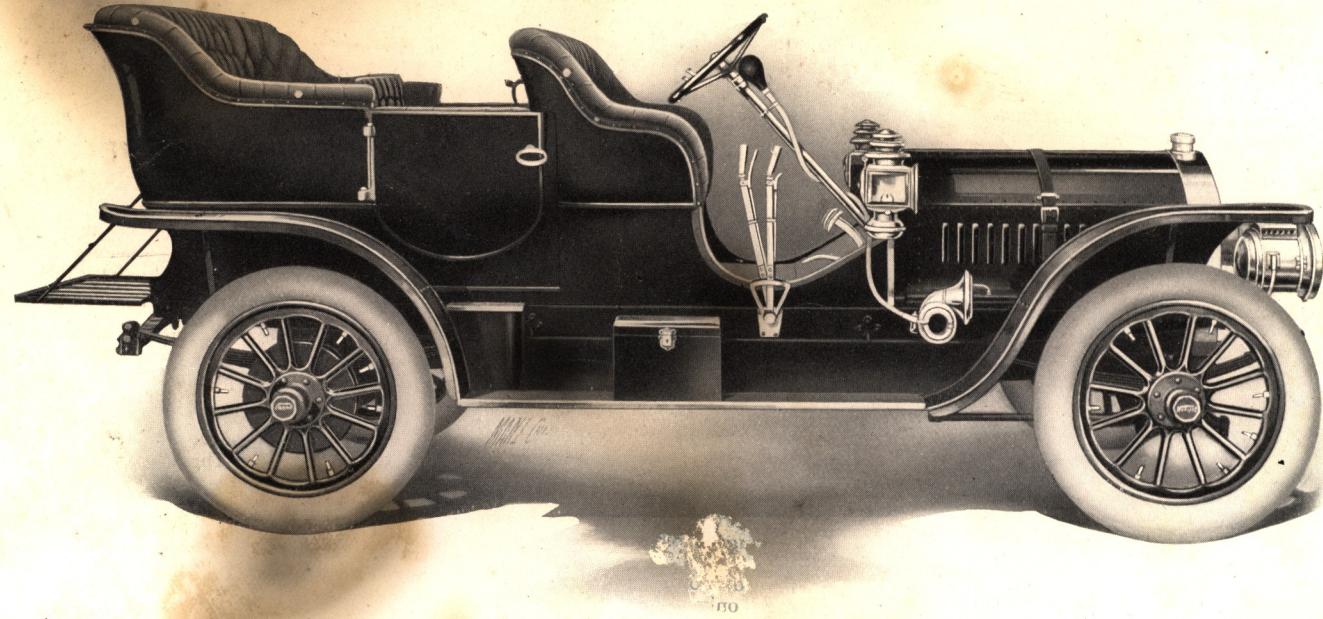
CONTROL—Single lever at driver's right controls all speeds. Three forward and one reverse.

SPRINGS—Half-elliptic, 40-inch front, under frame, 50-inch rear, outside of frame, 37-inch cross, on rear.

TOOL BOXES—Under tonneau seat and metal box on running board.

EQUIPMENT—Two 8-inch Rushmore searchlights with generator; side and tail lamps. Storm aprons, horn and tools.

PRICE—\$3500.00, F. O. B. Indianapolis.



National Model N, Four Cylinders, 5 x 5 inches

Specifications—Model N

MOTOR—Four cylinder, 5x5 inches vertical, individually mounted on sub-frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball bearing crank shaft and ball-bearing cam shafts. Two separate sets spark plugs. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear driven distributor. Divided aluminum crank case. Interchangeable parts.

CLUTCH—Self-contained, aluminum cone, leather faced, spring cushioned.

TRANSMISSION—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type ball-bearings on main and counter shafts. Gears run in oil.

WHEEL BASE—112 inches.

DRIVE—Bevel gear through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

BEARINGS—Annular type ball-bearings throughout.

OILING—Seven feed Crandall mechanical gear driven oiler, oiling direct to each cylinder and crank case of engine, transmission, clutch and rear system.

WHEELS—Wood, artillery pattern, twelve $1\frac{1}{2}$ -inch spokes front and rear.

IGNITION—Two separate, complete systems. One a gear driven high tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

GASOLINE CAPACITY—17 gallons.

WATER CAPACITY—6 gallons.

TIRES—34 x $4\frac{1}{2}$. Diamond or G & J.

BRAKES—Two systems. Four dust proof internal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies the second set.

GUARDS—Continuous enclosed metal guards, front and rear. Metal dust shield between frame and running board.

FRAME—Pressed steel $4\frac{1}{2}$ -inch channel section with sub-frame firmly riveted and braced.

FRONT AXLE—See less, cold drawn steel tubing, heavy gauge, forged yokes.

REAR AXLE—Compound construction, inner axle used only as a driver, wheels turn upon double annular type ball-bearings on hollow axle which carries all weight.

DUST PAN—Metal dust pan under all working parts.

BODY FINISH—Coach carmine, black stripes.

GEAR FINISH—Coach carmine, black stripes.

BODY—Curved line cast or straight line sheet aluminum, side entrances. Divided front seats. Carrying capacity, seven passengers. (Two on folding seats in tonneau.)

UPHOLSTERING—Luxuriously upholstered in bright or dull black leather. Special spring mattress cushions.

STEERING SYSTEM—18-inch hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connection to steering knuckle.

COOLING SYSTEM—Cylindrical or special straight line cooler, ball-bearing fan attached to engine base. Circulation by direct driven gear pump.

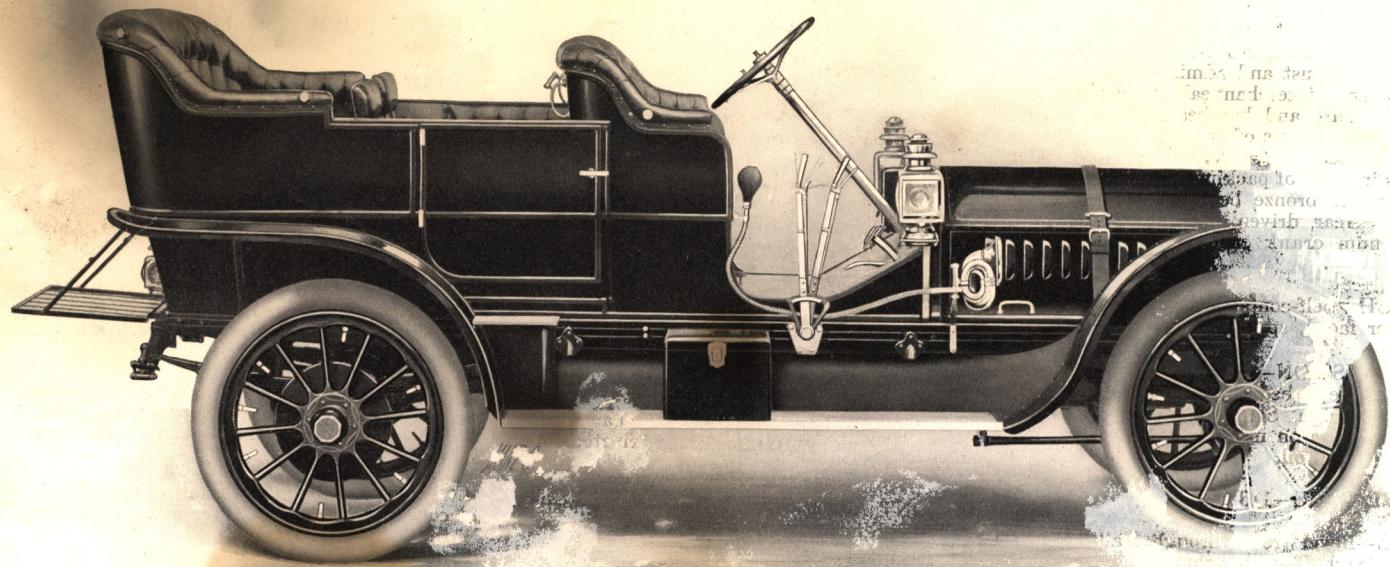
CONTROL—Single lever at driver's right controls all speeds. Three forward and one reverse.

SPRINGS—Half-elliptic, 40-inch front, under frame, 50-inch rear, outside of frame, 37-inch cross on rear.

TOOL BOXES—Under tonneau seat and metal box on running board.

EQUIPMENT—Two 8-inch Rushmore searchlights with generator; side and tail lamps. Storm aprons, horn and tools.

PRICE—\$3700.00, F. O. B. Indianapolis.



National Model R, Six Cylinders, $4\frac{1}{2} \times 4\frac{3}{4}$ inches

Specifications—Model R

MOTOR—Six cylinder, $4\frac{1}{2} \times 4\frac{1}{2}$ inches, vertical, in pairs, mounted on sub-frame. Mechanical valves, exhaust and admission on opposite sides and intakeable. Ball-bearing crank shaft and ball-bearing cam shafts. Two separate sets of spark plugs. Tapered nipples used on intake, exhaust and water pipes in place of fittings. Extra long Parsons white metal bearings on connecting rods. Magneto and distributor. Divided aluminum oil case. Interchangeable parts.

CLUTCH—Self-contained, aluminum cone, leather lined, spring cushioned.

TRANSMI~~SSION~~—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type ball-bearings on main and counter shafts. Gears run in oil.

WHEEL BASE—116 inches.

DRIVE—Bevel gear through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

DRIVEN OILER—Nine feed Crandall mechanical gear driven oiler, oiling direct to each cylinder and crank case of engine, transmission, clutch and rear system.

IGNITION—Two separate, complete systems. One a gear driven high tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

GASOLINE CAPACITY—17 gallons.

WATER CAPACITY—7 gallons.

WHEELS—Wood, artillery pattern, twelve 18-inch spokes front and rear.

TIRES—36 x 4 $\frac{1}{2}$. Diamond or G & J.

BRAKES—Two systems. Four dust proof internal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies the second set.

GUARDS—Continuous enclosed metal guards front and rear. Metal dust shield between frame and running board.

FRAME—Pressed steel 4 $\frac{1}{2}$ -inch channel section with sub-frame firmly riveted and braced.

FRONT AXLE—Seamless, cold drawn steel tubing, heavy gauge, forged yokes.

REAR AXLE—Compound construction, inner axle used only for lever, wheels turn upon double annular ball-bearings on hollow axle which carries all weight.

DUST PAN—Metal dust pan under all working parts.

BODY—Curved line cast or straight line sheet aluminum, side entrances. Divided front seats. Carrying capacity, seven passengers. (Two on folding seats in tonneau.)

BODY FINISH—Coach carmine, black stripes.

GEAR FINISH—Coach carmine, black stripes.

UPHOLSTERING—Luxuriously upholstered in bright or dull black leather. Special spring mattress cushions.

BEARINGS—Annular type ball-bearings throughout.

STEERING SYSTEM—18-inch hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connections to steering knuckle.

COOLING SYSTEM—Cylindrical or special straight line cooler, ball-bearing fan attached to engine base. Circulation by centrifugal pump.

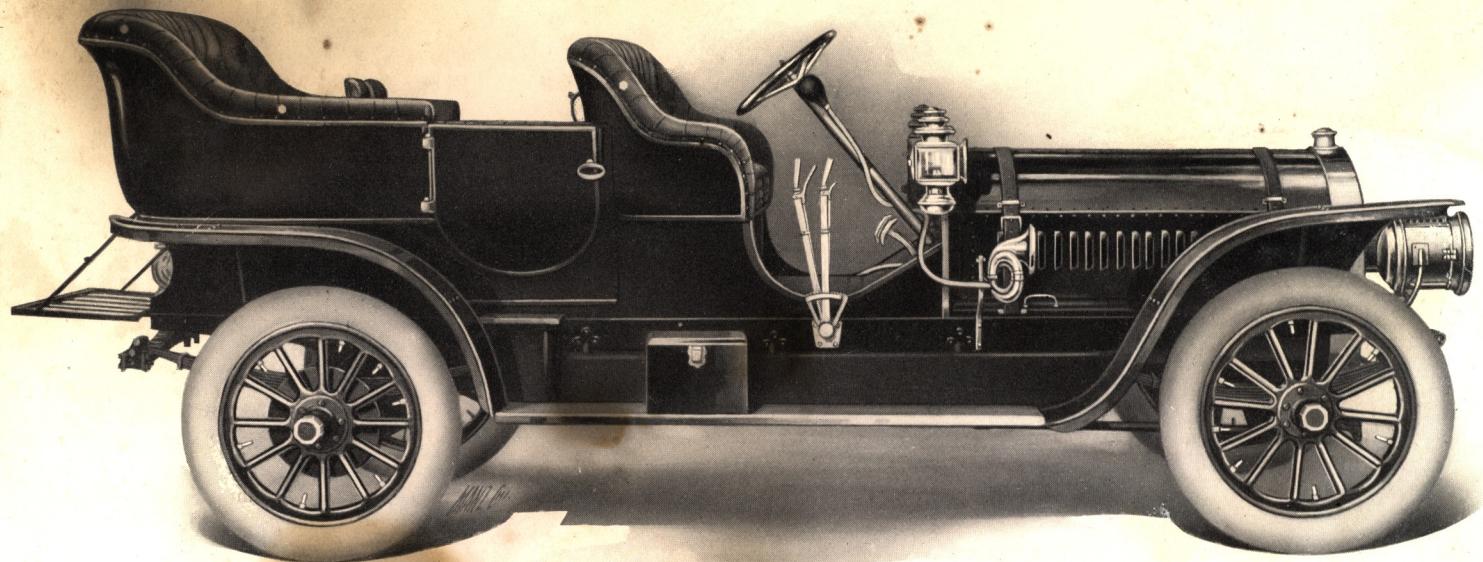
CONTROL—Single lever at driver's right controls all speeds. Three forward and one reverse.

SPRINGS—Half-elliptic, 40-inch front, under frame, 50-inch rear, outside of frame, 37-inch cross on rear.

TOOL BOXES—Under tonneau seat and metal box on running board.

EQUIPMENT—Two 8-inch Rushmore searchlights with generator; side and tail lamps. Storm aprons, horn and tools.

PRICE—\$4200.00, F. O. B. Indianapolis.



National Model T, Six Cylinders, 5 x 5 inches

Specifications—Model T

MOTOR—Six cylinder, 5x5 inches, vertical, individually mounted on sub-frame. Mechanical valves, exhaust and admission on opposite sides and interchangeable. Ball bearing crank shaft and ball-bearing cam shafts. Two separate sets of spark plugs. Tapered nipples used on intake, exhaust and water pipes in place of packing. Extra long Parsons white bronze bearings on connecting rods. Gear driven distributor. Divided aluminum crank case. Interchangeable parts.

CLUTCH—Self-contained, aluminum cone, leather faced, spring cushioned.

TRANSMISSION—Sliding gear selective type. Three speeds forward and one reverse, direct on high. Self-contained annular type ball-bearings on main and counter shafts. Gears run in oil.

WHEEL BASE—127 inches.

DRIVE—Bevel gear through ball-bearing propeller shaft and flexible joint to rear axle of improved design.

BEARINGS—Annular type ball-bearings throughout.

OILING—Nine feed Crandall mechanical gear driven oiler, oiling direct to each cylinder and crank case of engine, transmission, clutch and rear system.

WHEELS—Wood, artillery pattern, twelve $1\frac{3}{4}$ -inch spokes front and rear.

IGNITION—Two separate, complete systems. One a gear driven high tension Bosch magneto. The other a storage battery, single coil and distributor. Each system has a separate set of spark plugs.

GASOLINE CAPACITY—20 gallons.

WATER CAPACITY—8 gallons.

TIRES—36x5. Diamond or G & J.

BRAKES—Two systems. Four dust proof internal expanding metal to metal hub brakes. Hand lever applies one set. Foot push pedal applies second set.

GUARDS—Continuous enclosed metal guards front and rear. Metal dust shield between frame and running board.

FRAME—Pressed steel, 5-inch channel section, with sub-frame firmly riveted and braced.

FRONT AXLE—Seamless, cold drawn steel tubing, extra heavy gauge, forged yokes.

REAR AXLE—Compound construction, inner axle used only as a driver, wheels turn upon double annular type ball-bearings on hollow axle which carries all weight.

DUST PAN—Metal dust pan under all working parts.

UPHOLSTERING—Luxuriously upholstered in bright or dull black leather. Special spring mattress cushions.

BODY—Curved line cast aluminum, side entrances, removable tonneau, platform type. Divided front seats. Carrying capacity, seven passengers, (five carried in tonneau.)

BODY FINISH—Coach carmine, black stripes.

GEAR FINISH—Coach carmine, black stripes.

STEERING SYSTEM—18-inch hand wheel, inclined post. Worm and gear, non-reversible chuck. Ball joint connections to steering knuckle.

COOLING SYSTEM—Cylindrical or special straight line cooler, ball bearing fan attached to engine base. Circulation by direct driven gear pump.

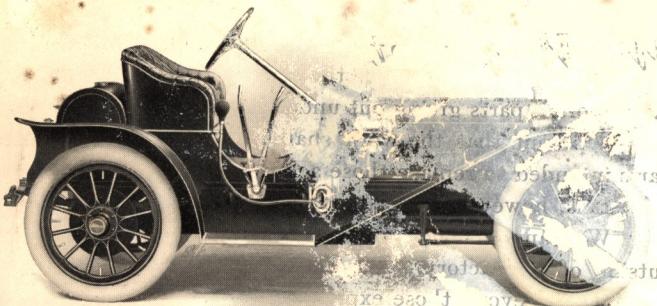
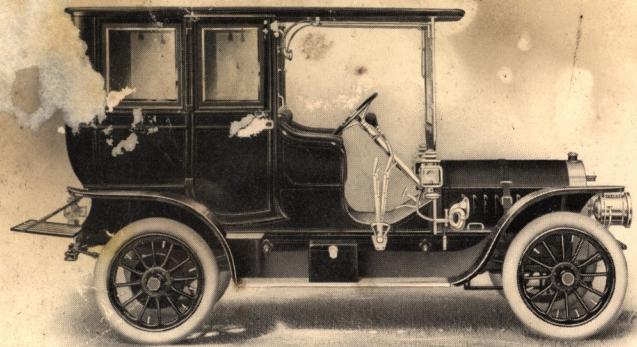
CONTROL—Single lever at driver's right controls all speeds. Three forward and one reverse.

SPRINGS—Half elliptic, 44-inch front, under frame; 56-inch rear, outside frame; 39-inch cross on rear.

TOOL BOXES—Under tonneau seat and metal box on running board.

EQUIPMENT—Two 9-inch Rushmore searchlights, with generator; side and tail lamps. Storm aprons, horn and tools,

PRICE—\$5000.00, F. O. B. Indianapolis.



National Limousine

Model K—Four Cylinders, $4\frac{7}{8}$ x $4\frac{3}{4}$ in.—
7 passengers \$4500.00

Model N—Four Cylinders, $5\frac{1}{2}$ x $4\frac{3}{4}$ in.—
7 passengers \$4800.00

Model R—Six Cylinders, $4\frac{1}{2}$ x $4\frac{3}{4}$ in.—
7 passengers \$5500.00

Model T—Six Cylinders, 5 x 5 in.—
9 passengers \$5000.00

National Roadsters

Model K—Four Cylinders, $4\frac{7}{8}$ x 5 in.—
Wheel Base, 102 in. \$3500.00

Model N—Four Cylinders, 5 x 5 in.—
Wheel Base, 102 in. \$3500.00

Model R—Six Cylinders, $4\frac{1}{2}$ x $4\frac{3}{4}$ in.—
Wheel Base, 106 in. \$4200.00

We also furnish above roadsters with the gasoline tank under the front seats and with single or double rumble seats.

National Warranty

We Warrant

all motor vehicles furnished by us for ninety days following the date of their shipment, up to the date of invoice covering the goods, this warranty being limited to the replacement of our parts by us in our factory or in any place to which we acknowledge to be defective.

However, understood that we make no warranty whatever regarding pneumatic tires or the batteries.

We do not accept any responsibility in connection with any of our motor cars when they have been altered or repaired outside of our factory. We are not responsible to the purchaser of our goods for any undertakings or warranties made by our distributors beyond those expressed above.

We wish it distinctly understood that we make no warranty of our goods except as stated above, but desire and expect that customers shall make a thorough examination of our goods before purchasing.

200000

WORLD'S RECORDS
MADE BY

National

STRIPPED STOCK
RS

| | | | |
|----------------------|--------------------------------------|---------------------------------|--------------------------------------|
| 100 miles, | 1 hour, 53 minutes, 21 4-5 seconds | 800 miles, | 17 hours, 17 minutes, 26 1-5 seconds |
| 150 miles, | 2 hours, 52 minutes, 32 4-5 seconds | 850 miles, | 18 hours, 23 minutes, 44 2-5 seconds |
| 650 miles, | 14 hours, 8 minutes, 51 2-5 seconds | 900 miles, | 19 hours, 44 minutes, 48 1-5 seconds |
| 700 miles, | 15 hours, 10 minutes, 29 3-5 seconds | 750 miles, | 20 hours, 54 minutes, 50 3-5 seconds |
| 750 miles, | 16 hours, 20 minutes, 25 2-5 seconds | 1000 miles, | 21 hours, 58 minutes, 2 seconds |
| | 1050 miles, | 23 hours, 7 minutes, 42 seconds | |

00 982

1094 3-16 Miles in 24 Hours Exceeding the previous World's Record
by 16 miles

The average speed maintained while running was 51.9 miles per hour

MANZ ENGRAVING COMPANY
THE HOLLISTER PRESS
CHICAGO

φ8-N#438.

