

LEADING TYPES OF AMERICAN RACING AUTOMOBILES.

The automobile built for fast traveling, although decried by many as a worthless and dangerous toy, holds in reality the foremost place in the development of the new sport, for it is on these queer-looking, huge, and speedy machines that the parts which go to make up the luxurious touring cars of to-day are tried and proven. When once such parts have given satisfaction on a racer, the manufacturer can use them in assembling his regular machines with certainty of their furnishing reliable service. The French have led the way in this "tried and proven" method of perfecting automobiles, and, by holding the international Gordon Bennett cup race every year, have given the automobile builders of their fair land a chance to demonstrate to the world at large the speed and endurance qualities of their machines. Last year, for the first time, the cup was wrested from them by the English, who were represented by Mr. S. F. Edge in an English-built Napier car; and this year, if the experience gained in track racing the past two seasons counts for anything, our automobile enthusiasts hope that one man of the racing team they are sending to compete for it, will fetch the cup to America, upon his return.

A brief description of some of the machines that have made excellent track records during the past year will no doubt interest our readers. We have chosen, accordingly, a machine of each type—electric, steam, and gasoline—although, for long distance road racing, "gasoline is king" up to the present at

tober last, and made a record of 17 minutes, 58 seconds for ten miles a day later. The improvements to be noted in this machine over the well known type of runabout, are the mounting of the motor longitudinally on the running gear, and the employment of a direct bevel gear drive, thus dispensing with a chain and its

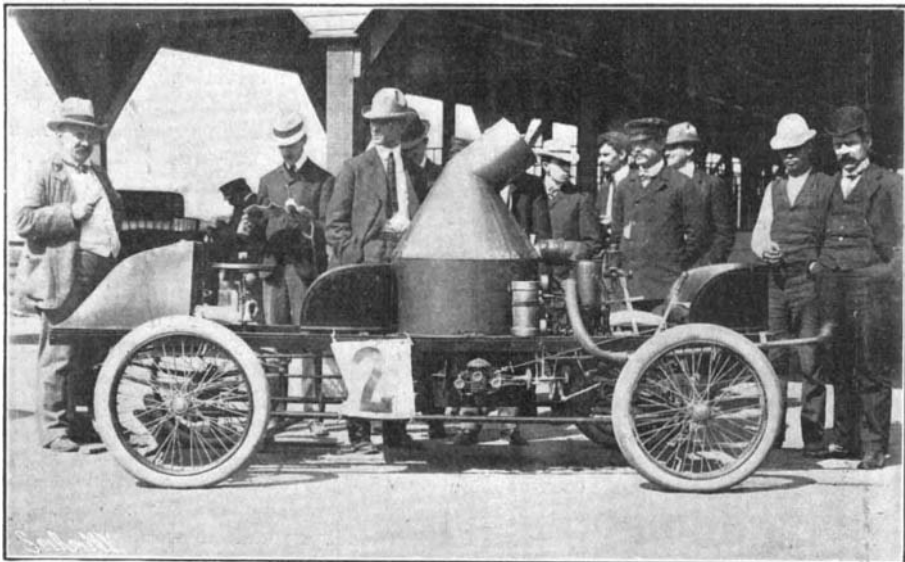
The Cannon steam racer belongs in the same class as the Riker electric racer, which covered a straight-away mile in 1:03 on the Coney Island boulevard a year ago last fall, in that it is a racing machine pure and simple, designed for speed purposes merely, without the development of a commercial machine in view.

It was built by Mr. George C. Cannon, a Harvard student, and, driven by him and T. C. Marsalis, has made some remarkable track records. In the Brighton Beach races, on the 23d of last August, it made a mile in 1:07½, thus reducing by more than half a minute the mile track record of 1:39 previously made by T. E. Griffin in a locomobile nearly a year before, while at Providence, R. I., a month later, it reduced its former time to 1:05¼, and covered five miles in 6 minutes, 5 seconds.

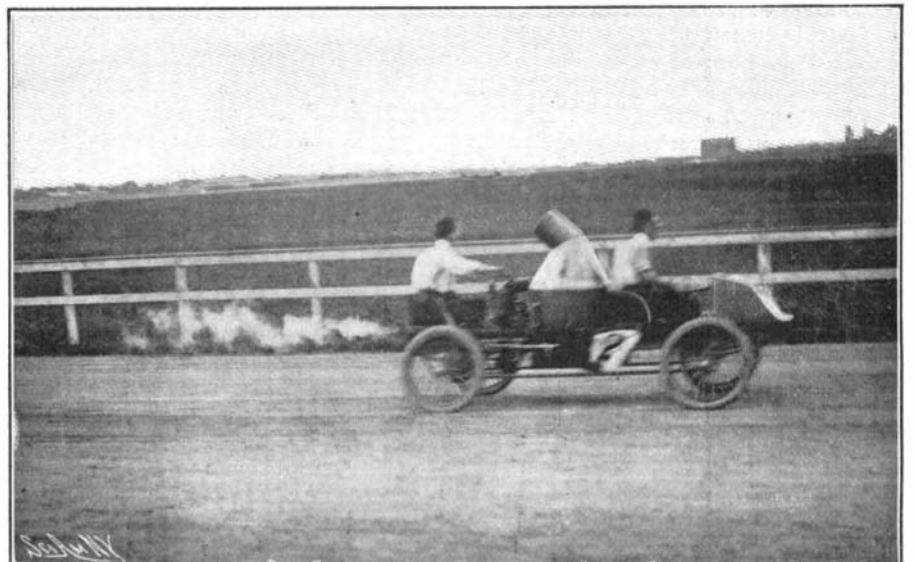
This racer, as can readily be seen from the photographs, is planned somewhat on the general lines of the Riker electric racer mentioned above. Like that machine, it has two seats—one for the steersman and one for the operator—but in this instance the power plant is situated between the two men. This consists of a 24-inch boiler and burner inclosed in an asbestos jacket an inch thick, which is held in place by a sheet-iron covering terminating at its top in a short smoke-stack, and bent forward at the bottom so as to form a scoop for giving a good draft when the machine is running fast. When making the records, the steam pressure obtained was over 400 pounds, and a pressure of 100 pounds was used in



Mr. Walter C. Baker in His Gentleman's Electric Road Wagon.



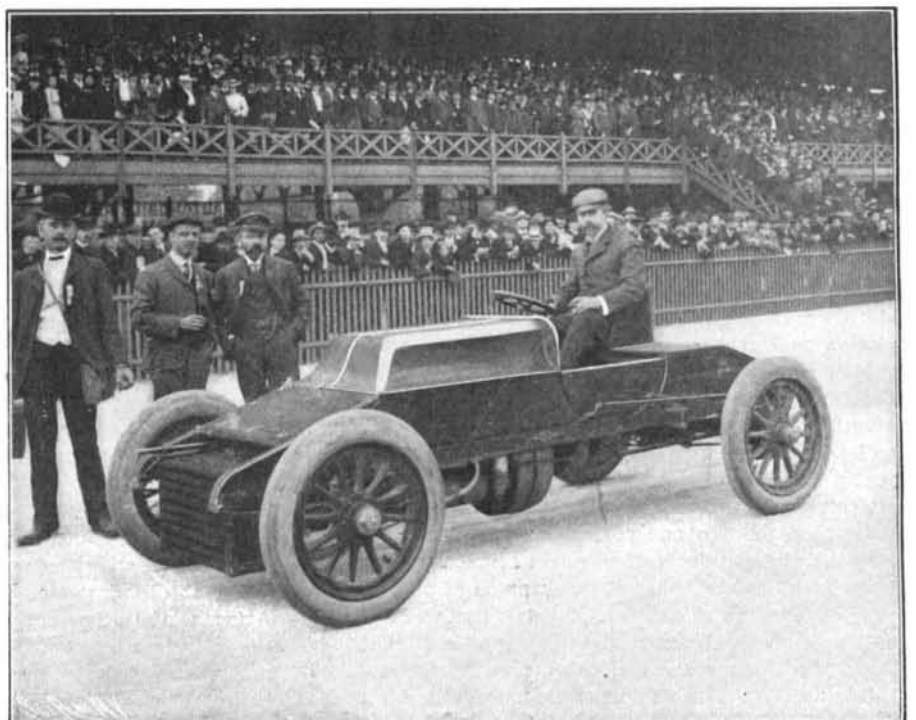
The Cannon Steam Racer.



The Cannon Racer Making a Record.



Henry Ford on His 70 Horse Power Gasoline Racer.



Alexander Winton in the "Bullet."

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least. The Baker electric road wagon, seen at the top of the page, after having undergone numerous track tests the past year, has become the standard 1903 model of this enterprising firm. The illustration shows Mr. Baker in the machine with which he covered a mile in 1:42 on the Detroit, Mich., track, the 24th of Oc-

tober last, and made a record of 17 minutes, 58 seconds for ten miles a day later. The improvements to be noted in this machine over the well known type of runabout, are the mounting of the motor longitudinally on the running gear, and the employment of a direct bevel gear drive, thus dispensing with a chain and its attendant troubles. The carriage is built heavier and stronger throughout, and is completed by a suitable top and mud-guards. It was equipped with all these fittings, as shown, when it made the record. Twelve cells of Gould storage batteries are used to propel the machine.

the gasoline tank for forcing the gasoline through the three spraying nozzles of the burner. Highly superheated steam was used in the engine, which is of the standard two-cylinder, 3½ x 4-inch, reciprocating type, situated just back of the boiler, and coupled direct by chain to the sprocket of the differential on the rear

axle, no speed reduction being used. The water tank at the front has a capacity of 20 gallons. Directly behind it is the horizontal steering wheel, which is connected, by a system of universally jointed levers, with the steering arms of the front wheels. The exhaust pipe of the engine can be plainly seen curving around and protruding out back of the rear seat. The throttle and brake levers for controlling the car are also distinctly visible. Mr. Cannon built his racer with stock parts obtained from several automobile jobbers, and the fact that the results obtained with it were so satisfactory, speaks well for the material some of these firms are turning out. For a purely amateur construction, the machine has accomplished more in the way of record breaking than any other that has as yet appeared.

Coming now to the racers of the gasoline type, that built during the past year by Mr. Henry Ford, of Detroit, Mich., is one of the most striking examples of the latest tendency in racers. This machine, like Cannon's, was built as simply as possible, and without regard to appearance, the utilization of power to the best advantage being the chief aim of the builder. In order to accomplish this the differential gear has been dispensed with, and the motor drives the rear axle direct through bevel gears, with a speed reduction ratio of four to five, a 28-tooth bevel pinion on the main shaft meshing with a 35-tooth bevel gear on the rear axle. There are no change speed gears, but simply a flywheel clutch of the usual type, for disconnecting the motor from the wheels. These are stout wire ones, 34 and 36 inches in diameter, front and rear respectively. The wheel base of the car is 9 feet, 4 inches, and the tread 4 feet, 8½ inches. The main frame is made up of two 1½ x 4-inch side bars of white ash, lined with ¼-inch steel plate, and bound together by three similar cross bars and two others of 4-inch channel iron, which support the motor. The side bars are trussed with steel rods, and the frame is braced laterally by a similar truss connecting the lower ends of the two steering knuckles. The frame is supported upon two semi-elliptical springs at the front end, but rests simply upon the bearings of the rear axle at the back. The motor used to propel this car is a vertical one having four 7 x 7-inch cylinders, cast integral, with cylinder heads and exhaust valve chambers thoroughly water jacketed. A separate exhaust pipe for each cylinder, with an area equal to that of the exhaust valve, conveys the burnt gases into the atmosphere. The inlet valves are automatic, being opened by the suction of the pistons only, and closed by a spring. A 2¼-inch gas supply pipe, connected to a single mixing valve, feeds all four cylinders. The gasoline tank for supplying this mixing valve is situ-

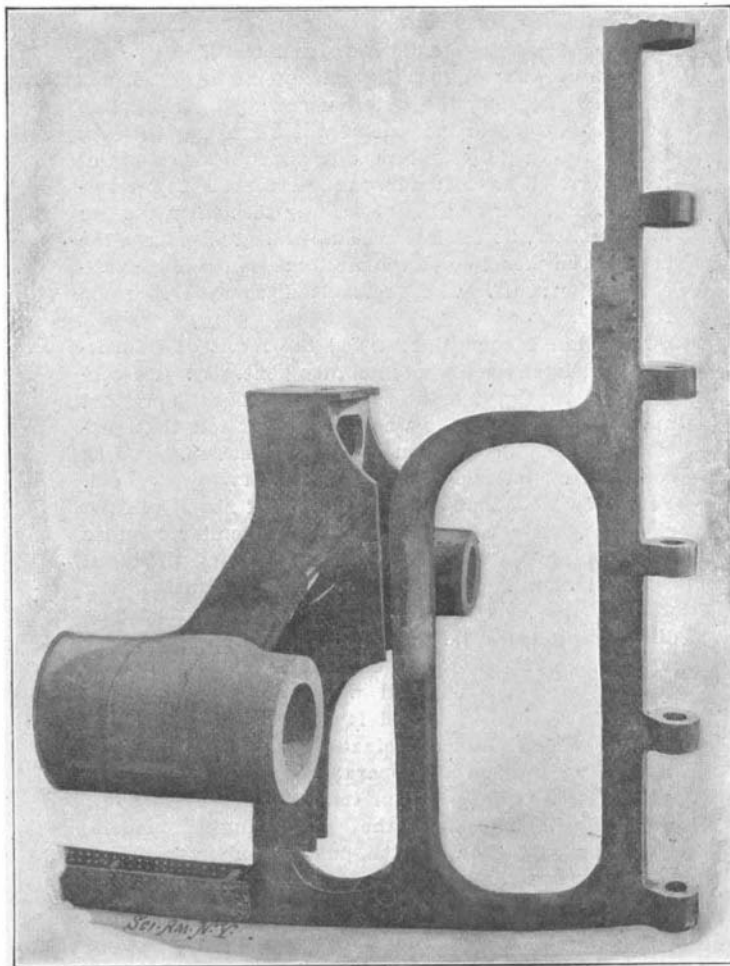
ated on the left of the engine. The water tank is under the driver's seat. The water is circulated by a gear-driven centrifugal pump, through 64 brass pipes, ¼-inch in diameter and 26 inches long, mounted on the front of the car. No radiating ribs are used. The crank-shaft of the motor is mounted in rigid bearings and is not incased, save for a tin cover hung

shaft has no universal joints, but is rigidly aligned with the crank-shaft, and carries a sleeve bearing the clutch upon it.

The ignition outfit consists of a battery of five accumulators, which supply current for four Rhumkorff coils. A suitable commutator switches the primary current to the proper coil for each cylinder. The spark-lead-controlling lever is at the right of the driver's seat, while on the left of his seat is a thumb wheel for regulating the supply of gasoline. The clutch pedal is located in the center of the foot box, directly in front of the operator; another pedal on the left of this box governs the throttle valve; and a third pedal, on the right side, puts on the brake. The vertical steering post has a 28-inch cross arm, with vertical handles at each end. This arm is so connected to the steering arms of the front wheels as to give a leverage of four to twelve.

The Ford racer made a record (unofficial) of a mile in 1:01 1-5 on the Grosse Point track, Detroit, December 1, 1902. Its builder thinks it capable of still faster time than this, however; and, in the near future, hopes to make an even better record. The machine is looked upon as one of the possible competitors for the Gordon Bennett cup.

The Winton "Bullet" is similar in many respects to the machine just described. Its best track records were the mile in 1:02¼, on the Glenville track, Cleveland, September 16, 1902, and ten miles in 10 minutes, 50 seconds. The machine is no longer in existence, but its indefatigable builder is busily engaged in constructing a new and still faster one, in which he will return to the use of his well-known horizontal motor. The new machine is already entered in the international cup race of 1903. Several other manufacturers throughout the country are building special machines, and, after a number of trial races have been held, the best three racers will be chosen to represent America in the contest next summer.



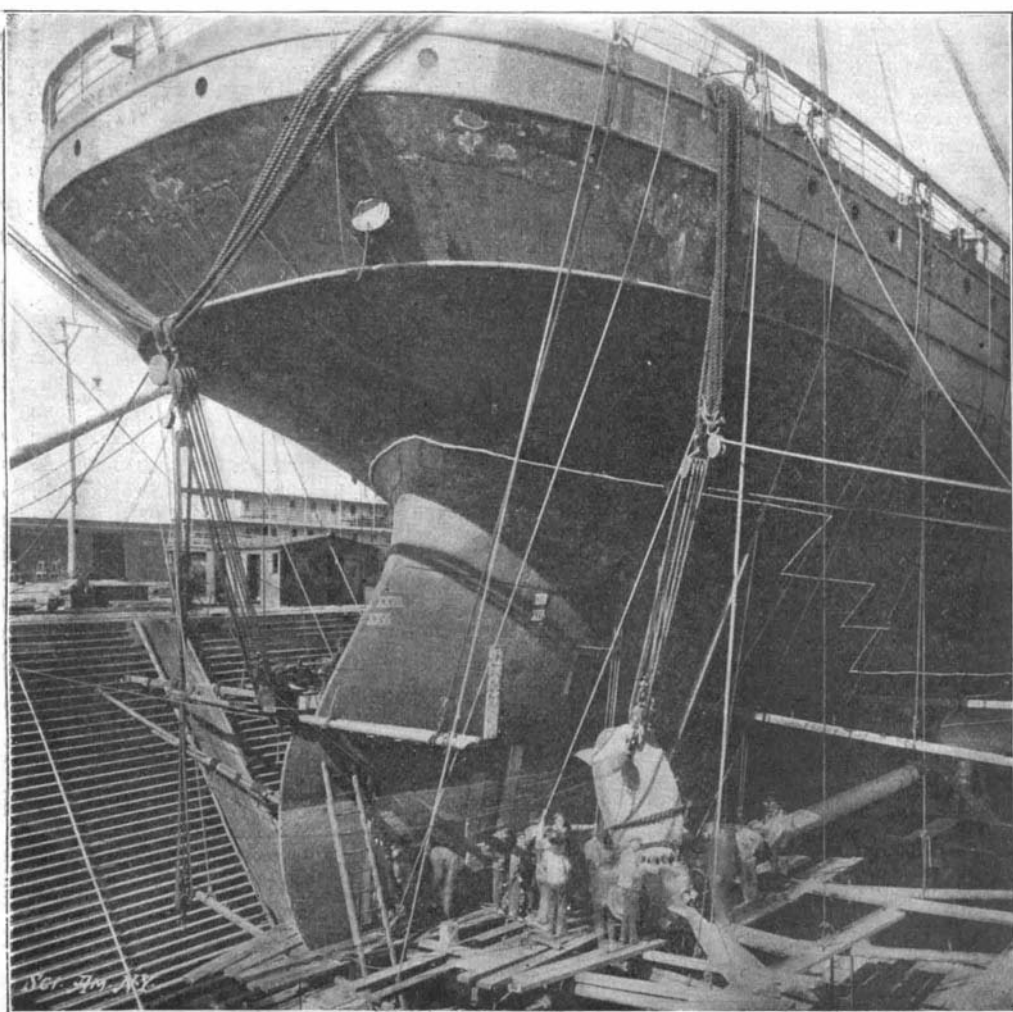
THE STEEL CASTINGS FOR NEW STERN OF STEAMER "NEW YORK." SPECTACLE FRAME, 38 TONS; STERN FRAME, 32 TONS.

Shown as assembled ready for plating in.

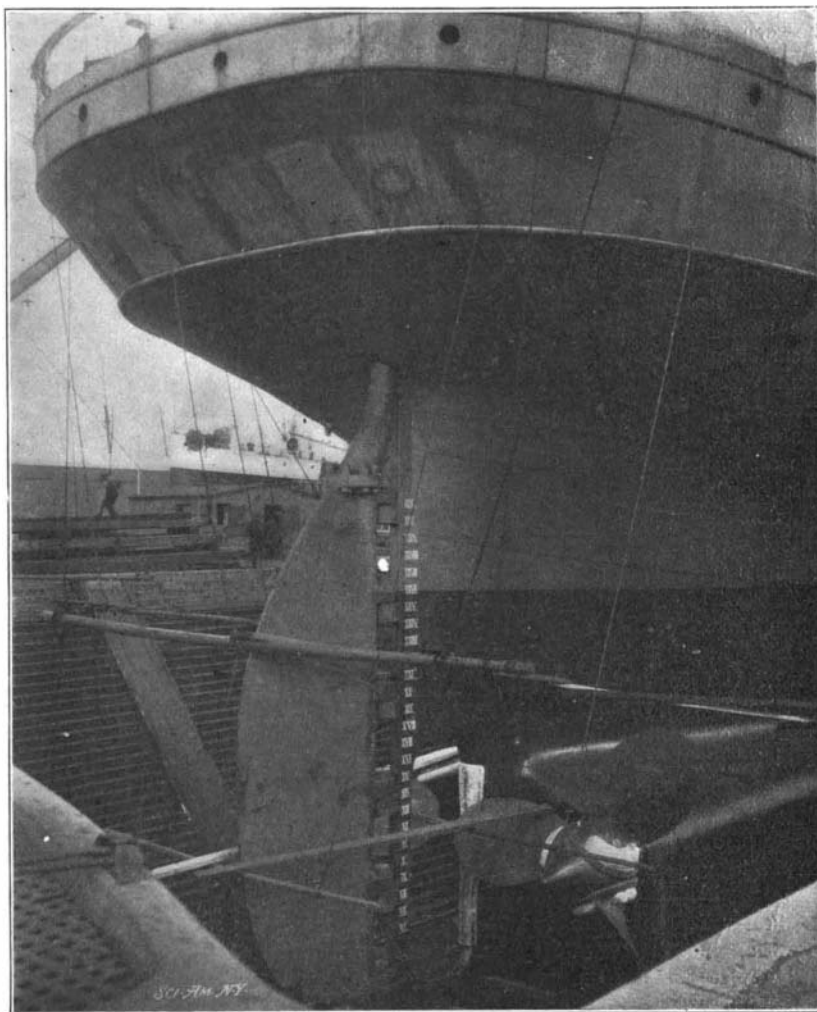
RECONSTRUCTION OF THE STEAMSHIP "NEW YORK"

There has lately been carried through at the Erie Basin drydock, Brooklyn, a most important work of reconstruction on one of the notable steamships of the world, the "New York" of the American Line, formerly the "City of New York" of the Inman and International Line. This vessel, with her sister, the "City of Paris," now the "Philadelphia" of the International Navigation Company, was built in 1889 and was the first of the modern, twin-screw, high-speed, transatlantic liners. The two vessels broke the transatlantic record early in their career, and were about as famous a pair of ships as were ever seen on the high seas. After their transfer-

beneath it to protect it from dirt and dust. The two center cranks are opposed to the two end ones, and an explosion occurs every half revolution in cylinders 1, 2, 4, and 3 respectively. On the end of the crank-shaft toward the rear of the car, keyed and fitted on a taper, is a 230-pound flywheel, 23 inches in diameter and 6 inches wide. A wooden block clutch is expanded, by means of levers, against the inside rim of the flywheel, thus locking the main driving shaft to the crank-shaft of the motor. The former



THE OLD STERN AND BALANCED RUDDER OF THE "NEW YORK" BEFORE RECONSTRUCTION. The white line on plating shows the portion which was rebuilt.



THE NEW STERN, PROPELLER SHAFT HOUSING, AND RUDDER COMPLETED.