jury as far as known in the recent fighting. Of less important battleships on the European station, there are the "Navarin," of 10,000 tons and 16 knots speed, and the "Apostoloff," 8,500 tons and 16½ knots speed, whose main armament consists of four 12-inch guns in turrets and, in the case of the "Navarin," eight 6-inch guns in broadside, and in the case of the sister ship four 6-inch guns mounted in broadside. These vessels have partial belts of compound armor. Of course, they are now relegated purely to duties of coast defense. Then there are the three vessels of the "Sinop" class, of 10,500 tons displacement and 16½ knots speed. They have 16-inch belts, and a 12-inch central redoubt, within which are six 12-inch guns, protected by the redoubts and by hoods of 2-inch armor. These vessels also carry seven 6-inch guns on the main-deck. The "Nikolai I." and "Alexander II." are old battleships of 9,800 tons and 15½ knots speed, protected with 14-inch compound armor belts and carrying two 12-inch guns in a turret forward and four 9-inch and eight 6-inch in a battery on the gun-deck.

The Russian navy also includes three fairly modern coast defense vessels built in 1895, of 4,126 tons and 14 knots speed. They carry some of them three and some of them four 9-inch guns in turrets, and four 6-inch guns in the central battery. They have a partial 10-inch belt, and a 3-inch armored deck.

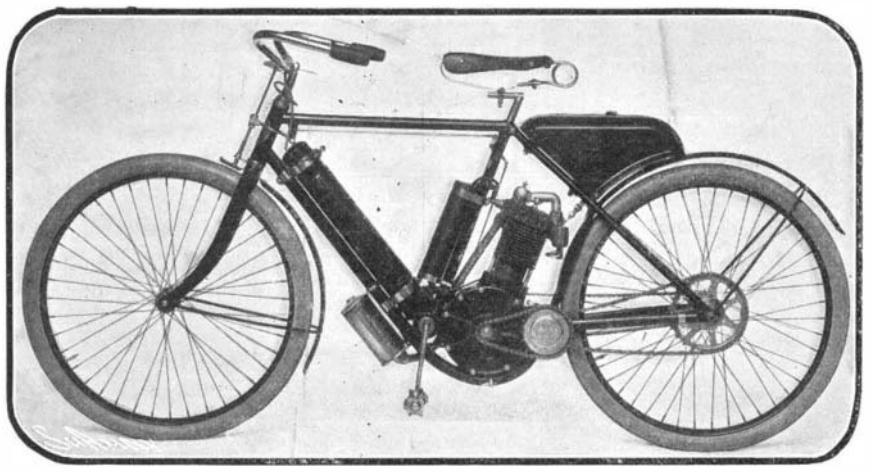
The Russian navy includes four large modern armored cruisers. The "Gromoboi," built in 1899, is of 12,367 tons and 20 knots speed, with a bunker capacity of 2,500 tons of coal, and provision for liquid fuel. The vessel has a partial 6-inch belt, a 2-inch deck, and 6 inches of armor on the casemates. She carries four 8.4-inch guns, sixteen 6-inch, twenty 3-inch, and twenty-four smaller guns, besides two submerged and two above-water torpedo tubes. She is practically an improved "Rossia," and the description of the "Gromoboi" will apply to the "Rossia," with the difference that the armor belt is 10 to 5 inches in thickness, and that she carries six above-water torpedo tubes. The "Rurik," of 10,950 tons and 18.8 knots speed, has a partial 10 to 5-inch belt and carries four 8-inch, sixteen 5.5-inch, six 4.7-inch, twenty-two smaller guns, and six above-water torpedo tubes. Although much smaller than the other vessels, the "Bayan," built at La Seyne in 1900, is the best designed of the armored cruisers. She is of 7,800 tons and 21 knots speed, has an 8 to 4-inch belt, 2-inch deck, and carries two 8-inch guns in 7-inch armored turrets, eight 6-inch guns in 6½-inch armor casemates, twenty 3-inch and seven smaller guns, besides two submerged torpedo tubes. There is also the "Nakhimoff," built in 1885, and rebuilt in 1899, which carries a 10-inch partial compound armor belt and mounts eight 6-inch, ten 4.7-inch, and several smaller guns.

Coming now to the protected cruisers, we have a class of six splendid vessels of about 6,500 tons displacement and speeds that vary from 20 to 24 knots. They have about the same armor and armament; and a description of the "Variag," which was built at Philadelphia and destroyed in the recent sea fight off Chemulpo, will answer for the class.

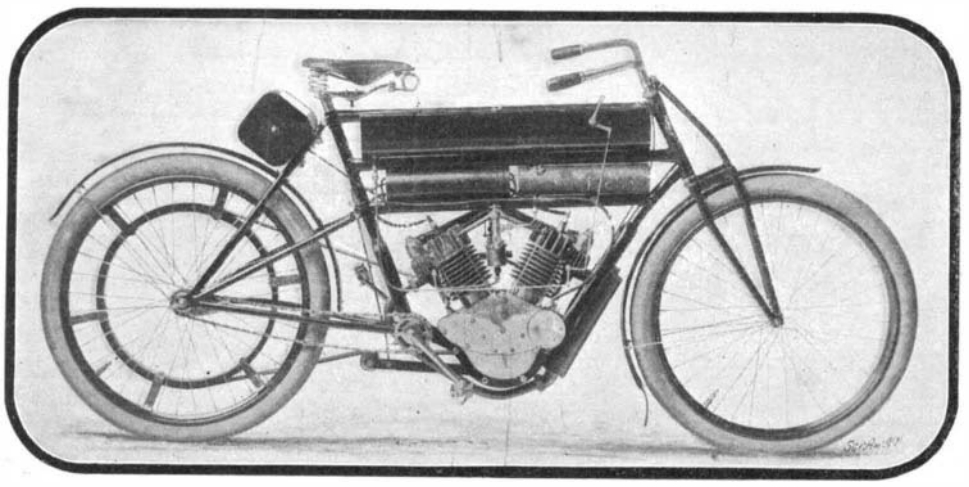
The "Variag" is, or rather was, of 6,500 tons displacement, 24.6 knots speed, and was protected by a 3-inch deck and by gun shields 6 inches or less in thickness. She carried twelve 6-inch, twelve 3-inch, and six smaller guns, besides two submerged and two above-water torpedo tubes. The other vessels of this class are the "Bogatyr," built at Stettin; the "Askold," a five-funneled boat built by Krupp; the "Pallada" and "Diana," both crippled at Port Arthur; and the "Aurora." Of the four other large protected cruisers, it is sufficient to say that, because of their age, they are in no way comparable to the foregoing ships. The "Pamiat-Azova," of 6,700 tons and 18.8 knots, is the best. She carries fourteen 6-inch guns, and has a partial belt of the old compound armor, which is not comparable in protective qualities to the modern steel protective decks. The "Dimitri Donskoi," of 5,800 tons, now on her way to the Pacific, and two other vessels, the "Monomakh" and "Korniloff," are protected by easily-penetrated compound-armor belts, and are armed with a numerous battery of 6-inch and 4.7-inch guns. They are of slow speed and doubtful utility against modern ships. The "Svietlana," built at Havre in 1896, is a serviceable 3,900-ton ship of 20 knots speed, with a 2-inch deck, mounting six 6-inch, twelve 3-pounders, and four above-water torpedo tubes. The "Novik," the fastest protected cruiser in the world, now disabled at Port Arthur, and the "Almaz" are 3,000-ton protected cruisers of 26 knots speed, carrying six 4.7-inch guns and eleven smaller guns. They have a 2-inch deck, and are provided with five torpedo-tubes, all located above the water line. Lastly, we have the three vessels of the "Boyarin" class, of 3,200 tons displacement and 22½ knots speed, protected by a 2-inch deck and carrying six 4.7-inch guns, eight smaller guns, and five above-water torpedo tubes. The "Boyarin" is another of the ships that was disabled at Port Arthur.

In addition Russia also possesses thirteen small cruisers and gunboats that range from 1,500 to 534 tons in displacement, two of the best of which have already been accounted for by the Japanese in the early days of the war. The torpedo-boat fleet consists of fifty destroyers, fifty-four first-class and twelve second-class torpedo boats, all of modern and first-class construction.

Besides these there are over 100 small torpedo boats of such early construction as to be practically obsolete. Before the opening of the war the personnel of the Russian fleet was something of an unknown quantity. It was supposed, however, to be very good; but until some reasonable explanations are forthcoming of the early reverses of the war, the public will conclude that the excellent Russian ships and general war material are vastly superior to the men who handle them.



2¼ H. P. COLUMBIA MOTOR BICYCLE.



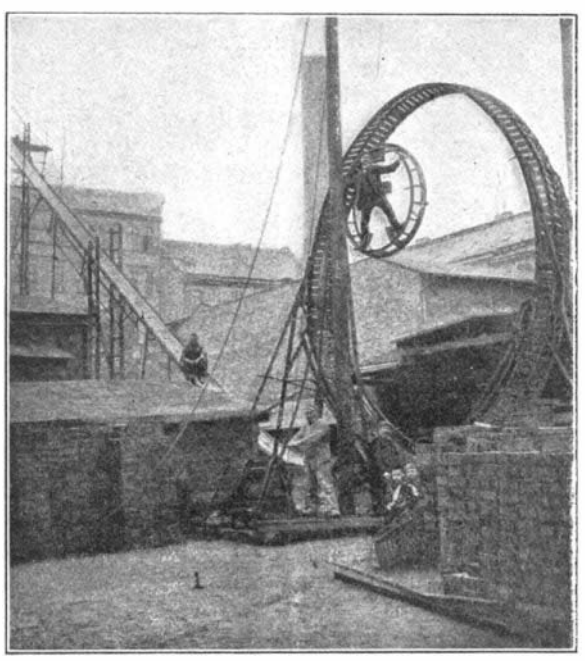
5 H. P. TWIN-CYLINDER CURTIS ROADSTER.

TWO NEW MOTOR BICYCLES.

One of our cuts shows a motor bicycle with an air-cooled V-shaped motor of 5 horse power, which made the fastest time at the recent Florida Race Meet. The machine is made by the G. H. Curtis Manufacturing Company, Hammondsport, N. Y., and it is intended for use as a powerful roadster for use on all kinds of American roads. Its weight complete is but 165 pounds, and it has gasoline and oil tanks of sufficient capacity for traveling 150 miles. The double-cylinder, V-shaped motor is placed in a 23-inch frame, and transmits its power directly to the rear wheel by means of a 2-inch flat belt made of two-ply Russian rawhide. A wooden pulley is used on the rear wheel, and a leather-covered pulley on the motor. The motor itself weighs but 60 pounds, has a 3-inch bore and stroke and develops 5 horse power at 2,000 R. P. M., thus making the bicycle one of the most powerful motor cycles ever built for use as a regular road machine. The crank shaft runs on roller bearings in hardened and ground steel bushings. The two cylinders add greatly to the flexibility of the motor, and make it possible to obtain a wide variation in speed. With the regular gear of 4 to 1, the machine will climb any hill where the road is of fairly good surface, and will travel at the rate of 45 miles per hour on the level. With the racing gear of 2½ to 1, it made a mile in 59 1-5 seconds and 10 miles in 8:45 2-5 on the Ormond-Daytona Beach.

The switch and spark advance are controlled by turning the left grip, while the exhaust valves can be raised by a small lever on the frame. The batteries and spark coils are placed across the upper part of the frame, the gasoline tank behind the seat. The carbureter is seen between the two cylinders of the motor. The company also builds a single-cylinder, 120-pound, 2½-horsepower machine. The two sizes of machines are respectively fitted with 2½ and 2-inch detachable tires, and have a 62 and 58-inch wheel base.

The new Columbia motor bicycle, built by the Pope Manufacturing Company, of Hartford, Conn., has a chain drive through a speed-reducing countershaft to the rear wheel. The sprocket of the former, on which runs the chain from the motor, is fitted with two coiled springs, which transmit the power, yet absorb the shocks of the explosions. The motor has a 2¾-inch bore and a 3¼-inch stroke. High compression is used in it, and, at a speed of 2,500 R. P. M., it will drive the bicycle 35 miles an hour. All the Columbia machines are run up a hill of 25 per cent grade, which they must climb at a 15-mile-an-hour rate as a final test. The arrangement of parts is readily seen in the cut. The batteries are in a case above the lower tube of the frame; the muffler is just below this tube; the spark coil is on the upright post; and the tank is over the rear wheel. The machine is controlled entirely by the lever of the plunger brake. Pushing this down speeds up the motor, and pulling it up slows it down and applies the brake. The inlet valve stem and spring is exposed. Both inlet and exhaust valves can be readily removed.



ECLAIR'S SOMERSAULT MONOCYCLE COURSE.

MR. ECLAIR IN HIS WHEEL.

SOMERSAULT MONOCYCLE COURSE.

In the present era of "weak nerves," the performance of "looping the loop," in which a cyclist traverses a vertically placed loop, has quickly staled, and has now been