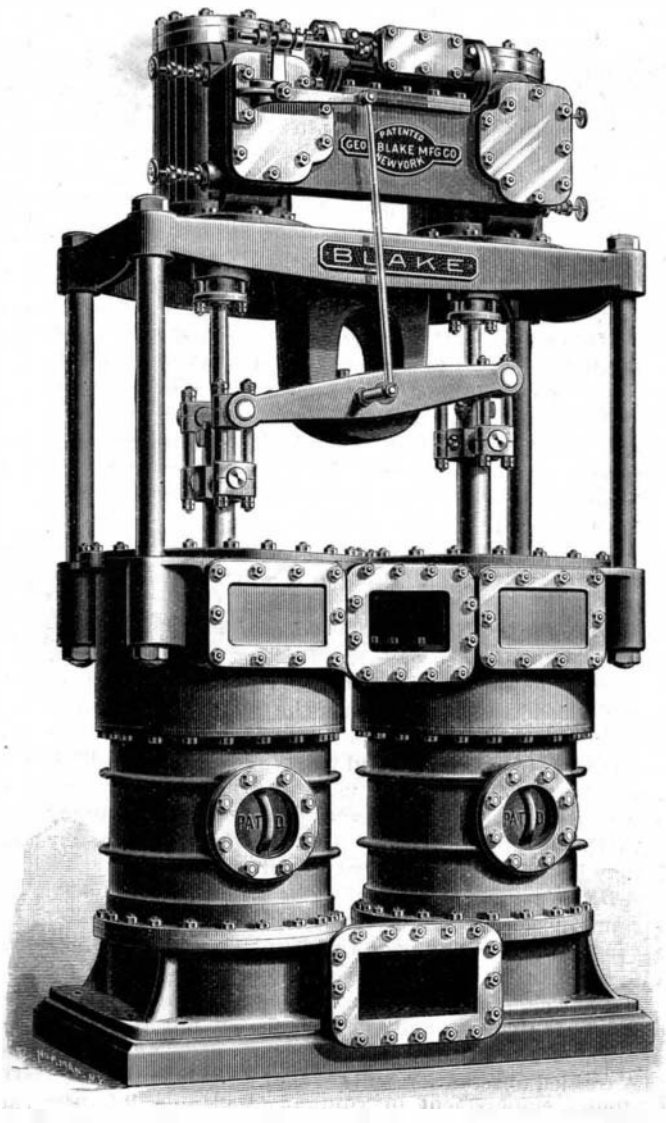
AIR PUMPS OF THE CRUISER NEW YORK.

The independent air pumps of the cruiser New York, built by the Geo. F. Blake Manufacturing Company, are quite novel in construction and performance. The New York, like all the government vessels, has very little room to spare for engines and their auxiliaries, consequently the design of the air pump had to be one combining compactness, minimum weight and maximum efficiency. As shown by the illustration the design of this pump is of the vertical direct acting type—Blake system. The air cylinders are of the vertical single-acting pattern, operated by double-acting steam cylinders; there being two air cylinders, the flow of the water and vapors is practically continuous. The piston rods are connected to the beam by means of links, etc. The air cylinders and the working parts of same are entirely of gun metal composition, which is the usual practice in the United States navy. The piston rods of the steam cylinders are of steel, as also the valve gear, which latter can be adjusted by hand even while the pump is in operation, thus securing full stroke at all times.

These pumps are particularly remarkable for the low percentage of power required to operate them in comparison with the power of the main engines. From the official report of the trial trip the I. H. P. of the Blake air pumps was less than one-quarter of one per cent of the I. H. P. of the main engines. The explanation is, perhaps, due to the very complete and perfect arrangement of the steam valve gear, which so thoroughly controls the operation of the pump that a very low rate of piston speed is sufficient to give a first-class working vacuum. The average speed of the air pumps on the trial trip of the New York was less than 16 double strokes per minute, while the minimum speed was only 9½ double strokes. The pumps can be run at practically any speed necessary without danger of "dead center." These air pumps are to be placed on all the vessels building for the navy by the Cramps, viz., the Columbia, Minneapolis, Brooklyn, Indiana, Massachusetts and Iowa. Each of the New York's air pumps has two double acting steam cylinders, each 12 inches diameter, two single-acting cylinders, each 25 inches diameter. Stroke of all, 18 inches. The working parts of these air pumps are exceedingly simple and strong. The steam valves of the steam cylinders are plain "D" slide valves, which, by means of levers, are operated by a supplementary piston which moves in the horizontal steam cylinder shown. This supplementary piston is also operated by a plain "D" valve connected to the valve rod which has adjustable collars for regulating stroke. This valve rod is moved by means of the rod attached to the working beam from which it gets its motion.



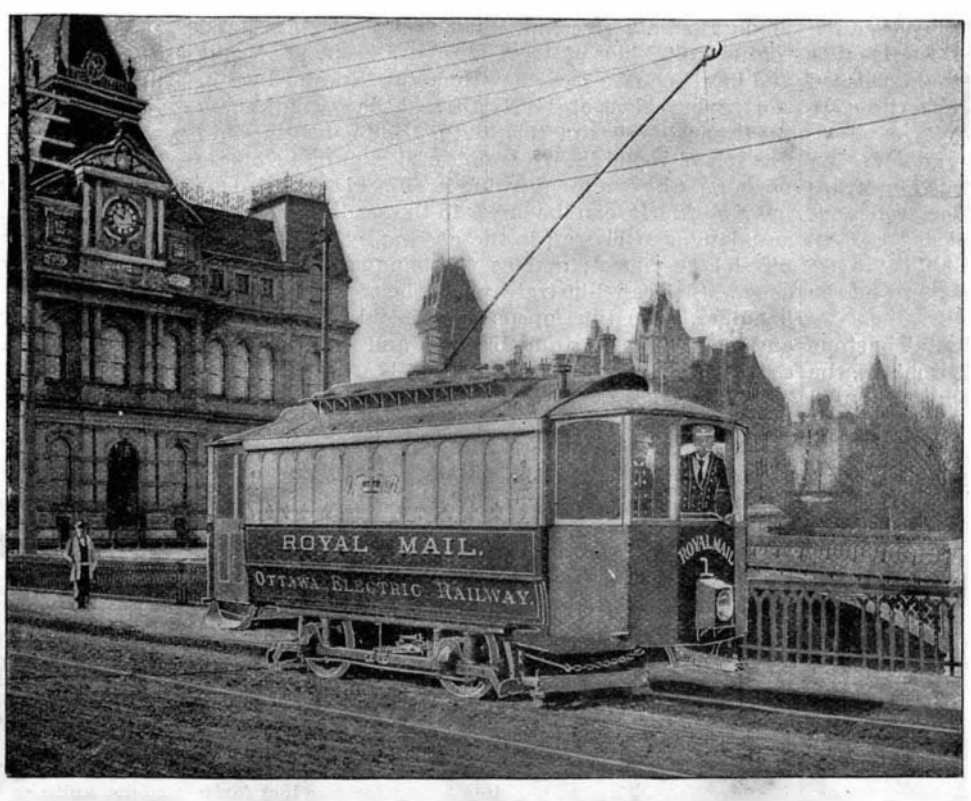
BLAKE'S VERTICAL TWIN CYLINDER AIR PUMP.

ELECTRIC RAILROAD MAIL SERVICE IN OTTAWA, CANADA.

In recent numbers of the SCIENTIFIC AMERICAN we have had occasion to speak of the utilization of cable and electric cars for the distribution of mail. It seems practicable to greatly improve the house to house delivery of mail, as well as the collection of letters from lamp post boxes, by utilizing the street cars for post office service. The cut accompanying this article shows how our northern neighbors are employing the electric car in post office service. The carrying of the mail "experimentally" from the Ottawa, Can., railroad station to the post office in the same city began on November 10, and the service has proved very satisfactory, so much so that other cities in Canada will undoubtedly adopt the same system, and the post office is expected to extend the operations to suburban places.

In Ottawa three cars have been put in service, one of which is shown in the above cut, for which we are indebted to the *Street Railway Review*. The cars were built by the Ottawa Car Manufacturing Co., specially for the post office work. Each car is twenty feet long, with vestibuled platforms, and is driven by a 30 horse power Westinghouse motor. The interior is arranged with the requisite facilities for loading and unloading the pouches. No sorting is done on the car, so that the usual glass windows are dispensed with.

A special alarm gong is provided for each car, which gives a different sound from the gongs on the passenger cars, thus making its approach known. Special sidings have been laid for the car at the post office and railway yard. The motormen and other employes are uniformed. The contract with the electric railroad company calls for a compensation of $4,000 per annum for the work, the motorman being supplied by the railroad company; the post office employes act as messengers. The delivery by horse and wagon formerly cost $3,000 a year. Thus there is no direct economy shown, but the efficiency of the service is presumably worth the difference.



ELECTRIC MAIL CAR No. 1, OTTAWA, CAN.

ACCORDING to a French statistician, there were in 1893 51,000 breweries in the world. Germany heads the list with 26,240, producing annually 4,750,000,000 liters of beer (the liter is equal to 1¾ pints nearly). England comes next with 12,874 breweries, the output being 2,600,000,000 liters. The United States is third, with 2,300 breweries, producing 3,500,000,000 liters. Austria, with 1,942 breweries, produces 1,300,000,000 liters. Belgium has 1,270 breweries and France 1,044; the former produces 1,000,000,000 liters and the latter 800,000,000 liters. The annual allowance of beer per head of the population in Bavaria is 221 liters; in England, 143; in the United States, 31; in Sweden, 11; and in Russia, 5.

The Nansen Expedition.

Dr. John Murray, the well known authority on Arctic and Antarctic exploration, has made the following statement with regard to Dr. Nansen's expedition:

"In all probability we shall not hear any more of Nansen for a long time to come. The last news from him clearly indicates that he was able to push his way through the Kara Sea early in August. By the time he arrived in the Nordenskjold Sea he most probably found the dogs an intolerable nuisance on board his small ship, and very likely he had made up his mind that they would be of little use to him, except in the improbable event of his finding a large stretch of land toward the North Pole. Supposing the expedition to be all well off Cape Chelynskin, there seems no reason why it should go south to Olenek. Nansen had no intention of going as far east as the new Siberian Islands, supposing an opportunity offered of penetrating the ice to the northeast of Cape Chelynskin, and all reports tell of open water in this direction during the past season. The chances are that he is now fixed in the ice somewhere between the longitudes 120 and 130 east and latitudes 78 and 80 north. If so, he is then in the most favorable position for progress next summer. During the winter it is not likely that any great advance will be made, but in the spring and summer months it is believed that the drainage from the Siberian rivers and the wind pressure on the surface of the ice floes combine to set the currents and ice from opposite the mouths of the Lena across the Pole and down into the Norwegian Sea between Spitzbergen and Greenland. If the Fram is carried through the Polar basin without being crushed among the ice floes, she will have an extraordinary run of good luck. It is possible, but not probable, for I have no great faith in her being lifted up on the ice, should she come in for a "nip." But supposing the Fram be crushed, Nansen's expedition is not at an end. In all probability he will be able to save his boats, transfer his stores to the ice floes, and there construct comfortable quarters. Should his supplies fall short, he will always be able to fish up from underneath the ice plenty of food in the form of minute crustaceans by means of tow nets let down through holes in the ice. Once when frozen in between Spitzbergen and Greenland, I procured enormous numbers of animals in this way which made an excellent soup. I presented the Nansen expedition with a large number of silk nets for this purpose. Nansen may be five or many more years in passing across the Arctic basin, he may fail altogether, but I shall be disappointed if he be not heard of to the north of Spitzbergen during the summer after next."

The Crozier-Buffington Disappearing Gun Carriage.

The value of disappearing gun carriages, especially for coast defense, has been clearly demonstrated. A gun on an ordinary barbette carriage offers an inviting target, and a fleet would naturally try to dismount it. The gunners are also exposed with a barbette carriage. A number of disappearing gun carriages have been invented and tried in this country. The Crozier-Buffington disappearing gun carriage is somewhat lighter and more graceful than the Gordon carriage, and the tests have been highly satisfactory. In the firing position of the Crozier-Buffington carriage the trunnions of the gun rest in sockets at the ends of a pair of huge levers which swing freely, and are attached to a large counterpoise. This is lifted and held up by a pawl and ratchet. When the gun is fired the piece recoils and the levers sink. With an 8-inch breech loading rifle the counterpoise weighed 37,000 pounds. Connected with the breech of the gun is a pivoted framework which keeps the gun in exactly the same position. In addition to the counterweight, which takes up only about one third of the recoil, there are two hydraulic cylinders which receive the remainder. The cylinders are horizontal and fixed while the pistons are stationary. The new carriage holds the record for speed, as ten rounds were fired in twelve minutes and three seconds. The time of firing a round is divided about as follows: In loading fifty-five seconds were consumed, in raising to position five seconds, in firing one second, and one second was required for the recoil. The new gun carriage is highly efficient and reflects great credit on the American inventors.