14, 1899. She is 330 feet in length over all, with a beam of 43 feet 9 inches, and a maximum draft of 15 feet 10 inches, and her displacement, according to figures furnished by her builders, is 3,402 tons with ammunition, stores, coal and water half consumed, and with all ammunition, stores, coal and water on board, 3,954 tons. She is driven by twin engines and screws; her maximum indicated horse power is 7,500, and her speed, as determined in recent trials in England under the official representative of our navy, was 20.73 knots for four hours under forced draft and 19·3 knots on a run of six consecutive hours under natural draft. The vessel is sheathed and coppered and will, therefore, be especially suited for service in tropical waters.

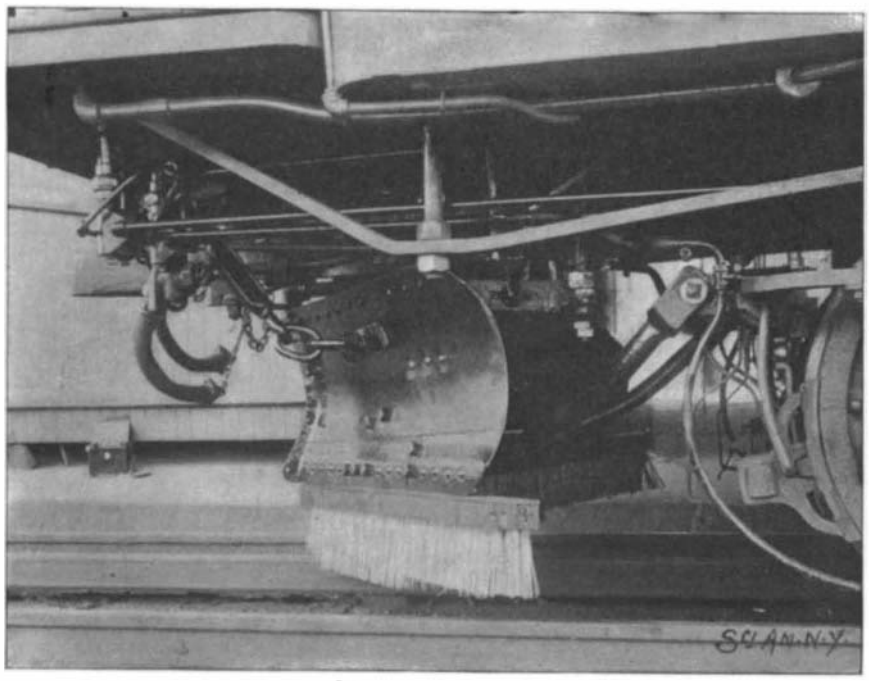
The "Albany" is thoroughly representative of the latest trend of ideas in the construction of protected cruisers. Like the best of her type she is distinguished by her good speed, generous coal capacity, considerable length in proportion to beam, enabling her lines to be carried out with great fineness and beauty, and by her powerful armament and her ability to deliver great energy of fire through a widely extended zone. In respect of defensive qualities, however, like all protected cruisers, she is certainly weak and open to attack. She is entirely devoid of vertical side armor, and her protection against the entrance of projectiles into the vitals consists merely of a curved deck of steel assisted by coal bunkers in the wake of the engines and boilers at the water line.

Although the "Albany" is about as good a representative of her class as exists in the world to-day, the class, as such, is somewhat discredited, the present tendency being to build larger cruisers and give them a belt of vertical armor at the water line.

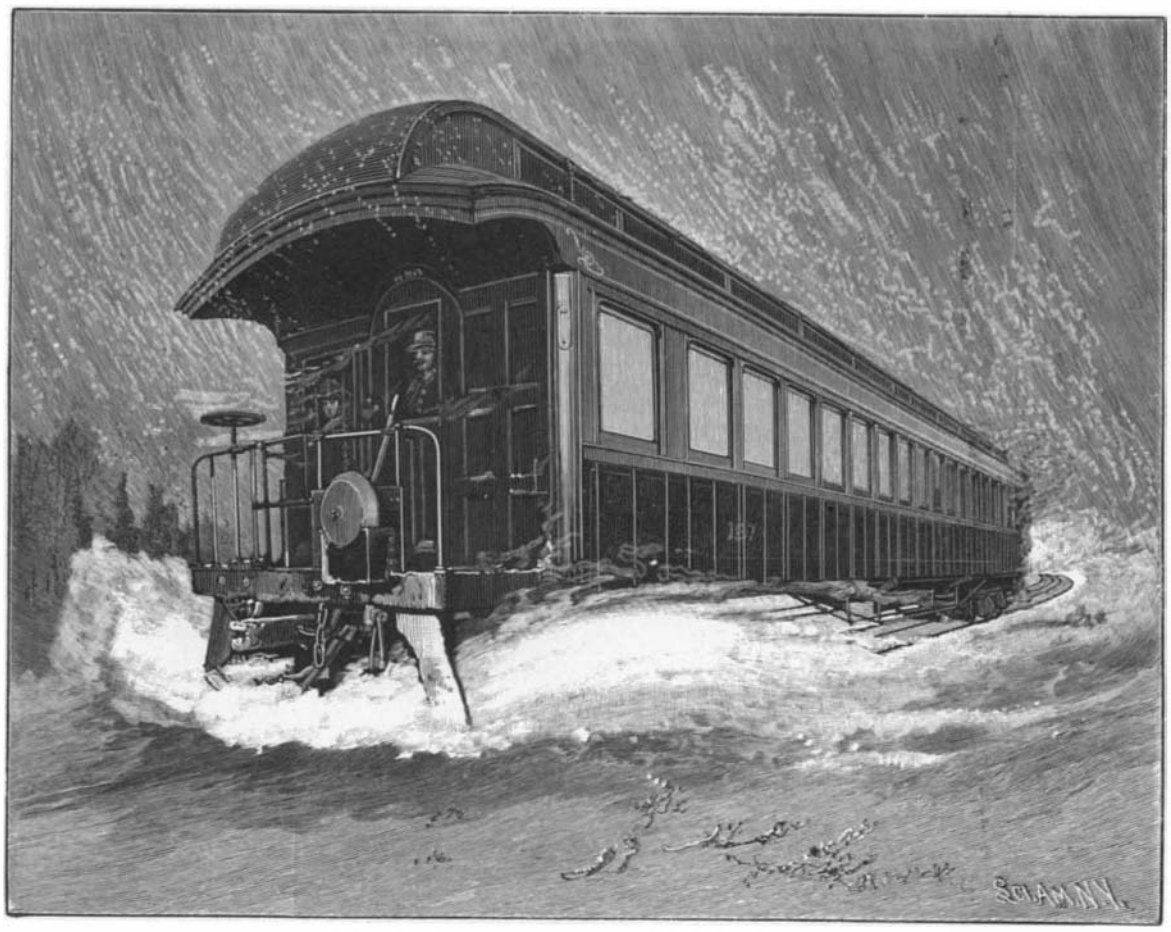
The main battery of the "Albany" is made up of six 6-inch and four 4·7-inch rapid-fire guns, and the secondary battery consists of ten 6-pounder rapid-fire guns, eight 1-pounders, and two Colts. The whole of the main battery is of the long 50-caliber type, manufactured by the builders of the vessel. The disposition of the battery is as follows: One 6-inch gun is carried on the forecastle deck, another aft on the poop, and four others are carried in sponsons on the main deck in the waist of the vessel, two of the latter being forward on either beam, and two aft. The sides of the vessel are cut away so as to allow these four guns on the main deck to be fired directly forward or astern parallel with the axis of the ship. The 4·7-inch guns are carried in broadsides on the main deck between the 6-inch guns. The battery of 6-pounders is carried on the main deck, forecastle and poop, two of these being in the bow, two in the waist, and two astern on the main deck, while the other four are carried on the forecastle and the poop. The vessel is provided with two military masts upon which there are no less than four separate fighting-tops in which are distributed the 1-pounders and Colts. The arrangement of the battery enables the vessel to concentrate the fire of three 6-inch guns dead ahead and astern, while the broadside fire consists of four 6-inch and two 4·7-inch guns.

The 6-inch gun of the "New Orleans" is carried in a trunnion sleeve or seating, in which it slides. It is held in the forward or loading position by coiled springs, inclosed in two cylinders which are attached to the seating. Attached to the gun are two pistons which travel in the cylinders, the latter being filled with glycerine, and it is the combined resistance of the springs and of this glycerine to the movement of the pistons which serves to take up the recoil. After the recoil the gun is returned to the loading position by the action of the coiled springs, which were compressed during the recoil. The breech of the gun and the crew are protected by a large shield of 4-inch Harvey steel. This type of gun has fired seven rounds in 61 seconds, and the 4·7-inch gun has a record of five rounds in 22 seconds. The 6-inch gun fires a 100-pound projectile with a muzzle velocity of 2,600 foot-seconds and a muzzle energy of 4,687 foot-seconds. This is equal to a penetration of 20½ inches of iron at the muzzle. The 4·7-inch guns have the same velocity, and a muzzle energy of 2,109 foot-tons with a penetration of iron at the muzzle of 15½ inches. At 2,500 yards the velocity of the 6-inch and 4·7 inch guns is 1,790 and 1,558 foot-seconds, respectively, the energy at that distance being in the 6-inch gun 2,224 foot-tons, and for the 4·7 inch guns 757 foot-tons.

For protection the "Albany" relies mainly upon a curved deck, which is 1¼ inches on the flat and 3 inches in thickness on the slopes, the latter extending along the sides from the flat deck, which is slightly above the water line, to a junction with the sides of the vessel several feet below the water line. This protection is reinforced by the large coal bunkers, which are extended along the berth deck on either side amidships, and present a horizontal thickness on each side of 8 feet of coal. The normal coal capacity is 512 tons and the bunker capacity, with full stowage, is about 800 tons.



ELECTRIC CAR SNOW-PLOW AND RAIL-BRUSH EQUIPMENT.



CLEARING SNOW FROM A THIRD-RAIL TRACK.

The Scientific American in Germany and Austria.

One of our exchanges of Vienna has favored us with a large bunch of clippings from German and Austrian papers which have reprinted articles from the SCIENTIFIC AMERICAN. The variety and reputation of these papers makes the compliment very gratifying including as they do The Hamburger Nachtrichton, Wiener Zeitung (Vienna), The Neue Freie Presse (Vienna), Deutsche Zeitung (Vienna), Triester Zeitung, The Frankfurter Journal, The Neues Wiener Journal (Vienna), The Berliner Local-Anziger, The Breslauer Zeitung (Breslau), The Linzer Tagespost (Linz), The Hamburgischer Correspondant, The Reichswehr (Vienna), The Merauer Zeitung, and many others.

FIGHTING SNOW ON THE THIRD-RAIL.

Since the advent of the electrically-propelled passenger car, deriving its motive current from an auxiliary third rail, it has solved the problem of a frequent rapid transit suburban service; one of the first difficulties which was encountered was that of keeping the third-rail clear in snowy weather, so that the connecting shoe of the car would make a good electrical contact. If this were not assured, however rapidly one might travel in good weather, he would not be certain of reaching his destination on time should a heavy snowfall occur.

The New York, New Haven, and Hartford Railroad Company, who were the first to adopt the third-rail system on their suburban lines, have had in operation for the past two winters a combination snow-plow and sweeper that has operated very successfully and kept the rail clear in the stormiest winter weather. As will be clearly seen from the smaller illustration, the arrangement consists simply of a small plow similiar to those used on locomotives, which is fastened to the car truck by two curved arms and chained to the end sill of the car by a few links of heavy chain. Attached to the bottom of the plow is a heavy bristle brush of like contour with it, and reaching to the top of the third-rail, which, if there is but a light snow, it effectually sweeps.

It is not only in light snowfalls, however, that the brush is effective, for it acts equally well in drifts or in several feet of snow on the level. During the heaviest storm in 1898-9 winter the cars were kept running on the Hartford, Conn.—Middletown and Berlin — Middletown lines long after the main steam lines in the State were blocked, and the lines could have been held open through the entire storm if the cars had been kept running, frequently through the night, as was done all day.

All this seems to prove the effectiveness of this simple arrangement and to show that motor cars, when properly equipped and frequently run, are much more efficient in preventing snow blockades than an occasional train hauled by a modern powerful locomotive.

The Roentgen Rays as a Depilatory.

Dr. Neville Wood records, in The London Lancet, a case in which a considerable overgrowth of hair on a woman's face was removed by applying the Roentgen rays. There were ten sittings per week of ten minutes each, the face and neck being protected with a lead-foil mask, except where the rays were intended to act. The distance between the anti-cathode and the skin was between 6 and 7 inches. The current of the primary coil was maintained at about five amperes, and the number of interruptions varied between 250 and 300 per second. After fourteen exposures, it was noticed that the darker hairs had lost some of their luster, and in a week's time there was an obvious lessening in their number. The hairs became brittle and pale in color, with atrophic bulbs. There was a slight reddening of the skin during this period. After forty-five exposures, the whole of a very thick, downy and hairy growth had disappeared, except nine hairs, which remained at least a week after the total removal of the others. They were found, however, to be readily separated at the bulbs, being retained in position by a more superficial part of the root-sheath. After cessation of the treatment, only a few thick hairs had returned, and these were removed with the well-known process of destroying them by the electric needle. Dr. Wood is of the opinion that the treatment is neither disfiguring nor painful, and thinks that about twenty will clear the ground for the use of the electric needle, and that between thirty or forty exposures will probably result in permanent alopecia.

THE Baltimore and Ohio Railroad is to use electrical locomotives on a 17-mile grade up the Allegheny Mountains. They will assist the ordinary locomotives in pulling the heavy freight trains up the steep grade.