EXPLOSION OF DYNAMITE AT THE RAPID TRANSIT SUBWAY.

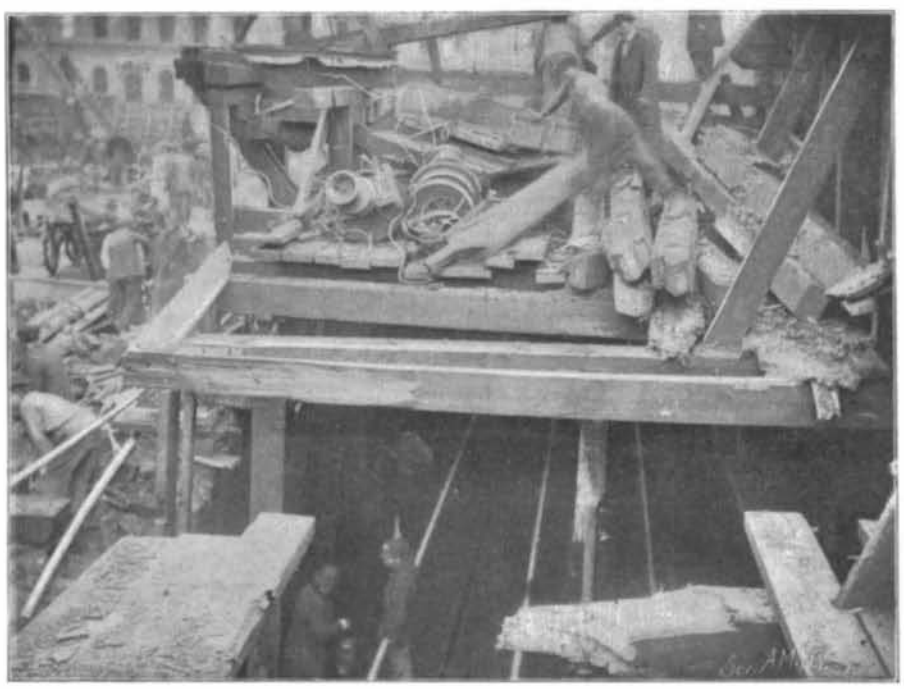
We present illustrations showing the destructive effects of the recent explosion of dynamite, which took place in New York city at the corner of Park Avenue and Forty-first Street, in the immediate vicinity of the Grand Central Station. It was due to the accidental detonation of some boxes of dynamite, which represented what was left of the daily delivery which is made at this point for the service of the particular section of the Rapid Transit excavation on which it occurred.

As we have frequently explained in previous articles on the New York Rapid Transit Subway, the tunnel is carried for a great part of its distance through solid rock, and where this occurs it is, of course, necessary to make use of high explosives in blasting out the rock. There are some sections of the Subway where the location of the line is continuously through solid rock. One of these is at Washington Heights, where the road passes into tunnel for several miles at a level that is in some places as low as 125 feet below the street surface. Another important rock-tunnel section is that which extends from Thirty-fourth Street to Forty-second Street. Here the four-track tunnel divides into two separate two-track tunnels, which are being driven below the existing tunnel, through which the tracks of the Fourth Avenue underground trolley road are carried. The two Subway tunnels do not lie immediately below the old tunnel, but on either side of it; and at either end of them vertical shafts have been driven, through which the excavated material of the tunnel is brought to the surface. Near one of these shafts, at the northern end of the westerly tunnel, at the intersection of Forty-first Street and Park Avenue, was a small shanty in which was stored the dynamite that was used in each day's blasting. The shanty stood at the surface of the street and not far from the railing which guards the street from the open cut by which the street railway tracks emerge from the mouth of the old tunnel as they approach Forty-second Street station. From the shanty to the front wall of the Murray Hill Hotel was a distance of about 25 feet.

According to the man who had charge of the maga-

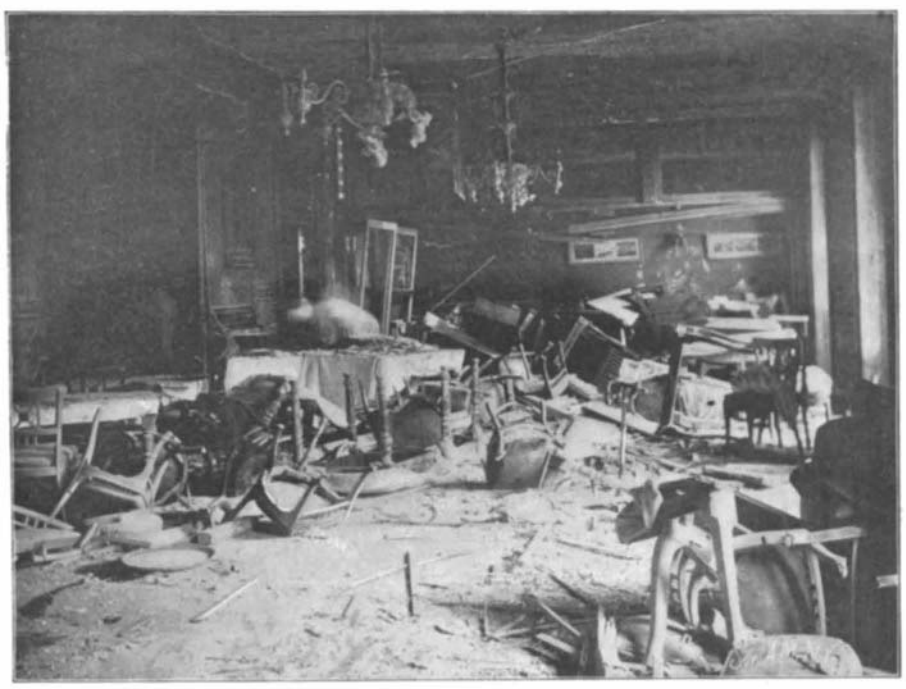
Looking South on Park Avenue. Cross Indicates Location of Dynamite.

Exact Locality of Explosion Showing Openings into the Subway and Park Avenue Tunnel.



View from Wrecked Platform of Hoisting Engine, Above Park Avenue Tunnel.

Looking South Toward Park Avenue with Subway Excavation at the Right of Tunnel.

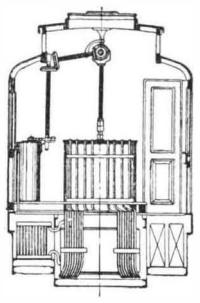


View Inside Murray Hill Hotel Cafe Immediately After Explosion.

Northeast Corner of Murray Hill Hotel, Which Felt Full Blast of Explosion.

DYNAMITE EXPLOSION ON RAPID TRANSIT SUBWAY.

zine, there was several hundred pounds of dynamite in the shanty at the time of the explosion, or twelve boxes of dynamite, each box holding about seventy-five sticks. The boxes were on a shelf which stood about four feet above the floor of the shanty, while underneath the shelf there was scattered a lot of paper wrappings from the cartridges. The shanty appears to have been lighted by a candle, which was stuck between nails driven into the wall. The man in charge of the shanty supposes that the setting off of a blast must have shaken the candle down onto the floor, where it set fire to the paper. Whether this was so or not, he states that he had been gone but a few minutes from the shanty when he heard a cry of fire, and running to the door saw the paper cartridge wrappings on fire and the shelf burning. Although a bucket of water was thrown upon it, it failed to put out the fire. The man had not run far from the place before the detonation occurred. His theory is that the heat of the fire had warmed the dynamite, and that the burning of the shelf caused the whole mass to fall to the floor, the jar and heat together causing it to detonate. On the other hand, it is stated by the President of the Rapid Transit Commission that there were thirty pounds of combustible in the magazine on the night before the explosion, that 440 pounds were delivered next morning, and that four-fifths of this amount had been used, leaving only about 100 pounds on hand at the time of the explosion.



Although the results were disastrous, they were not nearly as fatal as one might have expected from the ordinarily crowded condition of the streets at this hour. In all five persons lost their lives, three of them in the Murray Hill Hotel, and two or three hundred persons, the exact number of whom will never be known, were more or less injured. No great damage was done to the Rapid Transit Subway, the loss being confined to the destruction of a derrick and hoisting engine and some platforms and timbering of the tunnel shaft. The most serious destruction was that wrought on the adjoining buildings, and particularly the Murray Hill Hotel. On this building the force of the blast was sufficient to shatter not only every window, but practically every window-frame from street line to cornice. A mass of mud, earth, and splintered timbers was hurled into the nearest rooms, and the glass wreckage and blast of the explosion overturned furniture, wrecked the chandeliers and brought down large portions of the ceiling. The condition of the interior of the hotel may be judged from the photographs which are herewith presented. One of the fatalities occurred in a bedroom immediately opposite the scene of the explosion, the occupant being buried beneath a mass of rubbish, while another person was killed at the cigar stand. On the opposite side of Park Avenue the windows of the Manhattan Eye and Ear Infirmary were completely shattered, the same effects being produced on the Grand Union Hotel.

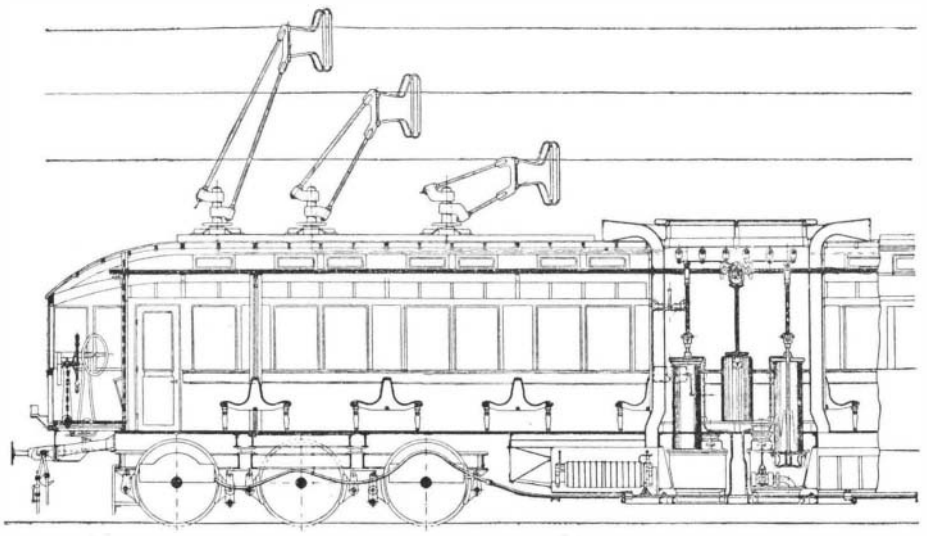
A curious effect, noticed immediately after the explosion, was a heavy piece of planking which had been driven through the cornice of the tower of the Murray Hill Hotel and hung in this position over 100 feet above the sidewalk. Another incident that attracted much attention was the instantaneous wreck of the two large clocks in the towers which flank the southerly façade of the Grand Central Depot. The clock faces were blown from their setting back into the clockroom. It is a matter for congratulation that, although the explosion occurred within a few feet of the tracks of the Metropolitan Street Railway, no lives were lost nor passengers seriously injured. It so happened that, although this is one of the most busy points on the system, there was no car in the immediate vicinity at the moment of the disaster.

HIGH-SPEED GERMAN RAILWAY AT ZOSSEN.

BY FRANK C. PERKINS.

The high-speed polyphase railway experiment is creating great interest in Germany as well as in this country. A speed exceeding 100 miles per hour has been attained of late, and it is claimed much higher speeds are possible.

The line installation, as well as the electrical equipment of one of the cars, was furnished by Siemens & Halske. This line is operated between Marienfelde and Zossen. The current is supplied from the power station of the Allgemeine Elektricitäts Gesellschaft at Oberschönweide. The accompanying illustrations and description have reference to the car equipment of the Siemens & Halske Company, of Berlin. The cars were supplied by Van der Zypen & Charlier, of Cologne, Germany. The road is about 14 miles in length, with grades up to 3 per cent. The current supplied has a frequency of 45 to 50 periods per second and a potential of 10,000 volts. The car as seen in operation may be noted in the accompanying photographic and diagrammatic views showing detail of construction and the arrangement of passenger and apparatus rooms. Cross seats are provided for 60 passengers in a center room and two end rooms, the former being nearly 8 meters and the latter about 4 meters long. The total length of the car is 22 meters, with platform at each end nearly 2 meters in length, from which the operator controls the car. Automatic Westinghouse brakes are used, two 10-inch cylinders being used for each truck, and the brake rods being so arranged that they may be applied by hand from either platform of the car.



LONGITUDINAL AND CROSS-SECTIONAL VIEWS OF CAR BUILT BY ALLGEMEINE ELEKTRICITAETSGESELLSCHAFT.

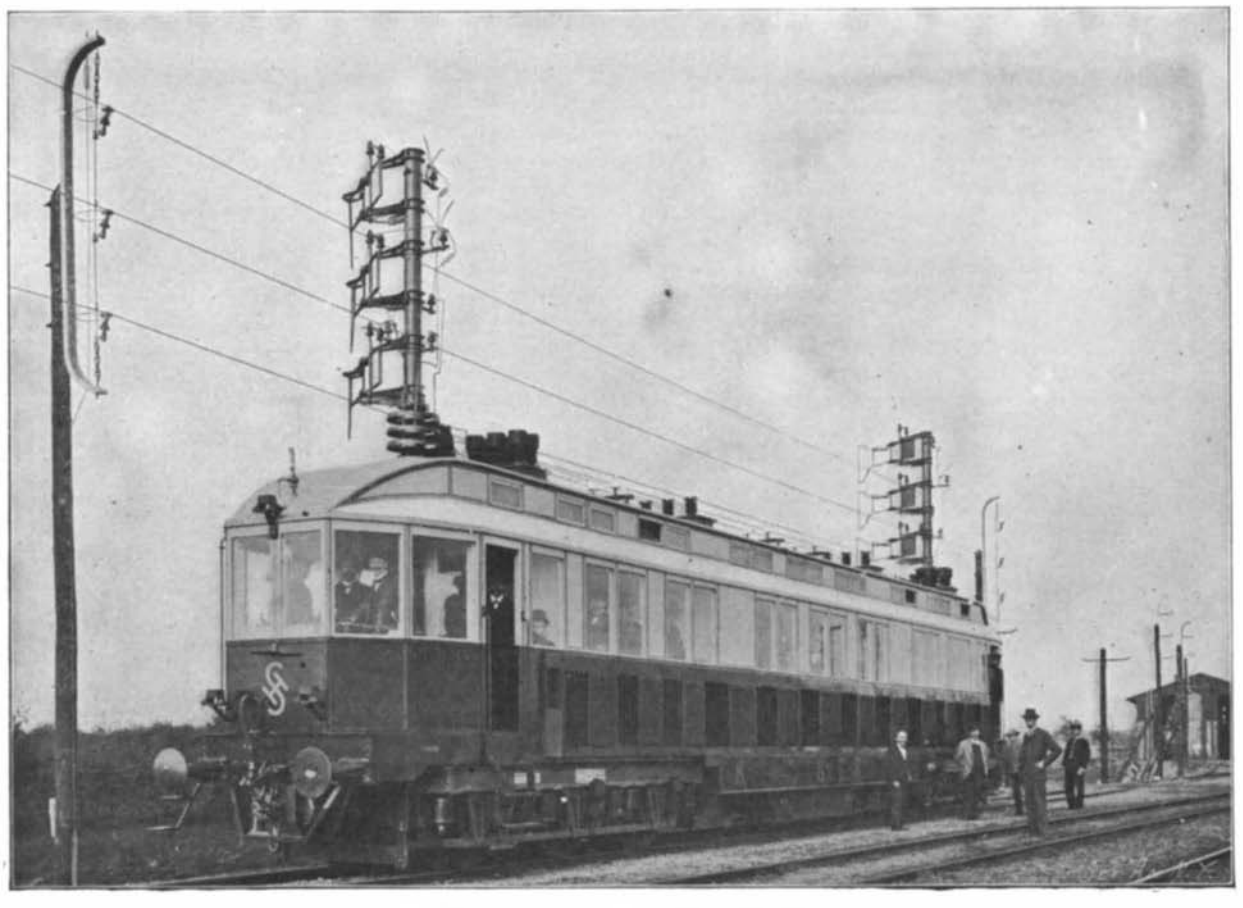
Compressed air is used not only for the operation of the brakes, but also to control the electrical apparatus from either platform of the car. Two sets of electrical apparatus are used, each consisting of two rheostat controllers, two motors, two motor switches, a large step-down transformer, together with an air pump with its own transformer and the necessary current collectors in three parts for conveying the current from the overhead wires to the transformers and motors. Two motors are supplied to each truck directly mounted on the axles, each of which has wheels 1,250 millimeters in diameter (about 4 feet). Each motor has a normal capacity of 250 horse power to 500 horse power. The four motors, when heavily loaded, have a capacity of 3,000 horse power, or 750 horse power each. The primary pressure is varied from 1,850 volts to 1,150 volts from starting to full speed, the currrent of primary being respectively 280 amperes and 120 amperes. The voltages of the secondaries of motor are 1,000 volts and 540 volts, while the current is 550 and 210 amperes.

The metallic resistances are placed behind the open shutters seen on the side of the car in the accompanying illustration. The cold air rushing through the openings keeps the temperature of these resistance coils down, as a large amount of heat is generated in regulating the speed of the motors by cutting these resistance coils in and out of the secondary circuit of the motors. Cold air is also supplied by pipes extending above the roof of the car, as shown in the diagram.

The high tension transformers operate at from 30 to 150 amperes, the potential of the primary being 10,000 volts, while the secondary voltage is varied according to whether the secondary winding has delta or star connections. The high tension winding is always connected as a star winding and carried through safety fuses to the distributing wires and thence to collector trolley.

The accompanying views show the car and high tension line to good advantage.

The line is divided into parts each 1 kilometer in length, a feeder connecting the center of each section. The poles are nearly 8 feet from the track, the three conductors being mounted vertically one above the other, the lowest about 20 feet from the ground. The poles are somewhat more than 100 feet apart, are of wood construction and have mounted upon them bow-shaped arms, the conductors not being rigidly fastened, but supported upon insulators of hard rubber mounted upon a vertical chain and wire system, as seen in the figure. The conductors are hard-drawn copper of 100 square millimeters in cross-section and have a conductivity of 97 per cent pure copper.



SIEMENS-HALSKE HIGH-SPEED POLYPHASE CAR.

Each trolley wire at its supporting insulator is connected to a loop of copper wire about one-third of an inch in diameter which is designed to become grounded in case the trolley wire breaks; by being pulled into contact with a vertically-suspended wire of the same cross-section, having a coil spring near its upper support, its lower end being directly connected to the track. Copper rail-bonds are used, and ground plates are placed at each section of the track. The four feeders on the high tension line consist of three high voltage conductors and a neutral wire mounted on porcelain insulators. Part of the conductors consist of insulated cables and part of bare wires, the latter having 50 square millimeters cross-section and the former having 70 square millimeters cross-section.

The current is collected from the trolley wires at the side of the track by three bow-shaped collectors specially designed for this installation. These are mounted on a mast consisting of two telescoped tubes about 8 inches in diameter. A mast is mounted at