

**COLLAPSE OF A LARGE GAS HOLDER.**

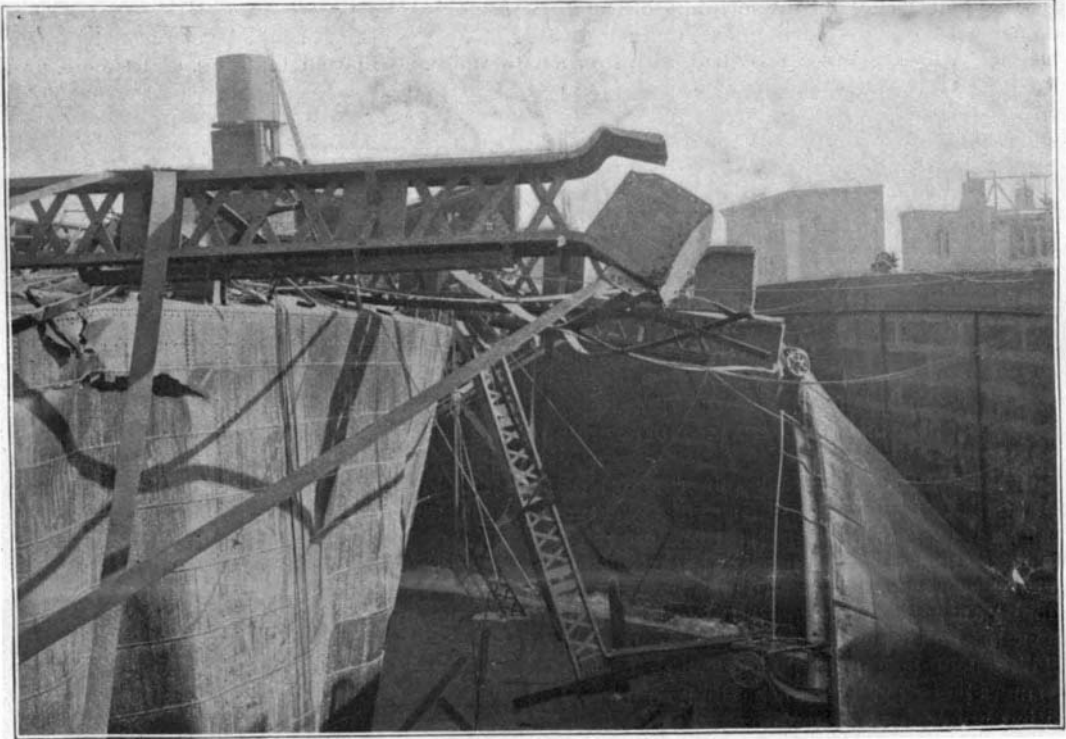
In the accompanying illustrations are shown the extraordinary ruins of a large gas holder which collapsed during its trial test on the afternoon of Tuesday, December 13. The wrecked structure had recently been built for the Consolidated Gas Company, of New York, on a portion of their property lying between First Avenue, Avenue A, Twentieth and Twenty-first Streets.

In order to understand the nature of the disaster and explain the complicated appearance of the wreckage, it will be well to explain briefly the method of constructing a large modern telescopic gas holder of this type. As the object of these structures is to serve as reservoirs in which to store up the gas as it passes over from the retorts and purifiers, and before it is drawn off into the city mains, it is evident that they must be capable of enlarging or reducing their capacity to match the greater or smaller surplus of gas at the works. If a variable storage capacity were not provided in the reservoirs, it would be necessary to compress the gas in heavy steel reservoirs—obviously too costly a method.

The system adopted is to use an inverted cylindrical holder closed at one end and with the open end resting in a tank of water. The gas is introduced by pipes which pass up through the water of the tank into the inverted gas holder. As the gas flows in it lifts the gas holder, and as it is drawn off into the mains the holder descends. To keep the holder in the vertical position and cause it to telescope concentrically within the water tank, it is provided around its upper edge with a series of guide wheels, which travel against guide rails carried on a series of braced vertical columns that surround the tank. The arrangement will

it was built in the ground and some 25 feet of it projected above the ground level. When the holder was extended to its full height, it stood over 160 feet above the ground. The capacity of the tank was about 3,500,000 cubic feet of gas, and it was one of the largest in the country, being exceeded by three others: One owned by the East River Gas Company in Long

Island City, of 5,000,000 cubic feet, one owned by the Mutual Company in East Twelfth Street, of 4,000,000 cubic feet, and another 4,000,000 cubic feet holder in Chicago. The largest in the world is in London; it holds 12,000,000 cubic feet, while there are two others of 6,000,000 cubic feet in London, and one of like size in Birmingham, England.



1.—TOPMOST SECTION OF HOLDER, WITH PORTION OF FRAME FALLEN ACROSS IT.



2.—WRECKAGE OF THE FRAME LYING ACROSS TWENTY-FIRST STREET.

The structure was being tested by filling it with air, when, at 5:30 in the evening, the wall of the tank on the north, or Twenty-first Street side, split open from top to bottom. The water rushed out in enormous volume, filling Twenty-first Street to a depth of several feet and flooding the neighborhood for several blocks around. The wall of the tank being split, it fell outward under the pressure, knocking away the posts of the guide frame, which fell in a tangled mass across the holder, the ruins of the frame reaching clear across Twenty-first Street and falling upon the holders in the adjoining lot (see Fig. 2). It is probable the fall of the guide frame was preceded by the dropping or telescoping of the holder, the various sections or lifts of which can be seen lying within one another in Figs. 1 and 3. The rush of water carried away the inclosing wall of the gas company's property, and eyewitnesses describe the "blast" as having been responsible for the wrecking of several buildings in the vicinity.

At the present writing the cause of the disaster is a profound mystery. The design of the structure was of a standard and well approved type, and as far as can be judged the material was of good quality. Some of the phenomena of the wreck, such as the blowing of material to a considerable distance, point to the possibility of gas having entered the holder with the air and formed an explosive mixture. The result of the investigation which is now being carried on will be looked for with considerable interest.

be understood by referring to the gas holders shown in our cuts as adjoining the wrecked structure.

In the earlier gas holders it was customary to place the water tank in an excavation, with the surface of the water at the ground level; but for reasons of economy it is now customary to place only about one-half the depth of the tank below ground. Moreover, in many locations where there is tide or river water in the vicinity, the work of excavation might be exceedingly troublesome.

When the gas works are located in the heart of a city, the great cost of the land makes it desirable to keep down the diameter of the gas holder and secure the necessary capacity by giving it additional height. As it is impossible, because of the cost, to greatly increase the depth of the tank, the inverted gas holder is made in sections, which telescope within each other, the topmost section being closed and those below it consisting of open-ended cylinders. When a gas holder of this kind is empty, the sections all rest on the bottom of the tank, the closed section being the innermost of the series. As the gas enters the inner and closed section it lifts it until the latter is clear of the tank, when it catches hold of the next section and pulls it up with it. This is repeated until the series is extended to its full height. The sections lift each other by means of rectangular troughs formed at their lower and upper edges, the trough around the upper edge of one section lapping over and down into the trough of the section above it. The troughs are filled with water, which forms a seal to prevent the escape of the gas.

The wrecked structure was of the telescopic kind, and the holder was built in four sections. The water tank, which was built of mild steel, was 42 feet deep and 178 feet in diameter. About one-half of



3.—LOOKING DOWN UPON THE WRECK OF THE TANK AND THREE LOWER SECTIONS OF THE HOLDER.