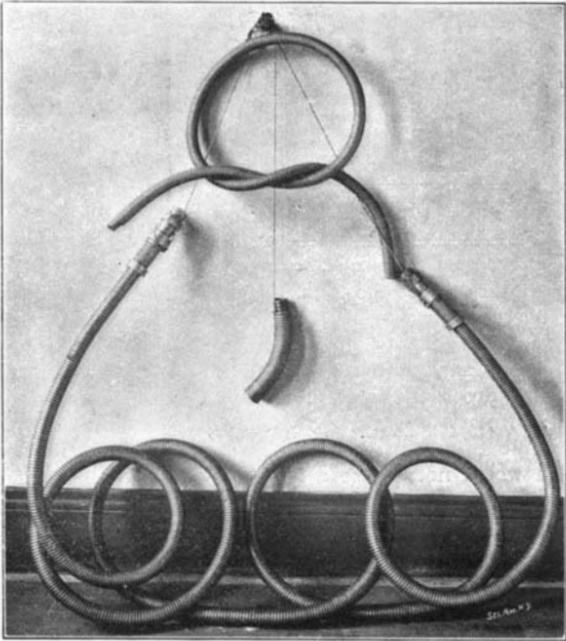


HOSE MADE ENTIRELY OF METAL.

Metal is about the last thing one would regard as a substitute for rubber, and particularly where great flexibility is a quality which was absolutely essential; but this has been done recently, and a hose has been manufactured out of a steel tape which has all the flexibility of a tube made of rubber, and also several

**METALLIC HOSE.**

advantages which the rubber does not possess, such as great durability in all classes of service and the power to resist the action of heat and corrosion as well as that of acids and other chemicals. It is therefore adapted to the conveying of steam, compressed air, water, oils, acids, alkalis, gases, benzine, naphtha and gasoline.

No rubber whatever enters into the manufacture of this hose. It is constructed entirely of a metal tape which is rolled up in the form of a spiral, so that the edges overlap and fit into each other without in the least interfering with its flexibility. As the tape is rolled up it forms a groove for the reception of a packing which is completely inclosed in the metal as it rolls, where it remains fully protected from external or internal wear and tear. The packing causes the tubing to be perfectly tight, while the jointing induces a flexibility superior to that of a rubber hose of equal dimensions. As this hose will not kink, crust or blister, it can always be relied on to deliver its full capacity, which is greater than that of a rubber hose of the same dimensions, from the fact that the connections are all made on the outside, leaving the full internal diameter of the hose always available. The accompanying cuts show some pieces of this hose tied in such knots as to demonstrate its extreme flexibility, and also show the method of construction. In the latter the packing is shown in its place.

The single hose is recommended for all ordinary purposes; but where it is designed to convey air or steam under pressure, a double hose is made which will, it is claimed, resist a pressure of three thousand pounds to the square inch. This is constructed by placing one metallic hose within another, the coils of each running in opposite directions. This combination enables it to withstand the hardest usage successfully. While this hose is just being introduced into this country it has been in actual use long enough in Germany, where it originated, to demonstrate its serviceability. It has been adopted by the German navy and by the North German Lloyd. It has also done excellent service at the Liverpool docks, where over one thousand feet of it are used to convey steam from the boilers to the grain elevators.

Metal hose cannot, like India rubber, be drawn

over the end pieces of the apparatus with which connection is to be made. When of small diameter and intended for light pressures it is fixed by means of special connecting pieces which are cemented or soldered to the hose. In the case of larger hose, and where heat is to be encountered, the fittings are similar to glands in general use for valves and piston rods on pumps and engines.

CURIOUS BRIDGE AT ZANESVILLE, OHIO.

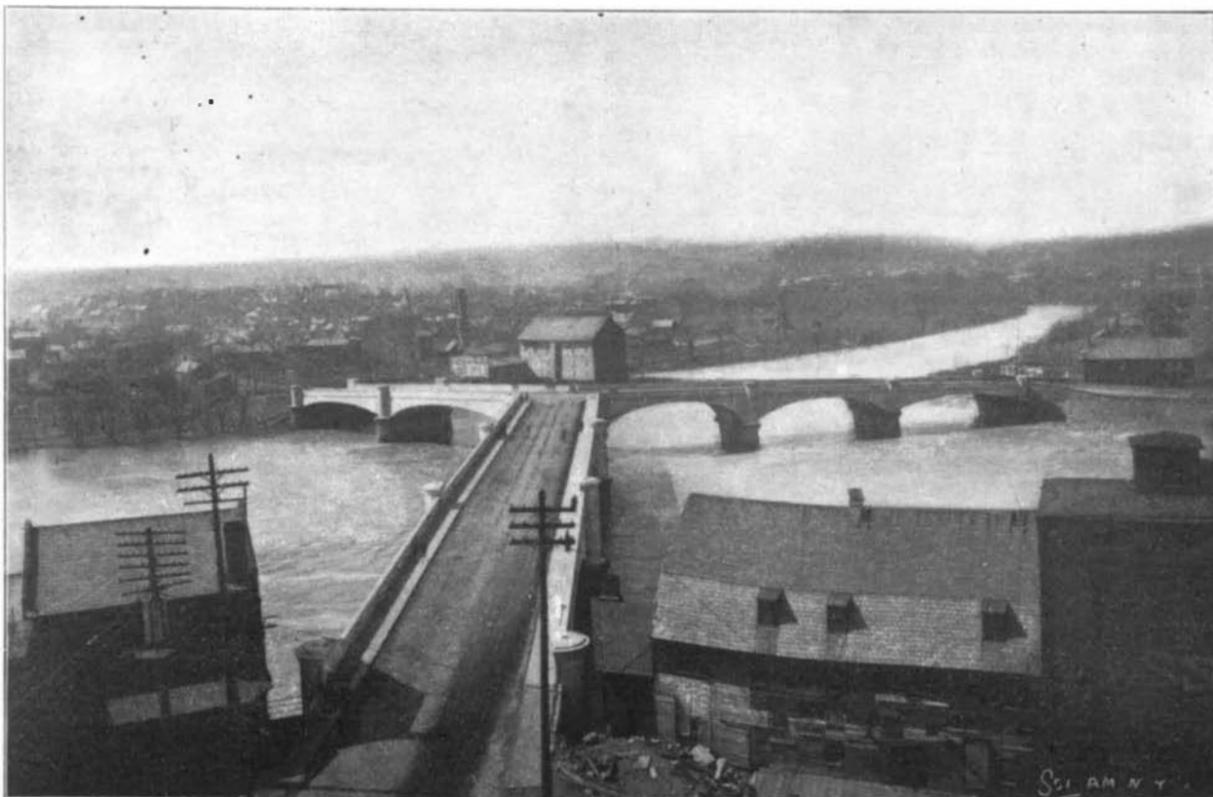
A bridge has recently been completed at Zanesville, Ohio, which is probably the only structure of a similar shape in the United States, if not in the world. It is popularly known as the "Y" bridge, from the fact that it consists of three arms, which join at the confluence of the Muskingum and Licking rivers.

It takes the place of a wooden covered bridge of the same design which was torn down in 1901 because it had become so weakened as to be dangerous for traffic. The site of the former bridge was utilized, but larger piers were constructed of masonry. Upon these was placed timber centering to sustain the steel ribs which constitute the permanent framework. The ribs are groups of pairs of bars, fifteen to an arch. A concrete filling consisting of gravel, sand and cement was placed upon the steel framework. Next to this was placed a layer of asphalt to prevent water from above reaching the tops of the arches, and upon the asphalt was laid a mixture of gravel, sand and cinders topped with another layer of concrete six inches in thickness. The roadway of the bridge is paved with brick and sustains the track for an electric railroad, the rails of which are bolted to steel channels embedded in the concrete. Conduits are also arranged under each sidewalk for electric and telephone wires as well as gas mains.

The east arm of the bridge is the longest, consisting of three spans 122 feet in length. The west arm is composed of spans 120½ and 99 feet in length respectively, while the north arm is composed of three, each of which is 81 feet in length. As is noted by the illustration, the arch rings are elliptical, while the piers sustaining them are finished with half-round columns or buttresses intended to support poles for electric lamps. Only the exterior of the piers is composed of masonry, the space within being filled with concrete also.

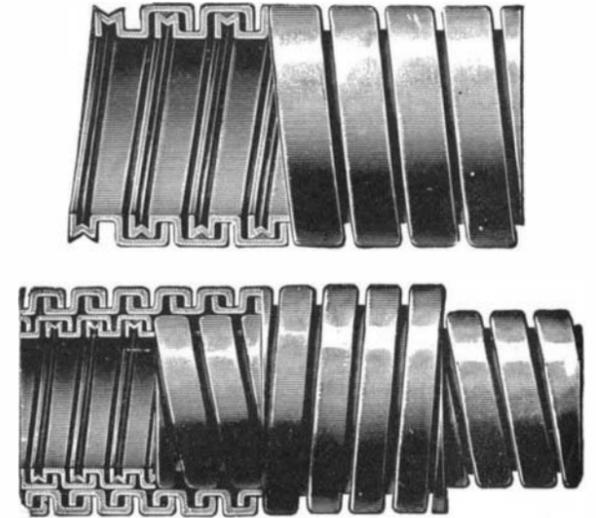
What it Costs to Keep Central Park in Condition.

The landscape gardener of New York city, Mr. Samuel Parsons, has drawn a gloomy picture of the future of Central Park, New York's famous pleasure ground. According to Mr. Parsons, about two million dollars will be required to save the park from ruin. The magnificent elms which line the Mall are said to be slowly dying for lack of nutrition. The removal of dead leaves in the interest of cleanliness has done its share to expose to the parching rays of the sun a soil

**THREE-ARM BRIDGE AT ZANESVILLE, OHIO.**

which is in itself not over-nutritious. Mr. Parsons naturally hesitates to demand two million dollars for the saving of the park. Indeed, it is a question whether it is not advisable to abandon the park altogether, and to seek another spot which might be converted into an open-air pleasure ground for the people. Property owners have for years complained that the peculiar situation of the park, splitting the city as it does in two long halves, necessitates detours and causes

not a little inconvenience. That the park will sooner or later give place to the all-devouring business needs of the city is hardly to be questioned, lamentable though that fact may be. Mr. Parsons is against the selling of the park for building lots, because in his opinion it is the most beautifully laid out property of its kind. In France and Germany are also magnificent parks, but it is doubtful if they can compare with the magnificent expanse of green that extends from 59th Street to 110th Street. But in one thing at least foreign parks excel us. Their vegetable growths are



more scientifically kept, with the result that there is little or no danger of denudation.

In times past a lake existed in Switzerland near the Marsby Valley, but either dried up or disappeared through drainage or analogous causes. Now several cantons have combined, and will fill the ancient lake-site by water from mountain torrents now going to waste near by. The head thus obtained will amount to 600 feet, and will afford 60,000 horse power. The work will take three years to execute, and is expected to cost about eight million dollars.

To Prevent the Freezing of Gas Pipes.

A simple but effective device for preventing the freezing of gas pipes is described in the *Illustrirte Zeitung für Blechindustrie*, consisting merely in the insertion of a wider piece of pipe just where the conduit issues from the ground or wall. For a conduit of a diameter from ¾ to 1½ of an inch a length of from 20 centimeters to 30 centimeters of a pipe 1 inch in diameter suffices. The deposition of the water particles contained in the gas, which on leaving the works have a temperature of about 10 degs. C., naturally takes place just where the gas is subjected to the most abrupt change of temperature, i. e., on its issue from the ground. If the external temperature is sufficiently low, the deposited water immediately congeals and clogs the conduit. As soon as the gas has acquired the temperature of the conduit the deposition of water and congealing cease, and this is said to be the case a short distance beyond the first cooling point. Therefore there should be no congealing beyond the inserted wider piece, and this piece is wide enough to accommodate a thick ice-crust and to still leave a free passage for the gas. As a matter of fact, the principle of this new method is already employed in street lamps, and with success. Anyhow, the expense involved is trifling, and it well merits a trial.

It is three hundred years since Bodley built his library at Oxford and the university is going to celebrate the anniversary. The Bodleian is the largest university library in the world, and ranks next to the British Museum and the Paris Bibliothèque Nationale in the number of volumes.