it is sometimes possible to save the bottom and lower ring of the tank, which is the most expensive part.

For the pipe lines, mild steel or wrought iron screw joint pipe is used. Bessemer steel also is used, but makes a cheaper and inferior grade of pipe.

In the collection of natural gas from the wells, there is often water or oil carried with the gas in such quantities that it will clog the lines. For this reason the wells are connected up with a trap to catch the liquid before it enters the lines. A number of wells are connected into a larger line and these larger lines converge to the trunk lines which carries the gas to a point near to where it is to be consumed. At this point it is usual to reduce the pressure of the lines before distributing. The distribution is carried on in the same manner as when handling manufactured gas. When the pressure at the wells is not sufficient to deliver the gas to the market, compressor stations are put in and the pressure raised to a point sufficient to carry the gas through to the point of consumption. The following formula can be used in computing the amount of gas which will be delivered through a given line:—

$$Q = C \sqrt{\frac{(P_1 + P_2)\ (P_1 - P_2)\ D^5}{L}}$$

Q = cubic feet per hour (15 lbs. absolute).

P_1 = absolute head or initial pressure in pounds per sq. in.

P_2 = absolute delivery or terminal pressure in pounds per square inch.

D = diameter of the pipe in inches.

L = length of the pipe in miles.

C = a constant.

The constant used for air computations is $C = 38.28$.

The constant for any other gas is inversely in proportion to the square root of the specific gravity of the gas.

For a natural gas having a specific gravity of 0.59 the corresponding constant is $C = 50$.

These constants have been checked by many tests on pipe lines of various diameters and lengths.

With natural gas, it is seldom necessary to use gas holders to regulate the supply at the point of consumption as the line itself forms a reservoir and can be used to store a large amount of gas by what is known as "packing the line," which consists in permitting the pressure back of the regulator to increase until it approximates the pressure in the field.

Pipe Line Requirements.—The transporting of gas requires a pipe line which shall be air tight. It is much more difficult to make a line to hold gas under pressure than it is to hold a liquid. Trouble has been experienced in almost all lines built for high pressures on account of the leaking of gas at the couplings. The first high pressure lines were laid with bell and spigot joints, caulked with lead. The lines might be tight when they were first laid, but the movement in expanding and contracting soon caused them to leak large amounts. The next lines used were of wrought iron or steel pipe, with screw joints. While these held much better than the bell and spigot pipe, there was still enough leakage to make it desirable to have a more perfect joint. The leakage on some of the earlier screw joint gas lines was such that by putting a rubber bag over the coupling, gas could often be collected at the rate of from 20 to 50 cu. ft. per hour, or enough to run a good sized torch. This was true of lines up to 8 or 10 ins. in diameter. When the lines became larger the leakage increased so much that it was practically impossible to use large size lines and get a large percentage of the product to the market. As the demand for natural gas increased it became necessary to use larger lines, and a rubber packed stuffing box was developed. The first successful joint of this kind in the market was the Dresser coupler, and it is due largely to this and other couplings that the natural gas industry has become so great.

The Dresser coupler consists of a sleeve into which the ends of the pipe are placed. There is a projection in the centre of the sleeve so that the ends of the pipe will be each inserted into the sleeves at the same distance. This sleeve acts as a follower to compress rubber in an annular space into the end rings which are drawn together by bolts. The rubber is surrounded on one side by the pipe, on another by the body of the coupling, and on the remaining sides by the end rings so that there is very little of the surface of the rubber exposed either to the gas on the inside or the air on the outside of the line. It is found that these joints will last for years.

The Hammond coupler is a modification of the Dresser, one of the principal features of which is that the projection at the centre of the sleeve is made by lugs welded on to the sleeve. When it becomes necessary to take apart one of these couplers, the lugs can be broken off and the coupler slipped back so as to allow of the pipe being easily removed.

Lines of pipe can be built in almost any kind of country, but it is necessary in some places to arrange to keep the line from acting as a Bourdon tube and expanding in one direction until the ends of the pipe may be pulled out of the coupling. To avoid this trouble it is customary in such places as river crossings to use screw pipe, and to place over the collar a clamp which is constructed to make a rubber joint between the ends of the collar and the pipe.

For power transmission lines or for temporary gas lines where the distances are short or the service temporary and it is not considered necessary to bury the pipe, it will be found that the screw joint pipe is satisfactory, but for other natural gas or air service, the rubber coupling has many things to recommend it, and when the capacity requires large pipe it is almost absolutely necessary to use this type of coupling. These couplings have been used for manufactured gas, but it is found that the condensation from the gas collects in the coupling and soon causes a leak in the rubber joint. Work is now in progress to perfect a material which will not be acted upon by the condensation in the gas and which will make a gas-tight joint.

CANADIAN SAND IMPORTS.

The following figures relating to imports of sand, etc., into Canada are from the returns of the Department of Customs:—

	1910-1911		1911-1912		1912-1913	
	cwt.		cwt.		cwt.	
Silex or crystallized quartz ground or unground	11,348	$10,634	7,445	$ 7,314	14,497	$12,898
Flint and ground flint-stones	68,953	32,362	74,061	49,481	72,937	47,956
	tons		tons		tons	
Gravel and sand..................	195,149	199,428	263,971	258,438	542,927	465,263

The forest wealth of Quebec province is placed at $600,000,000, of which white and red pine represent $200,000,000, spruce and balsam $250,000,000, other pulpwood $100,000,000, hardwoods $25,000,000, and cedar $25,000,000.

There were 95,116 short tons of fluorspar mined in the United States during 1914, valued at $570,041. This fell short of the 1913 production by 20,464 short tons, but has been exceeded only by the 1912 and 1913 productions.