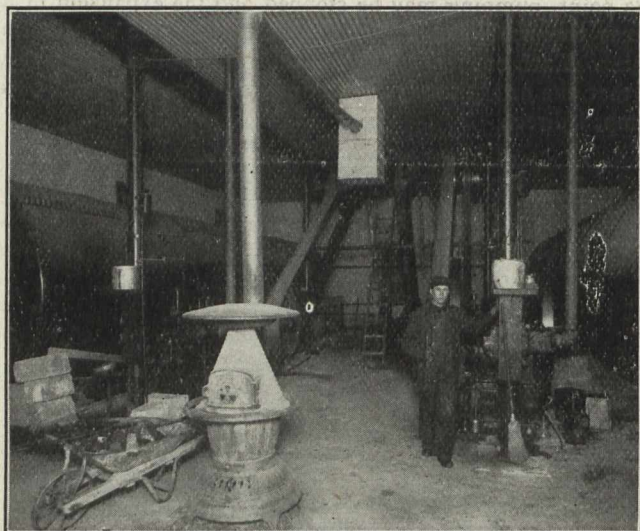


It is true that the storage capacity of these tanks is much less than that of the average stand pipe, unless several tanks are used together. However, in the case of the stand pipe, we might say that the water in the upper portion determines the amount which can really be made use of, since the pressure decreases directly as the water lowers in the tank, while in the case of the compressed air system, every drop of water can be made use of as the tanks can be entirely emptied and there still be a pressure of about 30 lbs.

The compressed air system has the advantage of being possible to install in quite small units, suitable for and within the financial reach of all small towns and still be just as



efficient as a larger system, and can be expanded as the town grows, without it being necessary to discard any part of the original plant.

The storage capacity of the plant can be increased by merely adding more storage tanks.

The average time for pumping for the whole year in Yorkton is only from 2½ to 3 hours out of the 24; the pressure for the remaining time being maintained by the compressed air.

The cost of maintenance is very low due to its thorough protection from the weather.

The whole plant may be located in any part of a town or city and not cause depreciation of value to adjoining property, as there is nothing unsightly about it.

The first cost of this system is much less than that of a stand pipe system of the same capacity and efficiency.

#### TANNERY WASTES IN SEWAGE.

While litigation over tannery wastes in sewage is not widespread, the growing disposition of the public to seek damages and to enforce purification makes the subject of the inoffensive disposition of such wastes a matter of by no means remote interest to the tanning industry in general. Gloversville, N.Y., the centre of the glove industry in this country, has had a particularly lively experience with damage suits against the tanneries there, and under pressure of adverse verdicts, backed by an extensible injunction, the city has had to devise a new system of sewage disposal. A report on the matter by Harrison P. Eddy, civil engineer, of Boston, and Morrell Vrooman, city engineer, of Gloversville, who were assisted by H. B. Hommon,

chemist, sets forth certain features of the new system that are likely to be imitated in other tanning centres whenever the question of sewage disposal becomes acute.

In addition to the glove manufactories, Gloversville has twenty-six tanneries, at which glove leather and the finer grades of shoe leather are prepared. There is also one hair mill, where the hair from the wastes of the various tanneries is recovered, besides knitting and silk mills and one brewery. All of the domestic sewage, tannery refuse and mill wastes were formerly emptied into the adjoining creek, and it was by riparian owners on this creek that the successful litigation was begun.

The gross weight of wet and dry hides tanned in Gloversville annually amounts to 9,000,000 pounds, and about 8,000,000 pounds of chemical reagents and other substances are used in the process. The waste liquors from this process contain spent chemicals, more or less of the active reagents, as it is not possible to completely exhaust the solutions, together with large quantities of hair, bits of flesh and dirt.

The shrinkage in weight in hides during the process of tanning probably amounts to not less than 50 per cent., or 4,500,000 pounds per year. It is also probably true that 50 per cent. of the chemicals and other agents employed in the process of tanning are carried away from the tanneries in the form of refuse. The only process which is employed to recover any portion of these wastes is that carried on at the hair mill for the recovery of the hair. While over 6,000,000 pounds of wastes are annually conveyed to the hair mill, only a comparatively small portion of these wastes is recovered in the form of hair. Much of the balance, together with chemicals from the exhausted baths, constitute a part of the sewage.

Analyses of the creek water indicate that the quantity of wastes which finds its way from the tanneries to the creek averages over 30,000 pounds per day, or 9,000,000 pounds per year. From the studies that have been made it appears that fully one-half of the total weight of hides and chemicals used in the process of tanning eventually finds its way into the creek. This is undoubtedly a low estimate of the total amount of solid and liquid wastes, for the reason that considerable portions are of such a nature that they do not readily flow along with the water, and may not, therefore, be included in the samples. At nearly every tannery are to be seen large quantities of lime and other refuse which have been dumped out upon the land, much of which could not be included in the samples analyzed, although some is washed into the creek in times of storm. The liquid wastes from the various tanneries and the hair mill contain not only large quantities of impurities in solution, but also much matter in suspension.

As the admission of the tannery wastes without the removal of any portion of the matters in suspension would not only place upon the purification plant a heavy burden for the disposal of sludge, but also might cause considerable deposit in the intercepting sewer, the city council passed an ordinance requiring all wastes from the tanneries to be passed through settling tanks before they were discharged into the intercepting sewer. Some of the interesting sections of this ordinance are as follows:—

No mill, factory or other manufacturing establishment having mill waste shall use the sewer system of the city of Gloversville for sewerage purposes without first connecting said mill, factory or other manufacturing establishment with settling tanks.