GARBAGE INCINERATION NOW UNDER DISCUSSION

Ald. G. C. Wright Gives Some Interesting Information.

KINGSTON HAS NEED

OF AN INCINERATOR TO HANDLE ITS GARBAGE.

A Mixed Collection Advocated—Destruction By Incineration Is the Most Sanitary as Well as The Most Efficient.

By George C. Wright.

While the matter of incineration is being discussed by the Special Garbage Committee appointed by the City Council, it is interesting to look into the subject and see what is being done in other places.

In Great Britain and Ireland there and some 250 municipalities and towns where incinerators are erected some 75 municipalities combine the incinerators with the electrical plants and utilize every pound of waste in the generation of electrical energy.

In Manchester, Eng., the corporation opefates 58 destructive cells with which the city's waste and garbage is entirely destroyed and the steam utilized for the operation of the sewage disposal plant.

In the great centre of Liverpool the municipality operates some 48 cells generating heat for the electrical department which brings a revenue of from £7,500 to £8,000 per annum.

At the Haddesdon Urbon district the incineration is carried on by one cell of the steam being utilized and the clinkers from the fires used to spread over the filter beds in connection with the purification plant run in connection with the plant.

In Dublin two sets of boilers are operated, and some 100 tons of garbage and refuse consumed every twenty-four hours. After midnight the refuse is drawn from the outlaying districts by the local railway corporation in special constructed dump cars. The plant overlooks the municipal buildings and no complaints have ever been heard about its operation.

In Seattle, Washington, the incinerator was erected by the Corporation Engineer; it consumes 67 to 70 tons per 24 hours, operates a 220 H.P. boiler giving a steam pressure of 160 lbs. The power is utilized for the operation of a million gallon pump for fire protection. There are forced draft apparatuses for boilers, and a 250 H.P. A.C. generator. No fuel of any kind has been used in this plant since starting of operations in 1908.

Milwaukee has the largest destructor in the United States. Some 300 tons of refuse are consumed every twenty-four hours. This plant was put in operation in May, 1910. It costs the city nearly $52,000 a year to operate this enormous plant and when the heat is fully utilized it will develop some 400 H.P. This is sufficient to operate a 500 K.W. generator. Placing the value of electrical energy at 1c. per K.W. per hour would represent a value of $12,000 a year.

The Situation In Kingston.

In Kingston we have available eighteen to twenty tons of refuse a day, that is including the garbage, waste paper, straw, rubbish, store sweepings, etc. The plant to handle this is in itself a very small affair, not any larger than an ordinary boiler setting of 80 or 100 H.P., only all free access to outside air is cut off and an enormous heat is generated by a coal or wood fire to start the plant. This great heat drives off the moisture in the refuse to vapor, this vapor splits in oxygen and hydrogen which immediately ignites and internal combustion is set up which bakes the mass into a solid clinker in from one and a half to two hours. It has no chance to stew and smoke as when put in an ordinary kitchen range. Dust retention and combustion chambers are built inside the destructor which entirely eliminate any nuisance. No smells or smoke come from the chimney, as these are entirely destroyed before they reach the flue by the terrific heat generated in the cells. In fact the heat is so intense that the brick work has to be held together by numerous steel rods and plates bolted and fastened on both sides and top, for if this were not done the walls would give way and buckle under the terrific blast.

A refuse destuctor is a complete self-contained plant, consisting of furnaces and operating machinery, designed for receiving and destroying under most modern sanitary conditions all the household refuse of a city, without giving offence or being otherwise objectionable to those who reside in the vicinity, and at the least cost for labor in operation and upkeep.

The destructor is the development of years of experience in older countries. It is the result of many experiments and many failures on the part of engineers to produce a system which will successfully burn all classes of refuse in one furnace, and keep the temperature above a certain point which has been established as being necessary to destroy all organic matter, and to dissociate the gasses of combustion and free them entirely from foul odors.

In a destructor everything is thrown into the furnace and burned at a high temperature without the use of additional fuel. Advantage is taken of every known means to perfect the combustion conditions. The air is preheated before being fed to the fires, and is supplied by a system of forced draft which is under such perfect control of the attendants that no more than needed is supplied to the furnace.

Destructors vary in size from small furnaces which would be suitable for institutions, to installations consisting of several furnaces, which would be necessary for a large city. In the latter case, besides the furnaces, there would be included steam boilers and usually a complete electric power plant.

The labor required above a destructor is for feeding the raw material to the furnace and removing the clinkers therefrom when the burning process is complete.

The product of a destructor are most elemental in their nature. They consist of clinkers and steam. The clinker is hard and clean, and may be crushed to the proper size for combining with cement and sand in making all classes of concrete. The steam which is generated in the boiler under pressure is available for driving steam engines, steam pumps, steam turbines, or it may be used for heating.

A suitable building for a destructor is of the power plant type, and is usually of brick or concrete.

Where To Build.

A destructor should be located as near as possible to the centre of population, for the obvious reason of reducing to a minimum the length of haul for the collecting carts and consequently the number of collectors required. At the same time, consideration must be given to the utilization of the steam which the plant will generate. By making good use of this steam the net cost of maintenance is greatly reduced. The amount of steam available depends upon the composition of the refuse burned. A good plant should give from one pound to two pounds of steam per pound of refuse.

The contour of the city should be taken into consideration in choosing the site. It is better to have the collecting carts travel on a down grade when loaded, as they will be in approaching a plant; in returning empty they will then take the upgrade.

No method heretofore tried can approach the destructor system for handling the city refuse, and no method is so satisfactory to the Health Department, the Street Department, and to the citizens at large.

Advantages of Incineration.

Incineration is at once sanitary, expeditious, and economical in first cost and maintenance. The plants are free from nuisance, and may, therefore, be centrally located. Thus the cost of collecting is minimized, owing to the relative shortness of haul on the part of the scavenging waggons; and since the average city refuse burnt best of all when rubbage and garbage are thoroughly mixed, there is no necessity for the householder to keep the refuse in separate receptacles. Thus we have an advantage in this system to the collecting force as well as to the householder.

Furnaces for burning mixed refuse have now been brought to a high state of perfection, and have in the past score of years come into very general use in the principal cities of the world, first in Europe and later in this country. These furnaces are commonly known as destructors, and may be briefly described as a plant consisting of a furnace, steam boiler, forced draft apparatus, regenerator, dust settling chamber, chimney, ventilating system, power devices for operating the furnace and disposal of clinker. All of these features are included in the most modern destructor.

Revenues Obtained.

The cost of operating a destructor plant is in a great measure offset, and frequently quite overbalanced, by the revenue derived from the sale of the clinker. If no steam power can be utilized outside the operation of the plant, a much cheaper boiler and setting may be used than if maximum efficiency is sought. From a properly constructed plant an evaporation of from one to two pounds of water per pound of refuse consumed readily obtainable, depending upon the quality of the refuse burned and the amount of moisture contained in it. The value of this to a city will be appreciated by a comparison. Suppose twenty tons of refuse are delivered to a plant in twenty-four hours and this is all burned during sixteen hours of the day. At the minimum rate of production of one pound of steam per pound of refuse, the total steam generated for the day would be 40,000 pounds, which if burned in sixteen hours would be 2,500 pounds per hour, or eighty boiler horse-power, at thirty pounds of water per horse-power per hour, or say 160 engine horse-power. This would go a long way in a city toward operating a pumping plant, either for water supply or for sewage disposal, or even for generating electricity for municipal lighting or street railway operation.

Separate Collection.

A separate collection of city refuse has been found to consist of three distinct classes of material:

First, and probably the most troublesome to take care of, is kitchen garbage. This contains a large percentage of water, and must be collected and disposed of promptly before it begins to putrefy.

The second class consists of household rubbish, such as rags, paper, bottles, old clothes, sweepings, etc., generally highly inflammable, and only difficult to dispose of because of the extreme variation in the size and shape of the ingredients.

The third class consists chiefly of household ashes, not in themselves a difficult thing to dispose of if they could be kept entirely free from the other classes of refuse. As a matter of fact, it is found that this is practically impossible. Such large quantities of garbage find their way into the household ashes, as collected in the average American city, that they are practically useless for filling land without first being sterilized to destroy the organic matter.

For a separate collection, we have the requirement for the householder to keep the material in three separate receptacles; the necessity for making three calls at each house; and the covering of the same ground by three different classes of collectors.

Mixed Collection.

For a mixed refuse collection the requirements are much simpler. Here the mixing is done by the householder, who places the garbage and rubbish in one receptacle. A simple form of collecting waggon is used, which receives the mixed contents of the cans. Such a waggon need not necessarily be water-tight, because in the mixed refuse the free water is absorbed by the drier materials found in the rubbish and ashes. The household visitation need not be so frequent, because the mixture with rubbish and ashes greatly retards the tendency of the garbage to decompose. The cans are tipped into the waggons with greater freedom from dust, and the mixed material occupies much less space, since the finer particles are contained within the voids of the more loose materials. There can be no doubt that the mixed collection is preferable from practically every point of view, and possesses such great advantages that it is doubtful if it is ever compensated for (from the citizens' point of view) by economies realized from any method of disposal requiring a separate collection.

Disposal Of Garbage

What is the best method of disposing of household garbage and street refuse? This question presents a serious problem in an increasing number of Canadian towns. Municipal and sanitary engineers in Canada, Great Britain and the United States have devoted much study to it, and have made many experiments with various methods to ascertain the most economical and efficient system of disposal. Opinion is nearly unanimous that destruction by high temperature incineration is the most sanitary as well as the most efficient. In several instances low temperature destructors have been installed because of their reduced cost, but experience has proved that this is not true economy. As a result, almost all the incinerators installed, both in the United States and Canada, within the last five years, are examples of the European practice of high temperatures.

The following cities and towns in the British Isles have incinerators located in the business of residential districts; Gloucester, adjacent to the Gloucester Cathedral; Dublin, (Rathmies) adjacent to City Hall; London, (Woodgreen) heart of residential district; Lowestoft, Ramsgate, Blackpool, Chiswick, Beckenham, Bolton, Sheffield.

The following cities and towns in the United States and Canada have incinerators located in the centre of the business or residential districts: New York City at New Brighton; Houston, Texas; London, adjacent to Victoria Hospital; Peterborough, Swift Current.

The following cities in Canada have incinerators: Calgary, Edmonton, Moose Jaw, Saskatoon, Swift Current, Winnipeg, Fort William, Regina, Windsor, Sault Ste. Marie, Toronto, London, Guelph, Berlin, Sarnia, Chatham, Peterborough, Montreal, Westmount.

Why not Kingston?

You should love your neighbor in spite of his spite fence.

A man who talks to himself hears a lot of compliments.

It's enough to disgust a hypocrite when he discovers that the man he has been posing for is no better than himself.