which is dependent upon the actual hours of service, plays an important part in the question of cost of operation. This is a decided advantage in dredging and excavating operations, etc., in which modifications of the standard type of bucket elevators are very frequently and extensively employed, as such operations are of necessity intermittent and, though not as conducive to economy as if the apparatus was more mechanically efficient, does enable accurate preliminary estimates of cost to be arrived at, etc., etc.

The continuous bucket type of elevator differs from the standard bucket elevator principally in design, consisting of a close succession of V-shaped buckets, having their sides projecting past the back of the bucket so as to form a kind of chute over which—on commencement of the downward travel of the buckets—the succeeding buckets discharge their load as they pass over the head elevator wheel or sprocket, and in the common omission of loading elevator boot. The elevator may be vertical or lie in a plane somewhat inclined to the vertical. In the former arrangement, take-up bearings must be provided for the tail elevator wheel to permit the maintaining of the proper tension in the elevator chain in order that the return (downward) run of buckets may not oscillate and interfere with the rising and loaded buckets. Inclined continuous bucket elevators, on the other hand, are seldom provided with take-up bearings, the tension in the chain of the rising run of buckets provided by the elevator drive, which for all types of bucket elevators is invariably located at the head of the elevator, keeping the loaded side of the elevator taut while the return run of empty buckets is allowed to descend in the path of a parabola—the exact curvature depending upon the slack in the chain. As appreciable time is required to fill each succeeding bucket of a continuous bucket elevator, and thus realize the full capacity of the apparatus, it must necessarily be run at a comparatively slow speed. It is in this exaction for efficiency that the main advantage of this type of elevator construction lies, and for this reason the continuous bucket elevator is not entirely replaced by the higher speed and cheaper elevator of standard bucket elevator construction. The slow speed of the buckets enables them to be filled directly—that is, the elevator load is usually delivered directly to the buckets, not to an intermediate receptacle from which the load is picked up by the moving buckets, as is the practice for the standard bucket elevator. The slow movement also permits the discharge of load in a comparatively slow-moving stream. Thus, breakage of material by the moving buckets at moment of loading the elevator is minimized, as is also the breakage on discharge.

The carrying capacity of each individual V-shaped bucket of the continuous elevator does not vary greatly from that of the individual bucket of the standard type of bucket elevator, so that the table of capacity of standard bucket elevators can be made applicable to the continuous bucket type of elevator by correcting for the speed of the elevator and the spacing of the buckets; which, in the case of the continuous bucket elevator, is approximately equal to the depth of the V-shaped buckets. The power required to operate a bucket elevator of either the standard or continuous bucket type is the same—elevators of the same carrying capacity—as the descending empty buckets compensate for the power required to raise the buckets themselves on the carrying stretch, so that the formula for horsepower required is the same for either type of bucket elevator. The formula for ascertaining the net operating cost of a standard bucket elevator (the measure of true economic value of the system) is also approximately correct for a continuous bucket elevator, for though the latter type is more expensive in first cost, its depreciation charge, etc., is not apt to be as high. The two inaccuracies tend to counteract each other, besides which any error is discounted by the fact that the major expenses, those for power, attendance, supplies, etc., are about the same under similar conditions of service.

Other modifications of bucket elevators are in common use for handling barrels, boxes, heavy bales of goods and for many other special purposes, but a detailed consideration of such is quite impossible in a limited discussion of this nature. However, the horsepower formulæ will be found to be of considerable value in considering the economic advantages of even such special types of apparatus, as but minor alterations in such formulæ need be made to suit any conceivable system. Net operating costs will vary in each special installation, however, and cannot readily be arrived at without careful consideration of all the particular conditions and requirements. Without such data, an opinion of the economic value of any such apparatus must be based largely upon the convenience that such an installation would promise, but it is usually safe to assume that in addition to convenience a considerable monetary saving would ensue from the installation of almost any kind of apparatus for mechanically elevating materials confined in boxes, barrels, or in other ways—a saving usually approaching that which is possible in the handling of materials in bulk.

DESTRUCTION OF GARBAGE BY INCINERATION.

By H. C. Andrews.

ACCORDINGLY as the population of this country increases so must the representatives of communities and officials in charge of public works give this important matter their more careful consideration, more especially in the large cities and thickly populated areas.

The health of the community is reflected in its commercial prosperity; and, unquestionably the sanitary arrangements of a town go very far towards promoting and maintaining the health and energy of its inhabitants. In this age of the application of science to all questions of sanitation, it is universally recognized that cleanliness (by which is meant the entire absence of filth) is not only "next to Godliness," but is absolutely essential for the prevention of such diseases as smallpox, typhoid fever, and consumption. Students of public health are agreed that such diseases have, in the past, been very largely caused by deposits of refuse providing the breeding ground for the multiplication of the most deadly of the known bacilli; and, as a consequence, the method of dealing with the refuse accumulating daily in a town of any size becomes a vital question.

In Canada, with its hot summer, collections of dumped garbage should be an unknown quantity, and it is surprising that the Department of Public Health should have allowed to exist so long as it has the large and offensive garbage tips one frequently sees, and upon which dwellings are subsequently erected, the occupants of which are likely to suffer from the exhalations that must necessarily arise in such cases.

It has been for some years past an acknowledged fact that the worst of our summer pests, commonly called the house fly, and the blue bottle, thrive and multiply in millions on these heaps, which are in various stages of putrefaction and decomposition; also that these flies are responsible for a large proportion of infantile mortality and other sickness during the summer months.