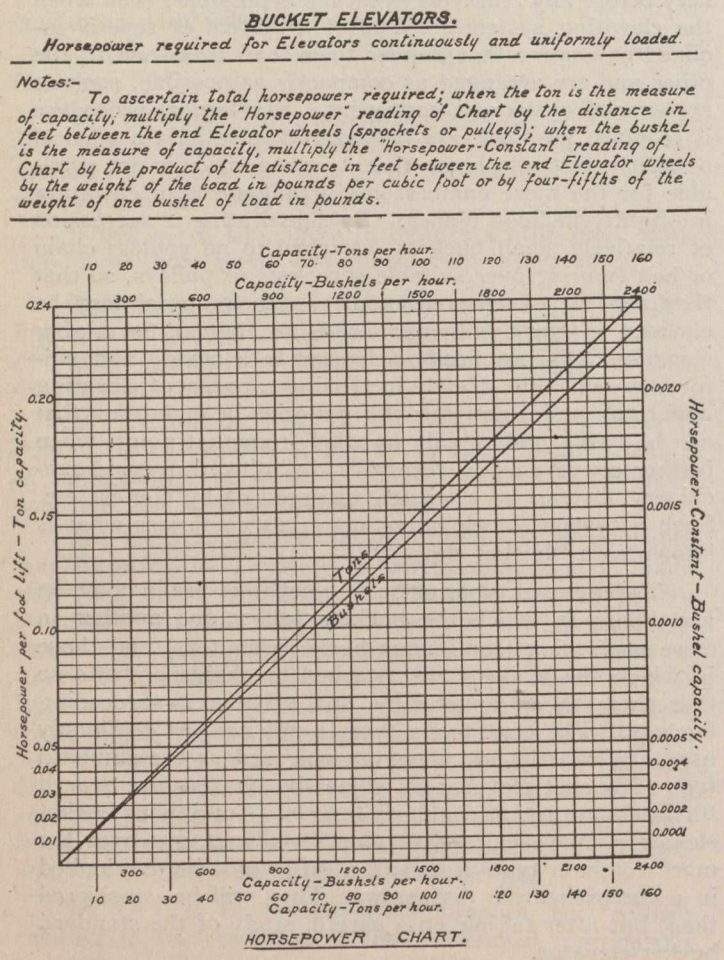
return (downward) run of conveyer close to the head elevator sprockets, or if the rising buckets are carried over a short more or less horizontal path before they descend to the elevator boot to be refilled—i.e., causing the path of the buckets to follow the outline of a right-angle triangle, the loaded buckets ascending the vertical stretch, then being carried and unloaded over a horizontal section of elevator and the empty buckets returned to the elevator boot in an inclined plane. The belt type of bucket elevator, not permitting the use of deflecting pulleys, must also be run in a plane inclined to the vertical, for, though the spill of load between the rising and descending stretches of elevator would not be as great as in the case of the single chain elevator, still much of the load would



fail to reach the discharge chute of the elevator and material would fall against the descending belt and be carried about the boot (lower elevator) pulley, causing disastrous wear to the belt, possible wreckage of elevator, etc.

Standard bucket elevators, of any of the three classes, are nearly invariably similar so far as their drives and loading equipment are concerned. They are driven, through a train of reducing gears ordinarily, by their head sprockets or pulleys and are loaded from an elevator boot which ordinarily contains adjustable take-up bearings for the boot sprocket or pulley by which the tension in the return run of buckets may be regulated—the excess slack taken up. Frequently the elevator is enclosed in a casing, from the elevator boot up, with suitable outlet for the discharge, which serves to protect the equipment from injury and to return any spill of the load to the elevator boot for re-handling. Modifications of these general types of elevators naturally exist, excluding special elevators for handling materials in barrels, boxes, bales, etc., etc., such as elevators in which the lower end consists of a more or less horizontal stretch over which the load is scraped or dragged, as in the case of a flight conveyer, before the buckets start their operation of elevating or where the upper end of the elevator is carried over a similar stretch before entirely discharging its load, but such modifications so closely resemble "bucket carriers" that they will be overlooked at present and referred to again when discussing the more complicated combined bucket elevator and conveyer, the bucket carrier. Limiting this discussion to the ordinary type of standard bucket elevator, therefore, further description is unnecessary owing to the extreme simplicity of the equipment.

Table VIII.—Capacity of Bucket Elevators (Standard Buckets)—Tons Per Hour. Material Weighing 100 Pounds Per Cubic Foot. Elevator Speed, 100 Feet Per Minute.

Size of Buckets	Buckets spaced 12 in.	15 in.	18 in.
5 in. x 4 in.	6.50	5.35	4.25
6 in. x 4 in.	7.75	6.00	5.00
8 in. x 5 in.	19.00	15.00	12.50
9 in. x 5 in.	21.25	17.00	14.00
10 in. x 6 in.	34.50	26.75	23.00
11 in. x 6 in.	37.75	30.00	25.00
12 in. x 6 in.	41.25	33.00	27.25
14 in. x 6 in.	48.00	38.50	32.00
16 in. x 6 in.	55.00	44.00	36.50
18 in. x 6 in.	61.75	49.25	41.00
20 in. x 6 in.	69.00	55.00	46.00
14 in. x 8 in.	78.50	62.75	52.25
16 in. x 8 in.	90.00	72.00	60.00
18 in. x 8 in.	100.00	80.00	66.00
20 in. x 8 in.	112.00	90.00	74.00
24 in. x 8 in.	128.50	104.00	86.00

The capacity of bucket elevators depends, of course, upon the size of the buckets, their number and the speed at which the elevator is run. The size of bucket also depends somewhat on the character of the material to be handled for bulky materials naturally require larger buckets than those which might be entirely suitable for the handling of fine material. However, the average class of materials usually handled in bulk by bucket elevators does not vary so much as to prevent a fair average carrying capacity being fixed for a bucket of specified size. The shape of the bucket also effects the question of its carrying capacity, but here standardization of equipment has devised a shape of bucket that is almost universally employed or when modified for special installations, such as those in which the inclination of the elevator from the vertical is great, has a carrying capacity about the same as the standard bucket, which is fairly constant for any particular size (size expressed as length x width of bucket) so that, for all practical purposes, the length and width of the bucket determines its carrying capacity. The number of buckets, as they are invariably attached to the chain or belt at regular intervals, depends upon the spacing; while the capacity of any elevator buckets and their spacing being the same, depends directly upon the speed at which the elevator is run, i.e., speed of elevator chain or belt. Table VIII. gives the best ordinary capacity, in terms of tons per hour, of standard bucket elevators, equipped with various common sizes of standard elevator buckets at ordinary standard spacings, when the elevator is continuously and uniformly loaded with material weighing 100 pounds per cubic foot and an elevator speed of 100 feet per minute. For elevators handling material of other weight or at other speeds, capacity varies directly with the weight of the material per cubic foot and with the speed at which the buckets are run. Table IX. gives similar data expressed as the number of bushels of material that can be handled by such elevators in an hour. The question of most efficient speed at which