

2245. Depreciation on Transmission and Distribution Storage System.

2246. Depreciation on Distribution System.

2247. Amortization of Preliminary Expenditures.

And under 23, "Miscellaneous Expenses," appear:

23115. Depreciation on Tools and Appliances—Plumbing.

23125. Depreciation on Buildings, Tools and Appliances—Shops.

23136. Depreciation on Buildings, Teams and Equipment—Stables.

23144. Depreciation of Rental Property.

23155. Depreciation on Tools and Appliances—Meters.

23164. Depreciation of Forest Lands and Reservations.

23174. Depreciation of Other Accessory Enterprises.

Under 232, "Expenses of Invested Funds," there is an item 2322, "Expenses of Depreciation Funds;" also 325, "Depreciation in Invested Funds Values;" and 342, "Depreciation and Amortization Funds." Among the assets under the general heading 5 appears 563, "Depreciation and Amortization Funds."

No accounts appear among the liabilities under general heading 6, where we should expect to find "Depreciation Reserves." This fact particularly appeals to me, as it is the special point on which I must criticize the otherwise admirable and exhaustive classification of Mr. Wehr. No explanations of Mr. Wehr's views concerning depreciation reserves appear in the text of his paper, but in the Census Bulletin, on page 334, the term "depreciation" is defined as given below. In the census classification, depreciation accounts appear under the following headings:

VII. Expenses for Water Service Depreciation.

208. On general Administrations, Buildings and Equipment.

209. On Accounting Equipment.

210. On Operating Management, Buildings and Equipment.

211. On Sources of Supply.

212. On Intakes and Aqueducts.

213. On Purification System.

214. On Pumping System.

215. On Transmission and Distribution Storage System.

216. On Distribution System.

There are also accounts for depreciation of pumping, rental property, meters, stables, etc., these bring in accord with Mr. Wehr's classification. The census definition or depreciation is as follows:

"Depreciation. Depreciation is a general designation of the gradual diminution in value which is caused by wear, decay, displacement, of obsolescence in the value of buildings and equipment, and of the sudden diminution which results from fire or other destructive forces. It is never actually or relatively the same for any two establishments, even of the same industry. For this reason it is impossible to frame concise, general rules for making allowances for depreciation which will not in their application be attended with a large margin of possible error. To use such rules without causing errors those employing them must have for each individual establishment exact data based upon inspection, showing how far and in what respects its actual depreciation differs from that of the average establishment of its class. For this reason, a physical examination and appraisal of water-works should be made every ten years, or even more frequently, in order to provide the basis for an approximate statement of the annual loss chargeable, as an expense, to depreciation. In the absence of such exact data for each water-supply system, however, it is to be assumed that de-

preciation takes place according to the average life of the several parts of such system and of water-supply plants as a whole. The knowledge at the command of the bureau of the census leads to the conclusion that this average life is approximately as follows: For horses, carriages, automobiles and laboratory fixtures and meters, ten years; office furniture and general equipment, fifteen years; boilers, steam pipes, and filtration equipment, twenty years; engines, pumping machinery, and wood pipes, twenty-five years; masonry of filtration plants, cribs, iron water pipes, intake pipes, fire hydrants, stand-pipes, and buildings, fifty years; reservoirs, tunnels, and aqueducts, one hundred years; and for the water system as a whole, fifty years.

"There are many methods which may be employed in the computation of depreciation from data such as are above referred to, all of which involve the assumption that depreciation proceeds either with a uniform or with a geometrically accelerated rate throughout the life of the plant or fixture. The actual rate of depreciation unquestionably increases geometrically, and for this reason the best method of computing the amount of depreciation which has taken place during a series of years, or during a particular year, is that which is sometimes called the sinking fund or compound annuity method. The depreciation during the first year of any property having an expected life of fifty years is represented by a quantity equal to the annual payment which would have to be made each year during the fifty years, and invested at some specified rate of interest, to amount at the expiration of the fifty years to a sum equal to the original value of the property. The depreciation for any subsequent year would be the same quantity plus an amount equal to the interest on the prior payments and accumulated interest earnings at the specified rate. . . By means of tables and diagrams, the depreciation for each particular portion of the water-supply system can be computed for any given year of its life, and thus the total depreciation for the system be ascertained, provided the enterprise has a detailed statement of its property and equipment as explained later under 'tentative instructions for accounts, with cost and present value;' and, provided further, that the probable life of each division of the system has been ascertained by physical inspection, and that the rate of depreciation has also been determined in the same manner. The depreciation taking place in the water-service system in a given year, calculated as above, should be charged as an expense in primary accounts 208 to 216. This depreciation, however, is primarily an entry in the accounts with property and equipment, as shown in the accompanying summary of the cost and value of the water-supply system and of its extensions, additions, and renewals. When detailed data are lacking for computing depreciation as outlined above, it may be assumed that the aggregate depreciation to be included in the accounts mentioned or in sub-general account VII, is 2 per cent. of the present value of the water system."

The census classification for water-works accounts does not set up a complete balance sheet of assets and liabilities, nor does it give a detailed list of liability accounts, in which should appear, according to the writer's opinion, a series of depreciation reserve accounts. It is owing to this omission, both in the census classification and in Mr. Wehr's, that the present paper has been written, and the writer will, therefore, give a brief explanation of his reasons for urging the inclusion of depreciation reserves in all such classifications.

Much experience under the conditions in which public service corporations are acting in most municipalities convinces the writer that it is fundamentally necessary that questions of depreciation should be carefully considered,