

foreman is given absolute control over the forces under him and is directly responsible to the superintendent for the condition of the streets in his section.

The equipment used in hand patrol work consists of hand machines, bag carriers, burlap sacks, push brooms, hand scrapers, sprinkling cans and shovels. The dirt collected is placed in sacks and left at convenient points to be collected by special wagons and taken to the dump in sacks, these being returned by the drivers. Sacks are used in preference to cans because of the weight, bulk and noisiness of the latter.

After all the hard material has been removed from the streets by the blockmen, a hand machine broom is used, which picks up all the fine dust and loose droppings. In other words, the machine broom is used to polish the street and if properly used does away with the necessity for using horse-drawn machine brooms.

Machine Broom Cleaning.—The area swept with machine brooms consists of 2,220,000 square yards, or 45% of the paved area of the city, being almost entirely residential and each street being swept every other day. The force employed consists of 4 gangs, each composed of 1 sprinkler, 3 machines, 4 carts, and from 4 to 7 broomers, depending upon the conditions in the particular sections.

Streets are always swept from the centre toward the curb, the machines following one another and overlapping slightly. If the street is too broad to be swept solid in one operation, the machines turn in rotation, each taking a block, as may be required.

Squeegee Cleaning.—The area included in squeegee cleaning comprises a large portion of the smoothly paved streets in the white wing or patrol sections, amounting to about 1,786,000 square yards or 64% of the total white wing area. At the present time the method of operation is 1 sprinkler, followed by 3 machines. The sprinkler precedes the squeegees some slight distance, which allows the baked dirt to be softened by absorption, the sprinkler throwing as much water as possible without flooding the pavement. The squeegees brush the dirt to the curb, after which it is swept into piles by the white wings and hauled away.

Street Flushing.—Flushing machines are used on poorly paved streets and block pavements in the white wing area, each street being flushed about twice weekly by a high-pressure flushing machine.

Alley Cleaning.—The majority of the alleys in Washington are wide enough to be cleaned by a one-horse street sweeping machine, cleaning a 5-foot swath. Alleys are cleaned about once each week. Alleys too narrow to permit of the use of machine brooms are cleaned by hand gangs, usually consisting of a foreman and 6 men. These alleys are cleaned once per week and at stated periods are flushed with a hose.

Suburban Cleaning.—The cleaning of the suburban streets consists in keeping the gutters clear, removing all trash, loose stones and leaves.

Collection and Disposal of Ashes, Rubbish and Garbage.—The collection and disposal of ashes, rubbish and garbage in the City of Washington is done by contract. The ashes are collected semi-weekly between November 1st and April 15th, and weekly during the rest of the year, within the thickly populated districts; the remainder of the city receives weekly collections from residences, boarding houses, apartment houses containing not more than 4 families, etc. Two-horse wooden wagons of about 4 cubic yards capacity, with canvas covers, are provided

for this purpose. All ashes are hauled to the authorized dumps, mostly low-lands.

Waste is collected weekly throughout the city. Single horse wagons with latticed sides, holding about $7\frac{1}{2}$ cubic yards, are used for the collections. The waste is hauled to the reclamation station maintained by the contractor, where the saleable products are sorted and the balance incinerated. The paper is sorted and baled; bottles separated and crated; the other materials reclaimed are leather, rubber, tin cans and metal scraps.

Garbage is collected daily except Sundays between May 15th and October 16th, in all sections of the city within the thickly populated districts. Between October 15th and May 15th, the garbage is collected but three times a week. Outside the thickly populated sections, collections are made three times each week, both winter and summer. Hotels, hospitals, market houses, etc., are given daily service, including Sundays, throughout the year. The wagons used are one-horse metal-bodied wagons, water-tight, and with a capacity of approximately $1\frac{1}{2}$ cubic yards. Garbage is disposed of by the reduction method.

Philadelphia.—Street cleaning in the City of Philadelphia is done under annual contracts, the city being divided into 8 districts and the work in under the supervision of the district engineers of the Highway Bureau and their corps of inspectors.

The specifications provide for the removal of ashes, waste and rubbish at least once each week from all buildings, and for the cleaning of all streets 6 ft. 6 in. in width or over, either by machine brooms, squeegees or flushers, in accordance with the schedule. All equipment to be operated in accordance with a schedule which specifies the streets in the order in which they are to be cleaned with the various types of equipment. Squeegee machines, high-pressure flushing machines and sprinklers are not used when the temperature conditions are such as to make their use undesirable, due to causing slippery streets in freezing weather. During the winter when this work cannot be done, additional machine brooms and gangmen must be provided to clean the streets with the frequency called for.

The total amount of yardage cleaned every day is 1,354,364 yds.; cleaned every two days, 9,898,918 yds.; cleaned every three days, 5,380,711 yds.; and cleaned once per week, 425,552 yds.; which makes an average cleaned per day of 8,134,987 yds. The total yardage of streets to be cleaned in this manner is 17,059,545. In addition to this the specifications provide for the cleaning of all alleys from one to six times per week, depending upon the necessity. There are approximately 12,000 alleys in the city under 6 ft. 6 in. in width.

The specifications also stipulate that the contractor must furnish a certain number of blockmen for each district, fully equipped with the necessary bags and bag carriers, scrapers, brooms, sprinklers, etc. The number of blockmen ranges from 57 to 140 per district. A certain number of hand machine brooms, squeegees, and flushers are also specified for each street cleaning district.

All blockmen and gangmen wear white uniforms with white helmet in the summer months and white caps in the winter months. All drivers and helpers wear khaki uniforms with khaki canvas hats in the summer and caps in the winter. Superintendents and foremen wear dark gray uniforms and caps. Inlet gangs are uniformed in khaki with hats in the summer and caps in the winter.

The following is a description of the methods of handling this work, which is divided as follows:—