

THE CHARLTON STREET SWEEPER.

The Charlton improved street sweeping machine, shown in the illustration, is of strong and simple construction, and has been proved to be of high efficiency, considering both the thoroughness with which it does its work and the quantity of work it is capable of. It weighs about 2,500 pounds, and is a light draught for two horses. The diagonally hung broom is operated in the usual manner, but the dirt, instead of being left in a windrow on the street, is swept into the open side of the drum represented in the figures. To facilitate this a flaring rubber flange is attached to the edge of the drum, which flange flattens where it touches the pavement, and thus forms an inclined plane, up which the dirt is swept into the drum. This is done with the utmost neatness, though the surface of the pavement may be quite uneven.

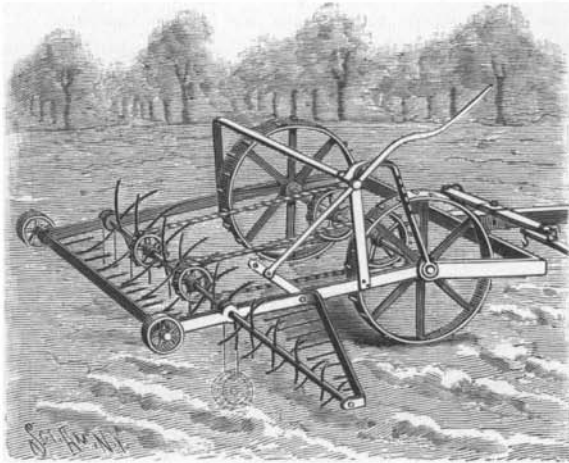
Buckets extend across the inner concave face of the drum, and serve to lift the sweepings up to the discharge chute. The latter is kept in position by a spring, which yields in case a large stone or other substance is taken up by the sweeper. So practical is this arrangement of the parts that Belgian block paving stones have been picked up by the machine without injury to it, and, on the other hand, in sweeping a wet asphalt pavement, the cart body of the machine has been half filled with water taken up. The outer edge of the rubber flange was at first protected by thin steel clips, to save it from wear; but this has been found unnecessary, as the flange has good endurance for the service, and it can be replaced at but small expense. The discharge chute empties into a box body, similar to that of an ordinary dumping cart, and which is readily dumped and again brought to upright position by the movement of a lever at the right of the driver. The free end of the broom works up to the curbstone, thus effectually cleaning the gutters.

With the street sweepers at present in general use, as is well understood, the dirt is swept to one side of the street, where it is left in a long, thin line to be swept into little hills by gangs of men following, it requiring a great many of these small accumulations to fill one of the carts which subsequently come along to

of the Shadbolt Manufacturing Company, Brooklyn, N. Y., under the direction of G. W. Brady. In its improved form it was in active operation in Newark, N. J., for several weeks under the auspices of the Public Works Department of that city. It was there used to clean the entire street and swept from $2\frac{1}{2}$ to 3 miles of streets in a day of eight hours, seven strokes cleaning the entire street from curb to curb.

A CULTIVATOR FOR USE IN ORCHARDS.

A cultivator which is more especially designed for working the ground around trees, particularly orange,



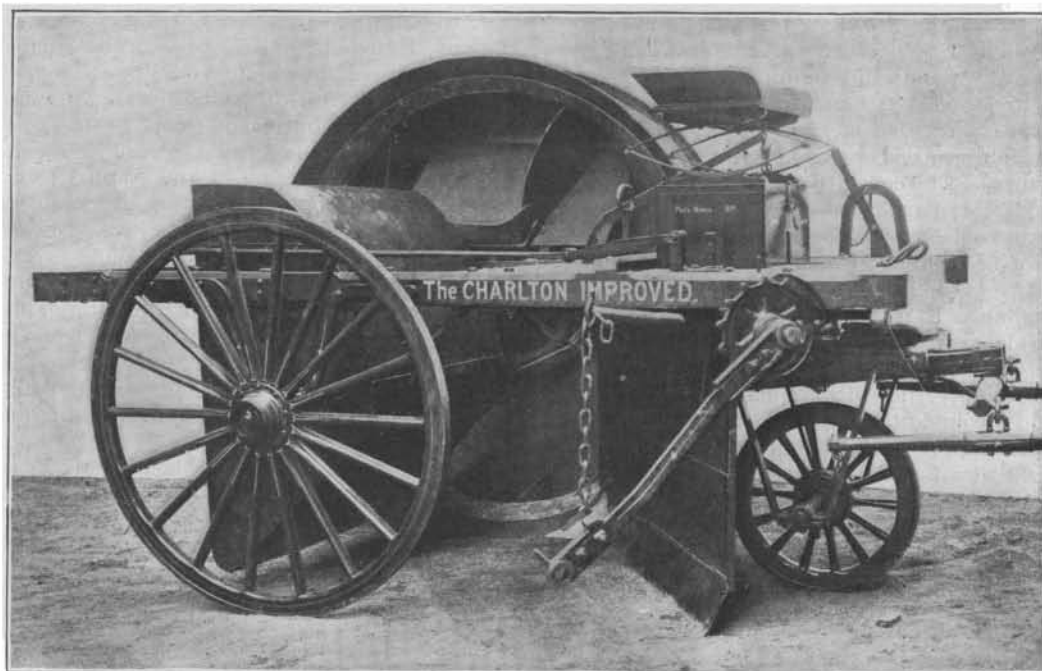
SMITH'S CULTIVATOR.

lemon, and olive trees, cultivating the ground close to the trunks of the trees without interfering with their roots, is shown in the accompanying illustration, and has been patented by Louis H. Smith, of El Cajon, San Diego County, Cal. The pole or tongue of the cultivator is attached to a U-shaped frame which extends forward from the main axle, and in side bars extending rearward from the axle is held the cultivator shaft, carrying curved teeth. A rearwardly extending cleaner frame is pivotally connected with the rear ends of the side bars, and this frame has small wheels adapted to

be brought in contact with the ground, raising the teeth of the cultivator, when the latter is taken to or moved from the field, or raised therefrom, as shown in the illustration, when the cultivator is in working position. Coupled at one side to the main cultivator shaft is an extension shaft, also carrying cultivator teeth, the teeth being shorter near the outer end of the shaft, and this exterior shaft is supported by a yoke frame extending out laterally from the main frame. The main cultivator shaft and its extension are rotated by sprocket wheels and chains from the main axle, the cultivator teeth passing between the teeth of the cleaner frame at each revolution. The rear wheels are raised or lowered, taking the cultivator teeth into or out of working position, by a lever in easy reach of the driver, this lever being connected by a link with a forwardly extending side member of the cleaner frame, whereby the latter may be carried to a substantially vertical position. With this cultivator the ground beneath the lower limbs and up to the trunks of the trees may be conveniently cultivated.

Distribution of White Corpuscles in the Vessels.

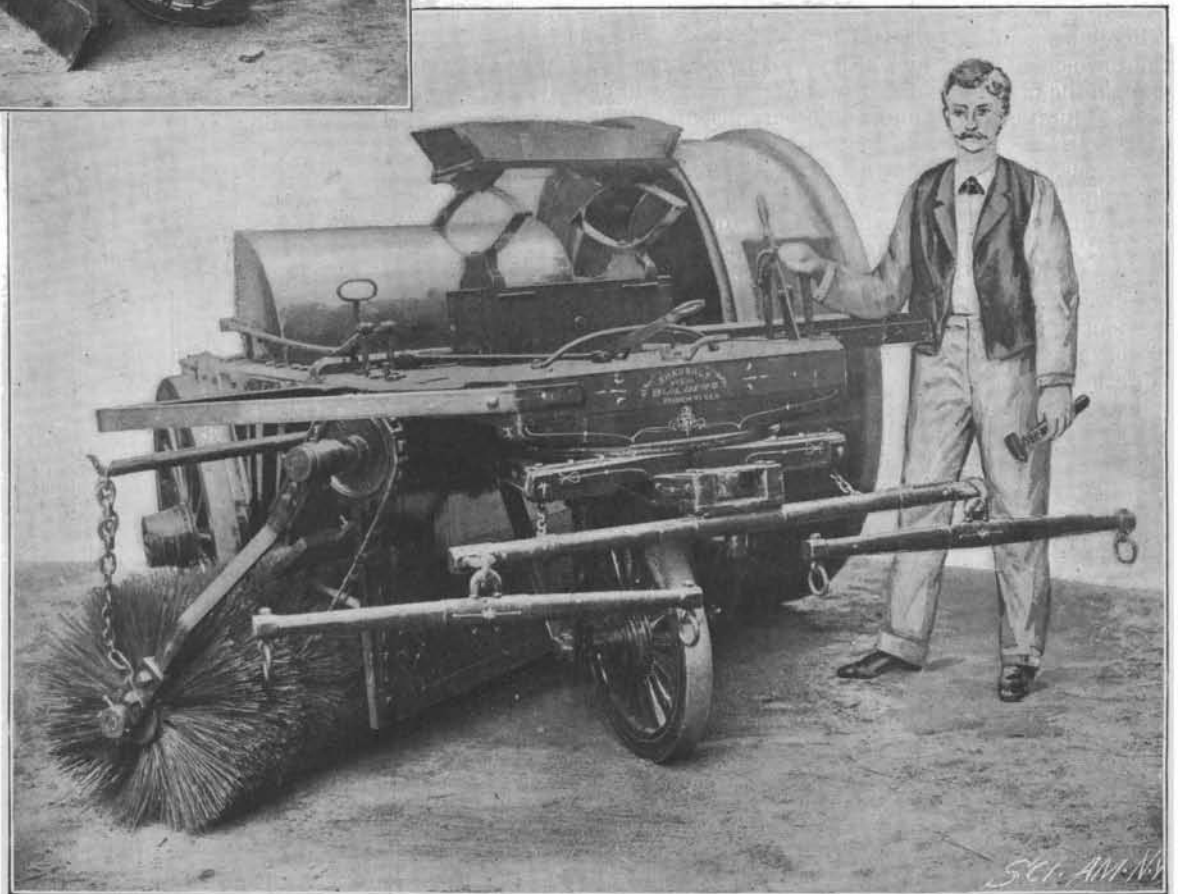
It has been held by some observers—Rieder and Schultz among others—that the leucocytes are very unequally distributed through the vascular system. The subject has been worked over again lately by Sémakine, who points out various reasons for considering these experiments to be unsatisfactory, especially because they took the blood for the purposes of examination from the dead animal, when it is not inconceivable that the blood in the central parts might contain more leucocytes than those in the peripheral regions of the vascular system. Sémakine's experiments were made on dogs and on rabbits in which leucocytosis and hypo-leucocytosis were artificially induced—the former by the injection of two or three cubic centimeters of a mixture of one part of turpentine to five of olive oil into the veins, the latter by the injection of five cubic centimeters of a solution containing one part of peptone in ten of water. In some of the rabbits leucocytosis was also induced by the subcutaneous injection of one part of papayotin in two hundred of water. Enumerations of the white corpuscles were also made in rabbits killed by a blow on the back of the neck, and in dogs killed with chloroform. The conclusions at which Sémakine arrived were that, so far as regards macroscopical vessels, the leucocytes are equally distributed, so that from an examination of the blood in the peripheric blood vessels the number of the white corpuscles in the central vessels may be determined. The same general statement holds good both for leucocytosis and for hypo-leucocytosis, the number of white corpuscles being increased in leucocytosis and diminished in hypo-leucocytosis equally in both central and peripheric vessels. In rabbits the mere fixation on the table as well as a blow on the back of the neck induces some kind of vaso-motor excitement, which causes an alteration in the number of the leucocytes to occur with extraordinary rapidity. These animals, therefore, are not well adapted for enumerative experiments of this nature. The unequal distribution of the leucocytes observed in rabbits when living is dependent upon the opening of the abdominal cavity, and the differences observed by Schultz were probably due to post-mortem changes.—Lancet.



STREET SWEEPER—SIDE VIEW, BROOM REMOVED.

gather up what has not already been scattered again by the wind or by the wheels of passing vehicles. Through the courtesy of the street cleaning department, the Charlton street cleaner last year underwent a thorough test in New York City on Fifth Avenue and Upper Broadway, sweeping some seven hundred miles of streets in conjunction with the department sweepers. The method employed was to pick up the dirt, which had previously been swept into or adjacent to the gutters, on each side of the avenue, by ordinary sweepers moving en echelon. During a part of the time the operation of the machine was observed by competent engineers who were engaged to witness and calculate the amount of work done. A portion of their report shows that during their observations, amounting in all to fifty seven hours, a distance of 128 miles was swept by the method above described; 129'34 cubic yards of dirt were picked up and deposited at convenient corners, in piles of 0'61 cubic yard each, at an average distance of 866 yards between each two piles. Since this test the sweeper has been greatly improved by carrying the sweepings directly into the drum instead of upon a belt as formerly, materially reducing the weight of the sweeper and increasing the efficiency, making the light and compact machine shown in the illustrations.

The machine shown in our illustration is being introduced by Marshall McLean, of No. 59 William Street, New York, the machines being built at the factory



THE CHARLTON STREET SWEEPER—FRONT VIEW.