J. W. McDONALD.

STREET-SWEEPER.

No. 183,584. Patented Oct. 24, 1876.

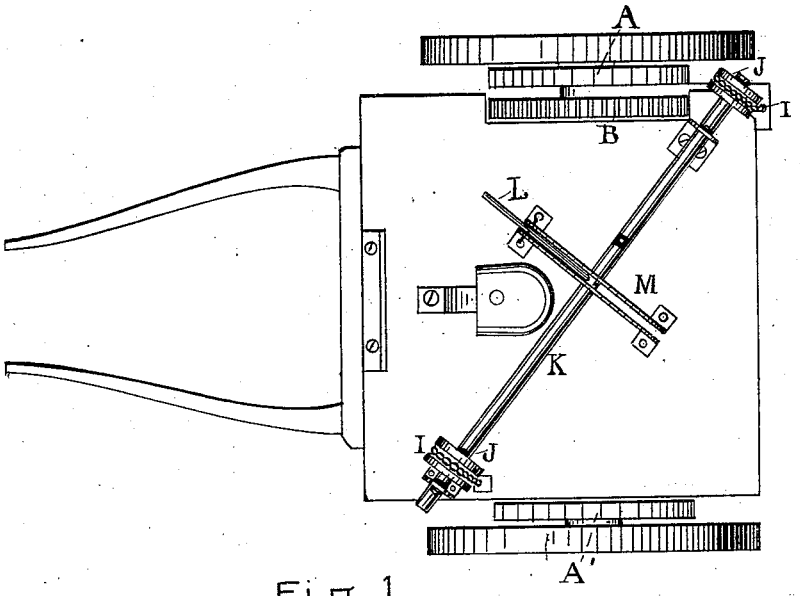

Fig. 1

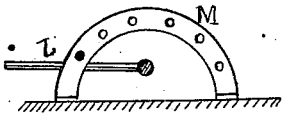

Fig. 6.

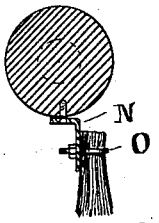

Fig. 5

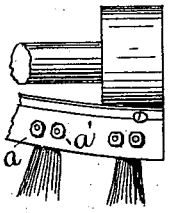

Fig. 4.

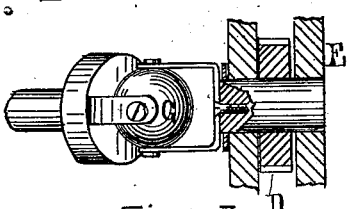

Fig. 3.

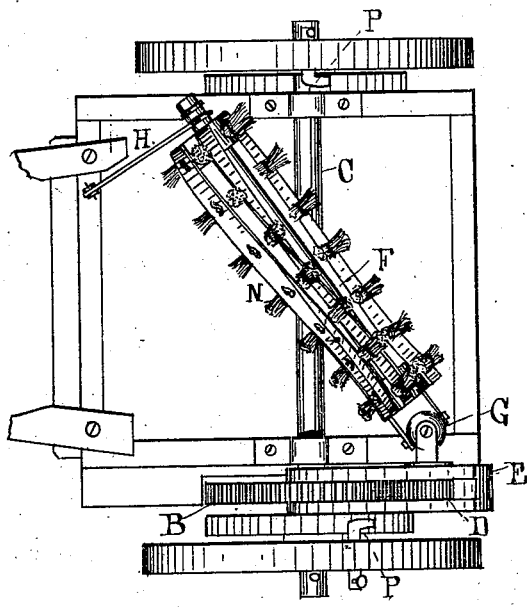

Fig. 2.

WITNESSES

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JAMES W. McDONALD, OF WOBURN, MASSACHUSETTS.

IMPROVEMENT IN STREET-SWEEPERS.

Specification forming part of Letters Patent No. **183,584**, dated October 24, 1876; application filed July 10, 1876.

To all whom it may concern:

Be it known that I, JAMES W. McDONALD, of Woburn, in the county of Middlesex and State of Masschusetts, have invented an Improvement in Street-Sweepers, of which the following is a specification:

This invention relates particularly to the method of revolving the broom-shaft. It also has for its object an easy and simple means of fastening the brooms to the broom-shaft, and a method of raising the same.

Reference is made to the accompanying drawing, forming a part of this specification, in explaining my invention, in which—

Figure 1 is a plan of the street-sweeper, showing more particularly the method of raising the broom-shaft. Fig. 2 is a plan of the bottom, the sweeper being inverted, and shows the brooms spirally fastened to the broom-shaft, which extends diagonally across the sweeper immediately under the axle. Fig. 3 shows the ball-joint, and Figs. 4 and 5 are detail views, showing the method of attaching the brooms to the shaft.

The customary method of revolving a broom-shaft diagonally across a street-sweeper has been by means of a bevel-gear and the customary cog-gearing, connected with and driven by the wheels of the sweeper. This method of operating the broom-shaft develops great friction, increasing the draft of the sweeper, and requires a nice adjustment of the broom-shaft.

My invention is designed to apply the power used in revolving the broom-shaft directly at the end of the shaft without the use of the bevel-gear, and consists in the ratchet-wheels A A′ and driving-cog B, all permanently fastened to the axle C of the sweeper. This driving-cog B meshes into the cog D, which has a bearing in the swinging frame E, and operates the broom-shaft F through the ball-joint G. The broom-shaft, as before explained, extends diagonally across the center of the sweeper, with one end connected with the ball-joint, having a bearing in a swinging frame, E, which is supported on the axle C. The other end of the shaft has a bearing in the swinging frame H, which is hung from the front forward corner of the sweeper. These frames E and H, together with the broom-shaft, are lifted, when desirable, from the ground or track on which the brooms are operating by means of the chains I, drums J, shaft K, which is arranged on bearings diagonally across the sweeper on the line of the broom-shaft and lever L, and the lever is secured to the shaft immediately behind the driver's seat, and is adjusted by a pin on the perforated segments M.

In the matter of gearing the broom-shaft to a driving-wheel, the broom-shaft lying diagonally across the machine, and the axis of the driving-wheel lying transversely, it has been usual to transmit motion by means of bevel-gearing, the gear upon the broom-shaft being hung either so as to move in a vertical plane, in which case there is a dislocation of the pitch-line and destruction of the teeth, or on a curve, the center of the wheel being coincident with the axis of the driving-wheel, in which case the axis of the broom-shaft is canted downward, or if a joint intervenes between the bevel-pinion and the broom-shaft, the broom-shaft is driven at great disadvantage. A third method, shown in the Critcherson patent of 1857, in which both the bevel-gears were fixed, would result in the unequal wear of the brooms.

My present contrivance consists in the use of a straight spur-gear for the driving-gear, a straight pinion mounted on a frame having a motion around the axis of the driving-gear, whereby the axis of the pinion is always parallel to the driving-shaft, and a ball-joint interposed between the axis of the pinion and the broom-shaft. This substitutes a slight change in the angle of the broom-shaft with constant relations among themselves of the gearing, for varying relations of the gearing and constant angle of the broom-shaft.

For facility in the manufacture and repair of the brooms, I cause the same to be fastened to strips of angle-iron N by the U-shaped bolt O and nuts *a a′*, and the angle-iron is bolted spirally to the broom-shaft. It will readily be seen that, by this means of securing the brooms to the shaft, they may be entirely worn out and new brooms inserted without changing the shaft.

The pawls P, secured to the wheels, engage with the ratchet-wheels. The shanks of these

pawls have two flat and one semicircular face. The springs attached to the spoke of the respective wheels bear upon the flat surfaces and prevent the turning of the pawl.

The operation of the sweeper is much like that of the ordinary street-sweeper in use, my improvements consisting of modifications which decrease the cost of manufacturing and the expense of working and keeping in repair.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In street-sweeping machines, the broom described, consisting of a shaft, F, the angle-iron N fastened thereon, and the brooms, secured to the projecting edges of the angle-iron, substantially as and for the purpose described.

2. The combination of the clasp O, the brooms, and the angle-iron N, all arranged in relation to each other so that the brooms may be adjusted upon the projecting edges of the angle-iron, substantially as described.

3. In a street-sweeping machine having a diagonal broom-shaft, as a means of actuating said broom-shaft, the combination of a ball-joint, G, and a pair of spur-gears, B D, revolving on parallel axes, and one of them mounted in the frame E and swung upon the axis of the other, substantially as and for the purpose described.

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Witnesses:
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