(No Model.)

2 Sheets—Sheet 1.

F. F. & J. C. BIOREN.

STREET SWEEPER.

No. 280,008. Patented June 26, 1883.

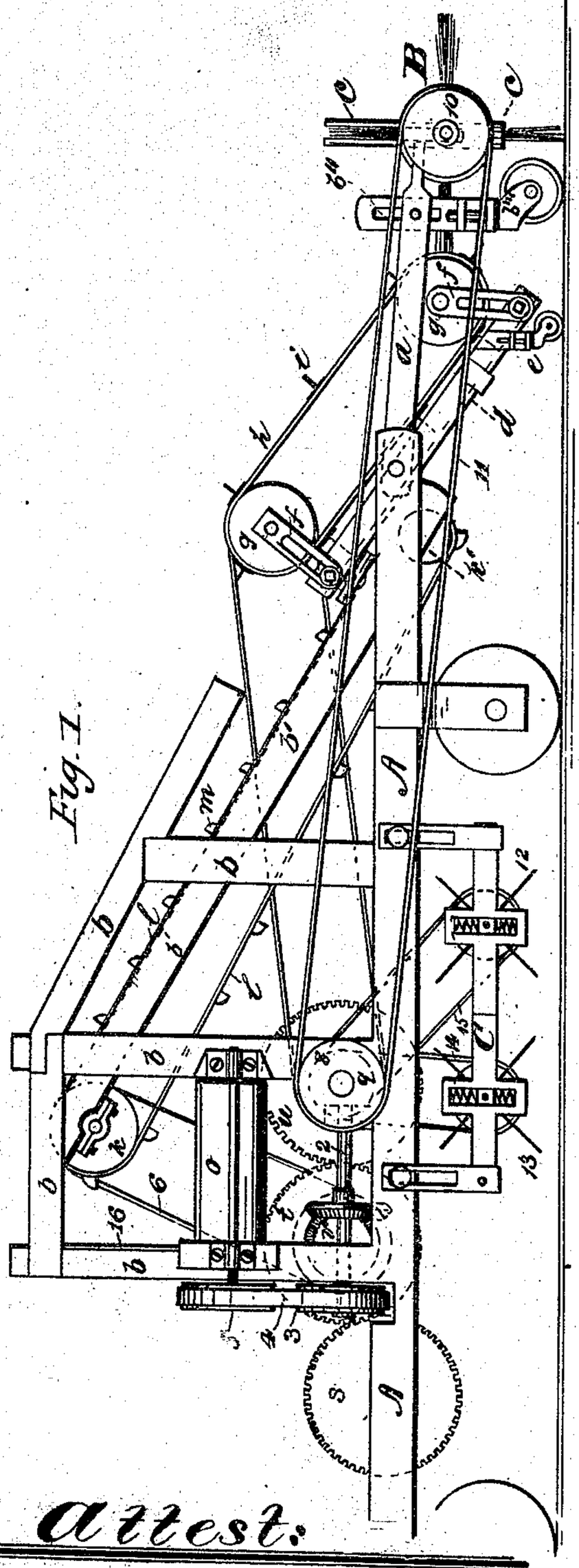

Fig. 1.

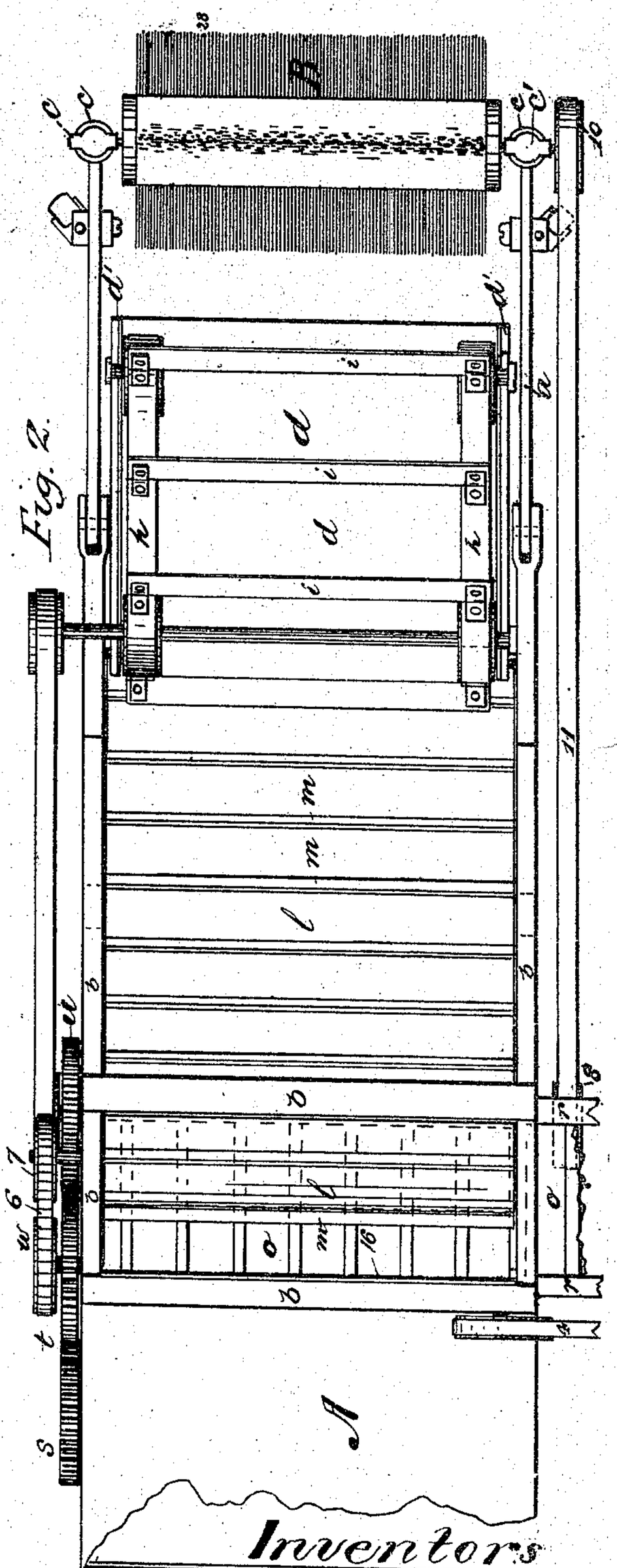

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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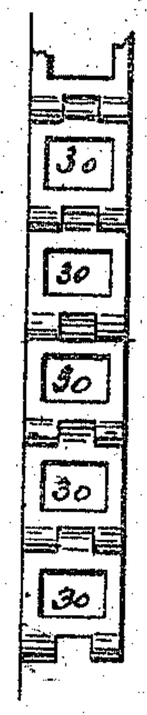

Fig. 5.

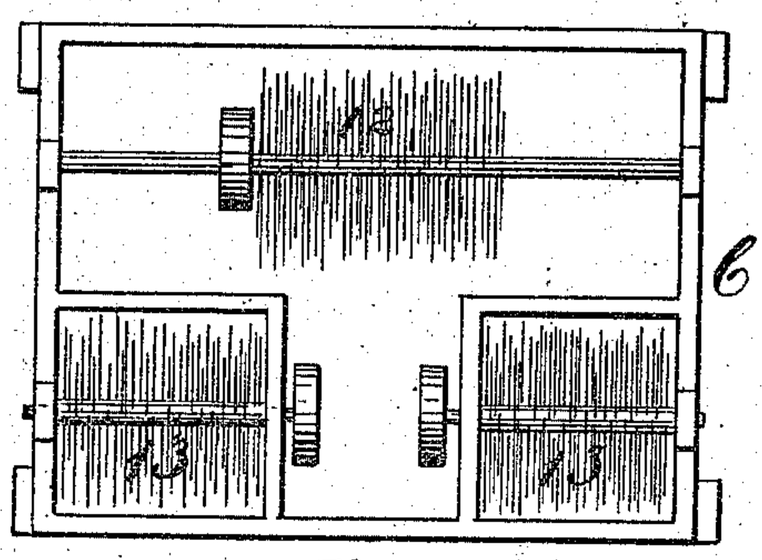

Fig. 3.

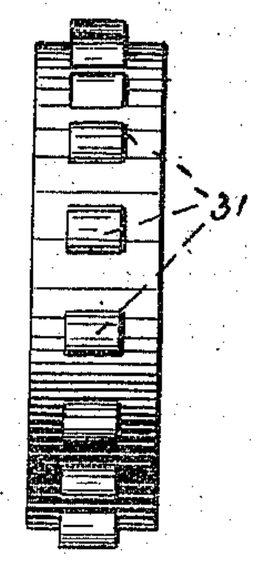

Fig. 4.

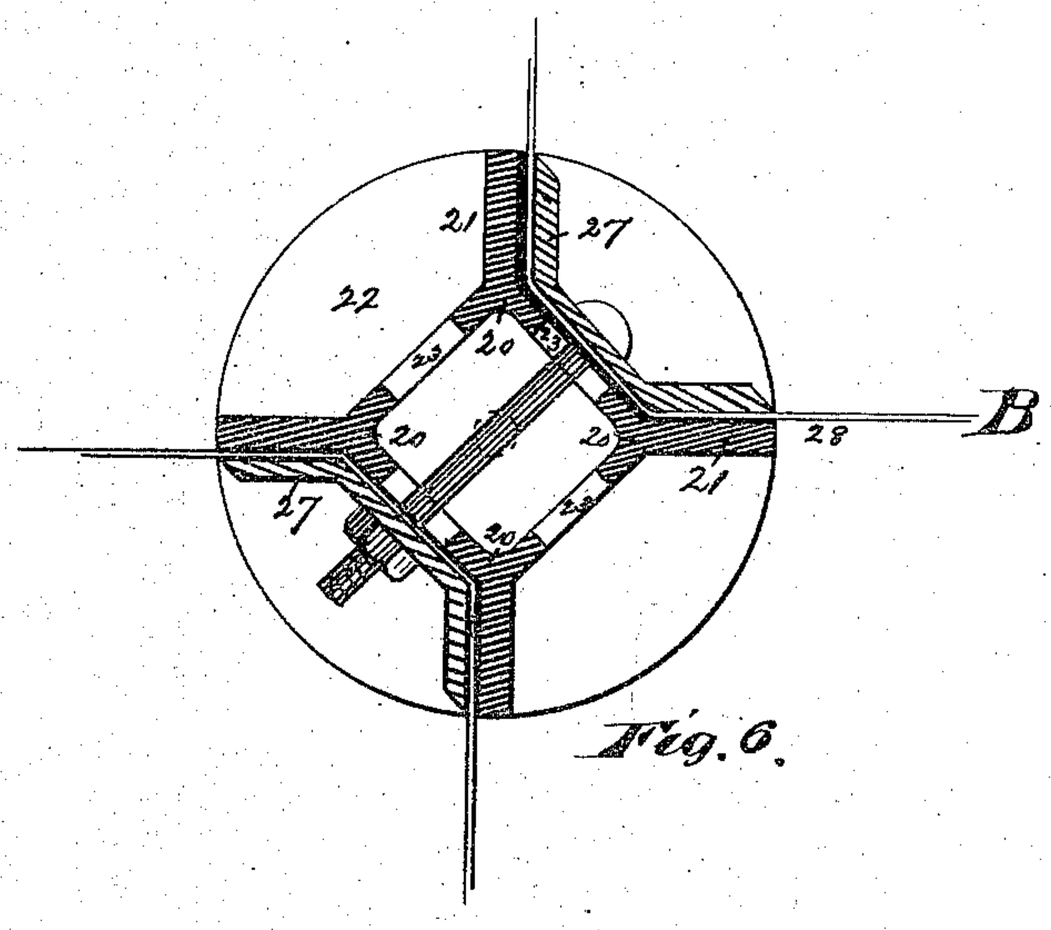

Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE.

FREDERICK F. BIOREN AND JAMES C. BIOREN, OF NEWARK, NEW JERSEY.

STREET-SWEEPER.

SPECIFICATION forming part of Letters Patent No. 280,008, dated June 26, 1883.

Application filed August 1, 1882. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK F. BIOREN and JAMES C. BIOREN, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Street-Sweepers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to clean streets with greater facility and perfection than has been done heretofore by devices for the purpose; and it consists in the arrangement and combination of parts, substantially as will be hereinafter set forth, and embodied in the claims.

Referring to the accompanying drawings, in which similar letters of reference indicate like parts in each of the several figures, Figure 1 is a side elevation of our improved sweeper, and Fig. 2 is a plan of the same, said figures clearly showing the general arrangement of parts and their relation to one another. Fig. 3, Sheet 2, is a plan of a "dirt-picking" portion of the device, by which the dirt is "picked" or loosened prior to being swept into the machine. Figs. 4 and 5 illustrate the manner of pulleys and belts employed to transmit power and prevent lost motion. Fig. 6 is a section of a revolving brush, and illustrates more especially the arrangement of the bristles therein. Fig. 7 illustrates one end of said revolving brush, showing its adjustable relation to its bearings.

In carrying out our invention we construct a suitable carriage or truck of sufficient capacity and strength to carry a small engine or other motor and the mechanism hereinafter described, and upon the same said truck we erect a frame-work, *b*, which carries certain traveling tables or belts, by which the dirt is conveyed from the brushes and thrown into a cart stationed alongside of the sweeping-machine.

On the posterior end of the machine are secured adjustable arms *a*, pivoted to the carriage at one end thereof, and supported by suitable wheels or casters, *b'''*, arranged at the other so that the last said end may be raised or lowered, the frame of the casters being provided with slots *b''*, which engage with bolts on the arms, as will be apparent upon reference to Fig. 1.

The arms *a* carry slotted bearings *c* for the revolving brush, journal-boxes *c'*, sliding in said bearings, and the journals of the said brush working in said boxes. Suitable springs are arranged beneath said journal-boxes to take a portion of the weight off the bristles, so that the same will not bear too hard upon the ground and wear away too rapidly.

The brushes B are constructed and actuated as will be hereinafter particularly set forth.

Upon the bar *b'* of the frame, upon the truck, or upon any suitable portion of the truck, is pivoted an inclined plane, *d*, extending from a point in close proximity to the ground, where it receives the dirt thrown by the rapid revolution of the brush B. The said inclined plane is provided with suitable rollers, *e*, which are preferably adjustably secured to the same. The inclined plane is further provided with adjustable bearing-arms *f*, in or on which pulleys *g* are journaled. Said pulleys carry straps or belts *h*, upon which are secured scrapers *i*, adapted to engage with the inclined plane and cause the dirt to be moved upward thereon, said inclined plane being provided at the sides with suitable guards, *d'*, to prevent the dirt from prematurely falling therefrom.

We arrange in the frame *b* the rolls *k k'*, the latter lying beneath the inclined plane. Upon said rolls we stretch a belt, *l*, provided with lags *m*, which, combined, carry the dirt to its highest elevation in the machine, as will be manifest. Beneath the upper extremity of the last-mentioned belt is arranged a transverse belt, *o*, carried by suitable rolls or pulleys, which work in journal-bearings *p* on the frame *b b*, one of said rolls being journaled at or near the extremity of arms *r*, Fig. 2, which project from the side of the machine a sufficient distance to overlie the body of the cart, which latter is intended to be coupled to the truck,

so that when said transverse belt is in operation the dirt which is received from the belt *l* will be thrown or dumped into said cart.

Beneath the truck A is arranged and secured a suitable frame-work, C, which carries the before-mentioned picking device. Said picking device is composed of rollers provided with comparatively rigid or stiff metallic rods of sufficient strength to cause the stiff earth, often to be found in streets, to be loosened up prior to being swept by the brush. The frame upon which said picking-rolls work is adjustable, as clearly indicated in Fig. 1, so that the same may be raised or lowered to suit the nature of the work to be accomplished or to take up wear. The picking-rolls are, preferably, divided into sections, as shown in Figs. 1 and 3, and are arranged in spring-bearings, so that the said rolls may adjust themselves to the usual curvature of the street or other irregularities therein. Each one of said rolls is provided with pulleys, as shown.

The parts thus described are actuated by suitable motive-power—such as a small engine stationed upon the truck—the said power being transmitted by gear-wheels, pulleys, and belting, or other means, as may be desired, the method we prefer being as follows: The said engine is attached to and communicates power to the gear-wheels *s.t u*, as will be clearly understood. The gear *t* is arranged on a shaft which carries the angle-gear wheel *v*, Fig. 1, and pulley *w*. The angle-gear wheel *v* actuates the short shaft 2, which, in turn, by means of the pulleys and belt 3, 4, and 5, actuates the rolls or drums which carry the transverse belt *o*. The pulley *w* upon the shaft with the gear-wheel *t* communicates power, by means of the belt 6 and pulley 7, to the drum pulley or pulleys *k*, which actuate the belt *l*. The pulley *u* is arranged upon a shaft with and communicates power to the pulleys 8 and 9, the latter being shown in outline in Fig. 1. Said pulley 8 is connected to the pulley 10, which causes the brush B to revolve by means of the belt 11, while the pulley or pulleys 9 communicate motion to the picking-rolls 12 and 13 by means of the belts 14 and 15.

The operation of the machine is as follows: Horses are attached to the truck in any ordinary manner and draw the machine over the surface to be cleaned. The engine causes the various mechanisms to revolve, and the picks loosen the dirt, as before stated, and bring it to a state such as that, when the brushes act thereon, it will be readily and thoroughly swept upon the inclined plane. The scrapers *i* cause the dirt to pass upward over the incline and to fall upon the belt *l*, provided with lags *m*, which continues the upward progress of the dirt until it reaches a point above the transversely-moving belt *o*, upon which the said dirt is thrown (a guard, 16, being stretched across the frame to prevent the dirt from passing beyond proper limits) and carried to and dumped into the cart. It is intended that the said cart shall be driven alongside of and make progress with the sweeping-machine being coupled thereto by some ready method of coupling; that when said cart is full that the same will be uncoupled and driven away and a second brought to work in conjunction with the machine, and so on as the work requires.

In forming the revolving brush we construct a bed, 20, Figs. 6 and 7, having wings 21 and side disks, 22, and having bolt-passages 23, all arranged in substantially the manner shown. The flanges, disks, and bed-proper form conjointly depressions, into which are arranged plates 27, adapted to conform thereto. The bristles 28, which are formed of any suitable material of sufficient strength and durability, are laid across the depressions, and the plates, when they are brought to bear thereon, bend said bristles into the depressions. Bolts are then arranged to secure the plates, as shown, the preferable method being to pass the bolts through bolt-passages and secure two plates at once, as clearly indicated.

To make the brush B readily adjustable in the machine we prefer to make the journals detachable therefrom, as illustrated by Fig. 7, in which 24 24 are bearing-plates bolted or otherwise secured to the side disks, 22 22, said plates having the journals 25 25 formed thereon or secured thereto. By simply unbolting the disk and plate, the brush may be quickly removed and be replaced by a new one.

The several pulleys herein shown are preferably connected by bolts formed of links hinged together as shown, each link having an aperture, 30, Fig. 5, therein, adapted to engage with lugs 31 upon the pulleys. This arrangement prevents the belt from sliding, and is necessitated by the uneven or irregular nature of the work to be performed.

Having thus described our invention, we do not wish to be understood as limiting ourselves to the precise arrangement of parts herein set forth, as it is evident that very material changes can be made in the device without departing from the spirit of the invention; but

What we claim is—

1. In combination, in a street-sweeping device, a brush, B, inclined plane *d*, scrapers *i*, belt *l*, and transversely-movable mechanism arranged to receive the dirt from the said belt *l*, substantially as and for the purpose herein set forth.

2. In combination with the truck-body, the brush, the inclined plane having scrapers arranged to cause the dirt to pass upwardly thereover, the belt having lags thereon adapted to cause the dirt to continue its upward progress, and the transverse belt, one end of which projects laterally from the machine, arranged to receive the dirt from the aforesaid belt having lags, all said parts being arranged and operating substantially as herein set forth and shown.

3. In a street-sweeper the combination, with the truck provided with journal-bearings and the revolving brush, of plates provided with journals adapted to be secured to the body of

said brush, all substantially as and for the purpose herein set forth.

4. In combination, in a street-sweeping device, the carriage-body, frame-work erected thereon, pivotal arms *a*, adapted to be raised or lowered and carrying slotted bearings for the revolving brush, said revolving brush, an inclined plane pivoted on the carriage, having scrapers adapted to cause the dirt to pass upward thereover, a belt, *l*, adapted to receive the dirt and carry it upward from said inclined plane, and a transverse belt, all said parts being arranged and operating substantially as herein set forth and shown.

In testimony that we claim the foregoing we have hereunto set our hands this 15th day of June, 1882.

FREDK. F. BIOREN.
JAMES C. BIOREN.

Witnesses:
CHARLES H. PELL,
O. DRAKE.