A. J. ROBERTS.

STREET SWEEPING MACHINE.

No. 50,630. Patented Oct. 24, 1865.

Fig. 1.

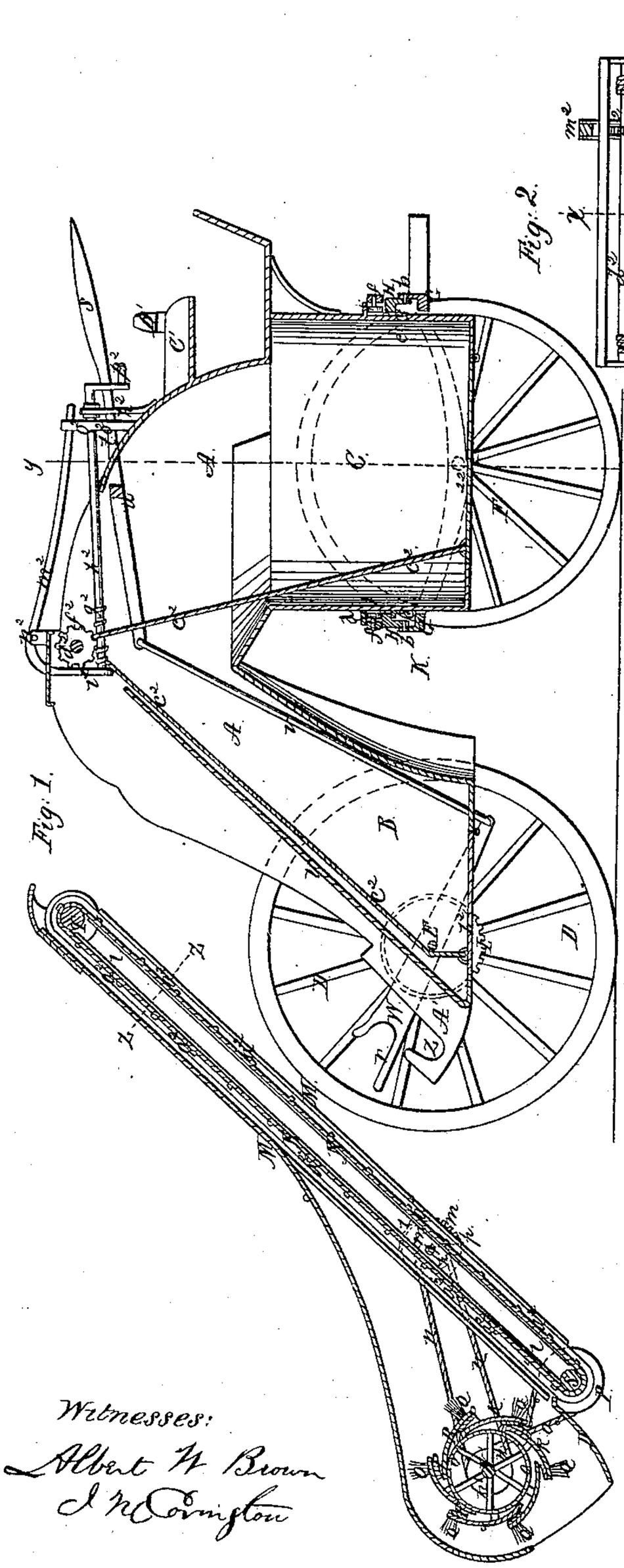


Fig. 2.

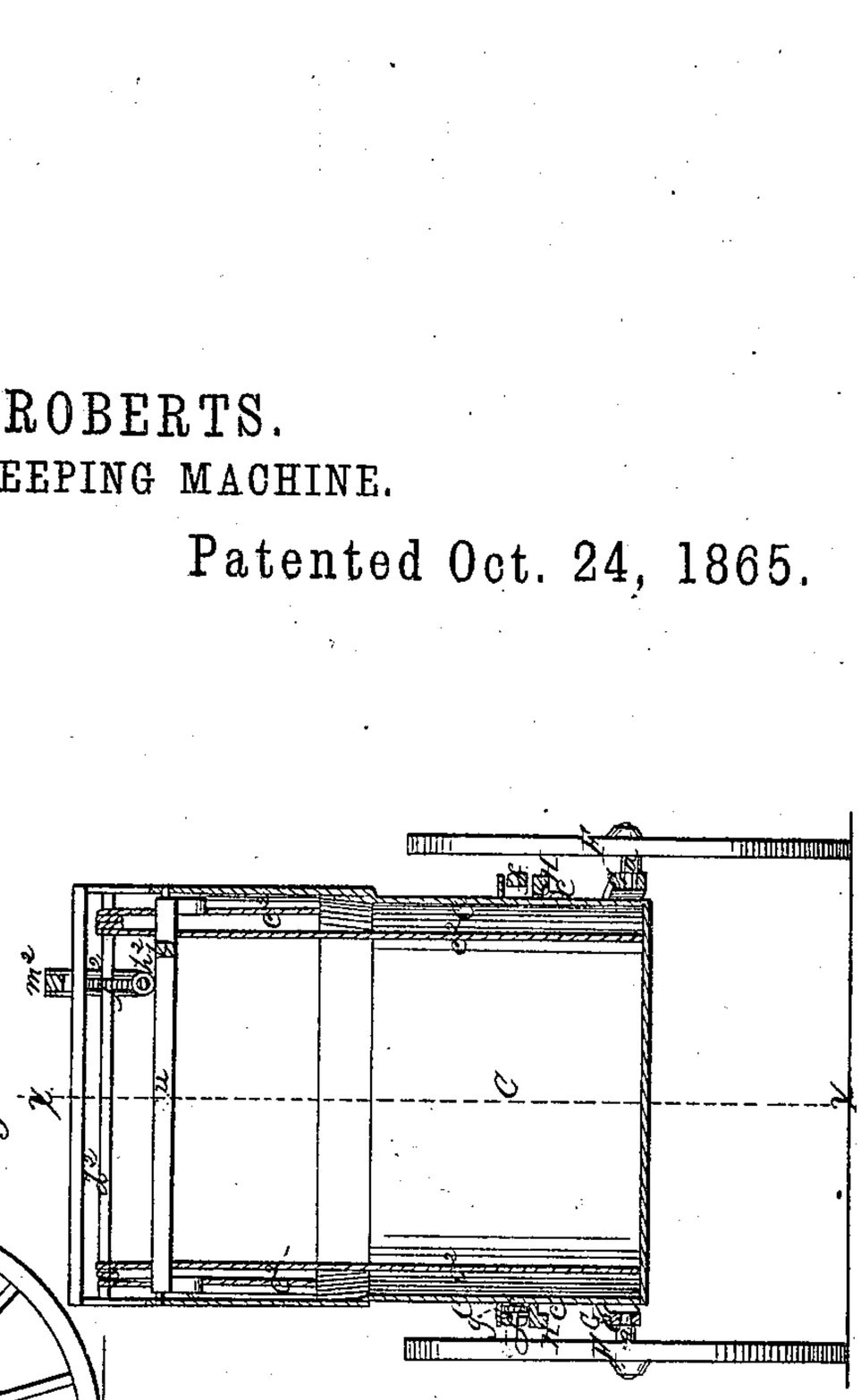


Fig. 3.

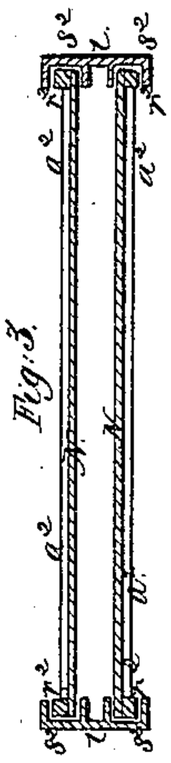


Fig. 4

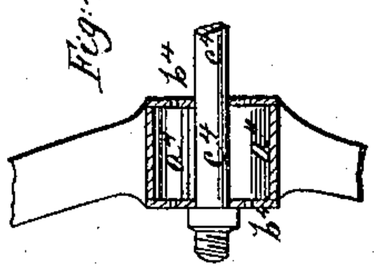
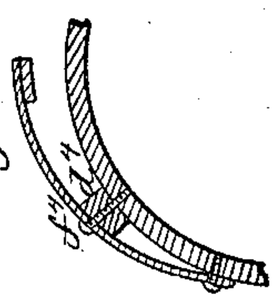


Fig. 5.



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UNITED STATES PATENT OFFICE.

ANDREW J. ROBERTS, OF BOSTON, MASSACHUSETTS.

IMPROVED STREET-SWEEPING MACHINE.

Specification forming part of Letters Patent No. **50,630**, dated October 24, 1865.

To all whom it may concern:

Be it known I, ANDREW J. ROBERTS, of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Street-Sweeping Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The present invention consists, first, in so attaching that portion of the machine containing the endless belt upon and by which the dirt as fast as swept up from the street is conveyed to the dirt box or receptacle of the machine, that it can be readily detached therefrom or placed thereon at pleasure, whereby when the dirt-box has been filled to its utmost capacity, or as much as desired, it can be then drawn away to any convenient place for depositing the dirt without necessarily carrying with it the sweeping devices of the machine, the advantages of which are many and manifest to all persons conversant with the subject-matter of my present invention; second, in a novel and peculiar manner of constructing and arranging the front axle-tree of the machine, as will be presently described; third, in an arrangement of devices for raising and lowering the bottom of the dirt-box, when desired, to dump or remove the dirt from the same; fourth, in the use of an elastic endless belt or band, made either of india-rubber, gutta-percha, or other suitable material, provided with proper-shaped ridges or lips for holding and retaining the dirt swept upon the same by the action of the brooms in passing over the street; fifth, in so forming or constructing the side pieces of the frame incasing the endless dirt-carrying belt that no dirt of consequence can posssibly work between them and the edges of the belt, which not only often causes serious injuries to the belt, but prevents its free and easy movement; and I have also made other improvements in the detail, construction, and operation of the machine, which will be hereinafter particularly explained, reference being had in the following description to the accompanying plate of drawings, of which—

Figure 1 is a central longitudinal vertical section, showing the sweeping mechanism detached from the main portion of the machine and taken in the plane of the line *x x* of Fig. 2, which is a transverse vertical section of the machine, taken in the plane of the line *y y*, Fig. 1. Fig. 3 is a detail sectional view on an enlarged scale in the transverse plane *z z* of the endless dirt-carrying belt or band of the machine, showing the manner in which it is arranged in the side pieces of its outer casing.

A A in the drawings represent the dirt box or receptacle of the machine, made of the general form shown in section in Fig. 1, and divided into chambers or parts B and C, one of which, C, is of a cylindrical shape; D D, the rear wheels turning on an axle, E, extending entirely across the lower portion of the inclined chamber B of the dirt-box and secured at each end in the same; F F, the front wheels turning upon the trunnions *a a* at diametrical points of the circular bar or ring G, extending entirely and loosely around the exterior of the cylindrical portion C of the dirt-box, and hung by swivel or pivot joints *b b*, at equal distances from the trunnions *a a*, to another ring, H, around the cylinder C and above the wheel-axle ring G, resting upon a series of suitable-shaped brackets, *c c c*, placed and secured at intermediate points upon the cylinder box, the said rings G and H being of the proper size to freely turn around the cylinder.

By thus hanging the front wheels of the sweeping-machine to and upon a loose circular axle, swiveled to another ring, resting upon the dirt-cylinder box, as described, it is evident that they can be not only more freely moved around, so as to allow the machine to be turned into any desired position, the wheels passing in their circuit under the dirt-box and through the cutaway portion K of the same, but, also, they are allowed a play in a vertical plane, whereby they adjust themselves to the inequalities on the surface of the ground being swept or over which the machine is traveling.

In order to relieve the circular rings to which the front wheels are hung of a considerable portion of the friction necessarily produced by the movement upon and around the cylinder-box, I employ a series of friction-rollers, *d d d*, placed in a loose ring, *f*, which rollers bear upon the upper surface of the ring H, as is plainly represented in Fig. 1.

Upon inner side of each hind wheel, D, and

turning in conjunction with the same, is a gear-wheel, L, interlocking with which, when the casing M, in which the endless dirt-carrying belt or band, N, is arranged, is placed upon the machine, as will be presently explained, a similar but smaller gear-wheel, *m*, engages, turning by its shaft, *h*, in suitable bearings of the side plates, *l*, of the casing M.

On each end of shaft *h*, and turning with it, is a pulley, *m'*, connected by a driving-belt, *n*, with a pulley, *n'*, upon the ends of a transverse horizontal shaft, N', turning in bearings of the outer casing, M, and extending across the lower end of the same, on which shaft a series of circular frames or wheels, O O, are attached, having secured upon their periphery the frames P P, in which the brooms or brushes Q Q are inserted by means of bent spring-plates R R, as has been particularly explained, and for the purpose specified in the description accompanying my application for other improvements in street-sweeping machines bearing even date herewith. Passing from the pulleys *n'*, at each end of the broom-shaft, is another belt, *o*, connecting it with the pulley *p* upon the ends outside of the casing M of a horizontal cylindrical drum-shaft, S, extending entirely across the interior of the casing M, over which passes the vertical inclined endless dirt-carrying belt or band N, moving around a similar drum-shaft, T, at the upper end of its casing. This casing, when in position upon the machine, extends upward and along upon the exterior surface of the inclined end plate, U, of the same, on which it rests, and is held by means of two lever-arms, W, hung and turning upon the rear axle, E, as a fulcrum, and outside of the dirt-box A, which arms have their outer ends, *r*, made of a hook-shape, so that by first placing the shaft *h* of the belt-frame N in the same, if to be attached to the machine, and then depressing the outer end or handle, *s*, of the lever *t*, hung in the upper portion of the dirt-box A, and connected through its cross-rod *w* with the inner ends, *u*, of each of the hooked shaped levers W by rods *v*, the hooked shaped ends will be depressed, carrying with them the endless belt-frame, and locking its shaft *h* in and around the cut-out portions *z z* of the projecting pieces A', upon each side of the dirt-box A, the two together forming a perfect circle or bearing for the said shaft, the shaft being secured thereon, consequently firmly holding the frame containing the sweeping devices to the box of the machine by a spring-catch, B' at or near the driver's seat C'.

To remove or detach the belt-frame from the body of the machine it is evident that it is only necessary to unhook the handle and lift it sufficient to release the hooked shape arms W from the fixed piece A' of the dirt-box, when the frame can be readily lifted therefrom, as is evident without further description.

From the above it is apparent that, by attaching the frame containing the sweeping devices to the machine, so that it can be readily placed thereon or detached therefrom at pleasure, the dirt-receptacle of the machine can be drawn off by itself to the place or locality where the dirt is to be dumped—a very important and great advantage.

The lower end of the belt-frame N terminates in a series of bent spring-plates, D', which bear upon the ground as the machine is drawn forward by the horses or other power used, and over which the brushes Q Q of the brush-shaft as they revolve through the devices connecting their shaft with the rear wheels of the machine pass, and sweep the dirt from the street up to and upon the endless belt N, which at the same time is traveling upward and toward the upper portion of the dirt-box, carrying the dirt thus deposited on it, and there held by its series of transverse parallel projecting ridges, a^2 a^2, attached to the same, which finally falls therefrom into the dirt-receptacle, as in ordinary street-sweeping machines employing an endless dirt-carrying belt. The dirt-box having been sufficiently filled, or to its utmost capacity, or the sweeping of the street having been completed, the machine is then drawn to any suitable place or locality for depositing the dirt, the frame containing the sweeping devices and dirt-carrying belt being either detached from the machine or not, as may be desired, which I accomplish by hinging one side of the bottom plates, b^2 b^2, of each part of the dirt-box A to the machine in such a manner that they can swing downward sufficiently to allow the dirt to fall through and out of the box, these plates b^2 b^2 being retained and held in a closed position when desired by means of connecting-cords c^2 c^2 attached to each of them, and passing upward through the interior of the box to and around the drum d^2 in the upper portion of the machine, having a pinion-wheel, f^2, engaging with a worm, g^2, of a shaft-rod, h^2, turning in bearings at one end of a standard, h^2, of the dirt-box, and at the other of the angular arm l^2 of a lever-handle, m^2, turning upon a fulcrum, n^2, of the dirt-box, and held at its outer end in a fixed spring-catch, o^2, thereof.

By the above-described arrangement of devices also the bottom plates, b^2 b^2, can be raised when desired by simply turning the crank-handle p^2 of the worm-shaft h^2 h^2 in the proper direction therefor, the worm and pinion being disengaged from each other when desired to open the bottom plates of the dirt-box by simply raising the handle-lever, which, as is evident, then leaves them free to fall or swing by the downward pressure or weight of the dirt upon them.

The endless belt or band for conveying the dirt to the dirt-receptacle of the machine I make of india-rubber, gutta-percha, or other suitable elastic materials, or of any of their respective elastic compounds, and in order to prevent the dirt from working in and between its edges and the inner sides of the frame, in which it moves, I form along and upon each edge of the belt, and for their entire length, a

raised lip or flange, r^2, which move in and through suitable-shaped grooves S^2 S^2 upon the inner surface of the side pieces, l, of the frame, as is plainly represented in Fig. 3.

In Fig. 4 is shown a detail sectional view of the axle of one of the wheels of the street-sweeping machine, in which a^4 a^4 are a series of frictional rollers hung in and between two parallel head-plates, b^4 b^4, over and upon which rollers the wheel turns, the object being to reduce the friction thereof and thereby decrease its wear as well as the amount of power necessary to be expended in the drawing of the machine over the surface of the ground; and in Fig. 5 is shown an enlarged view of the bent spring by which the brush-frames are secured to their common center shaft, together with an arrangement of a rubber or other elastic cushion, d^4, interposed between the spring and said shaft, through which passes a set-screw, f,[4] the turning of which to the right or left causes the brush-frame either to be thrown in toward, or out from, the center shaft, thereby decreasing or increasing the circuit described by its revolutions at pleasure.

It may be here remarked that the gear-wheels upon each end of the hind axle-tree I arrange in the same manner as that described for the pulleys and claimed by me in patent granted on the 18th day of May, A. D. 1858.

I claim as new and desire to secure by Letters Patent—

1. So connecting the frame containing the sweeping devices and the endless dirt-carrying belt or band to the wagon or dirt box of a sweeping-machine that it can be readily detached therefrom or attached thereto at pleasure, substantially as and for the purpose specified.

2. The combination of the axle-ring G and ring H, attached together and to the front wheels of the sweeping-machine, and operating substantially as and for the purposes specified.

3. The arrangement of the worm g^2, pinion f^2, and shaft d^2, lever-handle m^2, and lifting-cords c^2, operating substantially in the manner described, for the purpose of opening and closing the bottom plates of the dirt-box, as specified.

4. The combination of the hooked shaped lever-arms W with the fixed projecting plates A′, the arms being so connected to and with a suitable handle-lever, S, through rods v w, that by raising or depressing the said handle the hooked ends of the arms w will be correspondingly moved, substantially as and for the purposes described.

5. The employment, in street-sweeping machines, of an endless dirt-carrying belt or band made of india-rubber or any of its elastic compounds, and having suitable-shaped ridges, for the purpose described.

6. Forming upon and along each of the interior surfaces or faces of the sides of the frame M a guiding groove or channel, s^2, in and which the endless belt N moves, for the through purpose specified.

7. Inserting between the bent metallic springs by which the broom-frame is fastened to their center shaft and the said shaft an elastic cushion, d^4, in combination with a set-screw, f^4, for the purpose and arranged as described.

Witnesses: A. J. ROBERTS.

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