2 Sheets—Sheet 1.

E. T. PRINDLE.

CARPET SWEEPER.

No. 190,982. Patented May 22, 1877.

Fig. 1.

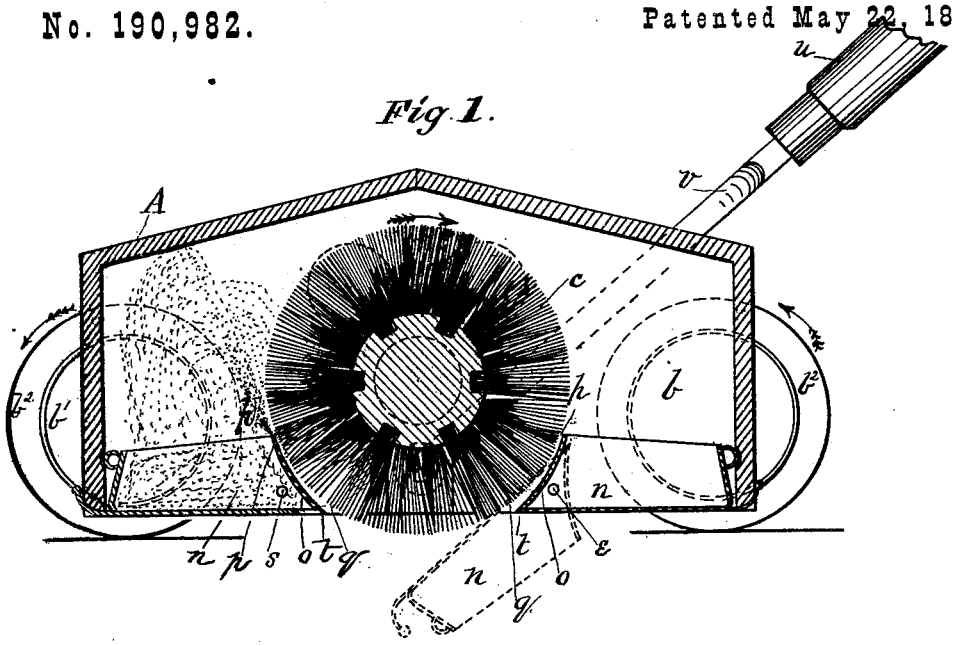


Fig. 2.

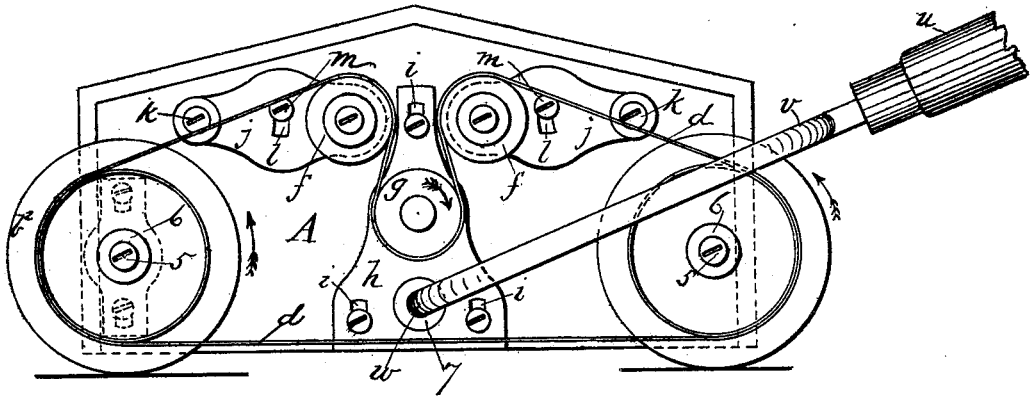
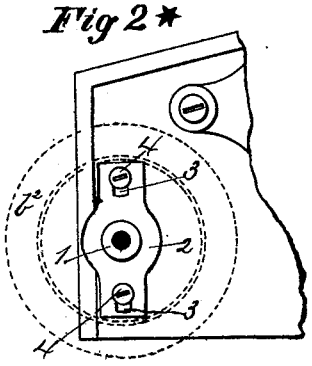


*Fig 2**



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2 Sheets—Sheet 2.

E. T. PRINDLE.

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Fig. 3.

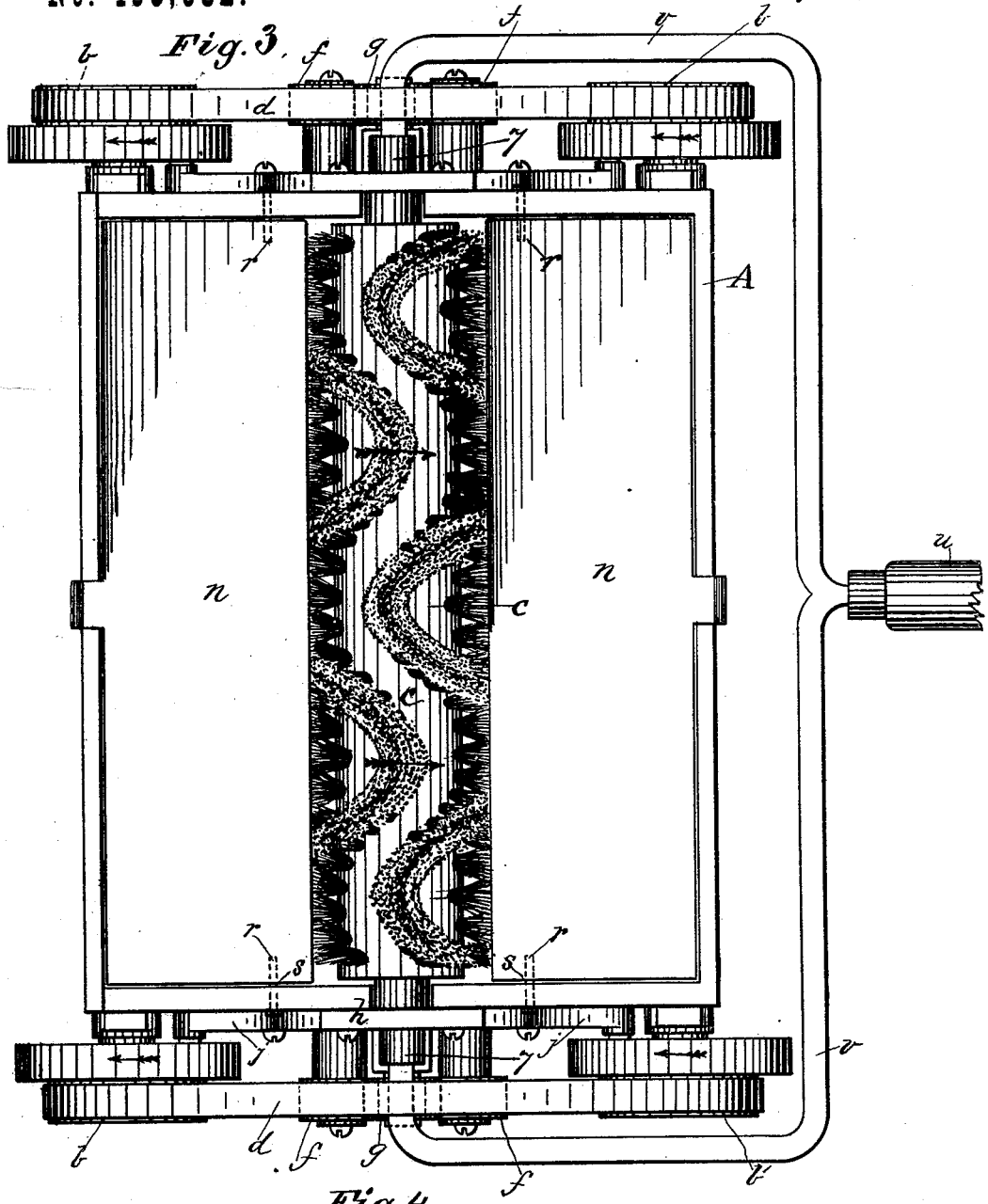
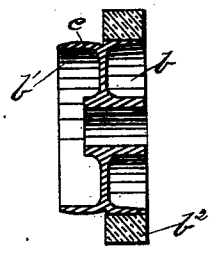


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD T. PRINDLE, OF AURORA, ILLINOIS, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO SIMON W. THATCHER, OF SAME PLACE.

IMPROVEMENT IN CARPET-SWEEPERS.

Specification forming part of Letters Patent No. **190,982**, dated May 22, 1877; application filed January 27, 1877.

To all whom it may concern:

Be it known that I, EDWARD T. PRINDLE, of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Floor and Carpet Sweepers; and I do hereby declare that the following is a full, clear, and exact description thereof, which 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 the letters of reference marked thereon, which form a part of this specification.

The objects of my improvements are mainly to furnish a floor or carpet sweeper which is practically noiseless, whether moving over a carpet, or over an uncarpeted floor, or over a waxed floor, oil-cloth, marble, or tiling, which will, more efficiently than as heretofore made, sweep cleanly and thoroughly; which dispenses with all toothed gears, and has ample provision for the adjustment of all parts which may need adjustment; and which has improved means for readily discharging the dirt collected in the pans.

My improvements relate to rendering a sweeper practically noiseless; to the means for driving the brush, and for adjusting the belts relatively to the brush-shaft and the four traction-wheels of a reversible sweeper; to combining an adjustable brush with the vertically-adjustable supporting-wheels; and to other particulars hereinafter stated.

Figure 1 is a transverse section; Fig. 2, an end view; Fig. 2*, a detail; Fig. 3, an under-side view; and Fig. 4, a central section, of one of the driving and running wheels and its rubber tire.

A is the box, provided preferably with a close cover, as shown, and having four running and driving wheels, b b b^1 b^1, two on each side, equally distant from the center. These wheels are all alike, and all alike serve both to carry the box, and to drive the revolving brush c. These wheels are preferably of metal, and have a broad periphery, about one-half of which is covered with a heavy tire, b^2, of india-rubber, or its equivalent, and the remainder is adapted for receiving a flat driving-belt, d; and, for the better holding the belt to place thereon, this part of the periphery is turned so as to be slightly higher at its center, as shown at e, and the rubber tire only of the wheels can come in contact with the floor.

Each of the belts d, one on each end of the sweeper, not only extends over both pulleys b b or b^1 b^1 on that end of the machine, but also up and over two guide-rolls, f f, and then downward and under the roller or pulley g on the end of the brush-shaft, and nearly encircling it, thus having a good purchase upon it. The hangers or journal-plates h, in which the brush-shaft is journaled, have vertical slots i i and screws, whereby the brush, as its bristles may wear away with use, may be lowered as found requisite, and secured to any adjusted position. This same adjustment may also serve to tighten the belt. If, however, the belt or belts need to be tightened or loosened, the guide-rolls f f may be raised or lowered for this purpose, each roll being journaled on a journal-plate, j j, which is pivoted at k, provided with a slot, l, and with a set-screw, m, whereby the plate, when swung on its center or pivot, may be firmly fixed in its adjusted position. From the course given to the endless belts it will be seen, as indicated by the arrows in Fig. 1, that the brush revolves in one direction while the driving-wheels revolve in the opposite direction, and, as a necessary consequence, the dirt, as picked up from the floor, is thrown forward, and not backward in the direction of that part which has just been swept.

The driving-wheels or pulleys b b b^1 b^1 are made vertically adjustable, as follows: Each is hung on a journal, 1, projecting from a plate, 2, having slots 3 3 and adjusting-screws 4. When these pulleys are applied to these journals they are held in place by screws 5, which enter these journals, and are provided with washers 6.

As the wheels b b b' b' are all alike, and all similarly situated relatively to the central line of the box, and all similarly and equally driven by the same devices and the same pair of endless belts, it follows that, with a handle centrally attached, the sweeper will operate precisely similarly and with the same efficiency, whether pushed or pulled over the floor, and

whether the handle be swung over to one or to the other side of the box, the dust pans *n n* being each alike and similarly located, one on either side of the brush; and, in whichever direction the sweeper may be propelled, the brush must always revolve in the opposite direction, so as to throw up the dirt in the direction of the unswept, and away from the swept, part of the floor.

The dust-pans *n n* have a peculiar construction, and are peculiarly hung, and for special objects, as will now be described. Their inmost or rear curved walls *o*, which are in proximity to the brush, instead of having such curvature concentric with the periphery of the brush, are so made that the curve, at its top, almost touches the brush, as seen at *p*, but gradually recedes therefrom toward its bottom, thus leaving the space between such curve and the brush gradually diminished or narrowed from the bottom, as seen at *q*, to the top.

It will be seen that if the walls *o* were made in a straight line or plane from *p* to *t* the brush could not properly perform its duty of raising the dirt; and if the curvature shown at *o* were the arc of a much smaller circle, it would be liable to a similar objection, as parts of it would be too far off from the brush; and if this smaller circle were such as to cut the circle described by the periphery of the brush, and project into such circle, the brush would be apt to suddenly spring its hairs and throw back upon the floor the dirt it had just gathered, besides needlessly wearing out the brush.

This construction allows the brush to come in closer contact with the concave of the pans at *p p* than would otherwise be practicable, and insures that the dirt and dust, as they are caught up by the brush, shall go directly into the pan, and not be so liable to be carried around by and retained in the brush, with the risk of dropping them again upon the floor from which they had just been taken. Thus my sweeper is found practically to effect a more thorough and cleanly sweeping than any other sweeper known to me.

The pans are neither fixed, as in some varieties of sweepers, nor swiveled centrally, as in other varieties, nor hung at their edge by hinges, all of which have their peculiar objectionable features. When fixed, the whole sweeper must be turned up-side down to discharge the dust, and the top or cover must be hinged for this purpose, and the dust will not freely drop from the sharp or acute angle of the box. When centrally swiveled, the same objection exists, and, besides, the pan does not open wide enough or drop low enough to discharge the sweepings in the best manner. When hung by hinges at their edges, any slight bending out of line of the axial line of the hinges causes the hinge to catch and be strained, and it soon becomes broken and difficult of repair; and if hinged at their outer edge, or farthest from the brush, then, when swung down to discharge the sweepings, a large portion of it drops into the acute angle formed by the curved side, and can only be picked out by hand, and imperfectly, and with much inconvenience.

I hang my pans upon pivots *r r*, which project inward from the ends of the box, and enter holes *s s* made in the ends of the box, close to the acute angle at *t t*. It will now be evident that the pan will swing freely under all conditions when unclasped, that no hinges are used or needed, that the entire pan swings down, and that the dirt, by its own gravity, then falls from the angle *t*, and the pan is readily emptied.

The handle *u*, by which the sweeper is moved, has its yoke *v*, not attached, as is customary, upon or in the same horizontal line with the brush-shaft, nor above it, but, on the contrary, it is attached at points *w*, which, while central of the breadth of the box, are also below the axis of the brush, and in vertical lines therewith. This avoids all tendency of the box to tip up as it is propelled, as the leverage from the floor to the points *w w* is so short, and the act of pushing also causes the implement to hug the floor more closely, and it also facilitates the overturning of the box when not in use, for any purpose desired.

The hangers or plates *h* are made each with a projecting hollow nipple or socket, 7, at its lower end, to receive the end of the propelling-yoke *v*.

My sweeper avoids the objections incident to those sweepers which have wheels at one side only, and rest on a metal or other runner at the other, for in all such constructions the brush, being driven at one end only, cannot work as truly nor work as well in its bearings; there are always more strain and resisttance at one end of the sweeper than at the other; the runner frequently doubles or buckles up the carpet if the latter lies a little loose upon the floor, and the carpet is often damaged from this cause.

Again, in a reversible machine, besides the advantages above stated as due to the four wheels, there is this further practical advantage resulting from making each of the four wheels contribute toward the driving of the brush. Should any one of the wheels tend to stick or to refuse to revolve, or should the belt from any cause slip or decline to work properly on one of the wheels, or upon both of the wheels at either the forward or rear side of the box, then the other wheels will compensate for such omission or contingency, and prevent the non-action or the unequal action of the brush, and this compensation is the same in whichever direction the implement is propelled. In other words, the certainty of the proper revolution of the brush is secured under all conditions, because it has four sources of power to drive it, and as a necessary consequence the wear and strain

upon each driving-wheel, and upon its axle or journal, are reduced to the minimum, or to only one-fourth of the whole.

My improvement also avoids the objections incident to that class of sweepers which have attempted to employ only one driving-wheel at each end, as such machines, when reversed, (if reversible at all,) operate differently and less efficiently when moving in one direction than when moving in the other. Nor when such two driving-wheels are employed, is it feasible for a successful reversible machine to employ at each end other supporting-wheels, which are not also drivers, for unless all four wheels are alike, and driven alike, and connect with the brush alike, it is evident they will not all move uniformly and coincidently. And all four must be rubber-tired; otherwise those which are not will positively prevent the sweeper being noiseless, especially on bare floors of marble or wood, and it is well known that the noise they make is one of the most serious objections to sweepers.

The material which forms the brush is laid in wavy, serpentine, or zigzag lines along the brush roll or cylinder, thus forming a series of what may be termed "pockets" for the gathered dirt, and in whichever direction the brush is revolved or the sweeper propelled the action of the brush is just the same in picking up and holding the dirt until discharged therefrom.

I claim—

1. A reversible carpet or floor sweeper supported and carried upon four similar noiseless end wheels, each pair of which, by means of an endless belt passing over both wheels of such pair, and around a pulley at each end of the brush-shaft, operates to drive the brush, as shown and described.

2. The combination, in a reversible sweeper, having a dust-pan both at front and rear, of two pairs of rubber-tired wheels, which severally serve to support the box, and also as drivers to a brush located midway of such wheels, the tires avoiding noise, the brush and pans being adapted to perform their duties in either direction of the propulsion of the sweeper or revolution of the brush, and each pair of wheels transmitting power to the brush by means of a belt passing over both wheels of such pair, and around a pulley at the adjacent end of the brush-shaft.

3. The combination, with a carpet-sweeper running on four wheels, of two endless belts, each passing over two similar wheels, over intermediate guide-pulleys, and around a pulley on the brush-shaft.

4. In combination with a carpet-sweeper, the belt-tightening and guide-pulleys *f*, each hung upon a slotted and pivoted adjustable plate, *l*, as shown and described.

5. The combination, with the vertically-adjustable roller-brush, of the four vertically-adjustable supporting-wheels.

6. The combination, with the vertically-adjustable roller-brush, of the vertically-adjustable supporting and driving wheels, and the adjustable belt-tightening pulleys, substantially as and for the purpose described.

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Witnesses:

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HORACE J. SEYMOUR.