No. 867,620. PATENTED OCT. 8, 1907.

W. L. TAFT & A. N. VERDIN.

FLOOR SURFACING MACHINE.

APPLICATION FILED JAN. 12, 1907.

4 SHEETS—SHEET 1.

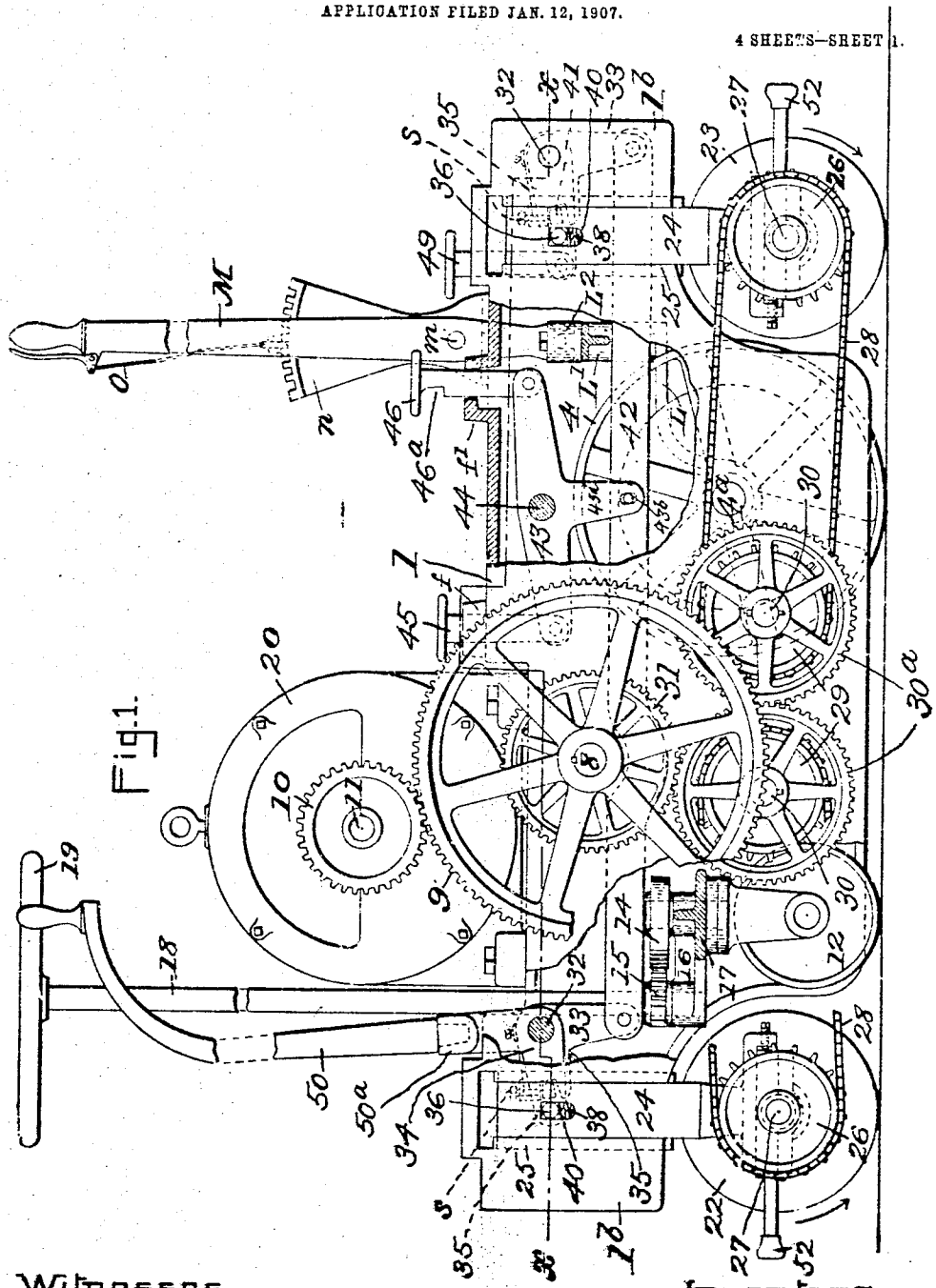


Fig. 1.

Witnesses.
Homer Bradford.
C. M. Fortune

Inventors.
Walter L. Taft and Alice N. Verdin,
by John Elias Jones,
their Attorney.

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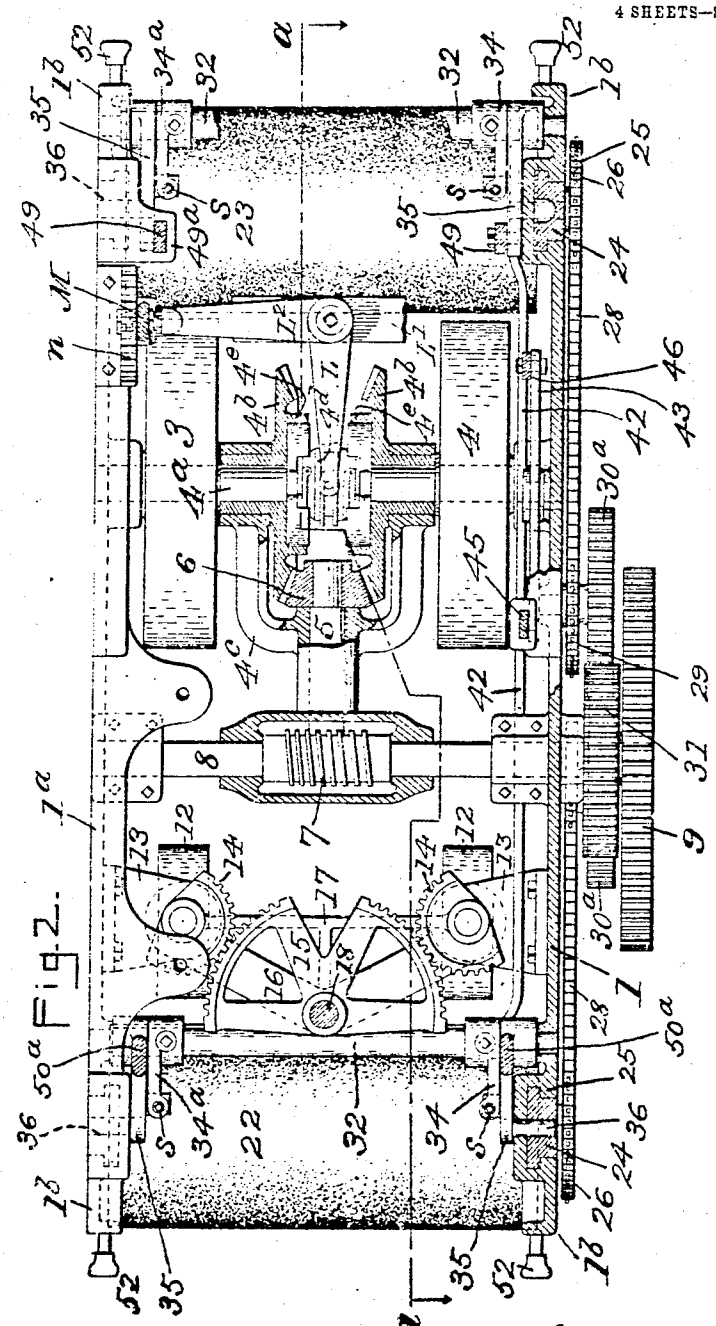


Fig. 2.

Witnesses.
Homer Bradford.
R. M. Fortune.

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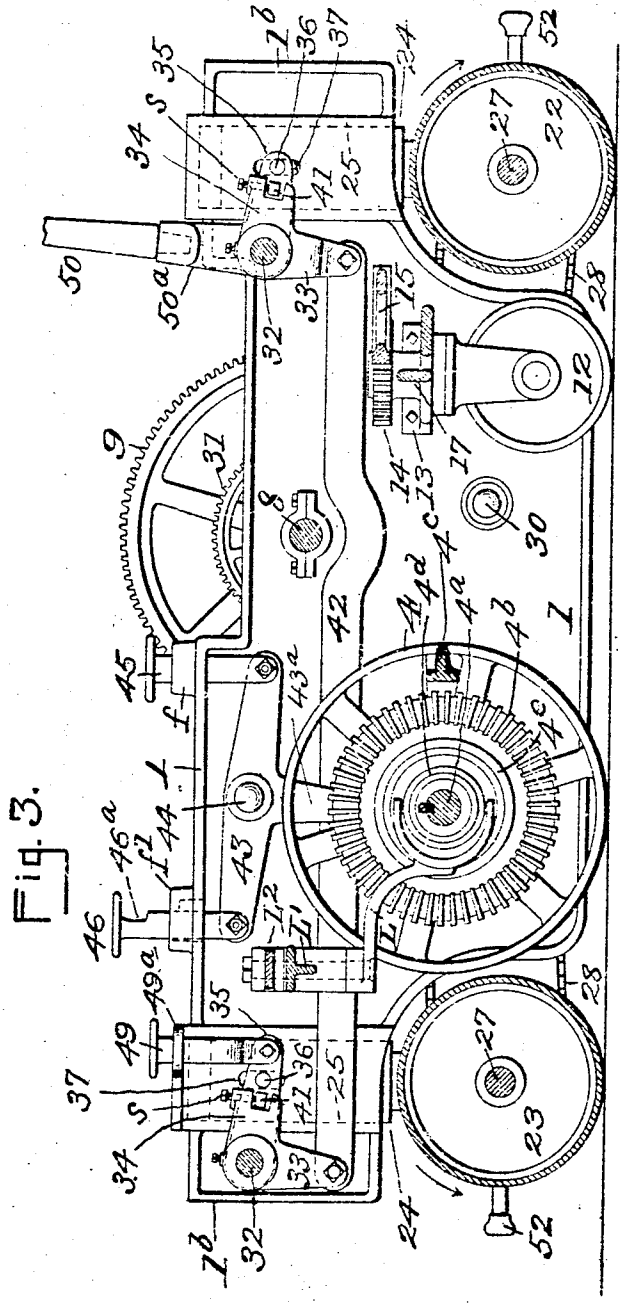


Fig. 3.

Witnesses.
Homer Bradford.
R. M. Fairbank.

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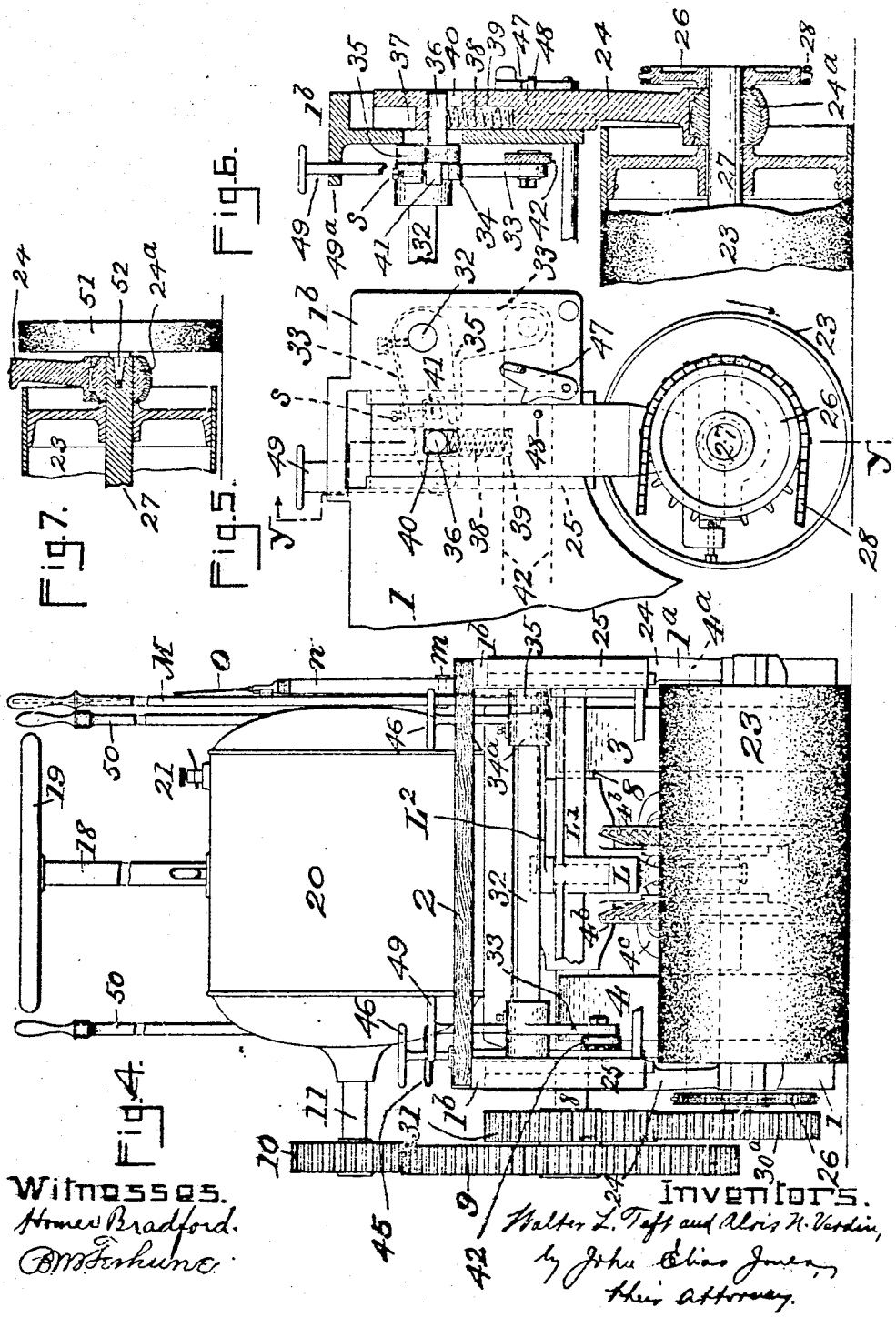


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Witnesses.
Homer Bradford.
B. B. Fortune.

Inventors.
Walter L. Taft and Alvis N. Verdin,
by John Elias Jones,
their Attorney.

UNITED STATES PATENT OFFICE.

WALTER L. TAFT, OF CINCINNATI, AND ALOIS N. VERDIN, OF GLENDALE, OHIO, ASSIGNORS TO WALTER L. TAFT, OF CINCINNATI, OHIO.

FLOOR-SURFACING MACHINE.

No. 867,620. Specification of Letters Patent. Patented Oct. 8, 1907.

Application filed January 12, 1907. Serial No. 351,959.

To all whom it may concern:

Be it known that we, WALTER L. TAFT, of Cincinnati, Hamilton county, and State of Ohio, and ALOIS N. VERDIN, of Glendale, said county and State, both citizens of the United States of America, have jointly invented certain new and useful Improvements in Floor-Surfacing Machines, of which the following is a specification.

This invention, relating to improvements in portable machines for use in traveling over or traversing floor-surfaces and carrying abrading drums or rollers that are adapted to dress down, clean, smooth, polish and otherwise finish said surfaces whether made of wood, marble, stone, or composite substance, will be readily understood from the following description, taken in connection with the accompanying drawings, in which latter—

Figure 1 is a longitudinal side elevation of the machine, showing some of the frame and other parts broken away to present to view some of the internal parts, the latter being partly shown in section; Fig. 2, a plan view of Fig. 1, but with the driving-motor removed and with the operating-levers shown in cross-section, one side of the machine being shown in section taken on the line *x*, *x*, of Fig. 1, and a central section of the devices for throwing into and out of gear the propelling parts of the machine; Fig. 3, a longitudinal sectional elevation taken on the dotted-line *a*, *a*, of Fig. 2, (in the direction of the arrows at both ends of said line,) and bringing most clearly to view the traction and steering devices and the several devices for controlling the action of the abrading drums or rollers at opposite ends of the machine; Fig. 4, an end elevation, taken at the right-hand of Fig. 1; Fig. 5, a fragmentary side elevation, on a somewhat larger scale, showing one corner of the machine (that at the right-hand seen in Fig. 1) and including a suitable form of latch device for holding the vertically-sliding bearings of the sand-drum up, when it is desired to elevate and support the latter above the floor-surface; Fig. 6, a fragmentary vertical section taken on the dotted-line *y*, *y*, of Fig. 4; and Fig. 7, a broken cross-section of one end of one of the surfacing sand-drums, including its pivotal support or bearing, and an elevation of the face of an auxiliary narrow sand-wheel attachment extending and mounted outside the bearing of the said sand-drum for the purpose of operating along the edges or border of the floor where the opposite ends of the said sand-drum cannot reach, such auxiliary sand-wheel being detachably-secured to the shaft of said sand-drum and applied thereto after the main surface of a floor has been finished and used for completing the work along said edges or border of the floor.

The supporting-frame of the machine is composed of a pair of longitudinal sides 1 and 1^a suitably connected together and having journaled and supported therein the various parts of the mechanism that are used in smoothing and dressing the surface of the floor and in guiding the machine in its movements along said floor.

2 is a platform or cover (shown in Fig. 4 only) spanning the space between the two side-frames 1 and 1^a, and on which the operator stands in performing the work of the machine.

3 and 4 indicate a pair of large truck or traction wheels mounted on a transverse shaft 4^a bearing at its ends in suitable boxes provided in the side-frames 1 and 1^a, as best seen in Fig. 2. The shaft 4^a is a continuous or through one across the machine, bearing at its ends in the side-frames 1 and 1^a, and has loosely-mounted thereon a pair of bevel-gears 4^b, 4^b, the laterally-projecting hubs of the latter being journaled in the outer open ends of a forked frame 4^c, and, in the hollow shank of which latter, is journaled a shaft 5 having at one end a bevel-pinion 6, the latter engaging the teeth of the bevel-gears 4^b, 4^b, to drive the machine on said truck-wheels 3 and 4 to and fro in either direction, and said shaft 5 having a worm-wheel (not shown) at its opposite end engaging a worm 7 on a transverse shaft 8, the latter having at its outer end a large spur-gear 9 driven by a spur-gear or pinion 10 mounted on the outer end of a motor-shaft 11.

A friction-clutch 4^d is splined to shaft 4^a to interlock alternately with the flanges 4^e, 4^e, on the bevel-gears 4^b, 4^b, for the reverse motion of the latter on shaft 4^a and, in turn, reversing the direction of rotation of the said truck-wheels. A crank arm or lever L projects from the lower end of a vertical shaft mounted in the cross-frame L^1 and has forked arms at its outer end engaging the clutch 4^d to slide the latter along the shaft 4^a. A lever L^2 projects from the upper end of the same shaft on which the forked arm L is mounted and has a reduced outer end that engages the forked lower end of the reversing-lever M, the latter being an upright one pivoted at *m* to a rack *n* and having a latch device O that engages said rack for locking the lever M in the desired position, the position of the lever M in Fig. 1 being that when the machine is at rest.

12, 12, represent supporting guide or steer wheels journaled in brackets 13 projecting inwardly from the side-frames 1 and 1^a, and 14, 14 are toothed segments at the upper ends of pivotal shanks or heads of the guide-wheels 12, such segments engaging toothed segmental portions of a mutilated gear-wheel 15 journaled in the forwardly-projecting web portion 16 of a cross-frame 17 whose opposite ends are supported on the brackets 13, 13 of the side-frames, as best seen in Fig. 2. The arc of toothed-contact or mesh of the respective segments 14, 14 and that of each of the toothed segmental portions of the wheel 15 correspond in length.

18 is a vertical shaft provided with a hand wheel or lever 19 and supported at its lower end in the wheel 15 for manipulating or swinging the latter to and fro on its bearing 16 for operative-engagement with the pivotal portions of the guide-wheels 12 and operating the latter in unison for steering the machine in the desired direction.

20 is a drum surrounding the motor that drives the machine, electric wires or conductors being connected with a suitable binding-post 21, as seen in Fig. 4.

22 and 23 indicate two respective sand-drums, one being journaled at either end of the machine in universal, spherical bearings 24^a (Fig. 6) at the lower ends of vertically-sliding bars or elongated blocks 24, the latter engaging guide-ways 25 provided in the forwardly and rearwardly projecting arms 1^b of the side-frames 1 and 1^a.

26 represents each one of two sprocket-wheels keyed to the outer ends of the shafts 27 of the sand-drums 22 and 23, and 28 represents each one of two chains engaging said sprocket-wheels 26 and, also, respectively engaging each one of the sprocket-wheels 29 mounted on studs 30, the latter projecting laterally from the side-frame 1 and each stud carrying a spur-gear 30^a free to turn thereon and meshing so as to drive the sprockets 29 that are rigidly connected therewith and which, in turn, impart motion through the medium of chains 28 to the sand-drums 22 and 23, and thus causing the latter to oppositely rotate, but toward the machine at the floor-contact, (as shown by adjacent arrows). One of the spur-gears 30^a engages a spur-gear 31 of like diameter rigidly mounted on the shaft 8 adjacent the large spur-gear 9, and is duly driven by the latter.

The devices for controlling the raising and lowering of the sand-drums and applying pressure thereto for the abrading operation, are composed of parts and are adapted to be operated as we shall now describe.

32, 32 represent transverse rock-shafts journaled in bearings in the forwardly and rearwardly projecting arms 1^b of the side-frames, and each of the two rock-shafts is provided with a bell-crank lever adjacent the inner faces of said arms 1^b of the side-frame 1. The two bell-crank levers are each composed of a pendent arm 33 and a horizontal arm 34, the latter being notched or forked at its outer end, as best seen in Fig. 3.

34^a represents a horizontal arm mounted on each rock-shaft 32, 32, adjacent the frame-arms 1^b of the side-frame 1^a. These arms 34^a are notched at their outer ends like unto the arms 34. A set-screw is provided to secure each bell-crank lever and each arm 34^a on its rock-shaft in the desired position, and a set-screw s is provided in the upper part of the forked end of each arm 34 and 34^a. An arm 35 is loosely-mounted on said rock-shafts, between each bell-crank, and, also, between each arm 34^a and the adjacent frame-arm 1^b, (Figs. 2 and 6), and a pin 36 projects laterally from each loose-arm 35 into a vertical slot 37 made in each arm 1^b, a vertical spiral spring 38 being provided under each pin 36 in a socket 39 made in the respective vertically-sliding bearing-bars 24. Each of the pins 36 crosses beyond the thickness of the frame-arm 1^b into an elongated opening 40 made in the bearing-bar 24, the lower end of said opening 40 being on the same plane as that of the lower end of slot 37, (Fig. 6). A flat-faced lug 41 projects inwardly from each loose-arm 35 toward and into the notch at the outer end of each arm 34 and 34^a, and each screw s is brought into engaging-contact therewith to adjust the sand-drum controlling-mechanism to a nicety for the proper abrading-action of said drums. 42 represents a longitudinal rod pivotally-connected at its opposite ends to the lower ends of the pendent arms 33 of said bell-cranks at one side of the machine only, to wit:—those adjacent the side-frame 1 (Figs. 2, 3 and 4), and 43 is a T-shape rocker arm or lever pivotally mounted on the stud 44 projecting inwardly from the side-frame 1. The vertical portion 43^a of the rocker-arm 43 is pivotally-connected at its lower slotted end 43^b to the connecting-rod 42 (Fig. 1), and two upright pedal-levers 45 and 46 are pivotally-connected at their respective lower ends to the respective opposite ends of the horizontal portion of the rocker-arm 43 and pass upwardly through openings in bosses f, f^1, made on the inwardly-flanged upper edge of the side-frame 1.

Foot disks or plates are provided in the upper ends of each lever 45 and 46 for depressing same and in turn rocking the lever 43 on its bearing 44 for actuating the connecting-rod 42 and the sand-drum bearing-bars for raising and lowering the sand-drums. The foot-lever or pedal 46 has a notch 46^a made in it beneath its top plate or disk, the horizontal portion of the notch forming a shoulder to be brought into engaging-contact with the lower edge of the metal on the interior of the boss f^1 when it is desired to support the sand-drums above the floor-surface for any purpose, such, for instance, as when the machine is at rest or running idly over the surface for changing position. An auxiliary device, such as the swinging latch-lever 47 mounted on the arm 1^b and adapted to engage a lateral pin 48 on the bearing-bar 24, (Figs. 5 and 6) may be provided to support the sand-drums above the floor-surface for like purposes. The pedal-lever 45 is the one used for depressing the sand-drums and holding them in abrading-contact with the floor-surface to be dressed, Fig. 1 showing said lever 45 down its full-stroke and the drums in operating-contact with the floor-surface. The pressure of the foot on the pedal 45 partially compresses the springs 38 in the bearing-bars 24, the said springs allowing for any sudden shocks occasioned by obstructions or raised ridges on the floor-surface, and forming an elastic bumper or cushion, they yielding when the obstruction or ridge is struck or collided with. The pedal 46 is depressed when it is desired to raise the sand-drums from the floor-surface, and it is pressed forward on its pivot by the heel of the operator's shoe when down full-stroke, so as to engage the shoulder of the notch under the top of the boss f^1 for temporarily locking the parts, free to be readily released for operation.

In the operation of the device, as thus far disclosed, the rock shafts are actuated in unison by the connecting-rod 42 and the bell-cranks, the latter and the arms 34^a acting in conjunction with their adjacent loose-levers 35 and thereby depressing the elastically-cushioned bearing-bars 24 that carry the sand-drums. It will be clearly observed in Fig. 3 that there is a space provided between the lower faces of the respective lugs 41 and the adjacent face of the notch in the outer end of the crank-arm 34, the purpose of which will be now described in connection with auxiliary devices for use in applying extra pressure to the sand-drums at their

opposite ends, independently of the remaining portion thereof, the universal bearings 24ª permitting such independent action.

49, 49, represent a pair of vertical foot-levers at the rear end of the machine, and 50, 50 a pair of vertical hand-levers at the fore end of the machine, the former (49) being short levers and having foot-plates and both pivotally-connected at their respective lower ends to the respective outer ends of the rear loose-levers 35 (Fig. 3) and passing upward through openings made in the lugs 49ª made on the inwardly-flanged upper edge of the arms 1ᵇ, and the said levers 50, 50 being long ones made of bars socketed at their lower ends in vertical integral portions 50ª of the fore loose-levers 35. In operation, the operator at the rear of the machine can conveniently and best use his feet on the rear auxiliary-pedals 49, 49 and his hands on the fore levers 50, 50, as is obvious, and when there is any particular spot on the floor-surface that he intends or wishes to dress down or finish, he simply depresses the levers 49 and 50 independently of each other and while the presser-lever 45 is in a depressing-state (Fig. 3). The space between each lug 41 and the forked portion of each arm 34, above mentioned, permits the depressing action of the several auxiliary levers 49 and 50 the distance of such space, which is sufficient for the purpose named in connection with the particular spots or places on the floor-surface to be dressed without otherwise affecting the other parts of the floor-surface. The reaction of the several springs 38, after the several auxiliary levers 49 and 50 are used, returns the latter to their normal positions, at rest, as best seen in Fig. 3.

In Fig. 7 we have shown an auxiliary narrow sand-wheel 51 for use in reaching the border or edges of a floor-surface adjacent the wall or base-board where the main sand-drums 22 and 23 cannot reach, the journaling and supporting parts of the frame otherwise preventing. This narrow wheel 51 has an abrading-surface and is provided with a central lateral arm or axle 52 having a screw-threaded inner end to engage the threaded inner end of a socket made in the outer end of each of the fore and rear sand-drum shafts 27 for ready adjustment. The said screw-threads are made the reverse of the direction of rotation of the sand-drums so that the narrow sand-wheel 51 will not become displaced in operation. The narrow wheel 51 is of greater diameter than the sand-drums, the latter being raised from the floor-surface when the former are being used, as it is not intended that both should ordinarily operate together in dressing a floor-surface. The narrow sand-wheel 51 is readily attached as occasion requires and detached when it is desired to use the sand-drums.

52, 52, represent pairs of bumpers at the opposite ends of the machine for preventing injury to the machine or surrounding objects, or to the wall of the room in the operation of the device.

We claim:—

1. A floor-surfacer comprising a propulsion-supported frame, an abrading-drum journaled in bearings sliding vertically in the frame, a T-shape foot-treadle pivoted intermediate its ends to the frame and having an upright pivotal presser-lever at one end and an upright pivotal releasing-lever at its other end, a horizontal rod pivotally-connected to the pendent portion of the foot-treadle, a transverse rock-shaft journaled at its opposite ends in the frame, a bell-crank lever mounted on the rock-shaft and pivotally connected at one end to the rod and at its other end pivotally engaging one of the vertically-sliding bearings of the abrading-drum and an arm on said rock-shaft pivotally-engaging the other sliding bearing of the abrading-drum.

2. A floor-surfacer comprising a frame, an abrading-drum journaled in vertically-sliding bearings at opposite ends of the frame, a transverse rock-shaft at the opposite ends of the frame adjacent the vertically-sliding drum-bearings, bell-crank levers rigidly attached to said rock-shafts adjacent said vertically-sliding drum-bearings at one side of the machine, independent horizontal arms or levers rigidly attached to said shafts adjacent the drum-bearings at the other side of the machine, a longitudinal rod or coupling-bar pivotally connected at its opposite ends to the pendent arms of said bell-crank levers, means at the outer ends of the other arms of said bell-crank levers and, also, on the said horizontal arms for pivotally connecting them with the vertically-sliding drum-bearings, a T-shape foot-treadle pivotally-mounted on the frame and pivotally-connected at its lower slotted end to said rod, a pivotal vertical presser-lever at one end of the horizontal portion of the foot treadle, a pivotal, vertical drum-raising or friction releasing lever at the opposite end of the foot-treadle, means for supporting and propelling the machine, and means for steering or guiding the machine over the surface to be dressed and finished.

3. A floor-surfacing machine comprising a propulsion-supported frame, steering means, abrading-drums mounted on vertically-sliding bearings at the opposite ends of said frame, a longitudinal rod, transverse rock-shafts at the opposite ends of the frame, bell-crank levers rigidly-mounted on said rock-shafts adjacent the said vertically-sliding bearings at one side of the machine, each bell-crank having pivotal-connection at one end with an end of the said rod, horizontal arms or levers rigidly mounted on the rock-shafts adjacent the bearings at the other side of the machine, horizontal arms loosely-mounted on the rock-shafts adjacent and parallel to the other arms of the bell-crank levers and to said horizontal levers, means for uniting said bell-cranks and horizontal levers through said loosely-mounted arms with the vertically-sliding drum-bearings so that all the latter shall act in unison, elastic means intermediate the bell-cranks and horizontal arms and the drum-bearings, means mounted on the frame and connected with the rod for actuating the latter in the operation of raising and depressing said abrading-drums, and means for actuating the abrading-drums.

4. A floor-surfacing machine comprising a propulsion-supported frame, abrading-drums mounted in vertically-sliding universal-bearings at opposite ends of the frame, elastic means in said bearings, transverse rock shafts at opposite ends of the frame adjacent the drums, bell-crank levers rigid on said rock shafts adjacent the vertically-sliding drum-bearings at one side of the machine, a longitudinal rod connecting the pendent or downwardly-projecting arms of said bell-cranks, horizontal levers rigid on the shaft adjacent the drum-bearings at the other side of the machine, means on the frame for moving said rod so that the bell-cranks, horizontal levers and said shafts operate in unison, loosely-mounted levers on said shafts adjacent said bell-cranks and horizontal levers and having lateral lugs at one side engaging forks in both the horizontal arms of the bell-cranks and in said horizontal levers, and lateral pins at the other side engaging springs in the vertically-sliding drum-bearings, and suitable levers, one at each corner of the machine adjacent a bell-crank arm and horizontal-lever, for independently depressing the respective opposite ends of each of the two abrading-drums against the pressure of said springs.

Signed at Cincinnati, Ohio, this 25th day of December, 1906.

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Witnesses:
JOHN ELIAS JONES,
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