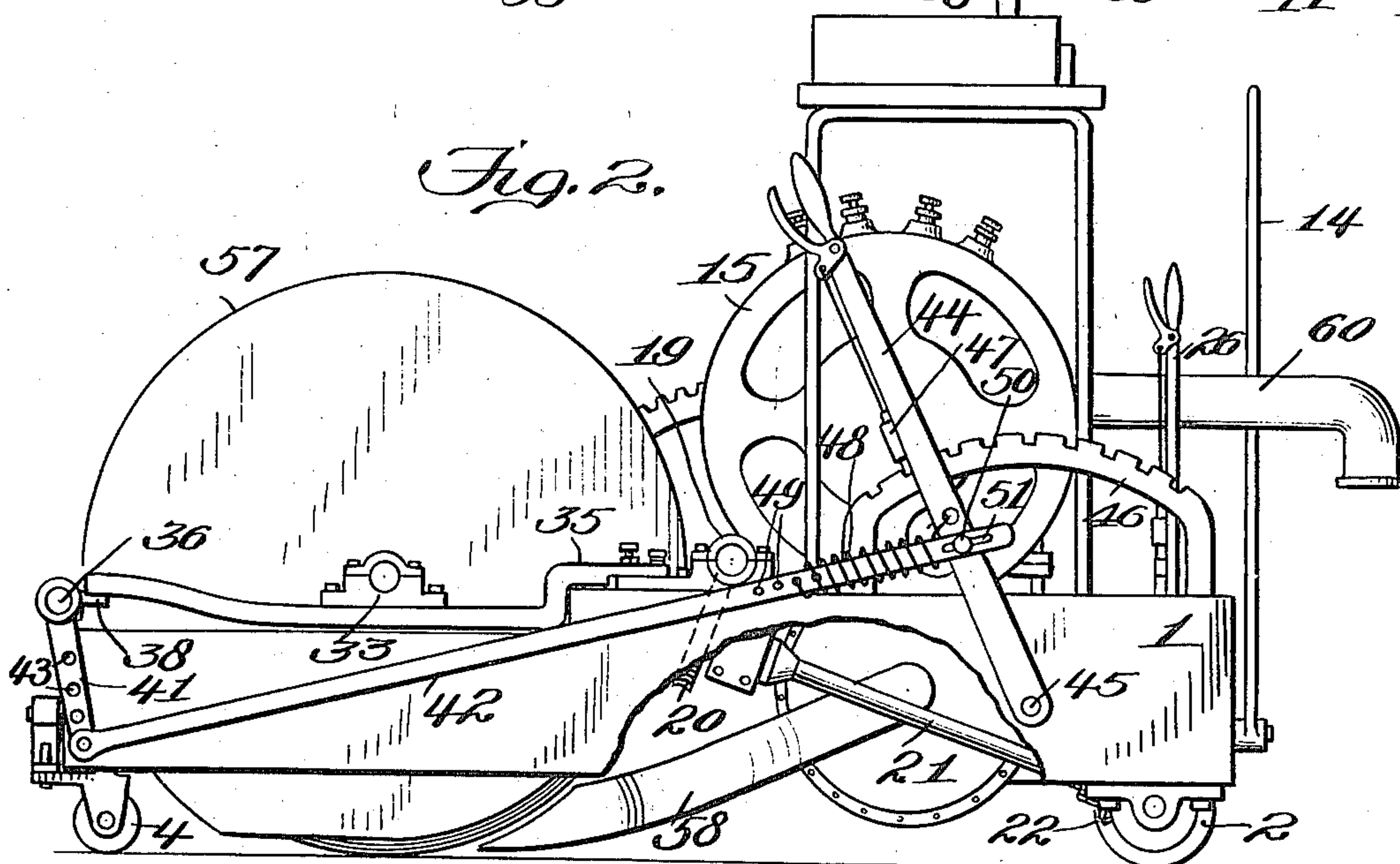
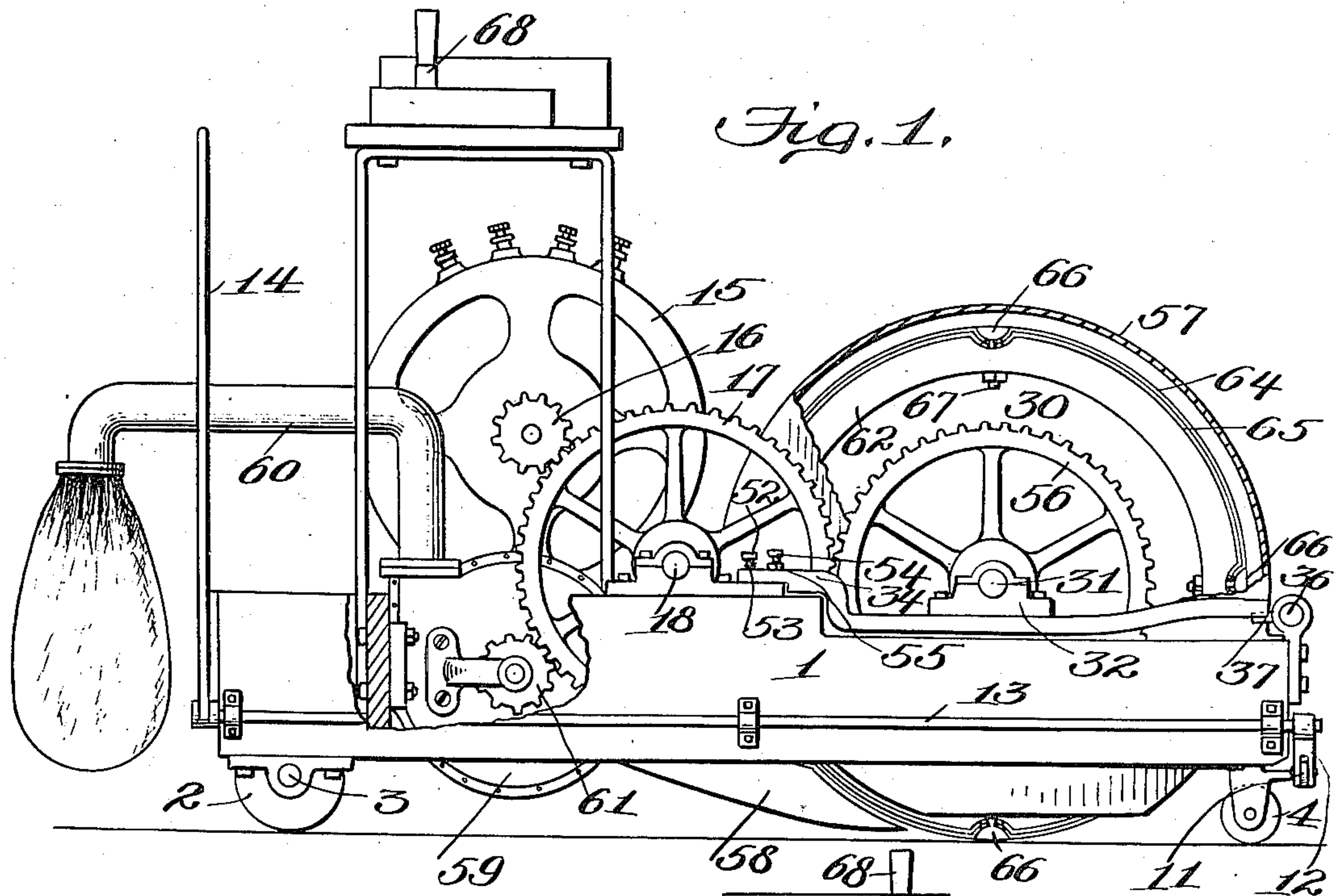


976,040.

3 SHEETS—SHEET 1.



Witnesses:

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*[Handwritten signature]*

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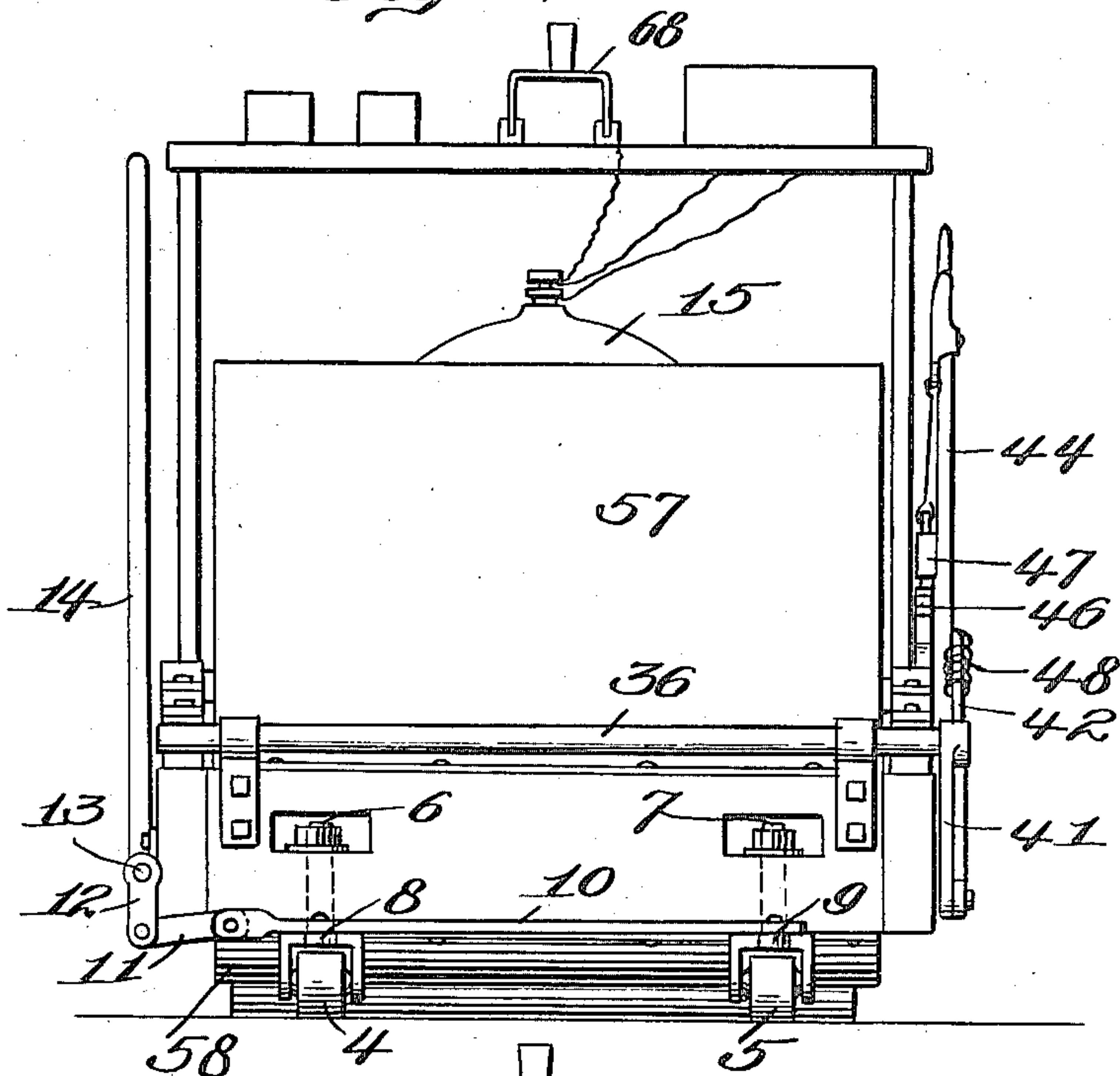
W. O. CANFIELD.  
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APPLICATION FILED APR. 29, 1908.

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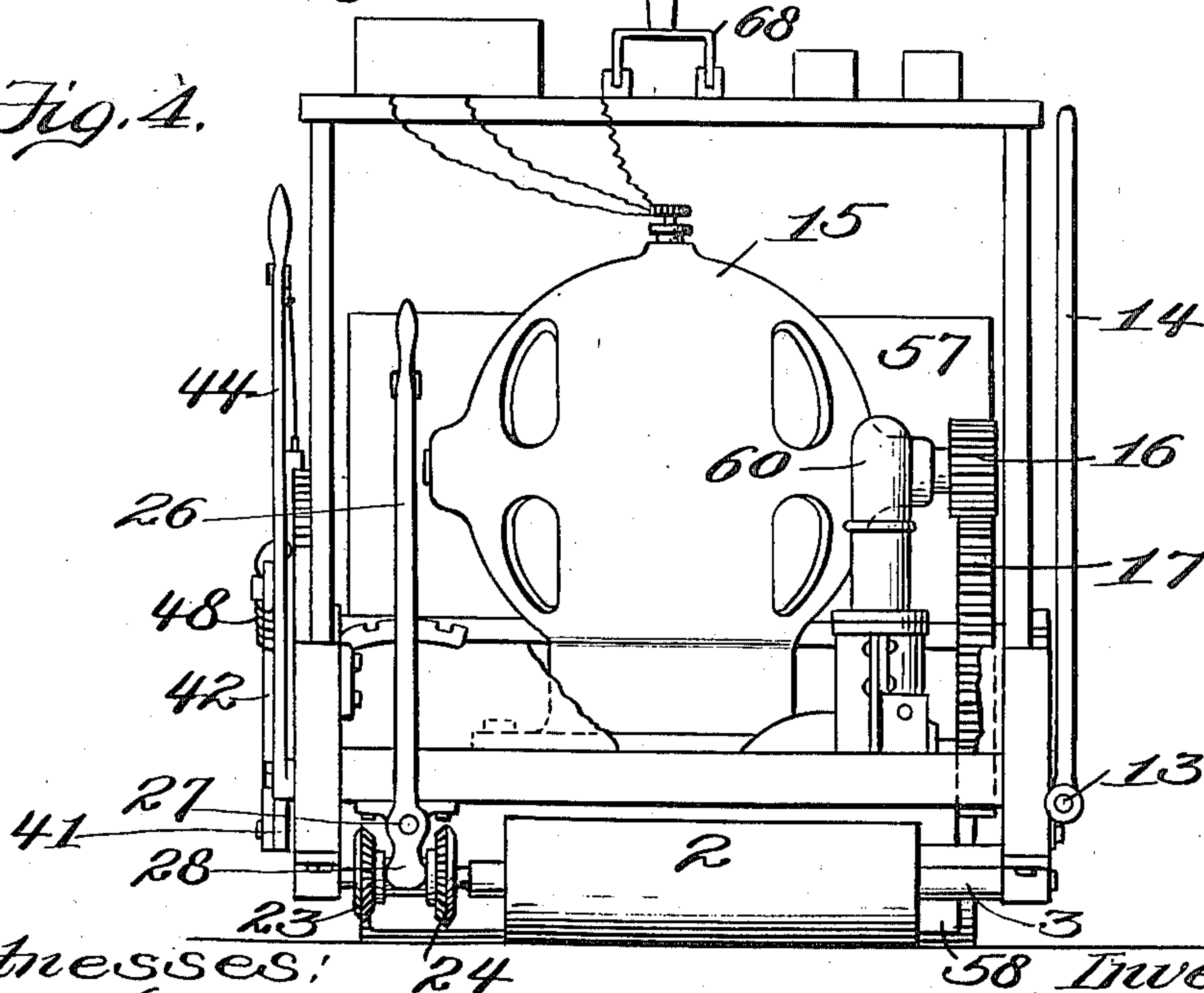
Patented Nov. 15, 1910.

3 SHEETS—SHEET 2.

*Fig. 3.*



*Fig. 4.*



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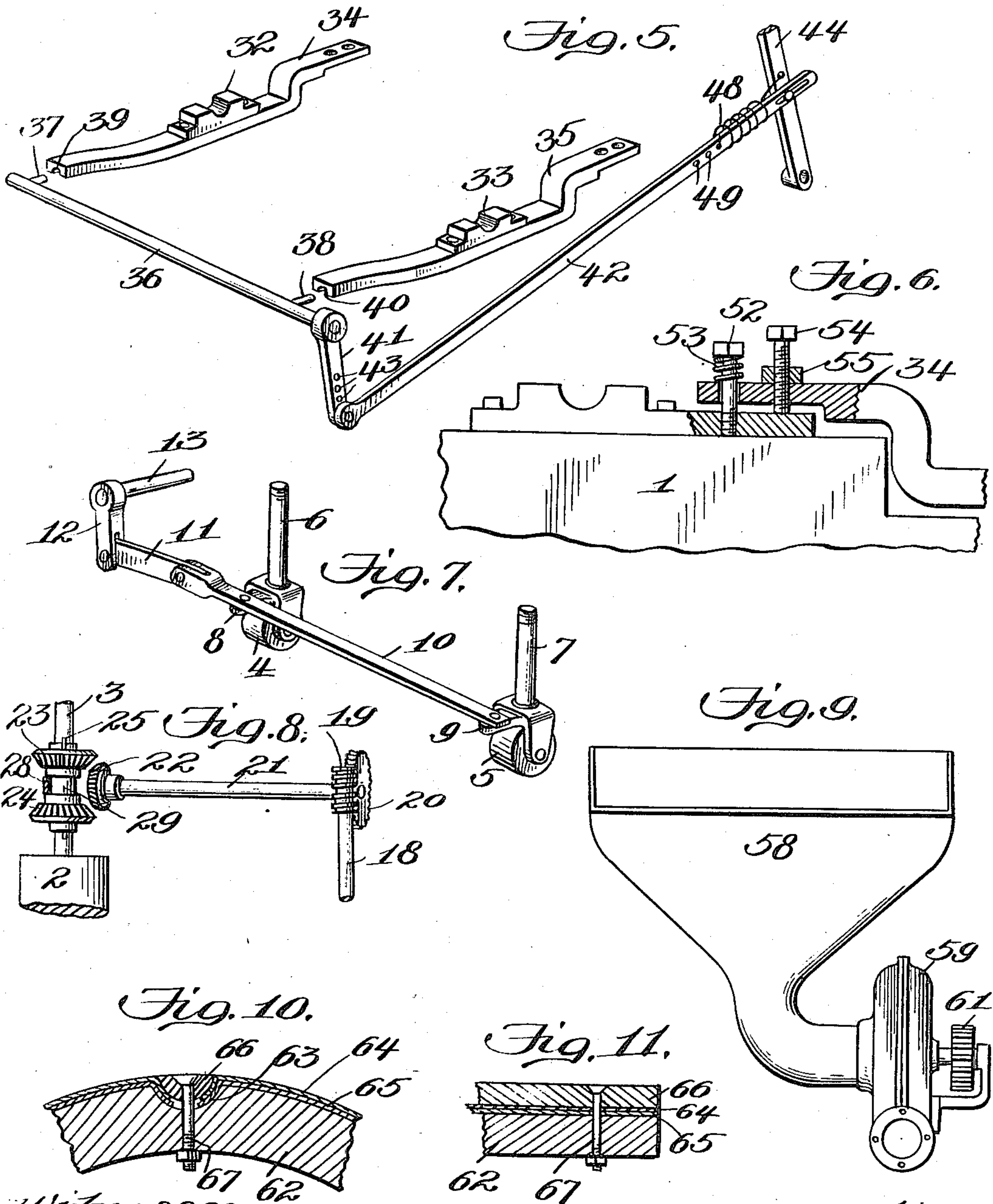


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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM OWEN CANFIELD, OF CHATTANOOGA, TENNESSEE.

## FLOOR FINISHING AND POLISHING MACHINE.

976,040.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed April 29, 1908. Serial No. 429,959.

*To all whom it may concern:*

Be it known that I, WILLIAM O. CANFIELD, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented new and useful Improvements in Floor Finishing and Polishing Machines, of which the following is a specification.

My present invention relates to improvements in machines for finishing and polishing wooden floors, and it has for its object primarily to provide an improved machine of this character having an abrasive roller provided with novel means for elevating and lowering it relatively to the surface of the floor, said elevating and lowering means being provided with leveling or adjusting devices whereby either end of the abrasive roller may be raised or lowered in order to secure a proper bearing of the periphery of the roller against the floor.

Another object of the invention is to provide an abrasive roller of this character having means for counterbalancing the weight thereof in order that the pressure of the roller against the floor may be conveniently and accurately adjusted by the operator.

Further objects of the invention are to provide a self-propelled finishing and polishing machine of this character having novel means for driving the same, and also to equip the machine with a casing which substantially incloses the abrasive roller and is provided with means for collecting the particles of sand and wood, an exhaust fan being provided for taking up these particles and conveying them to a suitable dust-collecting device.

To these and other ends, the invention consists in certain improvements, and combinations and arrangements of parts, all as will be hereinafter more fully described, the novel features being pointed out particularly in the claims at the end of the specification.

In the accompanying drawing: Figure 1 represents a side elevation of a floor finishing and polishing machine constructed in accordance with my present invention; Fig. 2 represents an elevation of the opposite side of the machine; Figs. 3 and 4 are end elevations of the opposite ends of the machine; Fig. 5 is a perspective view of the mechanism for elevating and lowering the abrasive roller and for counterbalancing the weight thereof; Fig. 6 is a detail view of novel

means for leveling or adjusting the ends of the roller with respect to the floor; Fig. 7 is a perspective view of the steering casters and the operating devices connected thereto; Fig. 8 is a detail view of a portion of the propelling or driving and reversing mechanism; Fig. 9 is a detail view of the dust-collecting hood and the exhaust fan therefor; and Figs. 10 and 11 are detail sectional views showing the means for fastening the sand paper or other abrasive material to the periphery of the abrasive roller.

Similar parts are designated by the same reference characters in the several views.

Finishing and polishing machines constructed in accordance with my present invention are applicable generally for use in dressing, finishing or polishing flat surfaces and floors of various kinds, and it will be understood that certain modifications may be made in the detail construction thereof, and the abrasive materials used upon the roller may be varied according to the work to be performed, the machine shown in the present embodiment of the invention being especially adapted for use in the finishing and polishing of hard wood floors.

In the present instance, the machine comprises a carriage or frame 1 of suitable construction which is supported at one end by a driving roller 2 mounted on a transverse shaft 3 journaled in suitable bearings at the under side of the frame, and the opposite end of the machine is supported by a pair of turnable casters 4 and 5, the latter having vertical stems 6 and 7 which are suitably journaled in bearings on the frame, and the casters are provided with steering arms 8 and 9 which are pivotally connected to the steering rod 10. One end of the latter is connected by a link 11 to a crank 12 arranged on one end of a rock shaft 13, the latter being journaled in suitable bearings at one side of the machine as shown in Fig. 1 and is provided with an upright lever 14 which may be tilted in the appropriate direction by the operator to direct the course of the machine.

The machine in the present instance is self-propelled, it carrying a motor 15, an electric motor being generally preferable by reason of its flexible and convenient power connections, and this motor is provided with a pinion 16 on its shaft which coöperates with a gear 17 mounted on a shaft 18 journaled on the frame, the said shaft being



provided with a worm 19 which coöperates with a worm wheel 20. This worm wheel is fixed to a longitudinal inclined shaft 21 which is supported in suitable bearings on the frame and carries a bevel pinion 22 at its lower end which is adapted to mesh alternately with a pair of reversely arranged bevel wheels 23 and 24. These bevel wheels are slidable axially of the shaft 3 of the driving roller, and a key 25 serves to rotatably connect these bevel wheels with the shaft. These bevel wheels are shifted axially of the shaft by means of a reversing lever 26 which is fulcrumed on the machine frame at 27 and is provided with a forked end 28 which engages a circumferential groove 29 formed in a part carrying the two bevel wheels. Obviously, by tilting the lever 26 in one direction, the bevel wheel 23 is operatively connected to the driving pinion 22 and rotation of the shaft 18 will serve to drive the roller 2 in one direction, and a tilting of the lever 26 in an opposite direction will disengage the bevel wheel 23 and engage the bevel wheel 24 with the driving pinion 22, and the driving roller 2 will then be rotated in a reverse direction. In this manner the movement of the machine across the floor in either direction may be readily controlled.

The abrading roller or cylinder 30 is mounted on a shaft 31, the latter being journaled at its opposite ends in a pair of journal boxes 32 and 33, and in order to provide for a vertical movement of the roller, these journal boxes are supported on a pair of roller supporting arms 34 and 35. These arms preferably rest above the machine frame and are adapted to be lifted at their rear ends by means of a rock shaft 36, the latter being journaled in suitable bearings on the frame and is provided with a pair of similarly arranged radial projections 37 and 38 which engage in recesses 39 and 40 formed in the under sides of the respective arms. The rock shaft is provided at one end with a crank 41 to which is pivotally attached an operating rod 42, the crank being preferably provided with a set of radially spaced bolt openings 43 in order to enable the rod to be adjustably connected thereto. The opposite end of the rod 42 is adapted to be operated by a lever 44 which is pivoted at 45 to the machine frame and is provided preferably with a notched sector 46 with which a hand-released dog 47 is adapted to engage so as to lock the lever in different adjusted positions.

In order to facilitate the lifting and lowering of the abrading roller and to secure the proper pressure thereof upon the floor, the weight of this roller is substantially counterbalanced by means of a spring 48, this spring in the present instance being of helical form and surrounding a portion of

the rod 42, one end of the spring being attached to the lever 44 and the opposite end being inserted in one of the openings 49 spaced longitudinally of the rod 42, the rod 42 being guided and connected to the lever so as to permit limited relative movement between these parts by means of a pin 50 on one of the parts, preferably the lever, which operates in a longitudinal slot 51 in the rod. By inserting the respective end of the spring in the appropriate aperture 49 in the rod, the tension of the spring may be adjusted so as to counterbalance to the desired degree the weight of the abrading roller.

In some cases, the periphery of the roller may wear to a greater extent toward one end than at the other and, in order to maintain all surfaces of the roller in proper engagement with the floor, novel means are provided for leveling or adjusting the roller supporting arms. In the present instance, the inner ends of these arms are apertured to receive guiding bolts 52 which are screwed into a relatively fixed part of the machine frame and helical compression springs or washers 53 are interposed between the upper sides of the respective arms and the heads of these bolts, the normal action of these springs tending to depress the roller supporting arms. The downward movement of these arms, however, is limited by a pair of set screws 54 which are tapped into the respective arms so as to permit them to be adjusted so as to space the roller supporting arms at the proper elevation. Lock nuts 55 are preferably provided for securing these adjusting screws in adjusted position. Obviously, by providing these adjusting devices at the inner ends of the roller supporting arms, it is possible to adjust the ends of the roller independently and without disturbing the connection between these arms and the rock shaft which serves to raise and lower the roller. The roller is rotated by means of a gear wheel 56 which is fixed to the shaft thereof and coöperates with the gear 17, previously described.

In order to render the operation of the machine dustless, it is generally preferable to substantially inclose the roller with a thin metal casing 57 which covers the upper portion and sides thereof, the lower portion of this casing being of course open in proximity to the floor in order to enable the roller to engage it, and the casing may be suitably constructed in sections so as to permit removal thereof in order to render the roller accessible for examination or recovering. A collecting scoop 58 is mounted on the machine frame at the proper side of the roller to receive the particles of sand and wood removed from the floor, this scoop having an elongated narrow mouth of a width corresponding to the length of the roller, and a pipe leads from this scoop to



an exhaust fan 59, the latter being provided with a discharge pipe 60 which leads to a fabric or other bag which is capable of retaining the particles of dust, although permitting the air to escape through the meshes thereof. This exhaust fan is preferably provided with a pinion 61 which meshes with the gear 17 so that it is driven continuously during the operation of the machine.

Any suitable abrasive medium may be provided for the periphery of the abrading roller, the latter in the present instance, being provided with a wooden rim 62 having one or more longitudinally extending grooves 63 in its periphery, and a sheet of sand paper or other abrasive material 64 may be applied to the periphery of the roller, or against a strip of carpet or other resilient material 65 which serves as a backing therefor, and the ends of the sand paper or backing are introduced into the groove 63, and a correspondingly shaped clamping bar 66 is applied to the groove and drawn into locked position by means of a bolt 67, this clamping bar of course lying below the periphery of the sand paper in order to prevent contact thereof with the floor surface. Such a clamping device enables the sand paper or other abrasive material to be readily renewed when necessary.

In operating a floor finishing and polishing machine constructed in accordance with the present embodiment of my invention, the flexible electric conductors are led across the floor or from the ceiling to a suitable controlling switch 68 through which the current is supplied to the motor, suitable fuse boxes and rheostats being provided for starting and controlling the speed of the motor as usual. The movement of the motor is transmitted through the gears 17 and 30 to the abrading roller, causing the latter to rotate, and at the same time the pinion 61 on the exhaust fan is driven from the gear 17 and serves to draw the dust into the scoop 58 and finally into the collecting receptacle. The worm 19 is also driven by the shaft 18, and the operator by shifting the lever 26 may engage either of the bevel wheels 23 and 24 with the pinion 22 and thus cause the machine to travel over the floor in the desired direction, and the course of the machine may be controlled by manipulation of the lever 14 which is connected to the pivoted casters. Normally the weight of the abrading roller is substantially sustained by the spring 48, but by releasing the dog 47 on the lever 44 and shifting the latter across the notched sector 46, the shaft 36 is rotated, the pins 37 and 38 thereon serving to elevate or depress the roller supporting arms, the dog 47 cooperating with the sector to lock the roller operating lever in the desired adjusted position. The periphery of the roller may be accurately ad-

justed into a position in parallelism with the surface of the floor by loosening the lock nuts 55 and suitably adjusting the set screws 54.

I claim as my invention:—

1. A machine of the class described comprising a portable carriage, an abrading roller, a pair of arms movable vertically with respect to the carriage and supporting said roller at points intermediate their ends, and adjustable fulcrums supporting the ends of said arms at one side of said roller for altering the elevation of said arms to adjust the roller with respect to the floor. 70 75

2. A machine of the class described comprising a portable carriage, an abrading roller, a pair of arms movable vertically with respect to the carriage and revolvably supporting said roller, adjustable fulcrums for said arms and a rock shaft mounted on the carriage and having projections cooperating with the respective arms at points thereon removed from said fulcrums for moving the arms vertically. 80 85

3. A machine of the class described comprising a portable carriage, an abrading roller, a pair of arms movable vertically with respect to the carriage and supporting said roller, the ends of said arms being provided on their under sides with recesses, and a rock shaft mounted on the carriage and having a pair of radial pins engaging in the recesses of said arms for varying the vertical elevation thereof. 90 95

4. A machine of the class described comprising a carriage, an abrading roller mounted for vertical movement on the carriage, and means for exerting yieldable force in a direction to counterbalance the weight of said roller. 100 105

5. A machine of the class described comprising a carriage, an abrading roller mounted for vertical movement thereon, means normally acting yieldingly to counterbalance the weight of said roller, and devices for varying the vertical elevation of the roller with respect to the carriage without varying the counterbalance of the roller. 110

6. A machine of the class described comprising a carriage, an abrading roller guided for vertical adjustment thereon, devices connected to the roller for adjusting the latter vertically and having means for locking it in adjusted position, and a spring connected between the locking means and the roller and normally acting to counterbalance the weight thereof. 115 120

7. A machine of the class described comprising a carriage, an abrading roller, a pair of arms movable vertically with respect to the carriage and supporting the roller, a rock shaft cooperating with said arms to elevate or depress them, a rod for rotating said shaft, a lever capable of a limited movement relatively to said rod, and a spring 125 130



having its ends connected respectively to said lever and rod and normally acting to counterbalance the weight of the roller.

8. A machine of the class described comprising a carriage, an abrading roller mounted thereon, and means cooperative with relatively fixed parts of the carriage for independently adjusting the elevation of either end of the roller with respect to the floor.

9. A machine of the class described comprising a carriage, an abrading roller, a pair of arms movable vertically with respect to the carriage and supporting said roller at points intermediate their ends, and independently operable devices on the corresponding ends of said arm for varying the elevation thereof with respect to the carriage.

10. A machine of the class described comprising a carriage, an abrading roller, a pair of arms movable vertically with respect to the carriage and supporting said roller, devices for permitting vertical movement of the corresponding ends of said arms, adjustable devices for limiting the movement of said arms toward the carriage, and means for normally holding said limiting means in engagement with the carriage.

11. A machine of the class described comprising a carriage, an abrading roller, a pair of arms movable vertically with respect to the carriage, a pair of bolts for guiding the corresponding ends of said arms vertically on the carriage, springs connected to said bolts and normally tending to depress the corresponding ends of the arms, and set

screws threaded in the arms and cooperating with the carriage to limit the relative movement between the latter and said arms.

12. A machine of the class described comprising a portable carriage, an abrading roller, a pair of arms having means at their outer ends for elevating and depressing them, and independently operable devices at the opposite ends of said arms for individually adjusting the elevation of the respective arms, the abrading roller being supported at its ends on said arms.

13. A machine of the class described comprising a portable carriage provided with a driving roller, an abrading roller mounted on the carriage and provided with a driving gear, a motor mounted on the carriage, a gear operatively connected to the motor and meshing with the gear on the abrading roller, an exhaust fan having a pinion meshing with the gear connected to the motor, the latter gear having a shaft provided with a worm, a longitudinal driving shaft having a worm wheel cooperating with said worm and provided with a driving pinion, and a pair of reversely arranged gears operatively connected to the driving roller and shiftable axially of the latter to alternately engage the driving pinion to move the carriage in reverse directions.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM OWEN CANFIELD.

Witnesses:

JOHN B. LEE,

W. A. LEE.