907,058.

A. KRAEMER & A. CHILD.

FLOOR DRESSING MACHINE.

APPLICATION FILED JUNE 20, 1905.

Patented Dec. 15, 1908.

3 SHEETS—SHEET 1.

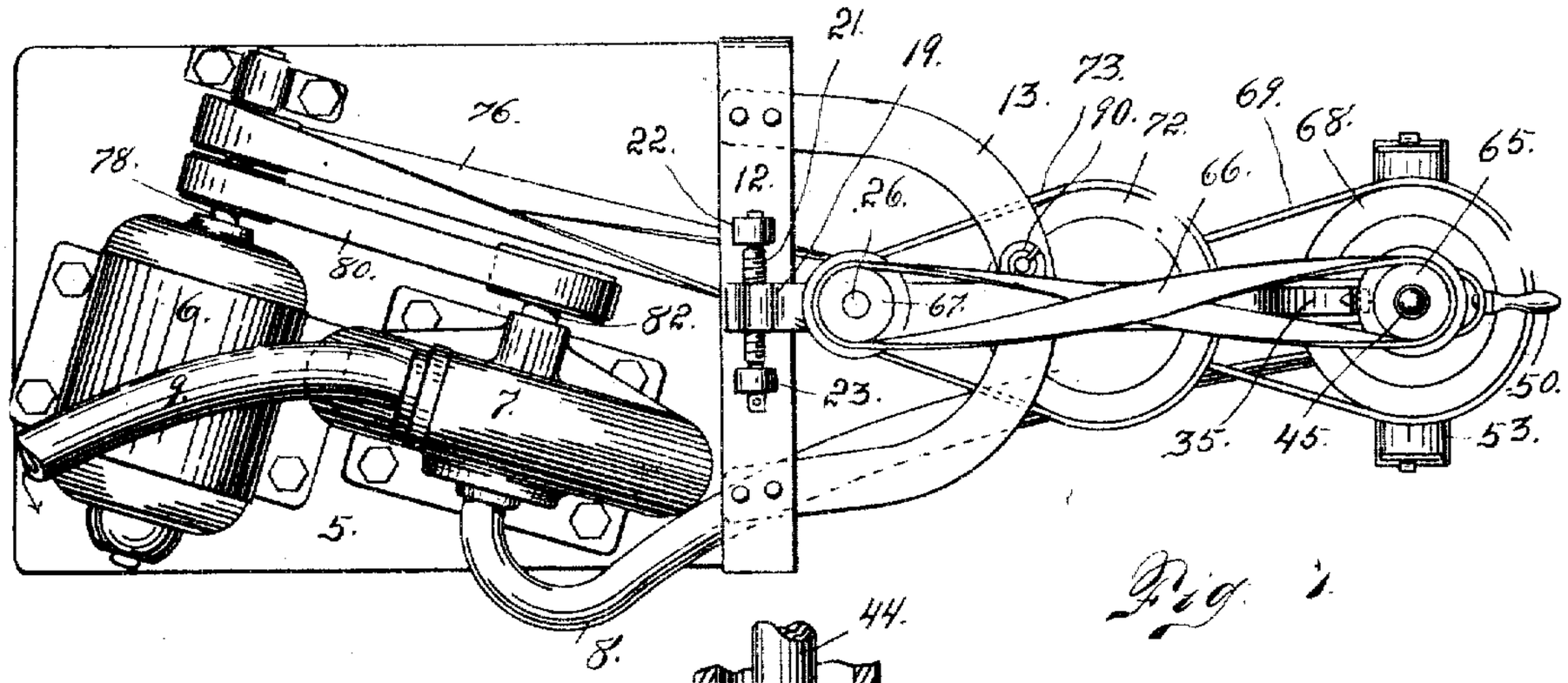

Fig. 1.

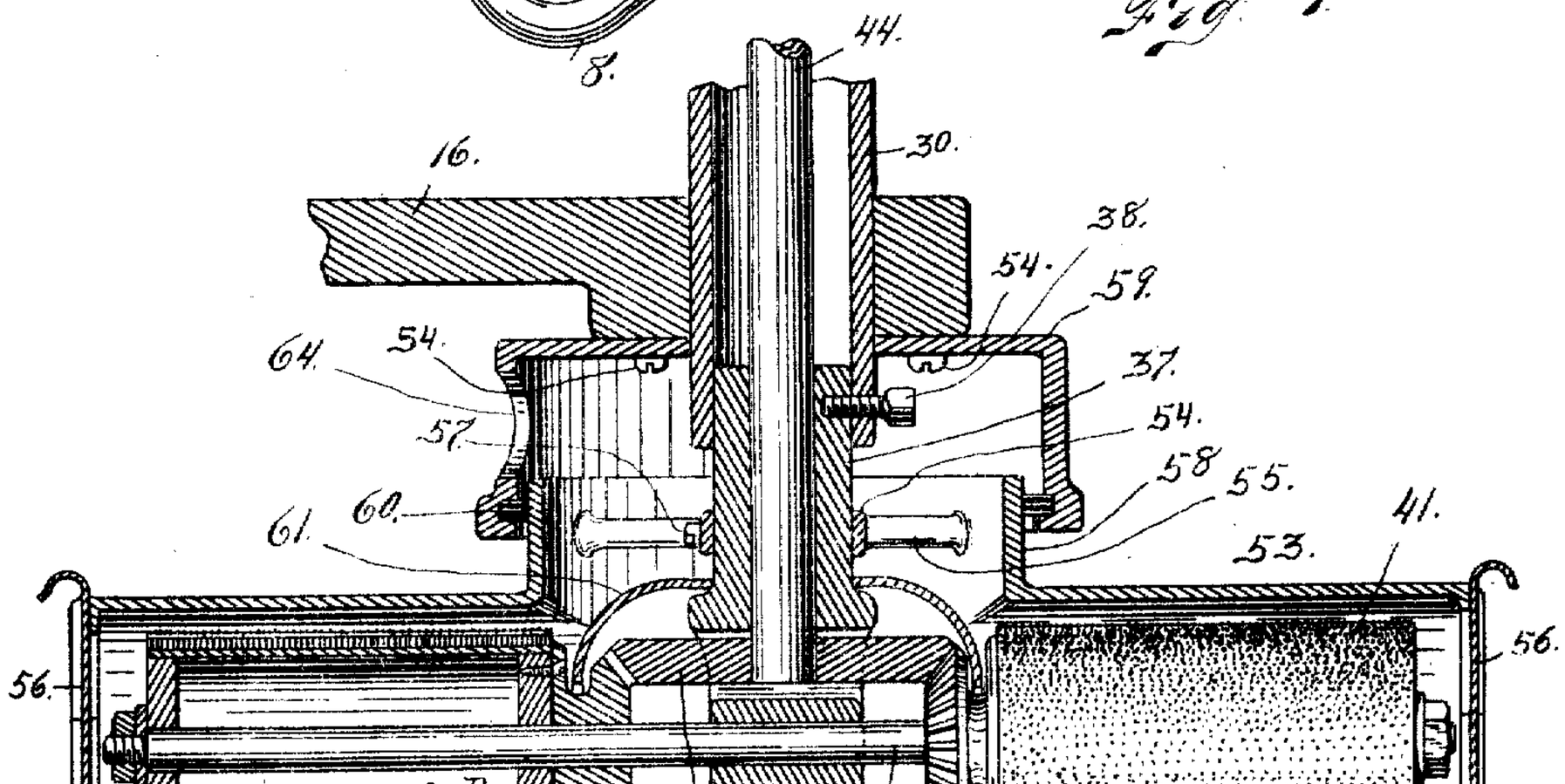

Fig. 4.

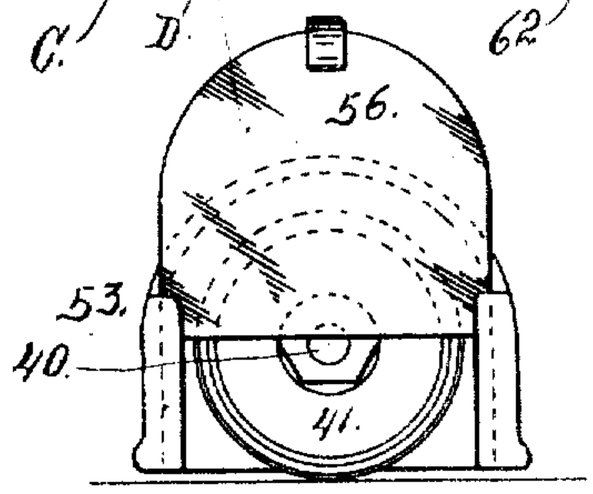

Fig. 5

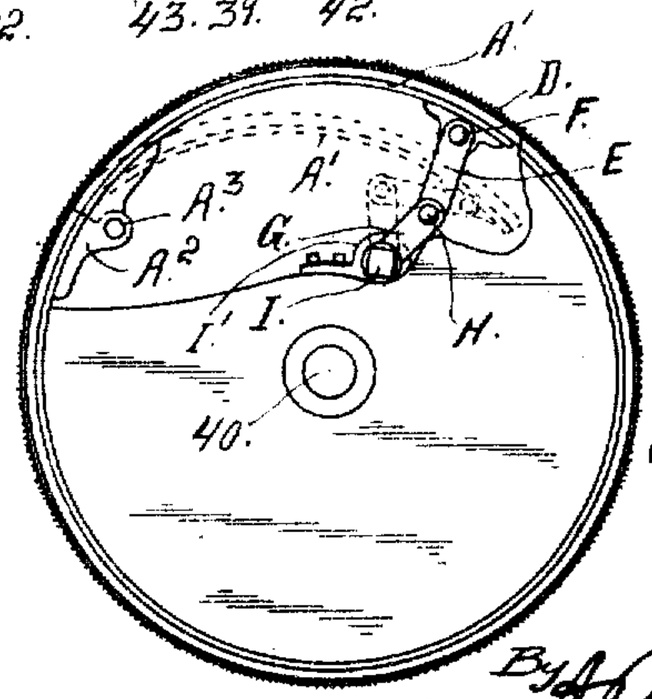

Fig. 6.

Witnesses

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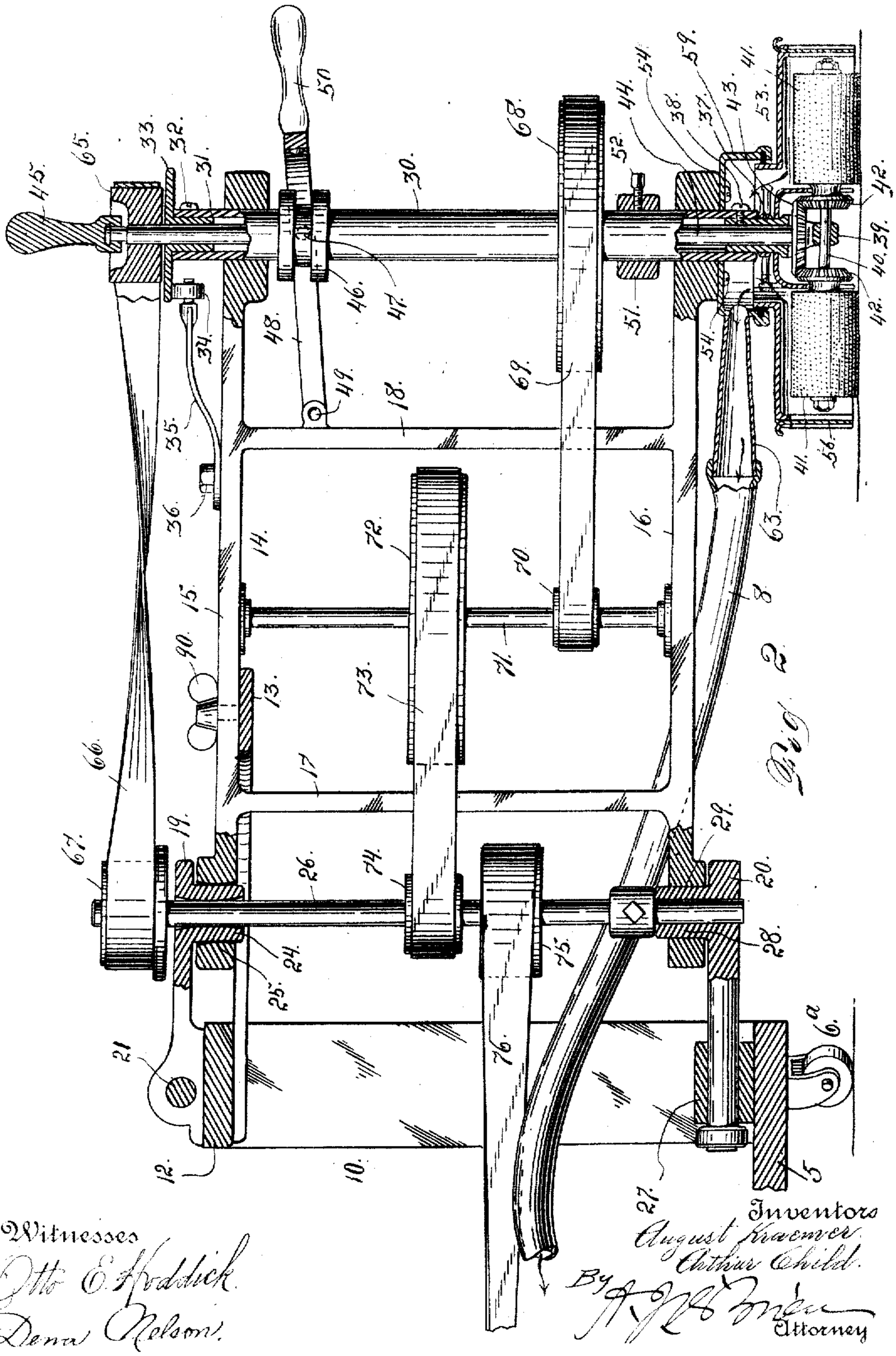

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3 SHEETS—SHEET 3.

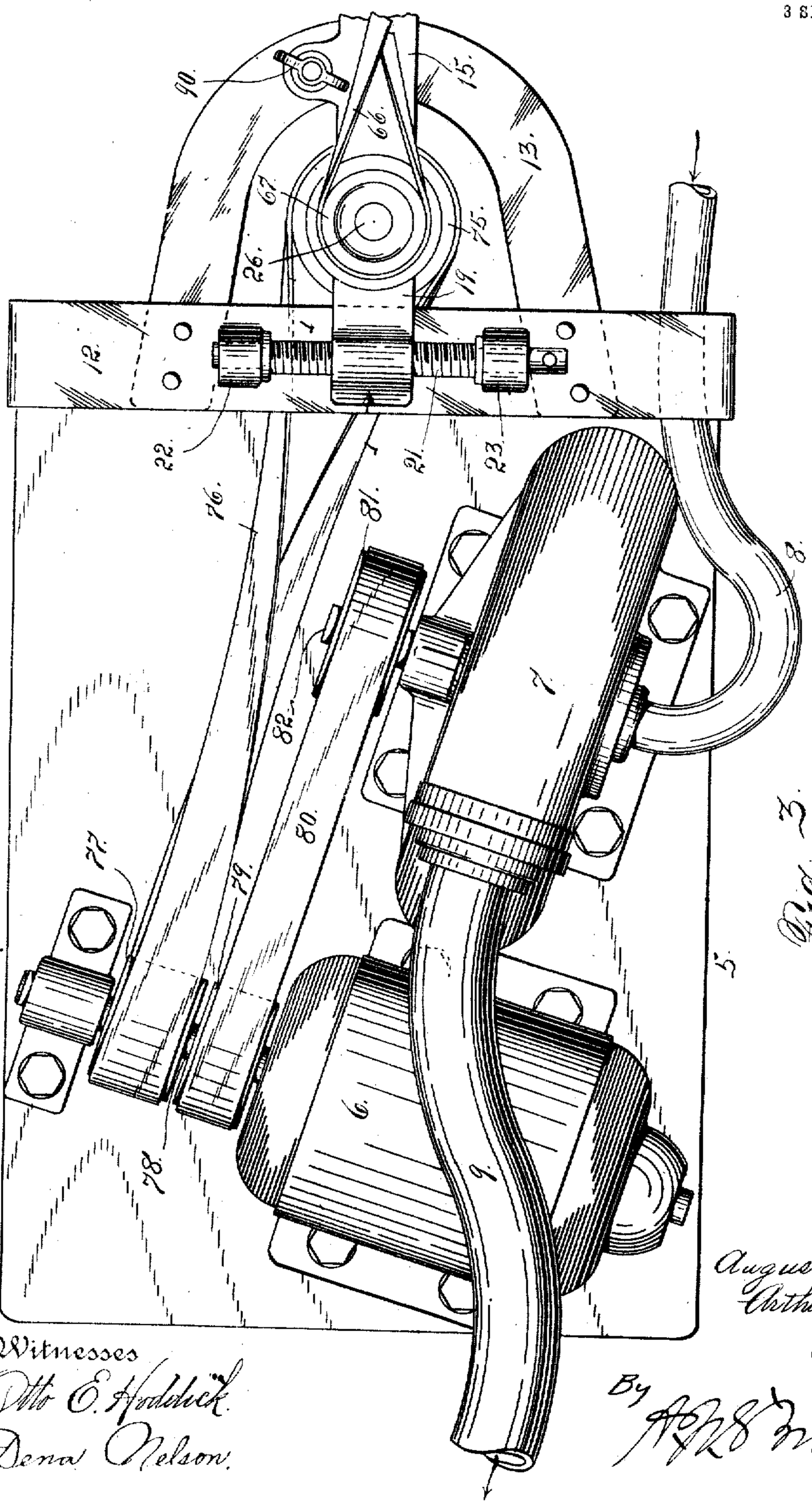

Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE

AUGUST KRAEMER AND ARTHUR CHILD, OF DENVER, COLORADO; SAID KRAEMER ASSIGNOR TO SAID CHILD.

FLOOR-DRESSING MACHINE.

No. 907,058. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed June 20, 1905. Serial No. 266,127.

To all whom it may concern:

Be it known that we, AUGUST KRAEMER and ARTHUR CHILD, both citizens of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Floor-Dressing Machines; and we do 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 the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to machines for smoothing, dressing and polishing floors or other surfaces where a machine of this nature is required.

In the form or embodiment of the invention illustrated in the drawing and hereinafter described, it consists of a platform mounted upon wheels or casters, with which platform is connected a swinging arm or frame. Upon the movable platform, is mounted a motor; while upon the swinging arm are mounted two upwardly projecting rotary shafts both of which are operated from the motor and independently of each other, the said shafts being rotated in reverse directions. With the lower extremity of one of these shafts is connected a gear which meshes with gears diametrically located and fast on rollers covered with an abrading, smoothing or polishing substance as sand paper or any other suitable or desirable material. The other shaft is connected with the central portion of the axle upon which the abrading or smoothing rollers are loosely mounted, whereby as the last named shaft is rotated, the roller axle is moved in a plane parallel with its own axis, thus giving the abrading rollers an orbital travel independently of their rotation on their individual axes; the orbital travel of the rollers is also opposed to their rotary action, thus increasing the friction between the rollers and the surface upon which they act.

We prefer to employ an electric motor but it is evident that any suitable motor may be employed. The abrading rollers or bodies are inclosed except at the bottom, by a housing with whose upper portion is connected a suction pipe communicating with a blower for removing the dust or material resulting from the abrading action of the rollers upon the surfaces to be dressed.

The rotary shafts for imparting the necessary movement to the abrading rollers, are vertically movable within sufficient limits to permit the rollers to be readily raised above the surface or lowered to engagement therewith as may be desired. For convenience the two shafts are normally spring-supported in such position as to cause the abrading rollers to rest a short distance above the surface upon which the machine stands. Then by a slight downward pressure exerted by the operator, the abrading rollers are brought into engagement with the surface to be operated upon.

Having briefly outlined our improved construction as well as the function it is intended to perform, we will proceed to describe the same in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a top or plan view of our improved device shown complete. Fig. 2 is a side elevation partly in section of the portion of the machine carrying the swinging arm upon which the abrading rollers are mounted, the parts being shown on a larger scale. Fig. 3 is a top view of the movable platform or truck, the swinging arm carrying the smoothing, abrading or dressing mechanism being broken away. This view is shown on a larger scale than in Fig. 1 but is supposed to harmonize in scale with Fig. 2. Fig. 4 is an enlarged vertical section taken through the housing inclosing the abrading rollers, one of the latter being also shown in section, and the other in elevation. Fig. 5 is an end view of the housing inclosing an abrading roller, showing the vertically sliding door or gate partly raised. Fig. 6 is an end view of one of the abrading rollers shown in detail and on a larger scale, the head of the roller being partly broken away to disclose the means for tightening the abrading material on the body of the roller.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a platform mounted on casters or rollers 6ª or in any other suitable manner to allow the device to be readily moved about. Upon this platform is secured a motor 6 (preferably an electric motor). Also mounted on this plat-

form and secured thereto is a blower or suction fan 7 to which leads an inlet conduit 8 and with which is also connected an outlet conduit 9. Upon what we will term the forward extremity of this platform, is mounted an upright frame 10 having a transverse piece 12 at the top. To this transverse piece is attached a forwardly projecting segmental plate 13, forming the support for the swinging frame 14 composed of upper and lower bars 15 and 16, connected by upright parts 17 and 18.

The rear extremities of the bars 15 and 16 are hinged to upper and lower parts 19 and 20. The part 19 consists of an arm whose forward extremity is threaded and engages a screw 21 journaled in bearings 22 and 23 mounted on the transverse part 12 of the portable platform. The forward extremity of the arm 19 is provided with a depending sleeve 24 passing through an opening 25 formed in the rear extremity of the arm 15, whereby the said arm is mounted to swing on the sleeve. In this sleeve is journaled the upper part of a vertically disposed shaft 26. The part 20 consists of a spindle journaled in a bearing 27 mounted on the forward extremity of the platform 5. This spindle is provided with an upwardly projecting sleeve 28 in which the lower extremity of the shaft 26 fits and is journaled. The sleeve 28 passes through an opening 29 formed in the rear extremity of the arm 16 whereby the said arm is allowed to swing freely on the sleeve.

By virtue of the connection of the arms 15 and 16 with the sleeves 24 and 28 of the parts 19 and 20, it is evident that the frame 14 may be swung at will around the axis of the shaft 26 as a center. If it is desired to tilt this frame 14 or cause it to occupy a plane inclined to the vertical, it is only necessary to turn the screw 21 by inserting a pin (not shown) in the apertured extremity of the screw in the ordinary manner. This will cause the arm 19 to move in the one direction or the other on the part 12 and as the sleeve 24 enters the arm 15 of the frame 14, this lateral movement will tilt the frame 14 from the vertical position in the one direction or the other, since the spindle 26 is free to turn in its bearing 27 on the platform. The opening in the sleeve 24 is slightly enlarged interiorly at its upper and lower extremities, to prevent the shaft 26 from binding therein.

In the forward extremities of the arms 15 and 16, is journaled a hollow shaft 30 in the top of which is inserted a short sleeve 31 secured to the shaft by a set screw 32. This sleeve is provided with a horizontal flange 33 at the top under which projects a roller 34 mounted on the free extremity of a leaf spring 35 secured to the bar 15 by a stud bolt 36. This spring-supported roller gives a yielding support to the hollow shaft 30. This shaft projects below the bar 16 of the swinging frame and in its open lower extremity is inserted a sleeve 37 which is connected with the hollow shaft by a set screw 38. The lower extremity of this sleeve is forked, the arms projecting outwardly and downwardly and merging at the bottom into a bearing 39 located directly beneath the center of the sleeve and through which passes an axle 40 upon which are loosely mounted two rollers 41 which perform the abrading, smoothing or floor dressing function when the machine is in use. These rollers are preferably provided with a covering of sand paper or a similar smoothing or abrading surface whereby they are adapted to perform the function heretofore stated. These sand paper sheaths with which we prefer to provide the rollers, are attachable and detachable in a manner hereinafter more fully described.

The two rollers 41 are located on opposite sides of the center of the axle 40 and the inner extremity of each is provided with a beveled gear 42 the said gears being fast on their respective rollers and meshing with an interposed beveled gear 43 engaging the two gears 42 at the top. This gear 43 is fast on the lower extremity of a shaft 44 passing through the hollow shaft 30 and journaled in the sleeves at the extremities of the hollow shaft. The upper extremity of the shaft 44, is provided with a hand piece 45, in which the shaft fits loosely so that while the said piece is held in the hand the shaft may rotate freely, its upper extremity being swiveled in the handle as indicated in Fig. 2.

The hollow shaft 30 is provided exteriorly with a grooved collar 46 which is engaged by a pin 47 carried by a bifurcated lever 48 fulcrumed on the bar 18 at 49, its outer extremity being provided with a handle 50. By means of this lever which is preferably provided with two pins 47 entering the circumferential groove of the collar 46, the hollow shaft may be vertically adjusted for the purpose of causing the abrading rollers 41 to engage the surface to be smoothed or dressed. As soon as the pressure on the lever 40 is released, the spring-supported roller 34 raises the hollow shaft and consequently the abrading rollers from the surface.

In order to limit the downward movement of the hollow shaft, the latter is provided just above the arm 16 with a stop collar 51 adjustably connected with the hollow shaft by a set screw 52.

The abrading rollers 41 and their operating gears, are inclosed except at the bottom by a housing 53 which is connected with the sleeve 37 of the hollow shaft in any suitable manner as by a ring 54 surrounding the sleeve and spider arms 55 connecting the ring with an upwardly projecting circular part 58 of the housing. The ring 54 may be connected

with the sleeve 37 by means of a set screw 57 or in any other suitable manner. The parts of the housing 53 which inclose the abrading rollers, are only slightly larger than the rollers which they inclose (see Fig. 5 of the drawing). The extremities of the roller housings are normally closed by sliding gates 56. When the device is in use the housing 53 rotates with the hollow sleeve 30, and its circular part 58 protrudes into a stationary housing part 59 connected with the forward extremity of the arm 16 by means of screws 38. The protruding housing part 58 engages a packing ring or washer 60 carried by the lower part of the stationary housing 59, whereby a dust-tight joint is formed between the stationary and rotary housing members.

In order to protect the gears 42 and 43 from the dust, a gear case 61 is located within the housing 53, its upper part fitting closely around the sleeve 37 of the hollow shaft, while its lower part engages circumferential grooves 62 formed in the gears 42, whereby the gear case moves with the abrading rollers in their orbital travel but is relatively stationary so far as their rotary or axial travel is concerned.

With the stationary housing member 59, is connected an outlet tube 63 whose inner extremity surrounds an opening 64 formed in the housing 59. To the outer extremity of the outlet 63, is connected the suction conduit 8 leading to the blower 7 as heretofore explained.

To the top of the shaft 44, is made fast a pulley 65 which is connected by a cross belt 66 with a pulley 67 fast on the upper extremity of the shaft 26. Just above the stop collar 51 on the hollow shaft, is made fast a relatively large pulley 68 connected by a belt 69 with a smaller pulley 70 fast on a countershaft 71 which is also provided with a relatively large pulley 72 connected by a belt 73 with a smaller pulley 74 fast on the shaft 26. Also fast on this shaft 26 is a pulley 75 connected by means of a belt 76 with a pulley 77 fast on the motor shaft 78. This motor shaft is also provided with a pulley 79 connected by means of a belt 80 with a pulley 81 fast on the blower shaft 82.

From the foregoing description it will be understood, that as the motor shaft 78 is rotated, power will be transmitted to the blower shaft 82 and to the shaft 26. From this shaft 26, motion will be transmitted through the belts 73 and 69 and the pulleys 74, 72, 70 and 68, to the hollow shaft 30. From this shaft 26 rotary motion will also be transmitted through the instrumentality of the cross belt 66 and the pulleys 67 and 65, to the shaft 44, whose movement will be in a direction the reverse of the hollow shaft 30 through which it passes. Hence it will be understood that the rotary action of the shaft 44 carrying the gear 43, will impart rotation to the two abrading rollers 41 in reverse directions by virtue of the gears 42 carried by the rollers and engaging the gear 43 at diametrically opposite points. It will also be understood that the rotary action of the hollow shaft 30, will impart a rotary movement to the axle 40 not on its own axis, but around the axis of the hollow shaft, and in the plane of the axis of the axle, thus giving an orbital travel to the abrading rollers simultaneously with their rotary action and in a direction opposite to their rotary action, thus increasing the friction or abrading action of the rollers upon the surface to be dressed.

The rollers 41 are hollow and their cylindrical walls A as shown in the drawing are composed of thin metal and in their extremities are inserted heads B. The cylindrical roller parts are preferably covered with carpeting material C or some other suitable fibrous yielding material, the same being preferably permanently attached to the cylindrical shells of the rollers. A suitable covering D of abrading material as sand paper may be applied to each roller in order to give the desired abrading or smoothing effect to the surface. This material is preferably applied in the form of cylindrical sheaths, one sheath being applied to each roller, the latter being so adjusted by means of a hinged sectional portion, that after the cylindrical abrading sheath is slipped over it, the hinged section may be thrown outwardly thus tightening the sheath in place upon the roller until it is desired to remove it when by another adjustment of the sectional part of the shell of the roller, the sheath may be loosened when it will readily slip off. This feature is illustrated in Fig. 6 of the drawing in which A′ designates the hinged portion or segment of the shell A of the roller. This portion A′ is hinged to a lug A^2 attached to the body of the shell. The hinge pin is designated A^3.

To the extremity of the shell-segment A′ remote from the hinge, is connected a link E as shown at F. This link E is connected with a link G as shown at H; while the link G is loosely connected with a spindle I which is journaled in the heads of the roller and adapted to be manipulated from one end thereof by means of a wrench, (not shown) the extremity of the roller being fashioned for that purpose. It will be observed that the links E and G form a toggle joint. By turning the spindle I to throw the links to the dotted line position, the section A′ will be drawn inwardly, thus reducing the diameter of the roller where the section A′ is located. There should be at least two sets of links E and G connected as shown in Fig. 6, one set being at each end of the roller. As each set is a duplicate of the other, it has not been thought necessary to illustrate

more than one toggle joint attachment in the drawing. There may of course be more than two toggle joints if required. But in any event the construction in this regard would be a mere duplication of that shown in Fig. 6.

Assuming that the section A′ is in the position shown by dotted lines, it is evident that an abrading sheath may be easily applied to the roller or removed therefrom. The size of this sheath must of course be so regulated that when the hinged section A′ is in the dotted line position it will slip on to the roller or slip off therefrom readily; while when the hinged part A′ is thrown to the full line position shown in Fig. 6, the abrading sheath will be locked securely on the roller. The toggle devices are preferably so regulated that when the section A′ is thrown outwardly to the full line position shown in Fig. 6, the toggle members will be thrown slightly beyond the dead center as shown in full lines in Fig. 6 whereby there will be no tendency for these members to accidentally change their position during the use of the machine in the regular performance of its function.

It should be stated that when the swinging frame 14 has been moved to any position, it may be desirable to hold it in the same position for some little time. We have therefore provided the arm 15 immediately above the support 13, with a set screw 90 which may be screwed against the supporting plate 13 whereby the frame may be locked in any desired position as will be readily understood.

Attention is called to the fact that the power from the motor is transmitted to the two shafts 30 and 44, in such a manner that the shaft 44 which rotates the abrading rollers, has much greater speed than the shaft 30 which imparts the orbital travel to the rollers or rotates their axle 40 in a plane parallel with the axis of the latter. In other words the speed of the motor shaft is greatly reduced when the motion is transmitted to the shaft 30, while the speed of the shaft 44 as shown in the drawing is substantially the same as that of the motor shaft, giving a comparatively high speed to the shaft which imparts the rotary movement to the abrading rollers as heretofore explained.

There is an advantage in having each roller housed independently of the other roller, since this construction permits the exposure of the surface acted on between the rollers so that the condition of the surface may be known to the operator without moving the smoothing or dressing head The term head may if desired be employed to designate the rollers mounted on their radial arms or individual axles and connected to have both rotary and orbital travel as heretofore described. In order to allow the individual housing of each roller, it of course becomes necessary that the housings for the rollers must rotate therewith. This also further necessitates a stationary housing member 59 with which the suction conduit 8 is connected as heretofore described. It is also necessary that there should be a tight joint between the rotary and stationary housing members as shown at 60 in Fig. 4 of the drawing.

The portable platform 5 may be termed a carriage, since it may be of any suitable construction adapted to perform the function heretofore explained.

In order to permit the tilting of the swinging frame 14 from the vertical position in either direction through the instrumentality of the arm 19, it is necessary that the bearing in the arm 15 which receives the sleeve 24, should be slightly enlarged above and below, since it must be assumed that the sleeve 24 occupies a vertical position on the assumption that the frame part 12 upon which the arm 19 is mounted occupies a horizontal position, the sleeve 19 moving laterally in the horizontal plane.

It may be stated that it is not considered that it will ever be necessary to tilt the frame 14 to any considerable extent, from the vertical position but it is thought that it may be desirable under some circumstances to throw this frame slightly from the vertical in one direction or the other, and this slight adjustment it is believed will be practicable by slightly enlarging the bearing or opening 25 at the top and bottom as shown in Fig. 2 of the drawing.

Referring again to Fig. 6, the spindle I may be journaled in suitable bearings I′ attached to the heads B on the rollers. Only one of these bearings is indicated in the drawing, but it will be readily understood that there is a similar bearing attached to the opposite head.

Having thus described our invention, what we claim is:

1. In a machine of the class described, the combination of a portable structure, a motor thereon, a frame mounted to swing on said structure, a pair of rollers mounted to rotate, an abrading sheath removably connected with said rollers, and means mounted on the swinging platform and actuated from the said motor for simultaneously imparting rotary movement to both rollers in reverse directions.

2. In a machine of the class described the combination of a portable structure, a motor thereon, a frame mounted to swing on said structure, an axle carried by the swinging frame, a pair of rollers loosely mounted on the axle, an abrading sheath removably connected with said rollers, and means mounted on the swinging frame and actuated from the motor on the portable structure for impart-

ing rotary movements to the rollers in reverse directions, and simultaneously actuating the axle to impart orbital travel to the rollers in a direction opposing their individual rotary action to increase friction.

3. In a machine of the class described, the combination of a portable frame, a motor carried thereby, a frame mounted to swing on the portable frame, an axle, two rollers loose thereon, a hollow shaft journaled in the swinging frame and connected to the axle between the rollers, yielding means connected with the frame for regulating said hollow shaft, another shaft passing through the hollow shaft, a gearing connection between the last named shaft and the two rollers whereby the rotation of the said shaft imparts motion to the rollers in reverse directions, a motor mounted on the portable frame, and means connected with the motor for operating the two shafts, whereby the rollers are given both rotary and orbital travel in opposing directions for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

AUGUST KRAEMER.
ARTHUR CHILD.

Witnesses:
A. J. O'BRIEN,
DENA NELSON.