

G. F. HALL.  
COMBINED FLOOR LEVELING AND SURFACING MACHINE.  
APPLICATION FILED JUNE 21, 1907.

970,043.

Patented Sept. 13, 1910.

3 SHEETS—SHEET 1.

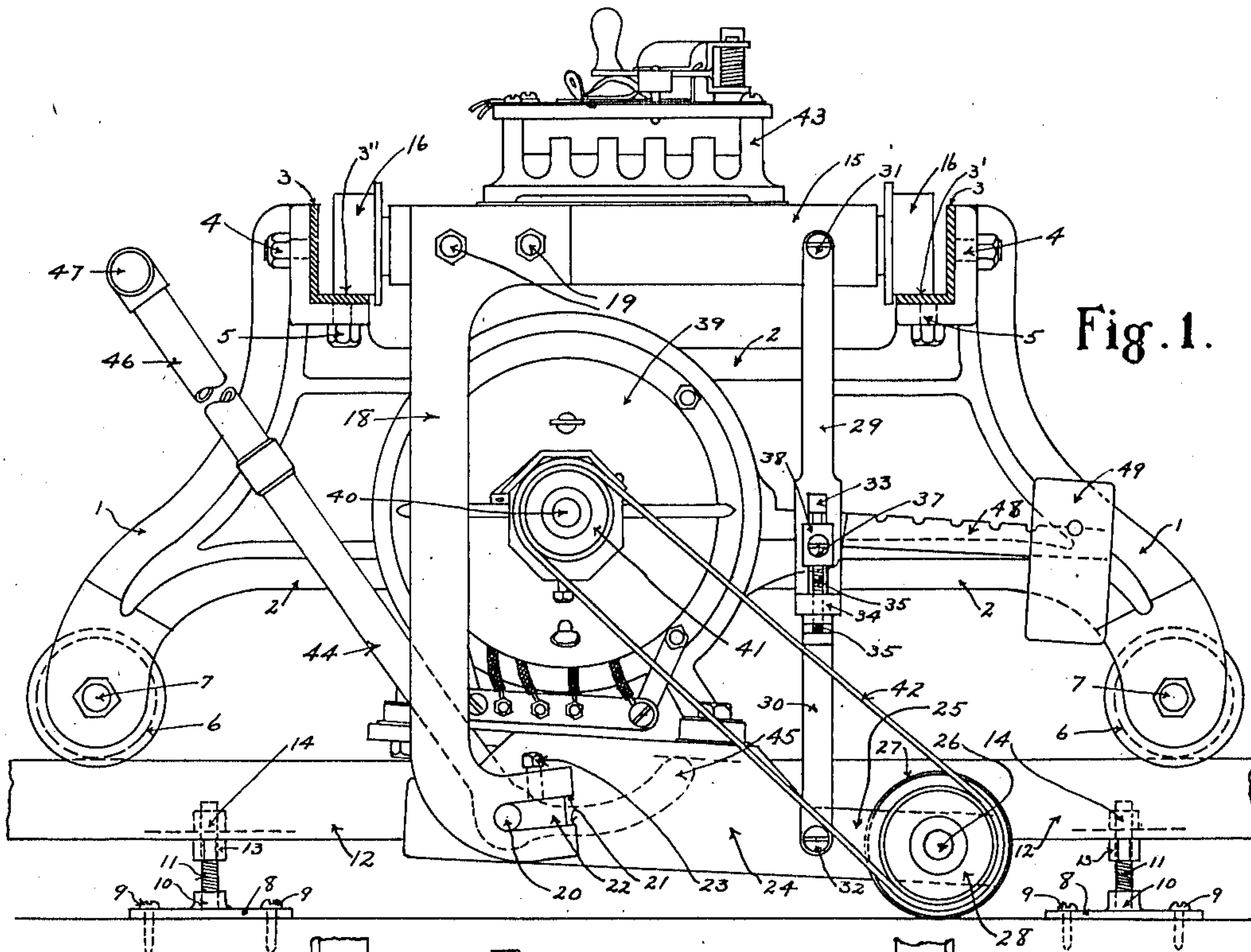


Fig. 1.

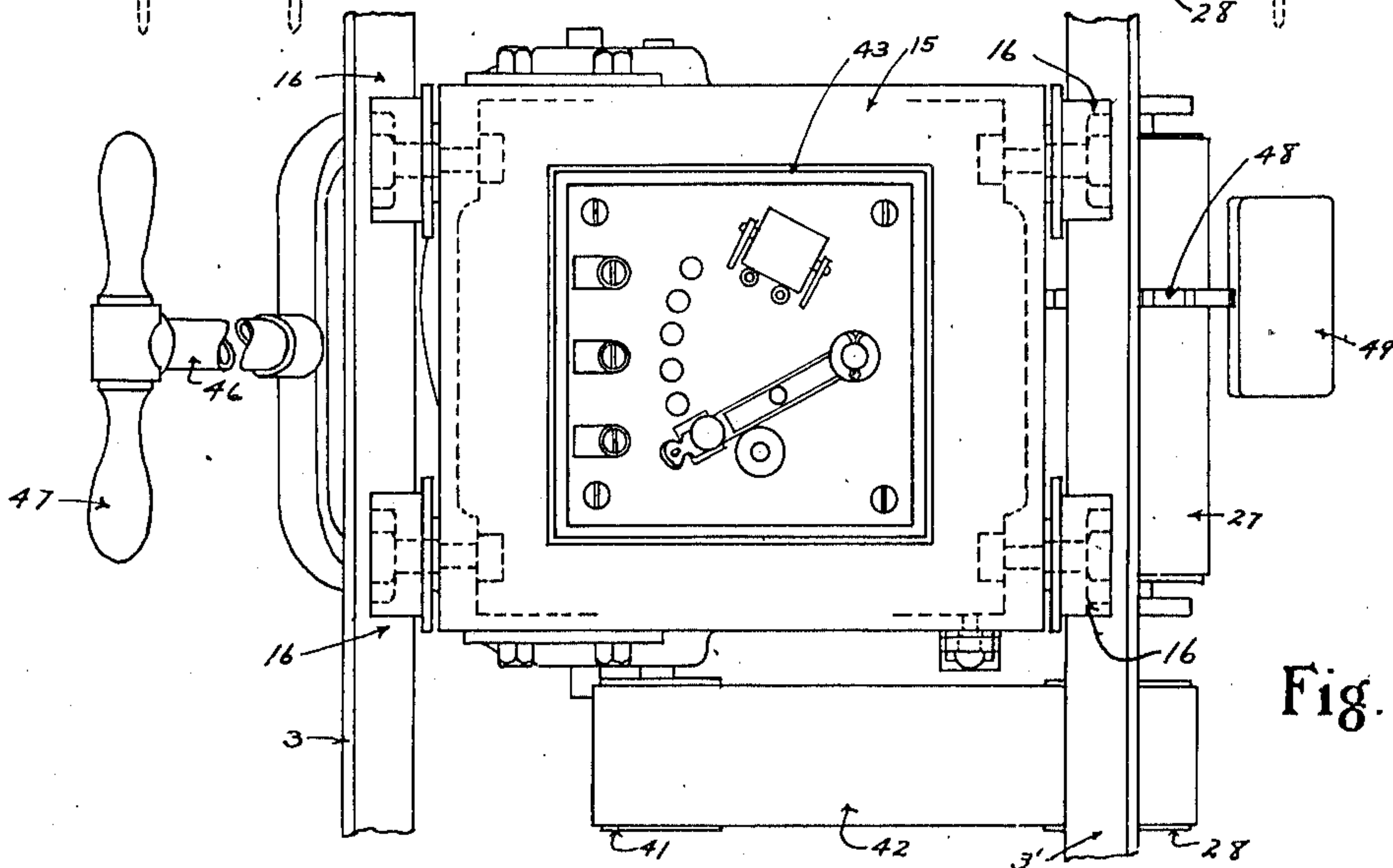


Fig. 2.

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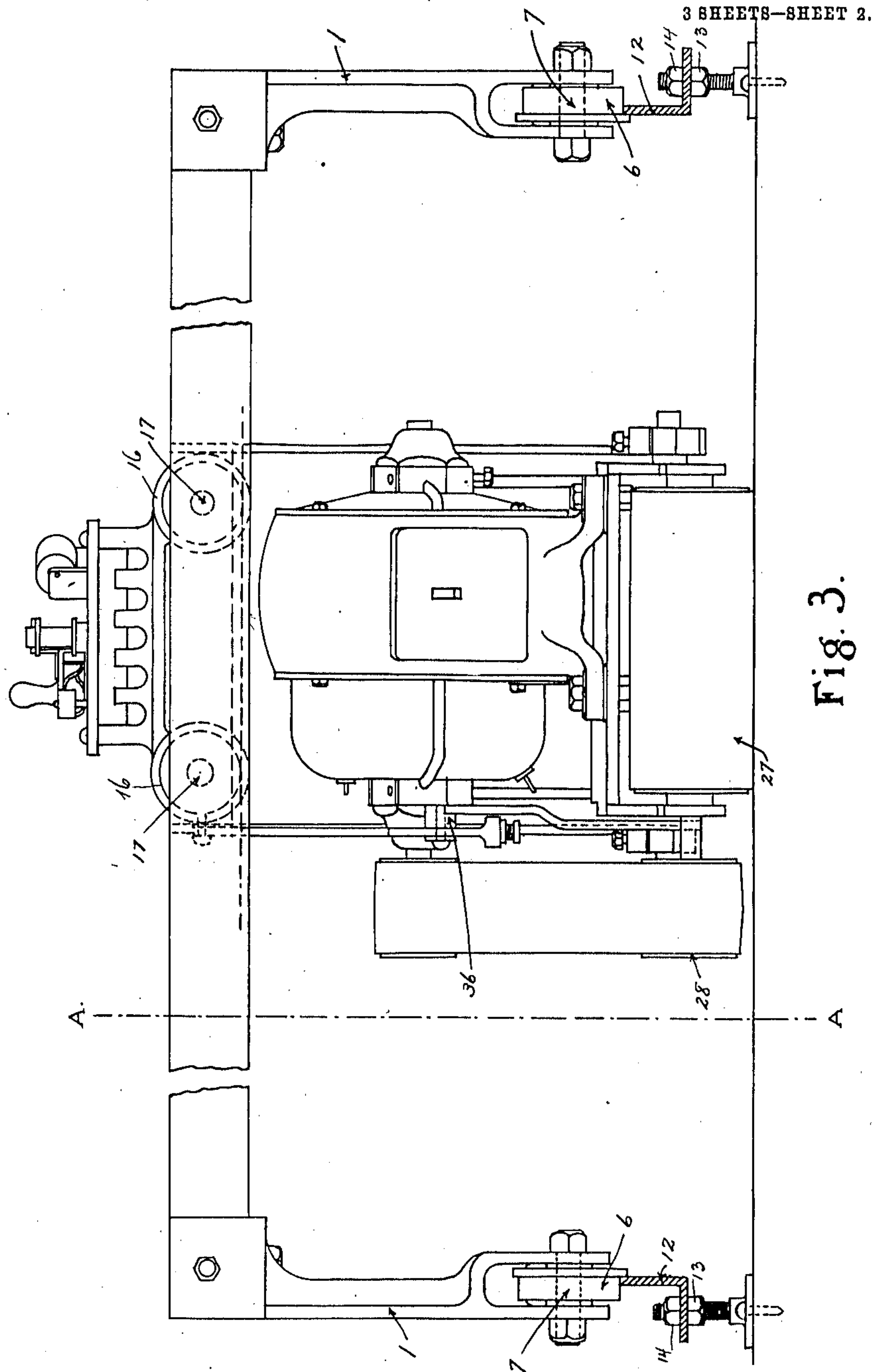


Fig. 3.

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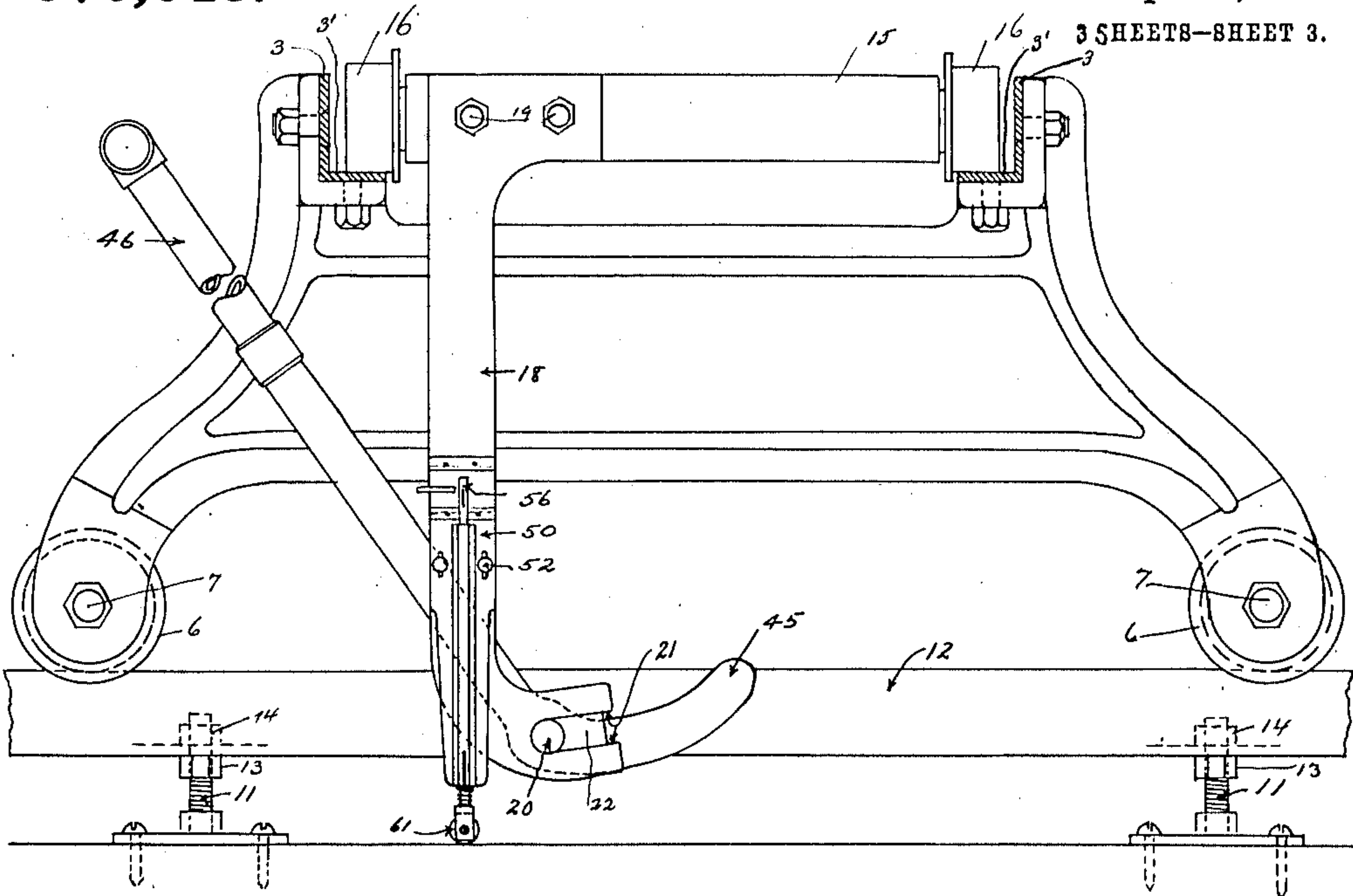


Fig. 4.

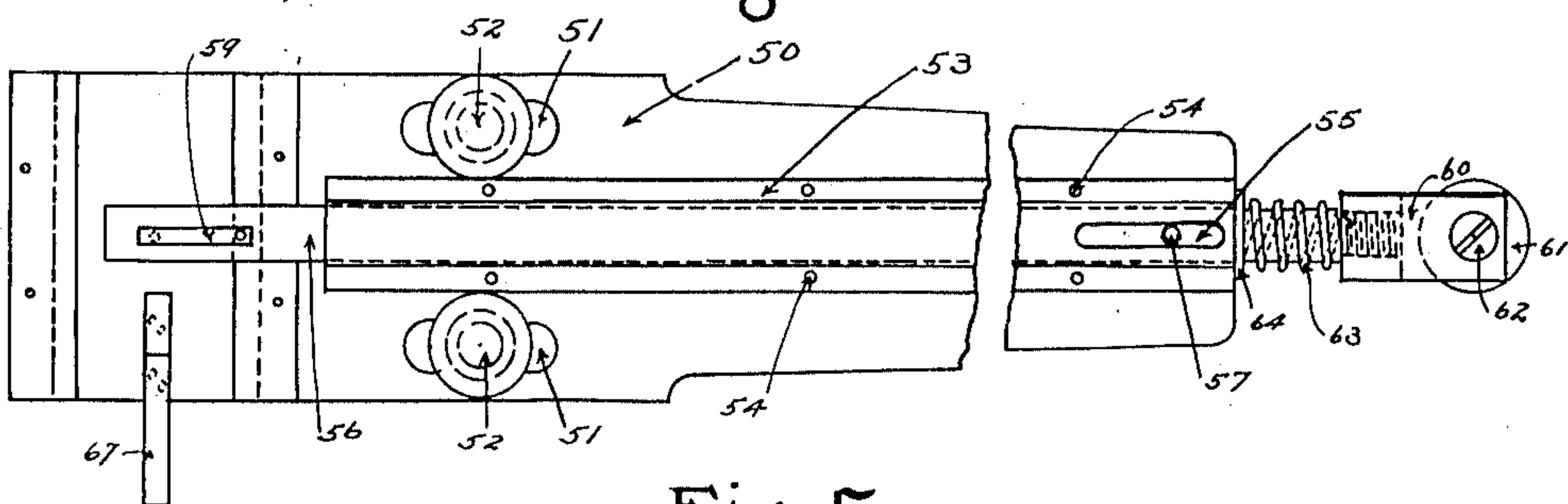


Fig. 5

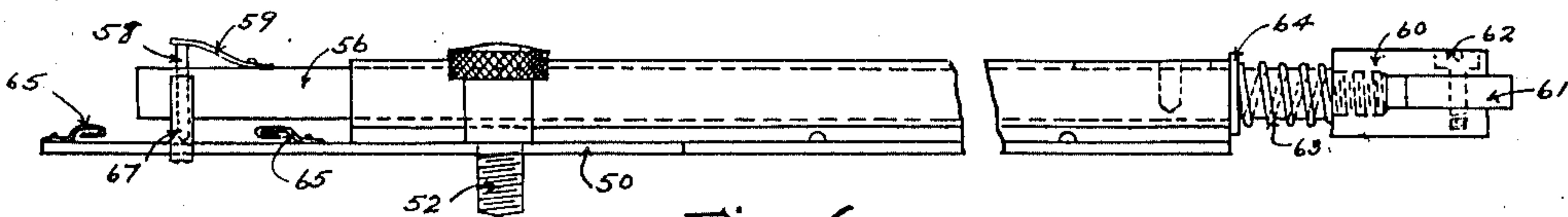
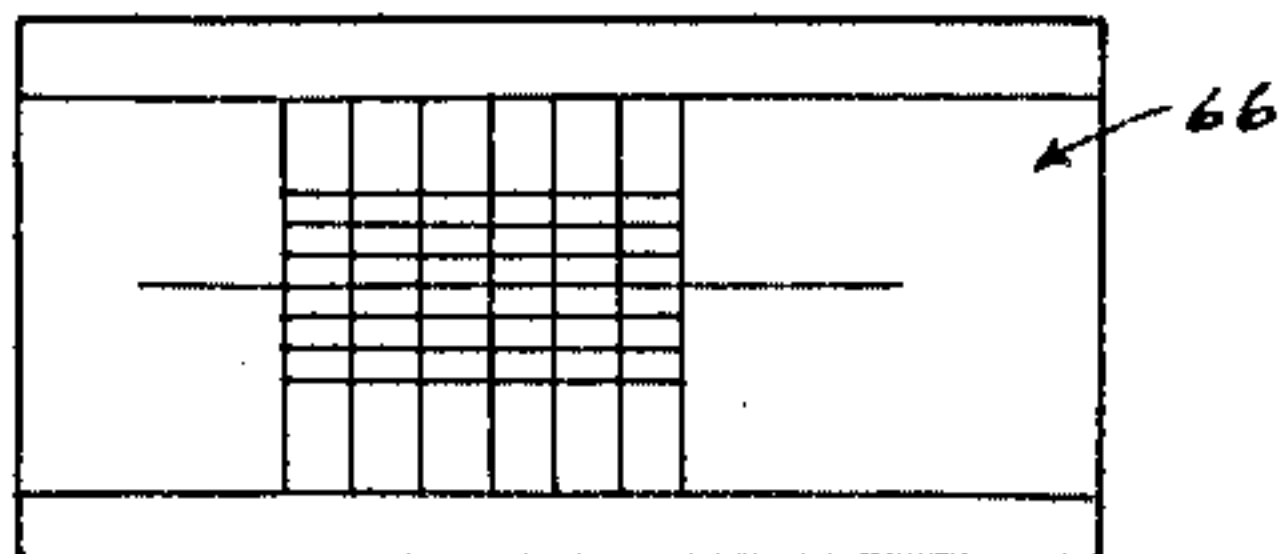


Fig. 6.

Fig. 7.



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# UNITED STATES PATENT OFFICE.

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COMBINED FLOOR LEVELING AND SURFACING MACHINE.

970,043.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed June 21, 1907. Serial No. 380,132.

*To all whom it may concern:*

Be it known that I, GEORGE F. HALL, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Combined Floor Leveling and Surfacing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

Like reference numerals indicate like parts.

Figure 1 is a side elevation of my invention. Fig. 2 is a top plan of the same. Fig. 3 is a front elevation of said machine. Fig. 4 is a side elevation of the frame of the machine and shows in position the device for indicating and charting the irregularities of a floor surface. Fig. 5 is a front elevation of said indicating device. Fig. 6 is a side elevation of the same. Fig. 7 is a plan view of the chart used with said indicating device, and illustrates the record of the irregularities of the floor surface.

My invention relates to machines for leveling and surfacing floors in position, and it consists of the novel construction, combination and arrangement of parts as hereinafter described and claimed.

This invention consists of the combination of leveling mechanism with a floor-surfacing machine such as is described in my pending application for Letters Patent, Serial No. 359,483, filed February 26, 1907. The details of construction of said floor-surfacing machine are not therefore closely specified in this application but are referred to sufficiently to give a general idea of said surfacing machine. It is, however, to be understood, that other forms of floor-surfacer machines may be used instead of that shown in the drawings and hereinafter described, the principal feature of my present invention being the combination with such a machine of means or mechanism to secure and maintain an absolute level in the operation of the floor-surfacing device.

The machine has a stable truck, as shown in Figs. 1 and 3, which serves as a bridge frame. This truck is composed of two side pieces or uprights 1, 1, and the cross pieces 2, 2. Angle irons 3 are bolted at 4 and 5 to the side pieces 1, 1. The section lines on the angle irons 3, seen in Fig. 1, are on the

line A A of Fig. 3. At the bottom of each of the four uprights or side pieces 1, they are bifurcated to furnish bearings. Flanged rollers 6, of equal diameter, are mounted in the said bearings upon axles 7.

Plates 8 are placed on the floor, which is to be leveled and surfaced, and are secured thereto by the screws 9. Each plate 8 has a central, vertical, tubular piece 10, which is tapped for the reception of the bolt 11. An L-shaped rail 12 has its horizontal portion tapped for the passage of the bolt 11. An adjusting nut 13 is engaged in the proper position upon the bolt 11 and supports the rail 12. A lock nut 14 upon the bolt 11 is screwed down into forcible contact with the upper surface of the horizontal portion of the rail 12 and secures it in position. The rollers 6 travel on the upper edge of the rail 12.

The bridge frame is assembled so that the tops 3' of the horizontal portion of the angle irons 3 are in a true plane, preferably horizontal or level throughout its entire extent, and the axis 7 of each of the rollers 6 preferably lie in a plane parallel to the plane of the horizontal portions of the angle irons 3. In leveling a floor it is necessary to bring the top edges of the adjustable rails 12 into one true horizontal plane or level. A spirit level or hydraulic level is used upon the top edges of said rails 12 and the adjusting nuts 13 are raised or lowered upon the bolts 11, as may be found necessary, so that the rails 12 are supported on the nuts 13 in such one level plane. The lock nuts 14 are then brought into forcible contact with the upper surface of the horizontal portion of the rails 12. The horizontal plane of each of the top surfaces 3' of the angle irons 3 is parallel to the plane of the top edges of the rails 12.

A carrying frame or platform 15 is mounted on four rotatable rollers 16, which are of equal diameter. Each roller 16 is carried by an axle 17 and is adapted to travel along the upper surface 3' of the horizontal portion of the angle iron 3, with which it is in contact. On each of two opposite sides of the frame 15 an arm or hanger 18 extends vertically downward and is secured at its upper end by bolts 19 to said frame. Each of the arms 18 is curved and slotted at its lower end, as illustrated in Fig. 1, to serve



as a bearing for the axle 20. The axle 20 is forced into the bottom of the slot 21 of the arm 18 by means of a wedge block 22, which is secured in its adjusted position by a set screw 23. The axle 20 projects from the sides of a frame 24, which is suspended near its rear side on the arms 18, and said suspended frame has two forwardly extending horns 25. A shaft 26 is revolvably mounted in the horns 25 at their lower ends and carries the tool or roller 27, which is fastened on said shaft. One end of the shaft 26 is extended, and a pulley 28 is fastened thereon. The shaft 26 is parallel with the plane of the horizontal surface 3' of the angle irons 3. Any horizontally revolving tool adapted to abrade, dress, or polish floors may be used upon the shaft 26. I preferably use a cylindrical roller, whose surface is covered with sandpaper, or other abrasive material, for reducing floor surfaces; and a revolving brush roller or buffing roller for polishing floor surfaces.

Attached to the frame 24 is an adjustable link bar, which is made of two parts 29 and 30. The part 29 is pivotally attached at its upper end by the screw 31 to the frame 15. The part 30 is pivotally attached at its lower end by a screw 32 to the frame 24. The parts 29 and 30 are connected at their contiguous ends loosely as follows. The lower end of the upper part 29 of the link bar has the slot 33, and the lower extremity of said part 29 is provided with a flange 34, in which is threaded the screw 35. A pivot block 36 is formed on the upper end of the part 30 and engages slidably in the slot 33, being held in sliding and pivotal adjustment by the screw 37 and washer 38. The adjusting screw 35 has a bearing upward against the block 36 and downward in the flange 34. In this manner the distance of the pivots 31 and 32 apart can be regulated by the screw 35. This connection between the two sections 29 and 30 of the link bar may be so adapted that the tool or roller 27 can rise and fall vertically in its progress over the floor surface, while at the same time it is limited in its downward movement to prevent the tool or roller from cutting below a pre-determined level. The two parts 29 and 30 of this adjustable link bar are free to swivel at the pivotal point, as well as at the end connections 31 and 32 thereof, with the carrying fixed frame 15 and the suspended frame 24.

A motor 39 is mounted on the suspended frame 24 and has a horizontal rotatable shaft 40, on one end of which a pulley 41 is fastened. A belt 42 from the pulley 41 communicates power and motion to the pulley 28.

A rheostat 43 is mounted on the frame 15 and is properly wired to connect with the

motor 39, but the connecting wires are omitted from the drawing. The rheostat 43 is connected with a source of electrical energy.

A bail 44 near its two lower ends is mounted on the axle 20 and these ends are curved or bent upwardly, as seen at 45 in Fig. 1, so that their extreme tips project upward beneath the frame 24 and are adapted for contact with the under side of said frame to raise and lower the forward end thereof to guide and control the movement of the tool or roller 27 into and out of contact with the floor, the movement being governed by the rod 46 and cross head 47, forming the handle, by which the workman propels the machine over the floor surface.

A projecting notched arm 48 is attached to the forward side of the motor 39 and carries a weight 49, adjustably mounted thereon. The change in the position of the weight 49 on the arm 48 varies the pressure of the tool or roller 27 upon the floor surface to the degree desired.

The axes of the shafts 26 and 40 and the axles 7 and 20 are all parallel with each other and with the surface 3' of the angle irons 3 and with the plane of the upper edge of the tracks 12.

The operation of the machine is as follows. The tracks or rails 12 are first leveled, as already explained. When the machine is at rest and the tool or roller 27 is normally raised from the floor by means of the weighted handle 47, the machine is in equilibrium on a stable base. The workman energizes the motor by throwing the lever of the rheostat 43, and the motor and the tool or roller revolve in unison. The workman pushes the carrying frame 15 along the bridge to one side, adjacent to one of the uprights 1. He grasps the handle 47 and pushes the machine forward along the rails or track 12, at the same time raising the handle and gradually allowing the tool or roller to come into operative contact with the floor. All the weight of the suspended frame 24 and of the superimposed parts is borne proportionately by the tool or roller, and the said frame is bearing on its axle 20. He continues to elevate the handle until the ends 45 of the bail 44 move down out of contact with the under surface of the frame 24. The thrust of the handle is now wholly on the axle 20 and is projected to the bridge frame forming the stable base and does not in any manner vary the pressure on the tool or roller 27, as long as the ends 45 of the bail 44 are out of contact with the suspended frame 24. The entire machine is thus pushed forward until it approaches the end of the rails 12. Then the handle is slowly moved downward and the tool or roller is gradually lifted from the floor and held in an elevated position by the weight of said



handle. The carrying frame or platform is now moved to a new location on the bridge frame, the roller 16 traveling along the rails or angle irons 3; then the operation is repeated, and so on, until nearly all the floor surface between the rails 12 is dressed, or brushed, or polished, as the case may be. The pulleys and other projecting parts prevent the machine from acting upon the entire floor surface between the rails 12. It is evident that in this manner the entire floor surface acted upon by the tool or roller may be dressed, but it is frequently necessary to dress the floor to an absolutely level surface, and to accomplish this the adjustable link bar, hereinbefore described, is used.

It is obvious that in fairing a floor, as distinguished from leveling, a machine of this type may be used without the rails 12, the legs of uprights 1, 1, being of such length that the wheels 6 bear directly upon the floor.

In preparation for leveling the floor, the lowest point in the floor is first determined and the depth of the cut is established, with relation to such lowest point. In determining the location of the lowest point in the floor surface within the area to be operated upon by the machine, I use the device illustrated in detail in Figs. 5, 6 and 7 and shown mounted in its location on the machine in Fig. 4. This device consists of a back plate 50, slotted at 51 and arranged for attachment to the frame of the machine (preferably the downwardly extending arm 18) by means of the thrust screws 52, for which threads would be tapped in the arm 18. The slots permit of a vertical adjustment. A guide plate 53 is attached to the back plate 50 by pins or rivets 54 and is provided with the slot 55. In the guideway, thus formed, travels vertically the plunger or sliding bar 56, which is prevented from turning by the pin 57, slidable in the slot 55. At the upper end of the plunger is mounted a pencil, pen, or other acceptable form of stylus 58, which passes through the plunger and is forced into contact with the back plate 50 by a spring 59. Mounted on the lower end of the plunger is the bifurcated block 60, in which is carried the wheel 61, revolving on the screw 62. A spiral spring 63 surrounds the plunger 56 and is located between a washer 64 and the top of the block 60, the tension of which spring forces the block downward and the wheel 61 into contact with the floor surface. Clips 65 are attached at the upper end of the back plate 50 and form a guideway, in which a card 66 is inserted, and a spring clip 67, attached to the back plate, holds this card in place. The card may be divided by vertical and horizontal lines into any number of spaces

or intervals, forming a chart, upon which the stylus will register the irregularities of floor surface, as the machine moves over such surfaces. In Fig. 7, six lateral divisions are shown. This device is used in the following manner. As there are six lateral divisions on the chart, the floor space between the rails 12 is divided laterally in six divisions, which extend longitudinally for a distance equal to the length of the rails 12. The machine is adjusted on the frame and rails so that the wheel 61 of the indicating device is in contact with the floor, within one of the lateral divisions of the floor surface, and the stylus 58 is in contact with the chart in one lateral division thereof. The machine is then propelled forward and traverses the floor for the full length of the rails 12. The wheel 61 is always in contact with the floor by reason of the tension of the spring 63, and the stylus is always in contact with the chart by reason of the tension of the spring 59. Therefore a vertical line is made on the chart, and this line will, by comparison with the horizontal lines on the chart, indicate and record the highest and lowest points of the floor, over which the device has traveled. In like manner, readings are obtained for the other lateral divisions of the floor surface, the chart being moved each time so that a different lateral division is beneath the stylus. When the whole floor has been thus gone over, the resulting record will, by comparison, indicate the highest and lowest points within the area. The machine is again propelled along the floor over the lateral division in which the lowest point is located and when that point is reached, the machine is started in its operation with the tool or roller acting upon the floor at that lowest point, by adjusting the screw 35 of the link bar 29, 30. Thus a level is fixed in the floor, down to which level all the floor area must be cut. When this cutting is done, the floor is absolutely level from end to end and from side to side, throughout the entire area, which has been acted upon by the tool or roller. Although the tool or roller is prevented from cutting below a certain predetermined level, it is free to rise and fall vertically, limited only in its downward fall by the adjustment of the screw 35, the suspended frame moving on the axle 20 as a fulcrum.

It is important that the tool or roller be pivotally supported in substantially the manner indicated so as to be free to rise vertically in its progress, because, if fixedly held in position on an irregular surface where the wood to be cut off is of some depth, the tool or roller would be liable to be stalled, and if forced suddenly forward, might cause great damage to the floor, or to the machine



itself. With a device of this kind, any depth of irregularity can be taken off the surface, as numerous cuts can be made with the certainty that the tool or roller will work freely and that the final result will be the absolutely level surface desired.

There are numerous modifications of this device for indicating and recording the irregularities of floor surface, and there are several ways in which such a device may be attached to a machine of this type, but any attachment forming a part of a floor-surfacing machine and adapted to indicate or record the irregularities of the surface, while mounted on such a machine and in contact with the floor surface, is within the scope of my invention.

It is seen that my improved machine consists essentially of two horizontal tracks and two trucks adapted to travel thereon, the lower track being supported from the floor and adjusted to a true horizontal plane, and the upper track being supported upon the truck parallel to said plane, but extending transversely with the first named track at right angles, and serving as a bridge for the travel of the upper truck thereon; and also of a floor surfacing device carried by the upper truck but adapted to have its operative end in contact with the floor surface at the will of the operator. The floor surfacing device when in operation, travels in a direction parallel with the floor rails, but within the same, and cuts a swath in the top of the floor. At the end of this cut, the floor surfacing device is moved on the upper rails sidewise and on the lower rails lengthwise to a lateral position, adjacent to its starting point, and there is ready to cut another swath in the top of the floor contiguous to the first named swath and parallel with the lower rails, within the same.

I claim as a novel and useful invention and desire to secure by Letters Patent:—

1. In a combined floor-dressing and floor-leveling machine; the combination of a truck having wheels; a frame carried by the truck and capable of a limited oscillation on pivotal supports; means for giving said oscillation to the frame; a dressing roller rotatably mounted in the frame and movable to and from the floor surface; a motor on said frame; means operated by the motor to rotate the roller; parallel tracks on which the truck wheels travel; a pair of parallel rails upon the truck extending transversely of the machine at right angles with the first named tracks; a platform mounted on the last named rails and adapted to travel thereon and supporting said oscillating frame; and an adjustable link bar extended between said two frames and adapted to limit the depth of the cut of the dressing roller in the floor.

2. In a machine of the class described, the combination of a truck having wheels; a frame carried by said truck and capable of a limited vertical oscillation on pivotal supports; means for giving said oscillation to the frame; a dressing roller rotatably mounted in the frame and movable to and from the floor surface; a motor on said frame; means operated by the motor to rotate the roller; parallel tracks on which the truck wheels travel; a pair of parallel rails upon the truck extending transversely of the machine at right angles to the first named tracks; a second set of four wheels traveling on the last named rails; a platform mounted on said wheels supporting said oscillating frame; and means for regulating at will the vertical extent of action of the dressing roller upon the floor.

3. In a machine of the class described, the combination of two parallel rails; adjustable means of supporting said rails in a true plane; a wheeled truck movable on said rails and having thereon a second set of parallel rails extending crosswise of said truck in a plane exactly parallel to the first named plane; a platform having wheels mounted on the second named rails; a vertically oscillating frame; a dressing roller rotatably mounted in the oscillating frame; means operated by the motor to rotate the roller; and means of adjusting the height of the roller and thereby to regulate the depth of its abrasive action upon the floor.

4. In a machine of the class described, the combination of two parallel horizontal rails; a wheeled truck adapted to travel on said rails; two parallel horizontal rails upon the upper portion of said truck extending in directions at right angles with the first named rails; a platform having wheels which is adapted thereby to travel on the second named rails; two downwardly extending arms or hangers fastened at their upper ends to the platform on opposite sides thereof and each having its lower end bent and provided with a slot; an oscillating frame carrying a dressing roller at its forward end and having two studs or shafts on its opposite sides, respectively, which studs or shafts extend into the slots of said hangers or arms, respectively; means for suspending the said frame from the platform; and a handle having its lower end bent to underlie said frame in contact therewith and pivotally mounted on said studs or shafts.

5. In a machine of the class described, the combination of two parallel horizontal rails; a wheeled truck adapted to travel on said rails; two parallel horizontal rails upon the upper portion of the truck and extending in directions at right angles with the first named rails; a traveling platform pro-



vided with wheels adapted to travel on the second named rails; an oscillating frame suspended at its rear end on supports extending from said platform and having at its forward end a dressing roller rotatably mounted thereon; a motor upon said frame adapted to assist by its weight in bringing the dressing roller into operative contact with the floor surface; a lever arm extending from said motor; a weight adjustably mounted on the lever arm; and means to rotate the dressing roller from the motor.

6. In a machine of the class described, the combination of two parallel horizontal rails; a wheeled truck adapted to travel on said rails; two parallel horizontal rails upon the upper portion of said truck and extending in directions at right angles with the first named rails; a traveling platform having wheels adapted to travel on the second named rails; an oscillating frame suspended at its rear end on supports extending from said platform; a dressing roller rotatably mounted at the forward end of the oscillating frame; means for rotating the dressing roller; a link bar pivotally mounted at its upper end to the platform and having a slot in its lower end and also a flange which has a screw hole tapped therein; a link bar pivotally mounted at its lower end to the oscillating frame adjacent to the dressing roller, and having at its upper end a pivot block, which is slidably mounted in the slot of the first named link bar; and an adjusting screw mounted in the flange of the first named link and having its upper end bearing against said pivot block.

7. In a machine of the class described, the combination of two tracks in parallel horizontal planes, one above the other, but at right angles to each other; two trucks movable along said tracks, respectively, the lower track being supported from the floor surface and the upper track being supported by the lower truck; a floor-dressing device pivotally supported by the upper truck; and means for preventing the floor-dressing device from coming into contact with the floor, consisting of a weighted handle adapted to propel the machine.

8. In a machine of the class described, the combination of two parallel tracks; means for adjusting said tracks in such relation to the floor surface that the corresponding parts of each track will be in the same plane; a carriage mounted to travel on said tracks and having itself tracks adapted for parallel adjustment in relation to each other and at right angles to said first named tracks; a pivotally suspended frame adapted for vertical oscillation and mounted to travel on the tracks of the carriage; a revoluble dressing tool mounted in the pivotally supported frame and adapted to engage the floor sur-

face; a motor operatively connected with the tool to revolve the tool; means of energizing the motor; means of propelling the tool lengthwise and crosswise over the floor surface in contact therewith; means of adjusting the machine so that the plane of the cutting face of the tool is parallel with the plane of the two parallel tracks on which the carriage is mounted; and means of so supporting the pivotally suspended frame that the pressure of the tool on the floor surface is wholly controlled by gravity of the weight of the component parts of the machine mounted upon or forming a part of said pivotally suspended frame.

9. In a machine of the class described, the combination of two sets of rails at right angles to each other; a pivotally suspended frame adapted to oscillate vertically and to travel on said rails lengthwise and crosswise over the floor surface; a revolubly dressing roller mounted in the suspended frame and adapted for contact with the floor surface; a motor operatively connected with the roller to revolve the roller; means of energizing the motor; means of so supporting the oscillating frame that the pressure on the roller is wholly controlled by the weight of the component parts of the machine mounted on said frame or forming a part thereof; and means of propelling the machine lengthwise and crosswise over the floor surface.

10. In a machine of the class described, the combination of two rails; means for adjusting said rails in such relation to the floor surface that corresponding parts of each rail are in the same plane; a carriage adapted to travel on said rails; a frame adapted to travel on the carriage at right angles to the direction of travel of the carriage on the rails; a pivoted frame suspended on the first mentioned frame and adapted for vertical oscillation; a revoluble dressing roller mounted in the pivoted frame and adapted for contact with the floor surface; means of maintaining said contact wholly by gravity of the weight of the pivoted frame and the component parts of the machine mounted thereon or forming a part thereof; a motor operatively connected with said roller to revolve the roller; means of energizing the motor; means of bringing the roller into and out of contact with the floor at will; means for propelling the machine lengthwise and crosswise over the floor surface; and means for limiting the downward action of the roller upon the floor surface to a predetermined degree, while said roller is free to rise and fall vertically until said limiting point in the fall is reached and is free to rise after said limiting point is reached.

11. In a machine of the class described,



the combination of a pivotally suspended revoluble tool oscillating vertically on its supports and adapted to contact with the floor surface; an energized motor operatively connected with the tool to revolve the tool; and means adapted to cause the tool to continuously follow the floor surface and reduce it to a predetermined level fixed by other means, the last mentioned means including a stop adapted to prevent the tool from reducing the floor surface to below said predetermined level, said stop, however, allowing the vertical oscillation of the tool until such level is reached.

12. In a machine of the class described, the combination of two parallel rails; means for so adjusting the rails with relation to the floor surface that the corresponding surfaces of each are in the same plane; a carriage mounted on said rails and adapted to travel longitudinally thereon; rails forming a part of the carriage and bridging the space intervening between said first mentioned rails; a frame adapted to travel on the bridge rails of the carriage approximately at right angles with the travel of the carriage on the first mentioned rails; a pivotally supported frame mounted adjacent to one end thereof upon the first mentioned frame; a revoluble floor-dressing tool mounted adjacent to the opposite end of the pivoted frame and adapted to contact with the floor and to support that end of the pivoted frame from the floor; a motor on the pivoted frame, operatively connected with the tool to revolve the tool; means of energizing the motor; and means of propelling the tool lengthwise and crosswise over the floor surface to dress said surface to a plane parallel to the plane of the surfaces of the two first mentioned rails on which the carriage travels.

13. In a machine of the class described, the combination of two parallel rails; means for so adjusting the rails with relation to the floor surface that the corresponding surfaces of each are in the same plane; a carriage mounted on said rails and adapted to travel longitudinally thereon; rails forming a part of the carriage and bridging the space intervening between said first mentioned rails; a frame adapted to travel on the bridge rails of the carriage approximately at right angles with the travel of the carriage on the first mentioned rails; a pivotally supported frame mounted adjacent to one end thereof upon the first mentioned frame; a revoluble floor-dressing tool mounted adjacent to the opposite end of the pivoted frame and adapted to contact with the floor and to support that end of the pivoted frame from the floor; a motor on the pivoted frame operatively connected with the tool to revolve the tool; means for ener-

gizing said motor; means of propelling the tool lengthwise and crosswise over the floor surface to dress said surface to a plane parallel to the plane of the surfaces of the two first mentioned rails on which the carriage travels; and means for pre-determining the relation of the plane to which the floor surface is to be dressed with the plane of the surface of the rails on which said carriage is mounted.

14. In a machine of the class described, the combination of two parallel rails; means for so adjusting the rails with relation to the floor surface that the corresponding surfaces of each are in the same plane; a carriage mounted on said rails and adapted to travel longitudinally thereon; rails forming a part of the carriage and bridging the space intervening between said first mentioned rails; a frame adapted to travel on the bridge rails of the carriage approximately at right angles with the travel of the carriage on the first mentioned rails; a pivotally supported frame mounted adjacent to one end thereof upon the first mentioned frame; a revoluble floor-dressing tool mounted adjacent to the opposite end of the pivoted frame and adapted to contact with the floor and to support that end of the pivoted frame from the floor; a motor on the pivoted frame operatively connected with the tool to revolve the tool; means of propelling the tool lengthwise and crosswise over the floor surface to dress said surface to a plane parallel to the plane of the surfaces of the two first mentioned rails on which the carriage travels; and means mounted on the machine for automatically preventing the tool, when once the relation of these two planes is established, from acting on the floor surface outside the confines of said parallel planes.

15. In a machine of the class described, the combination of a pivotally suspended frame adapted to oscillate vertically; a revoluble floor-dressing tool mounted in said frame and adapted to contact with the floor surface; means for maintaining said contact and for pre-determining the pressure of the tool on the floor surface wholly by the adjustment of the weight of the suspended frame and the component parts of the machine mounted thereon or forming a part thereof, with relation to the tool; and means of propelling the tool longitudinally and transversely over the floor surface in contact therewith while said pre-determined pressure of the tool on the floor surface is maintained.

16. In a machine of the class described, the combination of a floor-dressing tool; means for operating said tool; and a handle adapted normally to propel the machine over the floor surface and also capable of



holding the said tool out of contact with the floor surface at will and also to lower the tool into its initial contact with the floor surface but thereafter to be independent of  
5 said tool during the operation thereof.

17. In a machine of the class described, the combination of a stable base; a pivotally suspended floor-dressing tool carried by said base and adapted for vertical oscillation;

and mechanism adapting said tool to operate 10 upon a floor to bring the whole area of the floor to a uniform plane surface.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE F. HALL.

Witnesses:

FRANK H. MARTIN,

BENJAMIN A. ARMSTRONG.