No. 864,257. PATENTED AUG. 27, 1907.

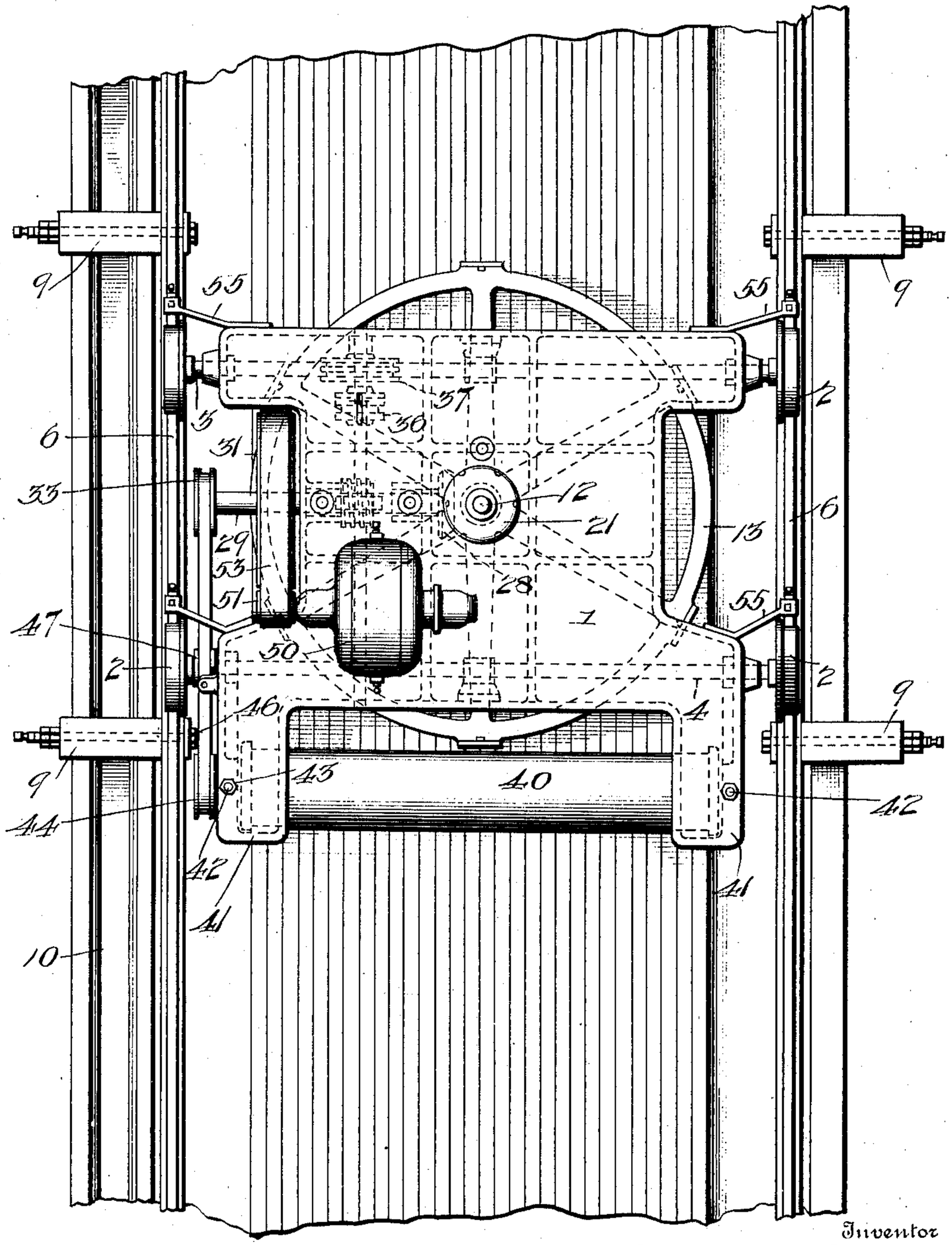
J. M. PORTER.

BOWLING ALLEY PLANER.

APPLICATION FILED DEC. 19, 1903.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

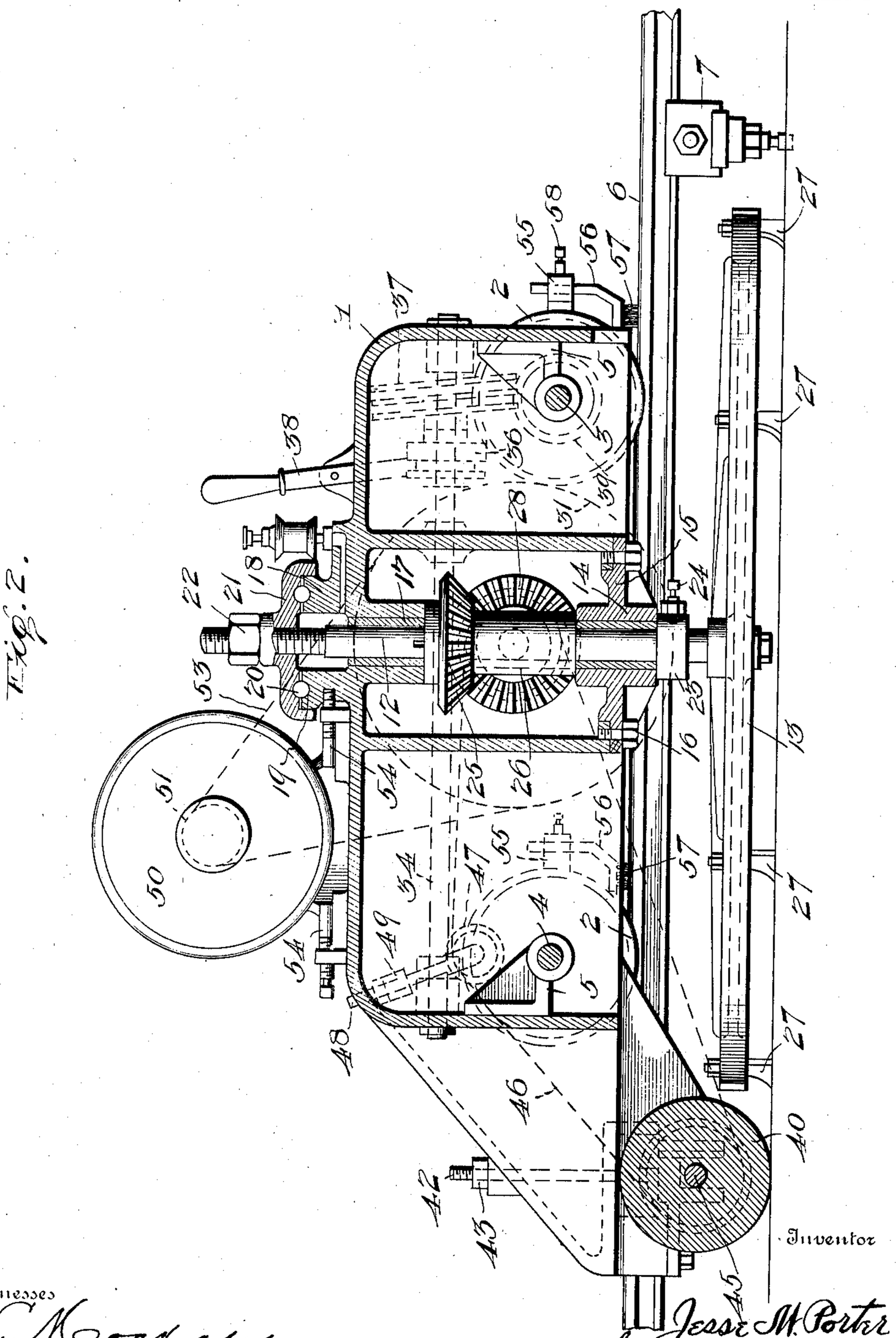

Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 3.

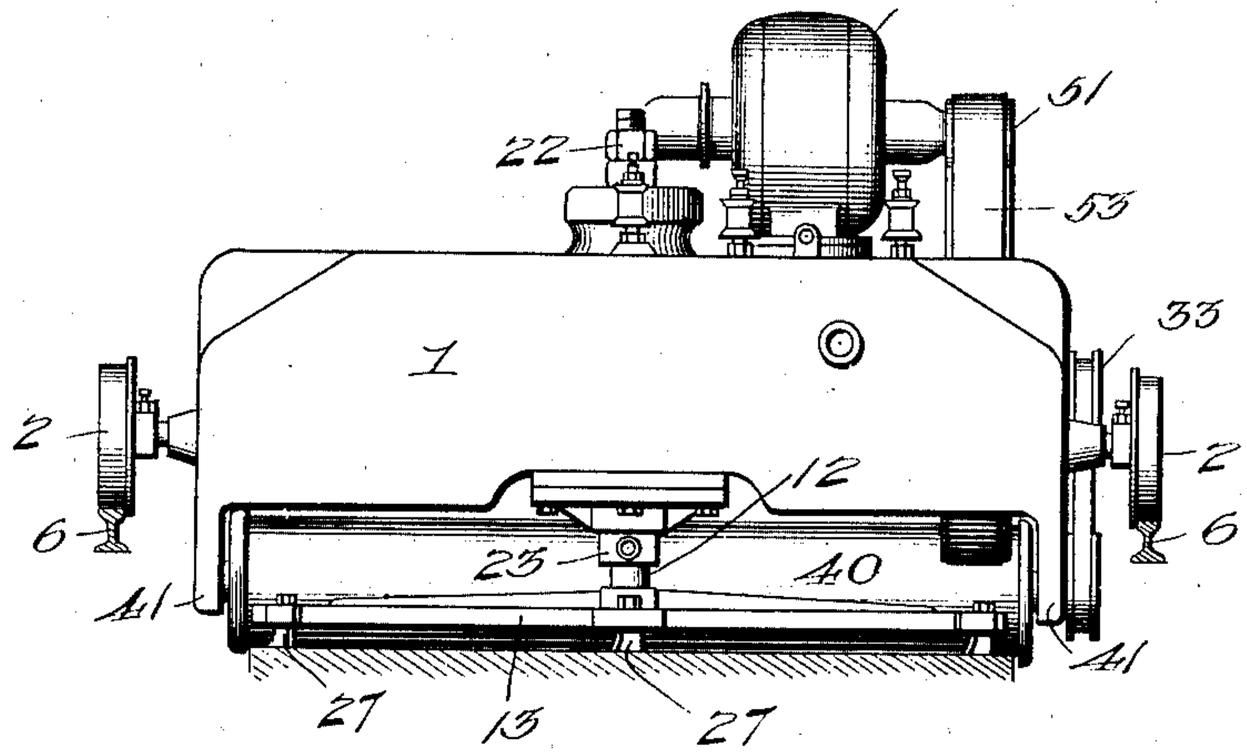
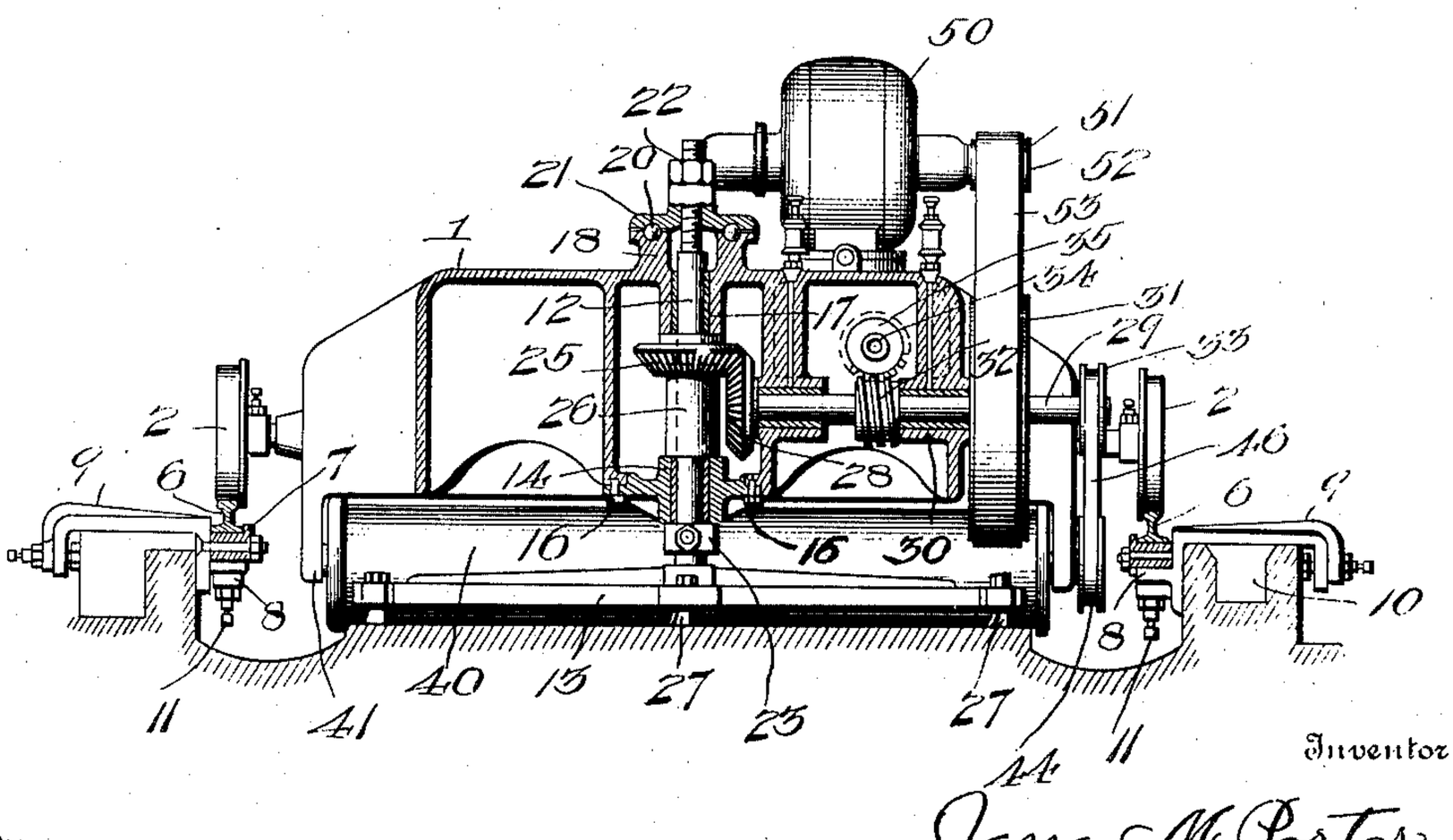


Fig. 4.



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UNITED STATES PATENT OFFICE.

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BOWLING-ALLEY PLANER.

No. 864,257. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed December 19, 1903. Serial No. 185,814.

To all whom it may concern:

Be it known that I, JESSE M. PORTER, a citizen of the United States of America, residing at Cuyahoga Falls, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Bowling-Alleys Planers; and I hereby 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 pertains to make and use the same.

This invention relates to machines for planing or dressing the surfaces of bowling alleys, and one of the principal objects of the same is to provide a machine for this purpose which will accurately and expeditiously dress the upper surface of a bowling alley to a true horizontal plane and render the surface smooth and level.

Another object is to provide a machine of this character with self propelling means which will move the machine at the required rate of speed longitudinally over the alley to insure a uniform and accurate operation of the planing and smoothing devices upon the entire upper surface of the alley in once passing over the alley.

Still another object of the invention is to provide a cutter head of such diameter as to extend entirely across the bowling alley, in order that the entire surface of the alley may be subjected to the action of the planer without requiring a lateral or transverse movement of the cutter head. Accuracy being of the greatest importance in a machine designed for this purpose, it has been the aim to provide a machine which will require but one trip or movement along the alley to finish the work, and it has been found in practice that greater accuracy may be attained in this manner than by a machine carrying cutters designed to move transversely across the alley while the machine is moved longitudinally from end to end of said alley; or by means of a machine which must be passed more than once over the surface to produce the desired result.

In the accompanying drawings: Figure 1 is a plan view of a machine made in accordance with this invention, and showing the machine mounted upon a track extending longitudinally of a bowling alley. Fig. 2 is a central longitudinal section of the same on a larger scale than Fig. 1. Fig. 3 is a front elevation of the machine. Fig. 4 is a transverse section.

The frame 1 of the machine may consist of a single casting of the required shape to support and carry the operative mechanism, and this frame is mounted upon the flanged wheels, 2, the axles 3, 4, extending transversely through the frame 1 and through central bearings or brackets, 5, securing to or formed integral with the frame 1.

In order that the machine may be adjusted to insure a true horizontal position of the cutter head, the rails 6 are seated at required intervals in chairs, 7, resting upon the horizontal lugs 8 formed upon the clamps 9, said clamps being rigidly secured to the ball return raceway, 10, as shown in Fig. 4, or to the curb opposite said raceway, as illustrated in said figure. Provision is made for firmly securing the rails 6 in the chairs 7, and in order that accurate vertical adjustment of the rails may be secured, set screws, 11, are provided. When the rails 6 shall have been adjusted to a true horizontal level, and firmly clamped in such position, the machine when traversing the track must move in a like horizontal plane. Journaled centrally in the frame 1 is a vertical shaft 12, to the lower end of which the cutter head, 13, is secured. This shaft 12 is journaled in upper and lower bearings, provided with bushings, the lower bearing 14 being formed in a face plate 15, detachably secured to the frame 1 by screws 16. The upper bearing 17 may be integral with the frame 1, as shown best in Fig. 2. A boss, 18, extending above the frame 1 is provided with an annular ball raceway, 19, for the steel balls 20, the bearing cap 21, also provided with a raceway for the balls 20, being mounted upon the upper screw threaded end of the shaft 12 and held in place by the nut 22. Under the lower bearing 14 a collar, 23 is secured to the shaft 12 by a set-screw 24. A bevel gear 25 is splined to the shaft 12, and a sleeve 26 surrounds said shaft below the gear 25, for a purpose which will presently appear. The cutter head, 13, consists of a skeleton wheel having a central hub through which the shaft 12 passes, and a number of spokes extending from the hub to an outer rim. At a point in line with each spoke, the rim has a plane flat surface to form a seat for the cutting tool or planer bit, 27. In the present instance six cutting tools are disclosed, but it will be understood that any desired number may be utilized.

It will be noted that the cutter head 13 is of a diameter sufficient to extend entirely across the surface of the alley, and thus the entire lateral area of the alley is operated upon as the machine is moved longitudinally along the track.

The bevel gear 25 meshes with a like gear 28 fixed to the end of the shaft 29, journaled in horizontal bearings, 30, in the frame 1. A belt pulley 31 is keyed to the shaft 29 outside the frame 1, and a worm 32 is also fixed to the shaft between the bevel gear 28 and the pulley 31, as shown in Fig. 4 of the drawings. On the outer end of the shaft 29 a small grooved belt pulley 33 is secured. Journaled at its ends in the frame 1 is a longitudinal shaft 34 to which is fixed a worm 35 which engages the worm 32 on shaft 29. A sliding clutch 36, which carries a worm 37, is mounted on the shaft 34 and may be shifted by means of the lever 38, (Fig. 2). The worm 37 engages a worm 39 fixed to the front axle 3. A sand paper roll 40, is journaled in adjustable bearings 41, at the rear end of the machine, the bearings 41 being connected to the threaded rods

42 fitted with nuts 43 for adjusting the roll at the required height relatively to the planer. A pulley 44 on the end of the axle 45 of the sand-paper roll is connected by a belt 46 to the grooved pulley 33, said belt passing over a belt guide and tightener 47 adjustable by means of the threaded rod 48 and nuts 49 to guide and give the required tension to the belt 46.

The machine is designed to be actuated and propelled by means of a suitable motor, as 50, mounted upon the frame 1, the pulley 51 on the driving shaft 52 of the motor being connected by a belt 53 to the belt pulley 31. The motor 50 may be moved by means of the set screws 54 to give the necessary tension to the belt 53. Secured to the frame 1 in front of the axles 3 and 4 are the laterally extended brackets 55, in which the shanks 56 of brushes 57 are adjustably secured by the binding screw 58.

The various adjustments and the operation of the machine may be described as follows:—After the rails 6 have been firmly secured in accurate horizontal position, by the means described, the machine is placed upon the track and the cutter head 13 is vertically adjusted to the desired depth of cut by turning the set screw 24 to release the collar 23 from the shaft 12, the nut 22 being adjusted on the threaded end of the shaft 12 to raise or lower the shaft and the cutter head carried thereby. The bevel gear 25 is fitted to slide on the shaft 12, but it revolves with the shaft owing to the spline and groove. When this adjustment has been made, the collar 23 is again secured in position on the shaft 12, as will be understood. The sand paper roll is also adjusted relatively to the cutter head and the machine is then set in motion. The shaft 12 carries the bearing cap 21 which rests upon the steel balls 20 and the worm 37 being shifted into engagement with the worm 39, the machine is moved at the required rate of speed along the track. The brushes 57 keep the rails clear of chips or small particles which would have a tendency to interfere with the exact horizontal position of the machine while moving over the track and thus produce a defective place on the surface of the alley. The sand paper roll is revolved in a direction opposite to the rotation of the traction wheels, and insures a smooth surface to the alley at one operation of the machine.

From the foregoing it will be obvious that the machine is comparatively simple and compact in construction, is capable of adjustment to meet various conditions of work to be done, and will perform its work in an accurate and efficient manner.

It will also be understood that by providing a number of bits in the cutter head any imperfection in the cutting edge of one blade is corrected or compensated by the other blades and that if there is a nail or similar projection on the floor which is being planed the first blade that strikes it will remove it and the following blades will not be injured.

Having thus fully described the invention, what is claimed therefor is:—

In a machine for leveling and smoothing the surfaces of bowling alleys, a cutter head of substantially the same diameter as the width of the alley connected to a vertical shaft, a sand paper roll mounted on a horizontal axis, a motor on the machine frame, and connections whereby the motor revolves the cutter shaft, moves the machine over the alley and rotates the sand paper roll.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses.

JESSE M. PORTER.

Witnesses:
VICTOR C. LYNCH,
G. M. HAYES.