N. C. QVIST & W. H. NORDSTRÖM.

PAVING RAMMER.

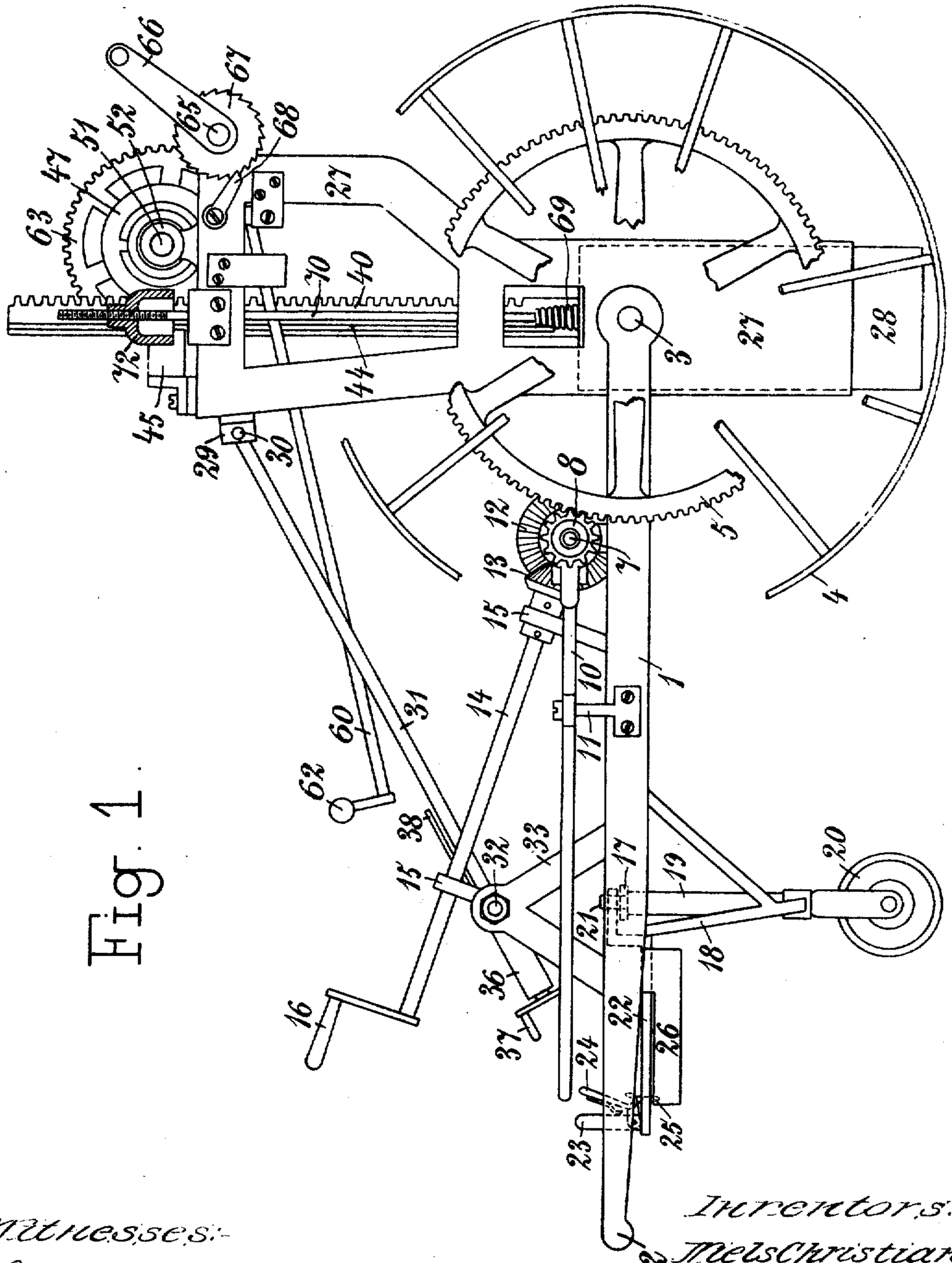
APPLICATION FILED JAN. 18, 1908.

**914,603.**

**Patented Mar. 9, 1909.**

3 SHEETS--SHEET 1.

Fig. 1.

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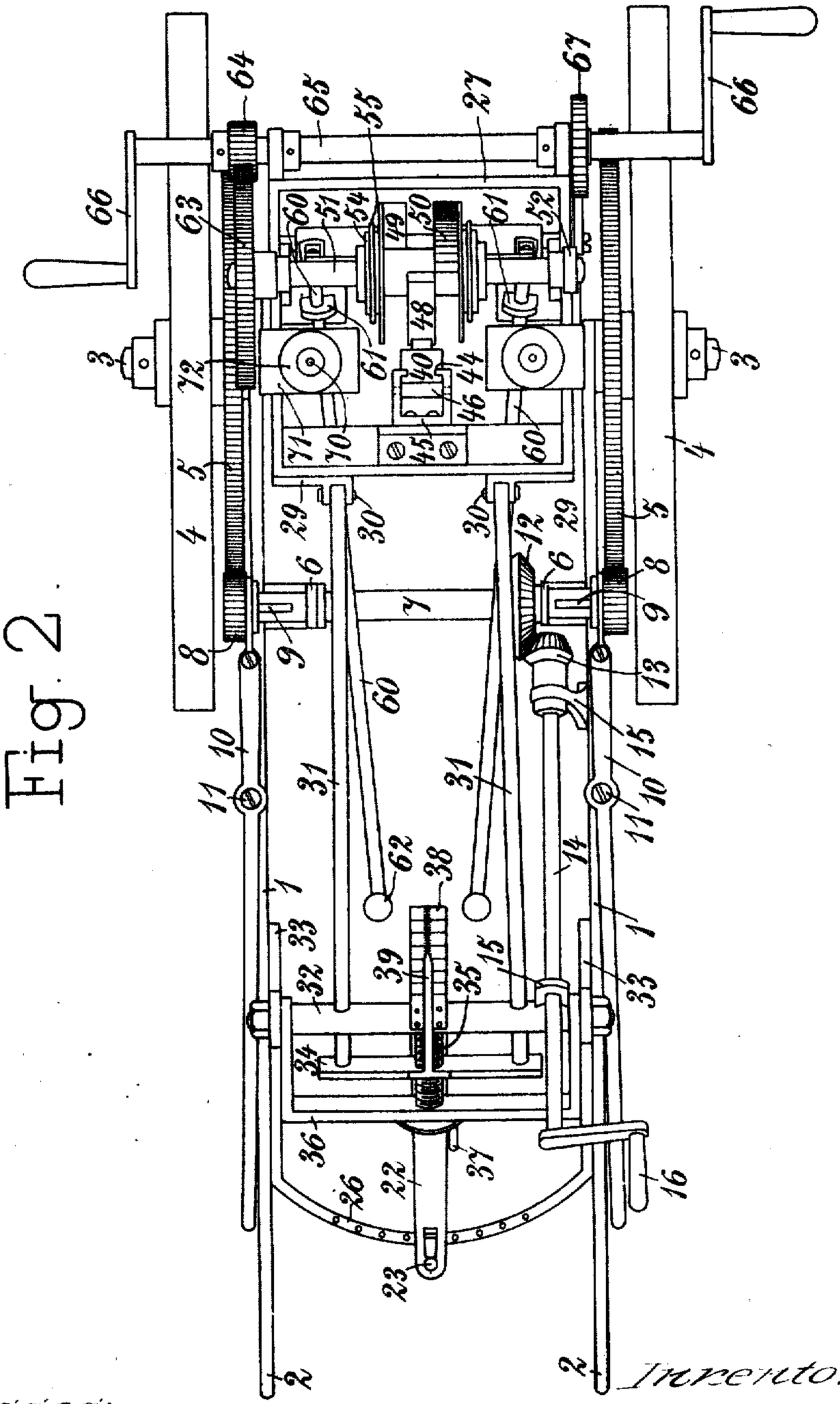
3 SHEETS—SHEET 2.

Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 4

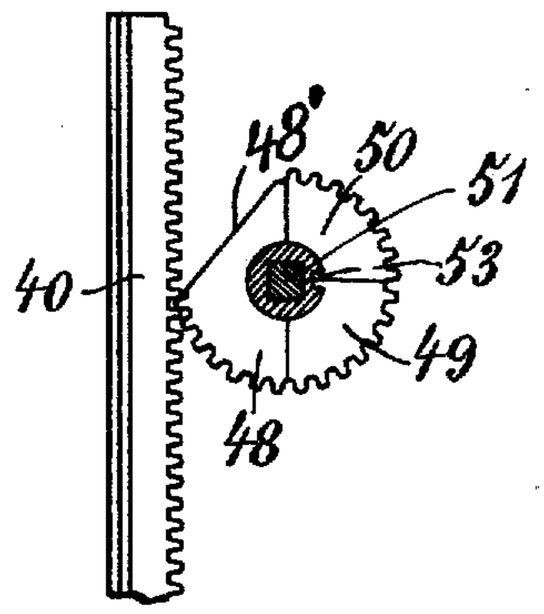



Fig. 3

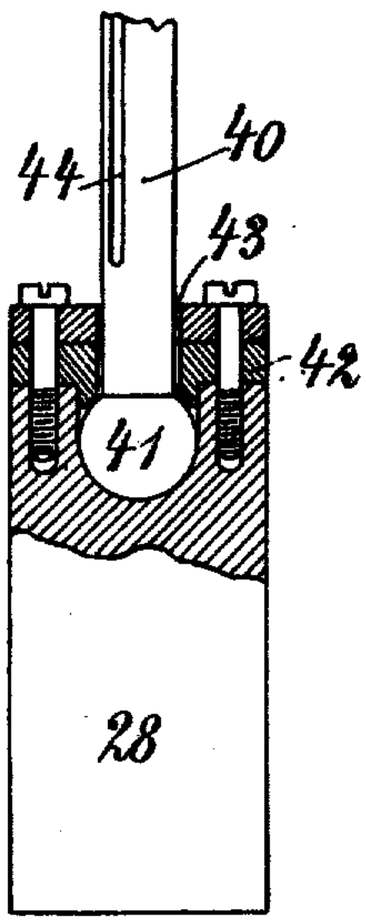
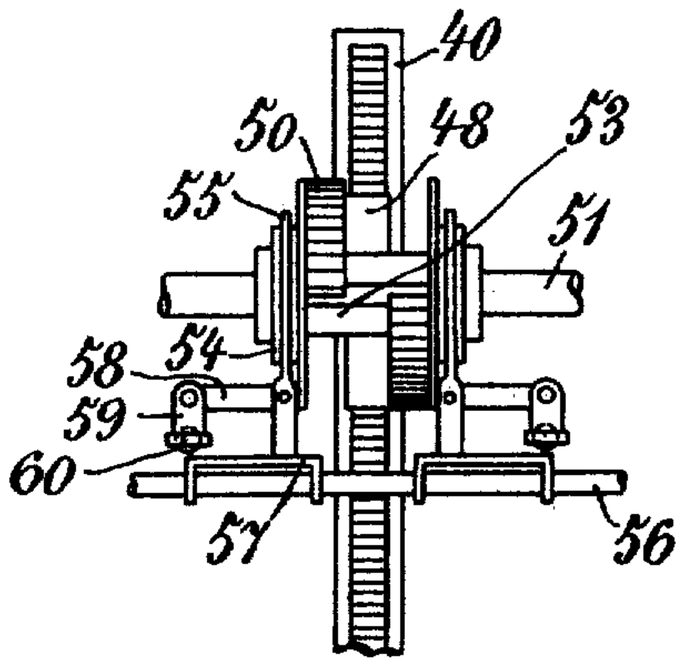



Fig. 5

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# UNITED STATES PATENT OFFICE.

NIELS CHRISTIAN QVIST AND WILHELM HERMANN NORDSTRÖM, OF HORSENS, DENMARK.

## PAVING-RAMMER.

No. 914,603. Specification of Letters Patent. Patented March 9, 1909.

Application filed January 18, 1908. Serial No. 411,490.

*To all whom it may concern:*

Be it known that we, NIELS CHRISTIAN QVIST, a subject of the Kingdom of Denmark, residing at 29 Fabriksvej, Horsens, Denmark, and WILHELM HERMANN NORDSTRÖM, a subject of the Empire of Germany, and residing at 36 Smedegade, Horsens, Denmark, have invented a new and useful Paving-Rammer; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to road making machines and has to do with an improved mechanism for operating a gravity paving hammer therefor, together with improved mechanism for controlling the machine and regulating the operation of the hammer.

The invention will be more fully described in connection with the accompanying drawings and will be more particularly pointed out and ascertained in and by the appended claims.

In the drawings Figure 1 is a view in side elevation of a road making machine embodying the main feature of our invention. Fig. 2 is a plan view thereof. Fig. 3 is a detached detail view of the tamping hammer and parts connected therewith. Fig. 4 is a detached detail view of a portion of the operating mechanism for the hammer showing the same in side elevation. Fig. 5 is a view of the part shown in Fig. 4 in front elevation.

Like numerals of reference designate similar parts throughout the different figures of the drawing.

As shown the device of our invention includes a frame 1 mounted upon supporting wheels 4 which wheels, which will hereinafter more fully appear, are driven by the operator. The frame 1 is provided with extensions 2 in the form of handles whereby the machine may be advanced by the operator to such position on the pavement or road as it may be desired to operate. The wheels 4 are mounted upon independent axles 3 which are journaled in the frame 1 and support on their inner ends a frame 27. Gear wheels 5 are provided for imparting rotation to the wheels 4 and pinions 8 are slidably and non-rotatably mounted on a shaft 7, as by being splined at 9, and said pinions 8 mesh with gears 5. Levers 10 pivotally mounted on the frame at 11 are provided for independently throwing the pinions 8 into and out of a mesh relation with the gear wheels 5. A bevel gear 12 is secured to the shaft 7, which is mounted in bearings 6, and said bevel gear 12 meshes with a bevel gear 13, secured to a shaft 14. Said shaft 14 is mounted on its rear end with a crank 16 and is mounted in bearing 15.

It will be noted that by throwing both gears into mesh with the gear wheels 5 the operator may advance the machine slowly during the paving operation by turning the crank 16, in a straight direction. By throwing either of the gears 8 out of mesh with their respective gears 5 the direction in which the machine is advanced may be changed in accordance with which bevel gear 8 is retained in mesh with its respective gear 5. This result is obtained by reason of the fact that the wheels 4 are mounted upon independent axles.

The lower portion of the frame 27 is contracted at 27′ to inclose a hammer 28 and guide the same during its reciprocating movement. The mounting of the frame 27 on the axle 3 forms a pivot about which said frame may be turned and in order to change the line of travel of the hammer 28 in either direction from the vertical means are provided for adjusting the frame 27 on the axles 3 and locking the frame in its adjusted position.

As shown rods 31 are pivoted at 30 to brackets 29 the latter are secured to the frame 27. The rear ends of the rods 31 extend through a transverse member 32 supported in brackets 33 on the frame 1 and the extreme ends of the rods 31 are connected to a nut which may be in the form of a bar 34. The bar or nut 34 is provided with an index 39 which travels abreast of a suitably graduated strip 38 secured to the member 32. An adjusting screw 35 has threaded connection with the bar or nut 34 and extends through a yoke 36 and carries on its outer end a hand wheel 37. The yoke 36 is pivoted on the member 32 so as to accommodate for the different angles which the rods 31 assume when the frame 27 is adjusted to the right or left of the position shown in Fig. 1. It will be readily seen that as the adjusting screw 35 is longitudinally immov-

able with respect to the yoke 36 that by turning the hand wheel 37 the desired adjustment of the frame 27 will be secured through the connection hereinbefore described.

Reference will next be had to improved means for operating the hammer 28 and varying the stroke thereof.

As shown in Fig. 3 there is formed in the upper end of the hammer 28 a socket adapted to receive a ball 41 formed on the lower end of an operating rack 40. The ball 41 is retained in the socket formed in the hammer 28 by plates 42 bolted to said hammer and having openings 43 to which the rack 40 extends. The rack 40 is provided with grooves 44 engaged by a guiding member 45 secured to the frame 27. The guiding member 45 may be provided with a roller 46 for reducing the friction of the rack 40 in said guide. A rack actuating shaft 51 is mounted in bearings 52 disposed on the frame 27 and is provided with a gear wheel 63 meshing with a pinion 64 mounted on a crank or guiding shaft 65. Said shaft 65 is mounted in suitable bearings as shown, and is provided with cranks 66 in cases where the hammer is to be driven manually. If it is desired to maintain the hammer 26 in an elevated position out of contact with the pavement when the machine is moved from place to place a ratchet-wheel 67 may be rigidly secured to the shaft 65 and engaged by a pawl 68. The pawl 68 is preferably pivoted in a manner so that it will normally swing out of engagement with the ratchet wheel 67 by gravity.

Gearing instrumentalities are provided for varying the stroke of the hammer 28 so that if a relatively light impact is desired between the hammer and the road surface the hammer will be raised a relatively limited extent and then permitted to fall, whereas if an impact of greater force is desired the upward stroke of the hammer is relatively increased so that its fall through a greater distance will correspondingly increase the force of the impact. According to the present invention the variation of the stroke of hammer can be effected without in any way altering or changing the operation of the crank shaft.

On the shaft 51 there is non-rotatably mounted a sleeve 53 on which a rack segment 48 is rigidly secured in a manner to mesh with the rack 40, as shown in Fig. 4. The sleeve 53 is screwed or splined so that segments 49 and 50 can be slidably and non-rotatably mounted thereon. Segments 49 and 50 rotate with the sleeve 53 and are so disposed thereon and are so proportioned with respect to the segments 48 that both the segments 49 and 50 may be shifted into and out of alinement with the segment 48 to increase or decrease the length of stroke of the hammer 28. The segment 48 is cut away at 48′ so as to free the rack 40 and permit the hammer to descend by gravity when the portion 38 is rotated abreast of the rack 40. It will thus be seen that when the segments 49 and 50 are out of alinement with the segment 48, as shown in Fig. 5, the segment 48 will engage the teeth of the rack 40 and raise the same until the last tooth of the segment 48 has been withdrawn from said rack. As shown in Fig. 4 this adjustment would raise the rack a distance equal to the peripheral length of the seven (7) teeth on the segment 48. If a slightly greater rising movement of the hammer is desired the segment 49 is adjusted inwardly into alinement with the segment 48 so that it will be brought into mesh with the rack 40. If a still greater lifting movement of the rack is desired the segment 50 may be adjusted inwardly in alinement with the segment 49 so that at each revolution of the shaft 51 the rack 40 will be raised a maximum distance. Each rack segment 49 and 50 is provided with a hub 54 slidable upon the sleeve 53 and each hub is engaged by a shifter connected with a support 57 slidably mounted upon a rod 56. Each shifting member 55 is provided with an extension 58 which is pivoted to a crank 59 of an operating rod 60. The operating rods 60 are mounted in bearings 61 and carry on their inner ends cranks 62 adapted for manipulation by the operator.

When it is desired to slightly retard the action of the hammer so as to prevent the same from engaging the pavement or road bed with an impact such as would result from the fall of the hammer when released by one or more of the segments 48 to 50 inclusive springs 69 may be connected with the hammer 28 and rods 70 and said rods may extend freely through brackets 71 and carry on their upper ends adjustable nuts 72. The nuts 72 may be adjusted as desired so as to effect yielding action of the springs 69 and consequent retardation of the stroke of the hammer to any extent desired.

If both of the gear pinions 8 are in mesh with gear wheels 5 and it is desired to steer the advancing machine in a straight or other direction an adjustable steering wheel 20 may be provided. As shown said wheel 20 is carried on a spindle 19 which is mounted in a bracket 18 and a transverse member 17. On the upper end 21 of said spindle 19 a lever 22 is secured and is provided with a handle 23 which may be engaged by the operator and adjusted as desired.

In order to retain the wheel 20 in its position of adjustment a quadrant 26 may be secured to the frame 1 and provided with a plurality of recesses as clearly shown in Fig. 2. A suitable locking device as indicated at 24 and 25 is provided on the lever 22 to lock the same through the quadrant 26 in any po-

sition to which the lever 22 may be adjusted.

We claim:—

1. A road making machine comprising in combination, a truck, a tamping hammer therefor, a rack connected with said hammer, gear segment meshing with said rack, means for operating said segment, and toothed gearing means for increasing the toothed portion of said segment to increase the stroke of said hammer.

2. A road making machine comprising in combination, a truck, a gravity acting tamping hammer therefor, a rack connected with said hammer, a gear segment meshing with said rack and serving to raise and release the same, means for operating said segment, and means for increasing or decreasing the toothed portion of said segment.

3. A road making machine comprising in combination, a truck, a gravity acting tamping hammer therefor, means for operating said hammer, and toothed gearing instrumentalities interposed between said means and hammer and including devices whereby the stroke of said hammer may be varied.

4. A road making machine comprising in combination, a truck, a gravity acting tamping hammer, a rack connected with said hammer, a gear segment meshing with said rack, means for operating said segment to raise and release said rack, and an auxiliary segment for increasing the toothed portion of said first mentioned segment.

5. A road making machine comprising in combination, a truck, a gravity acting tamping hammer therefor, a rack connected with said hammer, a main gear segment meshing with said rack for raising and releasing said hammer, means for operating said main segment, and a plurality of auxiliary segments for increasing the toothed portion of said main segment.

6. A road making machine comprising in combination, a truck, a gravity acting tamping hammer therefor, a rack connected with said hammer, a main gear segment meshing with said rack for raising and releasing said hammer, means for operating said segment, a plurality of auxiliary segments, and means for adjusting said auxiliary segments into and out of alinement with said main segments to increase or decrease the toothed portion of said main segment.

7. A road making machine comprising in combination, a truck, a gravity acting tamping hammer therefor, a rack connected with said hammer, a segment shaft, means for operating said shaft, a main segment rigidly secured to said shaft and meshing with said rack for raising and releasing said hammer, a plurality of auxiliary segments slidably and non-rotatably secured to said shaft, and means for adjusting said auxiliary segment into and out of alinement with said main segment to increase or decrease the toothed portion thereof.

8. A road making machine comprising in combination, a tamping hammer, and toothed gearing instrumentalities for operating said hammer, said instrumentalities including devices for varying the stroke of said hammer.

9. A road making machine comprising in combination, a supporting frame, two supporting wheels therefor, an axle for each wheel journaled in said frame, a hammer frame pivotally mounted on the inner ends of said axles between said wheels, a hammer reciprocally mounted in said frame, for operating said hammer, said operating means being wholly supported on said hammer frame, and means for adjusting said frame to vary the line of travel of said hammer.

10. A road making machine comprising in combination, a truck provided with two axles, a supporting wheel for each axle, means for effecting rotation of said supporting wheels independently or in unison, a frame mounted on said axles, a hammer mounted in said frame, means disposed on said frame for operating said hammer, means associated with said truck and frame for tilting the latter, a guiding or steering trailer wheel for said truck; and means for adjusting and rocking said steering wheel into its adjusted position.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

NIELS CHRISTIAN QVIST.
WILHELM HERMANN NORDSTRÖM

Witnesses:
FLEISCHER,
F PETERSEN.