No. 885,984. PATENTED APR. 28, 1908.

N. DE WIND & F. R. JONES.

GASOLENE ROAD ROLLER.

APPLICATION FILED MAR. 25, 1907.

5 SHEETS—SHEET 1.

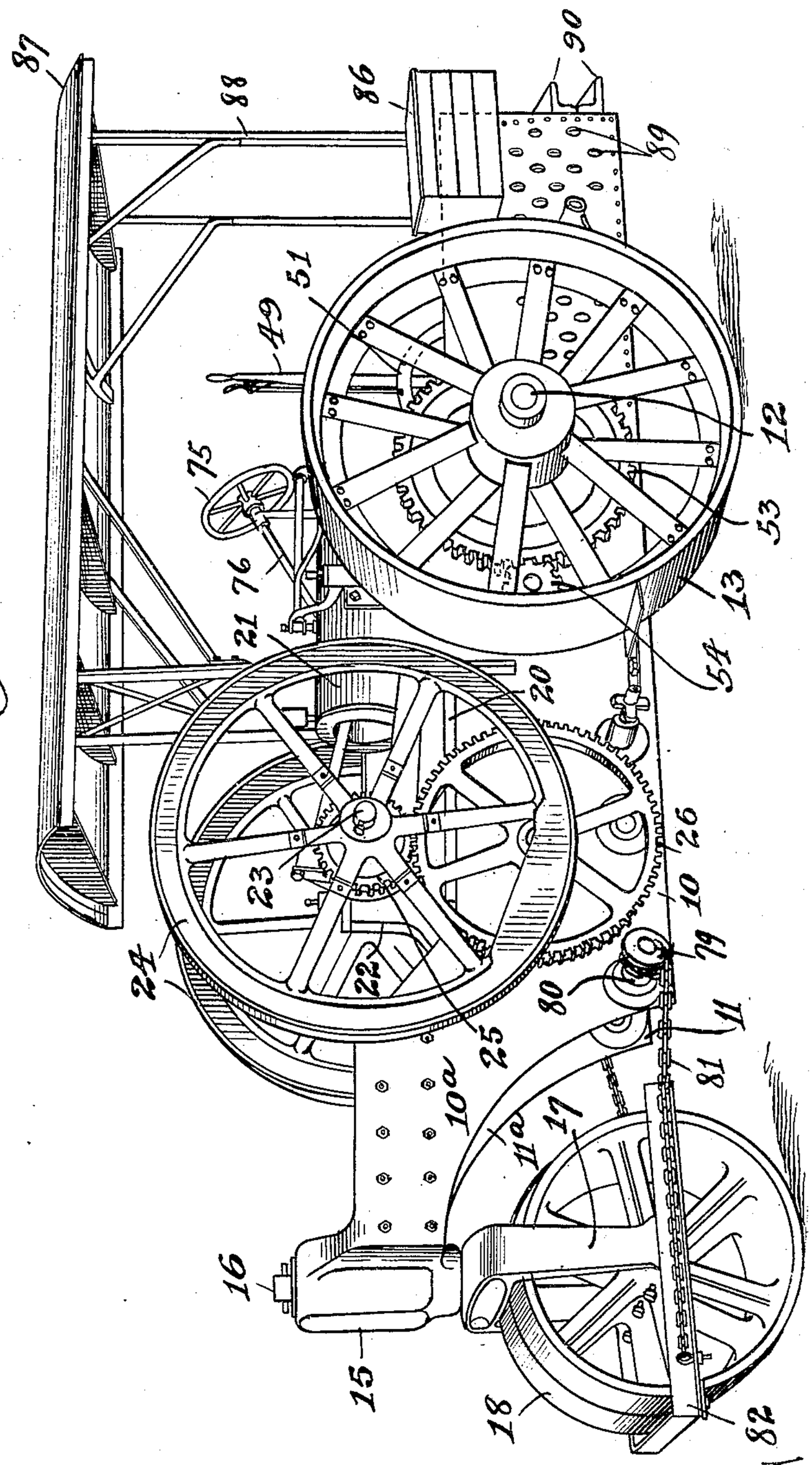

Fig. 1.

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5 SHEETS—SHEET 2.

Fig. 2.

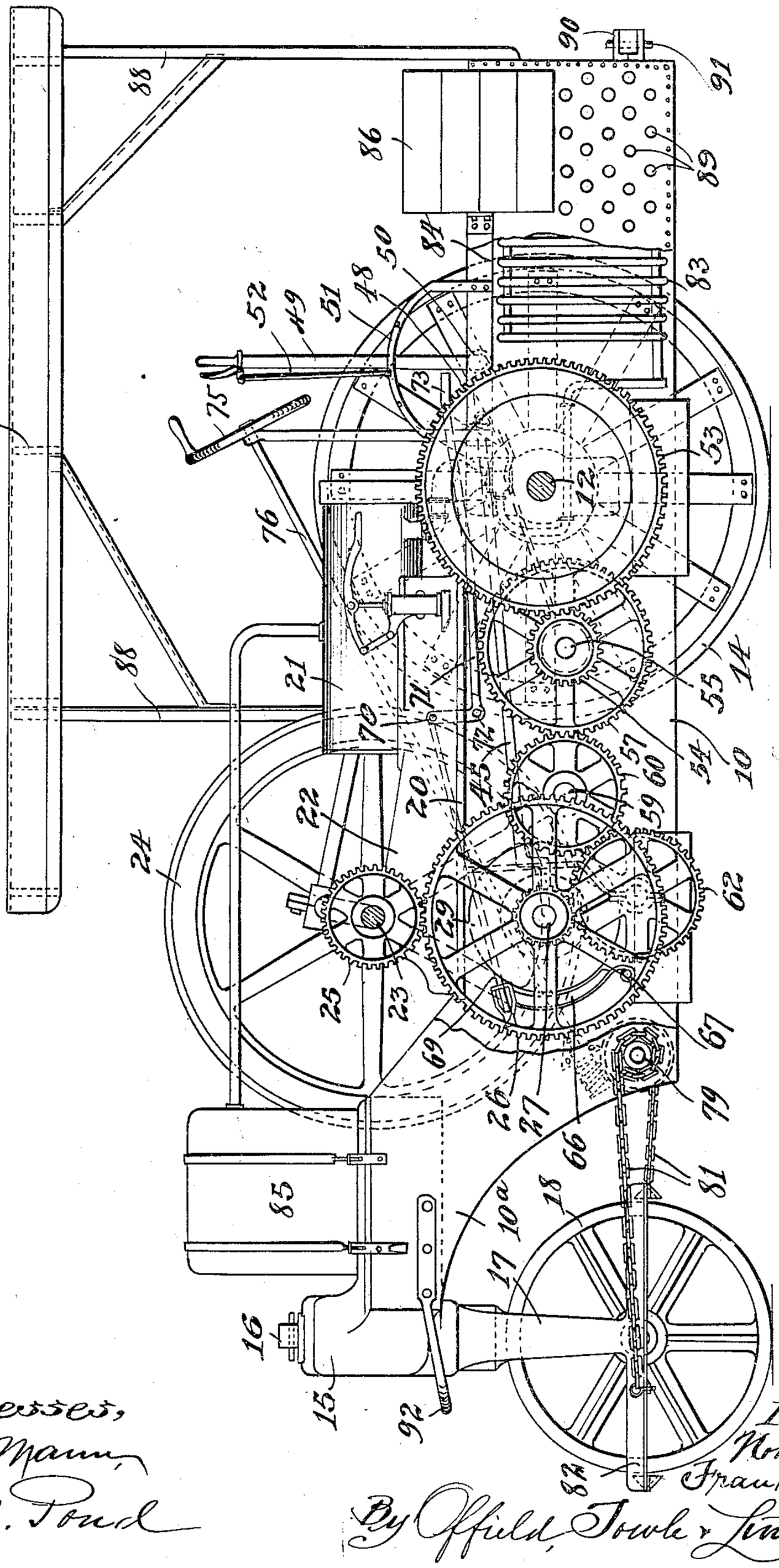

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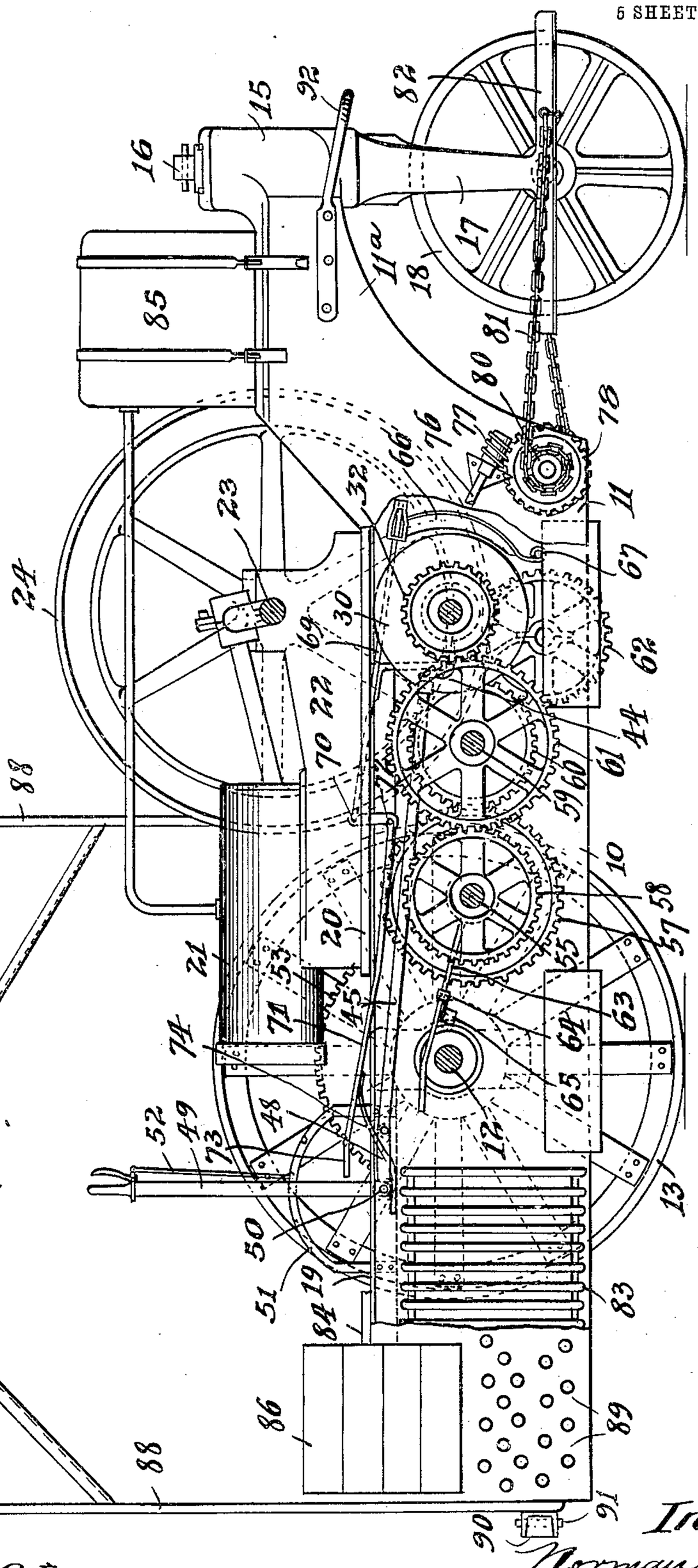
Fig. 3.



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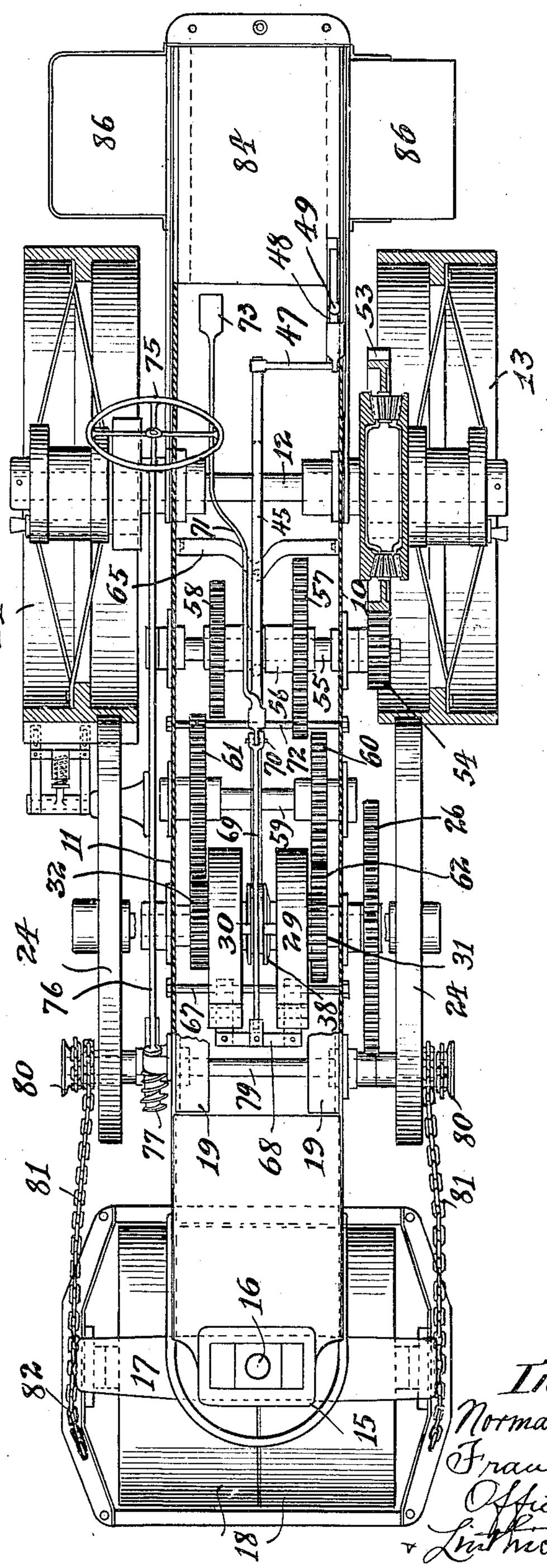
5 SHEETS—SHEET 4.

Fig. 4.



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5 SHEETS—SHEET 5.

Fig. 6.

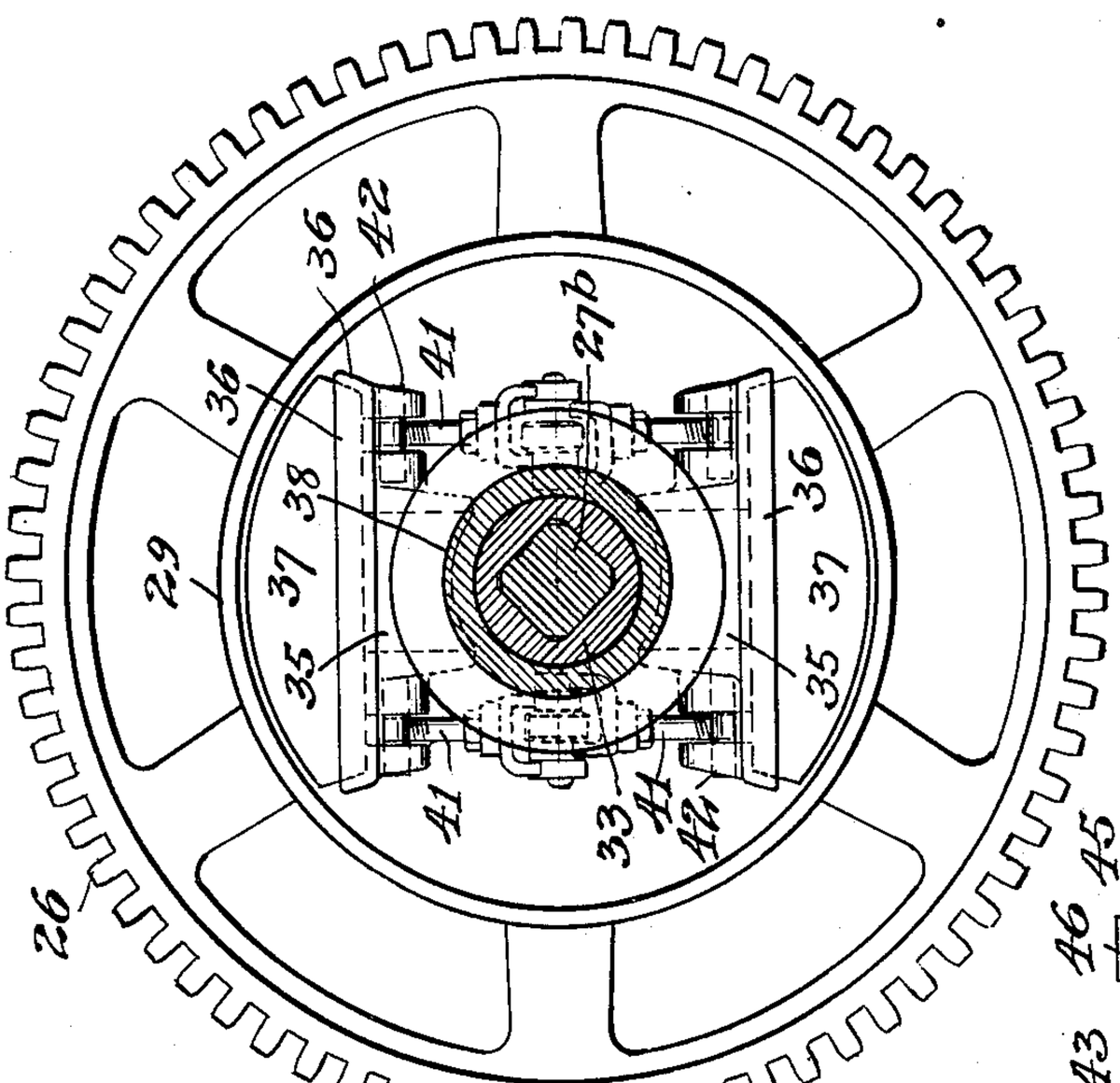


Fig. 5.

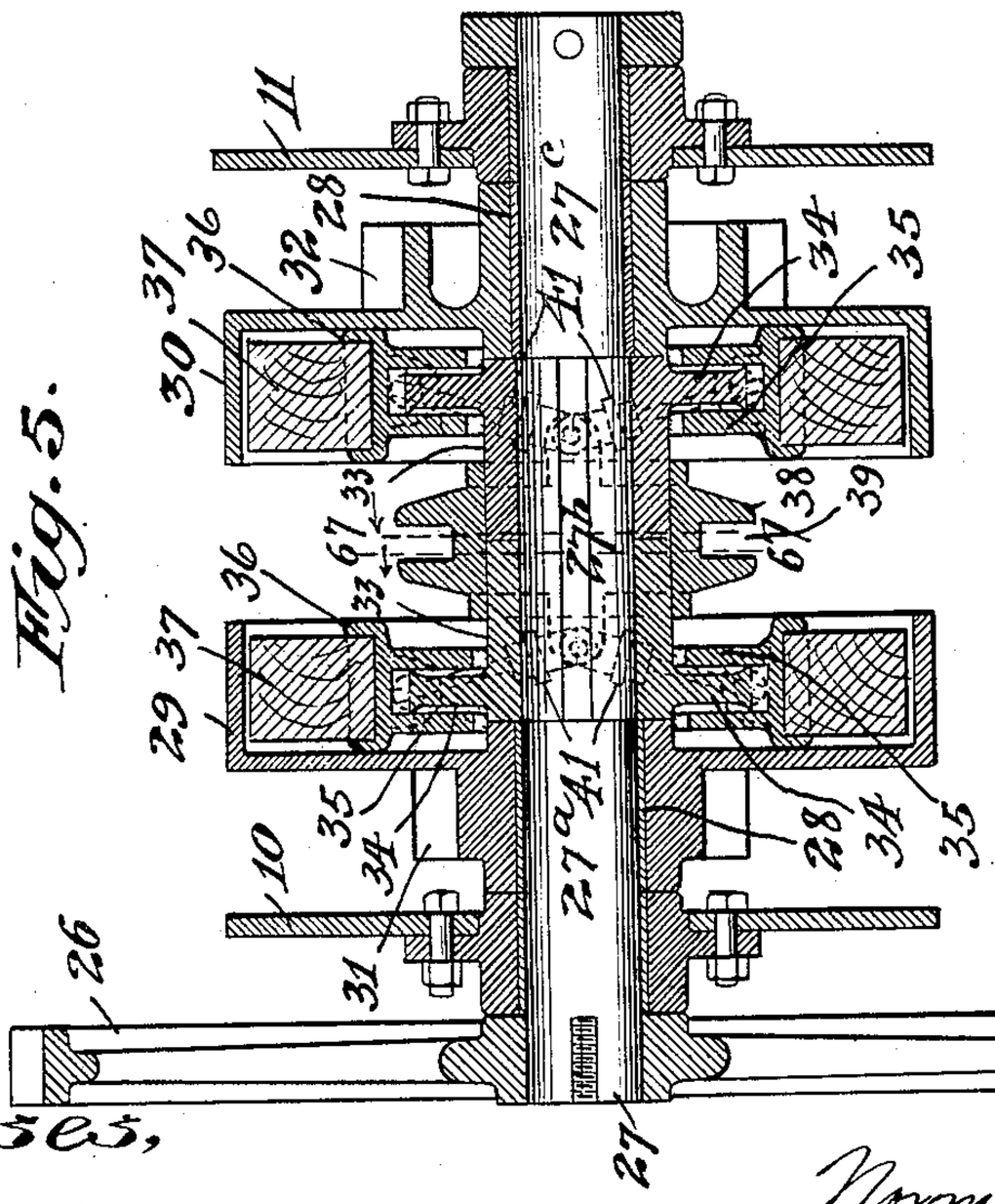


Fig. 7.

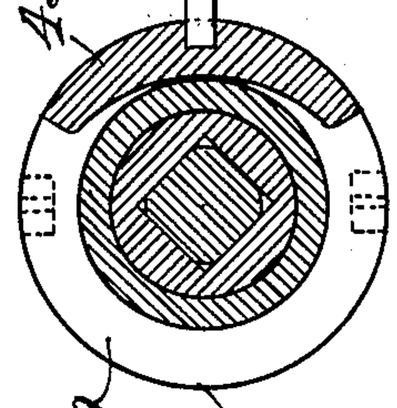
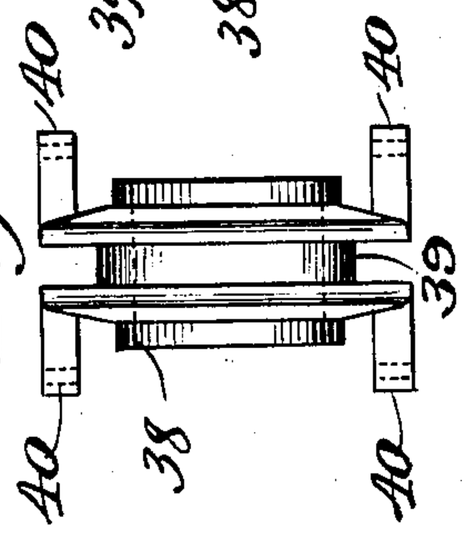


Fig. 8.



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By Offield, Towle & Linthicum
Attys.

UNITED STATES PATENT OFFICE.

NORMAN DE WIND AND FRANK R. JONES, OF HARVEY, ILLINOIS, ASSIGNORS TO AUSTIN MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

GASOLENE ROAD-ROLLER.

No. 885,984. Specification of Letters Patent. Patented April 28, 1908.

Application filed March 25, 1907. Serial No. 364,305.

To all whom it may concern:

Be it known that we, NORMAN DE WIND, a subject of the King of Great Britain, and FRANK R. JONES, a citizen of the United States, both residing at Harvey, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gasolene Road-Rollers, of which the following is a specification.

This invention relates to power-actuated road rollers, and has reference more particularly to a construction of road roller adapted to be propelled by a gasolene or other explosive engine.

The general object of our invention is to provide a power-propelled road roller of superior efficiency and economy of operation as compared with this class of road rollers at present in use; and to this end our invention resides in several novel features and combinations of parts, relating principally to the means for transmitting the power of the engine to the traction shaft; to means for reversing the direction of travel of the roller; to means for changing the speed of the roller, which is effected through a variation in the relative diameters of certain of the transmission gears; and to means for applying a braking action.

Other minor features of improvement will appear in connection with the subjoined description of the accompanying drawings, which illustrate an approved mechanical embodiment of our invention, and wherein,—

Figure 1 is a perspective side elevation of the complete roller; Fig. 2 is a side elevation, partly in longitudinal vertical section, just inside one of the longitudinal side-plates of the main supporting frame, more particularly illustrating the train of gears through which the power is transmitted when propelling the roller in one direction, and also showing a supplemental radiator which may be employed to cool the jacketing fluid of the engine; Fig. 3 is a similar side elevation, viewed from the opposite side, and partially in longitudinal vertical section, more particularly showing the other train of gears for propelling the roller in the opposite direction; Fig. 4 is a plan view of the machine, partly in horizontal section, with the motor removed; Fig. 5 is a longitudinal section on an enlarged scale through the clutch-shaft, more particularly showing the means for reversing the direction of travel of the roller; Fig. 6 is a cross-sectional view on the line 6—6 of Fig. 5; Fig. 7 is a detail cross-sectional view through the clutch-sleeve on the line 7—7 of Fig. 5, omitting the illustration of the clutch-member; and Fig. 8 is a detail plan view of the clutch-sleeve, detached.

Referring to the drawings, and first describing the supporting frame-work of the machine, this comprises as its principal elements a pair of vertical parallel side-plates 10 and 11 that extend substantially the full length of the machine and are of sufficient depth to have the effect of truss-beams to support the heavy parts carried thereby, and afford a strong and rigid carriage. These side-plates are suitably journaled on a rear axle 12 carrying the broad rear traction wheels 13 and 14; and at their forward ends they are arched upwardly in the form of necks 10^a and 11^a, and are suitably bolted to the shank of a head post 15, this latter being pivotally mounted on the spindle 16 of a fork 17, in which is journaled the broad divided front wheel or roller 18 of the machine. The side-plates 10 and 11 are rigidly connected and spaced through the medium of angle-bars 19 riveted to the inner sides of said side-plates along their upper edges, which angle-bars are bridged by the engine bed 20, on which is carried the engine cylinder 21. On the engine bed 20 are bearing-blocks 22 in which is journaled the cranked engine shaft 23, carrying at its outer ends and overlying the side-plates of the frame, the balance wheels 24. On the engine shaft, just inside one of the balance wheels 24 is a gear 25 that meshes with and drives a larger gear 26 fast with a counter-shaft 27 suitably journaled in and between the side-plates 10 and 11 of the frame. The shaft 27 (Fig. 5) has a cylindrical portion 27^a to which the gear 26 is secured, an intermediate squared portion 27^b, so formed that its diagonal diameter does not exceed the diameter of the circular portion 27^a, and another circular portion 27^c of less diameter than the portion 27^a. On bushings 28 loosely surrounding the circular portions 27^a and 27^c are mounted a pair of inwardly facing cup-shaped clutch-disks 29 and 30, said disks having integral with their outer sides gears 31 and 32, respectively, of differ-

ent diameters. On the squared intermediate portion 27^b of the shaft are mounted a pair of sleeves 33 each having a pair of oppositely disposed radially projecting arms 34, over which are telescoped the hollow stems 35 of the clutch-heads 36 each carrying a wooden or other friction clutch-shoe 37 conforming in shape with and adapted to engage the inner periphery of the disks 29 and 30. On the sleeves 33 is loosely mounted a clutch-sleeve 38. This sleeve has a central annular groove 39, and at its ends longitudinally projecting lugs 40 that are apertured to carry the pivot-pins of toggle arms 41, the outer ends of which are tapped into pivot-pins 42 mounted in suitable bearings on the inner sides of the clutch-heads 36. A shoe 43 (Fig. 7) lies in the annular groove 39, and this shoe is engaged on its outer side by the crank 44 of a clutch-shifting rod 45 that is mounted in suitable bearings 46 and extends upwardly over the rear axle 12, as shown in Fig. 4, and is provided at its outer end with an arm 47 having a loose bearing in the end of the short arm 48 of an angle-lever 49 pivoted at 50 to a member of the machine frame, the arm 49 lying alongside the usual segment-rack 51 and provided with the usual pawl 52 for holding it in idle or operative positions.

From the foregoing it will be plain that by throwing the lever arm 49 forwardly of its intermediate position, the clutch-sleeve 38 will be shifted to apply one set of clutch-shoes, and by throwing said lever to the other side of the center, the clutch-sleeve will be similarly actuated in the opposite direction to apply the other set of clutch-shoes.

The rear axle is provided with the usual differential gear, the central gear-ring of which is shown at 53 and is engaged by a pinion 54 on a counter-shaft 55 journaled in and between the side-plates 10 and 11. Splined on the shaft 55 is a sleeve 56 (Fig. 4) that carries on its opposte ends speed-changing gears 57 and 58, of different diameters. Fast on another counter-shaft 59 journaled in and between the side-plates of the frame, are a pair of intermediate transmission gears 60 and 61. The gear 61 meshes directly with the gear 32 on the outer face of the clutch-disk 30; and the gear 60 is operatively connected with the gear 31 of the companion clutch-disk 29 through an intermediate idler gear 62 suitably journaled in the side-plates 10 and 11. The gears 57 and 58 carried by the sliding sleeve 56 are spaced apart such a distance that when the gear 58 is engaged with the gear 61 the gear 57 is disengaged from the gear 60; and, conversely, when the gear 57 is engaged with the gear 60, the gear 58 is disengaged from the gear 61.

From the foregoing it will be seen that the train of gears from the clutch-disk 29 to the differential gear contains one more gear than the corresponding train between the clutch-disk 30 and the differential gear. Consequently, when one train of gears is operative, the roller is propelled in one direction, and when the opposite train is operative the roller is propelled in the reverse direction. The sleeve 56 is shifted by a simple lever mechanism consisting of a forked lever 63 pivoted at 64 to a cross-bar 65 and extending rearwardly over the rear axle to a point within reach of the operator adjacent to the main operating lever 49. It will also be observed that, by reason of the difference in diameter of the gears 57 and 58, when the drive is through the former the speed of propulsion will be less than when the drive is through the latter or smaller gear 58. Moreover, the proportions of the gears of both trains to one another are such that either of the two speeds can be used in both backward and forward road movements; in other words, the machine can run either backward or forward at a slow speed or at an increased speed, the machine having the capability of the same speed of travel, whether fast or slow, in both forward and backward directions.

In connection with the power-transmission mechanism above described, we have provided a simple form of brake mechanism which consists of a pair of brake-shoes 66 pivoted on a transverse rod 67 extending between the side-plates of the frame, said brake-shoes lying against the outer peripheries of the clutch-disks 29 and 30 and being connected at their upper ends by a cross-bar 68, to which latter is secured a connecting rod 69, the rear end of which is pivoted at 70 to an angle-lever 71 itself pivotally mounted on a cross-bar 72, the rear end of said lever terminating in a pedal 73 within convenient reach of the operator. The depression of the pedal 73 rocks the lever 71 and draws inwardly the connecting rod 69 and thus applies the brake-shoes. A spring 74 beneath the free end of lever 71, normally maintains the brake-shoes clear of the clutch-disks.

75 designates a hand wheel on the rear end of an inclined steering-post 76 suitably mounted in brackets carried by one of the side-plates of the frame, the lower end of said steering-post having a worm 77 engaging a worm-wheel 78 fast on a shaft 79 carrying at its ends drums 80 on which are wound chains 81 connected to the opposite sides of a frame 82 carried by the front fork 17.

The engine cylinder is, as usual, provided with a jacket for the circulation of a cooling medium, which may be either water or oil, preferably the latter; and in order to provide for the cooling of such cooling medium, we provide a radiator 83 that may conveniently be located directly beneath the rear platform 84 and between the rear ends of the side-plates; such radiator being connected to

the engine cylinder by suitable piping and centrifugal pump indicated in dotted lines in Fig. 2. We may also, either in addition to or in place of the radiator 83, employ another radiator conventionally illustrated at 85 that is mounted on the upper forward end of the frame just back of the steering-post; this radiator being indicated in Figs. 2, 3 and 4 and omitted in Fig. 1.

Laterally of the rear platform 84, and secured to the side-plates, we have indicated cupboards or boxes 86 that form convenient receptacles for various articles, such as tools, gasolene, batteries, and the like. The rear portion of the machine frame, above the operator's stand and the engine, is preferably supplied with a light canopy 87, suitably supported on corner uprights 88. In connection with the rear radiator 83, and to facilitate the circulation of air therethrough and thereover, we preferably provide in the inclosing side-plates of the frame opposite such radiator a series of holes indicated at 89.

90 indicates a pair of oppositely faced angle beams, or a channel, that may be secured across the rear end plate or door of the machine frame, and may be apertured to receive a vertical coupling pin 91 for the attachment of a tow-line when the machine is used as a traction engine. A clevis or draw-bar 92 secured to the forward end of the side-plates may also serve as a means of attachment for the tow-line from that end of the machine.

We claim;

1. In a power-propelled road-roller, the combination with a frame, a steering-wheel in the forward end thereof, and an axle and pair of traction wheels mounted thereon supporting the rear end, of a gas engine and engine-shaft mounted on said frame, a gear on said axle, two trains of power-transmitting gears between said engine-shaft and axle gear, one transmitting a forward and the other a backward travel to said roller, and a travel-reversing double-clutch serving to simultaneously render either train of gears operative and the other idle, substantially as described.

2. In a power-propelled road-roller, the combination with a frame, a steering-wheel in the forward end thereof, and a pair of traction-wheels supporting the rear end, of a gas engine and engine-shaft mounted on said frame, a differential gear in driving relation to said traction-wheels, two trains of power-transmitting gears between said engine-shaft and said differential gear, one adapted to transmit a forward and the other a backward travel to said roller, a double clutch adapted to render either train of gears operative and the other idle, and a speed-changing mechanism interposed in said gear trains, substantially as described.

3. In a power-propelled road-roller, the combination with a frame, a steering-wheel swiveled in the forward end and a pair of traction wheels supporting the rear end thereof, of a gas engine and engine-shaft mounted on said frame, a counter-shaft beneath and geared to said engine-shaft, a pair of clutch-disks loose on said counter-shaft, a slidable clutch-sleeve splined on said counter-shaft between said clutch-disks, a differential gear in driving relation to said traction wheels, two gear trains between said clutch-disks and said differential gear, respectively, adapted to transmit motion to the latter in opposite directions, and means for throwing said clutch-sleeve into driving engagement with either of said clutch-disks or into an intermediate idle position, substantially as described.

4. In a power-propelled road roller, the combination with a frame, a steering-wheel swiveled in the forward end and a pair of traction wheels supporting the rear end thereof, of a gas engine and engine-shaft mounted on said frame, a counter-shaft beneath and geared to said engine-shaft, a pair of clutch-disks loose on said counter-shaft, a slidable clutch-sleeve splined on said counter-shaft between said clutch-disks, a differential gear in driving relation to said traction wheels, two gear trains between said clutch-disks and said differential gear, respectively, adapted to transmit motion to the latter in opposite directions, a single operating lever, and connections therefrom to said clutch-sleeve whereby the latter may be thrown into driving engagement with either of said clutch-disks or into an intermediate idle position, substantially as described.

5. In a power-propelled road roller, the combination with a frame, a steering-wheel swiveled in the forward end and a pair of traction wheels supporting the rear end thereof, of a gas engine and engine-shaft mounted on said frame, a counter-shaft beneath and geared to said engine-shaft, a pair of clutch-disks loose on said counter-shaft, a slidable clutch-sleeve splined on said counter-shaft between said clutch-disks, a differential gear in driving relation to said traction wheels, two gear trains between said clutch-disks and said differential gear, respectively, adapted to transmit motion to the latter in opposite directions, a speed-changing mechanism interposed in said gear train, an operating lever therefor, a main operating lever, and connections from the latter to said clutch-sleeve, substantially as described.

6. In a power-propelled road roller, the combination with a frame, a steering-wheel swiveled in the forward end, and a pair of traction wheels supporting the rear end thereof, of a motor and motor-shaft mounted on said frame, a counter-shaft beneath and geared to said motor-shaft, a clutch-disk loose on said counter-shaft, a slidable clutch-

sleeve splined on said counter-shaft, a differential gear in driving relation to said traction wheels, a gear train between said clutch-disk and differential gear, means for throwing said clutch-sleeve into and out of driving engagement with said clutch-disk, a friction brake pivoted adjacent to and operative upon the periphery of said clutch-disk, and actuating means for said friction brake, substantially as described.

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