

No. 799,753.

PATENTED SEPT. 19, 1905.

J. O'CONNOR.
EXCAVATOR.

APPLICATION FILED JAN. 18, 1905.

3 SHEETS—SHEET 1.

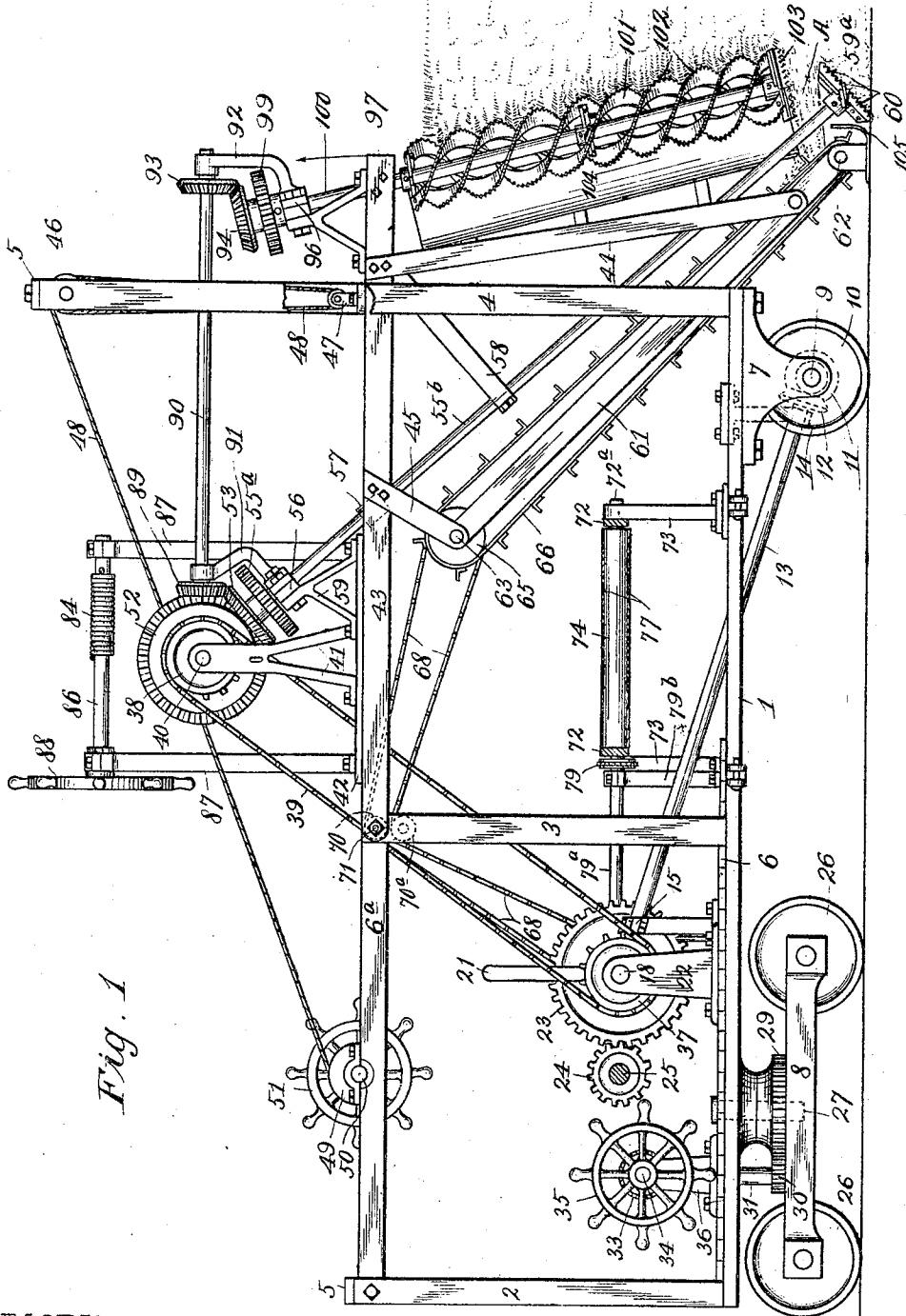


Fig. 1

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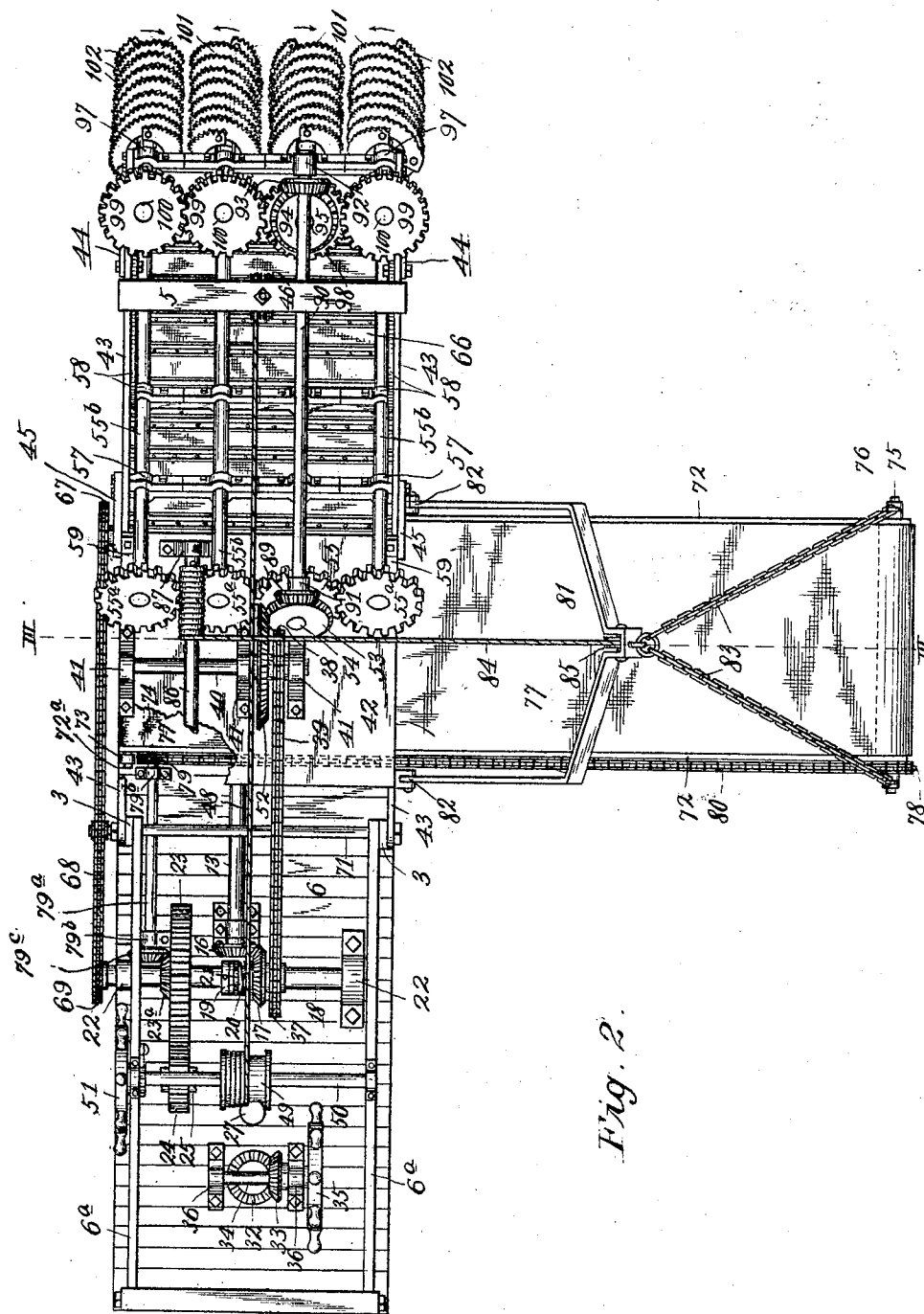
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3.

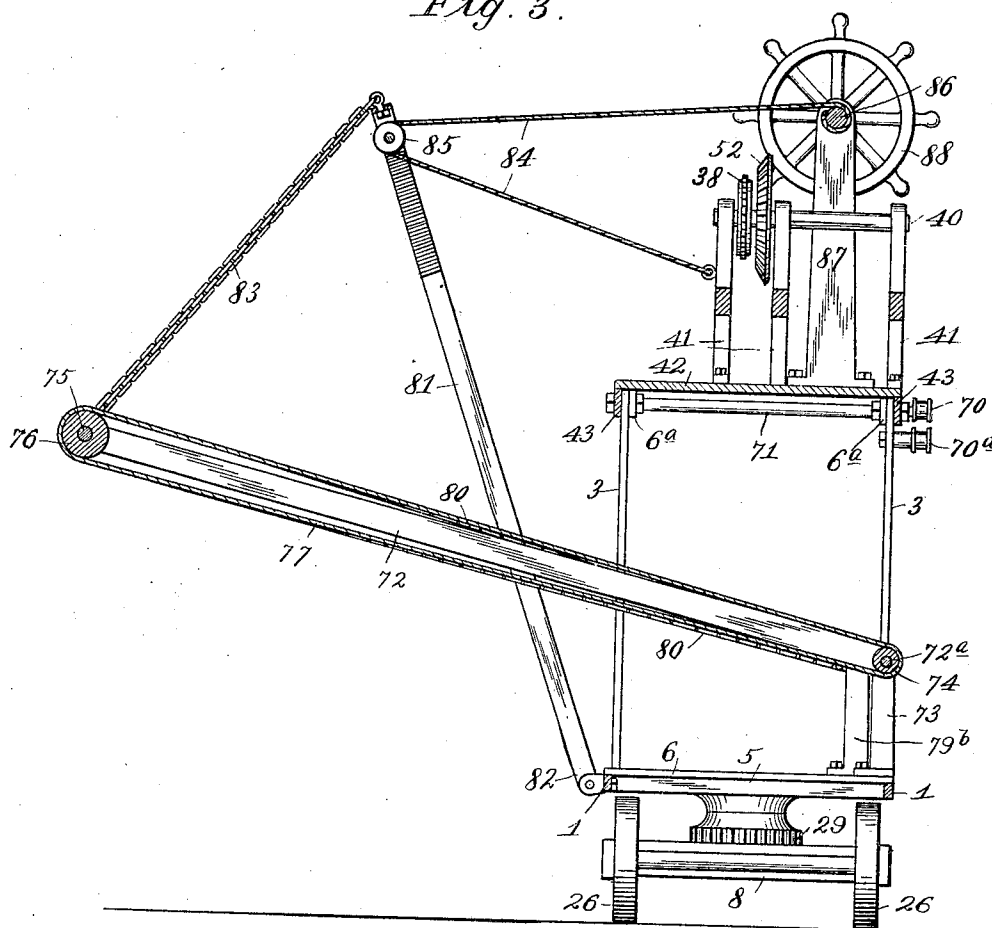


Fig. 4.

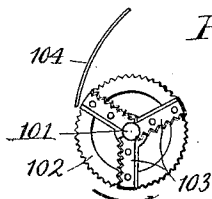
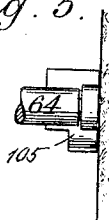


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN O'CONNOR, OF KANSAS CITY, MISSOURI.

EXCAVATOR.

No. 799,753.

Specification of Letters Patent.

Patented Sept. 19, 1905.

Application filed January 18, 1905. Serial No. 241,651.

To all whom it may concern:

Be it known that I, JOHN O'CONNOR, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Excavators, of which the following is a specification.

My invention relates to improvements in excavators for digging ditches, cutting roadways through hills, cutting down embankments, &c., and it may be mounted upon a flat-boat when excavating canals or upon car-trucks when building road-beds or upon traction-wheels, and thus rendered self-propelling.

The invention resides in the novel construction, combination, and arrangement of parts hereinafter described, and pointed out in the claims, and in order that it may be fully understood reference will now be made to the accompanying drawings, in which—

Figure 1 represents a side elevation of my improved excavator with its side-delivery conveyer removed. Fig. 2 is a plan view of the excavator. Fig. 3 is a transverse section of the main frame and the side-delivery conveyer with its operating mechanism, taken on line III III of Fig. 2. Fig. 4 is an inverted plan view of one of the spiral cutters forming part of the invention. Fig. 5 is a broken plan view of the lower end of one of the conveyers and a fender forming part of the invention.

In constructing my machine I employ a main frame consisting of sills 1, standards 2, 3, and 4, transverse beams 5, a deck 6, covering the rear portions of sills 1, and longitudinal beams 6^a, connecting the upper ends of standards 2 and 3. Said frame is mounted upon rigid forward trucks 7 and a rear or steering truck 8.

9 designates an axle journaled in trucks 7 and provided with a pair of rigidly-mounted carrying-wheels 10 and a centrally-disposed rigidly-mounted bevel-gear 11, intermeshing with a bevel-gear 12, rigidly mounted upon the lower terminal of an inclined shaft 13, journaled at its opposite ends in bearings 14 15, respectively. Shaft 13 is provided at its upper end with a rigidly-mounted bevel-gear 16, intermeshing with a bevel-gear 17, loosely mounted upon a main shaft 18 and provided with a clutch member 19 for engagement with a companion clutch member 20, mounted upon shaft 18 and provided with a hand-lever 21, whereby it is thrown

into engagement with member 19 when it is desired to lock bevel-gear 17 upon the main shaft. Shaft 18 is journaled in pedestals 22 and provided with a large rigidly-mounted cog-wheel 23, driven by a pinion 24, rigidly mounted upon a motor-shaft 25. Truck 8 is provided with carrying-wheels 26 and pivotally secured to the rear portion of the main frame by means of a king-bolt 27, so that it may be utilized in steering the machine as well as supporting the rear portion of the latter. Truck 8 is controlled by means of a large cog-wheel 29, rigidly secured thereto, a pinion 30, intermeshing with cog-wheel 29 and rigidly mounted upon the lower end of a shaft 31, a bevel-gear 32, rigidly mounted upon the upper end of shaft 31, a bevel-gear 33, intermeshing with bevel-gear 32 and rigidly mounted upon a horizontal shaft 34, and a pilot-wheel 35, rigidly mounted upon shaft 34, which latter is journaled in pedestals 36, rising from the deck 6.

37 designates a sprocket-wheel rigidly mounted upon the main shaft and connected to a similar sprocket-wheel 38 through the instrumentality of an endless sprocket-chain 39. Sprocket-wheel 38 is rigidly mounted upon a transverse counter-shaft 40, journaled in pedestals 41, secured upon a platform on top of beams 43, forming the upper portion of an adjustable frame comprising said beams and hangers 44 and 45. The forward end of said adjustable frame is raised and lowered by means of a tackle consisting of blocks 46 47, secured to the rigid standards 4 and the adjustable frame, respectively, and a cable 48, rove upon the pulleys of the blocks and attached at its opposite ends to the adjustable frame and a windlass, which latter comprises a drum 49, rigidly mounted upon a shaft 50, and a hand-wheel 51 for operating said windlass. Shaft 50 is journaled in bearings secured upon longitudinal beams 6^a above the deck 6.

52 designates a large bevel-gear, rigidly mounted upon counter-shaft 40, which drives a small bevel-gear 53, rigidly mounted upon an inclined cutter-shaft 54, provided with a rigidly-mounted cog-wheel 55, which drives a train of similar cog-wheels 55^a, all of which are rigidly mounted upon the upper ends of inclined cutter-shafts 55^b, paralleling shaft 54. All of said cutter-shafts are journaled in bearings 56, 57, and 58. Bearing 56 is secured at its opposite ends to brackets 59. Bearing 57 is secured at its opposite ends to

beams 43, and bearing 58, which is U-shaped, is also secured at its opposite ends to beams 43. Shafts 54 and 55^b are provided at their lower ends with rigidly-mounted rotary cutters 59^a, consisting of blades which loosen and deliver the soil to an upwardly and rearwardly extending conveyer. Said conveyer comprises side bars 61, secured to shafts 62 and 63, the former of which is journaled in said side bars, while the latter extends through the side bars and is journaled in hangers 45, rollers 64 65, mounted upon shafts 62 63, respectively, and an endless apron 66, connecting said rollers. Shaft 63 is driven by a rigidly-mounted sprocket-wheel 67, connected by an endless sprocket-chain 68 to a sprocket-wheel 69, rigidly mounted upon one end of the main shaft 18. Sprocket-chain 68 travels over a pair of idlers 70 and 70^a, arranged close together, idler 70 being mounted upon a rod 71, to which the rear portion of the adjustable frame is pivoted. By thus arranging sprocket-chain 68 to travel over idlers 70 70^a said chain will become neither taut nor slack when the adjustable frame is raised or lowered. Apron 66 delivers the soil upon a side-delivery conveyer comprising side bars 72, pivotally secured at their lower ends upon a shaft 72^a, journaled in standards 73, a roller 74, mounted upon shaft 72^a, a shaft 75, journaled in the free ends of side bars 72, a roller 76, rigidly mounted upon shaft 75, and an endless belt 77, connecting rollers 74 and 75. Shaft 75 is provided at one end with a rigidly-mounted sprocket-wheel 78, driven by a sprocket-wheel 79 through the instrumentality of an endless sprocket-chain 80. Sprocket-wheel 79 is rigidly mounted upon a shaft 79^a, journaled in standards 79^b and provided with a rigidly-mounted bevel-gear 79^c, which latter is driven by a bevel-gear 23^a, formed integral with cog-wheel 23 on the main shaft.

The free end of the side-delivery conveyer is controlled by a hoisting mechanism consisting of yoke 81, hinged at its lower ends 82 to one of the sills, chains 83, secured at their opposite ends to the upper end of the yoke and the ends of shaft 75, a cable 84, passing around a sheave-wheel 85 and secured at its opposite ends to one of the pedestals 41, and a shaft 86, which latter is journaled in standards 87 and provided at one end with a hand-wheel 88.

89 designates a bevel-gear intermeshing with gear 53 and rigidly mounted upon the rear end of a longitudinal counter-shaft 90, journaled in brackets 91 92 and provided near its forward end with a rigidly-mounted bevel-gear 93.

94 designates a bevel-gear driven by gear 93 and rigidly mounted upon the upper end of an inclined shaft 95, journaled in bearings 96 and 97 and provided with a rigidly-mounted cog-wheel 98, which drives a train of similar cog-wheels 99, rigidly mounted upon

shafts 100, paralleling shaft 95. Shafts 95 and 100 are provided with spiral cutters 101, having serrated edges 102, so that they will readily cut the soil. Cutters 101 are arranged above the lower end of apron 66 so that they will deliver the loose soil upon the latter and are provided at their lower ends with radial blades 103, which latter prevent the lower ends of said cutters from becoming clogged.

104 designates a pair of concave fenders located near the outer sides of the two outermost cutters 101 for delivering the loose dirt from the latter to apron 66, and thus preventing it from falling between the sides of said cutters and the adjacent sides of the ditch.

105 designates a pair of right-angled fenders mounted upon the opposite ends of shaft 62 and arranged to travel against the sides and bottom of the ditch for the purpose of pushing the loose dirt in front of apron 66.

In cutting a roadway through a hill the cutters 59^a 101 are gradually lowered into the ground as the machine advances until the upper ends of the spiral cutters are sunk almost to a level with the surface of the ground. The cutters are then adjusted to cut the bottom of the roadway in substantially a horizontal plane. As the machine advances cutters 59^a loosen the soil to a level with the bottom of the cut, so that the following conveyer may pick it up and conduct it to the side-delivery conveyer, which discharges it either upon one of the banks of the cut or into wagons hauled beneath the discharge end of said side-delivery conveyer. Cutters 101, like cutters 59^a, rotate at a high rate of speed and entering the forward bank of the cut loosen the soil thereof and throw it back upon the adjacent conveyer. As the blades 103 are some distance above cutters 59^a, a ledge of dirt A will be left between said blades and cutters, which will prevent the dirt loosened by the former from falling down and clogging the latter, thus leaving them free to perform their chief function of leveling the bottom of the cut.

When the machine is to be used for making very deep cuts, a rear-delivery conveyer (not shown) is substituted for the side-delivery conveyer, as the latter would interfere with the adjacent bank of the cut when the machine attained a certain depth.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an excavator, an adjustable frame, and a plurality of spiral cutters journaled therein having serrated edges.

2. In an excavator, a suitable frame, a plurality of cutters journaled therein, and radial blades secured to the lower terminals of said cutters.

3. In an excavator, a suitable frame, spiral cutters journaled therein, rotary cutters

also carried by said frame, and a conveyer located adjacent to both said cutters.

4. In an excavator, an adjustable frame, and a plurality of spiral cutters and a plurality of rotary cutters journaled therein.

5. In an excavator, a suitable frame, and a rotary cutter journaled therein consisting of a plurality of radial blades.

6. In an excavator, a suitable frame, rotary cutters journaled therein and having radial blades, and a conveyer located adjacent to said cutters.

7. In an excavator, a main frame, a second frame adjustably secured thereto, means for adjusting said second frame, with rela-

tion to the first, and one set of rotary cutters and another set of spiral cutters journaled in the adjustable frame and extending to different depths.

8. In an excavator, spiral cutters arranged to cut into a bank, and means located beneath said cutters for leveling the bottom of the cut and holding the side walls thereof away from said cutters.

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

JOHN O'CONNOR.

Witnesses:

J. W. BOLING,
F. G. FISCHER.