

No. 662,400.

Patented Nov. 27, 1900.

L. H. DYER.

GEARING FOR AUTOMOBILE VEHICLES.

(Application filed Apr. 26, 1899.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 2.

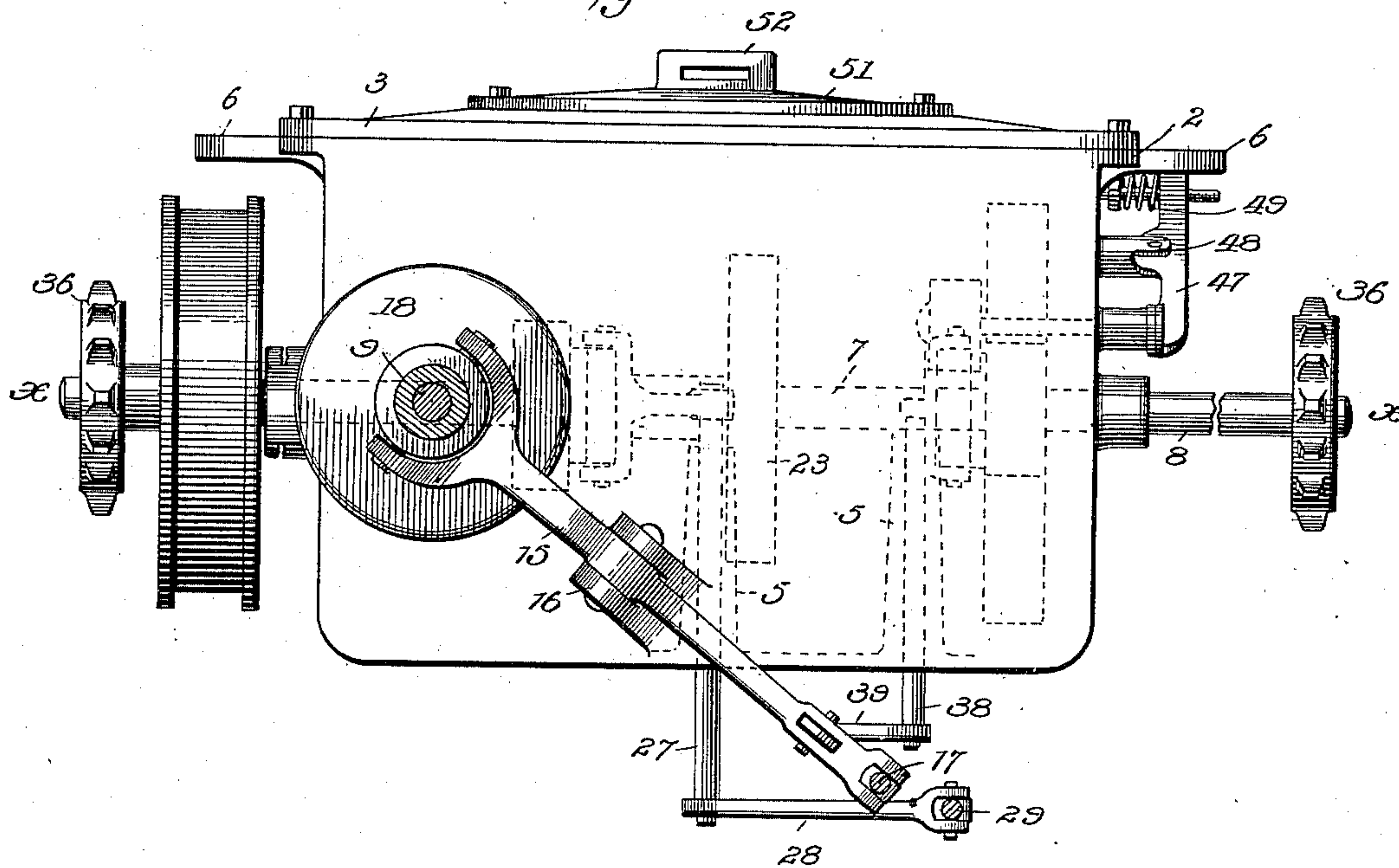
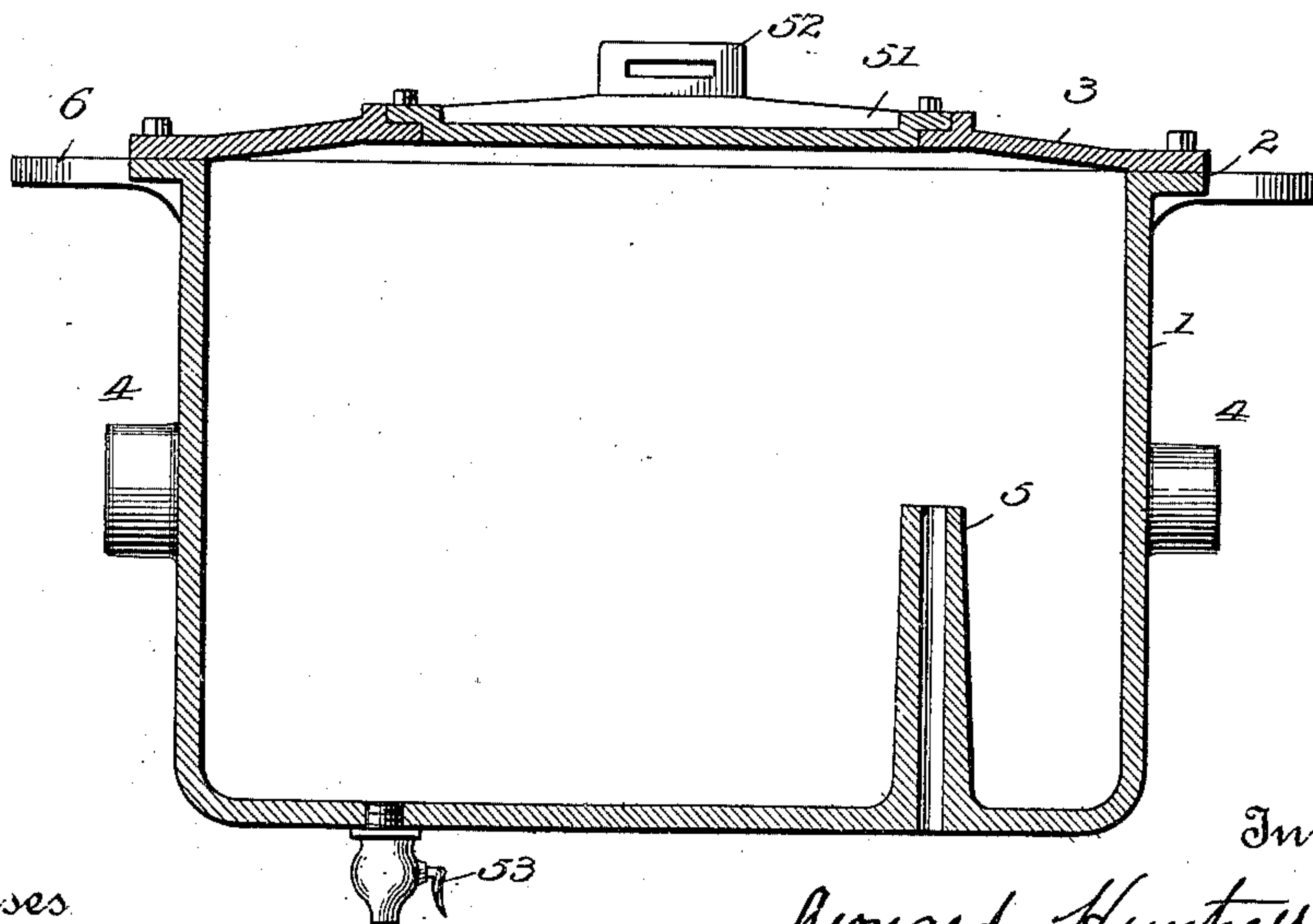


Fig. 3.



Inventor

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Witnesses

Harry S. Rohrer
Mary Agnes McLeod.

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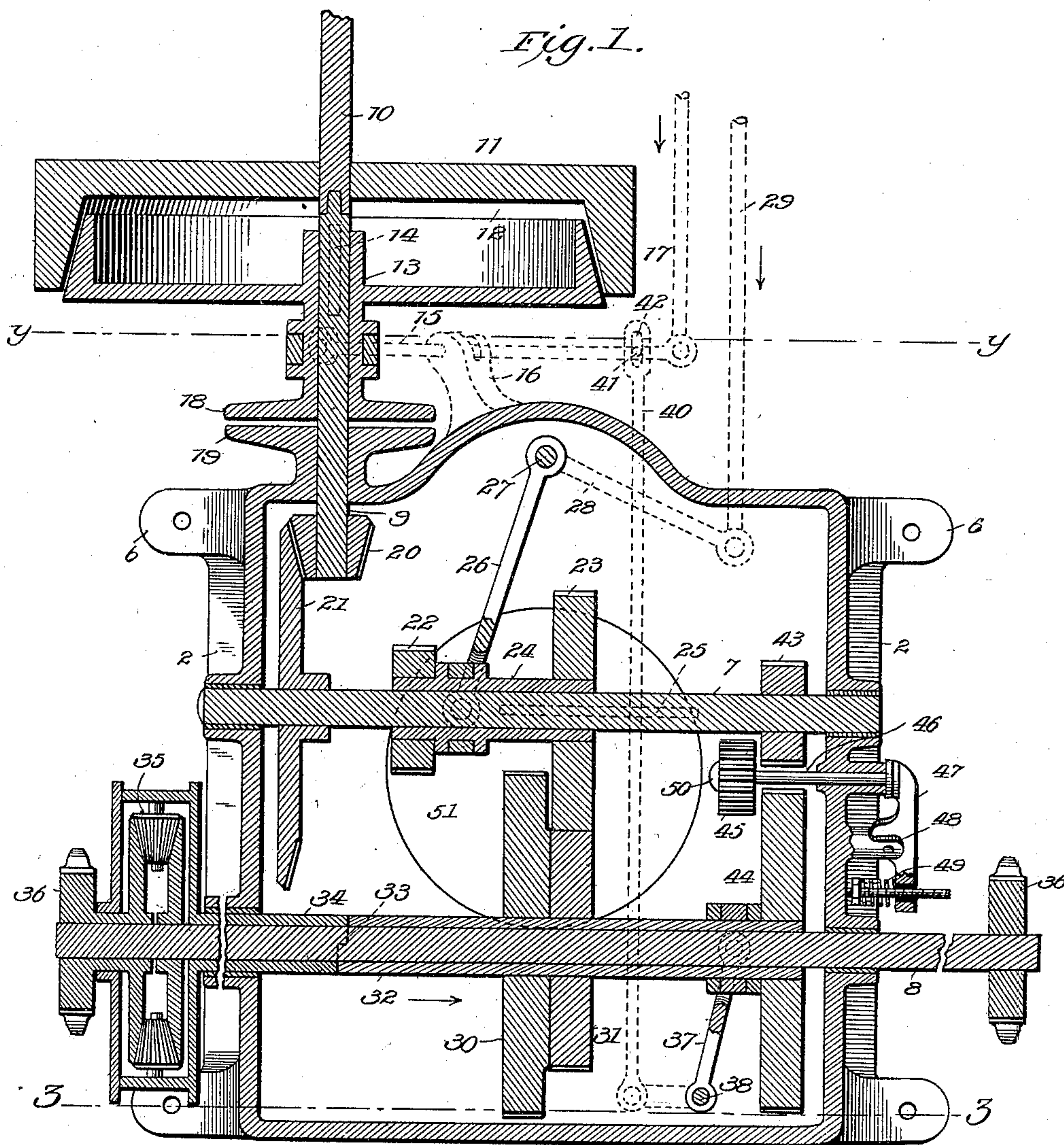
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Witnesses
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Inventor
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UNITED STATES PATENT OFFICE.

LEONARD HUNTRESS DYER, OF WASHINGTON, DISTRICT OF COLUMBIA,
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GEARING FOR AUTOMOBILE VEHICLES.

SPECIFICATION forming part of Letters Patent No. 662,400, dated November 27, 1900.

Application filed April 26, 1899. Serial No. 714,513. (No model.)

To all whom it may concern:

Be it known that I, LEONARD HUNTRESS DYER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Gearing for Automobile Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in the gearing which is interposed between the motor and the driving-wheels of automobile vehicles.

This invention has for its object to provide means whereby the driving-wheels may be stopped, started, driven at different rates of speed, and reversed without affecting the speed and direction of rotation of the motor.

My invention also relates to means for reducing the friction and the noise of the gearing.

In order to better understand the nature of the invention, attention is called to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a sectional view taken on the lines *xx* of Fig. 2 looking from below. Fig. 2 is a front view, partly in section, taken on the lines *yy* of Fig. 1; and Fig. 3 is a section taken on the lines *zz* of Fig. 1.

In all the several views like parts are designated by the same numerals of reference.

The casing or gear-box 1 is cast in one piece. It is of the general rectangular shape shown. It has formed integrally on its top or upper edge the flange 2, upon which the cover 3 is bolted. Suitable bearing-boxes 4 4 are formed integrally with the sides and the end, while from the bottom rise the hollow standards 5 5. Suitable ears 6 6 are formed adjacent to the upper edge of the box and serve as points of attachment to the frame of the vehicle.

Reference being had to Fig. 1, 7 and 8 are parallel shafts mounted within the boxes 4 4. The shaft 7 is carried entirely within the gear-box; but the shaft 8 is much longer and extends for some distance on each side thereof. At right angles to these shafts is a third

shaft 9, which enters the box from the front thereof. The shaft 9 is in the same line and forms a continuation of the engine-shaft 10.

The fly-wheel 11 of the engine is so formed as to act the part of one member of a friction-clutch 12. The other member 13 slides freely upon the shaft 9, but is kept from rotating thereon by means of the feather 14. The sliding member 13 is moved back and forth by means of the lever 15 engaging therewith and pivoted to a fulcrum 16, which may be formed integrally upon the front of the box 1. An operating-rod 17 extends to within reach of the operator and is there connected to any means suitable for manipulating it. The sliding member 13 of the clutch carries or has formed upon it a disk 18. A corresponding disk 19 is arranged adjacent to the front of the box 1. These disks are so arranged that upon the clutch being disengaged the two disks 18 and 19 may be brought into engagement, thus serving the purpose of a brake or stop.

On the inner extremity of the shaft 9 is a miter-pinion 20, which engages with a corresponding gear 21, keyed on the shaft 7. Two spur-gears 22 and 23 of different sizes are carried upon the sleeve 24, which freely slides upon the shaft 7, but turns therewith by means of the feather 25.

Suitable means are provided for sliding the sleeve 24 from side to side. These means, as shown, consist of the lever 26, keyed upon the vertical rod 27, with an operating-lever 28 at the lower extremity thereof at right angles thereto. A rod 29 leads to a point within convenient reach of the operator and is there adapted to engage with a lever or other suitable device for properly manipulating and adjusting it.

The shaft 8 carries the two gears 30 and 31, which are of sizes corresponding to the gears 22 and 23. They are so arranged upon the shaft 8 that either of the gears 22 or 23 may be engaged with their corresponding gears 30 or 31 by means of the lateral movement of the sleeve 24. The gears 30 and 31 are keyed upon the sleeve 32, which turns freely upon the shaft 8. One extremity of the sleeve 32 is formed into one member of

the jaw-clutch 33. The other member 34 is connected to and operates the differential 35. This latter may also serve as a brake-drum. The sprocket-wheels 36 are secured one to shaft 8 and the other to the differential. The sprockets 36 36 are connected to corresponding sprocket-wheels carried by the driving-wheels and operated by means of chains.

In order that the jaw-clutch 33 may be disengaged from its member 34, the lever 37 is provided. This lever is secured to a vertical shaft 38, which passes through the standard 5 and at its bottom is connected to the lever 39. A rod 40 connects the lever 39 to the lever 15, adjacent to the outer end thereof, by means of a pin 41. The end of the rod 40 is provided with a slot 42, engaging with the pin 41.

The levers and rods are so proportioned that upon the rod 17 being moved in the direction of the arrow the disks 18 and 19 will first be disengaged, then the clutch members 33 and 34 will be brought into engagement, and finally the two members of the friction-clutch 12 will come together. A reverse movement of rod 17 will first disengage the friction-clutch, will then separate the members 33 and 34 of the jaw-clutch, and will finally bring the disks 18 and 19 into engagement. By so doing it will be seen that the shaft 7 and the sleeve 32 may be entirely disengaged from the engine-shaft 10 and the differential shaft 8, thus allowing the engine to run along without load and the carriage to continue by means of its own momentum. While the gears 22 and 23 and 30 and 31 are stopped they may be easily shifted sidewise into position without danger of breaking the teeth thereof. As shown in the drawings, the gears 23 and 31 will produce about three times the speed of the gears 22 and 30.

In order that a reversing-gear may be provided, I key a pinion 43 to the shaft 7. A gear 44 is carried by the sleeve 32. An idler 45 is supported upon an auxiliary shaft 46. Suitable means are provided for normally keeping the idler to one side of the gears 43 and 44. These means consist of a lever 47, pivoted at 48 and provided with a spring 49. In order that the idler 45 may be brought into action between the gears 43 and 44, it carries a boss 50, which engages with one face of the gear 23. It will be seen that by moving the gear 23 toward the gears 43 and 44 upon the boss engaging with the gear 23 it will force the gear 45 into engagement with the teeth of the gears 43 and 44. Upon the gear 23 being moved back the spring 49 will disengage the gear 45.

To allow access to the box 1 without removing the entire cover, a manhole 51, with a handle 52, is provided.

It is intended that a certain quantity of oil shall normally be kept within the box. This oil may be introduced through the manhole 51 and removed by means of the petcock 53. As there are no openings other than the pet-

cock in the bottom or sides of the box lower than the bearing-boxes 44, it will be seen that there is no chance of the oil leaking out, provided, of course, that the level of the oil never extends above the bearings 44.

Having now described and ascertained the nature of my said invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a gearing for automobile vehicles, two shafts, gears thereon, a clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches, a stop on one of said shafts, and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

2. In a gearing for automobile vehicles, two parallel shafts, gears thereon, a clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches, a stop on one of said shafts, and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

3. In a gearing for automobile vehicles, two shafts, a plurality of pairs of gears thereon, a clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches, a stop on one of said shafts, and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

4. In a gearing for automobile vehicles, two parallel shafts, a plurality of pairs of gears thereon, a clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches, a stop on one of said shafts, and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

5. In a gearing for automobile vehicles, two shafts, gears thereon, a friction-clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches, a stop on one of said shafts, and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

6. In a gearing for automobile vehicles, two parallel shafts, gears thereon, a friction-clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches, a stop on one of said shafts, and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

7. In a gearing for automobile vehicles, two

clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches *seriatim*, and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

15. In a gearing for automobile vehicles, two shafts, a plurality of pairs of gears thereon, a friction-clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches *serialim*, and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

16. In a gearing for automobile vehicles, 85
two parallel shafts, a plurality of gears there-
on, a friction-clutch connecting one shaft with
the source of power, a clutch connecting the
other shaft with the driven mechanism, means
for applying and disengaging said clutches 90
seriatim, and means for intermeshing said
gears for transmitting motion from one shaft
to the other, substantially as set forth.

17. In a gearing for automobile vehicles, two shafts, gears thereon, a clutch connect- 95 ing one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches *seriatim*, a stop on one of said shafts, and means for intermesh- 100 ing said gears for transmitting motion from one shaft to the other, substantially as set forth.

18. In a gearing for automobile vehicles, two parallel shafts, gears thereon, a clutch 105 connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches *seriatim*, a stop on one of said shafts, and means for intermesh- 110 ing said gears for transmitting motion from one shaft to the other, substantially as set forth.

19. In a gearing for automobile vehicles, two shafts, a plurality of pairs of gears thereon, a clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches *seriatim*, a stop on one of said shafts and means for intermeshing said gears for transmitting power from one shaft to the other, substantially as set forth.

20. In a gearing for automobile vehicles, two parallel shafts, a plurality of pairs of 125 gears thereon, a clutch connecting one shaft with the source of power, a clutch connecting the other shaft with the driven mechanism, means for applying and disengaging said clutches *seriatim*, a stop on one of said shafts, 130 and means for intermeshing said gears for transmitting motion from one shaft to the other, substantially as set forth.

14. In a gearing for automobile vehicles, two parallel shafts, gears thereon, a friction-