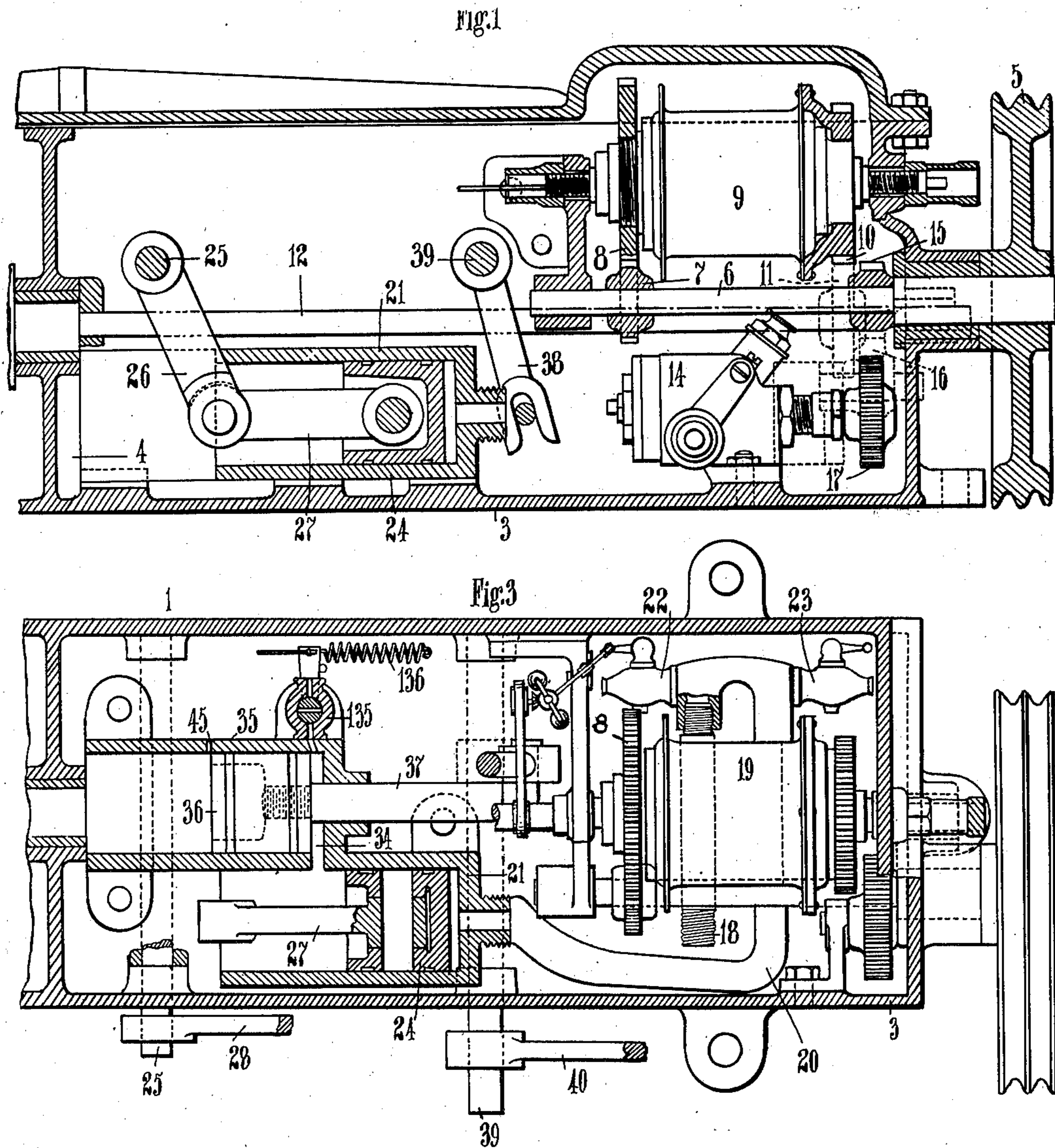


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 APPLICATION FILED MAR. 29, 1909.

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Patented Mar. 14, 1911.

2 SHEETS—SHEET 1.



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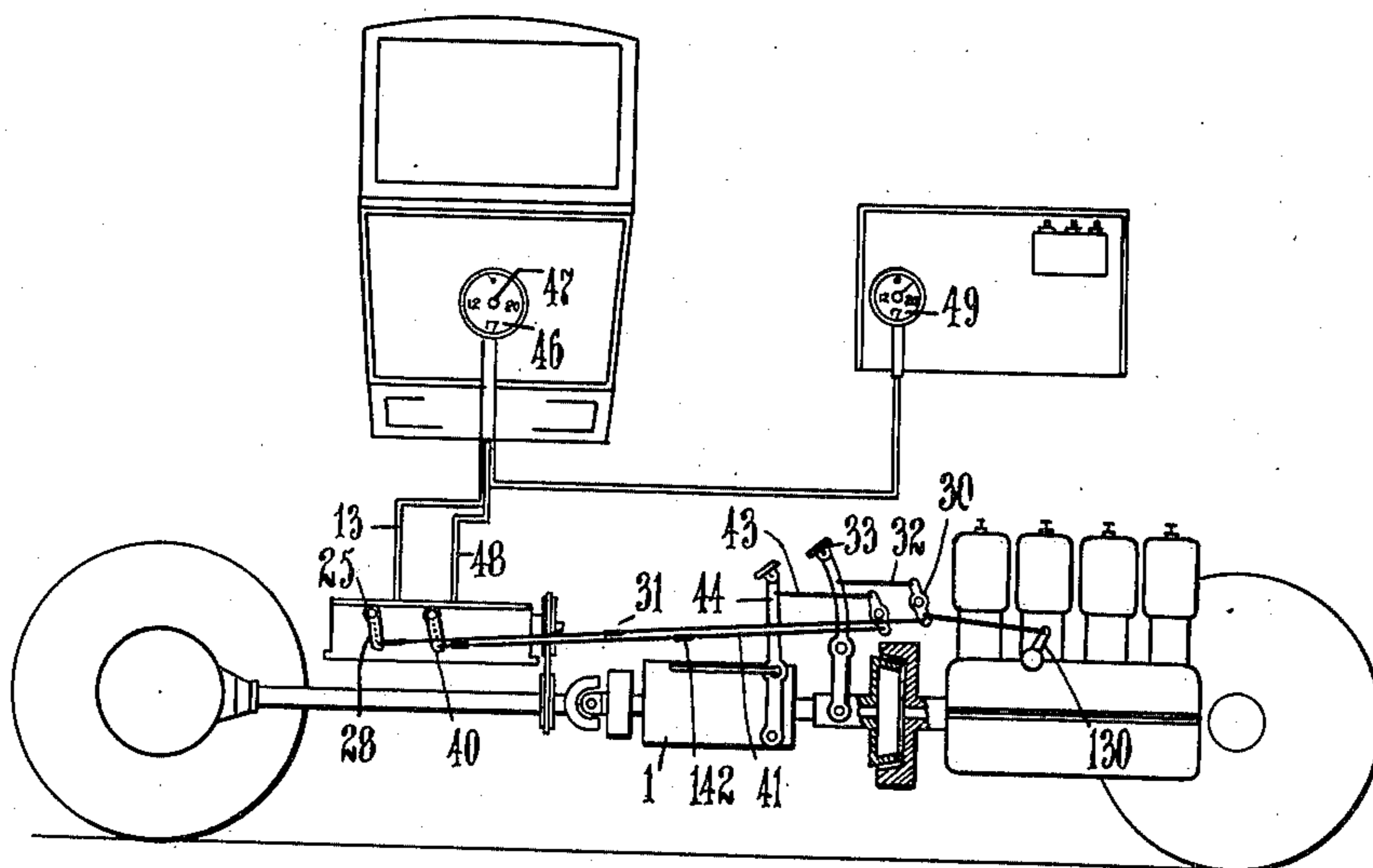


Fig. 4

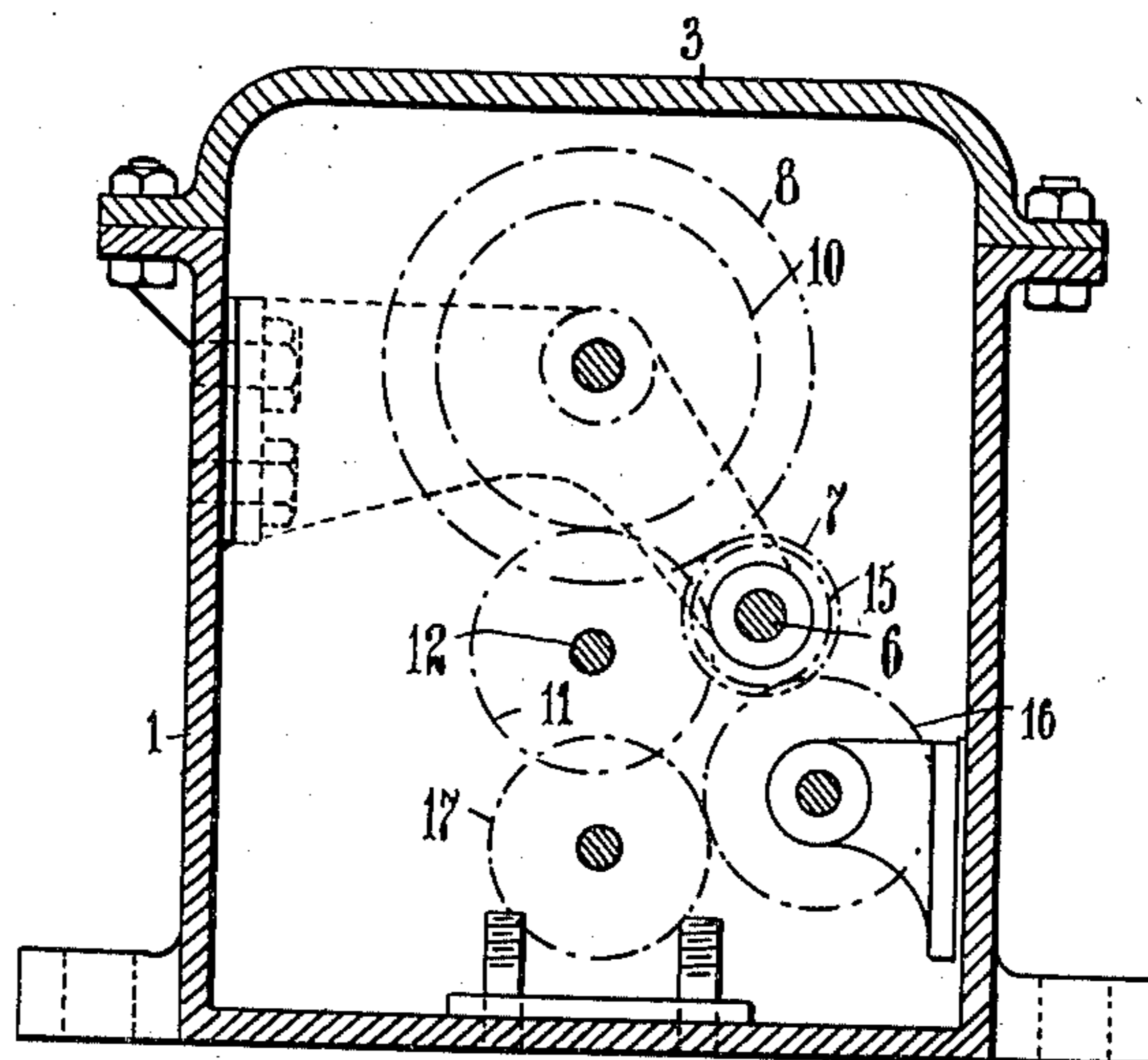


Fig. 2

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# UNITED STATES PATENT OFFICE.

WILLIAM ROPER, OF EALING, ENGLAND.

APPARATUS FOR LIMITING THE SPEED OF MOTOR-CARS AND OTHER VEHICLES.

986,503.

Specification of Letters Patent. Patented Mar. 14, 1911.

Application filed March 29, 1909. Serial No. 486,562.

*To all whom it may concern:*

Be it known that I, WILLIAM ROPER, a subject of the King of Great Britain, residing at "The Hillock," Park Hill, Ealing, in the county of Middlesex, England, engineer and shipbuilder, have invented new and useful Apparatus for Limiting the Speed of Motor-Cars and other Vehicles, of which the following is a specification.

10 This invention relates to apparatus by which upon a predetermined speed being exceeded, devices are operated which diminish the supply of power to the wheels of a vehicle.

15 An example of the apparatus is illustrated in the accompanying drawings in which—

Figure 1 shows a longitudinal sectional elevation of the apparatus. Fig. 2 is a transverse sectional elevation. Fig. 3 is a longitudinal sectional plan, while Fig. 4 is a diagrammatic general view showing the relations of the various parts concerned.

From Figs. 1, 2 and 3 it will be seen that the controlling device proper is contained within a suitable casing 1 which may be approximately half filled with oil. The casing has a cover 2 and may have an extension 3 separated from the main chamber by a partition 4. The extension 3 will contain no oil but is provided for the governor 50. This governor is operated from a driving wheel 5 which may be driven in any suitable way from the back axle, the transmission shaft or other part which rotates with the vehicle wheels. The shaft 6 of the driving wheel carries a pinion 7 gearing with the first pinion 8 of the change speed gear 9, and the last pinion 10 of this gear engages with the pinion 11 upon the shaft 12 of the governor. The change speed gear device may be of any suitable type such as that employed in cycle hubs, but it may be preferred to use a speed changing device capable of continuous variation; such a device may consist for example, of two wheels the edge of one being driven by the face of the other, and being movable radially over that face. Many speed changing devices suitable for the purpose are well known and therefore need not be referred to here. The ratio of the drive is altered by varying the position of the gearing members by means of a chain or like device 13.

55 A pump 14 is also driven from the wheel 5 through the medium of the gearing mem-

bers 15, 16 and 17. The inlet 18 of this pump merely opens into the lower part of the chamber 1, which, as stated, is partially filled with oil. The outlet 19 is connected by a pipe 20 with a cylinder 21, but in the outlet there are provided two outlet cocks 22 and 23 which open into the casing. The cock 22 is connected with the governor upon the shaft 12 so as to be closed when the governor is rotating at a high speed. The kind of connection required is already commonly employed in various valve controlling devices and so forth, and therefore is not illustrated.

In the cylinder 21 there is a piston 24 which can partially turn a shaft 25 through the medium of a crank 26 and connecting rod 27. On this shaft 25, outside the casing 1 there is provided a second crank 28 (Fig. 4) joined by a wire cable rod or the like 29 to a pivoted lever 30. Preferably provision is made for altering the position on the crank 28 at which the cord 29 is connected thereto; and it is also well to have a short chain such as 31 inserted in the cord 29, so as to prevent disturbance of the device when the clutch is released by the driver. The lever 30 is joined by a cable 32 to the clutch pedal 33 in the case of a motor car; in the case of other types of engine the cable 32 would operate a corresponding part of the mechanism. Preferably the pivoted lever 30 is joined by a rod to a cock 130 which serves to throttle the engine or otherwise suitably limit its speed.

The cylinder 21 has in its length an opening 34 leading into a second cylinder 35; and this contains a piston 36 connected through the rod 37 and forked crank 38 with the shaft 39. This shaft, like the shaft 25, has upon it, outside the casing 1, a crank 40 which is joined by a cable 41 to a pivoted lever 42, and this by a second cable 43 to the brake pedal 44. It is desirable that there should be a spring 142 in the length of the cable 41 so that the brake may not be applied with undue suddenness. As before, the point of connection of the cable 41 to the crank 40 may be adjustable and a chain may be provided as before to give flexibility. In both cases also devices may be provided in the cables for adjusting the length and if necessary taking up wear. The cylinder 35 may have an outlet port 45 to allow of the escape of the fluid after the piston has been sufficiently pushed back,

but it may be practicable to rely upon leakage to serve the purpose of this opening.

In Fig. 4 an indicating dial 46 is shown as mounted in the interior of the vehicle. The dial is provided with a handle 47 to which is connected the cord 13 of the change speed gear and also a cord 48 by which the cock 23 is operated. Upon the dial are marked the limiting speeds to which the different positions of the handle 47 correspond. In the example illustrated the handle when at the top opens the cock 23 so that there is no limit to the speed, while the positions marked as 20, 17 and 12 indicate the three positions of the speed gear 9. Since it is necessary that the driver of the vehicle should know what limit the passenger has imposed upon his speed, a second dial 49 may be provided at the dashboard of the vehicle or any other suitable position, and this may be connected with the dial 46 so that its indicator turns with the handle 47. Provision may be made, if desired, for locking or sealing this regulating apparatus, so that when the apparatus has been set by authority it cannot afterward be tampered with.

But little explanation is required to make clear the manner in which the apparatus works. Normally the pump 14 delivers the oil which it has drawn through the inlet 18 into the casing 1 through the cock 22. If, however, the vehicle gains in speed until the predetermined speed for which the apparatus is set is exceeded, the governor upon the shaft 12 will close the cock 22. The oil emerging from the outlet 19 will then have to pass through the pipe 20 to the cylinder 21. Here it will gradually, in the course of a number of revolutions, push back the piston 24, turning the shaft 25 and thus through the crank 28 and lever 30 disengaging the friction clutch of the vehicle and simultaneously operating the throttle or other device 130. Should the speed of the vehicle then diminish, as in general may be expected, the cock 22 will again be opened, and the spring operating upon the clutch pedal will be able to press the clutch into engagement again, turning the crank 28 and so pressing back the piston 24, while the oil contained in the cylinder 21 escapes through the cock 22. If, however, owing to the vehicle being upon an incline the speed does not diminish when the friction clutch is taken out, the oil will, after filling the cylinder 21, pass through the opening 34 into the cylinder 35. Here it will press back the piston 36 and so turn the shaft 39 and apply the brake through the medium of the brake pedal 44, until the required reduction in speed has been brought about; when the valve 22 is again opened the parts will be restored to their initial positions by the springs of the pedals. If it is desired to take the apparatus

out of action the cock 23 is opened. The pump 14 then continues to pump oil straight away into the casing 1 whether the cock 22 is closed by the governor or not. If, however, it is desired that the whole apparatus may be stopped instead of merely being allowed to run idly a clutch or other device may be provided as above suggested, to stop the drive. It will be seen that precisely similar operations will ensue if, when the vehicle is traveling at a speed of 25 miles per hour, the handle 47 is brought from the top position to the limiting speed of 20 miles per hour. In connection with such operations, however, an obvious risk arises, for if the vehicle were traveling at a very high speed and the controlling device were suddenly put into operation, the brake might be applied with considerable violence. This tendency is partially resisted by the spring 142 which will yield and so lessen the pull on the brake. If this provision is not sufficient it may be desirable to provide automatic locking means operated, for example, by the governor on the shaft 12, which will prevent the handle 46 being turned from the top position when the car is traveling very much above the highest limiting speed. In Fig. 3 there is shown on the brake cylinder 35, a cock 135, drawn toward its closed position by a spring 136. This cock may also be controlled by the governor being opened at very excessive speeds, so that in such cases, though the clutch can be automatically disengaged the brake cannot be applied by the device.

It will be perfectly clear that the details of the apparatus may be modified at will. Several modifications have been definitely suggested in the above with regard to the more important points and in the drawing itself alternatives are indicated, as for example in the construction of the connections between the pistons 24 and 36 and their shafts 25 and 39. Further modifications and other alternatives can be introduced or substituted at will without departing from the scope of the invention.

In case several controlling devices—*e. g.* the throttle and clutch,—are to be operated successively by a single cylinder, all except the device which first acts may be joined to the operating crank through slotted links; or their movement may be otherwise delayed in any suitable manner as by the use of spring connections and dashpots. An effective, though less convenient apparatus may be made, however, with the various control devices actuated simultaneously.

What I claim is:—

1. A speed limiting device for motor driven vehicles comprising a continuously driven pump, an outlet therefrom and a valve closing said outlet, a governor driven from the vehicle and controlling said valve,

a second outlet from the pump, a plurality of devices for controlling the speed of the vehicle, and means actuated by fluid issuing from said second outlet for operating said devices in succession.

2. A speed limiting device for motor driven vehicles, comprising a cylinder, means controlled by the speed of the vehicle for supplying fluid to said cylinder, a piston in said cylinder, devices controlling the speed of the vehicle and connections between said devices and the piston, whereby the movement of the piston operates the devices in succession.

3. A speed limiting device comprising a prime motor, a vehicle driven thereby, cylinders, means controlled by the speed of the vehicle for supplying fluid to said cylinders, connections between said supplying means and the cylinders whereby admission to one cylinder occurs when the other is substantially filled, pistons in said cylinders and connections between the pistons and devices controlling the speed of the vehicles whereby these latter are operated.

4. A speed limiting device comprising a prime motor, a vehicle driven thereby, a cylinder, a piston in said cylinder, means controlled by the speed of the vehicle for supplying fluid to said cylinder, an outlet from said cylinder, a second cylinder connected to said outlet, a piston in said second cylinder, and connections between said pistons and devices controlling the speed of the vehicle.

5. A speed limiting device for motor vehicles comprising a continuously driven pump connected to a cylinder, an outlet valve on the pump controlled by a governor driven from the vehicle, a plurality of devices controlling the speed of the vehicle and means for operating said devices in succession by admission of fluid to the cylinder.

6. A speed limiting device comprising a prime motor, a vehicle driven thereby, a pump driven from the vehicle, an outlet from said pump and a valve closing said outlet, a governor driven by the vehicle and controlling said valve, a second outlet from the pump, a cylinder connected to said outlet, a piston in said cylinder, an outlet from said cylinder, a second cylinder connected to said outlet, a piston in said second cylinder and connections between said pistons and devices controlling the speed of the vehicle.

7. A speed limiting device comprising a prime motor, a vehicle driven thereby, a pump driven from the vehicle, an outlet

from said pump and a valve closing said outlet, a governor driven by the vehicle and controlling said valve, a second outlet from the pump, mechanism adapted to be operated by fluid issuing from said second outlet and adapted to operate devices controlling the speed of the vehicle, and a third outlet from the pump operable by hand to put the device out of action.

8. A speed limiting device comprising a prime motor, a vehicle driven thereby, a pump driven from the vehicle, an outlet from said pump and a valve closing said outlet, a governor driven by the vehicle and controlling said valve, a second outlet from the pump, mechanism adapted to be operated by fluid issuing from said second outlet and adapted to operate devices controlling the speed of the vehicle, a third outlet from said pump, and a valve operable by hand closing said outlet whereby the control mechanism is taken out of action.

9. A speed limiting device comprising a prime motor, a vehicle driven thereby, cylinders, means controlled by the speed of the vehicle for supplying fluid to said cylinders, connections between said supplying means and the cylinders whereby admission to one cylinder occurs when the other is substantially filled, pistons in said cylinders and connections between the piston of the first cylinder and devices controlling the prime motor and connections between the piston of the second cylinder and means adapted to apply a brake to the vehicle.

10. A speed limiting device comprising a prime motor, a vehicle driven thereby, cylinders, means controlled by the speed of the vehicle for supplying fluid to said cylinders, connections between said supplying means and the cylinders whereby admission to one cylinder occurs when the other is substantially filled, pistons in said cylinders, connections between the piston of the first cylinder and devices controlling the prime motor and connections between the piston of the second cylinder and means adapted to apply a brake to the vehicle, an outlet from said second cylinder and a valve controlled by the speed of the vehicle closing said outlet.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM ROPER.

Witnesses:

LEONARD E. HAYNES,  
JOSEPH BARNARD.