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BALANCED VALVE FOR HYDRAULIC GOVERNORS

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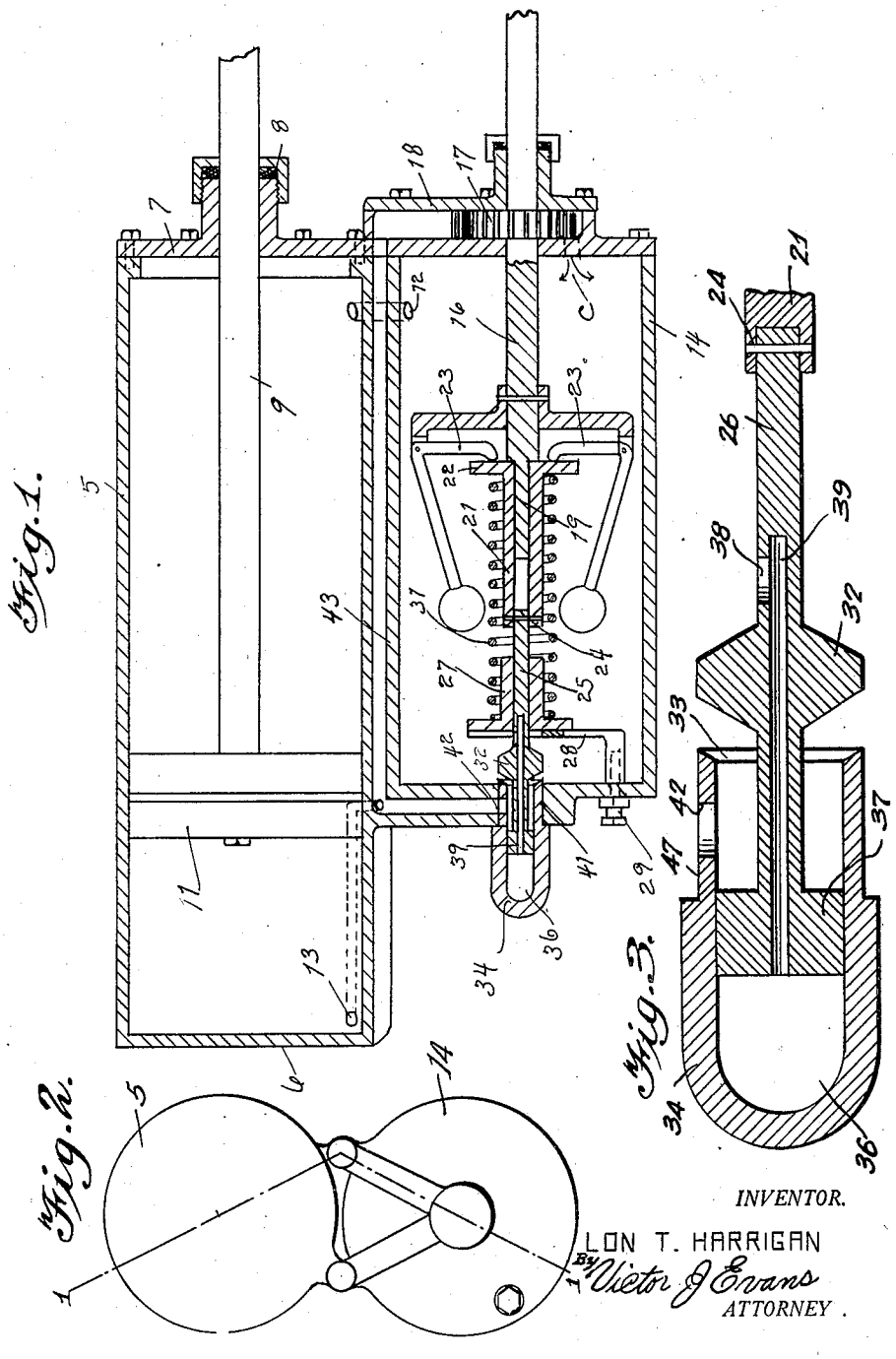


Fig. 1.

Fig. 2.

Fig. 3.

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BALANCED VALVE FOR HYDRAULIC GOVERNORS.

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To all whom it may concern:

Be it known that I, LON T. HARRIGAN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Balanced Valves for Hydraulic Governors, of which the following is a specification.

This invention relates to balanced valves for hydraulic governors of the type commonly employed on motor vehicles for reducing or maintaining the same at a speed not exceeding that for which the device is set.

The principal object of this invention is to produce a valve which will be so balanced that it will operate for the purpose of controlling the pressure in the circulating system without itself having to overcome excessive pressure as is common with the ordinary valves.

Another object is to produce a device of this character which is extremely simple and one which may be applied to the hydraulic governors now upon the market.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a vertical cross section of a hydraulic governor taken on the line 1—1 of Figure 2,

Figure 2 is an end elevation of Figure 1, and

Figure 3 is an enlarged detail view of my balanced valve.

Heretofore, excessive pressure against the valve would prevent its opening and closing as rapidly as is desirable. I have therefore provided means for relieving this pressure or equaling the same upon both sides of the valve so that it will operate freely.

In the accompanying drawings wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates a brake cylinder having a closed end 6 and an open end to which is attached a head 7. This head is provided with a stuffing-box 8 through which is adapted to move a brake rod 9. This brake rod has secured to the end within the cylinder, a piston 11. Ports 12 and 13 are provided in the cylinder and are connected to suitable passageways so that fluid pressure may be exerted in the cylinder upon opposite sides of the piston.

At 14 I have shown a governor cylinder within which is mounted a ball governor of the ordinary construction, which is rotated through the medium of a drive shaft 16. This drive shaft has connected thereto a gear 17 which meshes with a gear (not shown), thus forming a pump within a casing 18. The drive shaft 16 is rotated through a suitable connection with the propeller-shaft of the motor vehicle.

The end of the drive-shaft is reduced as shown at 19 and has slidably positioned thereon a tubular member 21 having a head 22 against which the arms 23 of the ball governor are adapted to press. This tubular member is pinned as shown at 24 to a valve stem 25. This valve stem is slidably engaged by a tubular member 27 which bears against an adjustable bracket 28 adjusted by a nut 29.

A spring 31 surrounds the tubular members 21 and 27 and extends between their respective heads. By now referring to Figure 3, it will be noted that the valve stem is provided with an enlarged portion 32 which forms a valve adapted to contact a valve seat 33 formed on the end of a shell 34. This shell is bored as shown at 36 so as to receive a piston head 37 formed upon the valve rod. This valve rod is provided with a port 38 which connects with a longitudinal bore 39. This bore forms a communication with the interior of the casing 34, at a point beyond the piston head 37. A portion of this casing 34 is reduced as shown at 41 and is provided with a port 42. This port 42 is adapted to register with a passageway 43.

A similar passageway communicates with the port 13 and with the passageway 43.

The operation of my device is as follows:—

Assuming that the same is attached to a motor vehicle and that the vehicle is moving, when the speed becomes excessive, the ball governors will move outwardly as is customary exerting pressure upon the head 22 of the tubular member 21. This will result in causing the valve stem 25 to move toward the left of the drawing, thus bringing the valve 32 into contact with its seat 33, thus cutting off communication of the casing 14 and the passageway 43, the result being that the discharge from the pump entering

as shown by the arrows C will rapidly build up a pressure within the casing 14 which pressure will be transmitted through the port 12 to the interior of the cylinder 5, thus causing the piston 11 to move toward the left of the drawing. The fluid upon the opposite side of the piston will be expelled from the port 13 and into the passageway 43 from which point it will return to the pump.

During this operation the pressure built up within the device will also enter the port 38, bore 39, casing 36 and exert pressure against the piston 37, the result being that an equal pressure is upon both sides of the valve 32, consequently, the same may be readily seated or unseated through the action of the governor. The bolt 29 is for the purpose of increasing or decreasing the amount of pressure upon the spring 31 for the purpose of governing the speed at which the brakes are applied.

It will thus be seen that I have provided a very simple mechanism for accomplishing the objects above set forth.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. In combination with a hydraulic braking mechanism having a circulating system, a valve positioned in said system, said valve being provided with a central bore, a piston secured to one end of said valve, and means for transmitting fluid pressure to said piston in such a manner as to equalize the pressure against said valve.

2. In a device of the character described, the combination with a hydraulic braking mechanism having a fluid circulating system, a valve casing having a valve seat, a port formed in said casing, said port communicating with said circulating system, a valve stem having a valve formed thereon and adapted to contact said seat, a piston head formed on said stem, a port formed in said stem, at a point adjacent said valve, a bore formed in said stem and communicating with said port for the purpose of transferring pressure from a point outside said casing to a point within said casing, for the purpose specified.

3. In a device of the character described, the combination with a hydraulic braking mechanism having a circulating system, a casing secured to said mechanism and adapted to be interposed on the circulating system, a valve seat formed on said casing, a sliding valve adapted to contact said seat, a piston head movable in said casing and connected to said valve, means for causing said valve to move into contact with its seat, and means for exerting and equalizing a fluid pressure on said valve and on said head, said pressures being opposed one to the other.

In testimony whereof I affix my signature.

LON T. HARRIGAN.