July 16, 1940. H. W. NOTHIGER 2,208,042

HYDRAULIC BRAKE

Filed April 26, 1938

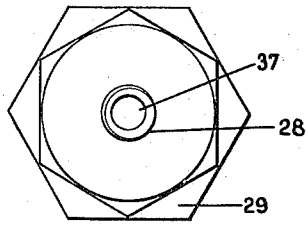


Fig. II

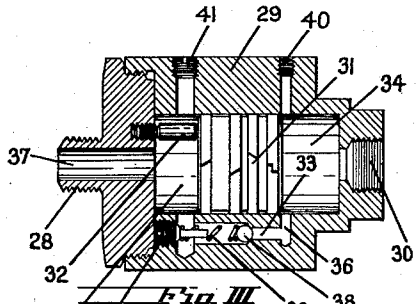


Fig. III

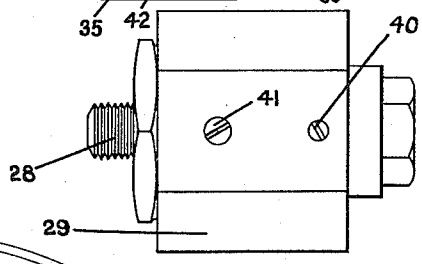


Fig. IV

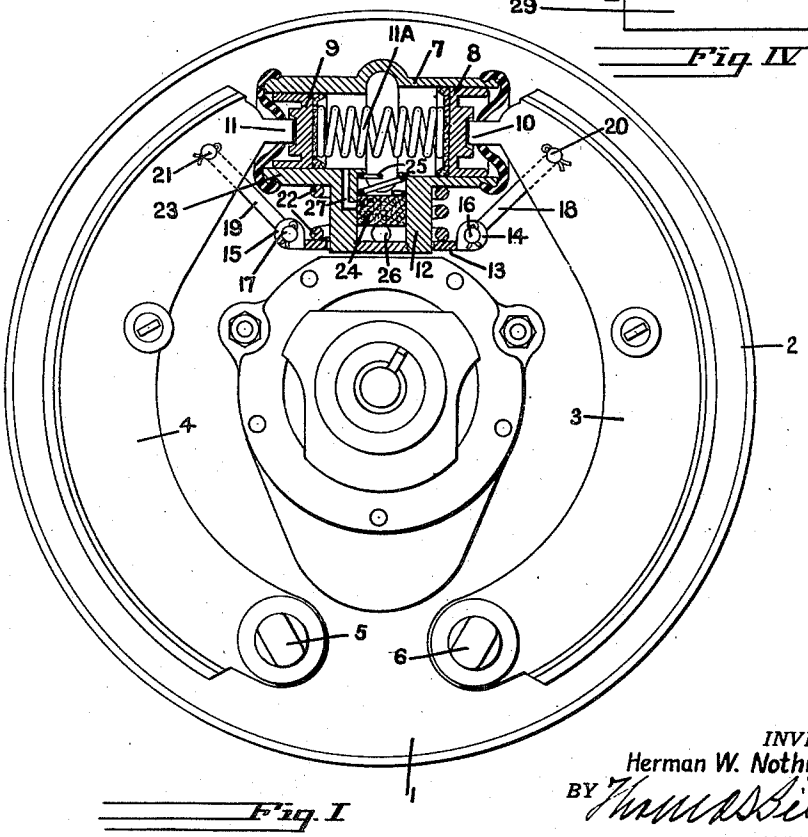


Fig. I

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2,208,042

HYDRAULIC BRAKE

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3 Claims. (Cl. 188—152)

My invention relates to improvements in hydraulic brakes.

The primary purpose of the invention is to provide a hydraulic brake that will give uniform travel to the pedal of the hydraulic brake irrespective of the amount of wear upon the braking mechanism, and the braking parts that are used for actuating the same.

Heretofore in hydraulic brakes now in common use, the amount of travel of the actuating pedal is governed by the amount of wear that has developed within the parts. That is to say, the more the wear, the more the travel of the foot pedal.

Through the use of my new and improved device, the travel is constant irrespective of the mechanical condition of the parts. I accomplish this result by placing a cylinder having a piston disposed therein in communication with the cylinder and piston assembly that is now placed within the wheel housing that is to be braked. In the preferred form of such development, the same is placed within the wheel and this will be done where the wheel assembly is open to give access to the interior of the wheel or where the complete unit is made and assembled at the factory and placed within the wheel before the vehicle is delivered.

However, I provide a modified form of device where the piston and cylinder assembly is secured to the cylinder disposed within the wheel to place the actuating instrumentalities and the fluid to be compressed thereby in communication with the standard cylinder disposed within the wheel, and having my cylinder piston assembly disposed upon the outside of the wheel; thus providing a device that may be used on wheels now in use as well as a device that may be placed within the wheel before the same leaves the factory.

With these and incidental objects in view, the invention consists in certain novel features of construction and combination of parts, the essential elements of which are set forth in the appended claims, and a preferred form of embodiment of which is hereinafter shown with reference to the drawing which accompanies and forms a part of this specification.

In the drawing:

Fig. I is a side view of the wheel assembly illustrating my new and improved device disposed within the wheel and secured to the cylinder now disposed within the wheel.

Fig. II is an end view of a modified form of cylinder that is to be placed in communication with the cylinder illustrated in Fig. I, but which is disposed upon the outside of the wheel.

Fig. III is a sectional side view of the mechanism as illustrated in Fig. II.

Fig. IV is a side view of the mechanism, as illustrated in Figs. II and III.

Like reference characters refer to like parts throughout the several views.

In the drawing, 1 is the brake drum housing, and 2 is the flange of the brake drum to which the braking effort is to be applied on the inside. 3 and 4 are the brake shoes of the conventional type, the respective shoes being rockably disposed about supporting pins 5 and 6.

The cylinder 7 is of the conventional type having pistons 8 and 9 disposed therein that engage the lugs 10 and 11 that are formed integral with and are in registry with each other and are secured to the brake shoes 3 and 4.

The conventional spring 11A normally maintains the pistons 8 and 9 spaced apart.

I provide a cylinder 12. The cylinder 12 is secured to the cylinder 7. A floating ring 13 is disposed about the cylinder 12 and brackets 14 and 15 are disposed at the opposite ends of the floating ring 13.

Hinged pins 16 and 17 are disposed within the brackets 14 and 15, and links 18 and 19 are secured upon their one end to the respective pins 16 and 17. These links are secured to the shoes 3 and 4 upon their opposite ends by hinged pins 20 and 21.

A coil spring 22 is disposed about the cylinder 12 and one end of the spring rests against the flange 23 of the cylinder 12. The oppositely disposed end of the spring 22 rests against the floating ring 13.

The object of the spring 22 is to maintain the assembly under tension, and to prevent rattle of the brake mechanism within the brake drum housing. The body of the cylinder 7 and the body of the cylinder 12 are made of a single piece as illustrated in Fig. I by numeral 23.

A piston 24 is reciprocably disposed within the cylinder 12 and the piston 24 is maintained in a retarded condition by a coil spring 25.

A port 26 communicates the interior of the cylinder 12 with the source of hydraulic fluid that is to actuate the pistons 8 and 9 and the piston 24. When the hydraulic fluid enters the cylinder 12 in sufficient pressure to overcome the action of the spring 25, the piston 24 is actuated to thereby actuate the pistons 8 and 9 disposed within the cylinder 7.

A by-pass port 27 is disposed within the walls

of the cylinder 12, and when the piston 24 is moved sufficiently to open the port 27, fluid will flow directly from the cylinder 12 into the cylinder 7 to thereby further extend the pistons 8 and 9 without further movement being imparted to the piston 24.

This form of construction is used in conjunction with the standard cylinder 7 and is preferably installed in relation thereto at the point of origin of the vehicle upon which the device is to be installed. It also may be installed upon the vehicle in the event that the wheel is dismantled to afford accessibility to the interior of the brake drum housing.

By using the cylinder assembly as illustrated in Figs. II to IV inclusive, a satisfactory result may be obtained without the disassembling of the wheel housing. When this is to be done, the standard connection leading to the cylinder 7 is removed and the threaded end 28 of the cylinder 29 is threaded into the space formerly occupied by the standard connection and the terminal end of the hose or the tubular member that conducts the fluid to the cylinder 7 is threaded into the end 30 of the cylinder 29.

A piston 31 is reciprocably disposed within the cylinder 29 and an adjustable stop 32 is disposed within the cylinder 29 and in the line of travel of the piston 31 to thereby predetermine the travel of the piston 31.

A by-pass 33 is disposed within the cylinder wall of the cylinder 29 and one end of the by-pass 33 is in communication with the end 34 of the piston 29. The oppositely disposed end of the by-pass is in communication with the end 35 of the cylinder 29 so that when the piston 31 is moved into engagement with the stop 32, the ported end 36 of the by-pass 33 will be opened as illustrated in Fig. III and the fluid will then flow into the end 35 of the cylinder 29 and out through the port 37 directly into the cylinder 7 in the conventional manner.

A valve 38 is disposed within the by-pass 33 and the valve is normally seated by the coil spring 39. Removable plugs 40 and 41 are provided as aids to the forming of the port 33, and a removable plug 42 is provided for the forming of the longitudinal length of the by-pass 33.

The mechanism illustrated in Figs. II to IV inclusive is intended for use upon hydraulic brakes already installed upon vehicles without the removal of the brake drum housing of the wheels.

Whereas the mechanism illustrated in Fig. I is intended for installation for wheels at their point of origin or when the same is disassembled for assembly thereupon.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the embodiment herein shown and described, as it is susceptible of embodiment in various forms, all coming within the scope of the claims which follow.

What I claim is:

1. In a device of the class described, in combination with a brake drum housing and a cylinder block having a plurality of cylinders associated therewith, a floating ring movably disposed upon the outside of one of the cylinders, brackets disposed upon the floating ring, a link connecting the brackets with the brake shoes of the drum housing, a compressible spring disposed about the cylinder and adapted for normally maintaining the floating ring outwardly extended, a port communicating the cylinder with the exterior, and a by-pass disposed within the cylinder wall.

2. In a device of the class described, in combination with a brake drum housing having a pair of brake shoes disposed therein and a cylinder block having a plurality of cylinders associated therewith, a pair of pistons disposed in one of the cylinders and a single piston disposed in another of the cylinders, a by-pass communicating the respective cylinders, a second port disposed in the cylinder having a single piston disposed therein, a floating ring disposed about the cylinder having a single piston, a pair of links connecting the floating ring with the brake shoes, a compressible spring disposed about the cylinder and positioned to maintain the floating ring extended about the cylinder and reactance means for maintaining the single piston spaced away from the cylinder having a pair of pistons disposed therein.

3. In a device of the class described, in combination with a brake drum housing having a pair of brake shoes disposed therein and a cylinder block having a plurality of cylinders associated therewith, a pair of pistons disposed in one of the cylinders with a single one of the pair of pistons being normally in contact with one of the brake shoes, reactance means disposed within the cylinder for normally urging the pistons into engagement with the brake shoes and a single piston disposed in another of the cylinders, a by-pass communicating the respective cylinders, a second port disposed in the cylinder having a single piston disposed therein, a floating ring disposed about the cylinder having a single piston, a pair of links connecting the floating ring with the brake shoes, a compressible spring disposed about the cylinder and positioned to maintain the floating ring extended about the cylinder and reactance means for maintaining the single piston spaced away from the cylinder having a pair of pistons disposed therein.

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