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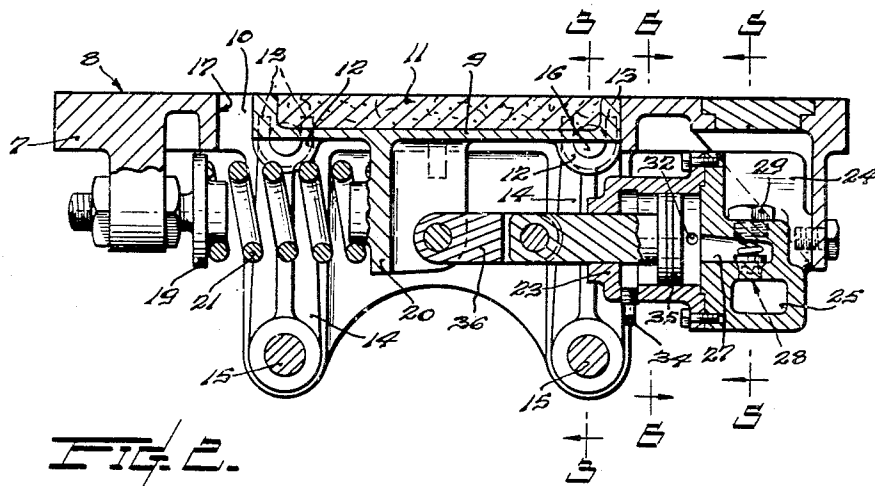
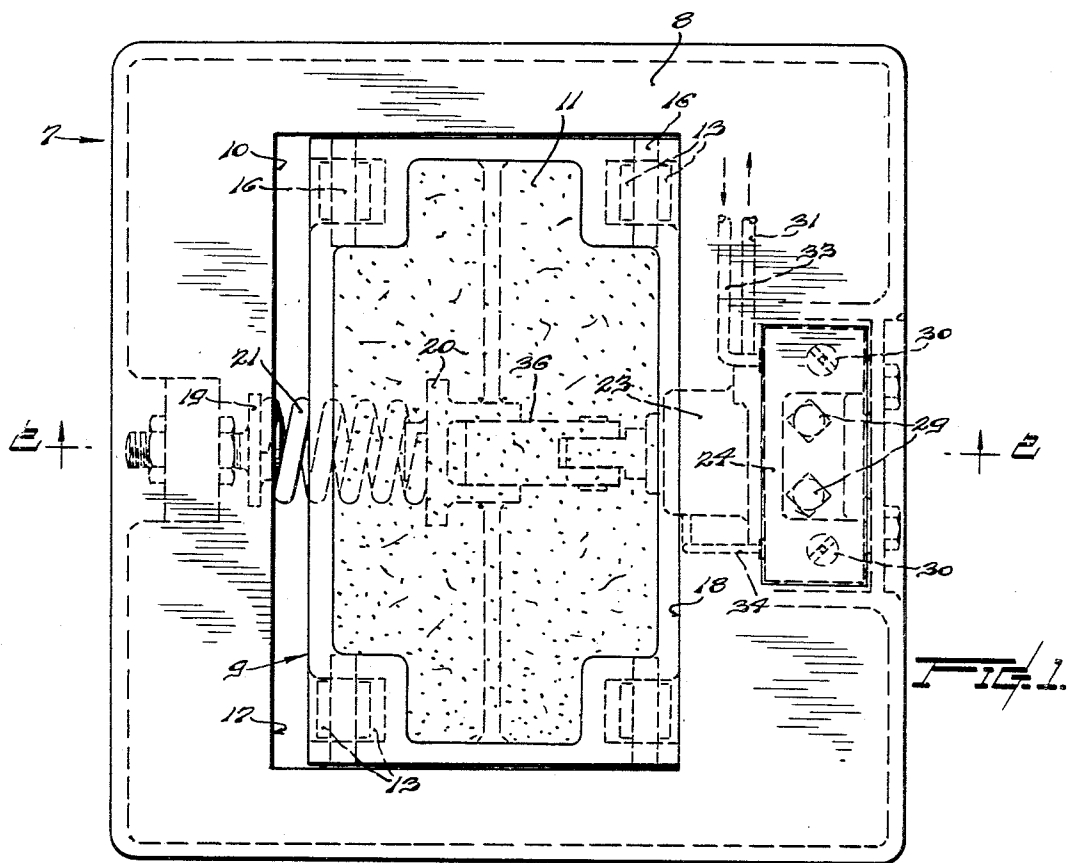
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2,070,873

BRAKE TESTING APPARATUS

Filed May 5, 1931

3 Sheets-Sheet 1



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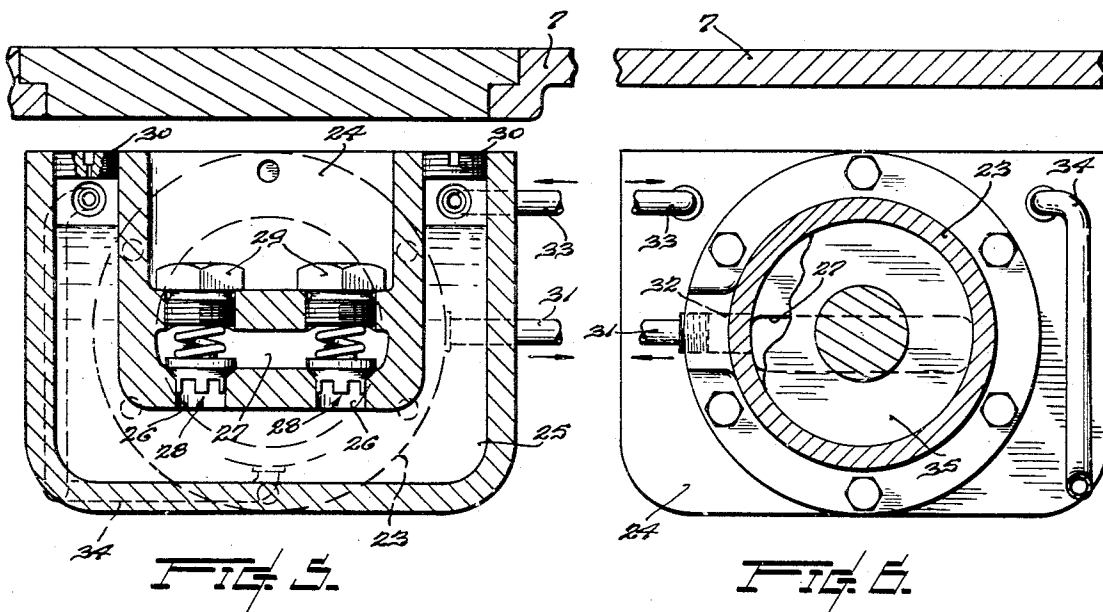
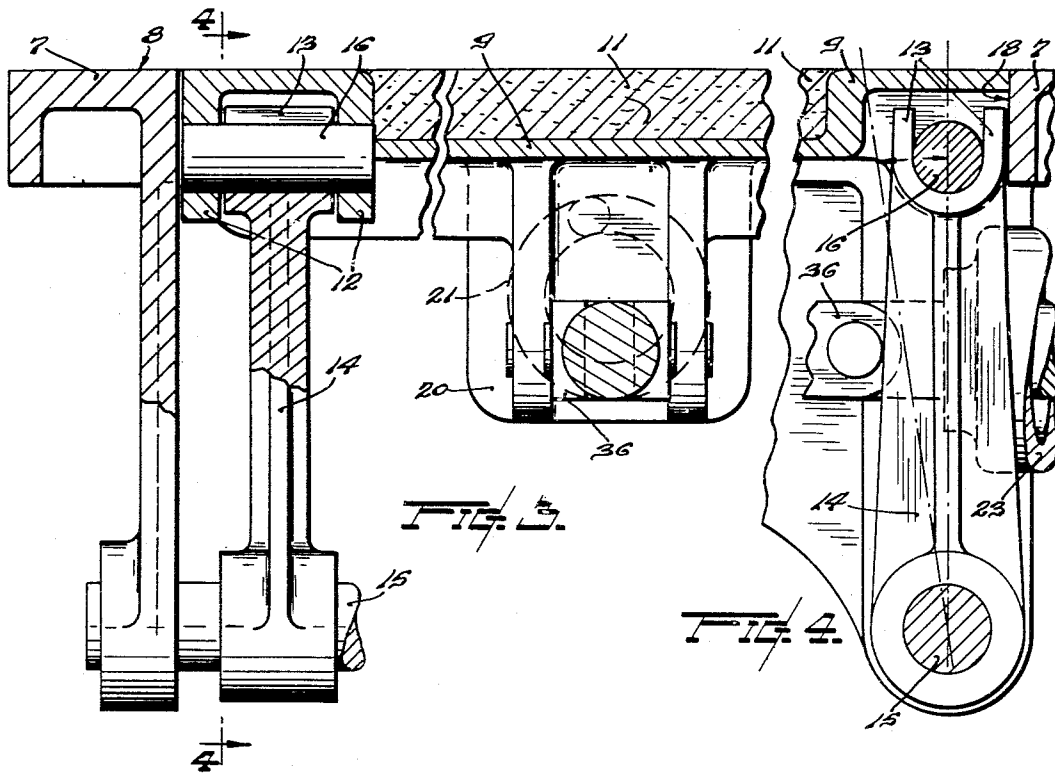
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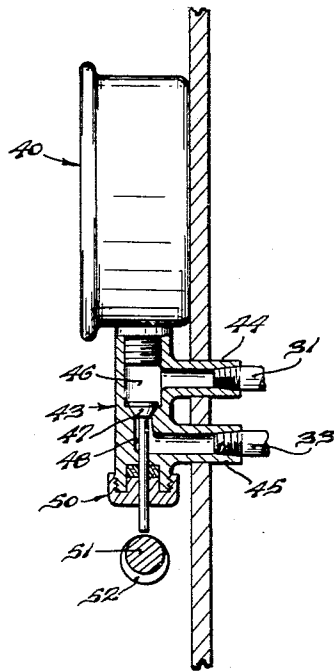
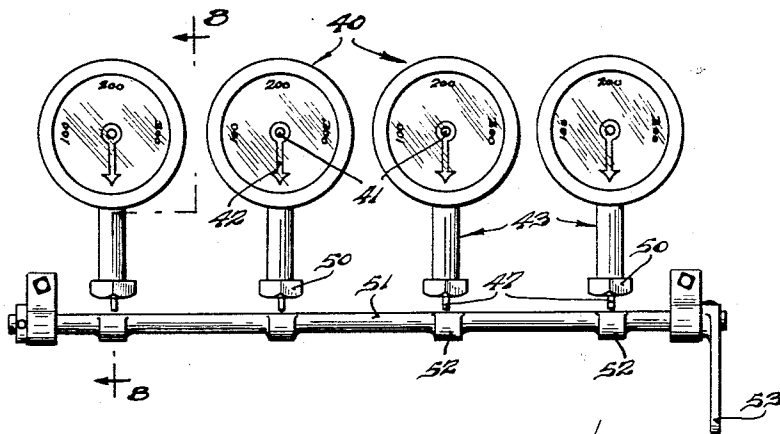
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BRAKE TESTING APPARATUS

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3 Sheets-Sheet 3



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BRAKE TESTING APPARATUS

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Application May 5, 1931, Serial No. 535,124

12 Claims. (Cl. 73—51)

This invention relates to brake testing apparatus, and more particularly to that character of apparatus wherein movable platforms are subjected, in opposition to compression springs or the like, to the force of inertia imparted from the braked wheels of a vehicle body passing thereover, the object, generally stated, being the provision of more serviceable and efficient mechanism for this purpose than heretofore devised.

A more specific object of the invention is the provision of means eliminating extensive calibration servicing such as has been heretofore required where the brake efficiency of the respective vehicle wheels is determined by actual movement rather than by the force of momentum.

A further object resides in the accommodation to a retention of the movable platform in planes constantly maintained parallel, in such wise imparting substantially uniform force to the operative mechanism throughout platform movement.

Fundamentally, the primary objective towards a determination of actual braking efficiency of the respective vehicle wheels in opposition to the vehicle's momentum is achieved in the instant invention by a gauging of the recoil rather than the forward movement of the compressed member, such recoil being necessarily proportionate to the actual force of compression as distinguished from a gauging of the movement of compression which necessarily varies responsive to the innumerable physical elements which may enter.

The above, together with further and more particular objects and advantages will, it is believed, become apparent throughout the course of the following detailed description and claims, the invention consisting in the novel construction, adaptation and combination of parts hereinafter described and claimed.

In said drawings,—

Figure 1 is a top plan view of apparatus embodying the present invention, representing by dotted lines the relative relationships of the operating structure therebelow.

Fig. 2 is a longitudinal vertical section taken on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged fragmentarily represented transverse vertical section through 3—3 of Fig. 2, parts being broken away.

Fig. 4 is a fragmentary longitudinal vertical section on line 4—4 of Fig. 3.

Fig. 5 is a transverse vertical section through 5—5 of Fig. 2, taken to an enlarged scale.

Fig. 6 is an enlarged transverse vertical section looking in the opposite direction to that of Fig. 5 through 6—6 of Fig. 2.

Figure 7 is a front elevation indicating the assembly of the indicating gauges for the respective platforms; and

Figure 8 is a vertical section taken to an enlarged scale through 8—8 of Figure 7.

The invention contemplates the use of four individually operative platforms so spaced as to approximately simultaneously accommodate the tracking engagement of the respective vehicle wheels. Each of said platforms and the associated mechanism therewith incorporating similar structure, the illustrative disclosure is confined to the showing of one.

Reference being had to said drawings, the numeral 7 represents a supporting body set into and suitably mounted for a flush disposition of the surface 8 thereof with the floor of a garage, service station, or the like, said frame centrally apertured as at 10 for the reception of a longitudinally-movable platform 9 having a gripping surface preferably provided by a concrete bed 11.

Said platform is, moreover, conformed to provide down-turned lugs 12 presenting bifurcate recessed corners accommodating the reception of the fork arms 13 of supporting members 14, said members respectively fulcrumed at lower terminals by cross shafts 15 received in depending laterally disposed bearings of the supporting body. Lug-supported wrist pins 16 are saddled in the respective fork arm sockets, the apparatus affording a swingable activity to an extent allowed by the end walls 17—18 of the aperture 10.

21 represents a compression spring surrounding the stud of a longitudinally adjustable thrust member 19 carried by frame 7, interposition of said spring therebetween and a depending strut 20 integral with the platform 9 normally maintaining the latter in its inoperative rearmost disposition represented in the respective views.

More particularly to operating mechanism serving to determine the recoil force from the compressed disposition of said spring, the invention provides at the oppositional end of said frame, a cylinder 23 secured as by bolts to a rigidly supported chambered head 24 integrally secured to the supporting body. Said cylinder communicates through an elongated throat 27, with a pair of outlet ports 26 leading from the reservoir 25 of said head. Insertable through

apertures closable by plugs 29, 28 indicates check valve assemblies for the respective ports.

As herein designed, said reservoir is of an approximate U-shaped configuration in transverse vertical section. Vented filler plugs 30 received in respective arms of said reservoir accommodate insertion of an oil or other desired fluid to the same.

31 represents a conduit connecting the port 32 of cylinder 23 with a suitable type pressure indicating gauge, a return passage 33 leading from said gauge to one arm of the head reservoir 25. 34 indicates a pressure release from the companion arm of said reservoir for the cylinder 23, such oil as may pass the ring of a cylinder-received plunger member 35 being recovered and returned thereby to the reservoir. A link connection 36 is represented between said plunger and the platform strut 20.

More especially with respect to the aforementioned indicating gauge, generally represented by the numeral 40, such may be of the conventional expandible-tube character, that is, a spiral tube encircling and having an eccentric connection with the arbor 41 of an indicating hand 42, said hand being revolvably actuated over the gauge face responsive to expansion of the tube.

In connecting said gauges with the aforementioned conduits 31, 33, I provide valve casings 43 each having a pair of lead arms 44, 45, both of which communicate through a chamber 46 with the expandible tube of the gauges. Such arms 44 receiving the respective conduits 31 while the other arm 45 connects with the respective pressure-release lines 33, I provide valves 47 serving to normally close the communicating passages 48 between said arms. 50 represents suitable packing glands and 51 a control shaft, cams 52 being supported thereby for dislodging the valves. 53 indicates a manually operated handle.

In operation, taking one wheel only as an example, the vehicle is allowed to gain momentum and subsequently checked by braking the wheels prior to passage over the concrete bed 11 of platform 9. The resultant forward momentum imparted to the latter compresses spring 21 to an extent proportionate to the braking resistance of the wheel. The responsive suction stroke of plunger 35 dislodges check valves 28 from their seats with the receptacle-contained oil being drawn through the ports and throat 27 to the head portion of the cylinder. Subsequent spring extension compresses the oil, closing check valves 28 and imparting the pressure of the fluid through conduit 31 to indicate the recoil force of spring 21 upon the gauge. The resultant readings upon the gauges are noted in determining the relative brake adjustments required, subsequent to which the gauge control shaft 51 is actuated to motivate the cams into unseating the valves, relieving the back-pressure on the cylinder. Responsive to such pressure release, springs 21 assert their compression energy in forcing the oil behind cylinder 35 through conduit 31, passage 48 of the valve casing, and conduit 33 to the receptacle 25.

As is believed evident, the recoil force of the spring is substantially identical to the actual force imparted to the spring in compressing the same.

While the illustrative disclosure represents structure now preferred by me, it is not my intention to confine the invention thereto, except as may be limited by the hereto annexed claims.

What I claim, is:—

1. Brake testing apparatus comprising a series of approximately rectangular platforms disposed to respectively receive the wheel of a moving vehicle, each of said platforms being supported for movement in the plane of the vehicle travel, compression springs for said platforms arranged in opposition to the forward movement of the same, said platform support comprising wrist pins carried in respective corners of the platforms, connecting rods having fork arms serving as saddles for said wrist pins, and stationary fulcrums for the opposite ends of said arms, plungers movable with the platforms, cylinders therefor, vented oil reservoirs having ports connecting the same with the cylinders, check valves normally closing said ports and adapted to open responsive to suction strokes of the plunger for admitting oil to the cylinder, pressure-indicating gauges for respective cylinders, and a conduit from each of said cylinders to the respective pressure-indicating gauge.

2. The apparatus as defined in claim 1, wherein is provided a return conduit leading from said gauge to the reservoir.

3. In brake testing apparatus, a horizontal platform arranged in the path of travel of a moving vehicle wheel and having a friction surface comprising a body of cement, said platform supported for movement in the plane of the vehicle travel, being a compression spring for said platform arranged in opposition to the forward movement of the platform, a plunger movable with the platform, a cylinder therefor, a vented oil reservoir, ports therefor connecting the same with the cylinder, check valves normally closing said ports and adapted to open responsive to suction strokes of the plunger for admitting oil to the cylinder, a pressure-indicating gauge, and a conduit from said cylinder to said pressure-indicating gauge.

4. In brake testing apparatus, a horizontal platform arranged in the path of travel of a moving vehicle wheel and having means supporting the platform for movement in the plane of the vehicle travel, a compression spring for said platform arranged in opposition to the forward movement of the platform, of a plunger movable with the platform, a cylinder therefor, a vented oil reservoir having a port, communication from said port to the cylinder, a check valve normally closing said port, said valve being adapted to open responsive to suction strokes of the plunger for admitting oil to the cylinder, a pressure-indicating gauge and a conduit from said cylinder to said pressure-indicating gauge.

5. The apparatus as defined in claim 4, the platform support comprising means for maintaining the platform substantially horizontal throughout the vehicle-imposed movement of the same.

6. In brake testing apparatus, a horizontal platform arranged in the path of travel of the wheel of a moving vehicle and supported for movement in the plane of the vehicle travel, a compression spring for said platform arranged in opposition to the forward movement of the platform, a plunger carried by said platform, a cylinder for said plunger, an oil receptacle, means to admit oil from said receptacle to said cylinder responsive to suction strokes of the plunger, a pressure-indicating gauge, a conduit from said cylinder to said pressure-indicating gauge, and means responsive to compression strokes of said plunger for imparting pressure of the oil in said cylinder to said gauge.

7. In brake testing apparatus, a platform arranged in the path of travel of the wheel of a moving vehicle and supported for movement in the plane of the vehicle travel, a compression spring for said platform arranged in opposition to vehicle momentum imparted to the platform, a plunger movable with the platform, a cylinder for said plunger, means to admit a fluid to said cylinder responsive to compression of said spring, a pressure-indicating gauge, and means responsive to the recoil action of said spring for imparting the plunger pressure upon the fluid to said gauge.

8. In brake testing apparatus, a platform arranged in the path of travel of the wheel of a moving vehicle, said platform supported for movement in the plane of the vehicle travel, a plunger movable with the platform, a cylinder for said plunger, means to admit a fluid to said cylinder responsive to vehicle-impelled movement of the platform, means arranged in opposition to said fluid-admission movement of said plunger for yieldably resisting the same, and means operated by said fluid to indicate the effective force of said resistance.

9. In apparatus adapted to determine braking efficiency upon a wheel under vehicle momentum, a platform movable responsive to frictional engagement of the braked wheel, means to yieldably resist said platform movement, a cylinder, means responsive to the travel of said platform in opposition to said resisting means for admitting a fluid to said cylinder, and means operable by said fluid

for determining the effective force of said resistance.

10. In apparatus for determining the braking efficiency upon a wheel under vehicle momentum, a platform movable responsive to frictional engagement of the braked wheel, a compression spring yieldably resisting said platform movement, means including a cylinder, a plunger therefor, and a fluid admission means for said cylinder rendered operative responsive to compression of said spring, and means operated by said fluid for determining the resultant force of opposition of said spring to the platform movement.

11. In apparatus for determining the brake efficiency upon a wheel under vehicle momentum, means movable responsive to frictional engagement of the braked wheel thereon, compression spring mechanism yieldably resisting said movable means, and force-measuring means including a gauge arranged to resist the recoil energy of the spring mechanism for indicating the force of compression imparted by said movable means to the spring.

12. In apparatus for determining brake efficiency upon a wheel under vehicle momentum, a platform movable responsive to frictional engagement of the braked wheel thereon, elastic means yieldably resisting said vehicle-impelled platform movement, and force-measuring means including a gauge arranged to oppose the rebound action of the elastic means for indicating the force imparted by the platform to the elastic means.

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