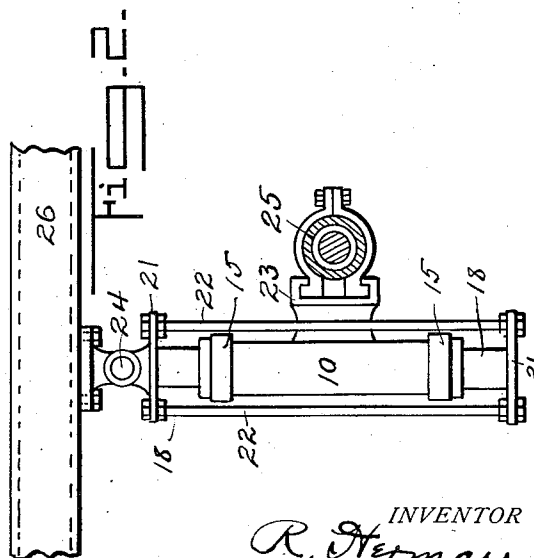
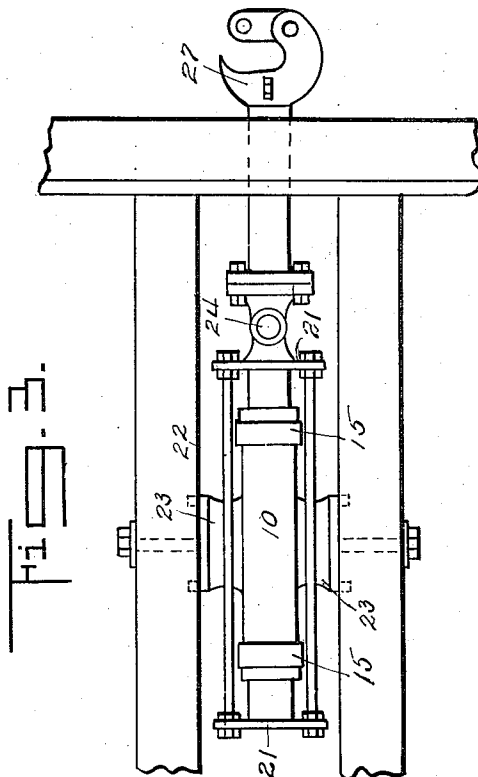
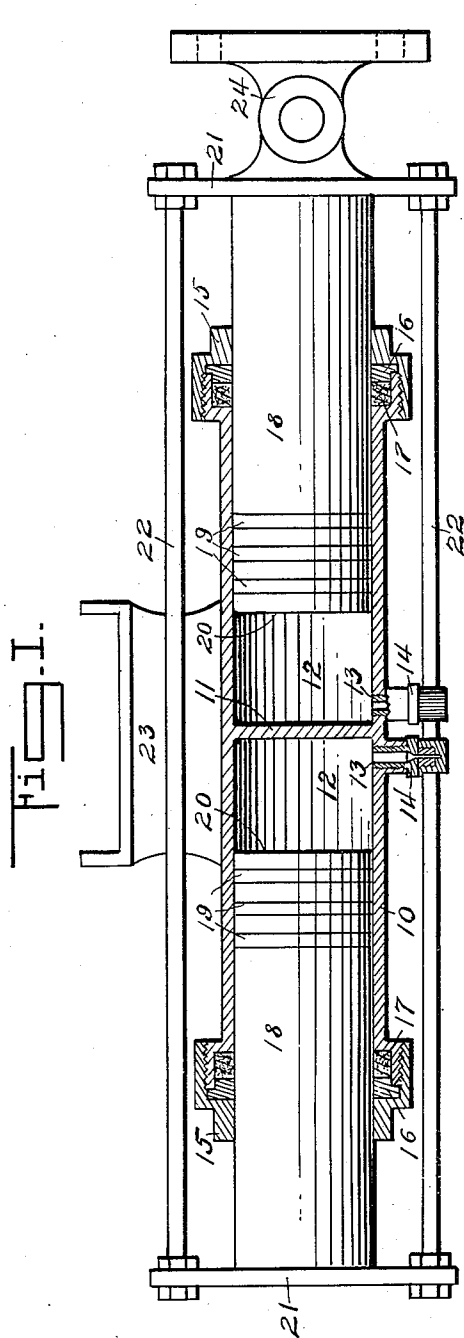


R. HERMAN.
SHOCK ABSORBING DEVICE.
APPLICATION FILED APR. 26, 1911.

1,064,214.

Patented June 10, 1913.



WITNESSES

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REINHOLD HERMAN, OF CRAFTON, PENNSYLVANIA.

SHOCK-ABSORBING DEVICE.

1,064,214.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed April 25, 1911. Serial No. 623,287.

To all whom it may concern:

Be it known that I, REINHOLD HERMAN, a citizen of the United States, residing at Crafton, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Shock-Absorbing Devices, of which the following is a specification.

This invention relates to certain new and useful improvements in shock-absorbing devices, and has particular relation to devices controlled by fluid pressure.

The principal objects of my invention are to provide a device, complete in itself, which can be employed in various connections, such for instance in connection with vehicles, or in connection with draft-rigging in cars, etc.; to provide a device in which a plurality of fluid-chambers are employed, each independent of the others, and each containing a piston, the several pistons being connected together, pairs of pistons being in opposition.

Another object is to provide a structure of this character which is simple and efficient in operation, durable in construction, readily manufactured at a relatively low cost, and which is capable of ready repair.

Another object is to provide a device of this character having opposing pressure-chambers free from communication and each being capable of receiving a pre-determined pressure regardless of the pressure of the opposing chamber.

With the above and other objects in view, my invention resides in the novel construction, combination and arrangement of parts to be hereinafter more specifically described and then particularly claimed, and in describing the invention in detail, reference will be had to the accompanying drawings forming a part of this application, and wherein like numerals of reference indicate like parts throughout the different views of the drawings, in which:—

Figure 1 is a longitudinal sectional view illustrating a preferred embodiment of my invention. Fig. 2 is a view in elevation of my device applied to a motor vehicle, the latter being somewhat diagrammatically, and, Fig. 3 is a plan view of the draft-rigging of a car showing my invention adapted thereto, portions of the car being shown in section.

My present invention generically, embodies the use of two chambers each having

a movable wall, and a fixed wall intermediate the chambers, the walls being in opposition to each other, the movable-walls being connected to move in unison, the movements of such walls being in opposite directions with respect to the fixed wall; each chamber is adapted to receive fluid-pressure to a predetermined amount, which pressure remains substantially constant in each chamber excepting when the movements of the movable walls affect the pressures by compressing or relieving the pressure in one chamber with the opposite action in the other chamber, the variation in each chamber however having no effect on the other chamber by reason of their being no pressure-communication between the chambers.

A preferred form of carrying this invention into effect is shown in detail in Fig. 1, in which 10 designates a cylinder of suitable length and having an intermediate fixed imperforate wall 11 forming a division wall or partition for dividing the cylinder into two chambers 12 located on opposite sides of the wall. While I have referred to the part 10 as a cylinder, it is to be understood that this part may be of any desired cross-sectional configuration, it being understood that the various parts hereinafter referred to and which co-act with the walls of said part are of a complementary cross-sectional configuration to produce the desired effect. Each chamber is provided with a port 13, adjacent the wall 11, said port being closed by a suitable check-valve structure indicated at 14, of well known type, and which is of a form suitable for temporary connection with a source of pressure supply, such for instance, as inflating pumps employed for inflating tires. The outer ends of the cylinder are preferably enlarged annularly and externally screw-threaded on such annular-portion to receive a cap 15, which, in connection with a follower or gland 16 is adapted to compress a suitable packing 17 onto a piston 18, which extends through the cap 15 and gland 16 into the cylinder. The piston is provided with suitable packing rings 19, and the inner face of the piston forms a movable wall 20 in opposition to the fixed wall 11, the structure being such that leakage of pressure around the piston is eliminated to the greatest possible degree, the purpose being to provide the chamber between the walls 11 and 20 substantially imperforate to pressure-leakage. As shown,

the pistons extend inwardly from the opposite ends of the cylinder, thereby placing the pressure-chambers on the opposite sides of the wall 11.

5 To provide movements of the pistons in unison, I preferably provide the outer ends of each piston with a cross head 21, of suitable form, and secure the two cross-heads together by two or more tie-rods 22, these
10 being external of the cylinder and properly positioned to provide for the securing of the device as a whole to the parts with which it is to coöperate. The tie-rods may be secured in position in any desired manner, the
15 form shown in the drawings being lock-nuts, thereby providing for adjustments in the distance between the cross-heads, enabling the chambers to be given an accurate contents-capacity, and providing for variations
20 in such capacity as the exigencies of service may require.

It is to be understood that, while I have shown the opposing chambers as of equal diameter, such diameters may be different
25 in the two chambers if desired, such diameter variation being especially desirable where there is a pressure-variation between the two chambers under normal conditions, the structure in each case however, providing opposing chambers free from inter-communication.

From the above, it will be understood that each chamber receives fluid, such as air, to a predetermined amount, readily ascertained
35 by a suitable pressure-gage, after which the ports 13 are closed. If now, pressure be placed on either cross-head, the piston of the cross-head on which pressure is applied will be forced inwardly tending to compress the fluid within the piston chamber, while the
40 opposite piston will be moved outwardly through the action of the tie-rods, thereby tending to relieve the pressure on the opposite side of the wall 11, leaving the pressures in the two chambers unbalanced. As soon as
45 the pressure on the cross-head is relieved, the compressed fluid will tend to return the parts to normal position, and this return then tends to again place the pressure previously relieved under its initial compression, with the effect of cushioning the return
50 movement and relieving the shock resultant from the original application of pressure to the cross-head.

The device is capable of use in various connections, and so far as I am
55 now aware, is best applied by connecting up one of the cross-heads with the part which provides the cross-head pressure, and mounting the part 10, to the support by means
60 of a bracket, such for instance, as indicated

at 23 secured to the side of the cylinder, approximate the center of its length, or extending on opposite sides of the division wall 11. The cross-head connection may be of any preferred type, such for instance, as that indicated at 24.

One form of application of the device is indicated in Fig. 2, where it is shown as applied to a motor vehicle, the bracket 23 being secured to the axle 25 of the vehicle in any
70 suitable manner, while the bracket 24 is secured by a knuckle-joint or other approved manner to the chassis-frame 26. Another form of application is shown in Fig. 3, wherein the bracket 24 is connected to the
75 rear end of a car-coupling 27, the cylinder 10 being suitably-mounted in the frame of the car.

While I have herein described a preferred embodiment of my invention, and various ways in which it may be employed, it will be readily understood that variations and modifications therein may be provided and be required by the exigencies of use, and I desire it to be understood that I reserve the
80 right to make any and all such variations and modifications therein as may fall within the spirit and scope of my invention as expressed in the following claims.

What I claim is:

1. In a fluid cushion shock absorber, a cylinder having an imperforate partition forming two opposing non-communicating chambers, an independent pressure controlling fluid inlet port for each chamber, a piston in each chamber, and means for connecting the pistons together externally to operate in unison, the movements of the pistons affecting the fluid pressures of the opposite chambers in unison to vary the pressure relation between them.

2. In a shock absorber, a casing having an imperforate partition forming two opposing axially alined chambers, a piston in each chamber, means for connecting the pistons externally to operate in unison in opposite directions relative to the partition, and an independent fluid pressure inlet port for each chamber to independently control the fluid pressure in each chamber, the movements of the pistons providing increasing and decreasing pressures respectively in the opposing chambers in unison, the pressure-decreased chamber forming a recoil cushion.

In testimony whereof I affix my signature in presence of two witnesses.

REINHOLD HERMAN.

Witnesses:

J. T. MONTGOMERY,
ERNEST PAYNE.