W. S. HUTCHINSON.

DRUM BRAKE.

APPLICATION FILED NOV. 15, 1913.

1,093,330.

Patented Apr. 14, 1914.

2 SHEETS—SHEET 1.

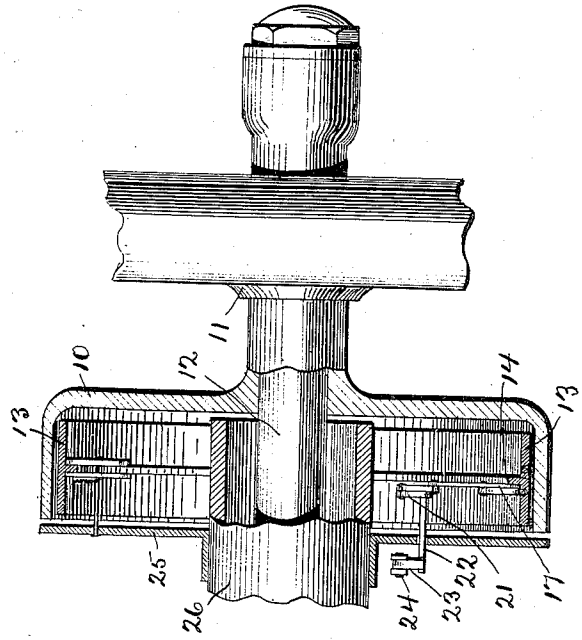


Fig. 2.

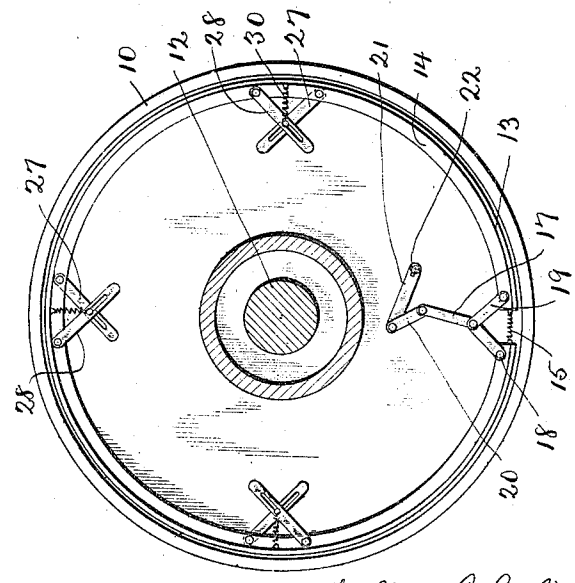


Fig. 1.

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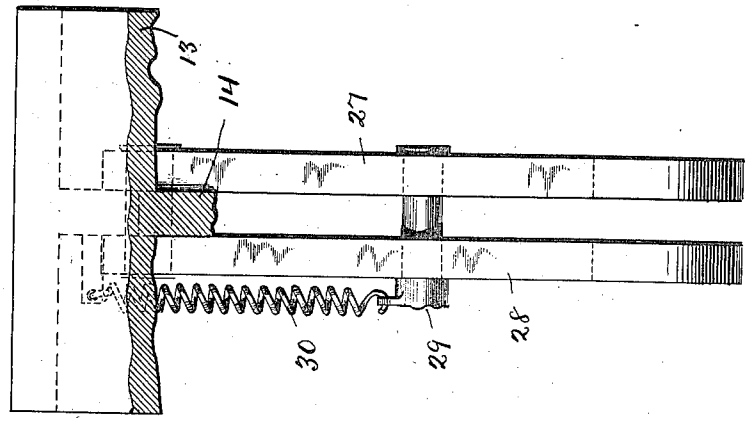


Fig. 4.

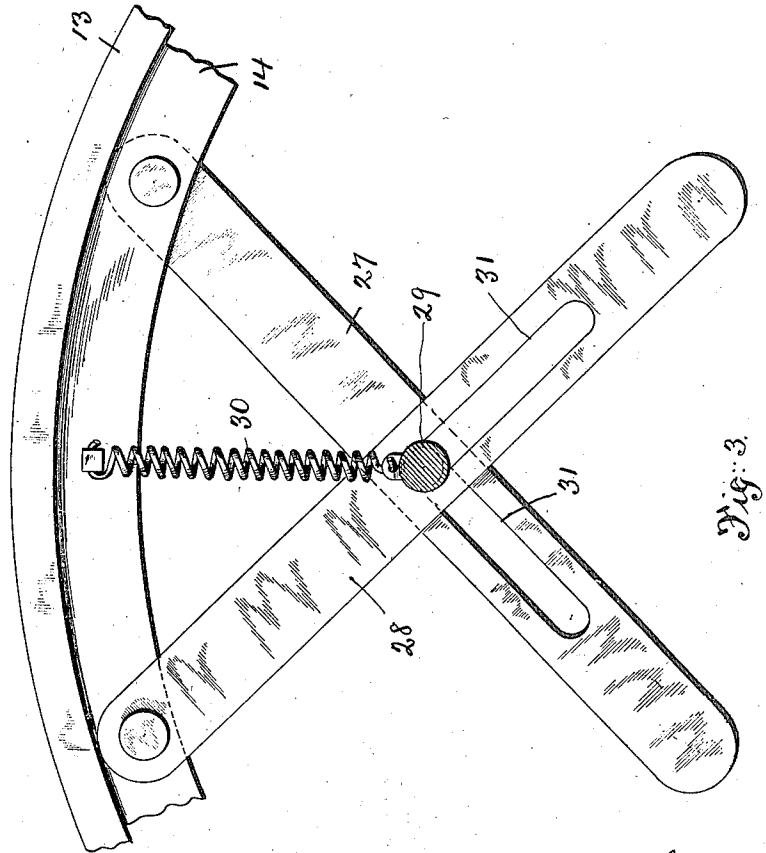


Fig. 3.

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UNITED STATES PATENT OFFICE.

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DRUM-BRAKE.

1,093,330. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed November 15, 1913. Serial No. 801,145.

To all whom it may concern:

Be it known that I, WILLIAM S. HUTCHINSON, a citizen of the United States, residing at Oyster Bay, Nassau county, New York, have invented a new and useful Improvement in Drum-Brakes, of which the following is a full, clear, and exact description.

My invention relates to improvements in drum brakes such as are generally used on automobiles, but which can be used on other vehicles, or in fact on any drum which it is desired to brake, and in which a shoe or shoes is made to impinge on the inner rim of the drum.

My invention is intended to improve and simplify the construction of brakes of this class, and to produce a brake which is absolutely positive in its action whether the drum is rotated backward or forward.

In general the object of my invention is to produce a cheap and thoroughly reliable brake, the mechanism of which is contained in a drum, and the shoe or shoes of which is arranged to impinge on the inner surface of the drum.

I have shown the brake as applied to a drum such as generally used on automobiles, but as above stated it can be used to brake a drum for any purpose.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is an inside elevation of the brake mechanism as applied to a drum, the axle and housing therefor being shown in section. Fig. 2 is a broken cross section through the brake mechanism and drum. Fig. 3 is a very much enlarged view in side elevation, of a pair of the brake shoe arms and their connection with the shoe, and Fig. 4 is a broken view at right angles to that shown in Fig. 3.

In the drawings I have shown the drum 10 of a kind generally used on automobiles but obviously the drum can be of any construction so long as it has an inner surface suitable to engage a brake shoe. I have shown it connected with the hub 11 of an automobile wheel, and arranged on an axle 12 as usual. Within the drum is a spring shoe 13 which is adapted to impinge against the inner drum surface, and which is preferably stiffened by a central rib 14. The shoe is split as shown in Fig. 1, and its ends are preferably, though not necessarily, connected by an extensible spring 15. It will be seen that when the shoe is expanded, it can be made to press against the inner surface of the drum, and when contracted it will be removed from said surface; and while I have shown the shoe in one piece, it will be obvious that it might be in several pieces, or in the form of several shoes, without affecting the principle of the construction, as will appear from the following description.

A bent arm 17 is pivoted as shown at 18 to one end of the shoe 13, and at the elbow of the arm is pivoted a link 19 which connects with the opposite end of the shoe 13, so that when the arm 17 is moved in one direction, the outer ends of the arm 17 and link 19 move away from each other and expand the shoe, while when pulled inward, the arm 17 will cause the end of the arm and outer end of the link 19 to approach, thus contracting the shoe. The inner end of the arm 17 connects by means of a link 20 with a crank arm 21 which is fast on the shaft 22, and this (see Fig. 2) is provided with a crank arm 23 connecting with the ordinary brake rod 24 which I have not shown in detail, as this connection is precisely as usual in brakes of this character. The shaft 22 extends through a plate 25 which covers the inner face of the drum 10 and which is fast on the housing 26 of the axle 12, or on some other stationary part of the structure.

At intervals around the inner periphery of the shoe 13 are pairs of arms 27 and 28 which are pivoted on a stud 29 supported on the part 25, although the studs can be supported in any convenient manner. The several studs are connected by springs 30 with the shoe 13, and this has a tendency to hold the shoe away from frictional contact with the drum 10 when the shoe is contracted, but the springs 30 can be dispensed with without interfering with the operation of the device.

The arms 27 and 28 are pivoted to the rib 14 of the shoe 13, and they cross as shown best in Fig. 3. Each cross arm is slotted longitudinally as shown at 31, and normally the studs 39 are in the outer ends of the slots as shown in Fig. 3. The object of the crossing arms is to provide for braking the drum whether the latter is turning backward or forward. For instance if the drum 10 is

turning to the right as shown in Figs. 1 and 3, and the shoe 13 is expanded, the latter will frictionally engage the inner wall of the drum 10 and will quickly be wedged between the ends of the arms 28 and the drum, while each arm 27 can slide up by reason of its slot 31. If, however, the drum 10 is turning to the left and the shoe 13 is expanded, the shoe will be wedged between the ends of the arms 27 and the inner wall of the drum 10, and the arms 28 will slide up by reason of their slots 31. In either case it will be seen that the action is a wedge action, and that by properly spacing the studs 29 from the rim of the drum 10, the brake can be given any power desired, as if the angle or pitch of the arms 27 and 28 is slight, the wedge action will be so quick and strong as to immediately stop the drum and wheel to which it is attached, but this matter can be adjusted by properly positioning the pivot studs 29 of the arms 27 and 28.

When the drum 10 is to be permitted to run free, the brake rod 24 is actuated so as to tilt the crank arm 21 and draw in the arm 17 and link 19, thus contracting the shoe 13, but if the brake is to be set, the crank arm 21 is swung outward thus expanding the shoe 13 as already explained, and bringing it into frictional engagement with the drum 10, where the wedge action of the arms 27 or 28 as the case may be, takes place, and the brake is firmly set.

I claim:—

1. A brake of the kind described comprising a drum, a shoe arranged within and in close proximity to the rim of the drum, and crossing arms pivotally connected to the shoe and having a sliding connection with a stationary support between the shoe and the axis of the drum.

2. A brake comprising a rotatable drum, a shoe concentrically arranged within the drum and adapted to impinge upon the rim of the drum, and crossing slotted arms having their slotted portions arranged on a stationary stud between the shoe and the axis of the drum and their outer ends pivoted to the shoe.

3. A drum brake having a rim, a shoe arranged concentrically with the drum rim and within the latter, arms of opposed pitch within the drum and pivoted to the shoe, stationary supports between the shoe and the axis of the drum, and a sliding and pivotal connection between the aforesaid arms and the stationary supports.

4. A brake comprising a rotatable drum having a rim, an expansible shoe arranged within the drum and in near relation to the rim of the drum, stationary supports between the shoe and the axis of the drum, and arms of opposed pitch pivoted to the shoe and having sliding connections with the aforesaid stationary supports.

5. A brake comprising a rotatable drum having a rim, an expansible shoe arranged within the rim of the drum and in close relation thereto, stationary supports arranged between the shoe and the axis of the drum, and crossing arms arranged in pairs, the outer ends of the arms being pivoted to the shoe, and the body portions of the arms having sliding and pivotal connections with the aforesaid supports.

6. A brake comprising a rotatable drum having a rim, a shoe arranged concentric with the rim and within the latter, a stationary support between the shoe and the axis of the drum, arms of opposed pitch pivoted to the shoe and having a sliding connection on the support, and means independent of the arms for moving the shoe into frictional engagement with the drum rim.

7. A brake comprising a rotatable drum having a rim, an expansible shoe concentric with the drum rim and within the latter, stationary supports between the shoe and the axis of the drum, arms arranged in pairs and of opposite pitch pivoted to the shoe and having sliding and pivotal connections with the aforesaid supports, and means for expanding and contracting the shoe whereby it is thrown into and out of frictional engagement with the drum rim.

8. A brake comprising a drum having a rim, an expansible shoe arranged within the drum and concentric with the rim, stationary supports arranged between the shoe and the axis of the drum, slotted arms of opposed pitch mounted on the supports and connected with the shoe, and a lever mechanism connected with the shoe ends for expanding and contracting the shoe.

9. The combination with the drum having a rim, the expansible shoe within the drum, and the opposed arms held on stationary supports and adapted to wedge the shoe against the rim, of a crank shaft arranged parallel with the axis of the drum, and a lever mechanism connected to the crank shaft and to the shoe ends for expanding and contracting the shoe.

10. The combination with the drum having a rim, and the expansible shoe arranged within and concentric with the drum rim, of the pivoted and sliding cross arms arranged within the shoe and pivoted to the shoe, and springs connected with the shoe and with stationary supports within it to hold the shoe out of contact with the drum rim.

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