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BRAKE MECHANISM

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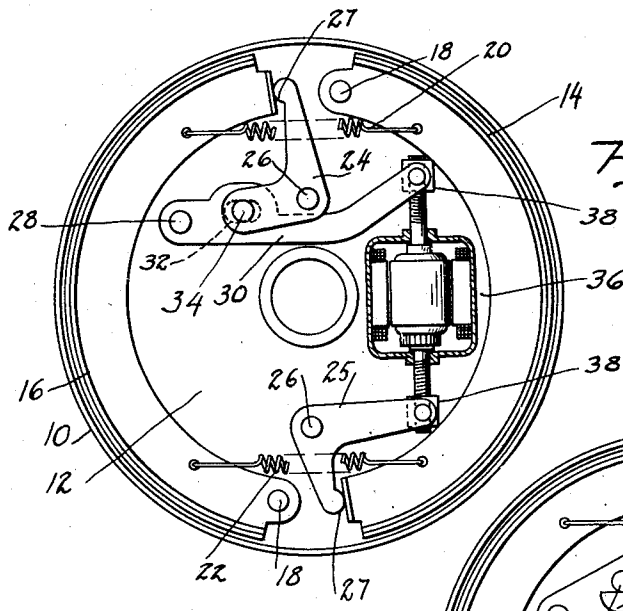


Fig. 1

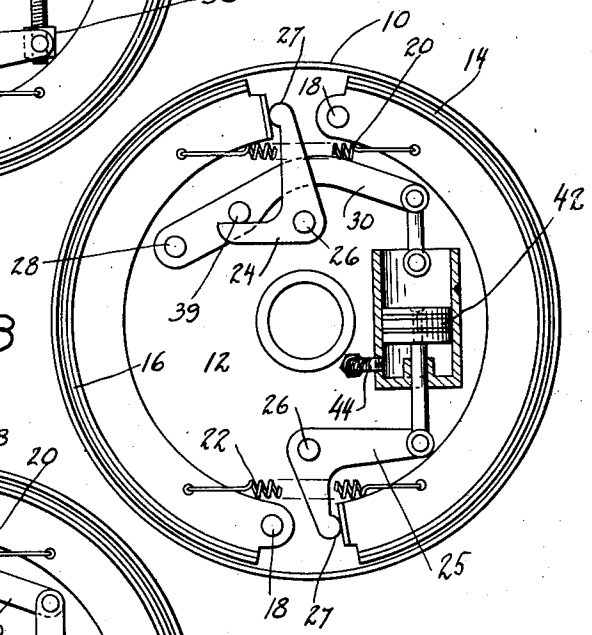


Fig. 3

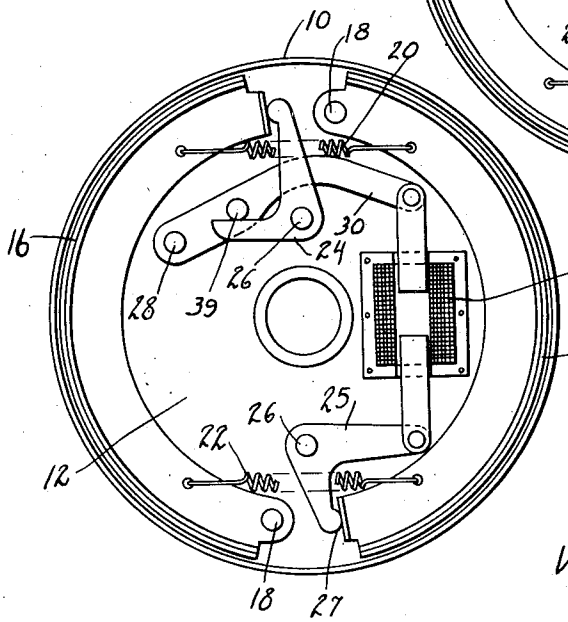


Fig. 2

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BRAKE MECHANISM

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6 Claims. (Cl. 188—78)

Our invention relates to brake mechanism for automotive vehicles, and has particular reference to power means for actuating the same wherein an individual power device is utilized in conjunction with each vehicle brake to apply the same.

An object of our invention is to utilize a plurality of movable friction means so linked up mechanically with a single power actuating device that each of these plurality of friction means will be independently actuated by the said power means.

Still a further object of our invention is to so arrange this mechanical linking up of each friction member with the single power actuating device that each friction member will be expanded against its positive anchorage while the brake drum is rotating in its forward direction. This direction of rotating is by far the most usual, of course, and by providing a plurality of friction members each expanding against its own anchorage and wrapping against the drum on this forward direction of rotation we obtain a very efficient ratio of power application and resultant braking pressure.

Various other objects and meritorious features will appear from the following description taken in conjunction with the drawing wherein like numerals refer to like parts throughout the several figures and wherein:

Fig. 1 illustrates the brake friction means arranged in conjunction with an electric motor,

Fig. 2 shows the brake arranged for operation by a solenoid, and

Fig. 3 discloses the use of a pneumatic pressure cylinder for actuating the expanding friction means.

In each of the figures we have illustrated the conventional rotating brake drum by the numeral 10. The assembly is provided with the conventional backing plate 12 used for the purpose of supporting the various operating elements which actuate the brake shoes. In each of the figures we have disclosed friction means in the form of two brake shoes 14 and 16. These shoes are arranged end to end and each is anchored on a pin 18 carried by the backing plate. These shoes are anchored at opposite extremities in such a way that, regardless of what means is utilized to expand them against the rotating brake drum, each shoe will be forced against its anchor point 18 as it wraps with the drum when rotating in the forward direction.

Conventional retracting springs 20 and 22 function to retain the brake shoes normally in their inoperative position.

To move each shoe against the drum we provide rocker arms 24 and 25, in the form of bell-crank levers, pivoted on pins 26, carried by the backing plate 12. One rocker arm acts on the free end of one shoe and the other rocker arm acts on the free end of the other shoe. One arm of each of these rocker arms is provided with a camming surface 27 which bears against the movable end of the friction means engaged thereby.

To actuate one rocker arm we provide a lever 30 pivoted upon a pin 28 in backing plate 12. This lever is provided with a slot 32 into which a pin 34 on the other arm of the rocker arm seats.

The other rocker arm 25 is connected directly to the power actuating mechanism, broadly indicated by the numeral 36 in Fig. 1. Connected to the opposite end of the power actuating mechanism is the free end of lever 30.

It is thus apparent that downward movement of the arm 30 will function through the upper rocker arm 24 to expand the friction means 16 against the drum, and that upward movement of the upper end of the lower rocker arm 25 will urge the brake shoe 14 against the brake drum. This particular linkage permits utilizing the various power actuating mechanisms which we have illustrated in the three figures.

In Fig. 1 we have shown a reversible electric motor wherein the armature shaft is threaded reversely at each end. In this modification a corresponding threaded runner 38 couples one end of the shaft to the lever 30 and a similar runner couples the other end of the shaft to the other rocker arm 25, and as the motor rotates these runner members are forced axially along the armature shaft in the proper direction for urging the brake shoes 14 and 16 against the drum to wrap therewith toward their anchor points 18. Reversible rotation of the armature shaft releases the brake.

In the disclosure of Figs. 2 and 3 we have shown a camming pin 39 on the lever 30 for the purpose of actuating the upper rocker member in lieu of the pin and slot connection shown in Fig. 1. In Fig. 2 we have disclosed the use of solenoid cores extending axially through the solenoid 40, each of which is so connected that its movement inwardly will actuate the linkage to expand the friction means, while movement outwardly will release them.

In the structure illustrated in Fig. 3 a fluid pressure cylinder provides the power. The fluid conducting conduit 44 constitutes a flexible con-

nection between the cylinder and the backing plate. The cylinder itself is linked to rod 30 and the piston stem connected to rocker arm 25. When the cylinder is operated the fluid tends to telescope the cylinder and piston stem, thus applying the brakes.

In so arranging our linkage for expanding the brake shoes I have permitted the use of a plurality of independent expanding friction means, each of which is urged against its own anchorage and each of which will tend to wrap with the forwardly rotating drum against said anchorage. In this way a more powerful pressure may be exerted against the rotating drum with the use of relatively small power in the actuating mechanism, and hence a very efficient braking action is obtained.

Having shown certain preferred embodiments of our invention others will become apparent to those skilled in the art and for that reason we limit ourselves only within the scope of the appended claims.

We claim:

1. Brake mechanism comprising a rotatable brake drum, a backing plate, a plurality of friction means independently anchored at one end by said plate, a plurality of rocker arms pivoted to the plate each having one arm bearing against the unanchored end of one friction means, a single power means secured to the backing plate, and means whereby said arms may be positively rocked in either direction by said power means.

2. Brake mechanism comprising a rotatable brake drum, a backing plate, a pair of friction means independently anchored by said plate at corresponding ends, a pair of rocker arms pivoted to said plate in proximity to the opposed ends of the friction means and each having a camming surface on one arm disconnectedly coupled with the unanchored end of opposed friction means, reciprocating power means secured to the backing plate, and connections between said power means and rocker arms whereby the latter are urged against the friction means on movement of the power means in one direction and positively retracted on reverse movement.

3. In combination with a fixed backing plate, a pair of friction means independently anchored at one end by said plate, a rotatable power driven device secured to said backing plate, independent means associated directly with said power driven device and coupled respectively with said friction means, said independent means being operable in opposite directions upon energization of said power driven device to actuate said friction means.

4. In combination with a fixed backing plate, a pair of friction means independently anchored at one end by said plate, a power driven device secured to said backing plate, independent means associated directly with said power driven device and coupled respectively with said friction means, said independent means being operable in opposite directions upon energization of said power driven device to actuate said friction means and positively operable in a reverse direction respectively upon reversal of said power driven device to permit release of said friction means.

5. In combination with a rotatable brake drum and a fixed backing plate therefor, a pair of friction members independently anchored by said plate at corresponding ends, a pair of rocker arms pivoted to said plate in proximity to the opposed ends of the friction members and each having a camming surface on one arm engageable with an unanchored end of one friction member, a rotatable power driven device secured to said plate, and independent means simultaneously reciprocable by said device and coupled with the other ends of said rocker arms for actuating the same.

6. In combination with a rotatable brake drum and a fixed backing plate therefor, a pair of friction members independently anchored by said plate at corresponding ends, a pair of rocker arms pivoted to said plate in proximity to the opposed ends of the friction members and each having a camming surface on one arm engageable with an unanchored end of one friction member, a rotatable power driven device secured to said plate, and independent means simultaneously reciprocable by said device and coupled with the other ends of said rocker arms for actuating the same, said independent means being reciprocable in opposite directions and reversible respectively as to direction in accordance with the direction of rotation of said power driven device.

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