

Feb. 20, 1940.

B. DICK

2,190,978

BRAKING MECHANISM

Filed April 8, 1939

3 Sheets-Sheet 1

Fig. 1.

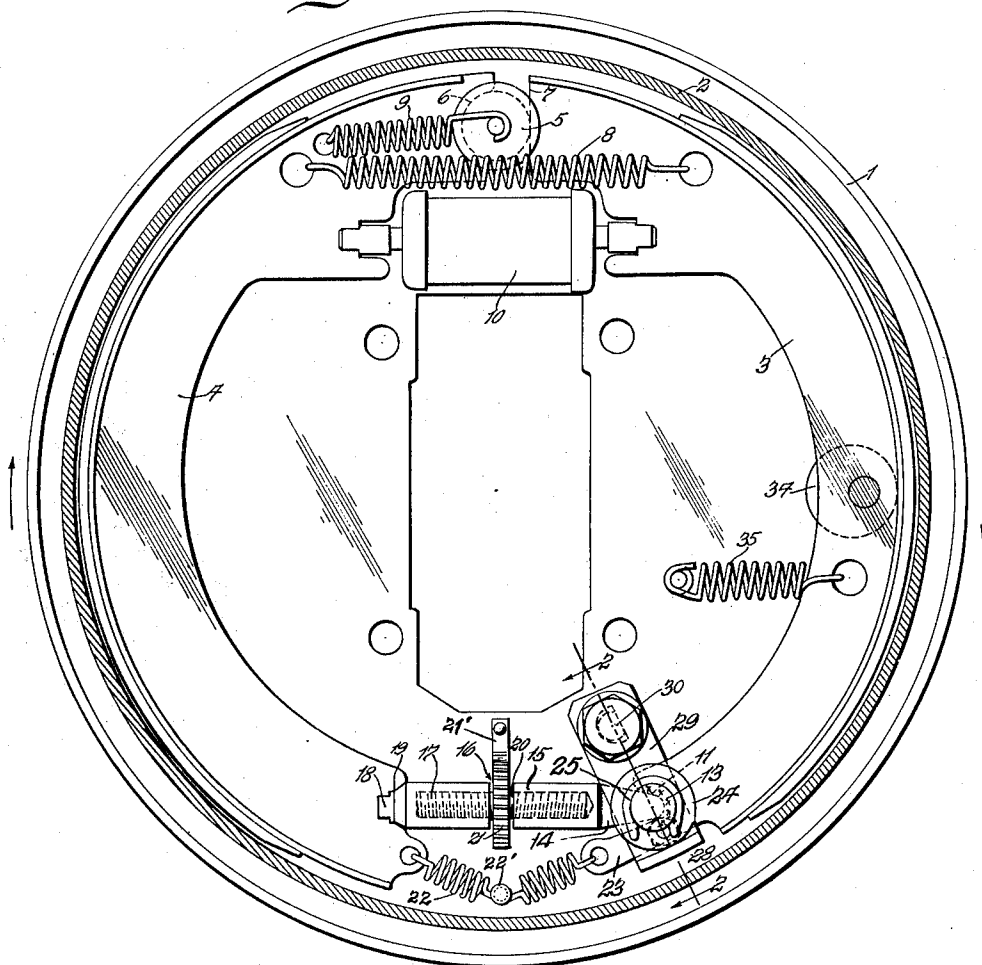
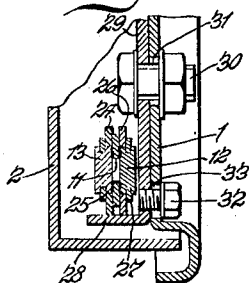


Fig. 2.



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Fig. 3.

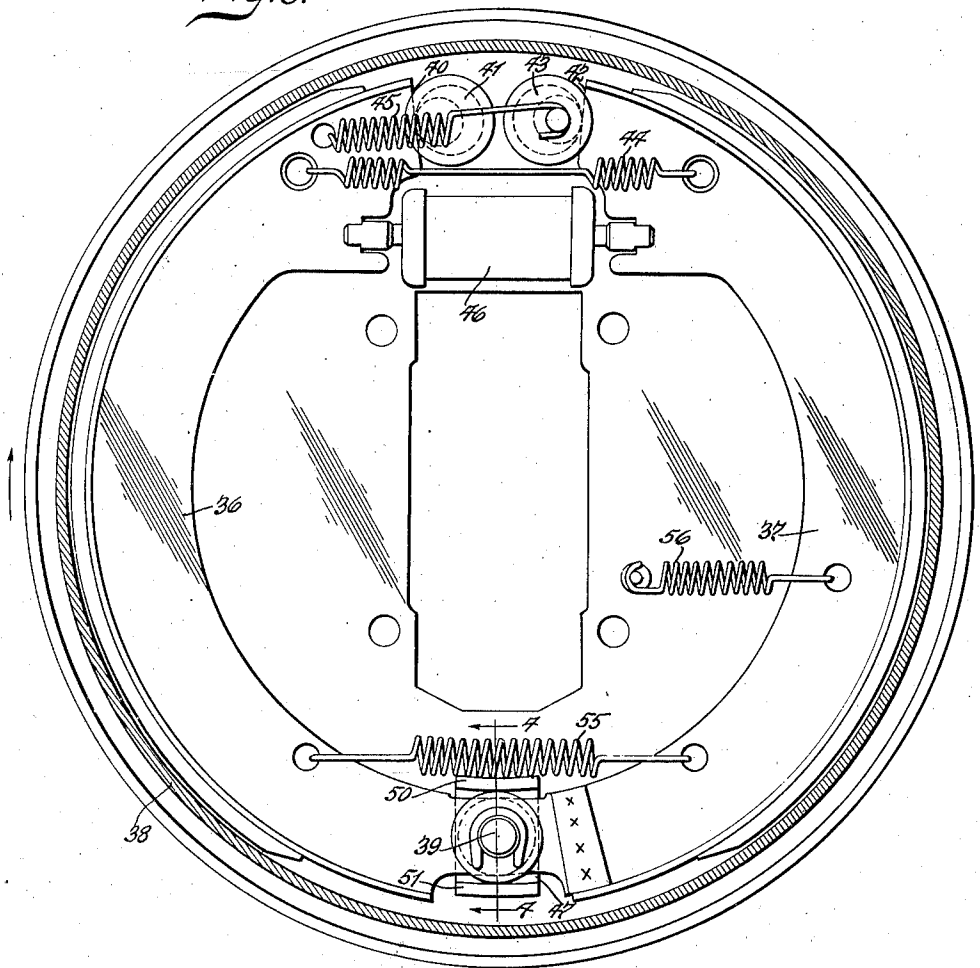
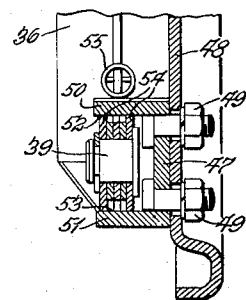


Fig. 4.



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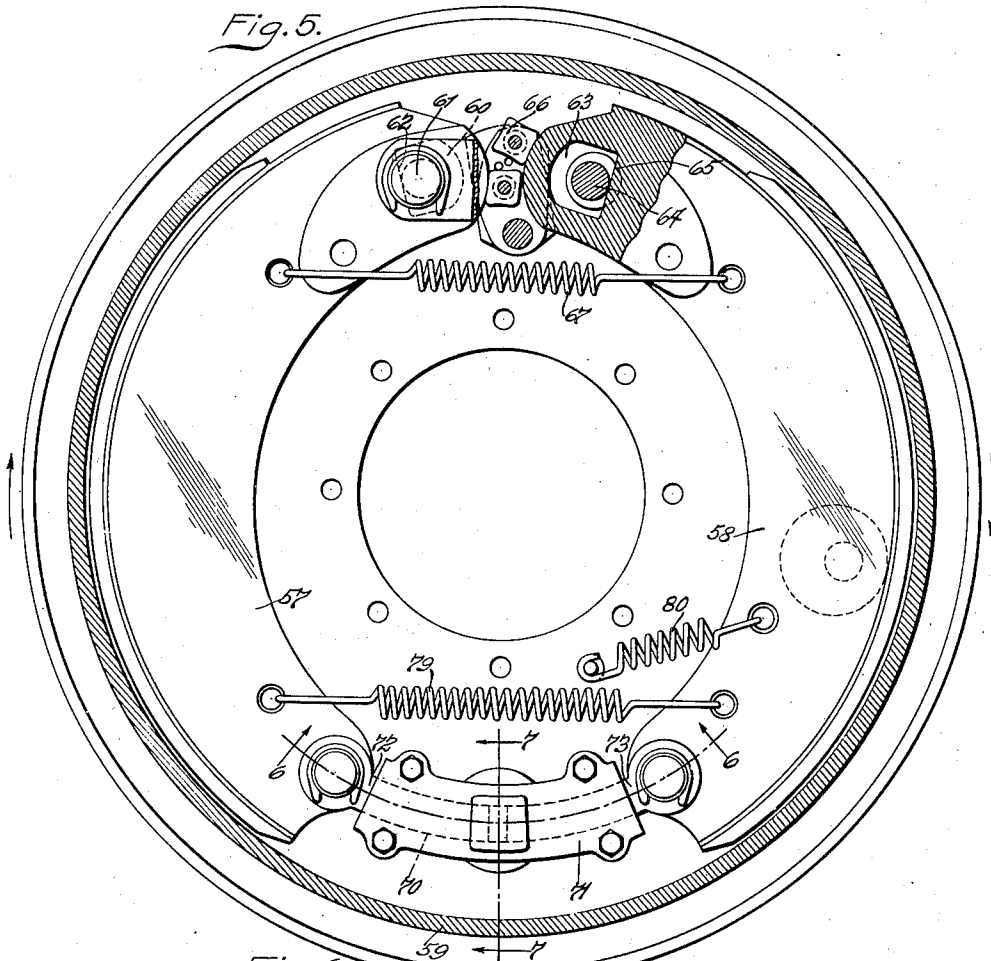
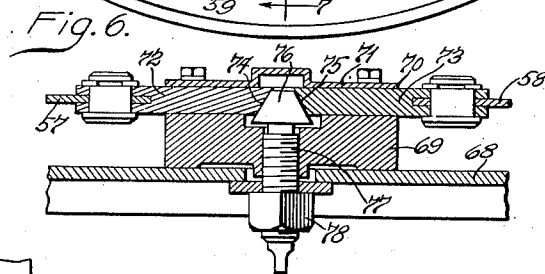
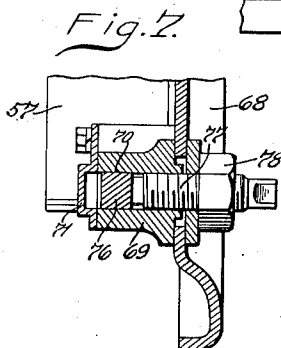
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,190,978

BRAKING MECHANISM

Burns Dick, Ferguson, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo., a corporation of Delaware

Application April 8, 1938, Serial No. 200,845

15 Claims. (Cl. 188—78)

My invention relates to brakes and more particularly to improvements in the type of brake wherein one shoe is capable of applying pressure to another shoe when the shoes are actuated into engagement with the drum.

One of the objects of my invention is to provide in a brake embodying two connected shoes, means for controlling the action of the connected end of the primary or "forward" shoe or the connected end of the secondary shoe or both.

Another object of my invention is to provide in a brake of the class described, guiding means for the connected end of the "forward" shoe which will permit the shoe to rotate about its connected end so that it may be brought into engagement with the drum and which will also maintain said end of the shoe at a predetermined distance from the axis of the drum during all conditions of operation of the brake and at the same time permit the shoe to have the necessary free circumferential movement to transmit a force to the other shoe connected thereto and thus more uniformly control the self-energizing action of said "forward" shoe and also the force transmitted to the other shoe, thereby resulting in a brake that can be better controlled by the operator during the braking period.

Other objects of my invention will become apparent from the following description taken in connection with the accompanying drawings showing two embodiments thereof in which Figure 1 is a side view, partly in section, of a brake of the type referred to and embodying my invention; Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1; Figure 3 is a side view, partly in section, of a brake assembly showing another form of a brake of the type referred to and embodying my invention; Figure 4 is a cross-sectional view taken on the line 4—4 of Figure 3; Figure 5 is a side view, partly in section, of still another form of brake embodying my invention; and Figures 6 and 7 are cross-sectional views taken on the lines 6—6 and 7—7, respectively, of Figure 5.

Referring to Figures 1 and 2, the support or backing plate 1 is fixed to a rigid part of the vehicle and is adapted to enclose the open side of a brake drum 2 fixed to the wheel of the vehicle as is common practice. Within the drum are two shoes 3 and 4 positioned in end-to-end relation and between the upper adjacent ends of the shoes there is provided a single anchor pin 5 which is adapted to be engaged by the notched end 6 of shoe 4 and the straight end 7 of shoe 3. A spring 8 is connected between the upper ends

of the shoes and normally biases these ends into engagement with the anchor pin. There is also provided an additional spring 9 between shoe 4 and the anchor pin whereby the force necessary to move shoe 4 away from the anchor pin will be greater than the force necessary to move shoe 3. The upper ends of shoes 3 and 4 are adapted to be actuated by a suitable fluid motor 10 connected to a remote source of pressure in a well-known manner.

The lower end of the web of shoe 3 is formed with a recess 11 and welded to the sides of the web adjacent this recess are bearings 12 and 13. The bearings form with recess 11, a pocket for receiving the rounded end of a member 14 welded to a threaded sleeve 15 forming part of an adjustable connecting link 16 between the lower ends of the shoes. A sleeve 17 similar to sleeve 15 cooperates with the lower end of shoe 4 by means of a notched portion 18 interengaging with a notched portion 19 in the web of shoe 4. The sleeves 15 and 17 are formed with opposite internal threads and cooperating therewith is a threaded member 20 provided at its center with a notched wheel 21, there being a suitable leaf spring 21' to hold the wheel in adjusted position. By means of this adjustable link the ends of the shoes may be moved away from each other to adjust for wear of the linings of the shoes. A spring 22 is connected to the end of shoe 4 and to a projecting member 23 on the end of shoe 3 and so cooperates with a pin 22 that the shoes will be held in engagement with link 16.

The bearing 13 has mounted thereon a disk roller 24 held in position by a C-washer 25 and the bearing 12 has mounted thereon a similar disk roller 26 held in position by a C-washer 27. The rollers 24 and 26 are biased by spring 22 into cooperative engagement with a ledge or flange 28 on a plate 29 carried by the backing plate 1. The surface of the ledge or flange 28 is arcuate and the center of curvature thereof coincides with the axis of the brake drum. The plate 29 is adjustable with respect to the backing plate and is secured to the backing plate by a bolt 30 passing through a slot 31 and also a stud bolt 32 passing through a slot 33. There is also provided an adjustable eccentric stop 34 for the central part of shoe 3 and the shoe is normally held in engagement with this stop by means of a spring 35 connected to the backing plate and the shoe.

When the brake is assembled, plate 29 is adjusted relative to the backing plate so that the lining of the lower end of shoe 3 is just free of the drum. The link 16 is also so adjusted that

the lining of both shoes will have a proper clearance with respect to the drum. The adjustable stop 34 is adjusted so that the shoe will be in engagement therewith and yet permit the shoe to have its proper clearance with the drum.

In a brake of the type just described and wherein no guiding means is employed for the lower end of shoe 3 for maintaining such end at a predetermined distance from the axis of the drum, shoe 3 has such self-energizing action that the torque of the shoe is not directly proportional, throughout the life of the brake, to the actuating pressure produced by the operator and thus the shoe cannot be so controlled that its input to the other shoe will be uniform. When the drum is rotating in the direction indicated by the arrows, which is the direction of rotation corresponding to the forward direction of the vehicle, and the fluid motor 10 is actuated, the upper end of shoe 3 will be forced into engagement with the drum and the upper end of shoe 4 will remain against the anchor pin 5 due to the action of spring 9. As the upper end of shoe 3 engages the drum, the drag of the drum on the shoe will tend to carry the shoe with the drum, causing the shoe to have circumferential movement. The force resulting from this drag on the shoe will be transferred through the adjustable link 16 to the lower end of shoe 4 and will cause this latter shoe to be moved into engagement with the drum, swinging about anchor 4. With no guiding device employed at the lower end of shoe 3, this end is free to move radially outward into engagement with the drum. This free movement of the end of shoe 3 is assisted by the angular relation of the adjustable link to the circumferential path of movement of shoe 3 which produces a wedging action. Since the lower end of shoe 3 is free to move and be forced radially into engagement with the drum, it will have a high self-energizing action which results in a brake applying force in addition to the actuating force produced by the fluid motor 10. The greater this self-energizing action becomes, the more difficult it is to control the brake directly by the actuating pressure produced by the fluid motor 10. In the type of brake being considered, the braking torque produced by the brake is such a function of the self-energizing action of shoe 3 that the brake becomes unstable and its braking torque is more difficult to control by the operator through the fluid motor 10.

When the lower end of the servo shoe 3 is confined to move in a definite arcuate path having its center coinciding with the center of the drum as is done by the particular guiding means shown in Figures 1 and 2, it has been found that the self-energizing action of shoe 3 is decreased to such an extent that the torque output of the brake is more nearly a function of the applying pressure produced by the fluid motor 10 than it is a function of the self-energizing action of shoe 3. The lower end of shoe 3 will not be free to move radially toward the drum as the shoe is applied, yet the shoe will be free to move circumferentially with the drum so it may apply pressure to the lower end of shoe 4 and actuate it into engagement with the drum. When shoe 3 is actuated, it will swing about the center of the bearings 12 and 13 and the action of the shoe will be the same in so far as the self-energizing action is concerned as though the bearings were a fixed anchor pin. The ability of shoe 3 to transfer force to the lower end of shoe 4 is not in any way restricted by the guiding means since it per-

mits free circumferential movement of shoe 3 due to the anti-friction action of the rollers on the curved flange 28.

Since a large braking torque is generally not required when a vehicle is moving in reverse direction, it is not essential that the brake operate as efficiently in this direction as in the forward direction and, therefore, no guiding means for the connected end of shoe 4 is employed. When the brake is operated and the drum is rotating in the direction opposite to that indicated by the arrow, shoe 3 will anchor against the anchor pin 5 and shoe 4 will be carried away from the anchor pin by the drag of the drum on shoe 4 and its force will be transferred by the adjustable link 16 to shoe 3. The straight surface 7 on the end of shoe 3 permits the shoe to shift radially in order to prevent binding at the rollers as the shoe swings about anchor pin 5.

Referring to the modification shown in Figures 3 and 4, the brake comprises two brake shoes 36 and 37 positioned within the drum 38 and pivotally connected at their lower ends by a pin 39. The upper end of shoe 38 has its web portion provided with a straight surface 40 for engaging an adjustable anchor pin 41, and the upper end of shoe 37 similarly has its web provided with a straight surface 42 for engagement with an adjustable anchor pin 43. The shoes are normally held in engagement with their respective pins by spring 44. An additional spring 45 is employed to give additional resistance to the movement of shoe 36 away from the anchor pin 41. The upper ends of the brakes are expanded by a suitable fluid motor 46 connected to a remote source of pressure in a well-known manner.

In order to guide the connected ends of the shoes for movement in a circumferential direction and to maintain these ends at a predetermined radial distance from the axis of the drum, there is provided a U-shaped member 47 adjustably secured to the backing plate 48 by bolts 49. The legs 50 and 51 of the U-shaped member extend at right angles to the backing plate and the inner opposed surfaces 52 and 53 thereof are concentric with each other with their centers of curvature at an axis of the drum. Cooperating with these surfaces 52 and 53 are disk rollers 54 journaled on the connecting pin 39 on opposite sides of the shoes, thus insuring that the connected ends of the shoes will be free to move in a circumferential path and at the same time be transmitted at a predetermined distance from the axis of the drum. A spring 55 between the lower ends of the two shoes maintains them in tight engagement with their connecting pin 39. There is also provided a spring 56 between shoe 37 and the backing plate in order to assist in retracting the shoe from the drum.

When the drum is rotating in its normal forward direction, indicated by the arrows, and the fluid motor 46 is actuated, shoe 37 will first be brought into engagement with the drum, the shoe 36 continuing to engage anchor pin 41 due to the action of spring 45. When shoe 37 engages the drum, it will be carried with the drum and apply force to the lower end of shoe 36, thereby forcing it into engagement with the drum, causing both shoes to anchor on anchor pin 41. The lower end of shoe 37 will not be free to move toward the drum due to the guiding effect of rollers 54 and the U-shaped member 47, and because of this, the brake will engage smoothly and be properly controlled by the pressure of the fluid motor at all

times in the same manner as the brakes shown in Figures 1 and 2. By providing a straight surface for anchor pin 41, this end of the shoe will be free to move radially into engagement with the drum and thus, although shoe 36 will tend to pivot about anchor pin 41, there will not be any binding action between the rollers 54 and the co-operating surfaces 52 and 53 as the shoe may shift longitudinally to alleviate any binding action which would normally be set up if the anchored end of the shoe were confined to pivot only about anchor pin 41.

When the drum is rotating in the direction opposite that indicated by the arrow and the fluid motor is actuated, shoe 37 will again be the first shoe to engage the drum and, due to its circumferential movement, it will bring shoe 36 into engagement with the drum. Both brake shoes will move circumferentially with the drum and against the cushioning effect of the fluid in the fluid motor until surface 42 engages the anchor pin 43 to provide the anchor for the brake. The surface 40 on shoe 36 under these conditions will move away from anchor pin 41. Shoe 36 will now become the "forward" shoe and shoe 37 the shoe receiving the force from shoe 36. The action of the brake will be the same as already described with respect to the other direction of rotation of the drum. The connected ends of the shoes will at all times be maintained at a predetermined distance from the axis of the drum as determined by the arcuate surfaces 52 and 53. There is also no binding action between the rollers and the cooperating surfaces since the straight surface 42 which engages anchor pin 43 permits this shoe and shoe 37 to shift radially.

Referring to the modification shown in Figures 5, 6 and 7, the brake comprises a pair of shoes 57 and 58 mounted within a drum 59. The upper end of shoe 57 is provided with an opening 60 for receiving an adjustable anchor pin 61, and the portion of opening 60 which cooperates with this anchor pin is provided with a straight surface 62. Similarly the upper end of shoe 58 is provided with an opening 63 for receiving an adjustable anchor pin 64 and the portion of the shoe which engages the anchor pin is provided with a straight surface 65. The upper adjacent ends of the brake shoes are actuated by the cam construction 66 of well-known construction and the shoes are normally held in "off" position against the anchor pins by means of spring 67.

Between the lower ends of the shoes a block 69 is mounted on the backing plate 68 and this block is provided with a curved slot 70 of rectangular cross section, the center of curvature of which coincides with the center of the drum. A removable cover plate 71 closes the open side of slot 70 in the block and thus forms a guide channel. The lower end of shoe 57 has pivotally mounted thereon a connecting member 72 of rectangular cross section and formed with a curvature corresponding to that of slot 70 whereby it may extend into the slot and be guided thereby. Similarly, the lower end of shoe 58 has pivotally mounted thereon a connecting member 73 of rectangular cross section and formed with the same curvature as slot 70 whereby it may extend into and be guided by the slot. The free end of member 72 is provided with a beveled surface 74 and the free end of member 73 is provided with a beveled surface 75 both of which are adapted to cooperate with an interposed wedge 76. The block 69 is held in engagement with the backing plate by a bolt 77 threaded therein and a nut

78 clamps the block to the backing plate. The bolt 77 also extends sufficiently in the block to engage wedge 76 whereby the wedge may be forced in and out as desired to change the length of the connection between the lower ends of the two shoes to permit adjustment to compensate for wear of the brake linings. A spring 79 forces the connecting members 72 and 73 into engagement with wedge 76. There is also provided an additional spring 80 to assist in retracting the shoe 58 from the drum.

When the drum is rotating in its normal forward direction as indicated by the arrows and the cam 66 is operated to actuate the brake shoes, shoe 58 will engage the drum first and move circumferentially with the drum to apply force to the lower end of shoe 57 which will anchor on anchor pin 61. The guiding block 69 will insure that the lower end of shoe 58 will be maintained at a predetermined distance from the axis of the drum, thus being prevented from moving radially into the drum as would be the case if it were freely connected to shoe 57 as has been done in the past. The shoe 59 is thus guided in a manner similar to that already described with respect to the shoes of the other brake constructions. By having the straight surface 62 of shoe 57 engaging pin 61, there will be no binding action produced between the connecting member 72 and the curved surfaces of the guide slot 70.

When the drum is rotating in the direction opposite that indicated by the arrow, the action of the brake will be the same except that shoe 57 now becomes the "forward" shoe and shoe 58 the shoe receiving the force therefrom. No binding action will be present between member 73 and the surface of the guide slot 70 because of the straight surface 65 cooperating with anchor pin 64 which now becomes the anchor for the shoe.

It is thus seen that the construction just described permits one shoe to apply pressure to the other shoe by the connecting means since wedge 76 is free to shift with the connecting members 72 and 73. The lower ends of the shoes, however, are confined to move in a circumferential path which is always at a predetermined distance from the axis of the drum. By means of this construction, the brake can be properly controlled by the pressure produced by the actuating cam.

Being aware of the possibility of modifications in the particular structure herein described without departing from the fundamental principles of my invention, I do not intend that its scope be limited except as set forth by the appended claims.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In braking mechanism of the class described, a support, a brake drum, two shoes within the drum and so connected together that when engaged with the drum one of the shoes applies pressure to the other shoe, anchor means for the shoes permitting the free end of one shoe to anchor on the support when the drum is rotating in one direction and the free end of the other shoe to anchor on the support when the drum is rotating in the other direction, actuating means for applying the shoes to the drum, and guiding means carried by the support adjacent the connected end of the shoe which applies force to the other shoe when the drum is rotating in one direction, said guiding means maintaining the end of the shoe at a constant distance from the axis of the drum but permitting said

shoe to move circumferentially with the drum and relative to the support.

2. In braking mechanism of the class described, a support, a brake drum, two shoes within the drum and so connected together that when engaged with the drum one of the shoes applies pressure to the other shoe, anchor means for the shoes permitting the free end of one shoe to anchor on the support when the drum is rotating in one direction and the free end of the other shoe to anchor on the support when the drum is rotating in the other direction, actuating means for applying the shoes to the drum, and guiding means carried by the support and associated with the connected end of the shoe which applies force to the other shoe when the drum is rotating in one direction, said guiding means comprising a member mounted adjacent the shoe and having an arcuate surface the center of curvature of which coincides with the axis of the drum and means carried by the shoe for engaging said surface and capable of movement relative to the surface for permitting circumferential movement of the shoe relative to the support.

3. In braking mechanism of the class described, a support, a brake drum, two brake shoes positioned within the drum and so connected together that when engaged with the drum one of the shoes applies pressure to the other shoe, means for anchoring the shoes, actuating means for applying the shoes to the drum, and guiding means carried by the support and associated with the connected end of the shoe which applies force to the other shoe when the drum is rotating in the normally "forward" direction, said guiding means comprising a member carried by the support and provided with an arcuate surface the center of curvature of which coincides with the axis of the drum and anti-friction means carried by the shoe end and cooperatively engaging the arcuate surface.

4. In braking mechanism of the class described, a support, a brake drum, two brake shoes positioned within the drum and so connected together that when engaged with the drum one of the shoes applies pressure to the other shoe, means for anchoring the shoes, actuating means for applying the shoes to the drum, and guiding means carried by the support and associated with the connected end of the shoe which applies force to the other shoe when the drum is rotating in the normally "forward" direction, said guiding means comprising a member carried by the support and provided with an arcuate surface the center of curvature of which coincides with the axis of the drum and anti-friction means carried by the shoe end and cooperatively engaging the arcuate surface and means for adjusting the arcuate surface radially to vary its distance from the drum.

5. In braking mechanism of the class described, a support, a brake drum, two shoes positioned within the drum and having adjacent ends, a force transmitting connection between the adjacent ends whereby one shoe can apply pressure to the other shoe when the shoes are engaged with the drum, anchor means for the shoes, means for actuating the shoes, a member carried by the support adjacent the connected end of the normally "forward" shoe and having an arcuate surface the center of curvature of which coincides with the center of the drum, bearings secured to the end of the shoe on opposite sides thereof, and rollers mounted on the bearings and cooperating with the arcuate sur-

face, said force transmitting connection between the shoes comprising an adjustable link one end of which has pivotal relation with the end of the normally "forward" shoe at a point coinciding with the axis of the rollers.

6. In braking mechanism of the class described, a support, a brake drum, two brake shoes positioned within the drum and having adjacent ends, an adjustable force transmitting member for connecting the adjacent ends of the shoes whereby one shoe will apply pressure to the other shoe when the shoes are engaged with the drum, means for anchoring the free end of one shoe when the drum rotates in one direction, means for anchoring the free end of the other shoe when the drum rotates in the opposite direction, and a member secured to the support adjacent the connected end of the shoe which acts as the normal "forward" shoe, said member being provided with an arcuate surface the center of curvature of which coincides with the axis of the drum and a pivoted roller mounted on the connected end of the shoe and cooperating with the arcuate surface whereby said end is maintained at a predetermined distance from the axis of the drum but is permitted to move circumferentially, the anchor means and the cooperating free end of the "forward" shoe being so related as to permit the end to shift toward or away from the drum.

7. In braking mechanism of the class described, a support, a brake drum, two brake shoes within the drum and having adjacent ends positioned in overlapping relation, a pin for pivotally connecting the overlapping ends whereby one shoe applies pressure to the other shoe when the shoes are engaged with the drum, means for anchoring the shoes, means for actuating the shoes into engagement with the drum, and guiding means carried by the support and associated with the pivot pin for maintaining the connected shoe ends at a predetermined distance from the axis of the drum but permitting said shoe ends to move circumferentially with the drum and relative to the support, said guiding means comprising a member having an arcuate surface, the center of curvature of which coincides with the center of the drum.

8. In braking mechanism of the class described, a support, a brake drum, two brake shoes within the drum and having adjacent ends positioned in overlapping relation, a pin for pivotally connecting the overlapping ends whereby one shoe applies pressure to the other shoe when the shoes are engaged with the drum, means for anchoring the shoes, means for actuating the shoes into engagement with the drum, and guiding means carried by the support and associated with the pivot pin for maintaining the connected shoe ends at a predetermined distance from the axis of the drum but permitting said shoe ends to move circumferentially with the drum and relative to the support, said guiding means comprising a member fixed to the support and having an arcuate surface the center of curvature of which coincides with the drum and a roller pivotally mounted on the pin and cooperating with the arcuate surface.

9. In braking mechanism of the class described, a support, a brake drum, two brake shoes positioned within the drum and having adjacent ends in overlapping relation, a pin for pivotally connecting the overlapping ends, means for actuating the other ends of the shoes, means for anchoring the free end of one shoe when the drum is rotating in one direction, means for anchoring

the free end of the other shoe when the drum is rotating in the other direction, said anchor means permitting free radial movement of the shoe ends, and guiding means carried by the support and associated with the pivot pin for maintaining the connected shoe ends at a predetermined distance from the axis of the drum but permitting said shoe ends to move said connected ends to move circumferentially with the drum and relative to the support, said guiding means comprising a member fixed to the support and having an arcuate surface the center of curvature of which coincides with the drum and a roller pivotally mounted on the pin and cooperating with the arcuate surface.

10. In braking mechanism of the class described, a support, a brake drum, two shoes within the drum and connected together so that one shoe applies pressure to the other shoe when the shoes are engaged with the drum, anchor means for the shoes, and means for actuating the shoes, said connection for said shoes comprising a guide member fixed to the support and a shiftable plunger in force transmitting relation with the ends of the shoes and guided by said guide member, said guide member and said plunger having cooperating arcuate surfaces the centers of curvature of which coincide with the axis of the drum.

11. In braking mechanism of the class described, a support, a brake drum, two shoes within the drum and connected together so that one shoe applies pressure to the other shoe when the shoes are engaged with the drum, anchor means for the shoes, and means for actuating the shoes, said connection for said shoes comprising a guide member fixed to the support, a shiftable plunger connected to the end of each shoe and extending into the guide member and an adjustable thrust means between the inner ends of the plungers and permitting shifting of the plungers, said guide member and said plungers having cooperating arcuate surfaces the centers of curvature of which coincide with the axis of the drum whereby the plungers will be maintained at a predetermined distance from the axis of the drum but will be permitted to shift circumferentially with the drum when the shoes are engaged.

12. In braking mechanism of the class described, a support, a brake drum, two shoes within the drum connected together so that one shoe applies pressure to the other shoe when the shoes are engaged with the drum, means for anchoring the free end of one shoe when the drum is rotating in one direction, means for anchoring the free end of the other shoe when the drum is rotating in the opposite direction, and means for actuating the shoes, said connection between the shoes comprising a guide member fixed to the support and formed with a curved slot the center of curvature of the surfaces of which coincide with the axis of the drum, a curved plunger pivotally connected to the end of one shoe and extending into the slot of the guide member, a second curved plunger pivotally connected to the end of the other shoe and extending into the other end of the slot of the guide member, a wedge co-

operating with the inner ends of the plungers and shiftable with the plungers and means for adjusting the wedge to vary the distance between the inner ends of the plungers.

13. In braking mechanism of the class described, a support, a brake drum, two brake shoes positioned within the drum and so connected together that when engaged with the drum one of the shoes applies pressure to the other shoe, means for anchoring the shoes, actuating means for applying the shoes to the drum, and guiding means carried by the support and associated with the connected end of the shoe which applies force to the other shoe when the drum is rotating in the normally "forward" direction, said guiding means comprising a member carried by the support and provided with an arcuate surface the center of curvature of which coincides with the axis of the drum and anti-friction means carried by the shoe end and cooperatively engaging the arcuate surface and said arcuate surface and the anti-friction means being so associated with each other and the end of the shoe that the shoe is free to pivot about said end when the shoe is actuated by the actuating means to force it into engagement with the drum.

14. In braking mechanism of the class described, a support, a brake drum, two brake shoes positioned within the drum and so connected together that when engaged with the drum one of the shoes applies pressure to the other shoe, means for anchoring the shoes, actuating means for applying the shoes to the drum, and guiding means carried by the support and associated with the connected ends of both shoes, said guiding means maintaining said shoe ends at a predetermined distance from the axis of the drum in both the operative and inoperative positions of the shoes but permitting said shoes to move circumferentially with the drum and relative to the support so that one shoe may apply pressure to the other shoe and said guiding means also permitting both shoes to be free to pivot about the connected ends when the shoes are actuated by the actuating means to force them into engagement with the drum.

15. In braking mechanism of the class described, a support, a brake drum, two brake shoes positioned within the drum and so connected together that when engaged with the drum one of the shoes applies pressure to the other shoe, means for anchoring the shoes, actuating means for applying the shoes to the drum, and guiding means carried by the support and associated with the connected ends of the shoes, said guiding means comprising a member carried by the support and provided with an arcuate surface the center of curvature of which coincides with the axis of the drum and anti-friction means carried by the shoe ends and cooperatively engaging the arcuate surface, and said arcuate surface and the anti-friction means being so associated with each other and the ends of the shoes that both shoes are free to pivot about their connected ends when the shoes are actuated by the actuating means to force them into engagement with the drum.

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