J. T. AUGER.

BRAKE.

APPLICATION FILED MAY 21, 1918.

1,320,669.

Patented Nov. 4, 1919.

3 SHEETS—SHEET 1.

Fig. 1

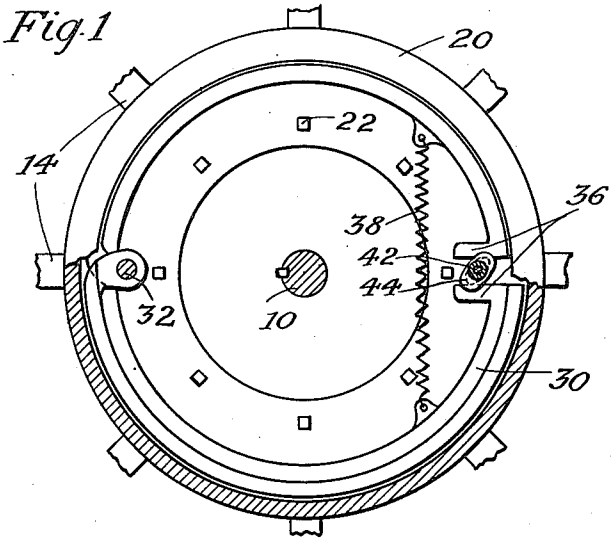


Fig. 3

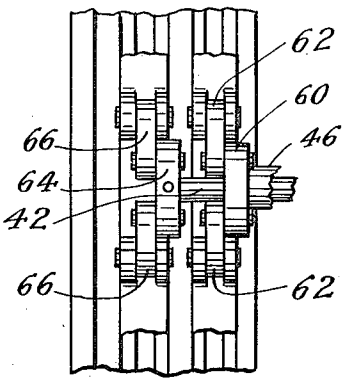


Fig. 2

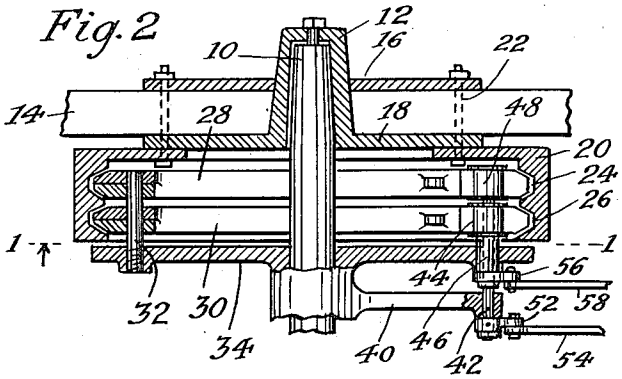
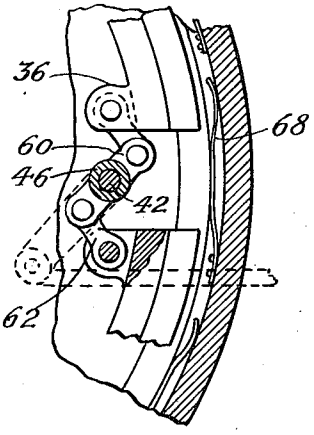


Fig. 4



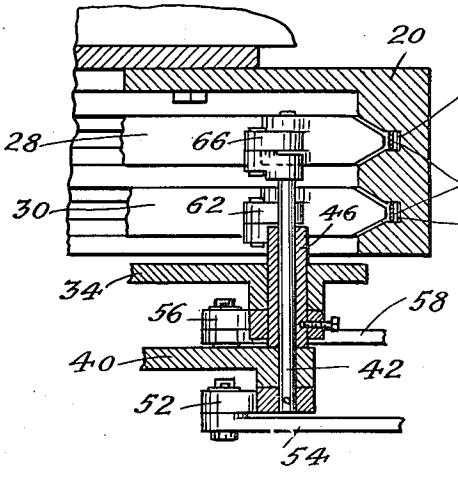


Fig. 5

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3 SHEETS—SHEET 2.

Fig. 6

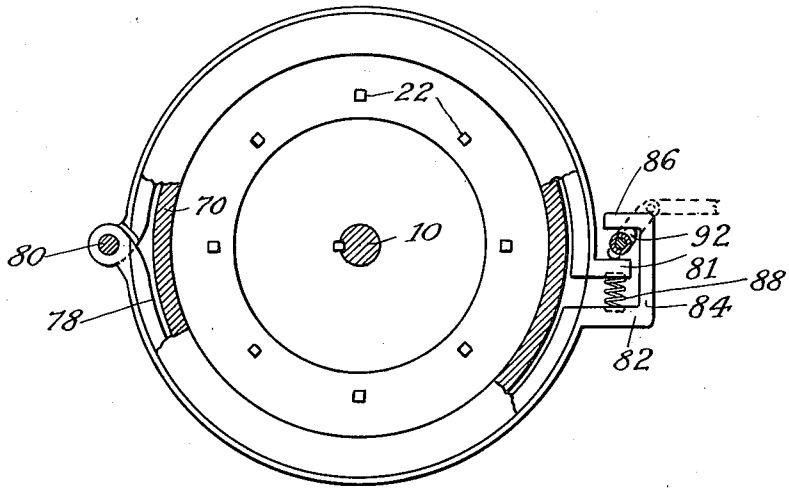
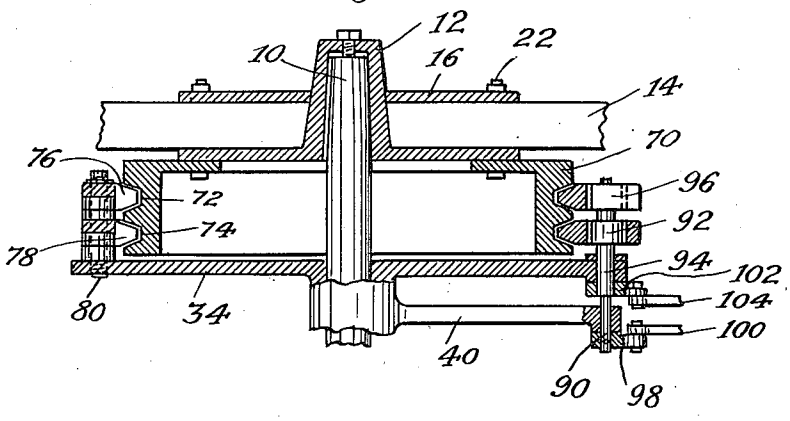


Fig. 7



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3 SHEETS—SHEET 3.

Fig. 8.

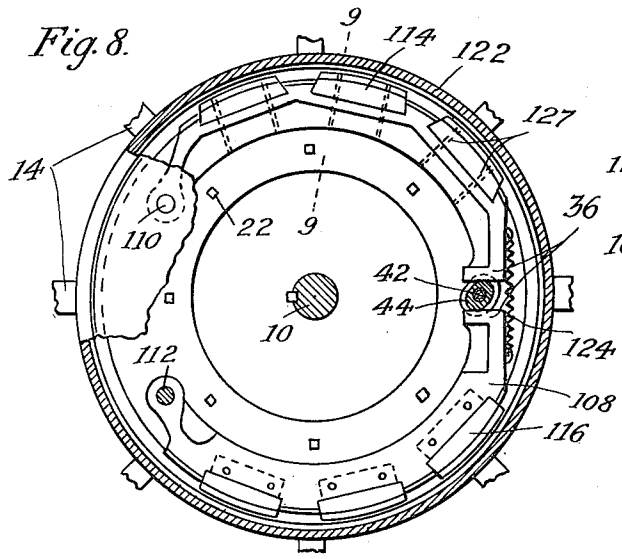


Fig. 9

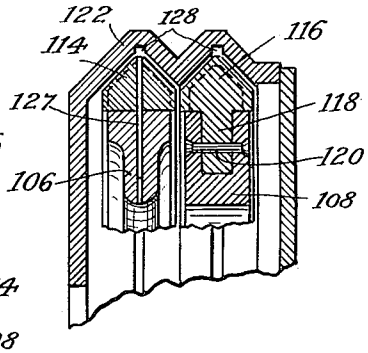


Fig. 12

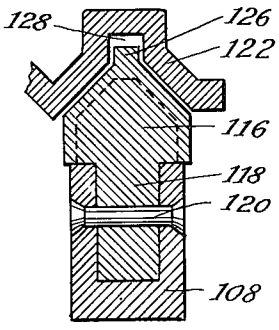


Fig. 10

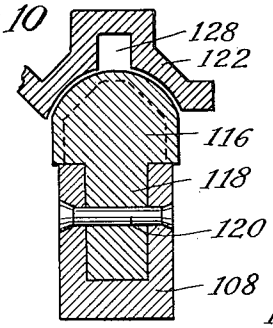


Fig. 11

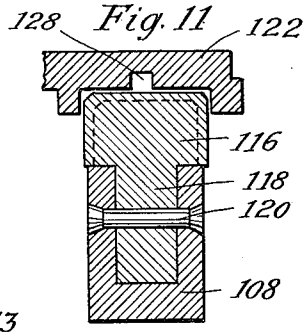


Fig 14

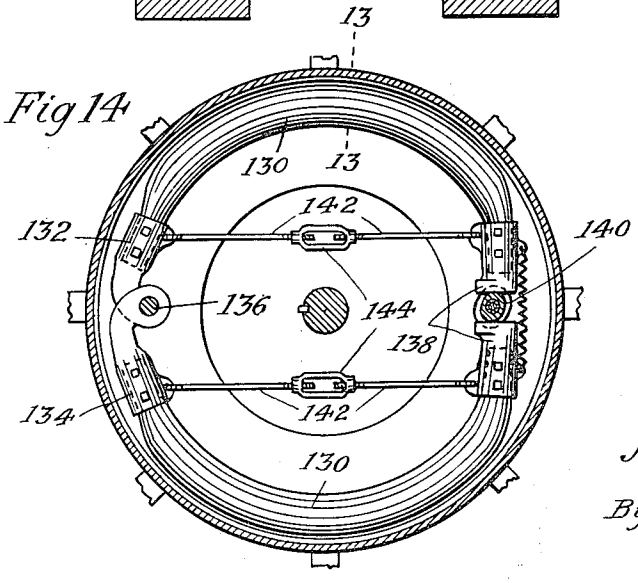
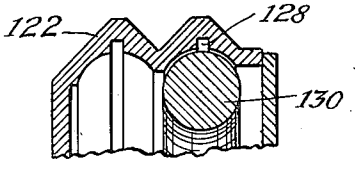


Fig. 13



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UNITED STATES PATENT OFFICE.

JOSEPH T. AUGER, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF THREE-EIGHTHS TO E. M. FERGUSON, OF ST. PAUL, MINNESOTA, AND THREE-EIGHTHS TO E. DU LAC, OF MINNEAPOLIS, MINNESOTA.

BRAKE.

1,320,669. Specification of Letters Patent. Patented Nov. 4, 1919.

Application filed May 21, 1918. Serial No. 235,816.

To all whom it may concern:

Be it known that I, JOSEPH T. AUGER, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Brakes, of which the following is a specification.

My invention relates to brakes and particularly to brakes for automobiles. The object is to provide a simple and effective brake of this kind in which are embodied a service brake and an emergency brake. I accomplish this by providing a single brake drum with which coöperate a pair of brake shoes which may be caused to operate separately or both may be caused to operate at the same time, if desired.

The full objects and advantages of my invention will appear in connection with the detailed description thereof and are particularly pointed out in the claims.

Referring to the drawings which illustrate my invention both in a preferred form and in modified forms,—

Figure 1 is a side view of the brake, partly in section, on line 1—1 of Fig. 2. Fig. 2 is a view in horizontal section taken just above the axle. Fig. 3 is a view of a modification looking toward the right in Fig. 4. Fig. 4 is a view in vertical section at right angles to Fig. 3. Fig. 5 is a view in horizontal section of the forms shown in Figs. 3 and 4. Fig. 6 is a side view partly in section of another modification. Fig. 7 is a view in horizontal section of the form shown in Fig. 6. Fig. 8 is a side view, mostly in section, of a somewhat different form of my invention. Fig. 9 is a view in section on the line 9—9 of Fig. 8. Figs. 10, 11 and 12 are detail views showing different shapes in which the brake engaging members may be made. Fig. 13 is a section on the line 13—13. Fig. 14 is a side view of another form of invention.

Referring to the form of my invention shown in Figs. 1 and 2, 10 represents the axle of an automobile upon which is mounted the rear wheel having the hub 12 and the spokes 14 secured to the flanges 16 and 18 in the usual manner. A brake drum 20 is secured to the wheel by bolts 22 which pass through the spokes 14 and the flanges 16 and 18. This brake drum, as is best shown in Fig. 2, has in its inner curved surface a pair of V-shaped grooves 24 and 26 with which coöperate a pair of V-shaped brake shoes 28 and 30 each of which is in two parts, which are hinged at one end upon a pintle 32 secured to a disk 34 on the casing. The opposite ends of each pair of shoes are provided with inwardly extending flanges and springs 38 tend to draw the two ends of the brake shoes together in order to entirely release the brake shoes. The casing is provided with an arm 40 and through this arm and the disk 34 extends a shaft 42. A cam 44 on a sleeve 46 surrounding the shaft 42 is adapted to coöperate with the flanges 36 of the brake shoe 30, while a cam 48 secured to the shaft is adapted to cooperate with the flanges 36 of the brake shoe 28. For operating the shaft 42 a crank arm 52 is secured thereto and to the other end of this crank arm is pivoted a rod 54 leading to a foot pedal for operating the brake shoe 28 in order to constitute a service brake. For operating the sleeve 46 a crank arm 56 is secured thereto and to the other end of this crank arm is pivoted a rod 58 leading to a hand lever for operating the brake shoe 30 to constitute an emergency brake. It is obvious that if both of the rods 54 and 58 are pushed rearwardly at the same time, both of the cams 44 and 48 will act simultaneously to expand the brake shoes 28 and 30 and cause both brakes to be applied in unison.

The form of my invention shown in Figs. 3, 4 and 5 is similar to that already described except that toggle links are substituted for the cams in order to operate the brake shoes. A shaft 42 and a sleeve 46 are mounted in the manner previously described. To the sleeve 46 is secured an arm 60 extending at diametrical sides thereof and to each end of this arm are pivoted links 62 which in turn are pivoted to the flanges 36 of the brake shoe 30. One end of the shaft 42 is an arm 64 similar to the arm 60, and to this arm 64 are pivoted links 66

which in turn are pivoted to the flanges 36 of the brake shoe 28. The brakes are operated by rods 54 and 58 which when pulled forward will tend to straighten the toggle links and by causing separation of the brake shoes will bring them into engagement with the grooves in the brake drum. 68 represents springs lying in grooves 24 and 26 for the purpose of engaging the outer periphery of the shoes 28 and 30 and thus increase the braking action. If desired, these springs may be used in the other forms of the invention.

The form of the invention shown in Figs. 6 and 7 is similar to that shown in Figs. 1 and 2 except that in this case the brake shoes are applied externally instead of internally of the brake drum. This drum, designated by the character 70, is secured by bolts 22 in the same manner as the brake drum 20 but differs therefrom in having the outer curved surface of the drum provided with V-shaped grooves 72 and 74 for cooperation with a pair of V-shaped brake shoes 76 and 78 each of which is in two parts hinged at one end on a pintle 80 secured to the disk 34 on the casing. The opposite ends of each pair of brake shoes are provided with simple flanges 81 on one side and flanges 82 on the other side. The flanges 82 are turned upwardly at right angles to form an extension 84 and are then turned rearwardly to form flanges 86. Springs 88 between the flanges 80 and 82 tend to keep the brake shoes out of engagement with the brake drum. A shaft 90 extends through the disk 34 and the arm 40. A cam 92 on a sleeve 94 surrounding a shaft 90 is adapted to coöperate with the flanges 80 and 86 of the brake shoe 78, while a cam 96 on the shaft is adapted to coöperate with the corresponding flanges of the brake shoe 76. The operation of the cams when turned is to cause the shoes to approach each other and engage the drum. For operating the shaft 90 a crank arm 98 is secured thereto and to the other end of this crank arm is pivoted a rod 100 leading to a hand lever. For turning the sleeve 94 a crank arm 102 is secured thereto and to the other end of this crank arm is pivoted a rod 104 leading to a foot pedal. The cams are caused to act by forcing the rods 100 and 104 rearwardly.

In the form of my invention shown in Figs. 8 and 9, the brake shoes are operated by cams in the same manner as in the form shown in Figs. 1 and 2, and hence it is not necessary in connection with Figs. 8 and 9 to show and describe the cam operating mechanism. In this form of invention, the pairs of brake shoes 106 and 108 are hinged upon separate pintles 110 and 112 and the brake engaging surfaces of the shoes instead of being formed continuously are provided with separate friction blocks. The shoes 106 are provided with metal friction surfaces 114 secured thereto in any suitable manner to constitute an emergency brake, while the shoes 108 are provided with friction blocks 116 of material which will give the flexibility and progressive take-up desirable for service brakes. The material I employ for this purpose is preferably hard maple wood. These blocks may be conveniently secured in place on the shoes by providing recesses in the latter into which extend reduced portions 118 of the blocks and by passing bolts 120 or rivets through the reduced portions and the side walls of the recesses. The brake drum 122 in this form of invention is similar to that in Figs. 1 and 2 except that the outside configuration corresponds generally to the configuration formed by the grooves which form the braking surfaces. The ends of the brake shoes adjacent the flanges 36 are flattened and a spring 124 is secured to these flattened portions so as to lie farther from the axle than the cams instead of being between the cams and the axle, as shown in Figs. 1 and 2.

Referring to Fig. 10, the brake engaging surfaces of the brake shoes instead of being V-shaped are rounded. Referring to Fig. 11, the brake engaging surfaces are formed with beveled edges while in Fig. 12 they are shown as formed with a projecting portion 126.

In Fig. 9, the metal friction blocks 114 for the emergency brake and the wooden friction blocks 116 for the service brake are shown as being of the same shape. Figs. 10, 11 and 12 show different shapes in which the brake engaging surfaces of the wooden friction blocks may be made and it is evident that the brake engaging surfaces of the metal friction blocks may have the same shapes as shown in these figures respectively. The manner in which the metal blocks are secured to the brake shoes is best shown in Fig. 8 in which the blocks are beveled to fit corresponding dove-tailed recesses in the brake shoe and are secured in place by pins 127 passing through the blocks into the shoes. Upon removing these pins, it is evident that the metal blocks may be readily detached. Both the metal and the wooden blocks are therefore removably secured to the brake shoes and when any of these blocks become worn, they may be readily replaced by new blocks. In order to vary the braking effect, some of the blocks may be removed to decrease the braking force while by adding to the number of blocks used, the braking force will be increased. In these figures the brake drum is shown provided with a groove 128 for containing a suitable lubricant such as hard oil or grease.

Referring to Figs. 14 and 13, the service

brake shoe consists of two members 130 of steam bent wood which is preferably seasoned hardwood which has been steamed and then bent into the desired shape. These members are preferably circular in cross section as shown in Fig. 13 and each member is bent longitudinally so as to extend for the greater part of a semi-circle. At two adjacent ends the members are provided with metal hinges 132 and 134 which are mounted on a pintle 136 secured to a fixed part preferably the casing, as shown in Fig. 2. The opposite ends of the members are provided with metal flanges 138 for engagement by the cam 140 operated by connections to a foot lever in the manner shown in Fig. 2. The members 130 may be held to the proper curvature by the rods 142 attached thereto at one end and adjustably connected by turn buckles 144. The drum 122 is formed with a rounded groove with which the members of the shoe engage when the cam is operated. The drum may have a groove 128 for containing lubricant. This form of the invention produces a particularly resilient flexible brake having a progressive take-up action which serves to stop the car without jerking. The members of the emergency brake may have the same shape as the members 130 or any desired shape.

The advantages of my invention will be obvious from the foregoing description. One of the brake shoes is operated by foot power to constitue a service brake, while the other brake shoe is operated by hand to constitute an emergency brake. In the forms shown in Figs. 8, 9, 10 and 11 the shoes which constitute a service brake have brake engaging surfaces of some material such as hard maple, which gives flexibility and progressive take-up when in operation. The brake shoes which constitute the emergency brake have brake engaging surfaces of metal which give less flexibility but quicker action. By providing detachable friction blocks, when these become worn they may be readily replaced by new blocks, while the braking effect may be readily varied by removing or replacing some of the blocks. By having the brake engaging surface of the shoes extend around for the greater portion of the circumference either with a substantially continuous formation or in form of separated friction blocks, the brake is exceedingly well balanced. On account of the brake engaging surface of the shoes when the device is in operation, not being removed entirely out of the grooves in the drum even when out of braking engagement, it results that the shoes are supported laterally in the grooves at all times and hence cannot become strained, bent or twisted out of proper position. It is obvious that I can apply my brake to both of the rear wheels of an automobile or truck if desired.

I claim:

1. A brake comprising a brake drum adapted to be secured to the wheel of a vehicle, a pair of brake shoes having engaging surfaces adapted to coöperate with said drum, the engaging surfaces of the pair being of different material, and means for causing braking action of either of said pair of shoes as desired.

2. A brake comprising a brake drum adapted to be secured to the wheel of a vehicle, said brake drum having a plurality of grooves in its curved surface, a pair of brake shoes having engaging surfaces adapted to coöperate with said grooves, one of said pair of shoes having its engaging surface formed of hardwood, and the other having its engaging surface formed of metal, and means for causing braking action of either of said pair of shoes as desired.

3. A brake comprising a brake drum adapted to be secured to the wheel of a vehicle, said brake drum having a circumferential groove for containing a lubricant, a brake shoe adapted to coöperate with said drum, and means for causing said brake shoe to engage said drum.

4. A brake comprising a brake drum having a groove in its curved surface, a brake shoe comprising two hinged members, a plurality of friction blocks removably attached to each of said hinged members, means for normally holding said hinged members with said friction blocks out of braking engagement with said groove while leaving them supported laterally thereby, and means for causing braking action of said blocks with said groove.

5. A brake comprising a brake drum having a plurality of grooves in its curved surface, a pair of brake shoes adapted to coöperate with said drum, each of said pair of shoes comprising two hinged members, a plurality of friction blocks attached to each of said hinged members, the blocks on the hinged member of one shoe being of different material from those on the other, and means for causing braking action of said blocks with said grooves.

6. A brake comprising a brake drum adapted to be secured to the wheel of a vehicle, said drum having a plurality of grooves in its curved surface, a pair of brake shoes adapted to coöperate with said drum, each of said pair of shoes comprising two hinged members which together constitute the greater portion of a circumference, a plurality of friction blocks removably attached to each of said hinged members, and means for causing either of said pair of shoes with its friction blocks to engage the coöperating grooves in the drum as desired.

7. A brake comprising a brake drum adapted to be secured to the wheel of a vehicle, said drum having a groove in its

curved surface, a brake shoe comprising two hinged members which together constitute the greater portion of a circumference, means for normally holding said hinged members out of braking engagement with said groove while leaving them supported laterally thereby, and means for causing braking action of said shoe.

In testimony whereof I hereunto affix my signature.

JOSEPH T. AUGER.