M. POTTER.

VEHICLE BRAKE.

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1,214,713.

Patented Feb. 6, 1917.

Fig. 1.

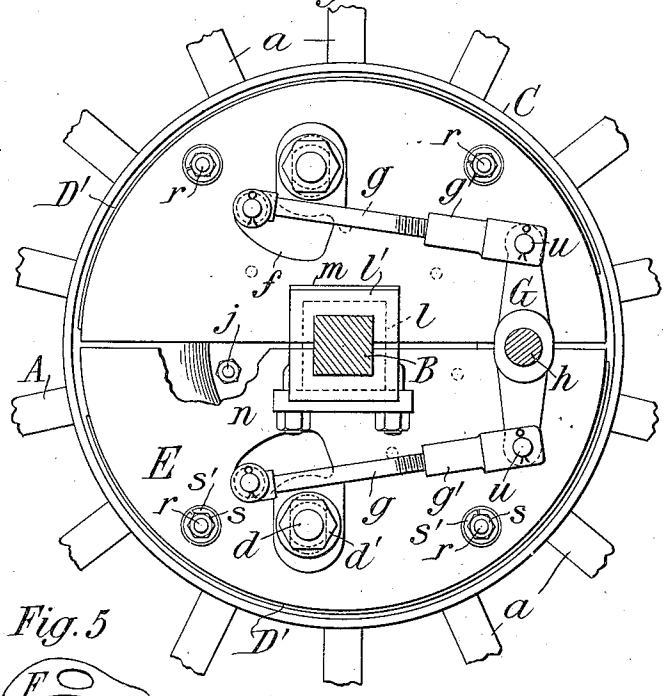


Fig. 2.

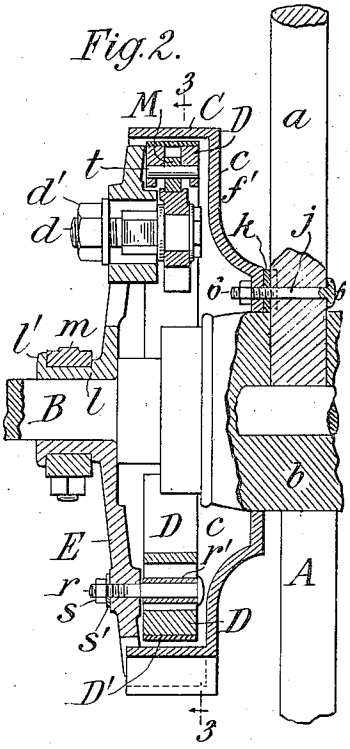


Fig. 5

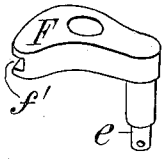


Fig. 3.

Fig. 4.

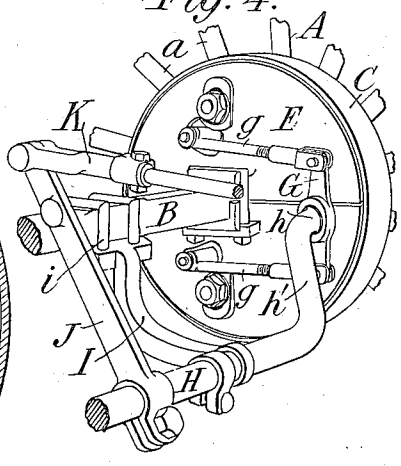
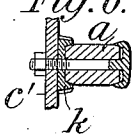


Fig. 6.



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VEHICLE-BRAKE.

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To all whom it may concern:

Be it known that I, MORGAN POTTER, a citizen of the United States, residing at Beacon, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Vehicle-Brakes, of which the following is a specification.

This invention provides an improved construction of internal expansion brake applicable to vehicles of various types, and particularly to carriages and wagons.

A drum is fastened to the vehicle wheel, and within it are brake shoes which are held stationary by engagement with a divided shell or disk which is fastened on the axle. The shoes are drawn in by springs and are pressed out by eccentric dogs connected adjustably to an equalizing lever, which in turn is engaged by a cranked rock-lever an arm on which is engaged by the operating rod.

The features of improvement are hereinafter set forth and defined in the claims.

In the accompanying drawings, Figure 1 is a sectional elevation, the axle and crank wrist of the operating rock-lever being in section, and the remaining parts in elevation looking from the middle of the axle outwardly; Fig. 2 is a vertical section in planes indicated by the line 2—2 in Fig. 3; Fig. 3 is a vertical section on the line 3—3 in Fig. 2 looking in the contrary direction from Fig. 1; Fig. 4 is a perspective view of the brake mechanisms looking outwardly and rearwardly; Fig. 5 is a perspective of one of the eccentric dogs; Fig. 6 is a cross-section through a spoke on the line 6—6 in Fig. 2.

Referring to the drawings, A indicates one of the hind wheels of the vehicle, here shown as a carriage or wagon, *a a* being the spokes and *b* being the hub, and B is the axle. To the wheel A is fastened a brake drum C; the fastening may be accomplished in any suitable way by attaching the drum either to the spokes or to the hub. The drum is closed on the wheel side by a web *c*. Within the drum are brake shoes D D, clearly shown in Fig. 3, which are held nonrotatively by being suitably engaged with a disk or shell E which closes the opposite open side of the drum and is fastened on the axle B. The disk E is preferably made in halves to facilitate applying it to the axle. They may be fastened thereto in any suitable manner.

For pressing out the shoes D D to engage them with the drum, means are provided whereby while each shoe is pressed outwardly independently of the other, the reactive pressure is transmitted to the opposite shoe, so that their outward pressures are equalized. In the preferred construction shown the shoes are pressed out by levers or dogs F F pivoted to studs *d d* which are fastened to the disk and bearing on one arm against the shoe, while the opposite arm has a pin *e* passing out through a slot *f* in the disk and engaged by a rod *g*. The two rods *g g* are connected to an equalizing lever G which is hung on a crank wrist *h* of a crank rock-lever H, which as shown in Fig. 4 is suitably supported as by being mounted to turn or rock in bearing brackets, one of which is shown at I, being fastened by clamps *i* to the axle. Only one end portion of the rock-lever H is shown with its crank *h'* for the brake on one wheel, the other being a duplicate of the one here shown. On the rock-lever H is clamped or otherwise fastened an arm J which is engaged by the usual brake operating pull rod K, which extends forward and connects in any usual manner with a brake-lever or treadle so that the pull thereon will apply the brake.

In operation, a pull in the direction of the arrow Fig. 3 on the rod K, acts through the arm J to rock the lever H and thereby swing its cranks *h'* forward; thus the crank wrist *h* is moved forward and carries forward the equalizing lever G, the opposite arms of which exert a like pull on the two rods *g g* which in turn rock the dogs F F, so that the latter thrust outwardly the shoes D D. On the cessation of the pull on the rod K the parts are restored to their normal position. The brake shoes are retracted by springs L L which are attached to pins projecting inwardly from the disk E.

The general construction and operation being now understood, some of the preferred details of construction will be explained.

For attaching the drum C to any ordinary wagon or carriage wheel having wooden spokes, it is preferable to extend the web *c* outward toward the wheel and provide it with a hub portion *c'*, Fig. 2, fitting over the inner side of the wheel hub and centered thereon. Through this hub portion holes are formed preferably alined with the middle lines of every alternate spoke, selecting for this purpose the spokes

on the inner side of the wheel when the usual arrangement of staggered spokes is employed. A bolt *j* is put through a hole bored in this spoke and through the coinciding hole in the hub portion *c'* to fasten the drum firmly to the spoke. While the drum might be clamped directly against the inner face of the spokes, yet it is preferable to place between them a spacer or shim *k*, best shown in Fig. 6, which supports the spoke, relieves side strain on the bolt, and prevents splitting of the spoke by such side strain. As sometimes there is some irregularity in the spokes, this may be compensated for by selecting shims of different thicknesses. Also by the selection of thicker or thinner shims the drum may be set farther from or closer to the wheel in order to bring the brake into the desired plane.

For fastening the disk E upon the axle it is not only made in halves, but each half has a hub portion or collar *l* fitting the squared portion of the axle, as shown in Figs. 1 and 2, and fastened thereto by a clamp preferably of the usual clip and bar type as shown; the clip is of rectangular U-shape fitting three sides of the square with a cross-bar *n* on the fourth side, the legs of the U having screwthreaded extensions passing through holes in the bar and forming bolts receiving the clamping ends. The neck *l* is provided with an outturned lip *l'*, Fig. 2, to keep the clip or clamp from slipping off. For the further securing of the disk halves to the axle, they are formed with ears *p* which are clamped together by bolts *p'*.

For connecting the shoes D to the disk E in such manner that the shoes are held from rotation while being permitted to freely move out toward the drum and inward therefrom, the shoes are formed with parallel slots *q* which are entered by pins *r* fastened to the disk. To avoid friction, each pin *r* has a freely rotating sleeve *r'* upon it forming a roller. The pin has a head sufficiently large not only to keep this roller from coming off, but also to overlap the margins of the slot and hold the shoe in place. Each pin is preferably fastened to the disk by being screwed into it against a neck or shoulder and locked by a nut *s* on the outside with preferably an intervening spring washer *s'*.

The brake shoes are preferably faced with a facing band D', which may be a fabric of wire, canvas and asbestos, such as is commonly used for facing brake shoes, and lubricated with graphite.

Each of the shoe operating levers or dogs F preferably has an eccentric face. Instead of having the eccentric portion of this lever directly engaging the shoe, an intervening rocker shoe M is provided which is pivoted by a pin *t* to the brake shoe D. This rocker piece has an inner face which is of the same curve as the eccentric outer face of the dog F. For keeping the parts in correct engagement notwithstanding any side play, the dog is formed with flanges *f'* embracing the rocker piece so that the latter is confined in the channel between the two flanges. Thus the shoe is held against pulling outward away from the disk by the flanges *f'* and the heads on the screw pins *r r*.

For adjusting the pivotal axes on which the dogs F turn, each pivot pin *d* is made adjustable in a slot in the disk E. The slot extends in nearly radial direction, as shown in dotted lines in Fig. 1. The pin D has flat sides embraced by the sides of the slot to keep it from turning and is clamped in any position to which it may be adjusted by means of a nut *d'*.

The pin *e* is best made integral with the dog F, as shown in Fig. 5. Its outer portion receives an eye formed on the end of the link *g*, the latter being held in place by means of a cotter pin put through a hole in the pin *e* near its outer end. Each of the links *g* is adjustable in length. This is accomplished by making the link in two sections, the section *g* being a threaded rod and the section *g'* having a threaded sleeve into which the rod screws and terminating in a fork which embraces the end of the equalizing lever G, a headed pin *u* being put through and fastened by a cotter pin. To adjust the length of the link this cotter pin and pin *u* are removed and the sleeve *g'* screwed out or in on the threaded rod, after which the pivoted pin is replaced, thus preventing any relative turning of the members of the link and so preserving the adjustment.

The bearing bracket I for the rock-lever H is fastened on the squared part of the axle by means of two clamps *i i* of the clip type, as shown in Fig. 4.

It will be observed that each half of the disk E carries independently the parts constituting one half of the brake mechanism, so that by first removing the clamp *m* either half of the disk may be taken out of the drum, thus carrying with it the one brake shoe, dog F and connected parts, and without disturbing those attached to the other half of the disk.

The brake shoes while held against rotation by the pins *r* are otherwise freely mounted, so that by the yielding of the springs L they may readily adapt themselves to the surface of the drum when pressed outwardly by the levers F. Each shoe is of a length somewhat less than half the circle, and is unsymmetrical to the extent shown, its end with which any point on the drum first makes contact being extended farther than its opposite end beyond the point of application of the expanding pres-

sure to the shoe. This has the effect of securing an even shoe contact with the drum and a uniform distribution of pressure for the whole length of the brake shoe, thereby giving a substantially uniform braking effect over its entire surface. It is found that with a symmetrical shoe the end which first receives the rub of the drum wears faster than the remaining portion, and this uneven wear is avoided by thus prolonging this end portion of the shoe.

The improved brake thus described is simple in construction, has an even and moderately applied brake action which may be readily graduated at will, is not liable to derangement by wear, is readily adjustable to adapt it to the requirements of practice, and is easily applied to existing vehicles.

I claim as my invention:—

1. A vehicle brake comprising in combination a drum attached to the wheel, a stationary shell mounted on the axle, shoes within the drum having non-rotative engagement with the shell, springs for drawing the brake shoes inwardly, independent means engaging the middle portions of said shoes for pressing them outwardly into braking contact with the drum, each said means carried by and reacting against said shell, an operative part for operating both said means, and intervening equalizing means for distributing the operative thrust to the shoe-gaging means.

2. The combination of a brake drum, a stationary shell, a brake shoe having non-rotative engagement with the shell, springs for drawing the brake shoe inwardly, and a lever pivoted eccentrically to the shell and having an eccentric face for forcing the shoe outwardly against the drum.

3. The combination of a brake drum, a stationary shell, a brake shoe having non-rotative engagement with the shell, springs for drawing the brake shoe inwardly, and an eccentric faced lever pivoted eccentrically to the shell and engaging the middle portion of the shoe for forcing the shoe outwardly.

4. The combination of a brake drum, a stationary shell, a brake shoe having non-rotative engagement with the shell, springs for drawing the brake shoe inwardly, an eccentric faced lever pivotally supported on the shell for forcing the shoe outwardly, and a rocking piece receiving the thrust of said lever and pivotally engaging the shoe.

5. The combination of a brake drum, a stationary shell, a brake shoe having non-rotative engagement with the shell, springs for drawing the brake shoe inwardly, an eccentric faced lever pivotally supported on the shell for forcing the shoe outwardly, and a rocking piece receiving the thrust of said lever and pivotally engaging the shoe, said lever having flanges between which the rocking piece is engaged.

6. The combination of a brake drum, a stationary shell, a brake shoe having non-rotative engagement with the shell, springs for drawing the brake shoe inwardly, a lever for forcing the brake shoe outwardly, and a pivotal stud for said lever engaging said shell and adjustable toward and from the drum.

7. The combination of a brake drum, a stationary shell, a brake shoe having non-rotative engagement with the shell, springs for drawing the brake shoe inwardly, a lever for forcing the brake shoe outwardly, and a pivotal stud for said lever engaging a radially disposed slot in said shell whereby it may be set outwardly or inwardly to adjust the lever, and means for clamping it in place.

8. The combination with a brake drum, of a stationary shell, brake shoes within the drum having non-rotative attachment to the shell, levers for pressing out the respective shoes pivotally connected to the shell, each lever acting against one shoe, rods engaging said levers, an equalizing lever connecting said rods, and a brake operating part engaging the middle part of said lever.

9. The combination with a brake drum, of a stationary shell, brake shoes within the drum having non-rotative attachment to the shell, levers for pressing out the respective shoes pivotally connected to the shell, each lever acting against one shoe, rods engaging said levers, an equalizing lever connecting said rods, either of said rods adjustable in length, and a brake operating part engaging the middle part of said lever.

10. The combination with a brake drum, of a stationary shell, brake shoes within the drum having non-rotative attachment to the shell, levers for pressing out the shoes pivotally connected to the shell, rods engaging said levers, an equalizing lever connecting said rods, and a brake operating shaft having a crank arm engaging said equalizing lever, and an operating arm.

11. The combination with a brake drum, of a stationary shell, brake shoes within the drum having non-rotative attachment to the shell, levers for pressing out the shoe pivotally connected to the shell, rods engaging said levers, an equalizing lever connecting said rods, a brake operating shaft having a crank arm engaging said equalizing lever, an operating arm, and a supporting bracket fastened to the axle affording a bearing for said brake operating shaft.

12. In a vehicle brake of the internal expansion type, a drum attached to the wheel, a shell fastened to the axle, and brake-shoes carried by such shell, combined with means engaging the medial portions of such shoes for pressing them out against the drum, the shoes being unsymmetrical their ends first rubbed by the drum being more distant from

the point of application of such outward pressure than their opposite ends.

13. In a vehicle brake, the combination of a drum attached to the wheel, a stationary shell, brake shoes carried by the shell, the shell having pins engaging slots in the shoes and such pins having heads overlying the slots, and means for pressing out the shoes against the drum having flanges engaging the shoes laterally, whereby each shoe is confined at three points against lateral displacement due to end play of the wheel.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

MORGAN POTTER.

Witnesses:
EDWD E. STRONG,
JOHN N. NICHOL.