

G. W. WALK.  
WHEEL.

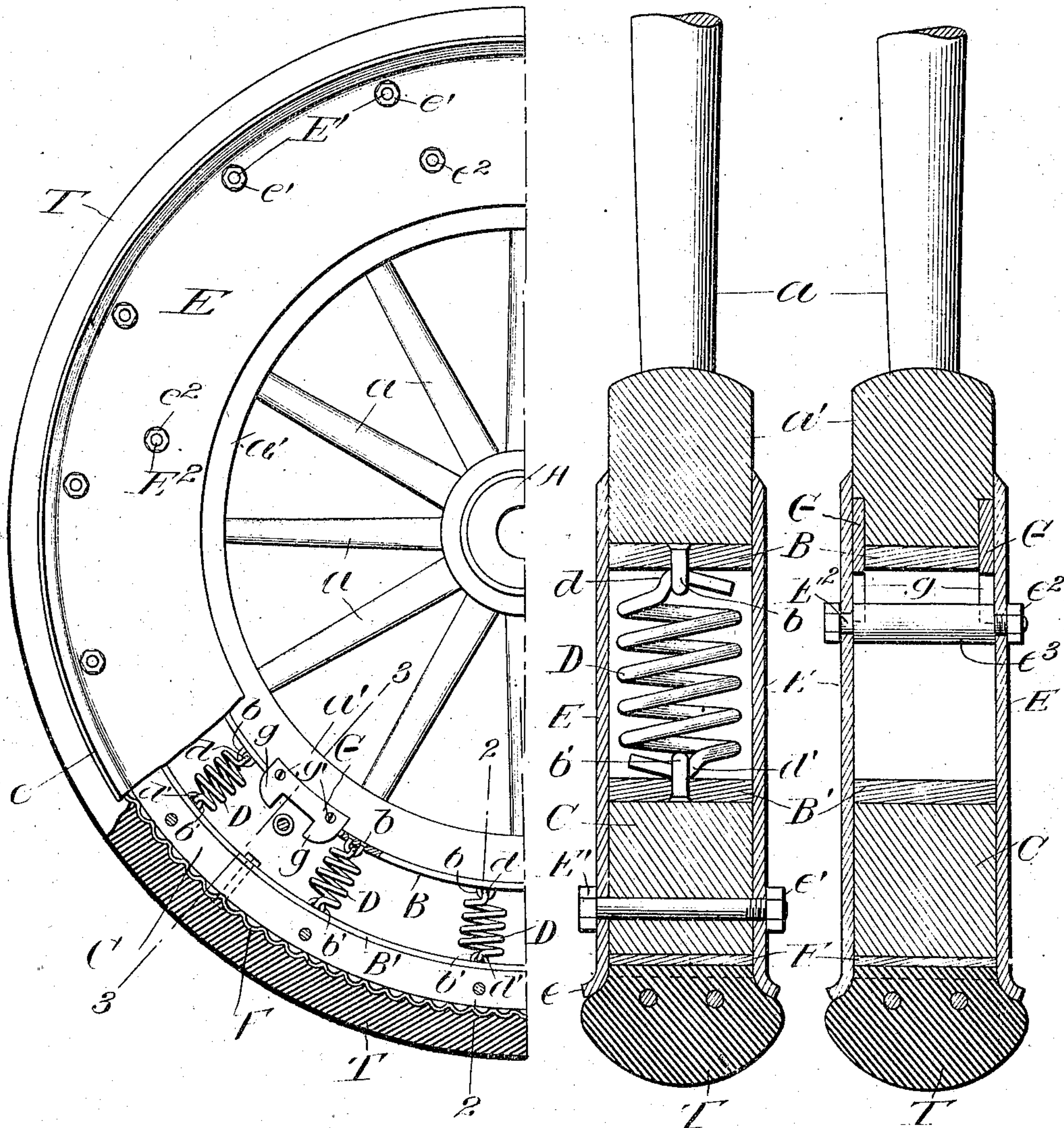
APPLICATION FILED FEB. 28, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

Fig. 2.

Fig. 3.



Inventor  
George W. Walk.

Witnesses

C. H. Walker.  
James B. Mansfield

By

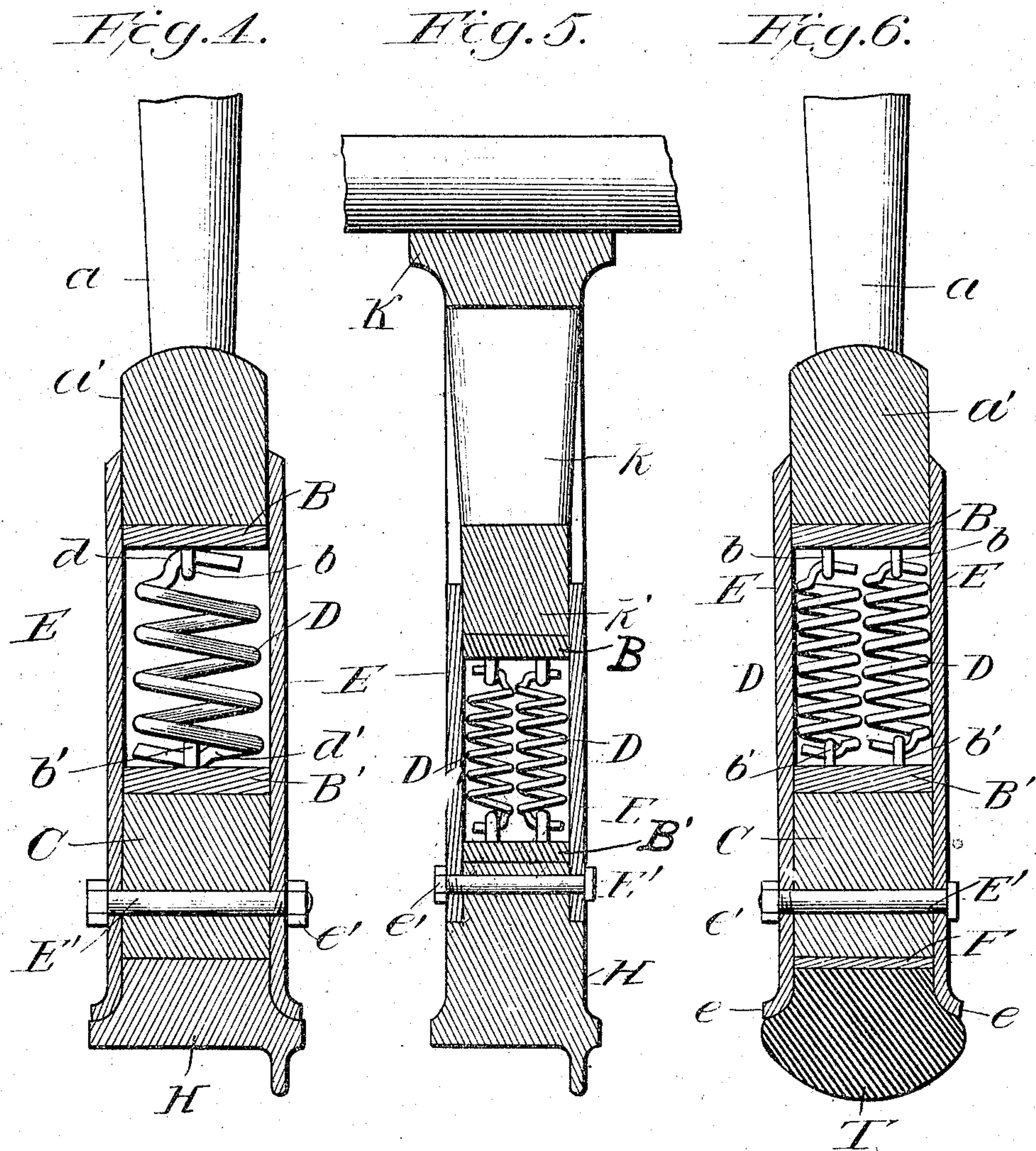
Alexander T. Fowell  
Attorneys



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2 SHEETS—SHEET 2.



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C. N. Walker,  
James D. Mansfield

By  
Alexander & Fowell  
Attorneys.



# UNITED STATES PATENT OFFICE.

GEORGE W. WALK, OF PITTSBURG, PENNSYLVANIA.

## WHEEL.

No. 848,142.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed February 28, 1906. Serial No. 303,509.

*To all whom it may concern:*

Be it known that I, GEORGE W. WALK, of  
Pittsburg, in the county of Allegheny and  
State of Pennsylvania, have invented certain  
5 new and useful Improvements in Wheels;  
and I hereby declare that the following is a  
full, clear, and exact description thereof,  
reference being had to the accompanying  
drawings, which form part of this specifica-  
10 tion.

This invention is an improvement in ve-  
hicle-wheels having a center or web portion  
and a felly portion connected by interme-  
diate springs or cushions so arranged as to  
15 both suspend and support the center portion  
centrally within the felly portion, so that the  
shocks sustained by the felly or tread of the  
wheel will be cushioned before transmission  
to the hub, and consequently a cushioned,  
20 easy-running, and durable wheel will be pro-  
vided, saving wear on the vehicle running-gear  
and on the wheel-tires and enabling "pneu-  
matic" tires to be dispensed with.

The present invention relates principally  
25 to the wheel as an entity and embodies va-  
rious novel features of construction and com-  
binations of parts hereinafter described and  
claimed. Subsidiary features of the wheel,  
which may be applicable to different kinds  
30 of wheel, are the novel means for preventing  
undue rotative movement of the felly and  
center relatively to each other and also un-  
due wear on the rim of the center. Another  
feature is a novel means for preventing  
35 cushion-tires creeping on the felly. These  
and other novel details of construction will  
be clearly understood from the accompany-  
ing drawings and the following description,  
and the parts for which protection is desired  
40 herein are set forth in the claims.

In the drawings, Figure 1 is a side eleva-  
tion of half of a vehicle-wheel embodying the  
invention and partly broken away to show  
the interior construction thereof. Fig. 2 is  
45 an enlarged transverse section on line 2 2,  
Fig. 1. Fig. 3 is a similar sectional view on  
line 3 3, Fig. 1. Fig. 4 is a detail section illus-  
trating a slight modification of the invention,  
and Fig. 5 is a detail sectional view illustrat-  
50 ing the invention applied to car-wheels.  
Fig. 6 is a detail showing an arrangement of  
two sets of springs.

The wheel-center may be of any suitable  
construction. As shown, it has a hub A con-  
55 nected by spokes  $a$  to a rim  $a'$ , which is en-  
circled by a band B, preferably of steel, to

which is attached at intervals U-shaped  
loops  $b$ , preferably having their ends inserted  
through apertures in the band and riveted to  
the under side thereof, so that the several 60  
loops stand in alinement and extend in a cir-  
cumferential series around the web portion  
of the wheel.

Surrounding the wheel-center, but of  
greater internal diameter than the external 65  
diameter of the latter, is a felly portion com-  
prising, as shown, a wood ring C, having on  
its inner face a band  $B'$ , provided with a se-  
ries of U-shaped loops  $b'$ , corresponding in  
number with and arranged radially opposite 70  
to the loops  $b$ .

Between the felly and wheel-center are  
radially-disposed springs D, which are pref-  
erably stout helical springs provided with  
bends  $d$   $d'$  on their ends, adapted to be en- 75  
gaged with the loops  $b$   $b'$ , respectively, as  
shown, and thus connect the center and felly  
of the wheel yieldingly together, and to re-  
tain them normally in concentric positions.

The bends  $d$   $d'$  on the springs when en- 80  
gaged with the loops  $b$   $b'$  lie transversely of  
the wheel and are prevented from disengag-  
ing the loops by means of annular side plates  
E, which are fastened to the opposite sides  
of felly C and extend inwardly across the 85  
space between the felly and rim  $a'$  and lap  
over the sides of the rim  $a'$ , so as to inclose  
the springs and effectually prevent dirt en-  
tering and clogging the space between the  
center and felly and the plates, also prevent 90  
the springs disengaging the loops, and also  
prevent any facewise movement of the felly  
and wheel-center relatively to each other,  
although not interfering with their relative  
radial movements.

When applied to vehicle-wheels for cush- 95  
ion-tires, as indicated in Figs. 1 and 2, the  
plates E are preferably projected outwardly  
beyond the outer periphery of felly C to  
form flanges  $e$  at each side thereof, so as to 100  
confine in position thereon a transversely  
corrugated or roughened band F, preferably  
of metal, around which a solid rubber cush-  
ion-tire T may be placed, the tire being kept  
in place by the outwardly-flared edges  $e$  of 105  
plates E E, as shown. The plates E E may  
be secured to the felly by bolts  $E'$  and nuts  
 $e'$ , as shown, or in other suitable manner and  
are kept from spreading or wedging apart at  
their inner edges next rim  $a'$  by means of 110  
stay-bolts  $E^2$ , nuts  $e^2$ , and spacing-sleeves  $e^3$ ,  
strung on the bolts intermediate the plates,



as shown. These stay-bolts  $E^2$  also serve as a means for preventing too great rotatorial play of the wheel-center relatively to the felly, being adapted to engage notched plates  $G$ , attached to the sides of rim  $a'$ , as shown, said plates being preferably sunk into the surface of rim  $a'$  and having outwardly-projecting lugs  $g$ , which lie on opposite sides of the adjacent bolt  $E^2$  and will engage there-  
 10 with and prevent undue rotatorial movement of one member of the wheel relatively to the other in starting or stopping the wheel, thus relieving the springs of such duty and preventing the severe strains and shocks on  
 15 the wheel which would arise if the springs were subjected to severe lateral distortion. The plates  $G$  may be secured in place by screws  $g'$ , and they also serve as bearing or wear plates to prevent the side plates  $E$  cut-  
 20 ting into the wood rim  $a'$ . The corrugated band  $F$  prevents the cushion-tire creeping on the felly, which is such an objectionable and dangerous feature of such tires, and thus insures better tractive action of the wheel.

25 Obviously the invention could be applied not only to ordinary road-vehicle wheels, but also to tram-car and other wheels. Thus, as indicated in Fig. 4, the cushion-tire  $F$  is replaced by a flanged metal tire  $H$ , so that  
 30 the resultant wheel is adapted to be used on a rail. When adapted to car-wheels, as shown in Fig. 5, the wheel-center, comprising the hub  $K$ , spokes  $k$ , and rim  $k'$ , could be made in one casting or part, if desired, and the felly could be made integral with the tire.  
 35 As shown in Fig. 6, two sets of springs  $D$  are employed. Such construction would be especially useful for wheels which have to carry very heavy loads.

40 It will be noted that by this construction of wheel the centers are not only supported on the lowermost springs, but suspended by the uppermost springs, the springs at diametrically opposite points reinforcing and  
 45 assisting each other; also, that the rotatorial play of the wheel-center and felly relative to each other is limited; but sufficient play is allowed the center both rotatorially and radially to insure thorough cushioning action.  
 50 Excessive loading on the axle would not crush the springs, but would cause the rim  $a'$  to settle onto the stay-bolts  $E^2$ . If by accident any spring or springs should be broken, the wheel could still be used until the vehicle  
 55 could be run in for repairs.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a wheel, the combination of a wheel-  
 60 center having a hub and rim, a felly of larger internal diameter than the center, loops on the outer face of the rim and inner face of the felly, helical springs having bends on their ends detachably engaging said loops, and an-  
 65 nular side plates fastened to the felly and

overlapping the rim and preventing the springs disengaging the loops, substantially as described.

2. In a wheel, the combination of a wheel-center having a hub and rim, a felly of larger  
 70 internal diameter than the center, a band on the outer face of the rim, a band on the inner face of the felly, each band provided with radially-disposed loops, and helical springs having bends on their ends detachably en-  
 75 gaging said loops to retain the springs in place, substantially as described.

3. In a wheel, the combination of a hub and rim, a felly of larger internal diameter  
 80 than the rim, springs attached to the inner face of the felly and outer face of the rim, annular face-plates attached to said felly and overlapping the rim, tie and spacing bolts be-  
 85 tween said plates, and notched plates attached to the rim and adapted to engage said bolts and limit the relative rotatorial movement of the felly and rim.

4. In a wheel, the combination of a hub and rim, a felly of larger internal diameter  
 90 than the rim, annular bands attached to the inner face of the felly and outer face of the rim provided with radially-disposed loops, helical springs having bends on their ends en-  
 95 gaging said loops, annular face-plates attached to said felly and overlapping the rim, tie-bolts and spacing-sleeves between said plates, and plates attached to the rim adapt-  
 100 ed to engage said bolts to limit the rotatorial play of the felly relatively to the rim, substantially as described.

5. The combination of a wheel-center, a felly of larger internal diameter than the center,  
 105 springs interposed between the center and felly, side plates attached to the felly and projecting inwardly over the springs and also projecting outwardly beyond the outer face of the felly to retain a tire thereon, and a tire surrounding the felly.

6. The combination of a wheel-center, a felly of larger internal diameter than the  
 110 center, helical supporting and suspending springs interposed between and connected to the center and felly, side plates attached to the felly and projecting inwardly over the springs and lapping onto the center, and also  
 115 projecting outwardly beyond the outer face of the felly to retain a tire thereon, and a tire surrounding the felly.

7. The combination of a wheel, a corrugated band surrounding the wheel-felly, and a  
 120 cushion-tire fitted over said band.

8. The combination with a wheel-center, a felly of larger diameter than the center,  
 125 springs interposed between the center and felly and connected therewith, a roughened band surrounding the felly, laterally-projecting side plates attached to the felly, and a cushion-tire fitted around said band, substantially as described.

9. In combination, a wheel-center having



a hub and rim, a felly of larger internal diameter than the rim, bands fitted to the outer face of the rim and inner face of the felly, helical springs interposed between the center and felly and fastened to said bands, annular side plates attached to the felly, a corrugated band on the outer face of the felly, and a tire attached thereto over said band.

10. The combination of a wheel-center, a felly of larger internal diameter than the center, springs interposed between the center and felly, side plates attached to the felly and projecting inwardly over the springs and also projecting outwardly beyond the outer face of the felly to retain a tire thereon, and a tire surrounding the felly; with stay-bolts between the annular plates adjacent the rim of the center, and notched wearing-plates attached to the center, substantially as and for the purpose described.

11. In a wheel, the combination of a wheel-center having a hub and rim, a felly of larger internal diameter than the rim, bands fitted to the outer face of the rim and inner face of the felly, and provided with inwardly-projecting loops, helical springs interposed between the center and felly and fastened to said loops, annular side plates attached to the felly and overlapping the rim, and projecting beyond the felly, and a corrugated band on the outer face of the felly, and a tire attached thereto over said band.

12. In a wheel, the combination of a wheel-center having a hub and rim, a felly of larger internal diameter than the center, loops on the outer face of the rim, and inner face of the felly, helical springs having bends on their ends engaging said loops, and annular side plates fastened to the felly and overlapping the rim; with stay-bolts between the annular plates, adjacent the rim of the center, and notched wearing-plates attached to the rim-center, substantially as and for the purpose described.

13. In combination, a wheel-center having a hub and rim, a felly of larger internal diameter than the rim, bands fitted to the outer face of the rim and inner face of the felly, helical springs interposed between the center and felly and fastened to said bands, annular side plates attached to the felly, a corrugated band on the outer face of the felly, and a tire attached thereto over said band; with stay-bolts between the annular plates adjacent the rim of the center, and notched wearing-plates attached to the rim-center, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses:

GEORGE W. WALK.

In presence of—

EDNA B. HARTLEY,  
J. A. YOUNG.