(No Model.)

J. V. D. HAVEN.

WHEEL.

No. 423,051. Patented Mar. 11, 1890.

Fig. 1.

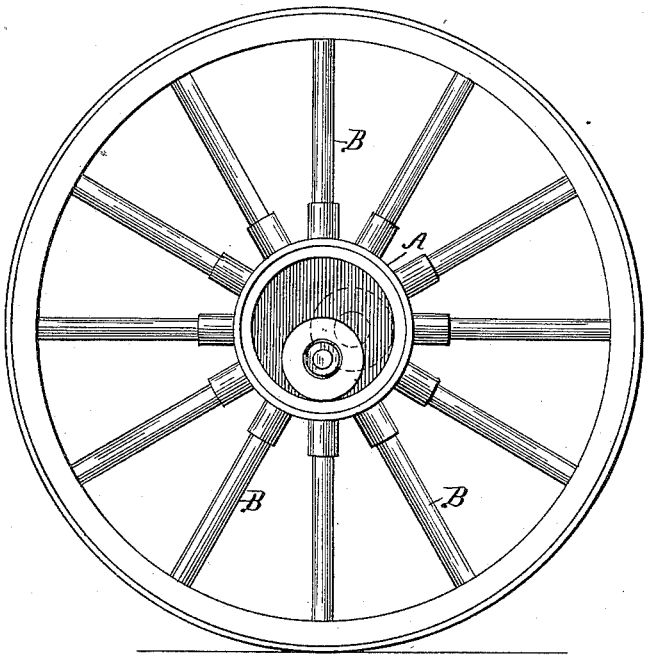


Fig. 2.

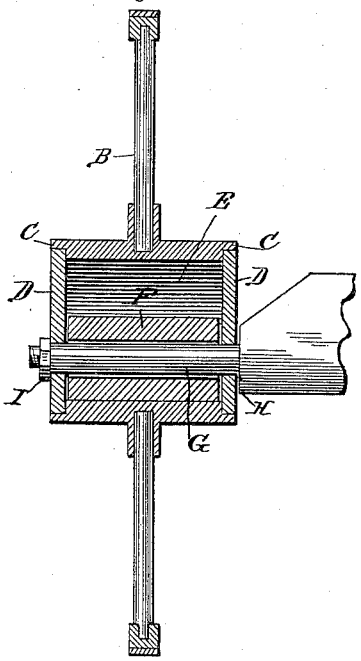


Fig. 3.

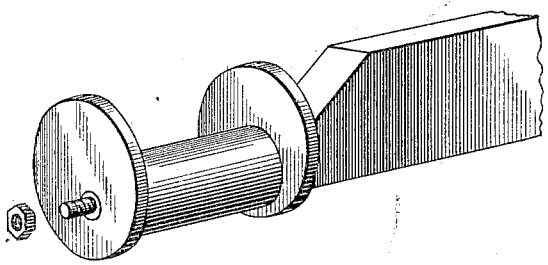
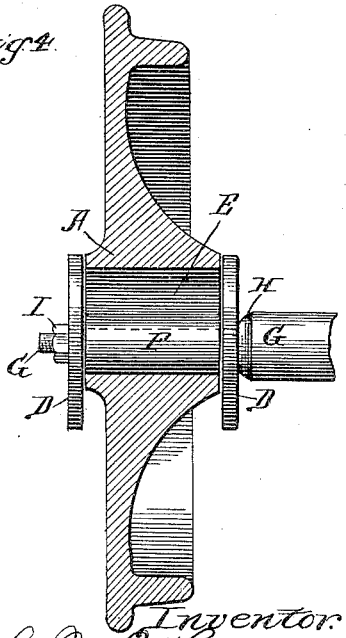


Fig. 4.



Witnesses.
Wm. M. Rheem.
J. R. Andrews.

Inventor.
John V. D. Haven
By Elliott Hs. Cushman Jrs.
Atty's.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN V. D. HAVEN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO ZAIDEE A. PHILLIPS, OF SAME PLACE.

WHEEL.

SPECIFICATION forming part of Letters Patent No. 423,051, dated March 11, 1890.

Application filed December 31, 1889. Serial No. 335,552. (No model.)

To all whom it may concern:

Be it known that I, JOHN V. D. HAVEN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wheels, of which the following is a specification.

This invention relates to improvements in vehicle-wheels in which heretofore the wheel and axle have had a common axis, the wheel-hub fitting snugly upon the axle and having no motion independent of the axle, excepting the rotary motion thereof.

The prime object of this invention is to have a movement of the axle within and independent of the rotation of the wheel without disconnection therefrom and during the running of the vehicle.

Another object is to have a vertical movement of the axle independent of the wheel, whereby the vertical position of the axle and vehicle-body supported thereby may be changed without lifting the wheel from contact with the ground.

A further object is to have a traveling bearing for the axle in the wheel-hub independent of and in addition to the forward bodily travel of the wheel, whereby the axle will not only be permitted to have a vertical movement, but by such movement will gain a leverage upon the wheel, materially aiding the latter to ride over obstructions; and, finally, to have the bearing of such a character as to not only be protected from the lodgment thereon of dust and other foreign substances, but which will maintain the wheel in proper alignment and position upon the axle, and to provide certain details in construction of the carrying out of my invention, all as illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of a vehicle-wheel embodying my invention; Fig. 2, a central vertical section thereof; Fig. 3, a detail perspective view of the axle end, showing my improved devices applied thereto; and Fig. 4, a view similar to Fig. 2, illustrating the application of my invention to an ordinary car-wheel.

Similar letters of reference indicate the same parts in the several figures of the drawings.

Referring by letter to the accompanying drawings, A indicates a cylindrical wheel-hub of any suitable dimensions and preferably composed of metal, to which the spokes B may be secured in any well-known and convenient manner either by socketing or otherwise. Each end of the hub is provided with an annular interior rabbet C, into which loosely fit disks D, effectually closing the ends of the hub, so as to form an internal chamber E, within which works a roller F of less dimensions than the bore of the hub and sleeved upon the axle G, which latter passes concentrically through and has a common axis with the roller, so that the latter may rotate freely thereon, but passes eccentrically through the disks, which latter, together with the roller, are held in position upon the axle by confinement between a shoulder H thereon and a removable nut I, screwed upon the end of the axle, there being sufficient play between the shoulder and nut for the disks and roller to permit the free rotation thereof. Thus it will be seen that the axle-roller and the wheel rotate upon different axes eccentric to each other, and that as the draft is on the axle the latter in moving backward or forward causes the roller to travel upon the inner surface of the hub about the axis thereof, and the disks D, which are eccentrically secured to the axle, to also turn within the hub to correspond with the location of the roller; hence when the wheel strikes an obstruction the momentum of and draft upon the axle causes the latter to move forward and the roller thereon to travel up the arc of the hub during the temporary check in the forward travel of the wheel produced by the impact of the wheel against the obstruction; but when the roller reaches the highest point within the wheel-hub which gravity and the draft will permit it will gain sufficient leverage upon the wheel to enable the forward motion of the axle to cause the wheel easily to override the obstruction, after which the roller will return to its lowest and normal position.

It will be observed that when the roller moves upward it compensates for the height

of the obstruction, and as the wheel is elevated and passes over the obstruction the weight of the load resting on the axle causes the roller to return with the same easy movement to its normal position, thereby greatly lessening and easing the shock caused by the wheel striking the obstruction, as well as materially lessening the effect of the wheel striking the ground after passing over the obstruction.

It is well known that when the ordinary wheel having a common axis with and rotating upon the axis of the axle rolls against and over a stone or other hard substance the wheel is thrown up, imparting through the medium of the axle and its connection a violent shock to the body of the vehicle and the acquired momentum, previously obtained, is absorbed in the impact without compensation; but by the employment of my invention these difficulties are entirely obviated, as well as a large portion of the increase in the draft heretofore necessary to override the obstruction, and also considerable of the friction in axles is dispensed with, besides which the vehicle will ride much easier and the draft be less, because the tendency of the roller on the axle is to travel back and forth in the hub, and thus compensate for the inequalities of the road by moving the axle up and down.

Obviously my invention may be applied to vehicle-wheels of any description—such, for example, as a car-wheel, (illustrated in Fig. 4;) and it is not absolutely essential that the disks should be eccentric upon the axle, as illustrated in Fig. 2, and working within the hub of the wheel for the purpose of maintaining the wheel in alignment, for they may be concentrically mounted upon the axle, as illustrated in Fig. 4, opposing the hubs and working against the ends thereof, being in this case of sufficiently greater diameter than the hub to entirely close the roller-chamber in the hub regardless of what position the roller may have in the hub. In this case the disks might be formed directly on the roller or rigidly secured thereto, so as to rotate therewith, or may be free upon the axle, as in the preferred construction, for the result will be substantially the same in either case, the main purpose of these disks, as before described, being to maintain the wheel in proper alignment and position upon the axle and to close the roller-chamber in the hub against the lodgment thereon of dust and other foreign substance.

This invention is of course applicable to wheels of all kinds which are employed for carriage or rendering portable any form of device, machine, or apparatus—such, for instance, as safes and heavy machinery and similar articles.

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

1. In a vehicle-wheel, the combination, with the hub, of the axle and a roller sleeved thereon of less diameter than the bore of the hub, whereby the axle may have a movement within and independent of the rotation of said hub, substantially as described.

2. In a vehicle-wheel, the combination, with the hub, of an axle, a roller sleeved thereon of less diameter than the bore of the hub, and means for retaining the axes of said hub and axle parallel to each other, substantially as described.

3. In a vehicle-wheel, the combination, with the hub, of an axle, a roller sleeved thereon of less diameter than the bore of the hub, and disks mounted upon said axle at each end of the roller opposing the ends of said hub, substantially as described.

4. In a vehicle-wheel, the combination, with the hub provided with an internal annular rabbet at each end, of an axle, a roller sleeved thereon of less diameter than the bore of said hub, and an eccentric disk mounted upon the axle at each end of the roller, rotatably operating in said annular rabbets, substantially as described.

JOHN V. D. HAVEN.

Witnesses:
R. C. OMOHUNDRO,
W. R. OMOHUNDRO.