No. 769,802. PATENTED SEPT. 13, 1904.

E. P. LEHMANN.

SLIDING AXLE FOR TOYS.

APPLICATION FILED SEPT. 20, 1902.

NO MODEL.

Fig. 1.

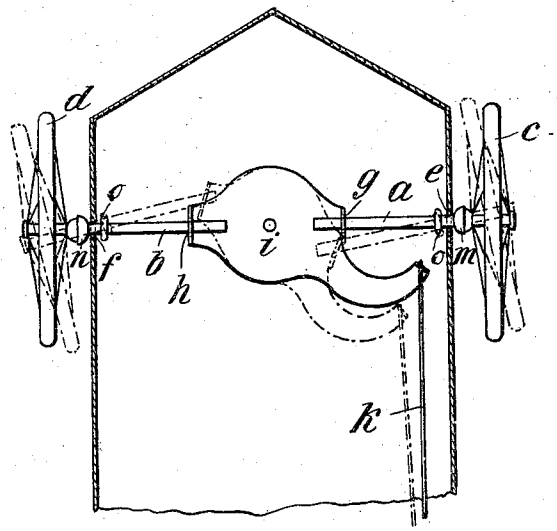


Fig. 2.

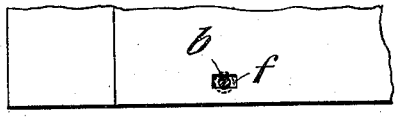
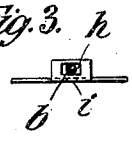


Fig. 3.



Witnesses:
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Ernst Paul Lehmann,
by George Willcox
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UNITED STATES PATENT OFFICE.

ERNST PAUL LEHMANN, OF BRANDENBURG-ON-THE-HAVEL, GERMANY.

SLIDING AXLE FOR TOYS.

SPECIFICATION forming part of Letters Patent No. 769,802, dated September 13, 1904.

Application filed September 20, 1902. Serial No. 124,189. (No model.)

To all whom it may concern:

Be it known that I, ERNST PAUL LEHMANN, a subject to the King of Prussia, German Emperor, and a resident of No. 6 Plauerstrasse, Brandenburg-on-the-Havel, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in and Connected with Sliding Axles for Toys, (for which I have made application for Letters Patent in Germany, Serial No. L 16,461, dated February 21, 1902, and in England, No. 5,397, dated March 4, 1902,) of which the following is a specification.

My invention relates to improvements in and connected with sliding axles for toys, particularly of the kind in which the toy when moving is desired to change its direction.

The object of my invention is to provide a construction and arrangement of parts in toys which affords the required simplicity and economy both of the means of attaining the object and of the space occupied by such means, the economy of space being of great importance in toys.

According to my invention, each of the two wheels of a set of wheels has an axle of its own separate from the other wheel-axle, and each of the two wheel-axles is journaled on one side in a fixed bearing of the frame or other suitable support and on the other side in a sliding bearing connected with the steering-disk.

In the accompanying drawings I have illustrated my invention.

Figure 1 is an under-side view of the carriage provided with the sliding axles and means for steering the same. Fig. 2 is a view of one side of the toy-frame, showing the bearing and play of the wheel-axle; and Fig. 3 is a view of one side of the steering-disk, showing the bearing and play of the inner end of the wheel-axle.

Referring to Fig. 1, *a* and *b* are the two sliding axles of a pair of wheels *c* and *d*. The said wheels are shown in full lines when taking their normal or straight position for moving in a straight direction. Deviation from said straight direction is obtained by shifting the two wheels into an oblique direction, as indicated by dotted lines, the angle of deviation being variable in one direction and the other. The outer journal of the two axles *a* and *b*, which may consist of wire, is supported in fixed bearings, as at *e* and *f*, provided in the frame or other suitable support. The said bearings *e* and *f* allow of a lateral movement of the axle when taking an oblique position, Fig. 2 showing the play of the axle within the aperature or bearing *f* of the frame. Suitable means provide against a sliding movement of the axles *a* and *b* in their longitudinal direction. Such means, for instance, may consist in varying the relative diameter of the axle at those portions lying within and at the side of the bearing. This may be accomplished by arranging collars, such as *o*, on the axle. The free or inner end of the axles *a* and *b* is supported in sliding bearings, as at *g* and *h*, carried by the steering-disk *i*, which by any suitable means receives an oscillating motion on its axis. The said motion may be imparted to the disk *i* by a connecting-rod *k* or by hand, and the degree of oscillating throw may be varied by suitable adjustment. If the toy is desired to move on in a straight direction only, the disk *i* may be locked against oscillation. The rod *k* is connected to an arm or eccentric of the disk *i*, and when the said rod *k* is moved from the normal position into the position indicated by dotted lines, the bearing *e*, supporting the inner journal of axle *a*, will be shifted in a rearward direction, while the bearing *f* of the other axle, *b*, is shifted in a corresponding parallel forward direction. The two axles *a* and *b*, with their wheels *c* and *d*, are thus placed in an oblique position for steering the carriage. If the forward throw of the rod *k* extends beyond the normal position of the disk *i*, the two axles and wheels will be placed into an oblique position opposite to that indicated by the dotted lines in Fig. 1.

It will be seen that as the bearings *g* and *h*, provided in the disk, are shifted in a forward or backward direction the free or inner journals of the axles *a* and *b* will slide within the said bearings, besides taking an oblique direction within the same. The said inner journals, however, might be prevented from sliding in their bearings in the direction of their

length if the outer journals instead of being prevented from sliding, as described, were free to slide in the direction of their length.

Instead of making the two inner bearings *g* and *h* integral with a common disk *i* each of said two bearings might be connected to a separate disk or shifting carriage, and the two disks or shifting carriages might receive a reciprocating motion by separate rods or other means.

The neck of the outer axle-journals between the wheels and the bearings *e* and *f* may be reinforced by guide-blocks, such as *m n*, preferably of semicircular or globular shape, said blocks being secured to the axle or to the frame.

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

1. In a steering mechanism, the combination, with a set of wheels, of a separate axle for each wheel, a fixed bearing for one journal of each axle, a movable bearing for the other journal of each axle, both the bearings being constructed to permit of longitudinal movement of the axle and to allow play to the journal in taking an oblique direction, and means for preventing one journal of each axle from sliding in its bearings in the direction of its length.

2. In a steering mechanism, the combination, with a set of wheels, of a separate axle for each wheel, a fixed bearing for the outer journal of each axle, a movable bearing for the inner journal of each axle, both the outer and inner bearings being constructed to allow play to the journal in taking an oblique direction, and means for preventing one journal of each axle from sliding in its bearings in the direction of its length.

3. In a steering mechanism, the combination, with a set of wheels, of a separate axle for each wheel, a fixed bearing for the outer journal of each axle, a lever pivoted at a point in line between the fixed bearings and provided with apertures serving as movable bearings for the inner journal of each axle, both the movable and fixed bearings so constructed as to allow lateral play, and means for preventing each of the axles from sliding longitudinally in one of its bearings.

4. In a steering mechanism, the combination, with a set of wheels, of a separate axle for each wheel, a fixed bearing for the outer journal of each axle, a movable bearing for the inner journal of each axle, means for preventing one journal of each axle from moving in its bearing in the direction of its length, and means for imparting to the inner end of each axle lateral movement.

5. In a steering mechanism, the combination, with a set of wheels, of a separate axle for each wheel, a fixed bearing for the outer journal of each axle, a movable bearing for the inner journal of each axle, both the bearings being constructed to permit of longitudinal movement of the axle, collars for preventing one journal of each axle from moving in its bearing in the direction of its length, and means for imparting to the inner end of each axle lateral movement.

6. In a steering mechanism, the combination, with a set of wheels, of a separate axle for each wheel, a fixed bearing for the outer journal of each axle, a lever pivoted at a point in line between the fixed bearings and provided with apertures serving as movable bearings for the inner journal of each axle, both the movable and fixed bearings so constructed as to allow lateral play and longitudinal movement, and collars for preventing each of the axles from sliding longitudinally in one of its bearings.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ERNST PAUL LEHMANN.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.