May 28, 1968 J. F. DAVIS 3,385,599

AMUSEMENT ROLLER SLIDE

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FIG. 1.

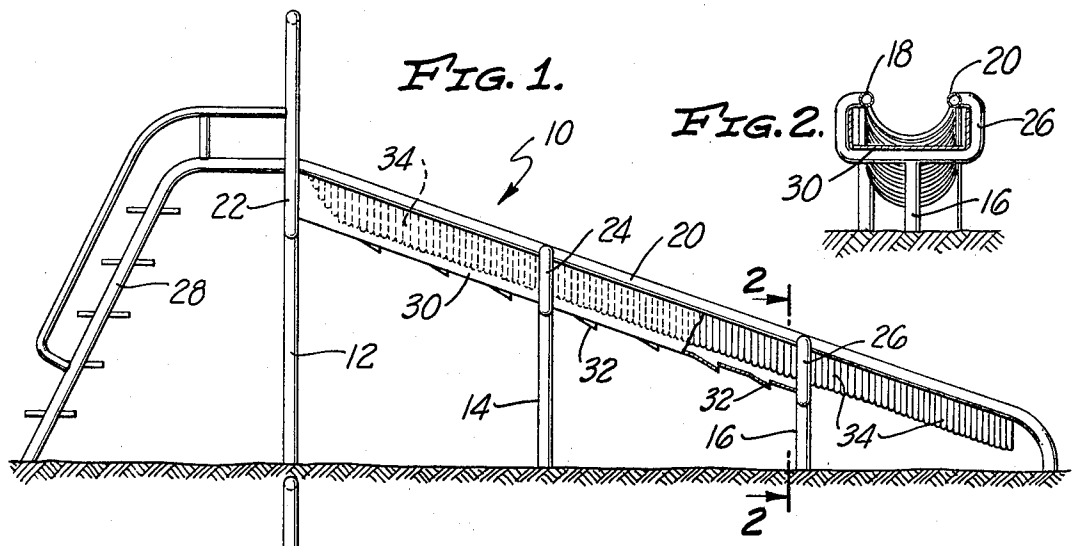
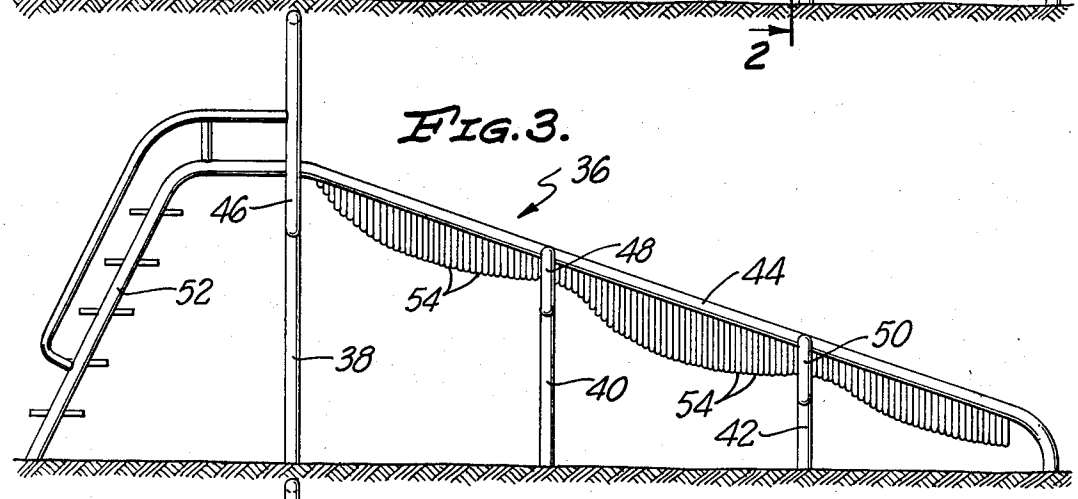


FIG. 2.

FIG. 3.



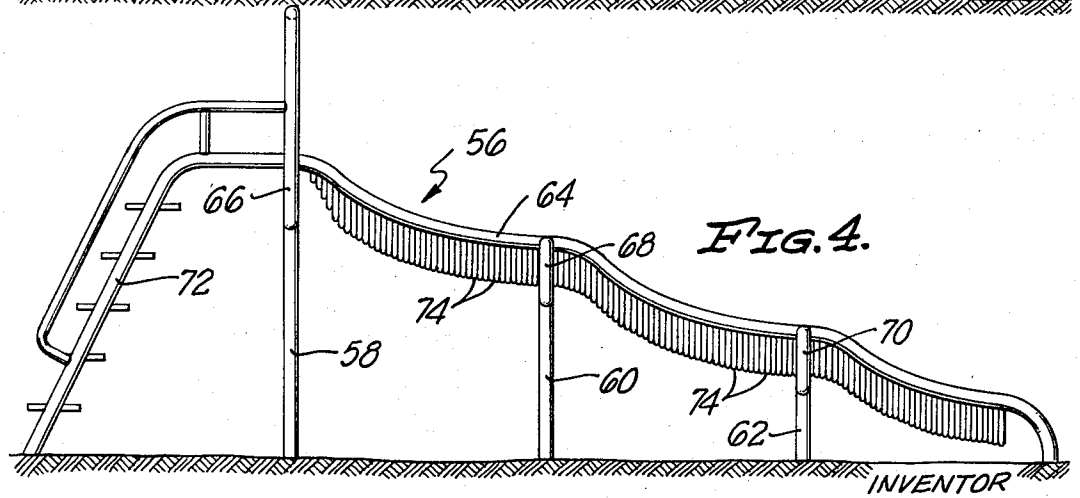


FIG. 4.

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AMUSEMENT ROLLER SLIDE

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FIG. 5.

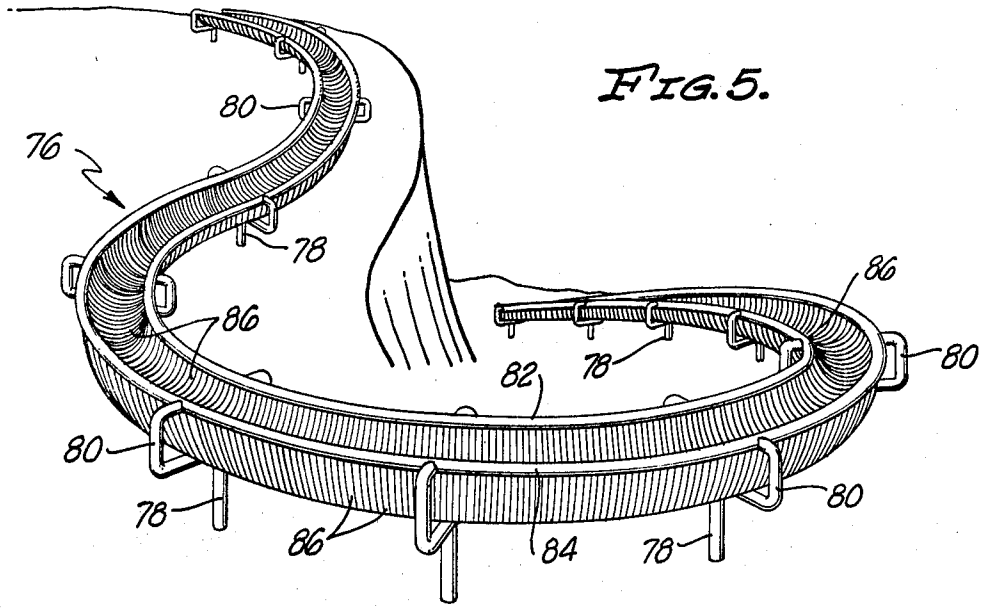
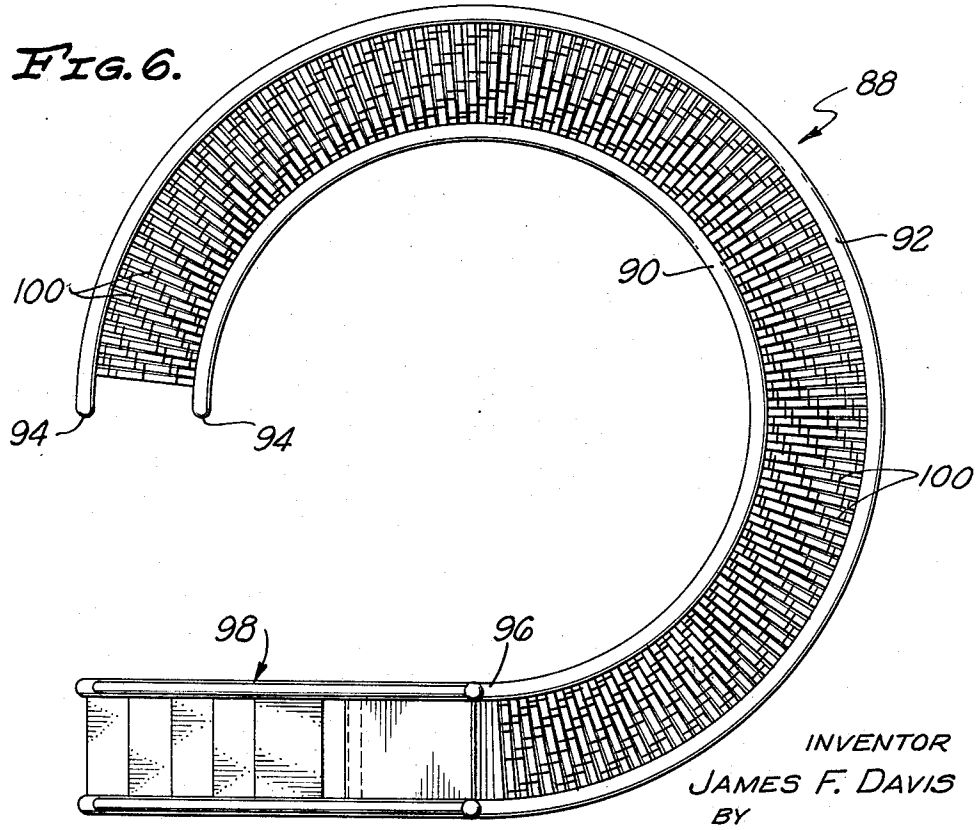


FIG. 6.



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AMUSEMENT ROLLER SLIDE

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FIG. 7.

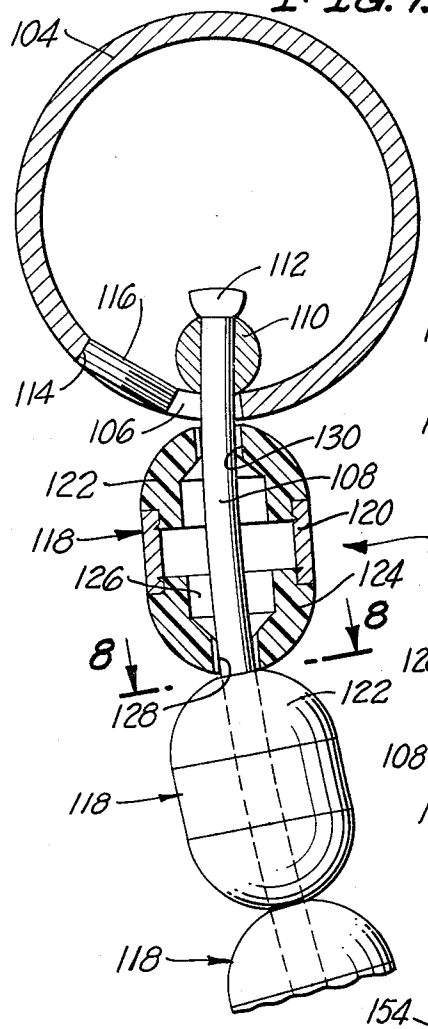


FIG. 9.

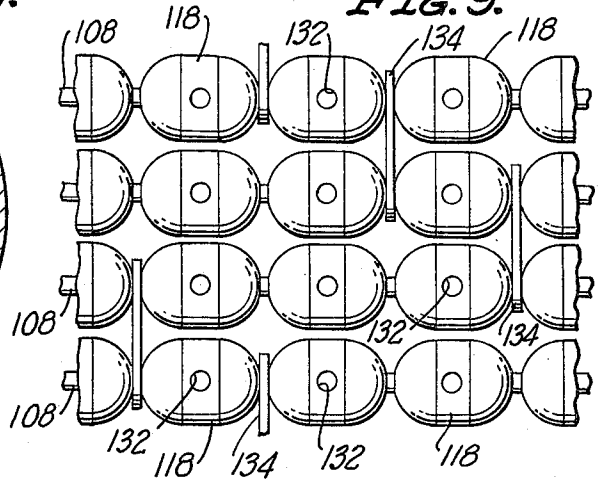


FIG. 10.

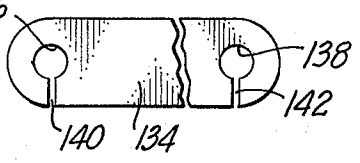


FIG. 8.

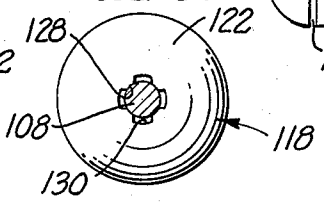


FIG. 11.

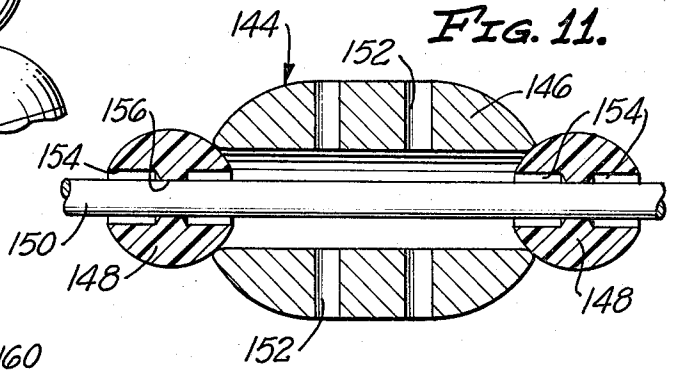
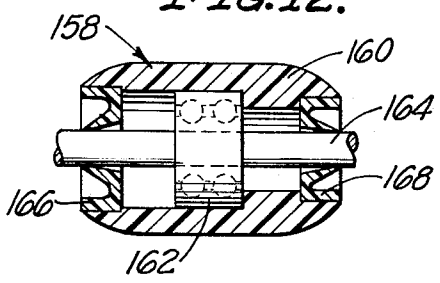


FIG. 12.



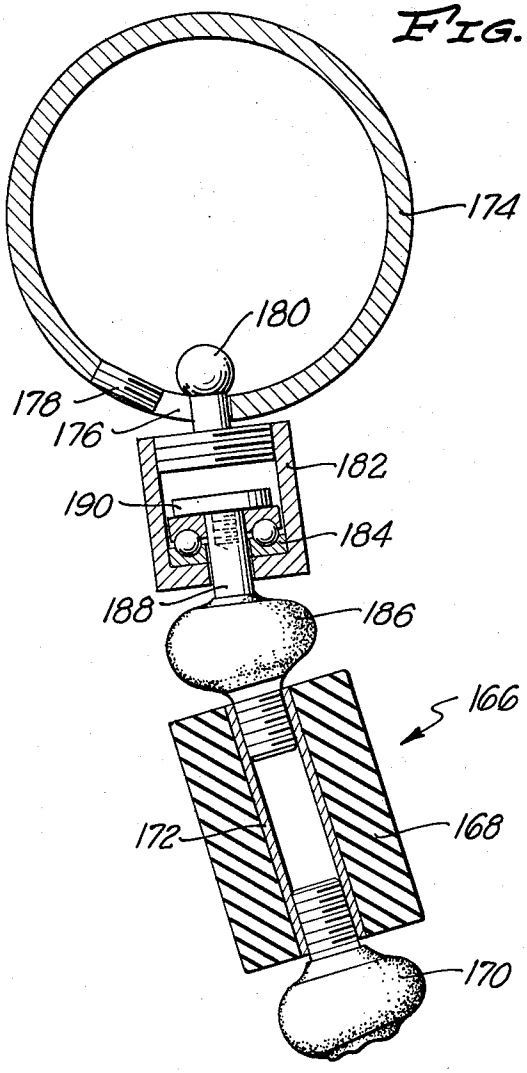
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FIG. 13.



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3,385,599

AMUSEMENT ROLLER SLIDE

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Filed Apr. 1, 1966, Ser. No. 539,405
17 Claims. (Cl. 272—56.5)

This invention is directed to a roller ride, the roller ride being an amusement device whereby persons can enter upon the ride at the higher end thereof and individually ride down to the lower end thereof, the ride being capable of several embodiments so as to impart different ride impressions.

Slides are well known in the children's playyard equipment field. Such slides are conventionally straight troughs which slant downward at a uniform angle so that when a child enters upon the top end he slides down to the bottom. Such slides are primarily effective when the sliding surface is clean and dry so that speed of different sliders is uniform, and none goes too slow or too fast. The angle is arranged so that when in the cleanest condition for the maximum sliding speed, this speed is limited to a reasonable value for safety. Thence, when the slide becomes dirty, sliding virtually stops. While undulation and horizontal curves are occasionally found in such slides, they are difficult to manufacture by reason of the nature of the sliding surface. Thus, such slides are severely limited.

It is an object of this invention to provide a roller ride which provides different ride characteristics from the well known children's slide and which is arrangeable in a plurality of different configurations for different effects in different environments.

It is a further object of this invention to provide a roller ride which provides riding characteristics which are different for different persons riding thereon, so that smaller, lighter persons proceed down the roller slide at a slower rate than heavier persons.

It is another object of this invention to provide a roller ride which is comprised of a large plurality of rollers arranged upon slings so that a rider rolls from one set of rollers to the other while supported by the slings.

It is another object of this invention to provide a roller ride having flexible slings so that the slings can be easily positioned in the roller ride during the building of the structure, and wherein the individual slings can adapt themselves to the various riders.

It is another object of this invention to provide a plurality of rollers on the roller ride sling, which plurality of rollers form into a generally channel shaped configuration so as to provide safe side support to prevent a rider from falling sidewards off of the roller slide, each of the rollers on each sling being rotatable to permit ease of forward, downward motion of the rider.

Other objects and advantages of this invention will become apparent from a study of the following portion of this specification, the claims and the attached drawings in which:

FIG. 1 is a side elevational view, with parts broken away, showing the preferred embodiment of the roller ride of this invention;

FIG. 2 is a section taken generally along the line 2—2 of FIG. 1;

FIG. 3 is a side elevational view of a second embodiment of the roller ride of this invention;

FIG. 4 is a side elevational view of a third embodiment of this invention;

FIG. 5 is a perspective view of a fourth embodiment of this invention;

FIG. 6 is a top plan view of a fifth embodiment of this invention;

FIG. 7 is an enlarged longitudinal section through one of the side support rails of the roller ride, showing details of the roller and sling structure of the preferred embodiment;

FIG. 8 is a section taken generally along line 8—8 of FIG. 7;

FIG. 9 is a top plan view of a plurality of rollers upon a plurality of slings, showing the inter-connection between the slings;

FIG. 10 is a side elevational view of an inter-connecting link;

FIG. 11 shows another embodiment of roller construction mounted upon a sling;

FIG. 12 shows a further embodiment of the roller structure mounted upon a sling; and

FIG. 13 is a section similar to FIG. 7, showing the further embodiment of the sling and roller construction.

As an aid to understanding this invention it can be stated in essentially summary form that it is directed to a roller ride. The roller ride comprises first and second side rails, spaced from each other and suitably supported. A plurality of slings connect the side rails. The slings are sufficiently long so as to form a hanging loop. A plurality of rollers are provided on each one of these slings, the rollers being rotatable. The overall angle of the bottom of one sling to the next is generally directed downwardly so that when a person enters upon the uppermost rollers in the uppermost sling, he descends from roller to roller to the outlet of the roller ride. In different embodiments, the side rails can be straight with the slings at substantially uniform lengths so that the roller ride provides a uniform down-hill passage. In other embodiments, the side rails extend downward at a uniform angle, but the slings are of different lengths so that the bottom of the slings defines a curved path. Thus, an undulating ride is obtained. In further embodiments, the side rails can be formed into a vertical curve and provided with uniform length slings so that an undulating ride is formed. In another embodiment the side rails are supported from downwardly sloping ground and are shaped to the ground contour so that a ride generally corresponding to the ground shape is obtained. In a further embodiment, the side rails are bent into circular arcs so that a downwardly spiral path of travel is enjoyed.

Several roller arrangements are possible. In one embodiment, a relatively thin metallic rod is connected as a hanging loop between the side rails. The rollers are rotatable on this loop. In one embodiment, anti-friction bearings are used for easy rotatability, in another embodiment, sliding bearings are used to provide greater friction to prevent excessive speed. In another embodiment, rollers are connected together by universal joints so as to form a rotatable sling. This sling has a rotating connection with the side rails.

This invention will be understood in greater detail by reference to the following portion of the specification where the drawings are described. FIG. 1 illustrates the preferred embodiment of the roller ride of this invention which is generally indicated therein at **10**. The roller side **10** comprises upright posts **12**, **14** and **16** which support side rails **18** and **20** through yokes **22**, **24** and **26**. As is illustrated in FIG. 2, the yokes extend crosswise on the upright posts, then upwardly and then inwardly and are secured to the side rails **18** and **20** to support them in position. As is seen in FIGS. 1 and 2, the side rails come down to the ground at the lower end of the ride **10** for support. Additionally, yoke **22** extends upwardly so as to provide a looped handhold, and extends across above the entry platform to force the riders to be seated upon entering upon the downwardly sloping portion of the ride. Also secured to yoke **22** is ladder **28** which permits the

riders to ascend to the entrance to the roller portion of this roller ride.

Protective pan **30** is mounted within yokes **22**, **24** and **26** so as to form a protective channel on the sides and the bottom of the roller ride between these points. Furthermore, pan **30** has louvres **32**, directed downwardly, to permit sand and debris to exit from the pan. The protective pan prevents mischievous youngsters from inserting objects between the rollers, which action may injure the riders on the roller slide. The lower portion of the roller ride is considered too close to the ground to require such a protective pan, but such could be provided if desired. Furthermore, the pan **30** is preferably applied in all embodiments of the roller ride, even though it is illustrated only in FIGS. 1 and 2 with respect to the roller ride **10**. It is omitted from the following embodiments in order to clarify the showings.

It is to be noted that in the embodiment of FIG. 1 the slings carrying the rollers are of uniform length and the side rails **18** and **20** are straight and uniformly downwardly inclined. The slings themselves will be disclosed in further detail in a later portion of this specification. For identification, the slings are indicated at **34**.

The second embodiment of this roller ride of this invention is generally indicated in FIG. 3 at **36**. The roller ride **36** comprises upright posts **38**, **40** and **42** which support a pair of side rails **44** by means of yokes **46**, **48** and **50**. Furthermore, ladder **52** provides a place to ascend into the top of the roller ride. It is to be noted that the roller ride **38** at it is described, is identical to the roller ride **10**. However, in the roller ride **36**, the slings **54** are of varying length so as to provide an undulating ride within the confines of the straight side rails **44**. Structurally the slings **54** can be identical to the slings **34**, except for the overall length of individual slings.

Referring now to FIG. 4, the third embodiment of the roller ride of this invention is generally indicated at **56**. The roller ride **56** comprises upright posts **58**, **60** and **62** which support a pair of side rails **64** by means of yokes **66**, **68** and **70**, in an identical manner as indicated with respect to FIG. 1. Furthermore, ladder **72** provides a place to ascend into the top end of the roller ride. Side rails **64** are formed into vertical curves to provide an undulating ride and slings **74**, secured to side rail **64** in supporting the rollers thereon, are of uniform length so as to provide an undulating ride. Again, the slings **74** are constructed similarly to slings **34**, and are described in more detail below.

Referring to FIG. 5, another embodiment of the roller ride is generally indicated therein at **76**. The roller ride **76** illustrates the application of the generic roller ride invention to a downwardly sloping contour. The roller ride **76** is supported on a plurality of upright posts **78**, each being surmounted by a yoke **80**. The side rails **82** and **84** are supported by the yokes **80**. Slings **86** are supported by side rails **82** and **84**. The slings **86** can be formed in the specific manner as hereinafter described. Furthermore, the slings **86** can either be of uniform length so as to provide a downward ride which conforms to the shape of the side rails or may be of somewhat different lengths so as to provide an undulating ride in specific areas. Furthermore, the height of the upright posts **78** may be varied in accordance with the ground contour so that the downward slope of the ride is appropriate and is only generally related to ground contour rather than exactly related to it. The only requirement is that the exit end of the roller ride **76** be of proper height for convenient entry and for safe exit. The entry end of this roller ride may be just above ground level with an appropriate entrance platform, or may be elevated and provided with a ladder of the type previously described. If desired, a protective pan may be positioned beneath slings and supported upon the yokes **80**, in the manner previously described to protect riders upon the roller ride **76**.

Referring to FIG. 6, a further embodiment of the roller ride is generally indicated at **88**. FIG. 6 is a top plan view of a roller ride having side rails **90** and **92** arranged in partially circular paths. As shown, they extend for three-quarters of a circle. In addition, they extend spirally downward so as to provide a circular roller ride. The lower ends **94** of side rails **90** and **92** are sufficiently close to the ground so that safe exit is permitted. The upper end **96** of the side rails **90** and **92** are elevated and have a ladder **98** connected thereto to permit the rider to ascend to the upper end of the ride. Slings **100** are connected between the side rails **90** and **92**. The slings provide rollers upon which the rider descends to roller ride **88**.

The particular sling structure useable in any of the roller rides **10**, **36**, **56**, **76** and **88**, are described in the FIGURES 7 through 13. Several different embodiments are disclosed therein, and the different embodiments can be employed in accordance with particular requirements. Referring particularly to FIGS. 7 and 8, sling **102** is shown as being connected on one end to side rail **104**. It is clear that side rail **104** may be any one of the previously described side rails. Side rail **104** is a cylindrical tube and has a plurality of fastening openings located along the lower surface thereof. Only one of such fastening openings is illustrated, but it is understood that there is one of such openings for each end of each of the slings of the roller ride. Slot **106** is wide enough to accept shaft **108**. Shaft **108** carries ball **110** on the end thereof, and shaft **108** swaged at **112** to prevent ball **110** from coming off the end of the shaft. Slot **106** is smaller than ball **110** so that the end of the shaft **108** is retained in side rail **104**. Hole **114** is threaded and is open to slot **106**. Hole **114** is large enough to pass ball **110** so ball **110** can enter therein and shaft **108** moved into slot **106**. Plug **116** is threaded into hole **114** to prevent the end of the shaft from coming out of side rail **104**. Each end of shaft **108** is secured to one of the side rails in this manner. Shaft **108** is sufficiently long and is sufficiently flexible so as to form a U-shaped sling. For example, shaft **108** may be a ⅛ inch stainless steel rod. The length of shaft **108** depends on whether an undulating ride is desired by different lengths of said shafts and it depends on the amount of U-shape desired between and below the side rails.

Rollers **118** are the preferred embodiment of the rollers mounted upon shaft **108**. Rollers **118** comprise a cylindrical tubular center portion **120** secured into roller ends **122** and **124**. Roller ends **122** and **124** and tube **120** are preferably of polymer composition material. The polymer composition material need be tough and have low friction and low wear properties. Ends **122** and **124** have large internal bores **126** which permit the shaft **108** to be in curved configuration within the roller. Bearings **128** engage directly upon shaft **108**. Bearings **128** are provided with reliefs **130** which reduce the area in contact to permit sand to run out of the end of rollers **118**. Furthermore, this reduced area in contact aids in proper bearing characteristics, especially in view of the bent character of shaft **108**.

FIGURE 9 illustrates the plurality of rollers **118** on a plurality of shaft **108**. The rollers **118** in the lower part of the U-shaped sling are provided with sand outlet holes **132**. These sand outlet holes permit the normal soil of a playyard to discharge from the rollers **118**. The sand holes **132** are formed in cylindrical tube **120**. The sand holes **132** are not necessary in the rollers positioned higher up on the sides of the sling **102**, for example as illustrated in FIG. 7, but they may be used there as well if desired.

In order to prevent the slings **102** from moving apart, and perhaps catching the clothing or a bodily member of the person using the roller ride, shafts **108** are interconnected by connecting links **134**. The connecting links **134** may be either metallic or polymer composition material and have holes **136** and **138** therein to engage over adjacent shafts **108**. Slots **140** and **142** are provided at each of the holes **136** and **138** so that the links may be

inserted over the shafts. The link **134** illustrated in FIG. 10 is broken to indicate that various lengths of such a link may be necessary, especially in cases where the side rails are formed in horizontal curves. In such cases, the shafts **108** are further apart at the outer side rail than at the inner side rail, and various lengths of link **134** would be necessary for proper inter-connection.

Another embodiment of rollers is generally indicated at **144**. The roller **144** comprises roller tube **146** and bearing balls **148**. Roller tube **146** is a relatively large bore tube, equal to about ⅔ the outside diameter of bearing balls **148**. The ends of the tube **146** engage upon the outer surface of balls **148** sufficiently toward the maximum diameter to provide stability. Roller tubes **146** and bearing balls **148** are alternately positioned along shaft **150** to form a complete sling which extends between the side rails. Roller tube **146** is appropriately provided with sand holes **152** to permit the exit of sand therefrom. Bearing balls **148** have large bores **154** entering each end so as to provide a relatively restricted bearing **156**. This permits curvature of shaft **150** and reduces the bearing area in contact. Furthermore if desired, the bearing can be formed with reliefs such as the reliefs **130** in FIG. 8. These reliefs would further aid in the discharge of sand and conformation of the bearing to the curvature of the particular shaft **150**.

It is noted that the roller structures shown in detail in FIGS. 7 and 11 are sleeve type or sliding type bearings. These bearings have a relatively high coefficient of friction as compared to rolling type bearings. While roller rides of substantially uniform downward grade can be provided with the same type of bearing, it may be desirable in those with changing slopes to provide bearings of lesser friction in the portions of lesser slope. For this purpose, roller **158**, see FIG. 12, is provided with anti-friction bearings. For example, roller **158** has body **160** having a bearing bore therein. Anti-friction bearing **162**, which is illustrated as a double-row ball bearing, but may be a single-row ball bearing or an appropriate roller or needle bearing, is mounted within the bearing bore. It is also engaged upon shaft **164** which forms part of a complete sling extending between and secured to the said rails of the roller rod. A plurality of rollers **158** are provided along the length of shaft **164**. Seals **166** and **168** are mounted in roller body **160** and engage upon shaft **164** to prevent the entrance of soil into the bearing **162**. By this means, individual slings having rollers thereon which roll more easily so as to maintain rider's speed can be selectively provided in the roller ride.

It should be noted that in the embodiments of FIGS. 7 and 12, the rollers each rotate on their support shaft independently of the adjacent rollers. Furthermore, a substantial independence of the rollers is provided in the structure of FIG. 11. However, in the embodiment of FIG. 13, the entire rotatable body of sling **166** rotates as a unit. A plurality of rollers **168** are arranged so that a univeral joint **170** is connected between each roller. Roller **168** comprises an outer polymer composition material tube having a metallic tube **172** therein. Universal joints are connected into the rollers and secured into the tube **172**. Thus, a string of rollers **168** and universal joints **170** forms the rotatable portion of the sling. The universal joints are of conventional construction, and are illustrated with a flexible covering to prevent dirt from entering therein. There are sufficient rollers **168** and universal joints **170** so as to substantially reach from one side rail to the other of the roller ride in which they are mounted.

One side rail is illustrated at **174**, and again is useable in the same embodiments as side rail **104**. Side rail **174** also has a slot **176** therein joining with plugged hole **178** which provides for entry and retention of ball **180**. Ball **180** is secured to bearing housing **182**. Universal joint **186** carries shaft **188** which extends into bearing housing **182** and terminates in flange **190** which bears on bearing **184**. Thus, the entire sling **166** is flexible along its length through the universal joints **170** and **186** and is flexibly connected to side rail **174**. Furthermore, the portion of this sling from bearing **184** through the universal joints and rollers to the similar bearing on the opposite end is secured to the opposite side rail and is rotatable. Thus, another embodiment of sling is useful in the roller ride of this invention.

Flexibility of the slings has been described with respect to the several embodiments. From these descriptions, it is clear that flexibility as viewed in the transverse cross section is the flexibility desired. This flexibility permits each individual sling to at least partially accommodate to the load of a person riding along from sling to sling to at least partially shape the sling to the person. Flexibility longitudinally of the ride is undesired, for it would permit sling separation in the longitudinal direction. Such would be uncomfortable, and would present the danger of catching a limb or clothing. Flexibility on the longitudinal direction may be minimized or limited by a number of different types of construction including the links **134**.

A definite use advantage of the roller ride of this invention is not immediately apparent from the constructional details recited above. This advantage is that smaller, lighter riders proceed more slowly down the roller ride than heavier riders. Thus, smaller children descend more slowly and safely, in view of the their age, than larger children. The cause of this functional advantage is that the momentum of a lighter child is less, and part of this momentum is consumed in accelerating the rollers on eah sling as they are reached. This is a very desirable built-in safety feature.

This invention having been described in its preferred embodiment, and several additional embodiments disclosed, it is clear that this invention is susceptible to numerous changes and embodiments within the scope of this invention and without the exercise of the inventive faculty. Accordingly, the scope of this invention is defined by the scope of the following claims.

I claim:

1. An amusement device comprising a roller ride, said roller ride comprising first and second spaced side rails, a plurality of slings interconnecting said side rails, the ends of said slings downwardly hanging from said side rails, said slings depending below said side rails, each of said slings comprising a plurality of rollers positioned end to end, said plurality of rollers extending substantially from one of said side rails to the other of said side rails, said slings defining a generally downwardly sloping path, said rollers being arranged so that as a person enters upon the rollers at the upper end thereof, the person rides downward on said rollers between said side rails and causes at least some of the rollers to rotate, and wherein said slings are flexible and said rollers at least partially conform in shape to the person riding on the roller ride as he descends along the roller ride from one sling to the next.

2. The roller ride of claim **1**, wherein there are upright posts, said upright posts being adapted to be ground supported, said upright posts carrying yokes adjacent the top thereof, said yokes extending around said slings and engaging said side rails so as to secure said side rails.

3. The roller ride of claim **1** wherein said side rails are straight.

4. The roller ride of claim **3** wherein said slings are of substantially equal length so that the downward path of travel on said roller ride is substantially straight.

5. The roller ride of claim **3** wherein said slings are of different length so that the downward path of motion of a person riding the roller ride is vertically curved.

6. The roller ride of claim **1** wherein said side rails are vertically curved and said slings are substantially of equal length so that the downward path of travel of the person riding the roller ride is vertically curved.

7. The roller ride of claim **1** wherein said side rails are horizontally curved so that the path of the person riding

the roller ride is horizontally curved as he descends the roller ride.

8. The roller ride of claim 1 wherein each sling comprises a rod, said rod being longer than the distance between said side rails, a plurality of rollers positioned on said rod so as to be rotatable with respect to said rod, said rollers thus being rotatable on said rod by passage of a person on the roller ride.

9. The roller ride of claim 8 wherein each of said rollers comprises a tubular center portion and ends, each of said ends having a bearing therein, said bearings engaging said rod.

10. The roller ride of claim 9 wherein said bearings are longitudinally grooved so as to reduce bearing area.

11. The roller ride of claim 8 wherein said roller comprises a roller tube and first and second bearing balls, said roller tube engaging on the outside of said bearing balls, said bearing balls having an interior bearing therein, said interior bearing engaging upon said rod so that said balls and said roller tubes are rotatable with respect to said rod.

12. The roller ride of claim 8 wherein said roller comprises a tubular roller body, and an anti-friction bearing mounted within said body, said anti-friction bearing being positioned on said rod, seals adjacent said bearing to inhibit the entry of contaminants into said bearing.

13. The roller ride of claim 8 wherein at least some of said rollers of said roller ride have sand holes therein, said sand holes permitting the exit of sand from the interior of said rollers.

14. The roller ride of claim 1 wherein inter-connecting links are connected between adjacent of said slings, said interconnecting links preventing substantial separation of said slings with respect to each other.

15. The roller ride of claim 1 wherein each sling comprises a plurality of rollers and a plurality of universal joints, said rollers and said universal joints being serially connected to form the rotatable portion of each sling, said rotatable portion of each sling being rotatably connected to said side rails.

16. The roller ride of claim 1 wherein said slings are disconnectedly secured to each of said side rails, each of said side rails having a hole therein and a slot connecting with said hole, an enlargement on the end of said sling, said enlargement passing through said hole and being engaged by said slot, said hole being closable.

17. The roller ride of claim 1 wherein said roller ride includes a pan positioned exteriorly of said slings so as to protect said slings from the exterior thereof.

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P. SHAPIRO, *Assistant Examiner.*