Jan. 8, 1963 R. A. SIMPKINS 3,072,399

AMUSEMENT RIDE

Filed Dec. 21, 1959 6 Sheets-Sheet 1

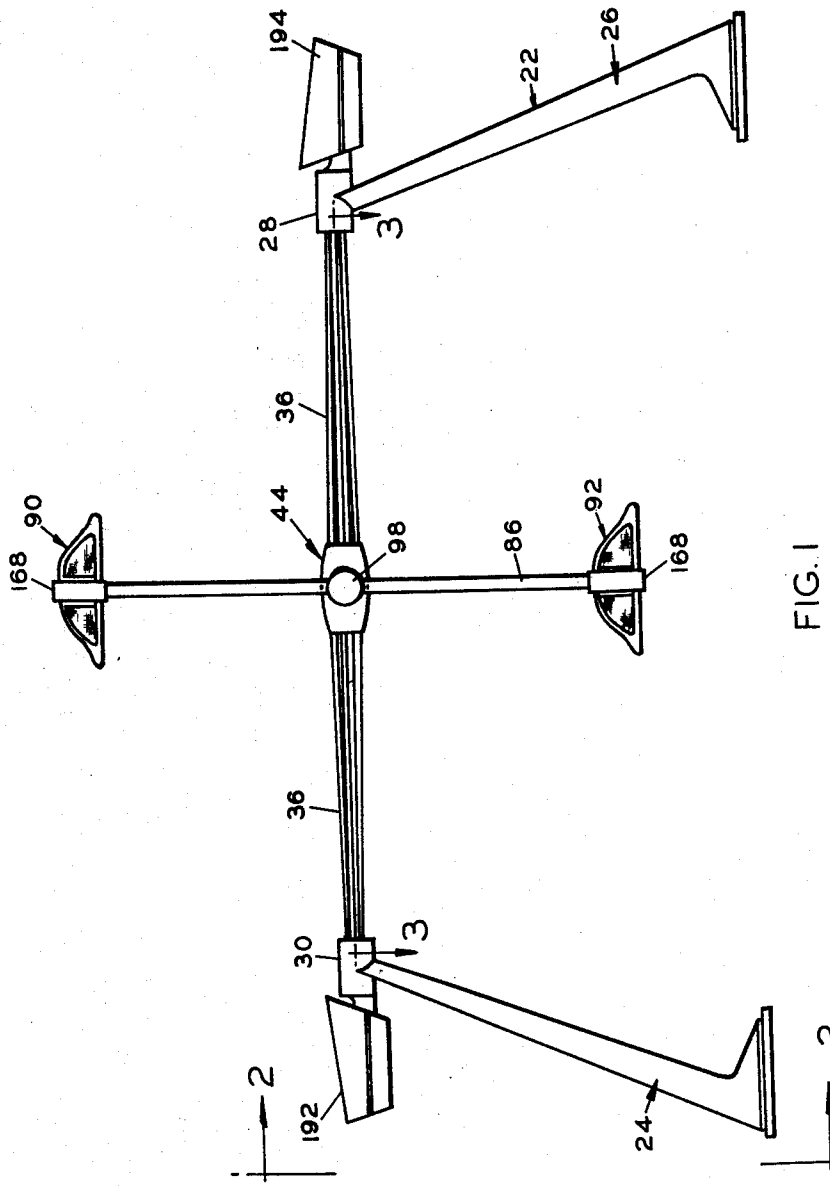

FIG. 1

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AMUSEMENT RIDE

Filed Dec. 21, 1959 6 Sheets-Sheet 2

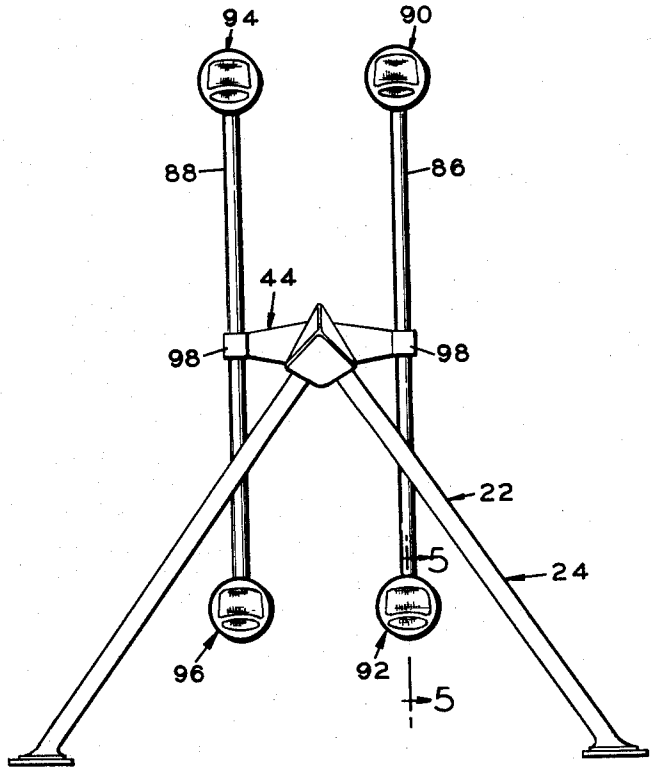

FIG. 2

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AMUSEMENT RIDE

Filed Dec. 21, 1959 6 Sheets-Sheet 3

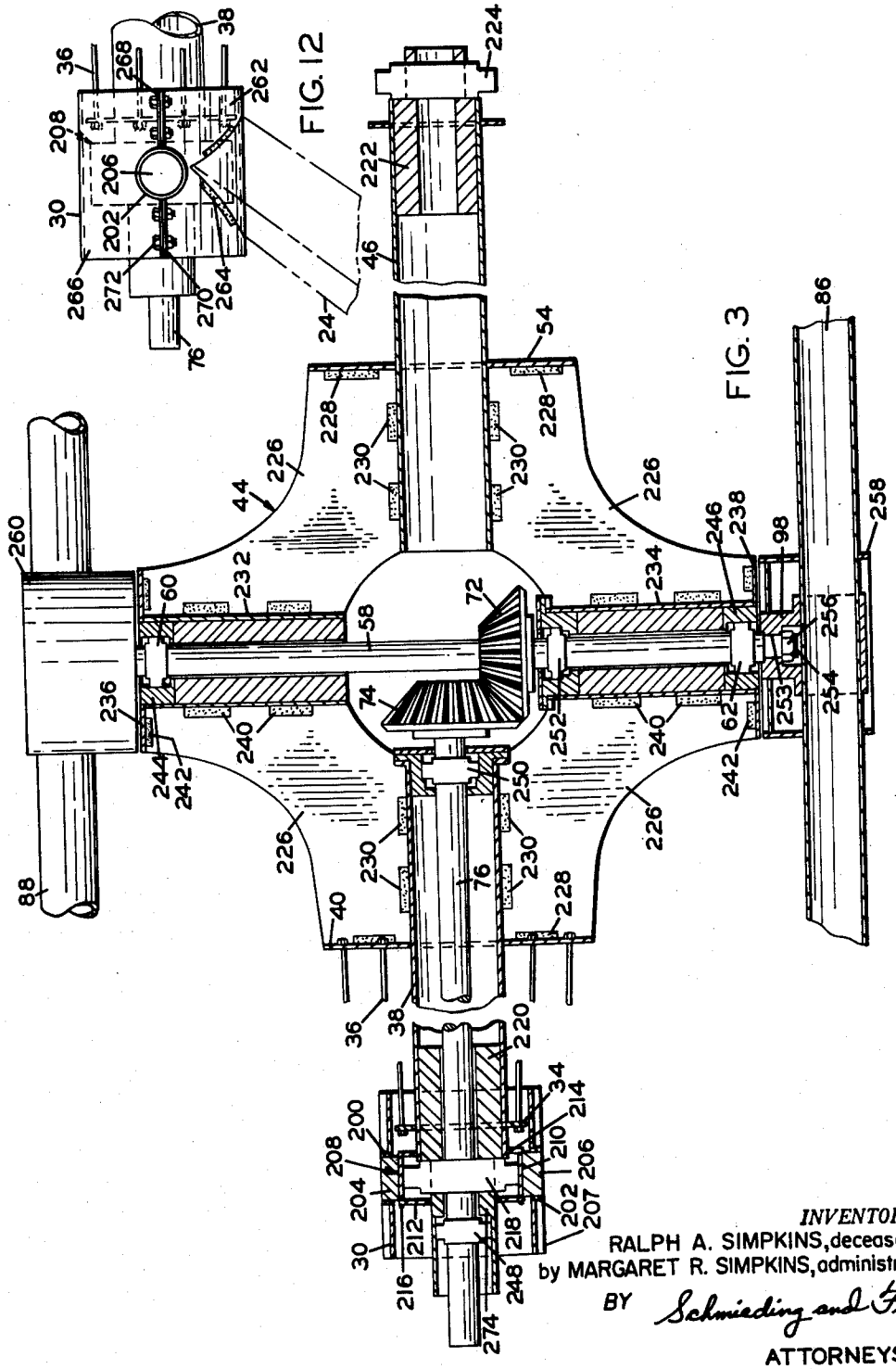

FIG. 12

FIG. 3

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AMUSEMENT RIDE

Filed Dec. 21, 1959 6 Sheets-Sheet 4

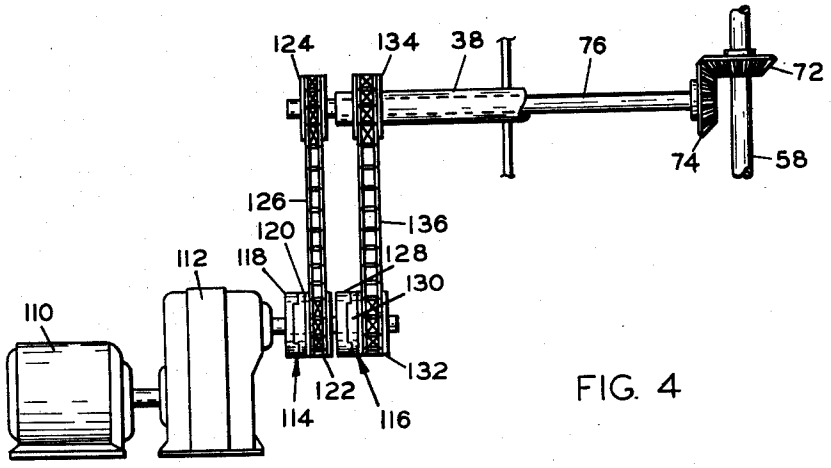

FIG. 4

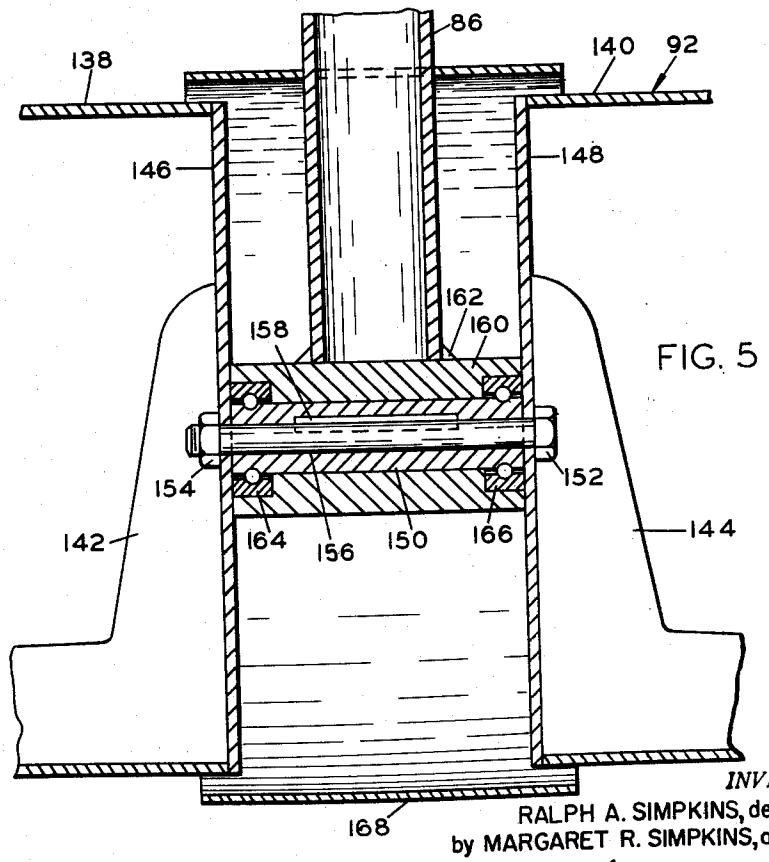

FIG. 5

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AMUSEMENT RIDE

Filed Dec. 21, 1959 6 Sheets-Sheet 5

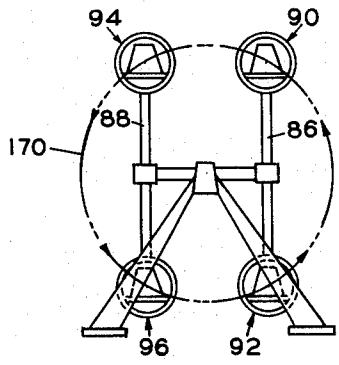

FIG. 6

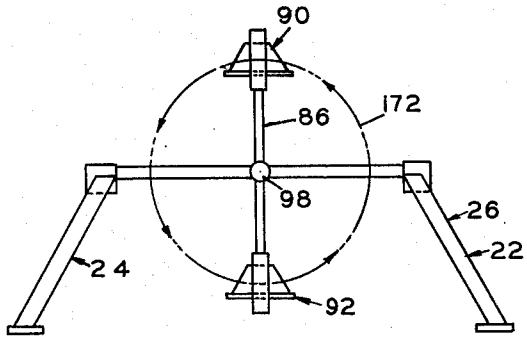

FIG. 7

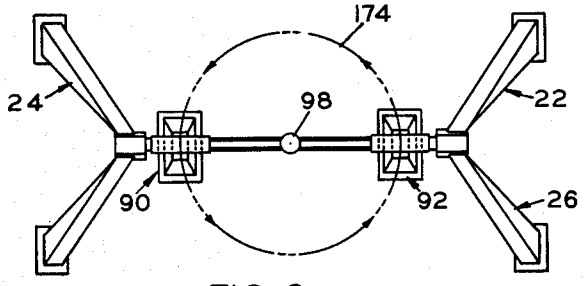

FIG. 8

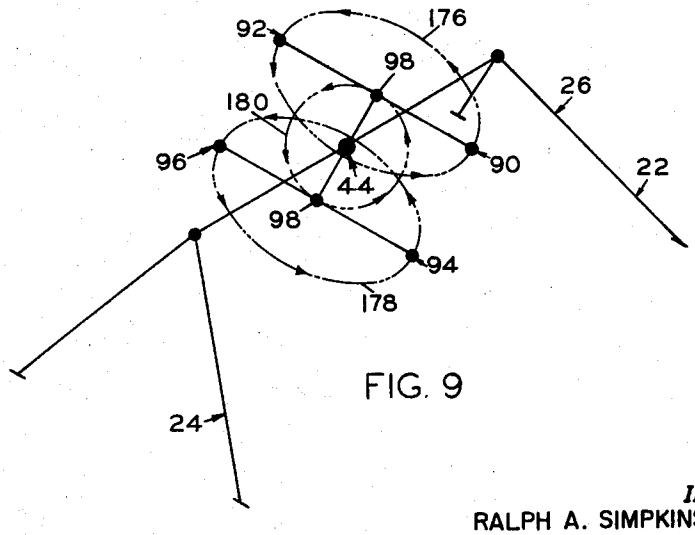

FIG. 9

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AMUSEMENT RIDE

Filed Dec. 21, 1959 6 Sheets-Sheet 6

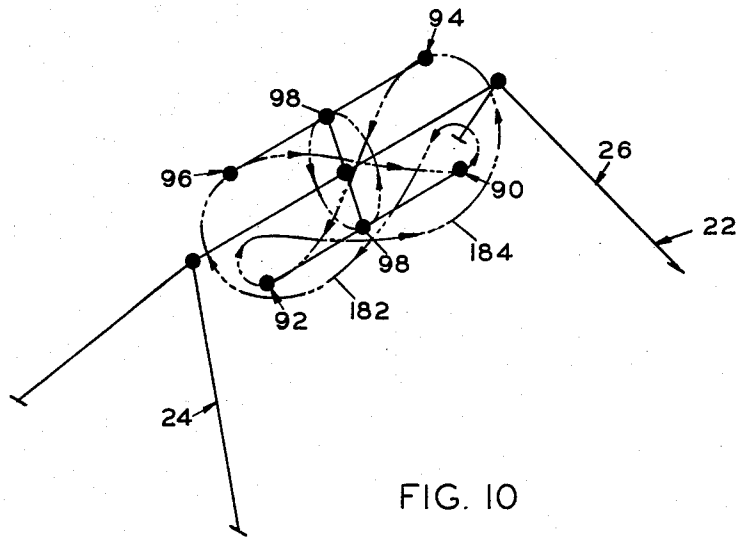

FIG. 10

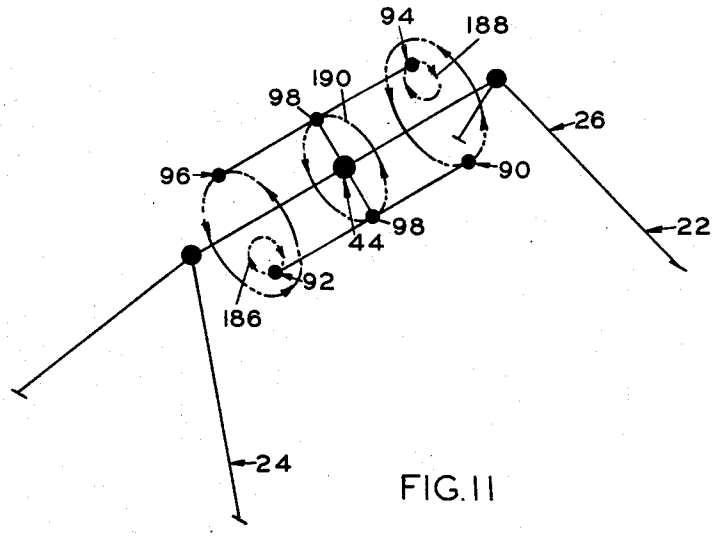

FIG. 11

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United States Patent Office 3,072,399 Patented Jan. 8, 1963

3,072,399

AMUSEMENT RIDE

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Filed Dec. 21, 1959, Ser. No. 861,029
12 Claims. (Cl. 272—36)

This invention relates to amusement rides and particularly to power driven machines wherein passengers are carried in cabs and moved through various maneuvers.

In general, the machine of the present invention includes a main frame that forms spaced upright supports. A hub means is mounted between said supports for rotation about a horizontal axis.

A pair of arms are mounted on the hub means for rotation about an axis disposed transversely of the previously mentioned horizontal axis passing through the hub pivot and each of said arms includes two cabs rotatably mounted on opposite ends thereof.

The hub means is rotatably driven by a first power means and the arms mounted thereon are independently driven by a second power means whereby the hub means and arms can be either independently or simultaneously rotated to cause the cabs to move through various complex paths of movement.

It is therefore an object of the present invention to provide a novel amusement ride wherein cabs for carrying passengers can be either independently or simultaneously rotated in planes normal to two transversely disposed axes of rotation.

It is another object of the present invention to provide a novel drive mechanism for an amusement ride of the type described.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred form of embodiment of the invention is clearly shown.

In the drawings:

FIG. 1 is a side elevational view of an amusement ride constructed according to the present invention;

FIG. 2 is an end elevational view of the amusement ride of FIG. 1, said view being taken along the line 2—2 of FIG. 1;

FIG. 3 is a top sectional view of a portion of the drive mechanism of the machine of the preceding figures, the section being taken along the line 3—3 of FIG. 1;

FIG. 4 is a side elevational view of two driving means comprising a portion of the drive mechanism of the preceding figures;

FIG. 5 is a partial side sectional view of a passenger cab comprising a portion of the machine of the preceding figures, the section being taken along the line 5—5 of FIG. 2;

FIG. 6 is an end elevational view of the machine of the preceding figures that shows a first plane of rotation through which the cab means can be moved;

FIG. 7 is a side elevational view of the machine of the preceding figures that shows another plane of rotation through which the cab means can be moved;

FIG. 8 is a top elevational view of the machine of the preceding figures that shows still another plane of rotation through which the cab means can be moved;

FIGS. 9 through 11 are diagrammatic views illustrating various compound maneuvers that can be executed with the amusement ride of the present invention; and

FIG. 12 is a partial side elevational view that illustrates a bearing mount comprising a portion of the apparatus of FIG. 3.

Referring in detail to the drawings, the machine of the present invention includes a supporting frame indicated generally at 22 which comprises spaced upright supports 24 and 26.

Support 26 carries a right journal housing 28 and support 24 carries a left journal housing 30. As seen in FIGS. 3 and 12, left journal housing 30 includes bushings 200 and 202 that carry pivot pins 204 and 206, said pivot pins being extended laterally outwardly from a bearing cradle indicated generally at 208. Cradle 208 includes an annular wall 210 and end cover plates 212 and 214. The outer end cover plate 212 is removably mounted to annular wall 210 by a plurality of bolts 216 whereby a bearing 218 can be mounted within cradle 208.

With continued reference to FIG. 3, an end plug 220 in a left tube 38 is journaled in bearing 218.

A right tube 46 includes an end plug 222 that is journaled in a right bearing 224, said right bearing being mounted in a cradle not illustrated but identical to the previously described left cradle 208.

A plurality of hub braces 36 connect a hub plate 40 with a fixed tube end plate 34. Four sheet metal webs 226 are joined to tubes 38 and 46 and hub plates 40 and 54 at the welds 228 and 230.

With continued reference to FIG. 3, hub 44 further includes transverse tubes 232 and 234 supported by the sheet metal webs 226 and end plates 236 and 238 at the welds 240 and 242.

With continued reference to FIG. 3, hub 44 further includes a transverse shaft 58 that extends through bearings 60 and 62, said bearings being mounted in bearing mounts 244 and 246 carried in the ends of tubes 232 and 234.

Transverse shaft 58 is driven by means of beveled gears 72 and 74, the latter being mounted on the end of a horizontally extended drive shaft 76. Drive shaft 76 is rotatably mounted within tube 38 by means of bearings 248 and 250. An inner bearing 252 provides central support for transverse shaft 58.

A first arm 86 is mounted on one end of shaft 58 and a second arm 88 is mounted on the other shaft end. The arms in turn rotatably support four cabs indicated generally at 90, 92, 94, and 96 as is best seen in FIG. 2.

Each end of shaft 58 carries an arm mount 98, one of which is seen in FIG. 3. It will be noted that arm mount 98 includes a hole 253 that receives a threaded end 254 of transverse shaft 58.

A nut 256 retains arm mount 98 on the end of shaft 58. It will be noted from FIG. 3 that the junctions of the ends of shaft 58 with arms 86 and 88 are enclosed by arm hubs or housings 258 and 260.

With reference to FIG. 12, it will be noted that left journal housing 30 includes a lower portion 262 secured to upright support 24 at a weld 264 and an upper portion 266, said portions being removably joined together at horizontal flanges 268 and 270 by means of a plurality of threaded fastenings 272.

It will be understood from the preceding description that cradle 208 is pivotally supported in left journal housing 30 on a horizontally disposed pivotal axis passing through the center of laterally extending pivot pins 204 and 206. This arrangement permits tube bearing 218 and shaft bearing 248 to align with a bearing portion 274 and with drive shaft 76 when the tubes and drive shaft deflect under load.

Reference is next made to FIG. 4 which diagrammatically illustrates a drive mechanism that includes a motor 110, a gear reduction unit 112, and two clutches indicated generally at 114 and 116. Clutch 114 includes a driving clutch portion 118 and a driven clutch portion 120, the latter being keyed to driving gear 122 that is connected to a driven gear 124 by chain 126, said driven gear being keyed to horizontal shaft 76.

Clutch 116 includes driving portion 128 and driven portion 130, the latter being keyed to a driving gear 132. A driven gear 134 is keyed to tube 38 and connected to driving gear 132 by chain 136.

It will be understood that when clutch 114 is engaged and clutch 116 is disengaged only shaft 76 will be rotated by motor 110. If, however, clutch 114 is disengaged and clutch 116 is engaged, only tube 38 will be rotated. If both clutches 114 and 116 are engaged then tube 38 and shaft 76 will simultaneously rotate.

Reference is next made to FIG. 5 which is a partial sectional view taken on a vertical plane through the center line of one of the cabs 92. It will be noted that the cab includes compartments 138 and 140 in which are mounted oppositely facing seats 142 and 144. The inner walls 146 and 148 of the compartments are joined by a bearing member 150 in a bolt 152 and nut 154, said bolt being extended through a hole 156 in bearing member 150. A key 158 is provided between bolt 152 and bearing member 150.

With continued reference to FIG. 5, a journal 160 is secured to the end of arm 86 at a weld 162 and bearings 164 and 166 are provided between journal 160 and bearing member 150. An annular cover 168 surrounds the bearing portion and the space between end walls 146 and 148, said cover being mounted on arm 86.

Reference is next made to FIG. 6 which diagrammatically illustrates a circular path 170 along which the cabs are rotated when arms 86 and 88 are vertical and both drive tube 38 and drive shaft 76 are rotated.

FIG. 7 illustrates a circular path 172 along which the cabs are rotated when only shaft 76 is being driven with drive tube 38 being stationary and transverse shaft 58 is in a horizontal disposition.

FIG. 8 shows a circular path 174 along which the cabs are rotated when transverse shaft 58 is disposed in a vertical configuration and only shaft 76 is being driven, drive tube 38 being stationary.

FIG. 9 shows paths 176 and 178 along which the cabs are rotated, relative to the arm mounts 98, and a circular path 180 along which the arm mounts are rotated, relative to hub 44. These three paths of movement will occur when both shaft 76 and drive tube 38 are simultaneously driven.

FIG. 10 diagrammatically illustrates paths along which the cabs actually travel when only drive tube 38 is rotated. It will be noted that cab 90 travels through path 182 and cab 92 travels through path 184. The other two cabs 94 and 96 travel along similar paths.

In FIG. 11, the paths 186 and 188 diagrammatically illustrate rotation of cabs 92 and 94 about their bearing members 150, FIG. 5, when hub 44 is rotated about its longitudinal axis by rotation of drive tube 38 and drive shaft 76 is simultaneously driven to hold the arms fixed relative to the hub. This causes arm mounts 98 to follow the path 190.

It will be understood that a drive mechanism such as that illustrated in FIG. 4 can be mounted either in a housing 192 for a left-hand drive or in a housing 194 for a right-hand drive. FIG. 3 illustrates a left-hand drive arrangement, it being understood that for a right-hand drive arrangement shaft 76 would be extended through tube 46 so that beveled gear 72 would engage beveled gear 74 from the right-hand side. In addition, drive tube 46 would be driven whereas drive tube 38 would merely be journaled for free rotation in left bearing 218.

While the form of embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

I claim:

1. An amusement device comprising, in combination, first and second spaced upright supports; hub means mounted between said supports for rotation about a horizontal axis; shaft means journaled on said hub means for rotation about a second axis extending transversely of said horizontal axis, said shaft means including first and second shaft ends located outwardly of said hub means; a first arm mounted on said first shaft end and including first and second cab pivots on the outer ends of said first arm; a second arm mounted on said second shaft end and including third and fourth cab pivots on the outer ends of said second arm; a plurality of cabs each of which is rotatably mounted on a respective one of said cab pivots; a first driving means for rotating said hub means relative to said supports; and a second driving means for rotating said shaft means relative to said hub means.

2. The amusement device of claim 1 wherein said first driving means includes a first clutch means and said second driving means includes a second clutch means, said clutch means being independently operable whereby said hub means and said shaft means can be rotated simultaneously or independently of one another.

3. The amusement device of claim 1 wherein the centers of gravity of said cabs are located below the axes of rotation of said cabs.

4. An amusement device comprising, in combination, first and second spaced upright supports; hub means mounted between said supports for rotation about a horizontal axis; a first shaft means journaled for rotation in said hub means, said shaft means having a longitudinal axis extending transversely of said horizontal axis; a second shaft means including a driving end journaled in said hub means and in driving engagement with said first shaft means, said second shaft means including a driven end journaled in one of said supports; an arm including a central portion mounted on an end of said first shaft means and an end provided with a cab bearing; a cab mounted on said cab bearing for rotation about its longitudinal axis; a first driving means for rotating said hub means; and a second driving means for rotating said second shaft means.

5. The amusement device of claim 4 wherein said first driving means includes a first clutch means and said second driving means includes a second clutch means, said clutch means being independently operable whereby said hub means and said second shaft means can be rotated simultaneously or independently of one another.

6. The amusement device of claim 4 wherein the center of gravity of said cab is located below its axis of rotation.

7. In an amusement device, in combination, first and second spaced upright supports; hub means intermediate said first and second supports; a first hollow member having one end rotatably mounted on said first support and the other end secured to said hub means; a second hollow member having one end rotatably mounted on said second support and the other end secured to said hub means; a first drive shaft extended through one of said hollow members and including a first driven end and a second end; a second drive shaft journaled in said hub and extending transversely of said first drive shaft, said second shaft including first and second ends; a driven connection between said second end of said first shaft and a central portion of said second shaft; a first arm including a central portion mounted on said first end of said second shaft and including first and second free ends carrying first and second cab bearings; a second arm including a central portion mounted on said second end of said second shaft and including first and second free ends carrying first and second cab bearings; four cabs, each of said cabs being mounted on a respective one of said cab bearings for 360° free rotation about a longitudinally extending cab axis; a first driving means for rotating one of said hollow members, and a second driving means for said first drive shaft.

8. The amusement device of claim 7 wherein said first driving means includes a first clutch means and said second driving means includes a second clutch means, said clutch means being independently operable whereby said one hollow member and said first drive shaft can be rotated simultaneously or independently of one another.

9. The amusement device of claim 7 wherein the center of gravity of each cab is located below its axis of rotation.

10. In an amusement device, in combination, spaced upright supports; hub means mounted between said supports for rotation about a first axis; an arm rotatably mounted on said hub means for rotation about a second axis extending transversely of said first axis, said arm including a first bearing portion; a cab including oppositely facing compartments and a second bearing portion disposed between said compartments and journaled in said first bearing portion, the axis of rotation of said bearing portions being disposed in the plane of rotation of said arm and substantially normal to the longitudinal axis of said arm, the center of gravity of said compartments being eccentric of said axis of rotation of said bearing portions.

11. An amusement device comprising, in combination, first and second upright supports; a first longitudinally extending tube journaled on said first support and including an inner end; a second longitudinally extending tube journaled on said second support and including an inner end; a first laterally extending tube; a second laterally

extending tube; a plurality of sheet metal webs joining said longitudinally extending tubes and said laterally extending tubes in a hub means; a transverse shaft extended through said two laterally extending tubes; a longitudinal shaft extended through one of said longitudinally extending tubes and in driving relationship with said transverse shaft; an arm mounted on an end of said transverse shaft; a cab mounted on an end of said arm; a first driving means for rotating one of said longitudinally extending tubes; and a second driving means for rotating said longitudinal shaft.

12. The apparatus defined in claim 11 wherein first and second pivotally mounted journals are mounted on said first and second upright supports and wherein said longitudinally extending tubes are rotatably supported by said pivotally mounted journals.

References Cited in the file of this patent

UNITED STATES PATENTS

846,925	Kramer	Mar. 12, 1905
2,229,966	Eyerly	Jan. 28, 1941