Jan. 17, 1967 J. E. WILLIAMS 3,298,685

COMPLETE CIRCLE SWING

Filed Jan. 16, 1963 3 Sheets-Sheet 1

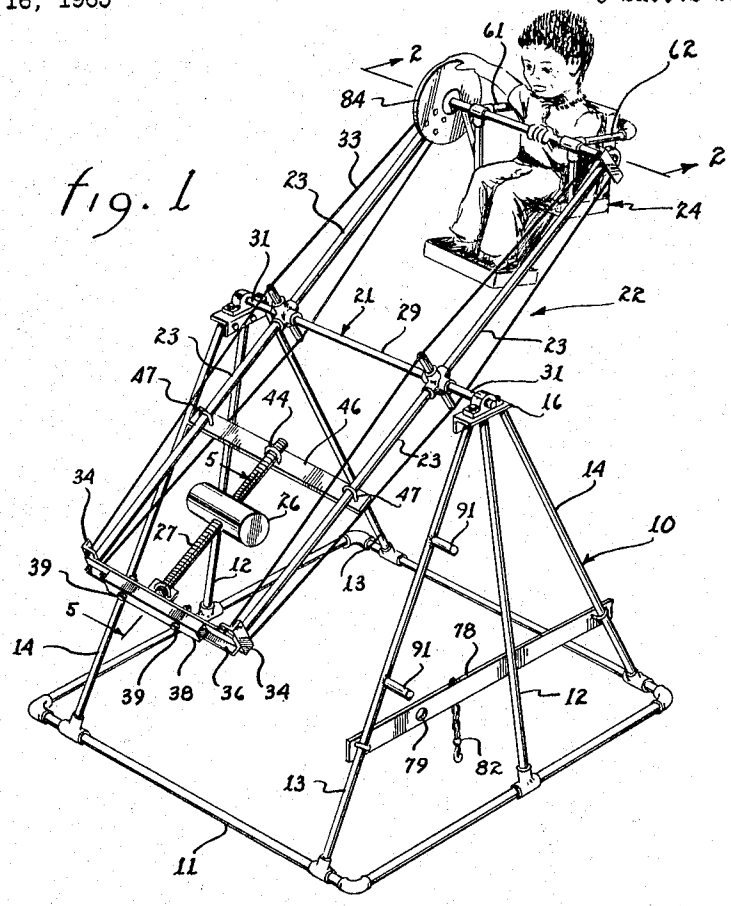


fig. 1

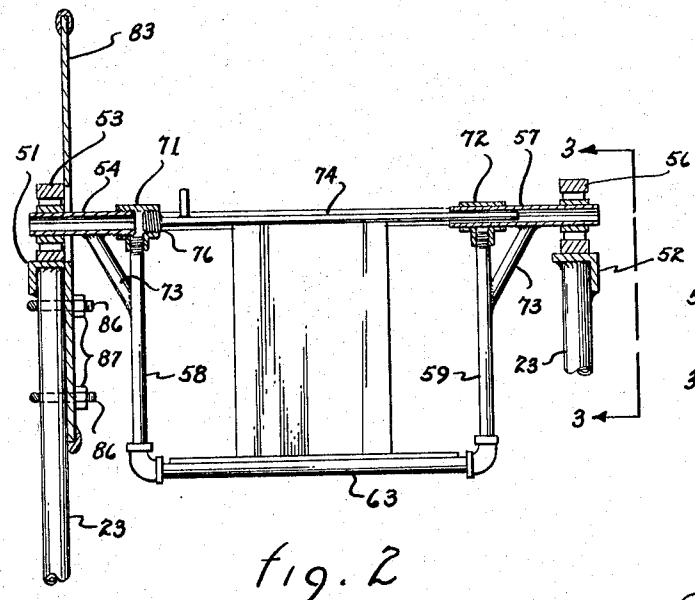


fig. 2

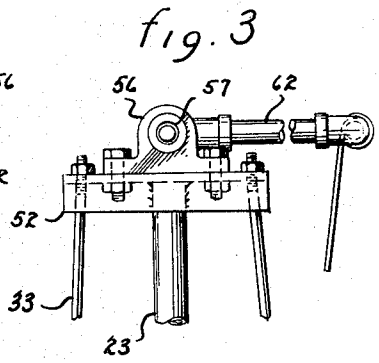


fig. 3

INVENTOR.
JAMES E. WILLIAMS
BY
John J. McLaughlin
ATTORNEY

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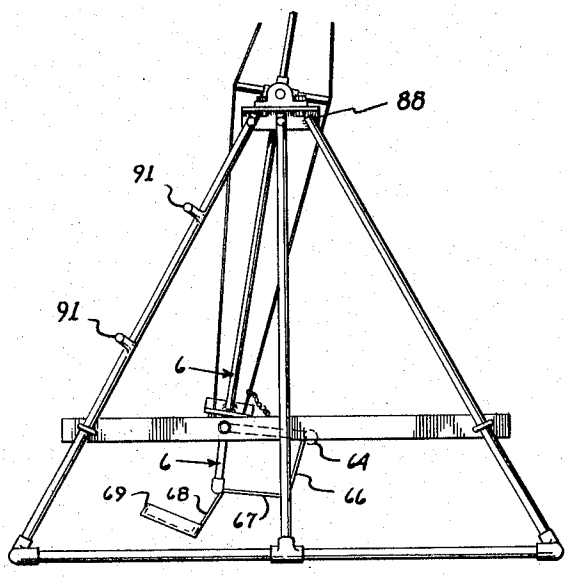


fig. 4

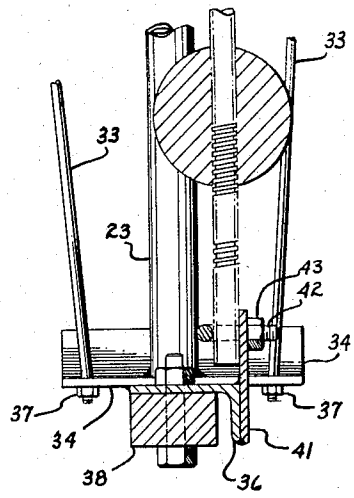


fig. 5

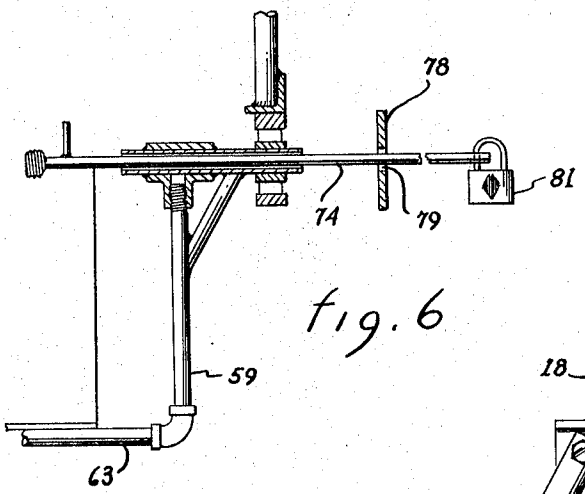


fig. 6

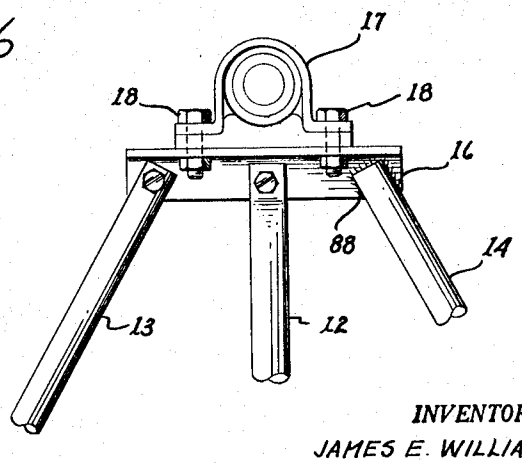


fig. 7

INVENTOR.
JAMES E. WILLIAMS
BY
ATTORNEY

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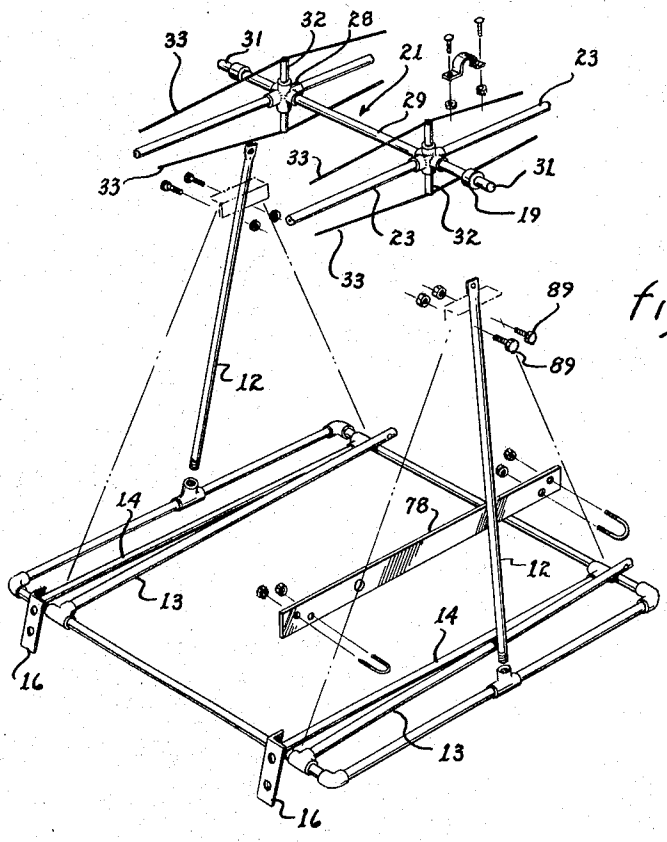


Fig. 8

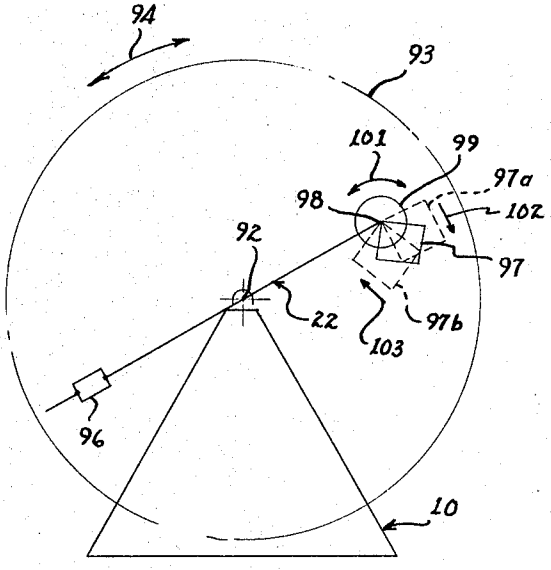


Fig. 9

INVENTOR.
JAMES E. WILLIAMS

BY
John J. McLaughlin

ATTORNEY

United States Patent Office 3,298,685 Patented Jan. 17, 1967

3,298,685

COMPLETE CIRCLE SWING

James E. Williams, 6043 S. 7th St., Phoenix, Ariz. 85040

Filed Jan. 16, 1963, Ser. No. 251,939
3 Claims. (Cl. 272—33)

My invention relates in general to an improved swing particularly adapted for play and amusement of children; and having as its significant characteristic the ability to rotate through a complete circle. The invention is characterised further by the fact that swing movement can be in either direction, and movement may be arrested by the swing occupant at any point in a circumference defined by the occupant's travel path.

Many types of swings are known, all having a swing member suspended from a pivot and adapted by forward and backward swinging movement about such pivot and normally below the same. Some such swings have permitted an unusually competent performer to develop sufficient momentum to move above the point of location of the pivot and at times even around the pivot. Amusement devices are known which are power-driven for rotation around a stationary or moving pivot, as may be seen at times in amusement parks. So far as I am aware, however, there has not been made available heretofore a swing designed to carry a child in a forward and reverse direction, after the common practice in conventional swings, to carry the child through a closed circular path in either direction, and permitting the child to arrest its progress at any desired location along the circular path defined by the movement of his body.

The principal object of my invention is the provision of a novel swing of the type identified.

Another object is the provision of a swing of the type identified in which all movement is entirely and at all times completely under the manual control of the child without utilization of power means of any kind.

A further object is the provision of a swing of the type described incorporating safety features limiting the possbility of the child's injuring himself while using the swing.

Other specific objects and features of the invention will be apparent from the following detailed description taken with the accompanying drawings wherein:

FIG. 1 is a perspective view showing a simple embodiment of the complete circle swing of my present invention;

FIG. 2 is a sectional view taken on the line 2—2 of FIG. 1 looking in the direction of the arrows;

FIG. 3 is a fragmentary side elevational view looking along the line 3—3 of FIG. 2;

FIG. 4 is a fragmentary side elevational view showing one of the swing supporting frames and showing the position of the swing seat at the time the child enters it;

FIG. 5 is an enlarged fragmentary sectional view partly in elevation taken along the line 5—5 of FIG. 1 and showing the manner in which the counter-balancing weight is adjusted;

FIG. 6 is a fragmentary sectional view partly in elevation taken along the line 6—6 of FIG. 4;

FIG. 7 is an enlarged fragmentary side elevational view showing a detail of the supporting frame structure;

FIG. 8 is a fragmentary perspective view with the parts in exploded relation to facilitate showing of details; and

FIG. 9 is a schematic view indicating the manner in which the swing operates.

In accomplishing the objects of the invention, I provide a suitable frame supporting a pivot bar on which a swing frame is rotatably supported. The swing frame comprises a pair of swing bars pivoted to the pivot bar intermediate their ends, with a swinging seat pivotably supported between the swing bars at one end and adjustable counter-weight between the swing bars at the opposite end. Reinforcing means in the form of truss rods or the like form a strong, light-weight cantilever-like swing frame construction. With a child occupying the pivoted swing seat, and the counter-weight suitably adjusted, the entire swing may be caused to rotate in either direction by the application of a relatively small amount of force to the swing frame by the child as will be explained. By adjusting the force, the child may swing in either direction continuously at a controlled rate of speed, or he may adjust the force at any point in his movement to hold himself in a stationary position. Those skilled in the art will understand that reference to a child is descriptive and has no limiting significance of any kind.

The supporting frame indicated generally by the reference character **10** includes a generally rectangular base portion **11** and a pair of substantially identical A-frames, each comprising a vertical upright **12** and a pair of diagonal uprights **13** and **14**. A bracket **16** shown as comprising a sectional angle iron has the three upright members **12**, **13** and **14** secured to the vertical portion of the bracket (FIGS. 3 and 7.) A pillow block **17** is secured to the horizontal portion of the bracket **16** by bolts **18**, and the pillow block engages around an enlarged bearing portion **19** (FIG. 8) on a horizontal pivot bar **21**.

Looking further at the supporting frame **10**, it will be noted that it is formed of pipe and pipe fittings except for the bracket **16**, and the latter is formed of a standard piece of angle iron purchasable on the open market. It was in this form that the invention was reduced to practice successfully, but those skilled in the art will understand that commercial construction would normally employ specially fabricated members for the purpose with some advantage in both strength and cost. It is for this reason that I have not described the various pipe fittings in detail, and also for the reason that the various T's and elbows employed are well-known and can be identified on sight by those skilled in the art.

The swing frame indicated generally by the reference character **22** includes swing bars **23** and a plurality of spacing cross members, each of which will be separately described in connection with its particular function. A swing seat indicated generally by the reference character **24** is supported at one end of the pivot bars and a counterbalance **26** adjustably supported on a threaded shaft **27** is at the opposite end of the swing frame **22**.

While various construction may be employed to provide a pivot bar on which the swing frame is rotatably mounted. I show a specific construction which has been satisfactory in actual use. This construction includes a pair of brackets **28** connected together by the first bar **29** which extends through them and to which the brackets **28** are welded. The pivot bar **21** is then divided with a center portion **29** and projecting ends **31** carrying the bearings **19**. The swing bars **23** may be separated at their centers and connected to the brackets **28** as shown particularly in FIGS. 1 and 8. Finally, side projections **32**, two for each bracket **28**, support truss rods **33** and hold them in spaced relation at the center of the swing frame. It is obvious that with this construction, the pivot bar may be considered as forming a part of the swing frame, although it performs the function of positioning and in part supporting top ends of the A-frames in the same manner as if it was part of the A-frames.

Looking now to the counter-weight end of the swing frame, as shown particularly in FIGS. 1 and 5, the ends of the contiguous swing bars **23** are butt-welded or otherwise secured to brackets **34** secured to a cross frame **36** in the form of an angle iron. The brackets **34** are, themselves, angle irons secured as by welding to the cross frame **36**. The truss rods **33** extend through holes in the bracket **34** and are tightened by means of nuts **37**.

A counter-weight bar **38** is secured to the cross frame **36** by bolts **39**.

At the center of the cross frame **36**, a plate **41** is attached as by welding, and a U-bolt **42** extending through the plate **41** anchors one end of the threaded shaft **27** by means of nuts **43**. At the opposite end of the threaded shaft **27**, it is similarly supported by a U-shaped bolt **44** secured to a cross frame **46** which is, in turn, secured to the swing bars **23** by means of U-shaped bolts **47**.

At the seat end of the swing frame **22**, a pair of brackets **51** and **52** are provided, the contiguous ends of the swing bars **23** being welded to a center portion of such brackets as shown particularly in FIG. 2. In each instance also, the truss rods **33** extend through the brackets **51** and **52** respectively and are tightened by nuts as indicated in FIG. 4 in the same manner as at the counter-weight end of the swing frame.

A bracket **53** secured to the bracket **51** forms a rotatable support for a swing supporting pivot **54**, and a similar bracket **56** secured to the bracket **52** forms a pivotal support for a second swing supporting pivot **57**. The swing itself comprises a frame defined by a pair of generally vertical pipes **58** and **59**, a pair of generally horizontal pipes **61** and **62**, a pair of transverse pipes **63** and **64**, and a plurality of articulated plate sections **66**, **67**, **68** and **69**, to which cushions or the like may be secured. The pipes **58** and **59** and **61** and **62** are secured to a pair of specially designed pipe connections **71** and **72** (see FIG. 2) secured to the swing supporting pivots **54** and **57** respectively. Suitable bracing members **73** may be employed where needed. Thus, with this construction, the swing seat will always remain in an upright position as shown in FIGS. 1, 2, 5 and 6, regardless of the position of the swing frame.

A transverse safety retainer bar **74** extends through the pivot **57** and has an enlarged threaded end **76** which is engaged in the internally threaded special coupling **71** as shown in FIG. 2 so that when the child is in swing position, it may grasp this safety bar and be prevented from falling out of the chair. For the child to get out of the chair, it is necessary that this retainer bar **74** be retracted. An anchoring bar **78** is secured to the near A-frame as shown in FIGS. 1 and 8, and it has a hole **79** into which the end of the retainer bar **74** may be projected as shown in FIG. 6. This arrangement has the effect of anchoring the swing frame against movement at the place where the child enters, removing the retaining bar **74** only at this position, and providing for locking the swing frame against movement when the swing is unattended, such as by means of a padlock **81** as shown in FIG. 6.

Another safety feature associated with the starting position is the use of an anchoring chain **82** which is secured to the bar **78** and is adapted for attachment to the swing frame when the seat is at its lowermost position as illustrated in FIG. 4.

Still another safety feature is the use of an actuating and safety disc **84** apertured at its center to pass the swing supporting pivot **54** and secured in position by a pair of U-bolts **86** extending around the contiguous swing bar **23** and tightened in position by means of nuts **87**. This disc prevents the possibility of the child getting his hand or arm caught between any of the relatively moving parts, and it also prevents a readily-engageable actuating member as will be explained. The disc **83** may also be employed on the right, but it is not shown to simplify the illustration.

One of the advantages of the specific instructions shown in the drawings is the ability to dismantle the entire assembly for shipping in the general manner indicated in FIG. 8. It will be noted that the bracket **16** is integral with the upright **14** of the A-frame and this is accomplished suitably such as by welding as indicated at **88** in FIGS. 4 and 7. Each of the uprights, of course, is also secured to the rectangular bottom frame **11** by threaded attachement to a T, and at the top for a flattened apertured area for attachment to the bracket **16** by means of bolts **89**.

The position of the adjustable counter-weight **26** may be adjusted to the weight of the swing occupant by a person in attendance, in which case the swing frame may be in any convenient position to permit the attendant to turn the counterweight for longitudinal movement such, for example, as the general position as indicated in FIG. 1. Normally, at least a preliminary adjustment will be made before the swing frame is released and while the parts are in the position shown in FIG. 4. A plurality of steps **91** may be provided on either or both A-frames, preferably on at least the A-frame carrying the bar **78**. Once a person's relative weight has been established by trial and error, the counter-weight may be set to exact position before starting to swing. Even a relatively young child, say, seven or eight years old, can frequently adjust the counter-weight himself to a mark suitably placed on the threaded shaft **27**, and to do this, he will use the steps **91** while the swing frame is locked in position by means of the locking bar **78**.

When the swing frame has been stabilized to provide equal weight at opposite sides of the horizontal pivot bar, the child may propel himself forwardly or backwardly by either a pushing movement or pulling movement, as the case may be, against the swing frame. When the safety and actuating disc **84** is employed, he may propel himself by a pushing or pulling movement on the disc itself. It should be borne in mind that the child's position relative to the swing frame will change as the swing frame rotates, because the swing itself, being suspended on a pivot, causes the child to retain an upright position, as shown in FIG. 1, at all times.

FIG. 9 is a schematic view which may be consulted in connection with the following explanation of the manner in which movement occurs and the manner of controlling such movement. In this view, the supporting from is indicated schematically by the reference character **10**, and the swing frame by the straight line **22**. A virtual pivot point is indicated at **92** and the swing frame is subject to movement through a complete circle **93** in either direction as indicated by the double arrow **94**. A fixed weight **96** is indicated near one end of the swing frame **22** and, at the opposite end, there is an equalizing weight **97** suspended from a pivot point **98**. The suspended weight **97** is adapted also to move through a circle **99** in either direction as indicated by the double arrow **101**. The suspended weight **97** in actual practice comprises the pivot swing with the child in it, and the fixed weight **96** comprises the counter-weights **26** and **38**, it being kept in mind that once the counter-weight has been adjusted, it remains immovable during the actual operation of the device.

With the arrangement of parts shown, it is obvious that any relative movement causing the suspended weight **97** to be partially distributed at an extended distance from the pivot **92** will cause the end of the swing frame carrying the suspended weight to move downwardly. This is due to the fact that when the weight is shifted away from the pivot **92**, it becomes relatively heavier in exactly the same way that a weight moved along a beam on a balance will reflect increased or decreased poundage and balance off increased or decreased poundage on the scale platform. In a similar manner, if the suspended weight is moved closer to the pivot, then an opposite movement of the swing frame will occur. More specifically, as shown in FIG. 9, the dotted line position **97***a* shows in an exaggerated fashion an unbalancing of the weight causing the swing frame to rotate in the direction indicated by the arrow **102**. On the other hand, if the weight **97** is forced to the position shown in **97***b* in broken lines, the movement of the swing frame will be in the direction indicated by the arrow **103**. It should be remembered also that when the swing frame moves past a dead center vertical position, with the suspended weight

97 at either the top or bottom, the forces involved are reversed; and if continued movement is desired, it is necessary that a pulling action be changed to a pushing action and vice versa. The movement is very simple and requires relatively very little strength, it being kept in mind that the extreme broken line positions 97*a* and 97*b* will seldom, if ever, be reached in actual practice.

The above explanation appears to explain the fact of movement by the child pressing against the swing frame; and while I believe such explanation to be correct in all respects, the invention is not in any way limited by such explanation.

I have found that children quickly master the technique of controlling the swing of the present invention to cause it to perform in its intended manner.

I do not wish to be limited to the exact structure shown and described, the scope of the invention being pointed out in the claims.

I claim:

1. A swing of the character described comprising:
(a) a supporting frame,
(b) a swing frame,
(c) means for pivoting the swing frame intermediate its ends for 360° rotation in a vertical plane,
(d) a swing seat,
(e) a pivot suspending said swing seat from said swing frame near one end of said frame for 360° rotation with respect thereto, said swing seat being dimensioned to place the body of the child in a sitting position partly above and partly below said pivot, said seat including a slidable retaining bar aligned with the seat pivot and adapted to engage the support frame when moved longitudinally to release the child from the seat, whereby to lock the swing frame against rotation, and
(f) a counter-balancing weight at the opposite end of said swing frame adapted to substantially exactly balance opposite ends of the swing frame, whereby pushing movement by the child against the swing frame will cause rotation thereof in one direction and pulling movement of the child against the swing frame will cause rotation in an opposite direction.

2. A swing of the character described comprising:
(a) a supporting frame,
(b) a swing frame,
(c) means for pivoting the swing frame intermediate its ends for 360° rotation in a vertical plane,
(d) a swing seat,
(e) a pivot suspending said swing seat from said swing frame near one end of said frame for 360° rotation with respect thereto, said swing seat being dimensioned to place the body of the child in a sitting position partly above and partly below said pivot,
(f) at least one actuating and safety disc secured to the swing frame in alignment with the swing seat pivot, and
(g) a counter-balancing weight at the opposite end of said swing frame adapted to substantially exactly balance opposite ends of the swing frame, whereby pushing movement by the child against the swing frame will cause rotation thereof in one direction and pulling movement of the child against the swing frame will cause rotation in an opposite direction.

3. A swing of the character described comprising:
(a) a supporting frame,
(b) a swing frame,
(c) means for pivoting the swing frame intermediate its ends for 360° rotation in a vertical plane,
(d) a swing seat,
(e) a pivot suspending said swing seat from said swing frame near one end of said frame for 360° rotation with respect thereto, said swing seat being dimensioned to place the body of the child in a sitting position partly above and partly below said pivot,
(f) a counter-balancing weight at the opposite end of said swing frame adapted to substantially exactly balance opposite ends of the swing frame, said counter-balancing weight including a weight fixed on the swing frame, a threaded shaft running longitudinally of the swing frame, and an adjustable counter-weight threaded on said shaft, to provide longitudinal adjustable movement of said counter-weight to balance the counter-weight to the weight of a child, whereby pushing movement by the child against the swing frame will cause rotation thereof in one direction and pulling movement of the child against the swing frame will cause rotation in an opposite direction.

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RICHARD C. PINKHAM, *Primary Examiner.*

F. B. LEONARD, A. W. KRAMER, *Assistant Examiners.*