Sept. 25, 1934. C. DAHL 1,974,531

AMUSEMENT AND EXERCISING DEVICE

Filed Dec. 26, 1929 2 Sheets-Sheet 1

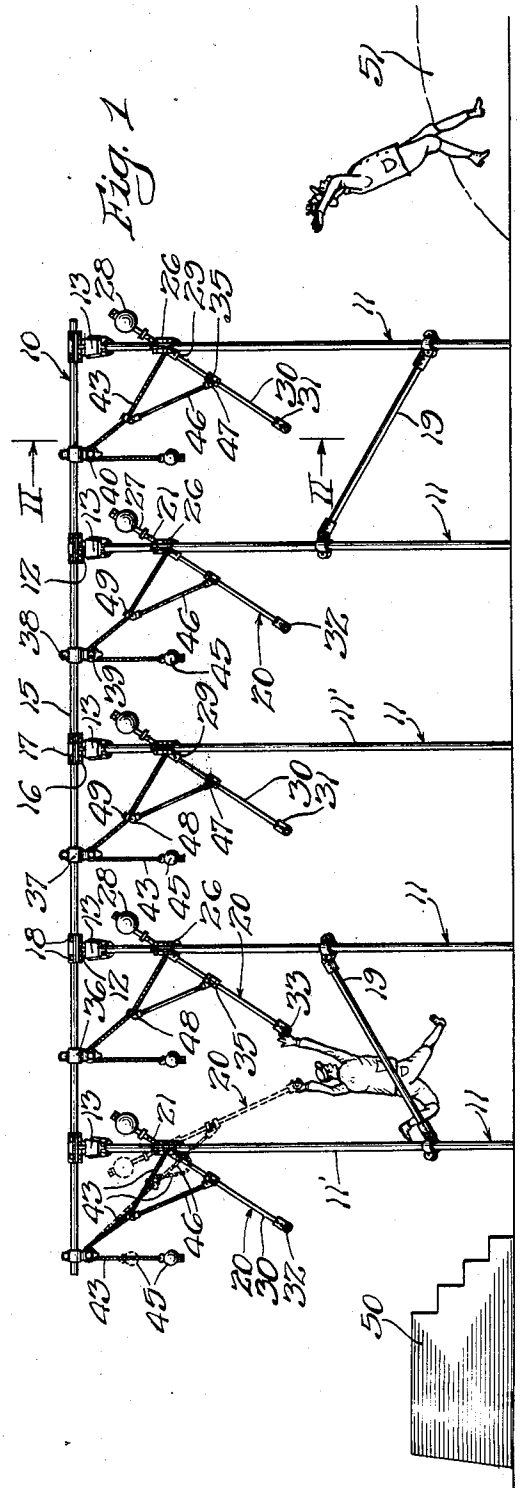


Fig. 1

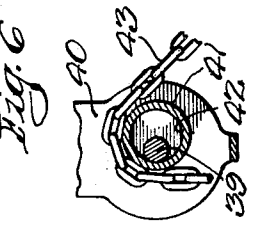


Fig. 6

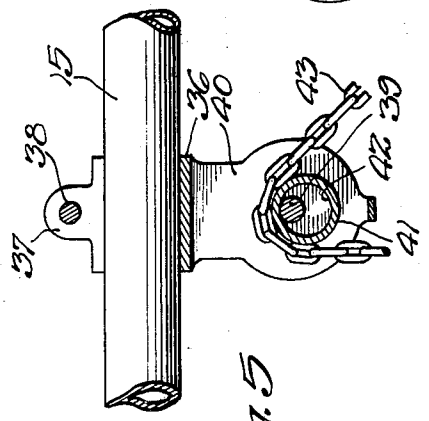


Fig. 5

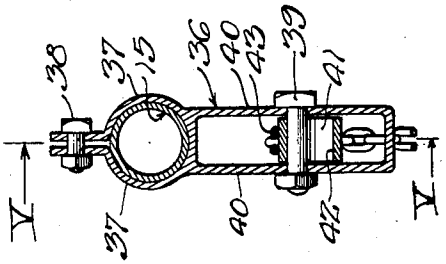


Fig. 4

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AMUSEMENT AND EXERCISING DEVICE

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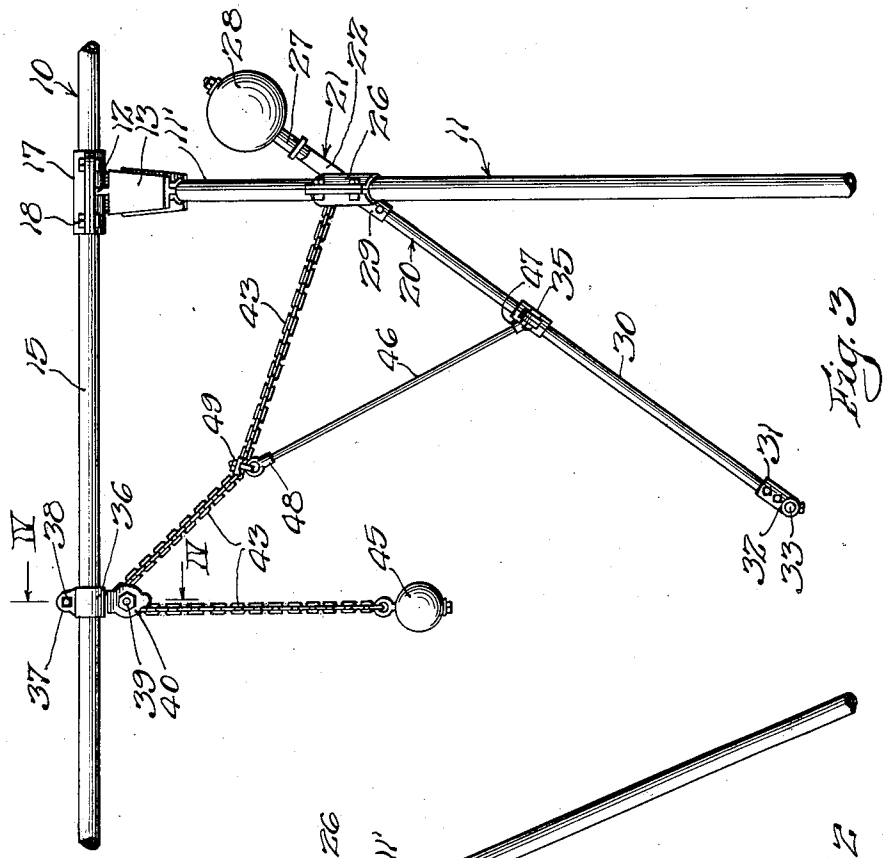


Fig. 3

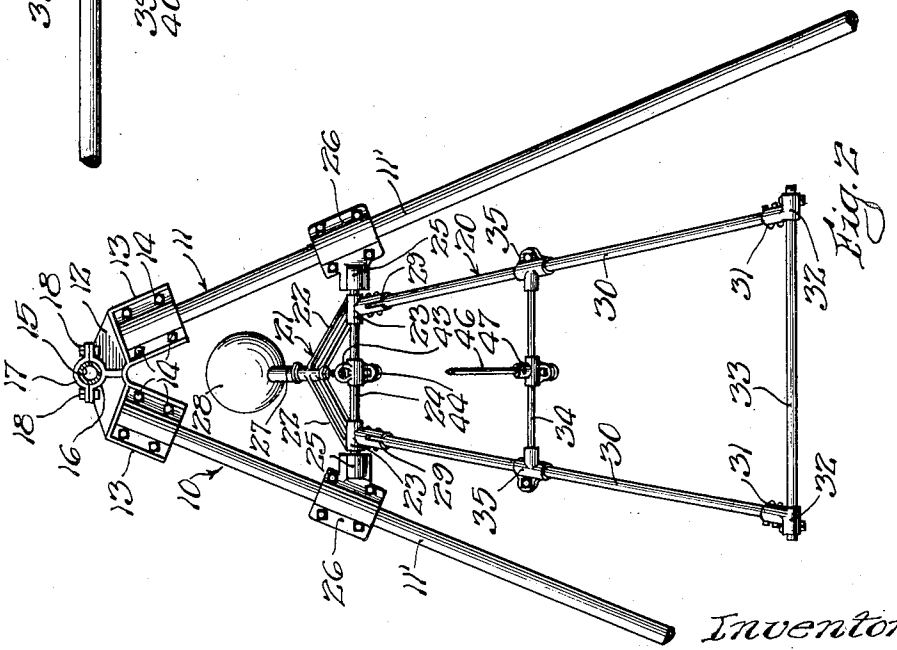


Fig. 2

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UNITED STATES PATENT OFFICE

1,974,531

AMUSEMENT AND EXERCISING DEVICE

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Application December 26, 1929, Serial No. 416,693

21 Claims. (Cl. 272—61)

This invention relates to amusement devices and more particularly to gymnastic or exercising apparatus, although certain features thereof may be employed with equal advantage for other purposes.

It contemplates more especially a series of swing members arranged in spaced relation in a manner to permit the rider to shift from one swing to the next to traverse space without resort to the ordinary means of locomotion. This application is a continuation-in-part of my applications serially numbered 301,771 and 371,345 filed on August 24, 1928, and June 17, 1929, respectively.

One object of the present invention is to provide novel improvements in the mechanism for controlling the action of oscillatable swing members.

Another object is to simplify the construction and improve the operation of devices of the character mentioned.

Still another object is to provide stabilizing means for effectively controlling the inertia effect having detrimental swing influences upon oscillatable members.

A further object is to provide means for effectively retarding the oscillation of swing members beyond predetermined limits of movement.

A still further object is the provision of a counterweight for retarding the movement of swing members in opposite directions to normally effect the return thereof to an initial position.

Still a further object is the provision of new and improved means for guiding the sliding movement of a flexible tension transmitting medium over a support or fulcrum.

Other objects and advantages will appear from the following description of a preferred embodiment of the present invention.

In the drawings:

Figure 1 is a side elevation of the apparatus embodying features of the present invention.

Figure 2 is a fragmentary transverse sectional view taken substantially along line II—II of Figure 1 with certain parts thereof omitted to clarify the showing.

Figure 3 is a fragmentary side view of a single swing unit constituting one of the series shown in Figure 1.

Figure 4 is a sectional view taken substantially along line IV—IV of Figure 3.

Figure 5 is a sectional view taken substantially along line V—V of Figure 4.

Figure 6 is a sectional detail view similar to Figure 5 with the eccentric bushing shown in another position.

The structure selected for illustration comprises a frame 10 which is composed of a series of spaced vertically erect triangular standards 11. The standards 11, in this instance five, preferably consist of a pair of upwardly converging struts or pipes 11', having supporting base flanges at their lower ends grouted or otherwise embedded in concrete within the ground or other suitable foundation to serve as a rigid support for instrumentalities to be hereinafter described. The upper ends of converging pipes 11' are rigidly secured together by a header having downwardly diverging arms, cast or otherwise shaped, to define split bearings 13 having complemental plates for receiving the pipe ends 11' therein, there being bolts 14 extending therethrough to establish a joinder therebetween.

The triangular standards 11 are maintained in fixed spaced relation by virtue of a longitudinally extending tie member 15 which serves to reinforce and brace the entire series of triangular supports. To this end, the headers 12 terminate in a flanged half-bushing 16 which conforms in contour to the tie member 15 retained in position by a split clamp 17 in confronting relation therewith for secural thereto by carriage bolts 18. These triangular supports or standards 11 may be additionally braced by diagonal struts 19 detachably associated therewith in any suitable manner, it being preferable that the standards 11, tie members 15 and struts 19 be in the form of hollow piping to afford maximum strength at minimum weight. It is to be noted that the spacing of the triangular standards 11 is determined by the oscillatable throw of the swings and the possible displacement of the rider from one to another; however, the frame 10 composed essentially of the supporting standards 12 may be varied in form and arrangement for any particular installation as commercial practice may dictate.

In the present embodiment, the triangular standards 12 correspond in number to the swings employed in series or as a unit to enable the transfer of the rider from one to another over an extended distance. In consequence thereof, the swing members 20 are oscillatably mounted for support from each triangular standard 12 in trapeze formation for pendulum movement. Each of the swings 20 comprises a yoke 21 defined by diverging arms 22 in integral association for termination in transversely spaced bosses or bearings 23 in horizontal alignment. The yoke bear-

ings 23 receive axles or pivot rods 24 having their extremities extending therebeyond for support in end bearings 25 which are firmly bolted or otherwise secured to the converging pipes 11' of the standards 11 by means of split clamps 26 having one element thereof in integral association with the bearings 25 thereof.

The yoke bearings 23 may be provided with rollers or roller bearings of standard or any approved construction so that the yoke portion 22 of the swing member 20 is free to oscillate with minimum frictional resistance relative to the pivot shaft 24. The converging arms 22 of the yoke 21 merge in a central boss 27 which serves as a support for a counter-weight 28 positioned substantially central of the swing member 20. The bearings 23 are formed with depending sockets 29 which are integrally or otherwise associated therewith to diverge outwardly at their lower ends. Elongated members, in this instance rods 30, telescopically engage the sockets 29 for termination in brackets 31 having laterally extending sockets 29 for termination in brackets 31 having laterally extending sockets 32 to firmly support a horizontal gripping bar or rod 33. The rod 33 is preferably of wood such as hickory so as to afford a relatively convenient and yielding grip for the rider who is suspended therefrom. As shown, the side bars 30 are connected or bridged by a cross bar or tie member 34 which is anchored in suitable bosses 35 clamped thereto for bracing and reinforcing the swing structure as well as to provide a convenient connection for mechanism designed to maintain the swing member 20 in an initial inclined position corresponding substantially to one limit of movement.

It is to be noted that the counterweight 28 and the yoke support 21 therefor which is pivotally carried above the fulcrum shaft 24 in substantially the same plane with the swing member 20, constitutes a mass which imparts a gravity urge thereto for rest in a vertical position central of the limits of swinging movement. However, to normally balance the swing member 20 in an inclined position accessible for grasp by the rider who is thus enabled to conveniently traverse the entire series thereof by manual successive body transfer, counter-balancing means are provided. By so doing, the swing member 20 is in effect a compound pendulum having an oscillatory movement which is considerably damped and reduced owing to the weighted control thereof.

A bracket 36 is, therefore, secured to the longitudinal tie member 15 in advance of each swing member 20, there being clamps 37 extending therefrom to envelop the pipe or tie member 15 for fixed association by means of a fastener 38. A carriage bolt 39 is secured for extension between the confronting bracket walls 40 to sustain a cylindrical bushing 41 which serves as a sheave having a bore 42 very much larger than the diameter of the bolt 39. As a result, a flexible chain 43 having one end thereof anchored to a lug 44 fixed to the center of the pivot shaft 24, extends over the sheave 41 with a weight 45 secured to the other end thereof.

Oscillation of the swing members 20 transfers a rectilinear ascent and descent of the weight 45 causing eccentric rolling of the sheave 41 over the pin 39, thereby arresting swing movement to the extent of precluding the wild oscillation thereof. So that the weight 45 will influence the oscillation of the swing member 20 in either direction from its normal inclined position, a control rod 46 is mounted in a lug bracket 47 clamped intermediate the extremities of the cross bar 34 for angular extension with respect to the plane of the swing member 20. An eyelet or loop 48 is fixed to the other extremity of the control rod 46 to enable secural to the chain 43 owing to a clamp 49 establishing connection intermediate the swing member 20 and bracket 36, thereby suspending the swing member in a forwardly inclined position for grasp by the rider.

It is advantageous, therefore, to dispose the inactive swing members 20 at a suitable inclination so that the rider may create sufficient impetus without the expenditure of excessive energy to carry his body a substantial distance beyond the center of swing oscillation to a position affording convenient grasp of the handle bar 33 of the next adjacent or successive swing member 20. This necessitates the maintenance of the swing members 20 in an inclined position without impeding on one hand, the required oscillation thereof and, on the other hand, precluding wild movement which endangers succeeding riders. Further, unharnessed movement does not serve to control the position of the swing member 20, thereby rendering it extremely difficult for the riders to properly gauge their traverse on known devices of the character mentioned.

It will be obvious that as the rider moves in a forward direction on the swing member 20, the counter-weight 45 is raised in vertical alignment with the bracket 36 while the counter-weight 28 on the swing proper oscillates through an arc from one side of the fulcrum 24 to the other. With the movement of the swing member 20 beyond central position, the effect of the counter-weight 45 is gradually diminished in that the lever arm, which is the distance between the tie bar 15 and the swing fulcrum 24 becomes more nearly parallel to the chain 43 as the swing member 20 approaches the opposite or extreme position of movement. With such a counter-weight arrangement, very little resistance is offered to the free pendulous action of the swing member 20, it being apparent that after the rider releases his grasp at the extreme position of movement, swing member 20 tends to return to a normal central position. Due to the force or pull exerted by the counter-weight mechanism, through the chain 43, however, the swing member 20 is returned to its original or initial inclined position. Return movement beyond the initial inclined position is retarded in that the control rod 46 will extend beyond the line of chain pull to elevate the weight 45, thereby precluding wild or uncontrolled oscillation in both directions. Due to the fact that the counter-weight 28 with the yoke 21 substantially offsets in weight the counterbalancing instrumentalities, it is obvious that very little force, in fact, just slightly more than the difference in the masses on the opposite sides of the swing fulcrum 24, will be necessary to move and maintain the swing member 20 in its desired positions influenced and controlled by the urge of gravity. Hence, the counter-weight 45 may be relatively light.

In order that the rider, especially in the case of children, can grasp the first swing member 20 of the series in a manner to create sufficient impetus to carry him over to the next adjacent swing member 20, it is preferable to provide a starting platform 50 so that the rider may firmly grasp the bar 33 of the adjacent swing member 20 while standing thereon. It may also be

desirable to provide a pile of sand or straw 51 at the opposite end of the apparatus to interrupt the impact owing to the yielding character thereof, thereby avoiding possible injury.

Various changes may be made in the embodiment of the invention herein specifically described without departing from or sacrificing any advantages thereof as defined in the appended claims.

I claim:

1. The combination with a frame, of a swing member fulcrumed adjacent its upper end for support by said frame to normally assume a vertical position, means carried by said frame for connection to said swing member for yieldingly maintaining it at an inclined position from its vertical position after imparted movement thereto has ceased.

2. The combination with a frame of a swing member fulcrumed adjacent its upper end for support by said frame to normally assume a vertical position, and means carried by said frame for connection to said swing member for yieldingly maintaining it at an initial inclined position, and means mounted for eccentric rolling movement responsive to the oscillation of the swing member to normally damp the pendulous action thereof.

3. The combination with a frame of a swing member fulcrumed adjacent its upper end on said frame to normally assume a vertical position, and counter-weight mechanism carried by said frame for connection to said swing member to yieldingly control its limits of swinging movement, said counter-weight mechanism including a bracket, a weight guided for ascent and descent relative to said bracket, a flexible member connecting said weight to said swing member, and a loosely journalled sheave to sustain said flexible member for damping the pendulous action of said swing member.

4. The combination with a supporting frame of a plurality of swing members fulcrumed for spaced support on said frame in the direction of swinging movement, each of said swing members including a rigid arm pivoted adjacent its upper end, and counter-balancing means operatively connected to said swing members for damping the pendulous action thereof in all directions of movement, said swing members having an upward extension beyond said fulcrum support, said counter-balancing means including a weight mounted on said extension in alignment with said swing member, a counter-weight operatively connected to said frame, and rigid means extending from said swing member for connection to said counter-weight to control the movement of said swing member in opposed directions.

5. The combination with a supporting frame of a plurality of independently operable swing members spaced for pivotal support on said frame, each of said swing members including a rigid depending arm fulcrumed adjacent its upper end, a weight carried by said arm above the fulcrum thereof to reduce the normal period of oscillation, separate counter-balancing mechanism suspended from said frame for connection to said arm, and means interposed between said counter-balancing mechanism and said arm below the fulcrum thereof to limit the oscillatory movement of said swing members.

6. The combination with a supporting frame, of a plurality of independently operable swing members spaced for pivotal support on said frame, each of said swing members including a rigid depending arm fulcrumed adjacent its upper end, a weight carried by said arm above the fulcrum thereof to reduce the normal period of oscillation, separate counter-balancing mechanism, a flexible chain for suspending said counter-balancing mechanism from said frame for connection to said arm, and means interposed between said counter-balancing mechanism and said arm below the fulcrum thereof to limit the oscillatory movement of said swing members, and a loosely journalled sheave for guiding said chain to retard the movement of said swing members.

7. The combination with a supporting frame, of a plurality of swings supported by said frame in spaced apart relation for swinging movement toward and from each other, and means for normally holding each swing at one limit of its own swinging movement to enable the approach thereof to an adjacent swing during the swinging movement of the former swing.

8. The combination with a supporting frame, of a plurality of swings spaced thereon in substantially their direction of swinging movement, each of said swings including a rigid depending arm and a counter weight operatively connected thereto for normally maintaining said arm inclined at substantially one limit of its swinging movement.

9. The combination with a supporting frame, of a plurality of swings spaced thereon in substantially their direction of swinging movement, each of said swings including a rigid depending arm and a counter weight operatively connected thereto for normally maintaining said arm inclined at substantially one limit of its swinging movement, said counter weight being adjustable for varying the position of balance which determines one limit of swinging movement of said arm.

10. A plurality of swings spaced apart in substantially the direction of their swinging movement, and counterbalancing means operatively connected to said swings for holding said swings at a predetermined initial position, said counterbalancing means being effective to diminish the counterbalancing influence as the swing approaches its other limit.

11. In combination with a supporting frame composed of a plurality of spaced struts, each strut including a pair of upwardly converging members, a header casting for rigidly securing the upper ends of said members together, said header being formed with a pair of depending and outwardly diverging arms at an angle corresponding to said strut members, said arms being split to provide clasping bearings for said members, and a pair of complemental plates adapted to be secured to said diverging arms to form clamping sockets for said strut members.

12. In combination with a supporting frame composed of a plurality of spaced struts, each strut including a pair of upwardly converging members, a header casting for rigidly securing the upper ends of said members together, said header being formed with a pair of depending and outwardly diverging arms at an angle corresponding to said strut members, said arms being split to provide clasping bearings for said members, and a pair of complemental plates adapted to be secured to said diverging arms to form clamping sockets for said strut members, the upper part of said header casting being formed with a socket extending transversely of said strut sockets, and

a tie member secured in place in said transverse socket for bracing said struts.

13. In a supporting frame for a swing, a pair of struts and a header casting having sockets for attachment of the upper ends of said struts from which the latter extend divergently downward, split clamps fixed to said struts below the head casting, horizontally extending bearings on said clamps, said end bearings comprising sockets in axial alignment on said struts for end reception of a supporting rod, a swing supporting rod disposed between said end bearings for journalled support therein, and the swing having a bearing support on said rod for oscillation between said struts.

14. In combination with a frame, of a swing fulcrumed adjacent its upper end for support by said frame and normally tending to assume a vertical position, and separate means carried by the frame and connected to the swing for yieldingly maintaining it at an initial inclined position.

15. In combination with a frame, of a swing fulcrumed adjacent its upper end for support by said frame and normally tending to assume a vertical position, separate means carried by the frame and connected to the swing for yieldingly maintaining it at an initial inclined position, and means directly associated with the swing and arranged to normally damp the pendulous action thereof.

16. In combination with a frame, of a swing fulcrumed adjacent its upper end on said frame and normally tending to assume a vertical position, and a counter weight mechanism carried by said frame and connected to said swing arranged to yieldingly maintain the latter at one limit of swinging movement.

17. In combination with a frame, of a swing fulcrumed adjacent its upper end for support by said frame and normally tending to assume a vertical position, positioning means carried by the frame and connected to the swing for yieldingly maintaining it at an initial inclined position, other means directly associated with the swing and arranged to normally damp the pendulous action thereof, said positioning means including a bracket, a weight guided for up and down movement by said bracket and a flexible member connecting said weight to said swing.

18. In combination with a frame, of a swing fulcrumed adjacent its upper end for support by said frame and normally tending to assume a vertical position, positioning means carried by the frame and connected to the swing for yieldingly maintaining it at an initial inclined position, other means directly associated with the swing and arranged to normally damp the pendulous action thereof, said positioning means including a bracket, a weight guided for up and down movement by said bracket and a flexible member connecting said weight to said swing, said rigid arm having an upward extension beyond the pivotal connection thereof, said other means being mounted on said extension in alignment with said swing.

19. In combination with a frame, of a swing fulcrumed adjacent its upper end for support by said frame and normally tending to assume a vertical position, positioning means carried by the frame and connected to the swing for yieldingly maintaining it at an initial inclined position, other means directly associated with the swing and arranged to normally damp the pendulous action thereof, said positioning means including a bracket, a weight guided for up and down movement by said bracket and a flexible member connecting said weight to said swing, said arm having an upward extension beyond the pivotal connection, said other means being mounted on said extension in alignment with said swing, and flexible means connected to said swings for normally tending to maintain each of them at an initial inclined position.

20. The combination with a supporting frame, of a plurality of independently operable swings carried by said frame and spaced apart in the direction of their swinging movement, each of said swings including a rigid depending arm pivoted adjacent its upper end, and a yielding mechanism carried on said frame for connection to said swing arms below said pivotal connection for maintaining said swing at an initial position corresponding to substantially one limit of its movement, the effectiveness of said mechanism being gradually diminished as the swing approaches its other limit of movement.

21. The combination with a supporting frame, of a plurality of independently operable swing devices carried on said frame and spaced apart in the direction of their swinging movement, each of said swings including a rigid depending arm fulcrumed adjacent its upper end, the portion of said arm above the fulcrum being weighted so as to reduce the normal period of oscillation of said swing arm, and separate counterbalancing mechanism carried on the frame connected to the arm below the fulcrum and arranged to yieldingly maintain said swing at an initial inclined position.

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