

M. ROBINSON & J. DALE.

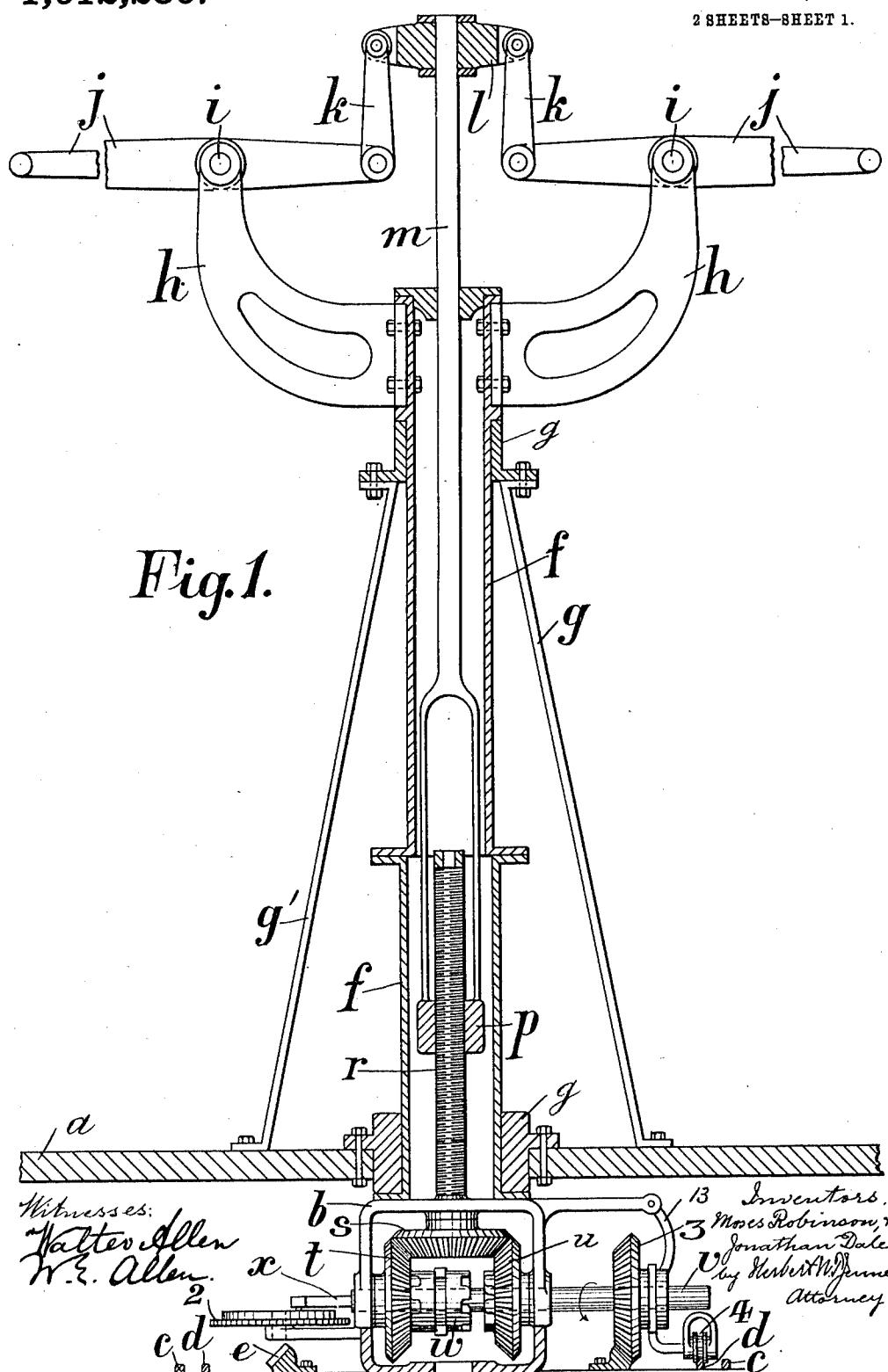
ROUNABOUT.

APPLICATION FILED MAY 27, 1910.

1,012,280.

Patented Dec. 19, 1911.

2 SHEETS—SHEET 1.



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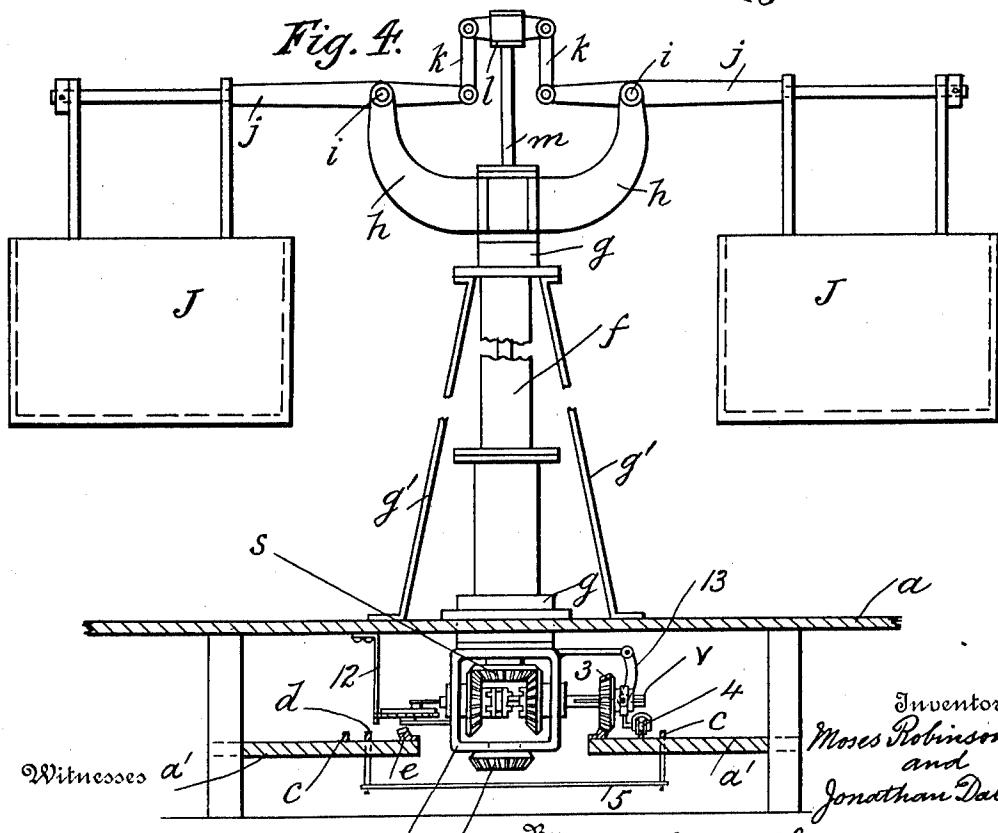
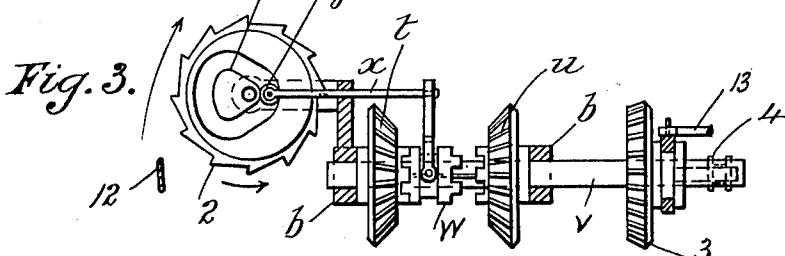
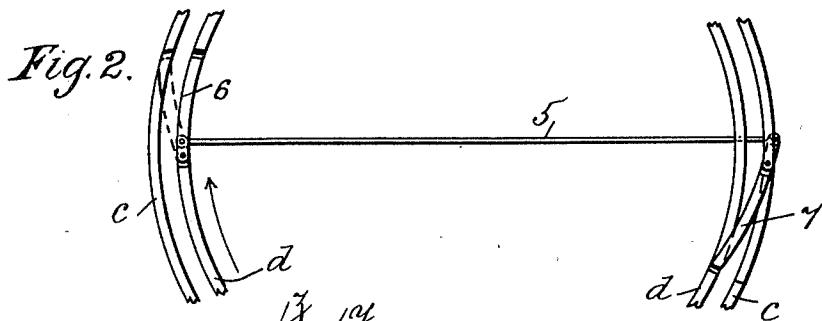
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2 SHEETS-SHEET 2.



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ROUNDABOUT.

1,012,280.

Specification of Letters Patent. Patented Dec. 19, 1911.

Application filed May 27, 1910. Serial No. 563,778.

To all whom it may concern:

Be it known that we, MOSES ROBINSON and JONATHAN DALE, residing at Huddersfield and Burnley, respectively, both in England, have invented certain new and useful Improvements in Roundabouts; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates primarily to roundabouts and the like apparatus for purposes of amusement, of the type comprising a number of cars, which may be constructed in the form of airships or aeroplanes, suspended on arms rotatable around a central shaft, and which cars are raised into the air when the apparatus is set in motion.

20 The said invention is also applicable to toy models imitating such apparatus.

According to this invention, we provide means for automatically raising and lowering the arms on which the cars are suspended, with means for rendering the rising and falling movements intermittent, so that the cars can be allowed to continue revolving at any desired height within the capacity of the apparatus, for any desired 30 period of time, before being lowered.

In the accompanying drawings we have illustrated an exemplification of the application of our improvements.

Figure 1 is a sectional elevation of the apparatus. Fig. 2 is a partial plan view of the two circular rails and their switches. Fig. 3 is a plan view of the clutch mechanism and the tappet mechanism, showing the gear-box in section. Fig. 4 is a side view 40 of the apparatus, partly in section, and drawn to a smaller scale.

Letter *a* indicates the passenger platform, under which is a gear box *b* adapted to be rotated by an engine (not shown) or other 45 prime mover connected to a beveled toothed wheel 10 secured to the bottom of the gear-box. On a lower platform *a'* are two circular rails *c d*, concentric with a circular rack or crown wheel *e* which wheel is provided with bevel teeth. Secured to the top 50 of the gear box *b* is a hollow shaft or pillar *f* working in bushes *g* supported from the platform *a*. The stays *g'* shown in the drawing may be taken to represent a tapered 55 lattice-work tower of square or other cross section inclosing the lower part of the shaft

f. At the upper part of the said shaft *f* are six or other number of brackets *h*, to each of which is pivoted at *i* one of the arms *j* to the outer ends of which the vehicles or cars *J* are suspended. The inner ends of these arms *j* are connected by links *k* to a spider head-piece *l*, secured to a central shaft or pillar *m*. The lower end of the pillar *m* is forked and is provided with a nut *p* engaging a screw *r* adapted to be rotated by the upper bevel pinion *s* in the gear box *b*. The other pinions *t u* in the gear box run loose on the shaft *v*, a sliding clutch *w* being adapted to place one or other of such pinions *t* or *u*, in operative connection with the shaft *v* when required. The clutch *w* is linked by a rod *x* to a bowl *y* working in a cam groove *z* on the face of a ratchet wheel 2 (shown in plan in Fig. 3) which ratchet 75 wheel is rotated by any convenient means, as, for example, a fixed tappet 12 secured to the upper platform *a* and adapted to engage the wheel 2 once in each revolution of the gear box *b*. A bevel pinion 3, having a 80 long key or spline, slides on the shaft *v*; the boss of the bevel wheel 3 being connected, by any suitable pivoted lever mechanism 13, to a tread wheel 4 adapted to run on either of the rails *c d*. When the wheel 4 runs on 85 the inner rail *d*, the bevel 3 is in mesh with the rack *e*. A rod 5 (see plan, Fig. 2) is connected to the switches 6, 7, by means of which the said wheel 4 can be guided on to the outer rail *c*, and the bevel 3 thereby 90 taken out of engagement with the rack *e*.

The wheel 4 being on the rail *d*, and the bowl *y* in the position shown in Fig. 3, so that the clutch *w* engages the bevel *t*, the engine is started, and rotates the gear box *b* 95 to the right, that is, clockwise. The shaft *v* drags the bevel 3 over the teeth of the rack *e*, and thereby acquires rotation, which it transmits through the clutch *w* and bevels *t* and *s* to the screw *r*, which draws down the nut *p*, shaft *m*, and links *k*, and thus raises the outer ends of the arms *j*, until the bowl *y* has receded far enough from the center of the wheel 2 to cause the clutch *w* to leave the bevel *t*. The screw *r*, nut *p* and shaft *m* 100 now continue to rotate together with the shaft *f* and gear box *b*, but the additional rotation conveyed from the shaft *v* to the screw *r* ceasing, the position of the nut *p* on the screw *r* remains unaltered, and the 105 arms *j* revolve at the height they have already reached, until the further rotation 110

of the wheel 2 causes the clutch *w* to engage the bevel *u*, when the action of the screw *r* on the nut *p* is reversed, and the arms *j* are lowered, a second "dwell" taking place at the end of the lowering operation.

When the cars have reached their highest point, or at any other period of their ascent or descent, the rod 5 can be actuated to move the switches 6, 7, in such manner as to form a path for the wheel 4 from the inner rail *d* to the outer rail *c*. When the wheel 4 is on the outer rail, and the bevel 3 clear of the rack *e*, the shaft *v* ceases to drive the clutch *w*, and a pause in the raising or lowering of the nut *p* and converse lowering or raising of the cars will occur, without entailing any pause in the revolution thereof. The revolution of the cars continues because the gear box *b* to which the supporting pillar or shaft *f* is secured is driven continuously by the beveled gear wheel 10 which is secured to the bottom of the gear box. The tappet mechanism for operating the clutch *w*, comprises the tappet 12, the wheel 2 with its cam groove, and the roller or bowl *y* with its slideable rod *x* operatively connected with the clutch. This tappet mechanism is operated periodically as long as the gear box is revolved, but it merely slides the clutch *w* back and forth and has no effect on the screw *r* until the shaft *v* is revolved. The reverse movement of the rod 5 restores the wheel 4 to the inner rail, when the operation of the screw *r* recommences.

It will be observed that the raising and lowering of the cars can be positively effected by the mechanism, although if the speed of revolution be sufficient, centrifugal force will assist in raising them. For this feature of our apparatus, we do not claim novelty, as it has previously been proposed to effect such raising and lowering by various mechanical, electrical, or hydraulic means, as, for instance, by a nut engaging a screw thread on the rotary shaft. We are not aware, however, of any mechanism having been previously described for this purpose by which the reversal of the raising and lowering mechanism was effected automatically, that is, without reversal of the direction of rotation of the main driving shaft, or the like operation requiring personal attention.

55 Claims:—

1. In a roundabout, the combination, with a supporting frame, and a vertical pillar journaled therein and provided with laterally projecting brackets; of lever arms

pivoted to the said brackets, cars suspended from the outer ends of the lever arms, a central shaft slideable vertically in the said pillar and having a nut at its lower end, links connecting the inner ends of the lever arms with the upper end of the said shaft, a gear box secured to the lower end of the said pillar, a screw journaled in the gear box and engaging with the said nut, a beveled toothed wheel secured on the said screw, a pair of beveled toothed wheels also journaled in the gear box and engaging with the said beveled toothed wheel, a driving shaft, clutch mechanism adapted to place the pair of beveled toothed wheels in engagement with the driving shaft alternately, means for revolving the gear box and pillar, and tappet mechanism for operating the said clutch mechanism automatically as the gear box is revolved.

2. In a roundabout, the combination, with a supporting frame, and a vertical pillar journaled therein and provided with laterally projecting brackets, of lever arms pivoted to the said brackets, cars suspended from the outer ends of the lever arms, a central shaft slideable vertically in the said pillar and having a nut at its lower end, links connecting the inner ends of the lever arms with the upper end of the said shaft, a gear box secured to the lower end of the said pillar, a screw journaled in the gear box and engaging with the said nut, a beveled toothed wheel secured on the said screw, a pair of beveled toothed wheels also journaled in the gear box and engaging with the said beveled toothed wheel, a driving shaft journaled in the gear box and having the said pair of wheels mounted loose on it, a slideable clutch splined to the driving shaft and operating to drive the said pair of wheels alternately, a stationary toothed rack, a toothed wheel splined on the driving shaft, two circular guide rails provided with switches, a roller running on the said rails and operatively connected with the last said toothed wheel, means for revolving the gear box and pillar, and tappet mechanism for operating the said clutch mechanism automatically as the gear box is revolved.

In testimony whereof we affix our signatures, in presence of two witnesses.

MOSES ROBINSON.
JONATHAN DALE.

Witnesses:

ERNEST PRIESTLEY NEWTON,
JOSEPH LANCASTER FLEMMING.