No. 720,838. PATENTED FEB. 17, 1903.

C. A. NEEDHAM.

AERIAL DEVICE.

APPLICATION FILED MAY 27, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig: 1.

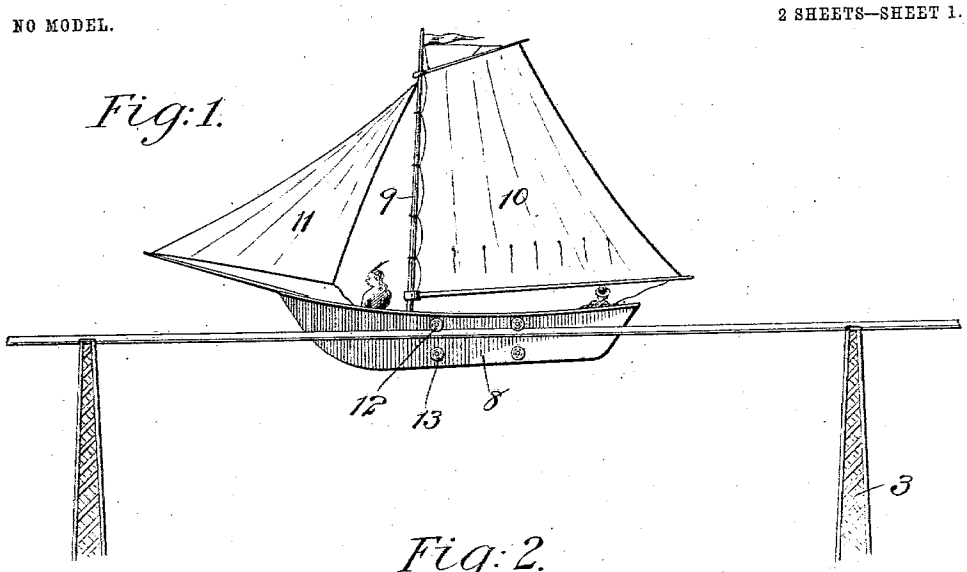


Fig: 2.

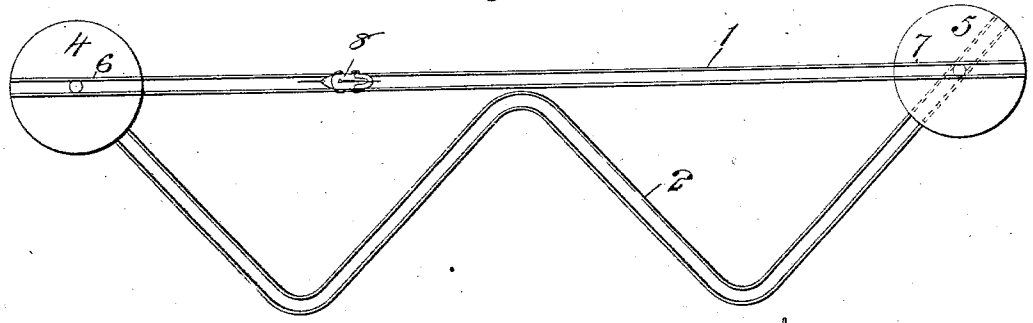


Fig: 3.

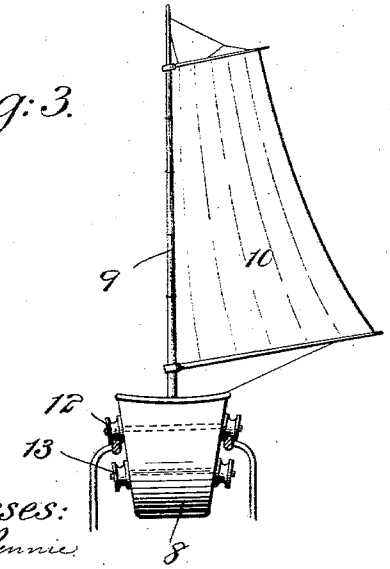
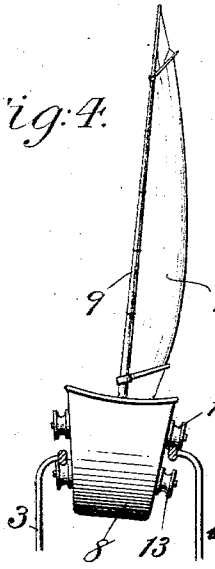


Fig: 4.



Witnesses:
John A. Rennie
George Barry Jr.

Inventor:
Charles A. Needham
by attorneys
Brown & Seward

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C. A. NEEDHAM.

AERIAL DEVICE.

APPLICATION FILED MAY 27, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

Fig: 5.

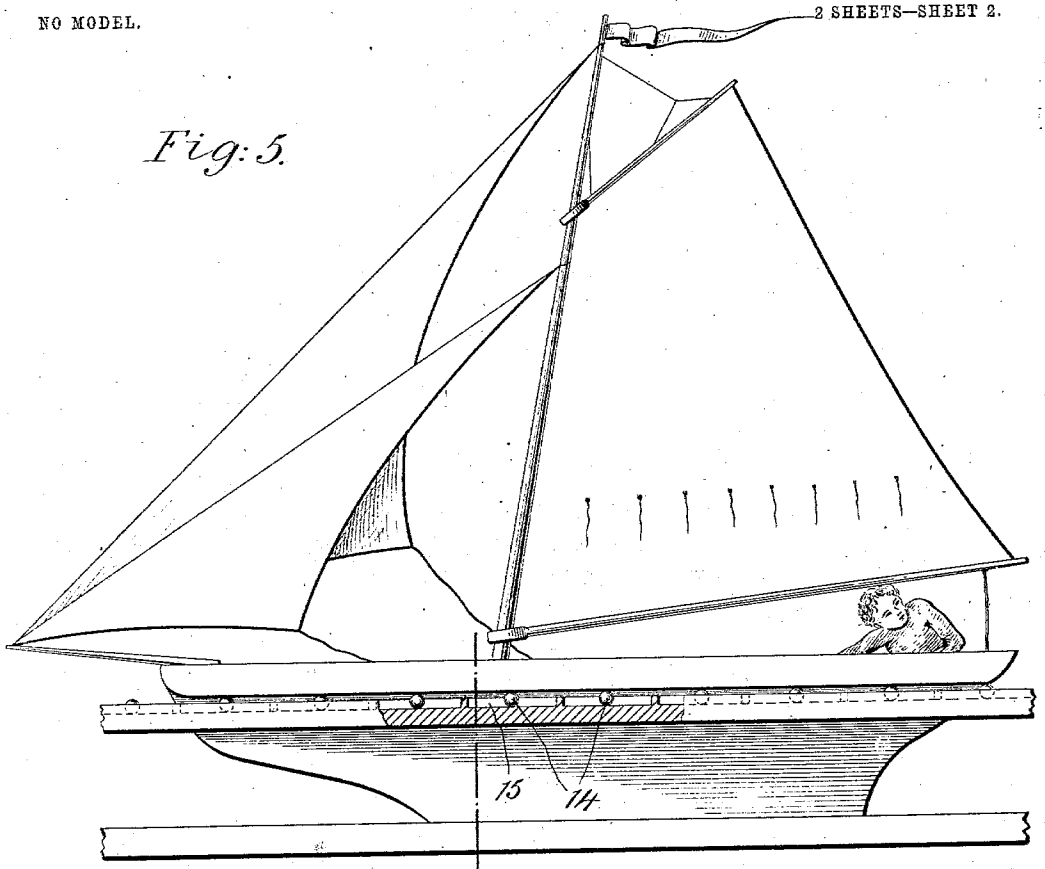
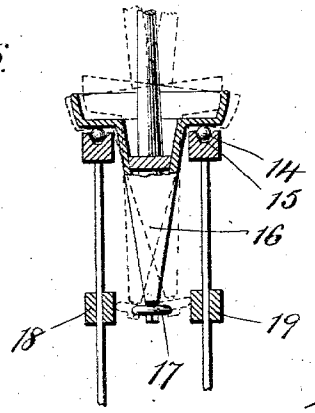


Fig: 7.

Fig: 6.



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UNITED STATES PATENT OFFICE.

CHARLES A. NEEDHAM, OF NEW YORK, N. Y.

AERIAL DEVICE.

SPECIFICATION forming part of Letters Patent No. 720,838, dated February 17, 1903.

Application filed May 27, 1902. Serial No. 109,149. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. NEEDHAM, a citizen of the United States, and a resident of the borough of Manhattan, in the city and State of New York, have invented new and useful Improvements in Aerial Devices, of which the following is a specification.

My invention relates to improvements in aerial devices, and has for its object to provide an aerial device comprising an elevated structure having a way or track and a sail-boat fitted to travel along the said way or track.

A further object is to provide a device of the above character in which the elevated structure comprises a straight track, a zigzag track, and turn-tables at the opposite ends of the structure for shifting the boat from one track to the other track.

A still further object is to provide certain improvements in the construction, form, and arrangement of the several parts, whereby the sails of the boat may be manipulated to cause the wind to propel the same along the elevated structure, the boat being fitted to travel either in an upright position or in an inclined position, according to the direction of the wind and the strength of the same.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents my improved aerial device in side elevation, a portion only of the elevated structure being shown. Fig. 2 is a top plan view of the device on a reduced scale. Fig. 3 is a transverse vertical section through the elevated way or track, the boat being shown in end elevation in its vertical position. Fig. 4 is a similar view showing the boat in its tilted position. Fig. 5 is an enlarged side view of the boat and a part of modified form of levated structure, a portion of the track being broken away to show the arrangement of the antifriction-rollers upon which the boat rests. Fig. 6 is a detail vertical transverse section showing the boat in full lines in its vertical position and in dotted lines in its tilted positions, and Fig. 7 is a detail view of a modified form of way or track.

The elevated structure which I have shown herein comprises the following parts: A straight way or track 1 and a zigzag way or track 2 are provided, which ways or tracks are supported at the desired distance from the ground by posts or pillars 3, arranged at suitable intervals. The opposite ends of the tracks 1 and 2 are brought in close proximity to each other, and at each end of the structure I provide turn-tables 4 and 5, having tracks 6 and 7, which may be rocked for bringing them into alinement with the track 1 or the track 2, as may be desired.

In the form shown in Figs. 1 to 4, inclusive, the boat is denoted by 8, and it is provided with a mast 9 and suitable propelling-sails 10 and 11.

The boat is fitted to travel along the elevated structure by the following arrangement: Each side of the boat is provided with a plurality of pairs of upper and lower rollers 12 and 13, spaced a short distance apart in position to engage the upper or lower sides of the rails of the track. In the present instance I have shown the boat as provided with two sets of upper and lower rollers. When the boat is traveling along in a vertical position, the upper traction-rollers on both sides of the boat rest upon the rails of the track. When the boat is tilted by the pressure of the wind, the upper rollers along one side of the boat are caused to engage one of the rails of the track and the lower rollers along the other side of the boat are caused to engage the other rail of the track.

In the form shown in Figs. 5 and 6 I have shown the boat as having a ball-bearing engagement with the track, the balls 14 being fitted to have a limited rolling movement in raceways 15 in the rails of the track. In this form the boat is provided with a depending portion 16, the lower end of which is provided with an antifriction-roller 17, fitted to engage stop-rails 18 or 19 for limiting the tilting movements of the boat.

By the arrangement of the straight and zigzag tracks the boat is enabled when there is wind to be propelled along the tracks by manipulating the sheets leading to the different sails.

If the wind is in such a direction that the boat cannot be propelled back and forth along the straight track, it will permit the boat to be propelled along the straight track in one

direction and then propelled along the zigzag track after it has been shifted onto the same by one of the turn-tables.

If so desired, the tracks may be made undulating, as shown in Fig. 7, so as to cause the boat to rise and fall as it is forced along the track by the pressure of the wind.

It is evident that numerous changes might be resorted to in the construction, form, and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth; but

What I claim is—

1. An aerial device comprising an elevated structure having a straight track, a zigzag track and a sail-boat fitted to travel along the same.

2. An aerial device comprising an elevated structure having a straight track, a zigzag track, a sail-boat fitted to travel along the same and turn-tables for bringing the boat into communication with one or the other of the tracks.

3. An aerial device comprising an elevated way or track and a sail-boat fitted to travel along the same, the said sail-boat having a tilting movement on the way or track and means for positively limiting the tilting movement of the said boat.

4. An aerial device comprising an elevated way or track, a sail-boat fitted to travel along the same and an antifriction connection between the boat and track comprising a set of upper and lower rollers on each side of the boat in position to engage the top or bottom sides of the rails of the track.

5. An aerial device comprising an elevated way or track, a sail-boat fitted to travel along the same and an antifriction connection between the boat and track comprising a plurality of sets of upper and lower rollers on each side of the boat in position to engage the top or bottom sides of the rails of the track.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 24th day of May, 1902.

CHARLES A. NEEDHAM.

Witnesses:
FREDK. HAYNES,
HENRY THIEME.