

W. A. BOND.
LAUNCHING DEVICE FOR FLYING MACHINES.
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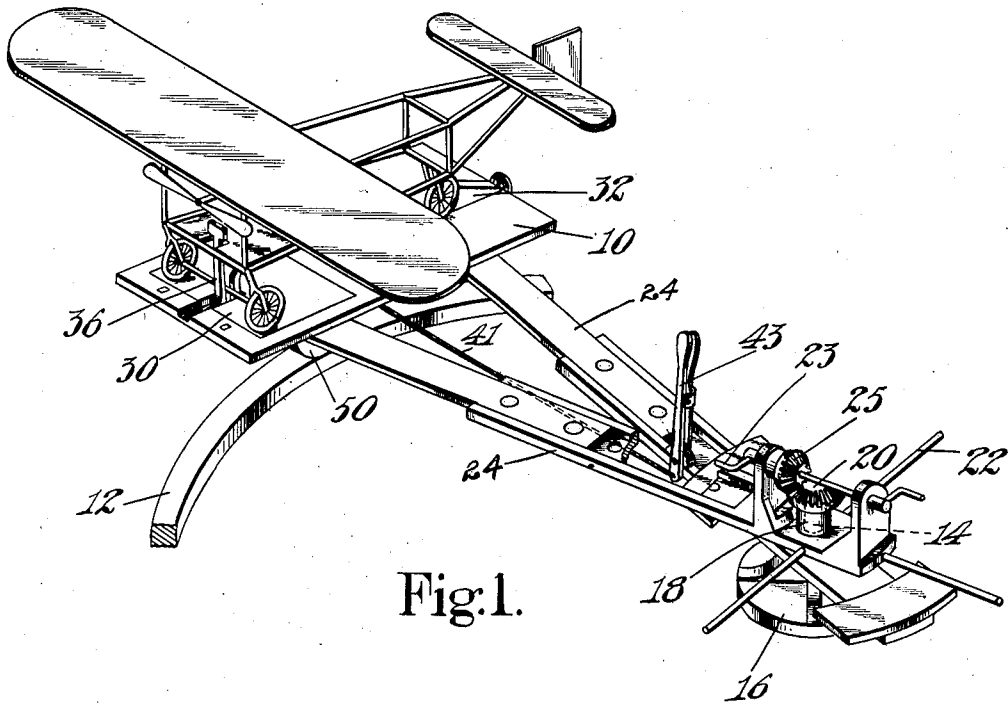


Fig. 1.

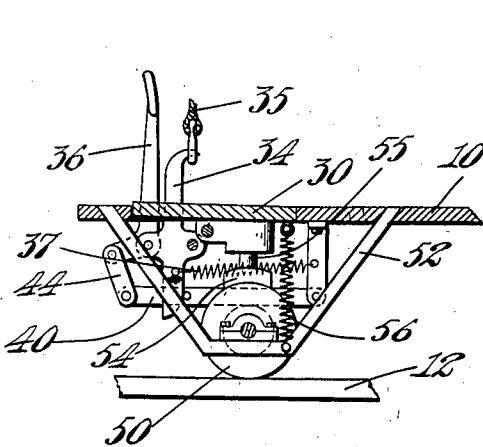


Fig. 2.

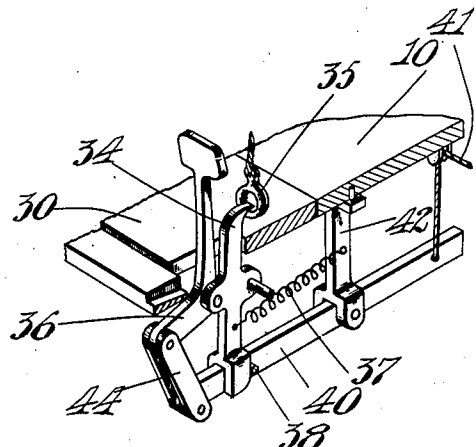


Fig. 3.

WITNESSES.

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LAUNCHING DEVICE FOR FLYING-MACHINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM A. BOND, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain Improvements in Launching Devices for Flying-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to devices for launching flying machines.

It is necessary to impart to a flying machine a high rate of speed along the ground before the machine will take to the air and heretofore the extended space required has rendered it inconvenient or impossible to launch a flying machine from the top of a building, the deck of a vessel, or other restricted surfaces.

It is an object of this invention to provide a device whereby sufficient speed for launching may be imparted to a flying machine by moving it in a fixed path so limited in its extent that the movement of the flying machine may take place within a relatively small area.

To this end an important feature of the invention consists in a carriage for a flying machine movable in a fixed path in combination with a retaining device arranged to be operated for releasing the flying machine from the carriage when a sufficient rate of speed has been acquired.

As herein shown the carriage is movable over a circular track about a fixed center. Any suitable means may be used for moving the carriage over the track. It may be drawn along by the tractive force of the flying machine connected thereto or swung about its axis by force applied at the center of the track.

Another feature of the invention consists in the provision of a retaining device for connecting temporarily the flying machine and its carriage which device may readily be operated by the aviator to release the flying machine without interfering with his control of the flying machine or requiring him to assume an inconvenient position. Preferably mechanism is also provided whereby the retaining device may be operated by an

assistant from near the axis of the carriage so that, if found expedient, the aviator may be relieved of this operation.

Still another feature of the invention consists in the provision of a brake and mechanism for applying the brake to retard the carriage when the flying machine has been released. As herein shown the brake is arranged to operate automatically when the carriage is relieved of the weight of the flying machine.

To this end another important feature of the invention consists in the combination of a pivoted platform, upon which part of the flying machine may rest, with a brake connected to, and operated by the movement of, the pivoted platform.

While the device of my invention is intended primarily for use in launching flying machines it may also prove useful in affording the aviator an opportunity without leaving the ground to become accustomed to the sensations he will experience in actual flight.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings, in which—

Figure 1 is a view in perspective of the apparatus showing a flying machine in position upon the carriage. Fig. 2 is a view in section of the retaining device with its associated parts and the brake. Fig. 3 is a view in perspective of the retaining device with its associated parts.

As shown in Fig. 1 the carriage 10 is mounted for movement in a circular path on the track 12 about the axis of the spindle 14 as a center. The spindle 14 projects upwardly from a circular base plate 16 which may be bolted to the deck of a vessel or secured to the ground in any location from which it is desired to start the flying machine. Journaled upon the spindle 14 is a sleeve 18 having a pair of radially extending arms 24 projecting therefrom upon the outer ends of which rests the carriage 10. The arms 24 are formed with an adjustable section so that the radial distance of the carriage 10 from the spindle 14 may be varied within convenient limits.

The carriage 10 comprises a main portion

which rests on the arms 24 and a pivotally mounted platform 30 arranged to support near its front edge the forward wheels of the flying machine. An adjustable stop 32 is provided at the rear end of the carriage for engaging the rear wheel of the flying machine and preventing rearward movement thereof relatively to the carriage, the stop 32 being adjustable to accommodate flying machines of different lengths. A retaining catch 34 projects upwardly through a slot in the pivoted platform and is arranged to hook into a ring 35 connected with part of the flying machine and so prevent the latter from being dislodged by centrifugal force when the carriage is put in motion.

Any suitable means may be provided whereby the aviator may cause the catch 34 to disengage and release the flying machine when he is ready to make an ascent. One form of releasing mechanism is shown herein and comprises a bell crank lever 36 pivotally mounted in a bracket below the platform 30 and having its upper end formed as a treadle and disposed within reach of the aviator in the flying machine. The catch 34 is pivoted to turn about the same axis as the releasing lever 36 and is held in engaging position against the action of a spring 37 by a stop pin 38 which projects laterally from a lever 40 pivotally supported in the lower bifurcated end of a bracket 42 bolted to the under side of the carriage 10. The forward end of the lever 40 is connected through the double link 44 with the lower arm of the releasing lever 36, the arrangement being such that when the releasing lever is pushed forwardly and downwardly by the aviator the lever 40 is swung downwardly and the stop pin 38 carried below the lower end of the catch 34 permitting the spring 37 to swing the latter downwardly and release the flying machine. I have shown the releasing lever as arranged to be operated by the aviator in the flying machine and I believe that in practice, the aviator will prefer to operate the releasing mechanism himself but in case he should prefer to have this attended to by an assistant means are also provided whereby the releasing mechanism may be operated from near the axis about which the carriage travels. For this purpose a rope or chain is connected to the rear end of the lever 40 and carried over a pulley 41 on the carriage to a hand lever 43 mounted near the inner end of one of the arms 24. By throwing the upper end of the lever 43 outwardly the lever 40 is swung downwardly at its front end as it is by the action of the treadle lever 36 and the retaining catch is thus released as already explained.

The carriage is supported by an elongated wheel or roller 50 journaled in hangers 52, one of which is shown in Fig. 3. The width

of the wheel 50 permits the radial adjustment of the carriage, before mentioned, without the wheel being carried off the track 12. A brake 54 is arranged to cooperate with a wheel 50 for the purpose of retarding the movement of the carriage at the moment of launching the flying machine. As herein shown, the brake 54 is mounted upon the lower end of a bar 55 secured to a bracket on the lower side of the pivoted platform 30.

The platform is normally held elevated slightly at its front end by a spring 56 in which position the brake 54 is held against the periphery of the wheel 50. When, however, the fore wheels of the flying machine rest upon the platform it is tilted into a horizontal position by the weight of the machine and the brake is moved away from the wheel 50. It will be seen therefore that so long as the flying machine occupies its position on the carriage the latter is free to move over its track but when the flying machine leaves the carriage the brake acts instantly to retard the movement of the carriage.

Motive power to propel the carriage may be furnished either by the action of the propeller of the flying machine or from an independent source. Where the flying machine itself is depended upon the carriage is drawn along by its connection with the ring 35 of the flying machine. The carriage may also be moved by pushing or pulling on the hand spikes 22 which project from the inner ends of the arms 24, or by turning the crank 23 of a shaft journaled in standards on one of the arms which causes the bevel gear 25 to rotate about the fixed bevel gear 20 on the upper end of the spindle 14. In the latter case the assistants who operate the cranks may ride upon the arms or upon a small platform attached to the lower arm and disposed upon the opposite side of the spindle 14 from the arm.

In operation the flying machine is properly placed upon the carriage and the retaining catch 34 set to engage the ring 35. The carriage is then set in motion by any of the means above discussed and when sufficient speed has been attained the retaining catch is disengaged and simultaneously the aviator will set his planes so that the flying machine shall rise into the air. As soon as the platform 30 is relieved of the weight of the machine it is tilted by the spring 56 and the brake applied retarding the carriage and expediting departure of the flying machine from it.

It will be noted that the forward arm 24 is somewhat higher than the rear arm and consequently the surface of the carriage is slightly inclined downwardly toward the rear. By changing the relative position of the two arms any desired angle may be imparted to the carriage.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A carriage for a flying machine movable in a horizontal path about an external axis and means for retaining a flying machine in position upon said carriage arranged to be operated to release the flying machine by the aviator.
2. A carriage for a flying machine, a fixed track over which said carriage is movable, a device for retaining a flying machine in fixed position on said carriage, and means extending into the proximity of the aviator arranged to be operated for disengaging said retaining device.
3. A carriage for launching a flying machine, said carriage having a wheel and a brake movable to engage the wheel to stop the movement of said carriage, and a spring actuated brake controlling member arranged to cause the operation of the brake automatically when the flying machine leaves said carriage.
4. A carriage for a flying machine, and a brake for stopping the movement of said carriage, said brake being held in an inoperative position by the weight of the flying machine while the latter is upon said carriage.
5. A movable carriage for a flying machine including a pivoted platform and a brake controlled by the position of said platform.
6. A carriage for launching a flying machine movable in a circular path about a fixed axis and supported from beneath in all positions, and means connecting said carriage with said fixed axis whereby said carriage may be made to revolve, said connecting means being adjustable to permit the radius of the path of said carriage to be varied.
7. A revolving carriage for a flying machine having a retaining device for holding a flying machine in position upon it, a stop to prevent disengagement of said retaining device, and means arranged to be operated by the aviator for permitting the movement of said stop to an inoperative position.

8. A carriage for launching a flying machine having a retaining device mounted thereon with a portion shaped to engage the flying machine and hold the latter in fixed position on the carriage and against outward movement, a lever disposed within reach of the aviator, and toggle mechanism connected with said lever and movable thereby to effect the release of said retaining device.

9. A carriage for launching a flying machine, bodily movable in a circular path about an axis, connecting members disposed between the carriage and its axis, means for supporting the carriage from beneath independently of the connecting means, means for temporarily securing a flying machine to the carriage in order that the machine may furnish motive power thereto, and means for rotating the carriage from another source of power.

10. Arms pivoted to swing about a fixed axis, a carriage having retaining means for a flying machine carried by the arms and supported from beneath in all positions independently of the arms, a radially disposed roller for said carriage, and means for causing said roller to travel along the track.

11. A device for launching a flying machine having, in combination, a carriage, a device on the carriage for temporarily connecting a flying machine thereto, and means connected to said device and arranged to be operated at a distance from the flying machine to release the flying machine.

12. A device for launching a flying machine having, in combination, a carriage, a catch for temporarily connecting a flying machine thereto, means on said carriage for releasing the catch, and independent means arranged to be operated at a distance from the carriage to effect the same result.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM A. BOND.

Witnesses:

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M. W. COUPE.