March 31, 1931. E. HEINKEL 1,798,940

STARTING DEVICE FOR FLYING MACHINES

Filed June 6, 1929

Fig. 1.

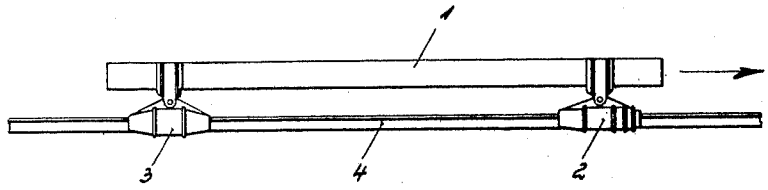


Fig. 2.

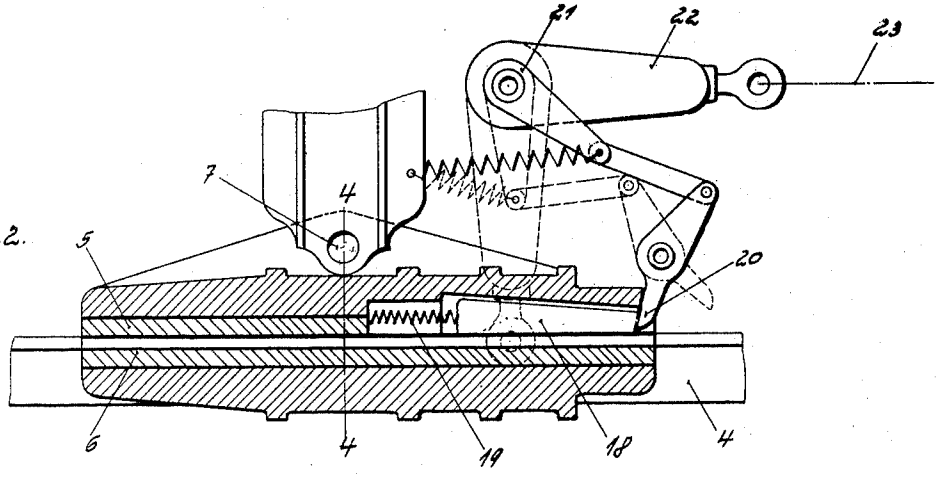


Fig. 3.

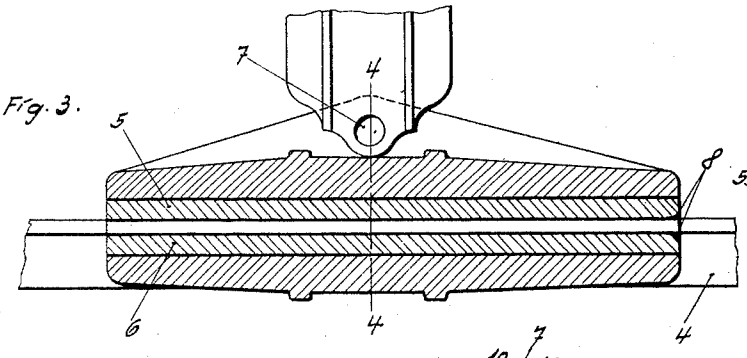


Fig. 4.

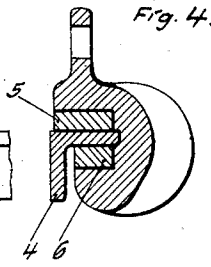
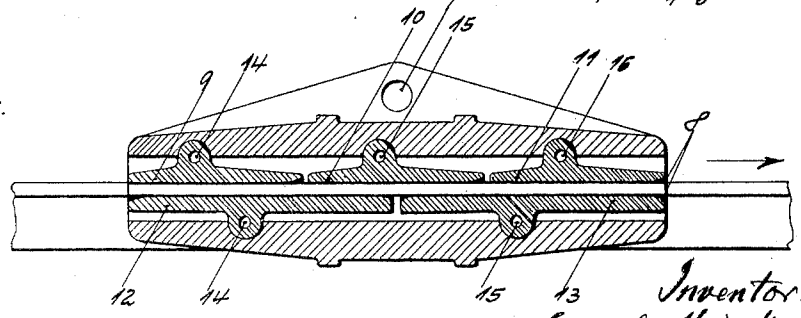


Fig. 5.



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Patented Mar. 31, 1931 1,798,940

UNITED STATES PATENT OFFICE

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STARTING DEVICE FOR FLYING MACHINES

Application filed June 6, 1929, Serial No. 368,767, and in Germany April 25, 1927.

My invention relates to flying machines and more particularly to starting devices, such as a starting carriage adapted to move on rails, whereby the required speed is imparted to the flying machine to enable it to rise into the air. According to the present invention, the glide-shoes, by means of which the carriage moves along the rails, are not rigidly secured to the carriage, but are mounted thereon in such a way as to enable them to swivel about a pivot disposed transversely of the starting track.

In the annexed drawing, in which I have shown, by way of illustration, an embodiment of my invention,

Fig. 1 is a side elevation of a starting carriage; Figs. 2 and 3 are longitudinal sections respectively through a forward and rear glide-shoe; Fig. 4 is a section along line 4—4 in Figs. 2 and 3; Fig. 5 is a similar view as Figs. 2 and 3 showing a modification.

At 1 in Fig. 1 is indicated the starting carriage adapted to move by means of the glide-shoes 2 and 3 on the rails 4 of the starting track. The glide-shoes engage the flange of the rails and are so designed as to transmit to the rails both downwardly and upwardly directed forces. In the glide-shoes are provided special cheeks 5 and 6 which are adjustably and exchangeably mounted.

At 7 in Figs. 2, 3 and 5 is shown a bolt, whereby each glide-shoe is so connected to the brackets of the starting carriage as to be capable of a swivelling movement. The bolts 7 extend transversely of the starting track.

The rails 4 are made preferably of profile iron, e. g. angle iron, and the glide faces are left unfinished, because to finish them would be very difficult because of the length of the starting course. Consequently, the glide faces of the rails are not entirely level, and because of the load upon them they are liable to bending. As the starting carriage operated by an accelerating device (not shown) moves over the rails with considerable speed, jars and vibrations are inevitable, where the glide-shoes of the carriage are rigidly connected therewith, which, of course, is bad both for the framework of the starting track and for the flying machine. And further, because the glide-shoes do in that case not rest on the rails with their entire surface, considerably increased pressures will occur at certain places which, in view of the great speed means a greatly increased wear of the rails as well as of the glide-shoes. All these defects are successfully overcome by the present invention providing for a swivel connection between the glide-shoes and the starting carriage enabling the glide-shoes to always automatically so position themselves that the entire faces of the cheeks in the glide-shoes will bear on the rails.

The greasing of the glide faces can be considerably improved by this that that portion of the glide face located in front of the pivot bolt 7 in the flying direction is extended and is bevelled at the extreme front edge. This construction results in a decrease of the bearing pressure in the front portion of the glide-shoe permitting the insertion of a grease wedge 8 between the glide-shoe and the rail.

Where large glide-shoes are used, the glide face can be sub-divided in such a way that the single portions of the glide face are all mounted so as to swivel about pivot bolts disposed transversely relative to the moving path of the carriage. Such a construction is shown in Fig. 5, according to which the upper and lower glide faces are subdivided into separate glide faces 9, 10 and 11, and 12 and 13 respectively, all of which faces are capable of swivelling about bolts 14, 15 and 16.

A portion of the glide face of one or more glide-shoes can be movably disposed in such a way that upon a rearward movement of the glide-shoes, it will act as a brake-shoe causing a considerably increased bearing pressure on the rails 4. The purpose of this is to prevent the starting carriage from oscillating rearwardly at the end of the starting track in cases in which by means of a brake rearwardly acting forces are directed onto the carriage.

According to Fig. 2 of the drawing, a portion of the glide track is made wedge-shaped, as shown at 18. On the return movement of the glide-shoe, this wedge 18 becomes firmly engaged between the body of the glide-shoe and the rail 4, which wedging action is aided

by the spring 19. To return the starting carriage to its initial position without the need of any special manipulation to disengage the wedge 18 acting as a brake-shoe, the arrangement is such that ordinarily, the wedge 18 occupies an inoperative position and is released only at the end of the starting operation, which is done automatically, as will now be described with reference to Fig. 2. By means of a system of levers 20, 21 and 22 which are connected with the cable 23 of the accelerating device, the wedge 18 is held in inoperative position against the action of spring 19. At the end of the starting operation, the cable 23, by means of pulleys reversing the direction of the cable, causes the levers 20, 21 and 22 to assume the broken-line position shown in Fig. 2, permitting the wedge 18 to be moved by spring 19 into the brake position. It is evident, of course, that other means may be employed for moving the wedge from its inoperative to its operative position.

I claim:

1. In combination with a starting carriage for flying machines, pivot bolts extending transversely through brackets of said carriage, and glide-shoes suspended from said pivot-bolts, said glide shoes comprising a plurality of independent glide faces and means for pivotally suspending said glide faces transverse of the path of travel of said carriage.

2. In combination with a starting carriage for flying machines, glide-shoes pivotally suspended therefrom transverse of the path of travel of the carriage, a brake-shoe associated with said glide-shoes, means tending to normally hold said brake-shoe in inoperative position, and means automatically releasing said brake shoe at the end of the starting operation.

3. A starting mechanism for flying machines comprising a track, a glide shoe mounted on said track for movement therealong, a carriage for the flying machine, and a pivotal connection between the glide shoe and the carriage, permitting the glide shoe to accommodate itself to irregularities in the track.

4. A starting mechanism for flying machines comprising a track, a glide shoe slidably mounted on said track, a carriage for the flying machine, and a pivotal connection between the glide shoe and the carriage permitting the glide shoe to accommodate itself to irregularities in the track, the axis of said pivotal connection being disposed transverse with respect to the track.

5. A starting mechanism for flying machines comprising a track, a glide shoe mounted on said track for movement therealong, a carriage for the flying machine mounted on said glide shoe, and a plurality of separate members pivotally connected with said glide shoe and each having a glide face for sliding engagement with the track.

6. A starting mechanism for flying machines comprising a track, a glide shoe mounted on said track for movement therealong, a carriage for the flying machine pivotally mounted on said glide shoe, and a plurality of separate members pivotally connected with said glide shoe and each having a glide face for sliding engagement with the track.

7. A starting mechanism for flying machines comprising a track, a glide shoe mounted on said track for movement therealong, a carriage for the flying machine pivotally mounted on said glide shoe, and a plurality of separate members pivotally connected with said glide shoe and each having a glide face for sliding engagement with the track, the axis of each of said pivots being disposed transverse with respect to the track.

8. A starting mechanism for flying machines comprising a track, a carriage for the flying machine mounted on said track for movement therealong, a brake element on the carriage for cooperation with the track, means normally holding said brake element in an inoperative position, and means for automatically releasing said brake when the carriage reaches a predetermined position in its starting movement along said track.

In testimony whereof I affix my signature.

ERNST HEINKEL.