Sept. 30, 1930. A. CONNORS 1,777,254

BRAKE FOR FLYING MACHINES

Original Filed May 27, 1927 3 Sheets-Sheet 1

Fig. 1.

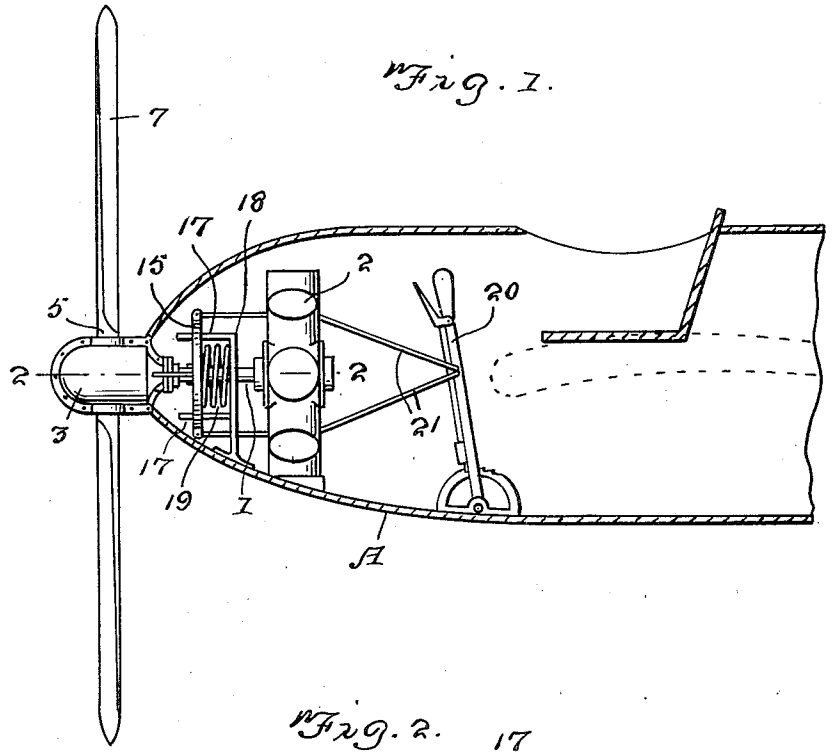
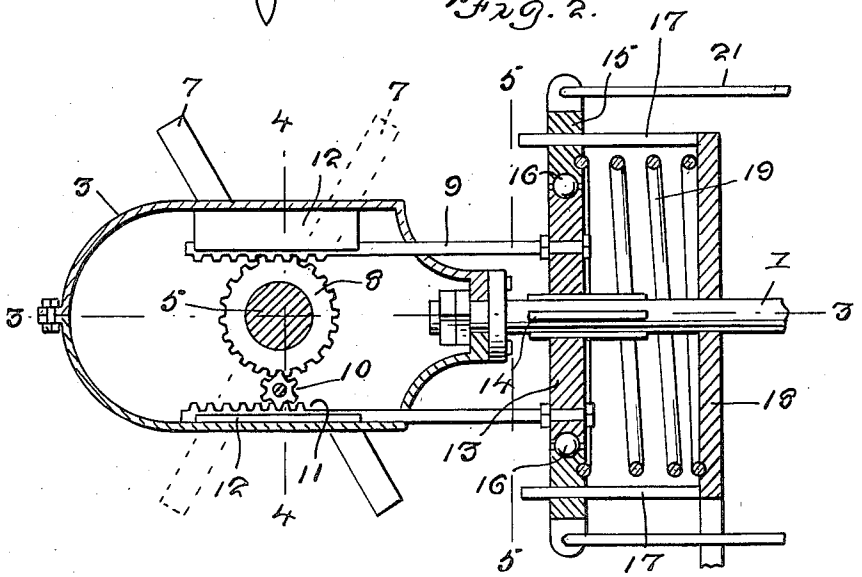


Fig. 2.



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Fig. 3.

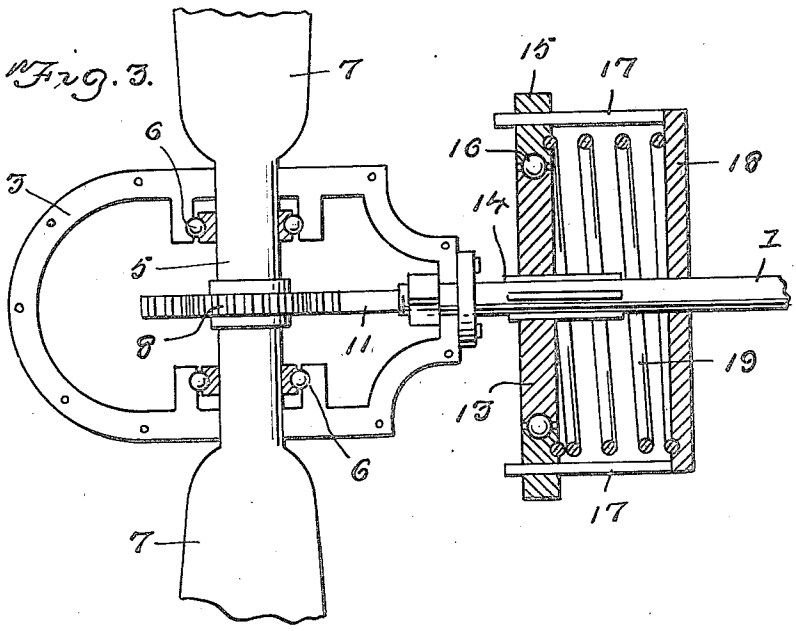


Fig. 5.

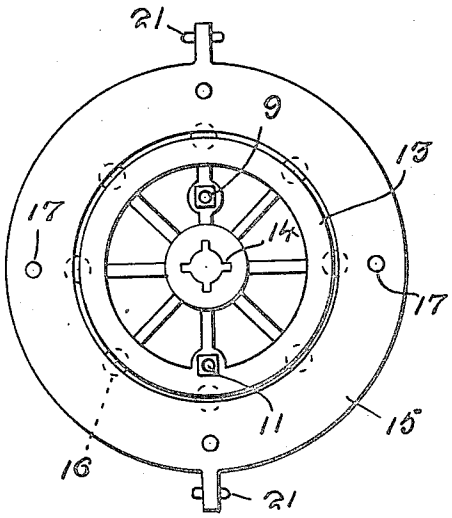
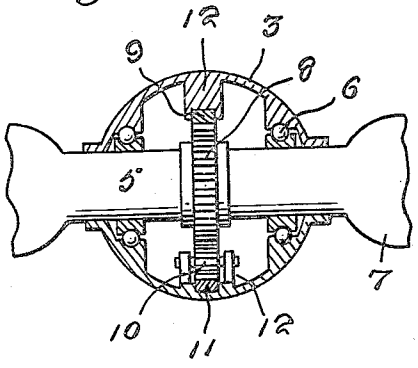


Fig. 4.



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Fig. 6.

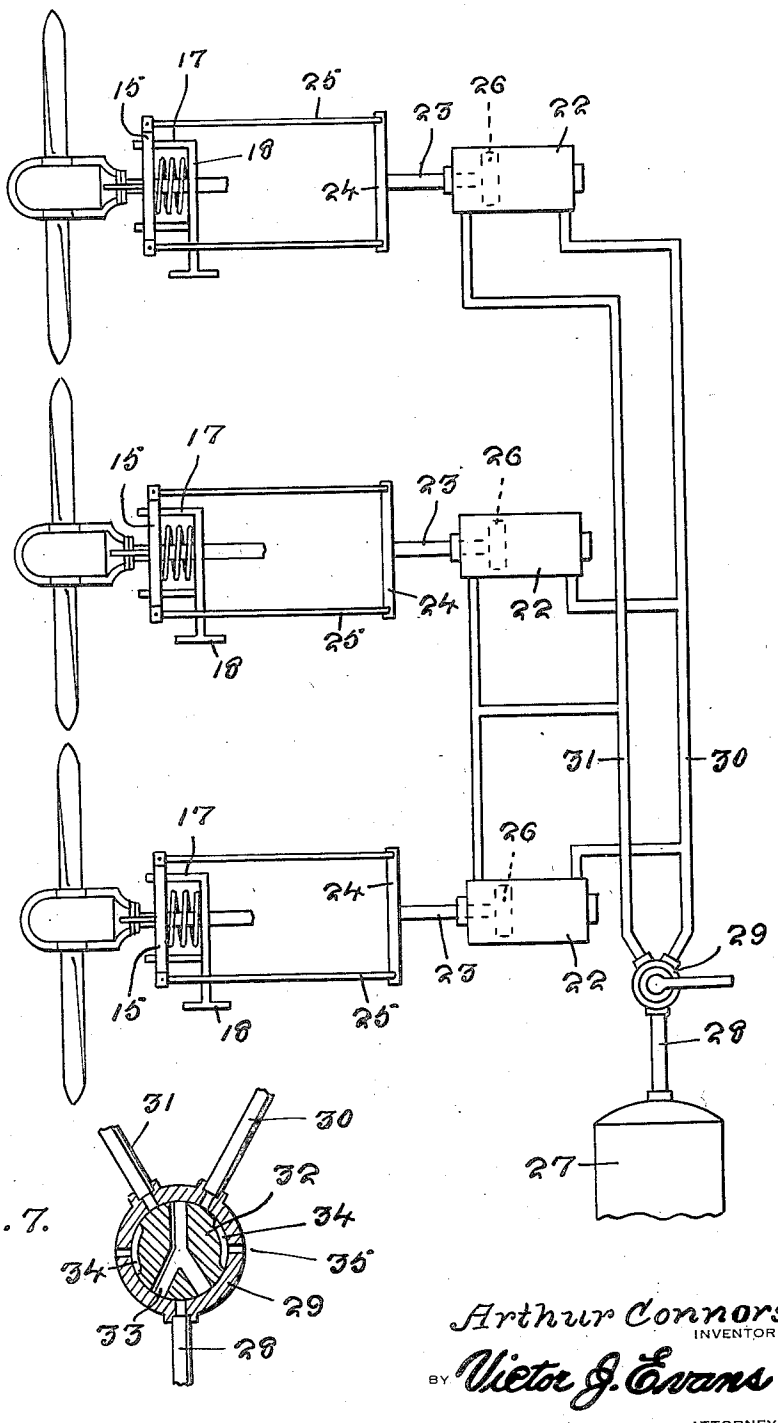


Fig. 7.

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Patented Sept. 30, 1930

1,777,254

UNITED STATES PATENT OFFICE

ARTHUR CONNORS, OF BROOKLYN, NEW YORK

BRAKE FOR FLYING MACHINES

Application filed May 27, 1927, Serial No. 194,822. Renewed February 26, 1930.

This invention relates to a brake for an aircraft or other craft driven by a propeller, the general object of the invention being to provide means for reversing the blades of the propeller so that the propeller will tend to move the craft in a direction opposite to that in which it is traveling so that the propeller will act as a brake and thus check the momentum of the craft and permit it to land without difficulty.

Another object of the invention is to provide rack means located within the propeller head for turning a shaft to which the blades of the propeller are attached for placing the blades in either a "pulling" or a "pushing" position.

A still further object of the invention is to provide spring means for normally holding the parts with the blades in a position to propel the craft in a forward direction.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a sectional view through portion of a flying machine, with the propeller and the parts associated therewith in elevation.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 is a section on line 5—5 of Figure 2.

Figure 6 is a diagrammatic view showing the invention in use with a craft having three propellers.

Figure 7 is a sectional view through the valve shown in Figure 6.

In these drawings, 1 indicates the drive shaft which is driven from the engine 2 which is arranged in the fuselage of the flying machine which is shown at A in Figure 1, and 3 indicates the propeller head which is made in the form of a casing suitably attached to the outer end of the shaft 1. A shaft 5 passes transversely through the casing 3 and is suitably journaled therein through means of the anti-friction means 6, and the ends of this shaft have connected therewith the propeller blades 7, these blades being preferably formed with the shaft, as shown in the drawings. A gear 8 is fastened to the center of the shaft 5 and the teeth of a rack bar 9 meshes with this gear and an idle gear 10 also meshes with this gear, this idle gear being oppositely arranged from the rack bar and said idle gear is engaged by the teeth of a second rack bar 11. These rack bars are movable in guides 12 in the casing and they pass through holes in the rear part of the casing 3 and have their outer ends connected to a circular member 13 which is slidably but non-rotatably mounted on the drive shaft 1 through means of the keys 14 on the shaft engaging slots in the member. This member 13 is also rotatably arranged in a ring 15 and is connected to said ring by the balls 16 engaging raceways formed in the member 13 and the ring 15. The ring 15 is slidably mounted on the guiding bars 17 which are carried by a support 18 fastened to a part of the fuselage and through which the drive shaft 1 passes. A coiled spring 19 surrounds the drive shaft and is placed between the support 18 and the ring 15 and tends to hold the ring and the member 13 in their full position with the rack bars projected and holding the propeller blades at an angle which will drive the craft forwardly. By pulling the ring and the member 13 inwardly against the action of the spring, the rack bars will be caused to partly rotate the gear 8 and the shaft 5 so as to reverse the position of the propeller blades so that they will tend to move the craft rearwardly which will act to check its speed, as this reverse driving motion of the propeller will act as a brake. The parts may be moved inwardly through means of a hand lever 20 arranged in the fuselage and connected with the ring by the flexible members

21 so that by pulling upon tne hand lever, the ring and the member 13 will be moved inwardly so as to cause the rack bars to reverse the position of the blades to check the speed of the craft.

Figure 6 shows the invention applied to a craft having a number of propellers. As shown in this figure, each propeller is provided with the means before described for reversing the position of the blades but instead of the hand lever, a cylinder 22 is provided for each propeller, the piston rod 23 of which is connected to a cross head 24 and links 25 connect the cross head with the ring 15, so that when the piston 26 in each cylinder is moved rearwardly, the ring will be moved inwardly so as to reverse the position of the blades, as above set forth. The pistons are actuated by compressed air, a tank 27 being provided for holding a supply of compressed air, and this tank is connected by a pipe 28 with a valve casing 29 and pipes 30 connect this casing with the rear ends of all the cylinders while pipes 31 connect the valve casing with the front ends of all the cylinders. A valve 32 is arranged in the valve casing 29 and this valve is provided with the Y-shaped port 33 for connecting the pipe 28 with either the pipes 30 or the pipes 31. The valve is also provided with a pair of recesses 34 for connecting the pipes 30 or 31 with the bleed ports 35 in the casing so that the pipes 30 will be connected with the atmosphere when the pipes 31 are connected with the supply and vice versa. Thus in this case, when the plane is to be checked in its flight, the valve is turned to place the pipes 31 in communication with the tank 27 so that compressed air will flow into the front ends of the cylinders and force the pistons rearwardly, thus moving the rings 15 and the parts associated therewith against the action of the springs and causing the rack bars to reverse the position of the propeller blades so that they will act as brakes for checking the speed of the plane. With this invention, the speed of the plane or other craft will be checked by simply reversing the position of the propeller blades, and by checking the speed in this manner, the plane can land without difficulty.

It is thought from the foregoing description that the advantages and novel features of my invention will be readily apparent.

I desire it to be understood that I may make changes in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claim.

What I claim is:—

A propeller driven craft comprising a body, a drive shaft therein, a hollow propeller head connected with the drive shaft, a transversely arranged shaft passing through the head and journaled therein blades at the outer ends of the shaft, a gear on the shaft within the hollow head, a rack bar engaging the gear and passing through the rear of the head and means for reciprocating the rack bar to partly rotate the blade carrying shaft to change the pitch of the blades, such means comprising a circular member slidably but nonrotatably mounted on the drive shaft, a ring member surrounding the circular member, anti-friction means placed between the circular member and the ring member, a stationary member, guiding rods attached thereto and passing through the ring member to guide the same, spring means for holding the ring member normally in outward position said means being arranged between the stationary member and the ring member and means for moving the ring member inwardly against the action of the spring means to cause the rack bar to act on the blade shaft to reverse the position of the blades.

In testimony whereof I affix my signature.

ARTHUR CONNORS.