April 22, 1930. J. B. LIEVRE 1,755,928

SAFETY AEROPLANE CONTROL STICK

Filed Dec. 13, 1929

Fig. 1.

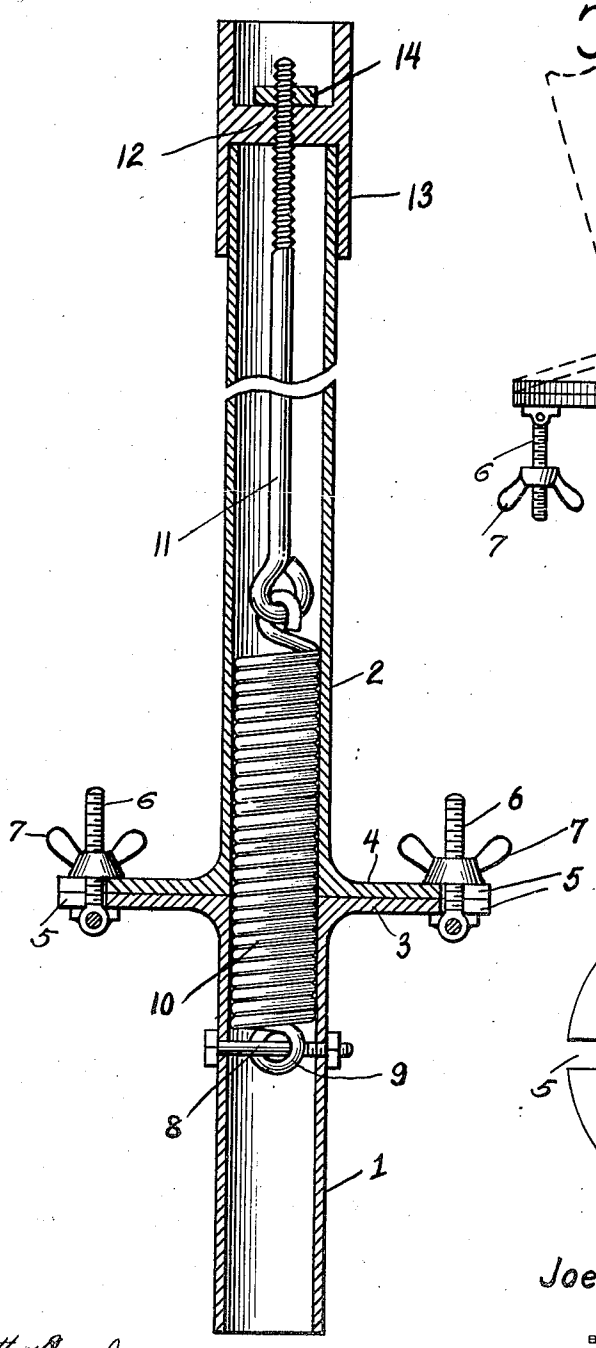


Fig. 2.

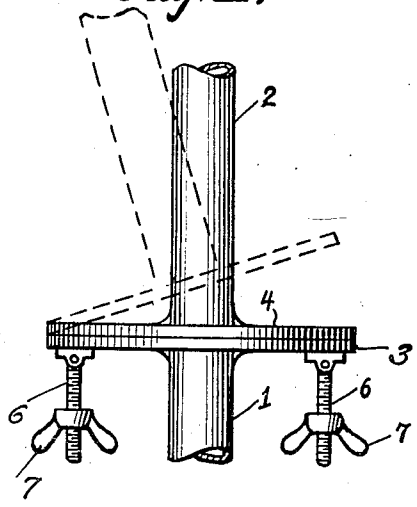
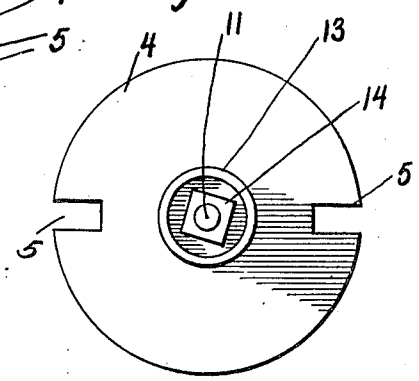


Fig. 3.



Joe Ben Lievre INVENTOR

BY Victor J. Evans ATTORNEY

Arthur Evans Jr. WITNESS

Patented Apr. 22, 1930 1,755,928

UNITED STATES PATENT OFFICE

JOE BEN LIEVRE, OF SAN ANTONIO, TEXAS

SAFETY AEROPLANE CONTROL STICK

Application filed December 13, 1929. Serial No. 413,856.

My present invention has reference to a new and novel improvement in control sticks for aeroplanes designed to be used by a student. The construction of the stick is such as to teach the student to fly smoothly and gently or, in other words, to teach a student who is prone to jerk the controls or handles them faster than the surfaces are able to act the knack or art of properly handling the stick, while at the same time the instructor will always have full control of the airship.

To the attainment of the foregoing the invention consists in the improvement hereinafter described and definitely claimed.

In the drawings:

Figure 1 is a substantially vertical longitudinal sectional view through the improvement, the sections comprising the stick being locked, as when employed by the instructor or in solo flying.

Figure 2 is a side elevation of a sufficient portion of the improvement to illustrate by dotted lines the manner in which the upper or handle portion of the stick can be swung to a determined extent without influencing the lower portion thereof which is connected to the controls.

Figure 3 is a plan view of the device as illustrated by Figure 2.

In the drawings I have not deemed it necessary to illustrate the instructor's stick nor the connection between the improvement which constitutes the student's stick and the instructor's stick.

As disclosed by the drawings the stick is in the nature of a tubular member and comprises a lower section 1 and an upper section 2. The sections 1 and 2, at the confronting ends thereof are formed with flanges 3 and 4, respectively which are round in plan, and the said flanges, at the opposite edges thereof are provided with notches 5, respectively. The lower flange, to the sides of the notches therein is provided with ears between which are pivoted bolts 6, and these bolts are engaged by wing nuts 7. The wing nuts, when the bolts are swung through the flanges are designed to be screwed against the flange 4 and thereby lock the stick sections 1 and 2 together.

Passing transversely through the stick section 1 there is a bolt 8 engaged by a suitable nut, the said bolt passing through the eye end 9 of a strong coil tension spring 10. Obviously means other than a bolt may be employed for securing the end of the spring in the stick section 1. The spring 10 is of a length to extend into the lower portion of the stick section 2 and this end of the spring is provided with an eye to be engaged by a similar eye at the end of a bolt 11. This bolt is screwed through a partition wall 12 in a tubular handle 13 which is arranged over the outer end of the stick section 2. The threaded end of the bolt which projects through a partition 12 is engaged by a lock nut 14. It will be apparent that by turning the handle on the stick section 2 the bolt 11 will be moved longitudinally and thereby regulate the tension of the spring 10.

In training ships there is an extra stick in the front cockpit which is occupied by an instructor and another stick for the student. Of course, there is a connection between the sticks. Should the student, for any reason refuse to yield the controls to the instructor, the situation is known as freezing to the stick or freezing to the controls and in such instance the instructor must employ his whole strength for operating his stick, and should the student be of greater physical strength and providing the controls do not distort or break, a crash of the ship is almost certain. With my improvement it will be apparent to those skilled in the art that the instructor will always have full control of the ship and that the stick will teach the student to fly smoothly and gently as when the sections of the stick are in released position, as disclosed by Figure 2 of the drawings. With a student who is prone to jerk the controls or handles the same faster than the surfaces are able to act the flange 4 of the section 2 will be canted or tilted on the flange 3 of the lower section 1 and the spring will carry the lower stick section at the speed at which the aeroplane itself is designed to be controlled. Thus should the control stick be moved rapidly say to the right it

does not mean that the aeroplane will answer with the same rapidity as it will take its time to bank on that side as quick as the design of the ship warrants and not as quick as the stick is jerked or "yanked" over. It will be thus seen that the excessive abruptness not only is rough handling and leads to no quicker response, but actually hinders the control of the ship as it "squashes" the aerodynamic efficiency of the surfaces. It is to be further noted that the spring can be readily adjusted by simply turning the handle 13 and thereafter screwing home the jamb nut 14, so that the said stick can be set according to the characteristics or the sensitiveness of the controls of the several particular ships. A ship easily cnotrolled, that is a ship that does not require much pressure on the stick to move the control surfaces, would have the stick adjusted for the maximum pressure needed, and if the flanges 4 separate from the flanges 3 under pressure upon the upper stick section 2 the controls will continue to be applied as smoothly as they should have been, and this will demonstrate to the student that he has applied too much pressure or the sudden impulse on the stick. The eagerness that prompts the student to apply his controls too roughly, indicates that he is not calm nor at home or in other words, that he is flying under strain and nervous tension. The construction of my stick will warn him of this condition and prove to him the futility of the sudden jerking of the stick and will result in composing the student and curing him of nervousness so that he will shortly find himself at home.

In serious cases, that is where students are obstinate in roughly handling their controls, the spring can be so adjusted that it will absolutely refuse to carry the controls only when applied very smoothly.

It is believed that the safety of my improvement will be obvious, it being, of course, understood that the instructor's stick is positively connected to the control below the flanges so that the instructor has full control of the ship even should the student freeze his stick or antagonize the instructor's movements in any way. The spring of the improvement is susceptible to both a bending and pulling action.

Aside from the above advantages of my improvement, the fact that the instructor has no trick lever, no cable, no spring trap to pull or any other contrivance which might or might not work in an emergency and also that the stick is of such construction that the same may be employed by the instructor when flying in the student's cockpit, in which instance, of course, the flanges are locked together. Thus it will be noted that my stick may be employed either for use by students or the instructor or by students in solo flying and that the same will eliminate any mental worry upon the part of the instructor when flying in the student cockpit, and likewise that the spring may be so tensioned that the stick may operate even when the flanges are not locked together.

Having described the invention, I claim:—

A student's control stick for airships comprising a lower tubular section and an upper tubular section, flanges on the confronting ends of the sections having peripheral notches, swingable bolts carried by the lower flange movable through the notches, wing nuts on said bolts, a coil tension spring having one end fixedly secured in the lower section, a bolt member connected with the outer end of the coil spring, a tubular handle on the upper stick section having a partition through which the bolt is threaded, a lock nut on the bolt contacting with the partition and said handle being turnable on the said stick section for imparting a longitudinal movement to the bolt and for adjusting the spring.

In testimony whereof I affix my signature.

JOE BEN LIEVRE.