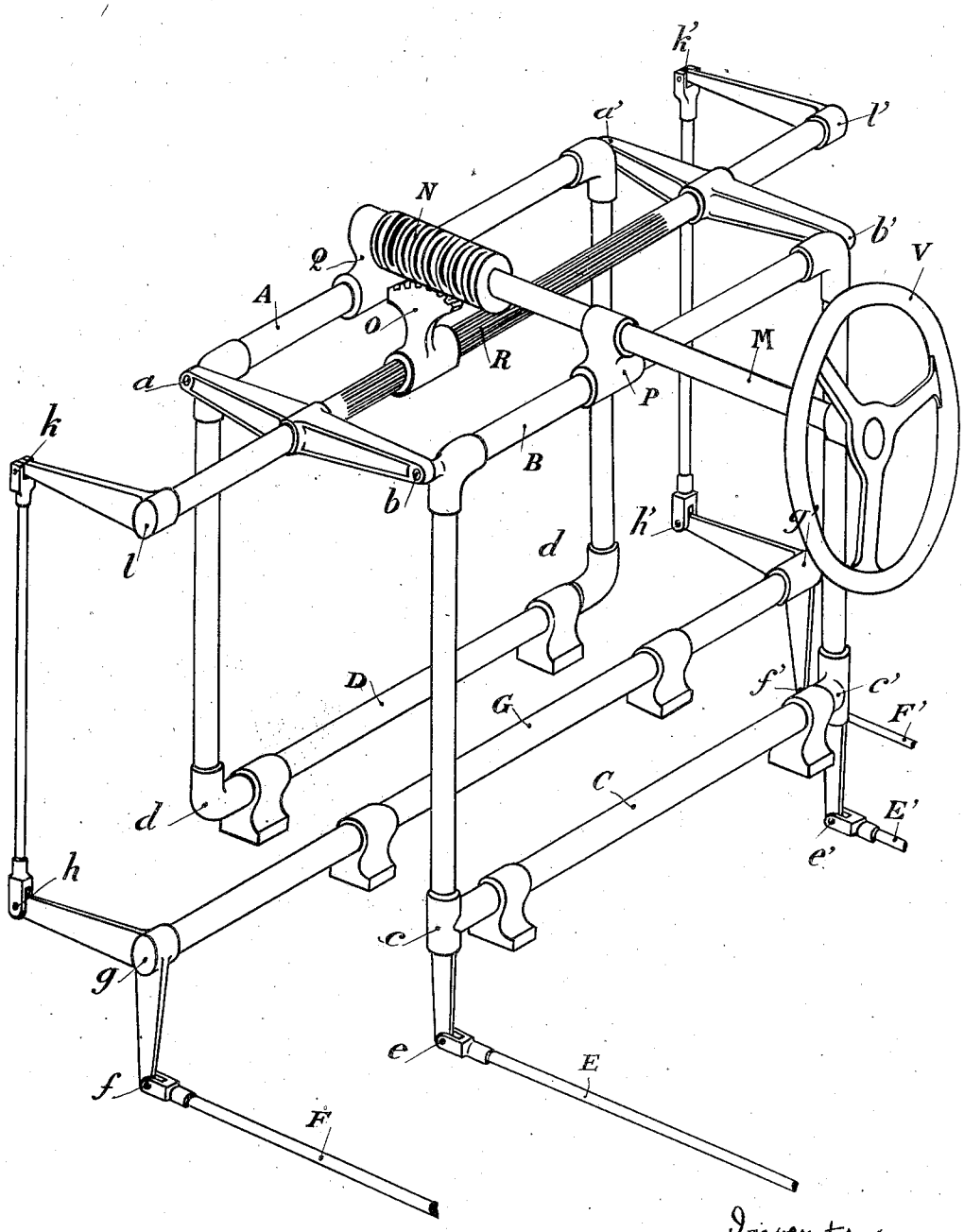
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N. E. METHLIN

CONTROL POST

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UNITED STATES PATENT OFFICE.

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CONTROL POST.

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To all whom it may concern:

Be it known that I, NICOLAS EMILIEN METHLIN, a citizen of the Republic of France, resident of Paris, France, have invented new and useful Improvements in Control Posts, which are fully set forth in the following specification.

This invention has for its object to provide improved control posts for aeroplanes, characterized by the use of deformable parallelograms for affording a conjugated control of the elevator and the ailerons and allowing of providing a double or multiple control post with a single hand-wheel.

A practical form of this invention is illustrated by way of example applied to a double-control station in the accompanying drawing.

In the illustrated example, the improved apparatus comprises two jointed parallelograms a—b—c—d and a'—b'—c'—d' whereof the apices c, c' and d, d' are fixed points. These two parallelograms are coupled together at their movable apices a, a' and b, b' by means of bars A, B, and if desired also at their fixed apices d, d' and c, c' by means of bars C, D.

On the bars A and B there is mounted a casing (not shown) comprising two bearings P and Q in which the bars A and B can turn, and which, together with the said casing, are able to slide freely along these bars. A hand-wheel V enables the pilot or pilots, through the medium of a shaft M (capable of turning but not of sliding in the bearings P and Q) to actuate the transmission for the control of the ailerons and the control of the elevator.

The sides c—d, and c'—d' of the parallelograms being horizontal, then, when the pilot exerts a pushing or a pulling force upon the hand-wheel V, the shaft M of this hand-wheel remains horizontal like the sides a—b and a' and b' parallel to c—d and c'—d'. In this forward or rearward manœuvre the pilot acts upon the elevator through the medium of the levers c—e and c'—e' formed as extensions of the bars b—c and b'—c' and pivoted to the connecting rods E, E'.

The control of the ailerons is effected in the following manner:—

The levers g—f and g'—f' controlling the ailerons, are secured to the sides g—h and g'—h' of two jointed parallelograms g—h—k—l and g'—h'—k'—l' the apices g, g' and l, l' of which are situated respectively in the planes formed by the bars D and C on the one hand and A and B on the other hand; the sides g—l and g'—l' being parallel to the direction a—d.

These sides g—l and g'—l' need not be provided in concrete form because the sides a—d, a'—d', b—c, b'—c', are sufficient for assuring the rigidity of the structure. On the shaft M of the hand-wheel V there is fixed a worm N meshing with a wormwheel sector O which latter is mounted on a bar R which, together with the bar G, serves for coupling together the two parallelograms g—h—k—l, and g'—h'—k'—l'. This bar R is provided with flutes or longitudinal grooves along which can slide inner ribs formed on the hub of the sector O for the purpose of allowing the latter to be shifted along the bar R. This bar R and the sector O are however rigidly fixed together as regards the rotational motion of the sector O.

The combination of the sector O, the worm N, the bearings P and Q and the hand-wheel V, contained in a casing is then capable of being moved parallelly to itself along the bars A, B and R.

If the pilot pushes or pulls the hand-wheel V without causing it to rotate, the angle enclosed by the sides a—b and k—l will remain unaffected, and the parallelograms a—b—c—d, a'—b'—c'—d', g—h—k—l and g'—h'—k'—l' are deformed without the levers g—f and g'—f' being affected thereby. Solely the elevating control is then actuated.

If the pilot causes the hand-wheel V to rotate without giving it a translation movement, the elevating control will remain unaffected, whereas the angle enclosed by the sides k—l and a—b will be altered with the result of causing deformation of the parallelograms g—h—k—l and g'—h'—k'—l' which carry along with them the lever g—f and g'—f' that actuate the ailerons by means of the rods F, F'.

The two motions, namely the forward or rearward translation of the hand-wheel and the rotation of the latter, may be effected simultaneously, so that the control of the ailerons and the control of the elevating rudder can be combined together.

Since the hand-wheel and the casing are adapted to slide along the bars A, B and R, it is possible to operate both controls in any

position of the said hand-wheel on the said bars. The casing may be fixed in front of each pilot's seat by means of a suitable catch.

In the case of a single control post the parallelogram *a'—b'—c'—d'* may be dispensed with, as well as the bars A, B, C, D. In such a case the casing is fixed and constitutes the side *a—b*.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A control device for aircraft comprising, in combination with an elevator and ailerons, a pair of jointed parallelograms, levers for said elevator connected to said parallelograms, means connecting said parallelograms, a shaft slidably mounted on said means between said parallelograms, a hand wheel carried by the shaft, a worm carried by the shaft, a bar pivotally carried by said parallelograms and having a splined portion, a worm sector slidably mounted in the splined portion of the bar and having engagement with said worm, a pair of parallelograms operatively connected to said bar, and levers connecting said ailerons and said last named parallelograms.

2. A control apparatus for aircraft comprising a pair of parallelograms, each of said parallelograms including a pair of elements movable about fixed pivots, levers connected to said parallelograms, a bar pivotally carried by said parallelograms, a worm sector slidably mounted on said bar, rods rigidly connecting said parallelograms, a member slidable on said rods, a worm carried by said member in engagement with said sector, a wheel carried by said member, a pair of parallel linkage devices operatively connected to said bar, and levers connected to each of said devices.

3. In combination with an elevator and ailerons, a pair of jointed parallelograms, motion transmitting means connected to said elevator and parallelograms, a bar carried by said parallelograms, a member carried by said bar, connecting means for said parallelograms, means carried by said connecting means and having operative engagement with said member, a pair of articulated parallelograms operatively connected to said bar, and motion transmitting means connected to said ailerons and said articulated parallelograms.

4. In combination, a pair of parallel linkage device, motion transmitting means connected thereto, rotatable means carried by said devices, connecting means for said devices, manually operable means slidably mounted on the connecting means and operatively engaging said rotatable means, a pair of parallel linkage devices connected to said rotatable means, and motion transmitting means operatively connected to said last named pair of devices.

5. Control apparatus for aircraft comprising, in combination with an elevator and ailerons, a pair of pivotally mounted elements, motion transmitting means secured to one of said elements and to said elevator, a shaft pivotally connected to said elements, a worm carried by the shaft, a hand wheel carried by the shaft, a rotatable bar, a worm sector carried by the bar in operative engagement with the worm, a pair of jointed parallelograms connected to said bar, and motion transmitting means connected to said parallelograms and ailerons.

6. Control apparatus for aircraft comprising, in combination with an elevator and ailerons, a pair of pivotally mounted elements, motion transmitting means secured to one of said elements and to said elevator, manually operable means pivotally connected to said elements, a rotatable member operatively engaging said manually operable means, a pair of parallel linkage devices connected to said rotatable member, and motion transmitting means connected to said devices and ailerons.

7. Control apparatus for aircraft comprising, in combination with an elevator and ailerons, a pair of pivotally mounted elements, manually operable means pivotally connected to said elements, means connected to one of said elements for transmitting pulling and pushing movements exerted on the manually operable means to said elevator, a pair of articulated parallelograms, means for transmitting motion from the manually operable means to each of said parallelograms, and control means connected to said parallelograms and said ailerons.

In testimony whereof I have signed this specification.

NICOLAS EMILIEN METHLIN.

Witnesses:

ANDRÉ MOSTICKER,

LOUIS GARDET.