March 4, 1924. 1,485,785

R. KAUCH

COMPENSATING SIGHTING INSTRUMENT

Filed May 13, 1922

Fig. 2.

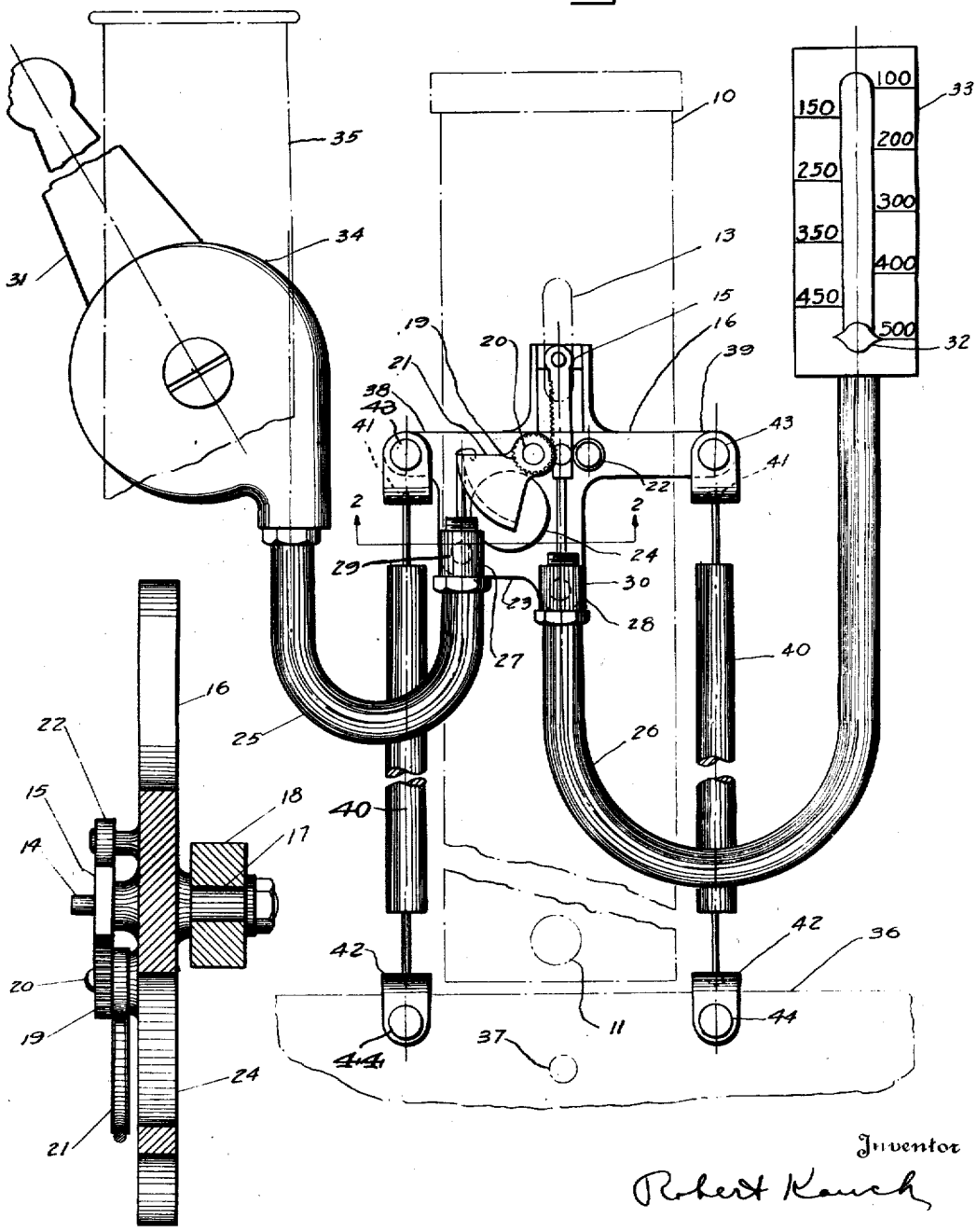


Fig. 1.

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UNITED STATES PATENT OFFICE.

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COMPENSATING SIGHTING INSTRUMENT.

Application filed May 13, 1922. Serial No. 560,701.

To all whom it may concern:

Be it known that I, ROBERT KAUCH, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Compensating Sighting Instruments, of which the following is a specification.

This invention relates to a sighting instrument adapted to compensate for the speed of a moving target by leading the target by the line of sight the correct amount for any given range.

The apparatus hereinafter described is particularly applicable to fixed gun installations of airplanes in which the aiming of the gun or guns is accomplished by the steering of the airplane, but it will be understood that the invention may be otherwise employed and embodied without departing from the spirit and scope thereof.

In the following specification the invention is described in connection with the accompanying drawings, in which:

Figure 1 is a diagrammatic view of an embodiment of the invention associated with the rudder bar of an airplane.

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

In Figure 1 the telescope 10 is shown partly in broken lines in order to disclose the compensating mechanism located below it. The telescope or sighting device is intermediately pivoted by trunnions 11 projecting therefrom and rotatably mounted in a suitable support (not shown) preferably forming a part of the fuselage. Toward its objective end the outer casing of the telescope is formed with an elongated slot 13 in which a pin 14 projecting upwardly from a rack 15 is slidably mounted. The rack 15 is, in turn, slidably mounted on a bracket 16 which is pivoted on a stud 17 journalled in a support 18.

A pinion 19 meshing with the rack 15 is rotatably mounted on a pin 20 projecting from the upper surface of bracket 16 and this pinion carries a gear sector 21, integral therewith. A roller 22 mounted on a stud on bracket 16 maintains the rack in engagement with the pinion 19. The left hand side of the bracket 16, as shown in Figure 1, is provided with a rectangular enlargement 23 having a lightening hole 24 therein. Bowden wires 25, 26 are provided with end connections 27, 28 respectively, which are pivotally connected to this rectangular enlargement as indicated at 29, 30. The corresponding inner ends of the inner transmitting member of the Bowden wires 25, 26 are connected respectively to the sector 21 and to the rack 15 while the outer ends thereof are connected to a Bowden control lever 31 and the indicator 32 of a range indicating device 33. The wire 25 preferably enters a casing 34 which is attached to the control stick 35 or otherwise arranged within convenient reach of the aviator. A rudder bar 36 pivoted as indicated at 37 is connected at opposite sides of its pivot to the oppositely projecting arms 38, 39 of the bracket 16 at equal distances from the axis of rotation thereof, by means of the Bowden wires 40 to the ends of which are fastened clips 41, 42 which are respectively pivotally connected to the bracket 16 and rudder bar 36 by pins 43, 44.

In operation, the range of the target is found by any suitable range finding instrument and this range is laid off on the indicating device 33 by actuating the lever 31 in the proper direction. Motion is transmitted from this lever, to Bowden wire 25, thence to the gear sector 21, pinion 19, rack 15, and Bowden wire 26 to the indicator 32. The pinion 19 is rotated and moves the pin 14 in the slot 13 of the telescope. Now the rudder bar is moved so that the airplane and guns carried thereby follow the target as viewed through the telescope 10. The movements of the rack place the pin 14 at various positions in the slot 13 in accordance with the range of the target, thereby changing the distance from the fulcrum 11 of the telescope to the axis of said pin. Equal angular motions of the rudder bar will therefore impart different angular movements to the telescope depending upon the position of the pin in the slot 13 which automatically compensates for the speed of the target in relation to the airplane at the given range.

I claim:—

1. The combination with the rudder bar of an aircraft, of a sighting device, and means connecting the rudder bar and sighting device, said means including compensating mechanism for varying the angular relation between the movements of said rudder bar and the corresponding movements of said sighting device.

2. The combination with the rudder bar

of an aircraft, of a pivoted telescope having a longitudinal slot in the casing thereof, a pin engaging in said slot, means connected to said rudder bar adapted to swing said pin so as to move the telescope pivotally, and means for positioning said pin in accordance with the range of the target.

3. The combination with the rudder bar of an aircraft, of a pivotally mounted telescope having a longitudinal slot in the casing thereof, a pivoted bracket, a rack slidably mounted on said bracket and carrying a pin adapted to engage in said slot, means connecting said bracket and rudder bar whereby the angular movements of the latter are imparted to the former, and means associated with said rack for positioning said pin in said slot in accordance with the range of the target.

4. In an airplane having a fixed gun installation, a sighting device means for directing the airplane toward the target through said sighting device, and mechanism connecting said means and sighting device whereby the gun installation is aimed at the correct angle to compensate for the speed and range of the target.

5. The combination with the rudder bar of an aircraft, of a pivoted bracket adapted to be rotated and maintained in parallel relation thereto, a sighting device, mechanism connecting said bracket and sighting device and means for varying the position of said mechanism in accordance with the range of the target.

In testimony whereof I affix my signature.

ROBERT KAUCH.