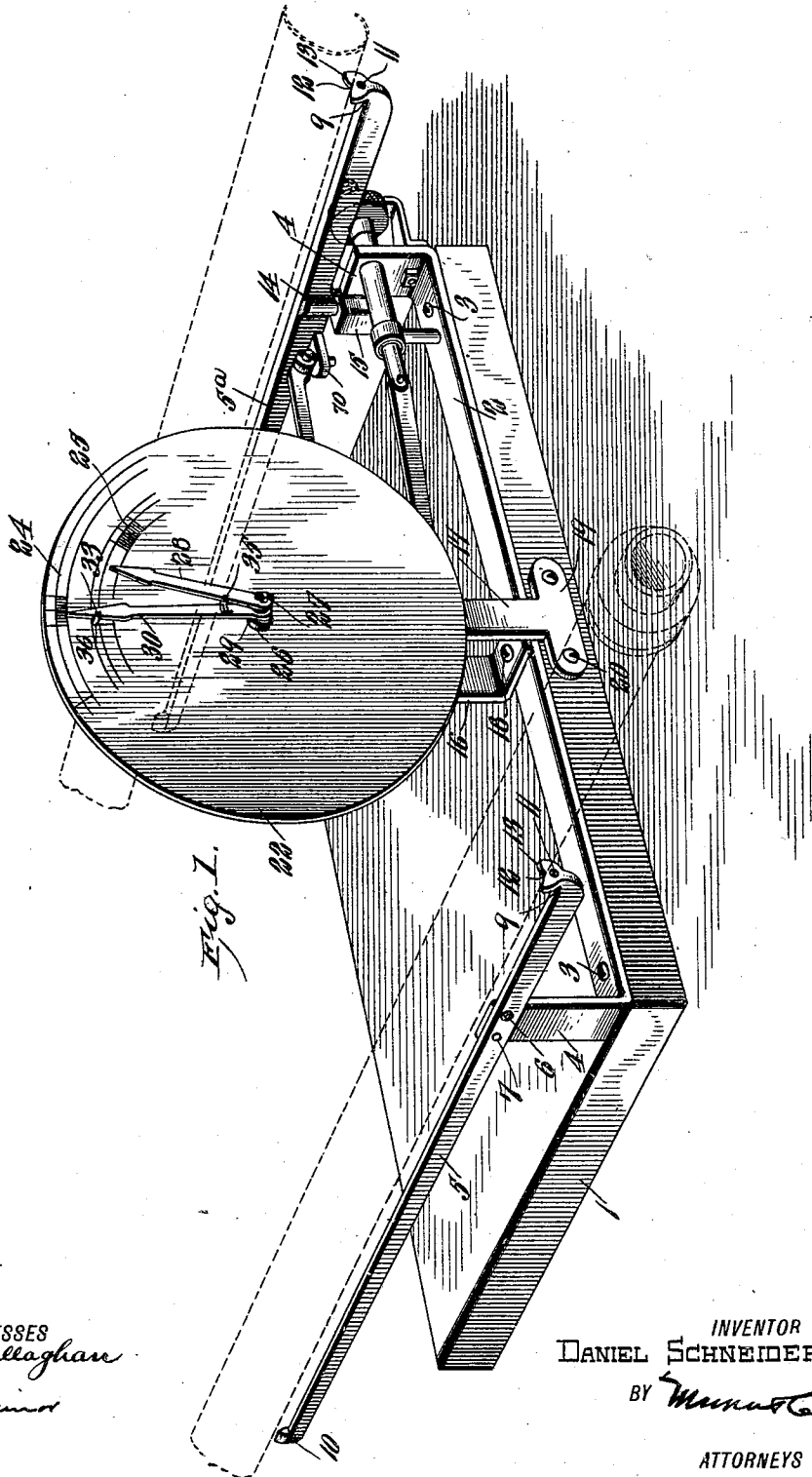


968,426.

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APPLICATION FILED JUNE 30, 1908.

Patented Aug. 23, 1910.
3 SHEETS—SHEET 1.

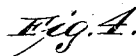


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3 SHEETS—SHEET 2.



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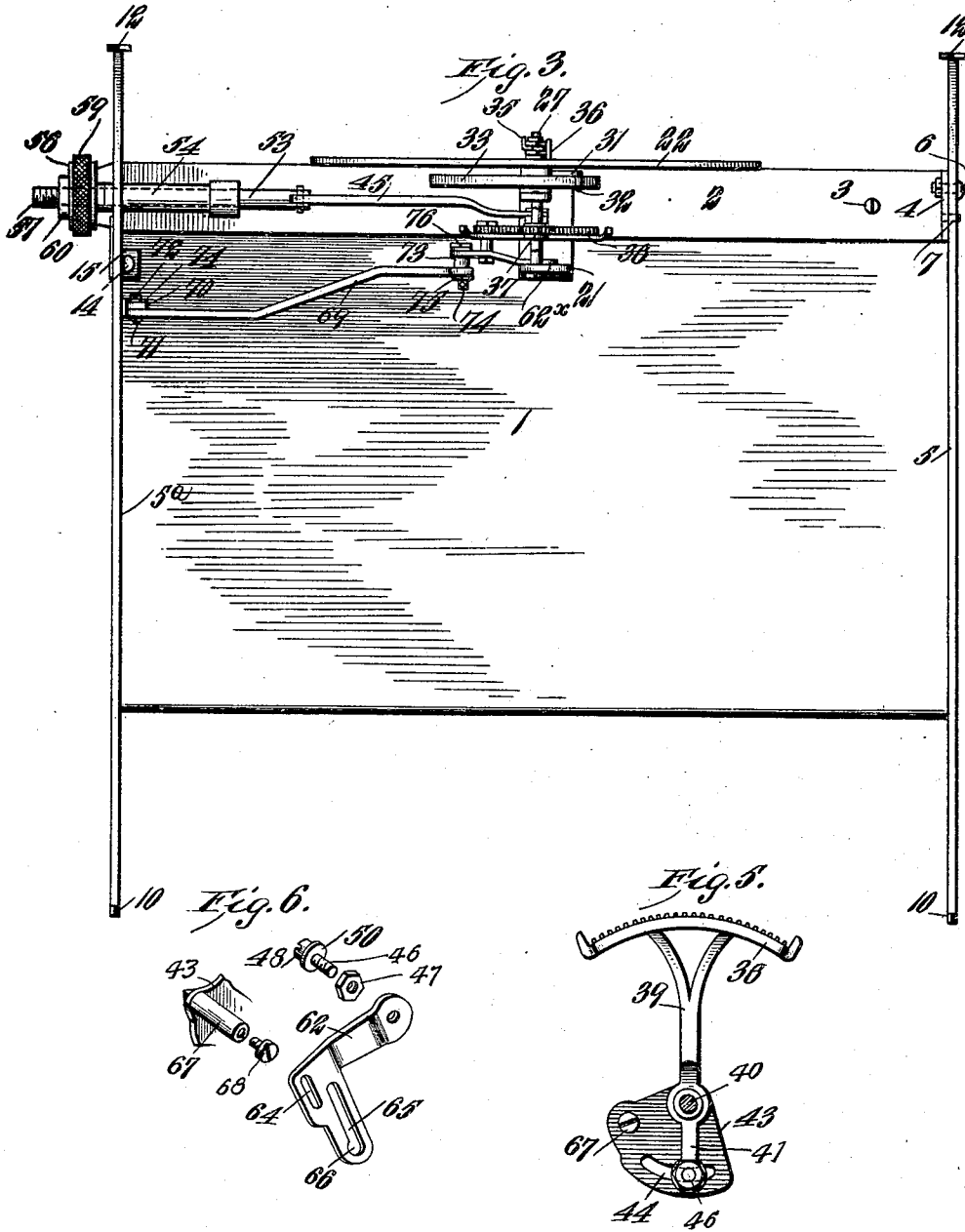
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UNITED STATES PATENT OFFICE.

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RANGE-FINDER.

968,426.

Specification of Letters Patent.

Patented Aug. 23, 1910.

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To all whom it may concern:

Be it known that I, DANIEL SCHNEIDER, a citizen of the United States, residing at Dixie, in the county of Walla Walla and State of Washington, have made certain new and useful Improvements in Range-Finders, of which the following is a specification.

My invention is an improvement in range finders and consists in certain constructions and combinations of parts hereinafter described and claimed.

The object of the invention is to provide a device of the class described, which will indicate on a dial, the angle of variation between a pair of normally parallel supports, upon each of which is rigidly mounted a telescope.

Referring to the drawings forming a part hereof: Figure 1 is a perspective view of the improvement, Fig. 2 is a rear view of the improvement, Fig. 3 is a plan view, Fig. 4 is a section on the line 4-4 of Fig. 2, Fig. 5 is a detail front view of the segment, and Fig. 6 is a perspective view of a portion of the mechanism.

The embodiment of the invention shown in the drawings, comprises a base plate 1, having secured to one of the edges thereof, a plate 2, by means of screws 3, and the ends of the plate are upturned as at 4.

A telescope support 5 is fixed to one upturned end, by a rivet 6, which traverses the support and the upturned end, and the said support is provided with a pin 7, which engages an opening in the upturned end to prevent swinging movement of the support on the said end. A similar support 5^a is connected with the other upturned end in a manner to be presently described, the said support being provided with a journal pin 14, engaging a bearing in a block 15 integral with the adjacent upturned end of the plate, the said journal pin forming a vertical axis, upon which the support swings. Each of the said supports comprises a bar gradually decreasing in cross section from that side of the base plate to which the plate 2 is fixed, and which will hereafter be designated as the front. At their small ends, the supports are provided with a front sight 9, and at the opposite end with a back sight 10, the said front sight consisting of a lug having a circular opening 11 there-through, and with a vertical incision 12, which has its edges flaring as at 13. The point of support

for each of the supports, is as shown much nearer the front sight than the back sight.

At approximately the center of the plate 2, a pair of spaced standards 16 and 17 are arranged, the standard 16 being secured to the base plate and plate 2 by a screw 18, while the standard 17 is provided at its lower end with a cross head 19, which is secured to the edge of the base by screws 20. A gear-casing 21 is supported by the standard 16, and a dial 22 is secured to the standard 17, the upper end of the said standard being provided with a cross-head 23, to which the dial is secured in any suitable manner.

The front of the dial as shown in Fig. 1, is provided with a plurality of circular series of graduations, forming a pair of concentric scales 24 and 25, the scale 25 being a continuation of the scale 24 and at its center the dial is provided with an opening 26, through which extends the end of a shaft 27, which is journaled in the gear casing, and the said extended end has secured thereto, a hand 28, coöperating with the inner scale 25, and an arbor 29 is journaled on the shaft, upon which is secured a hand 30 coöperating with the outer scale 24.

An arm 31 is rigidly connected within the inner end of the arbor 29, and the free end of said arm is provided with a pin 32, to which is connected the outer end of a spiral spring 33, the inner end of the said spring being connected to a pin 34 upon the gear casing. The hand 30, which is of greater length than the hand 28, is provided with a lateral pin 35, for engagement by the short hand 28, and the dial is provided with a pin 36 for engagement by the long hand, the said pin being at such a distance from the center of the dial, that the short hand will not engage the same when it is rotated around the dial.

The shaft 27 before mentioned, is provided with a pinion 37 within the gear casing, and the pinion is engaged by a gear segment 38 on the end of an arm 39 extending from a counter-shaft 40, also journaled in the gear casing. Said shaft is provided with another arm 41, having in the free end thereof, an opening. A segmental plate 43 is journaled on the countershaft, and is provided with a segmental slot 44, which is adapted to register with the opening of the arm. A link 45 is provided in one end with

an opening, adapted to register with the opening of the arm, and the slot 44, and a bolt 46 traverses the registering openings and the slot, and the end of the bolt is engaged by a nut 47, for retaining the parts in position.

A bolt 46 is provided with a head 48, and with a washer 50, adjacent to the head, and a washer 49 is arranged on the bolt between the link 45 and the plate 43 to retain them in spaced relation, and the bolt is engaged by a nut 47 to secure the parts in place. The opposite end 51 of the link 45, is received between perforated ears 52 on a rod 53, and a pin 52^a traverses the ears and the interposed end of the rod, for securing the parts together. The rod is slidable in an elongated bearing sleeve 54, supported by a standard 55 projecting upwardly from the plate 2, and the end of the rod which extends through the bearing and through a bearing 56 on the adjacent upturned end of the plate 2, is threaded as at 57, and engaged by a nut 58, having a milled head 59. The outer end of the rod passes through an opening 60 in a bracket arm 61 secured to the adjacent upturned end.

An angular arm 62 is secured to the gear casing, by a screw 63, and the angular portion of the arm is provided with parallel slots 64 and 65, the slot 65 being of greater length than the slot 64, and provided at its lower end with an enlargement 66.

A sleeve 67 is provided with a reduced portion received in one of the openings in the plate 43 before mentioned, and the other end of the sleeve is internally threaded. A screw 68 is passed through the slot 65 of the arm 62, and engages the threaded end of the sleeve 67. The lower end of the slot is engaged as shown at 66, so that when the screw is loosened it may be moved to the end of the slot and the head withdrawn and the link 69 is pivotally connected by one end to an ear 70 on the movable telescope support, and by the other end to the slot 64 in a manner to be presently described.

Each end of the link is provided with a bearing, and a bolt 71 traverses the bearing adjacent to the movable telescope support and the ear 70, and a pin 72 secures the bolt in place. The opposite bearing is traversed by a bolt 76, a collar 73 being arranged between the angular arm, and the bearing, and a pin 74 passes through the outer end of the bolt for securing the parts in place, and washers 75 are arranged on both of the bolts 71 and 67.

It will be evident from the description, that the connection between the link 69 and the angular plate may be adjusted by moving the bolt 67 in the slot 64, and that the connection of the said angular plate with the segmental plate may be varied by moving the bolt 67 in the slot 65. The connec-

tion between the segmental plate and the arm 40 may also be varied by means of the bolt 46.

The normal position of the hands is as shown in Fig. 1, the hands being in parallelism and pointing toward the zenith, with the long hand at zero, on the outer scale, 24, and with the short hand at zero on the inner scale 25, and when the hands are in such position, the movable support is in parallelism with the fixed support.

The normal position of the hands is shown in Fig. 1, the long hand resting against the pin 33, and the short hand resting against the pin 35. Now, when the nut is rotated to draw the rod 53 through the bearing 54 the short hand is turned clockwise, until it makes approximately a complete rotation about its pivot, that is until it engages the pin 35, on the opposite side from the position shown in Fig. 1. The continued turning of the two moves the short hand farther, and the long hand is carried therewith, against the resistance of the spring, until it engages the pin 33 on the opposite side and is checked.

As the rod 53 is drawn outward through the bearing, the upper end of the segment is swung to the right of Fig. 2, thus rotating the pinion 37 and the shaft 27 to which the short hand is secured. The long hand is moved altogether by the short hand, and returned by the spring.

The oscillation of the shaft 40, to which the gear segment carrying arm is connected, moves the link 69, which in turn swings the movable telescope support on its vertical axis, thus gradually decreasing the angle between the two supports and the extent of decrease is indicated by the hands on the dial, the said graduations being marked in degrees for that purpose.

The dial is graduated experimentally, in each instrument, on a known range, and the instant the two telescopes are focused upon the same object the distance is automatically calculated and registered on the dial.

I claim:

1. A range finder comprising a base, a standard at each end thereof, one of said standards having a block provided with a vertical opening, a fixed telescope support on the other standard, a movable telescope support provided with a journal pin engaging the opening of the block, a bracket intermediate the standards, a dial secured thereto and provided on its face with an inner and an outer series of graduations, a shaft journaled in the standard and projecting through the dial at the center thereof, a hand secured to the shaft for cooperating with the inner series, an arbor on the shaft, a longer hand secured thereto and cooperating with the outer series, a pin on the last named hand, a pin on the dial, a spring

connected with the arbor and normally retaining the long hand in contact with the pin, a pinion on the shaft, a rock shaft journaled in the bracket, and provided with an arm and with a gear segment meshing with the pinion, a rod slidable in the standard provided with the movable support, a link connecting the rod with the arm of the rock shaft, a nut threaded on the rod and engaging the standard, a plate pivoted to the bracket and provided with a plurality of slots, a pin adjustable in one of the slots and connecting the plate with an arm of the rock shaft, and a link pivoted to the movable support and adjustably connected with the other slot.

2. A range finder comprising a base provided at one end with a fixed telescope support and at the other with a movable telescope support adapted to swing on a vertical axis, a dial arranged between the supports, and provided with inner and outer annular scales, a shaft journaled concentric with the scales, a hand secured to the shaft, and co-operating with the inner scale, an arbor on the shaft, a hand secured thereto and co-operating with the outer scale and of greater length than the other hand, said outer scale being a continuation of the inner scale, means for moving the short hand, a connection between said means and the movable support for operating the same, a spring connected with the arbor for returning the long hand, said long hand having a pin for engagement by the short hand, and a pin on the dial for limiting the movement of the long hand to a single rotation.

3. In a device of the class described, a dial provided with concentric annular scales, the outer scale being a continuation of the inner scale, a pair of hands coöperating with the scales, a spring for moving one of the hands in one direction, a pin on said hand for engagement by the other hand to move said hand in the opposite direction, means for limiting the movement of the first hand to one complete revolution, a fixed telescope support, a movable telescope support, and a connection between said support and the second hand for operating the same.

4. A device of the class described compris-

ing a dial provided with concentric annular scales, the outer scale being a continuation of the inner scale, a pair of hands coöperating with the scales, a spring for moving one of the hands in one direction, a pin on said hand for engagement by the other hand to carry said other hand in the opposite direction, means for limiting the first hand to one complete revolution, a fixed and a movable telescope support, and a connection between the movable support and the second named hand for moving the same.

5. A range finder comprising a pair of normally parallel telescope supports, one of said supports being fixed, and the other mounted for swinging movement on a vertical axis, a scale, an indicator coöperating with the scale, a swinging plate provided with a plurality of parallel slots, means for operating the indicator adjustably connected with one of the slots, and a link connected at one end to the movable support and at the other in the other slot.

6. In a device of the character described, a dial provided with concentric annular scales, the outer scale being a continuation of the inner scale, a pair of hands coöperating with the scales, a fixed and a movable telescope support, a connection between the movable support and one of the hands for moving the same, means for connecting said hand with the other hand when said first named hand has made approximately a complete revolution, whereby to carry said last named hand therewith, and a spring for returning the last named hand.

7. In a range finder, a plurality of scales, one of which is a continuation of the other, an indicator coöperating with each scale, an operating mechanism for one indicator, means on the other indicator for engagement by the first-named indicator, whereby to move the second indicator, a spring for returning said other indicator, and means for stopping said other indicator at the end of the first scale.

DANIEL SCHNEIDER.

Witnesses:

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